

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



SØNDERBORG, 5 September 2011

Nina Burhenne, shecco



shecco

SUSTAINING OUR ATMOSPHERE

about shecco



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

100+ customers worldwide



our business areas



public affairs

b2b online platforms

market research



events management

getting your technologies

faster to market

our business areas



public affairs

b2b online platforms

market research



events management

getting your technologies

faster to market

shecco b2b platforms



- shecco manages 3 business-to-business web platforms promoting natural refrigerant technologies
 - 2000+ articles about natural refrigerants
 - 1.5 million+ page views
 - 8000 +/- experts (incl. policy), 150 + countries
 - www.R744.com
 - www.ammonia21.com
 - www.hydrocarbons21.com



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. A user profile section for Marc Chasserot is visible, showing a welcome message and links for 'my profile', 'settings', and 'logout'. The main content area is titled 'COMMUNITY ACTIVITIES' and shows a search bar, a 'Find' button, and a list of activities. One activity by 'dongho lee' is highlighted, stating they are looking for a 'Seal' for a CO₂ Heat pump. Another activity mentions Marc Chasserot attending the 23rd IIR International Congress of Refrigeration. On the right side, there are sections for 'Notifications' (2 requests, 1 message), 'People' (listing Daniel de Beer, Klaas Visser, and Sabine Lobnig), and 'Popular Products' (listing Rotary 2-Stage CO₂ Compressor).

- the first global professional network for natural refrigerants
- exchange knowledge, connect with partners, customers
- set up meetings, comments, network updates
- integrated community concept: share content about CO₂, NH₃ and HCs - without any barriers

our business areas



public affairs

b2b online platforms

market research



events management

getting your technologies

faster to market

ATMOsphere - faster to market



A screenshot of the ATMOsphere website homepage. The header includes the ATMOsphere logo with the tagline "faster to market natural refrigerants" and a navigation menu with links for HOME, EVENTS, NEWS, SPONSORS, MEDIA, and CONTACT. A search bar is located on the right. The main content area features a grid of workshop presentations with speaker photos and titles, such as "Didier Coulomb: Mission of the IIR" and "Volkmar Hasse: The costs involved in HC conversions". Below this is a section for "EVENTS" with details for "ATMOsphere Europe 2011" and "ATMOsphere 2010". A "NEWS" section lists "Selected Technical Case Studies" and "2 new supporters for ATMOsphere: Parker and Linde". A "SPONSORS" section lists Platinum sponsors like Carrier and Gold sponsors like MAREKAWA and MYCOM.

- 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 2010



- 27-28 September 2010, Brussels
- 40 presentations: policy, technology
- 3 panel debates: Retail, India, Education
- 3 technology sessions
- 30 moderators for 3 roundtable discussions
- 44% suppliers; 26% policy; 18% academia, associations, NGOs; 12% end-users

ATMOsphere Europe 2011



- Brussels, 11-12 October 2011
- interactive workshop with focus on the European Union
- 170 participants
- topics:
 - policy: F Gases, Eco-Design
 - technology: case studies
 - end-users: panel debates
- Roadmap with 10 point action plan

ATMOsphere Europe 2011



Policy	The logo for the United Nations Environment Programme (UNEP), featuring a stylized human figure within a laurel wreath. UNEP	End-Users	The logo for Carrefour, consisting of a stylized 'C' with a red triangle on the left and a blue triangle on the right. Carrefour
The logo for the European Commission, featuring the flag of the European Union (a blue rectangle with twelve yellow stars in a circle). EUROPEAN COMMISSION	The logo for the European Parliament, featuring a stylized dome structure above a smaller European Union flag. EUROPEAN PARLIAMENT	The logo for COOP, featuring the word "coop" in a bold, blue, lowercase sans-serif font.	The logo for Marks & Spencer, featuring the words "MARKS & SPENCER" in a grey, uppercase serif font, with the ampersand in yellow.
The logo for the Federal Public Service Health, Food Chain Safety and Environment, featuring a stylized red and green circular graphic. federal public service HEALTH, FOOD CHAIN SAFETY AND ENVIRONMENT	The logo for Miljøministeriet (Danish Ministry of the Environment), featuring a crown above the text "Miljøministeriet".	The logo for TESCO, featuring the word "TESCO" in a bold, red, uppercase sans-serif font with blue diagonal stripes below it.	The logo for Migros, featuring the word "MIGROS" in a bold, orange, uppercase sans-serif font.
The logo for Umwelt Bundes Amt, featuring the text "Umwelt Bundes Amt" in green and a small circular icon with a cross. Umwelt Bundes Amt Für Mensch und Umwelt	The logo for Industrial Chemistry Research Institute Poland, featuring a stylized blue 'i' and 'r' combined into a circle. Industrial Chemistry Research Institute Poland	The logo for Coca-Cola, featuring the word "Coca-Cola" in its iconic red script font.	The logo for Unilever, featuring a stylized blue 'U' with intricate floral patterns inside, above the word "Unilever" in a blue serif font.

ATMOSphere Europe 2011



<p>Industry</p>		<p>Commercial Refrigeration</p>	<p>Domestic & Industrial Heat Pumps</p>
		<p>Mobile Air Conditioning</p>	<p>Commercial Cooling</p>
			<p>Industrial Refrigeration</p>
			

ATMOsphere Europe 2011



SANDEN Manufacturing Europe:
Development of a high efficiency CO₂ Heat Pump for domestic hot water use in Europe

KAV Consulting: The world's first two stage CO₂ transcritical refrigeration system at a food processing plant

Obrist Engineering: New safety system for hydrocarbons in Mobile Air Conditioning

Star Refrigeration: NH₃ large heat pump at Nestle factory

Carrier Transicold: Efficient and sustainable container refrigeration applications using CO₂

Mayekawa: Field case studies of industrial plants operating with natural refrigerants

Sanyo: High ambient energy efficient CO₂ supermarket showcases

DTI: Server room heat recovery and free cooling with CO₂ and Propane

Johnson Controls: R290 chillers & R600a heat pumps replacing an R22 system in a hospital

Frigo-Consulting: Waste heat recovery with combined adsorption and transcritical CO₂

Danfoss: Energy consumption of second generation CO₂ refrigeration system

R290 Air Conditioning systems in China - serial production & cost savings (tbc)

ATMOsphere America 2012



ATMOsphere faster to America
AMERICA natural refrigerants

The Business Case for Natural Refrigerants
April 2012
Washington DC



Programme

For the first time the successful ATMOsphere Natural Refrigerants workshop concept will be coming to America, with the aim to bring CO₂, ammonia and hydrocarbons refrigerants faster to the North American market.

In April 2012, around 200 key industry experts and stakeholders will be meeting in Washington DC to discuss the Business Case for Natural Refrigerants. With the main focus on the industry in North America, ATMOsphere America 2012 will be very timely as more and more companies in the US and Canada are looking into Natural Refrigerants as alternatives in commercial and industrial refrigeration, heat pumps as well as air-conditioning applications.

www.ATMO.org

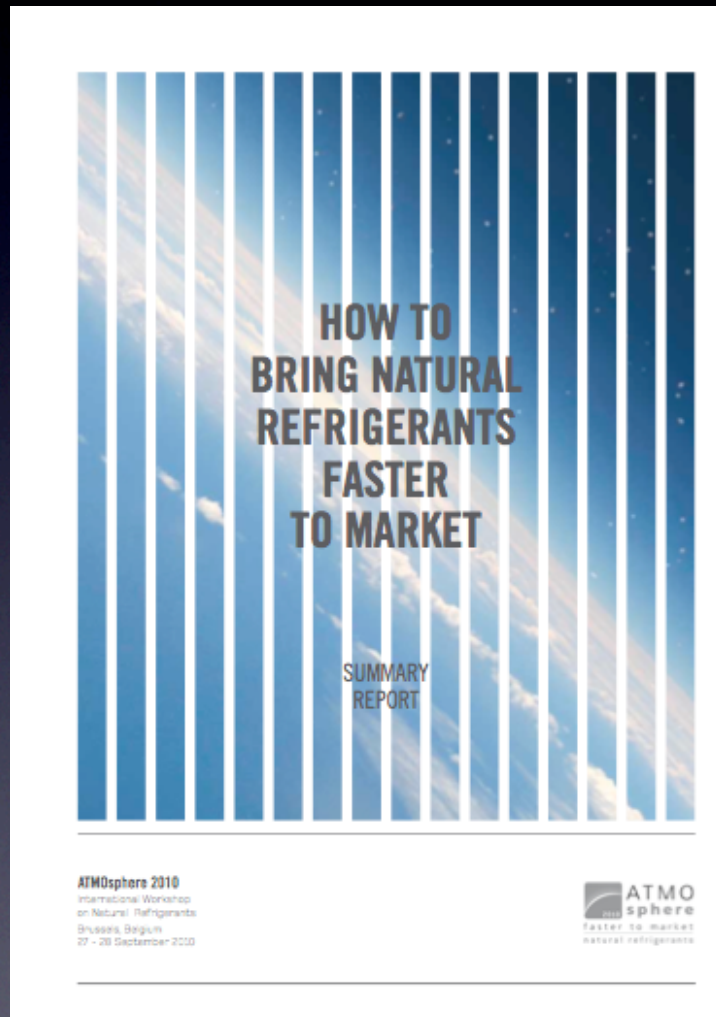
ATMOsphere Methodology

Our special methodology to ensure a truly interactive networking event includes:

- Moderated workshop discussions in groups of 10; preselected to ensure balanced distribution of suppliers, retailers, associations, policy etc
- ATMOsphere Roadmap with 10-Point Action Plan for North America published after the event
- Online ATMOsphere Community as a discussion forum before, during and after event
- Realtime phone polling
- More interactivity with targeted discussion questions
- Many networking opportunities

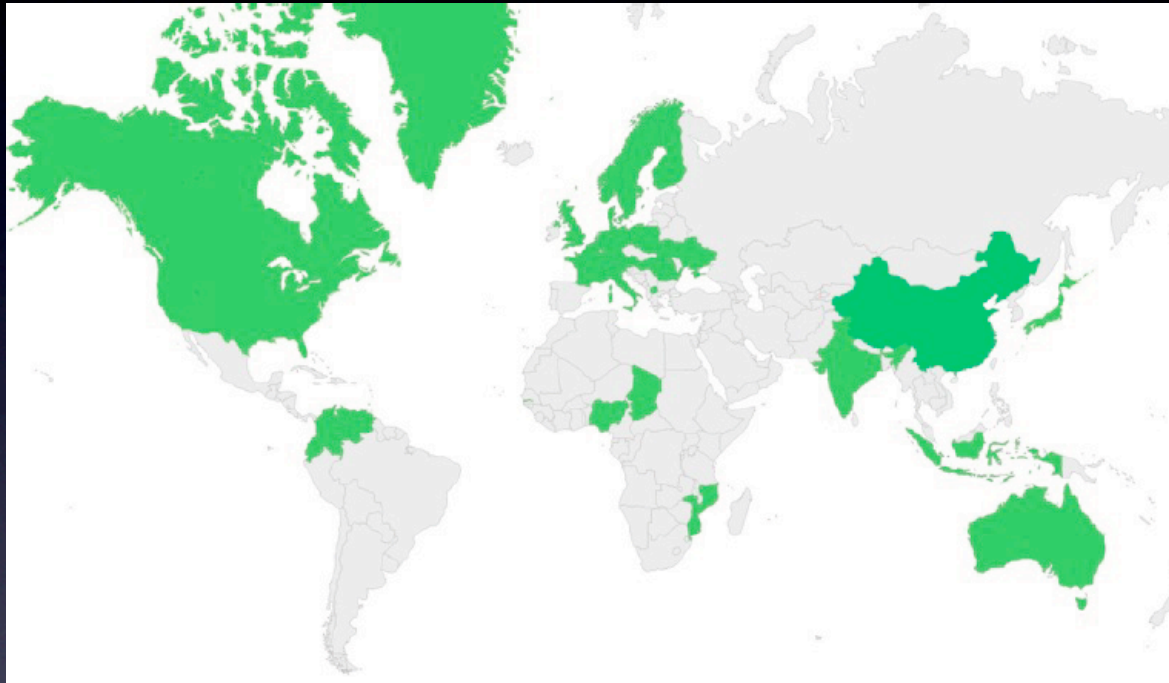
- Washington DC, 18-19 April 2012
- conference format
- 200 participants, mostly industry experts
- 'Business Case' North America
- increasing interest in natural refrigerants:
 - ammonia: strong market
 - carbon dioxide: growing market
 - hydrocarbons: emerging market

ATMOsphere 2010 Report



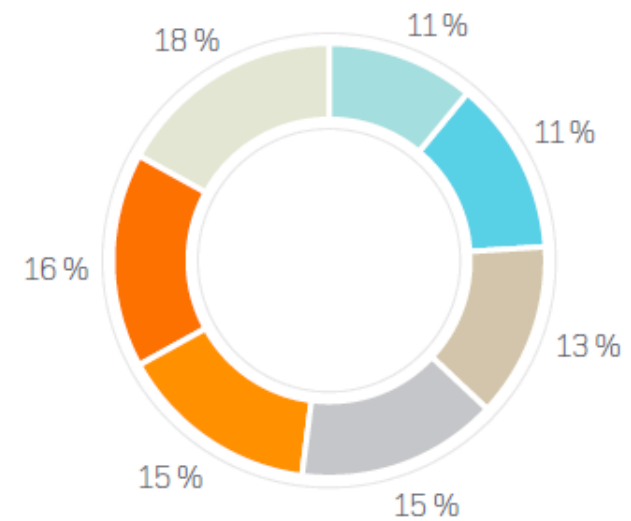
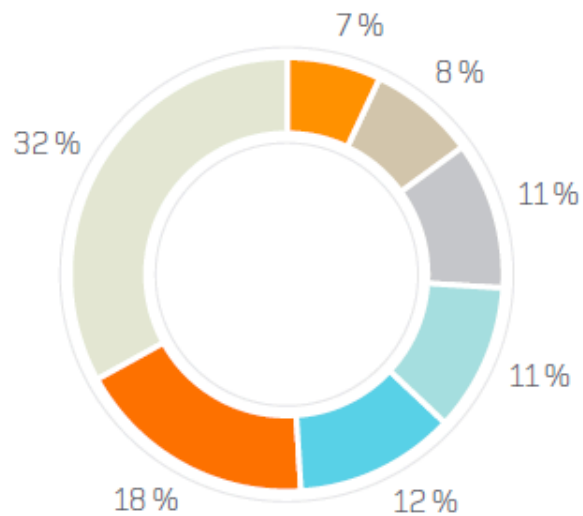
- summary of presentations and discussions
- recommendations for natural refrigerants
- survey among 200 participants / stakeholders about 7 most important barriers
- 7000 + experts via media
- free distribution to policy & industry
- <http://www.atmosphere2010.com/files/ATMOsphere-report.pdf>

ATMOsphere 2010 - participants



© 170+ participants, 30 countries, 6 continents

ATMOSphere Report: barriers



- Funding & Support
- Technology & Safety
- Training & Know-how
- Supply & Availability
- Markets & Marketing
- Legislation
- Psychology

global survey - objectives

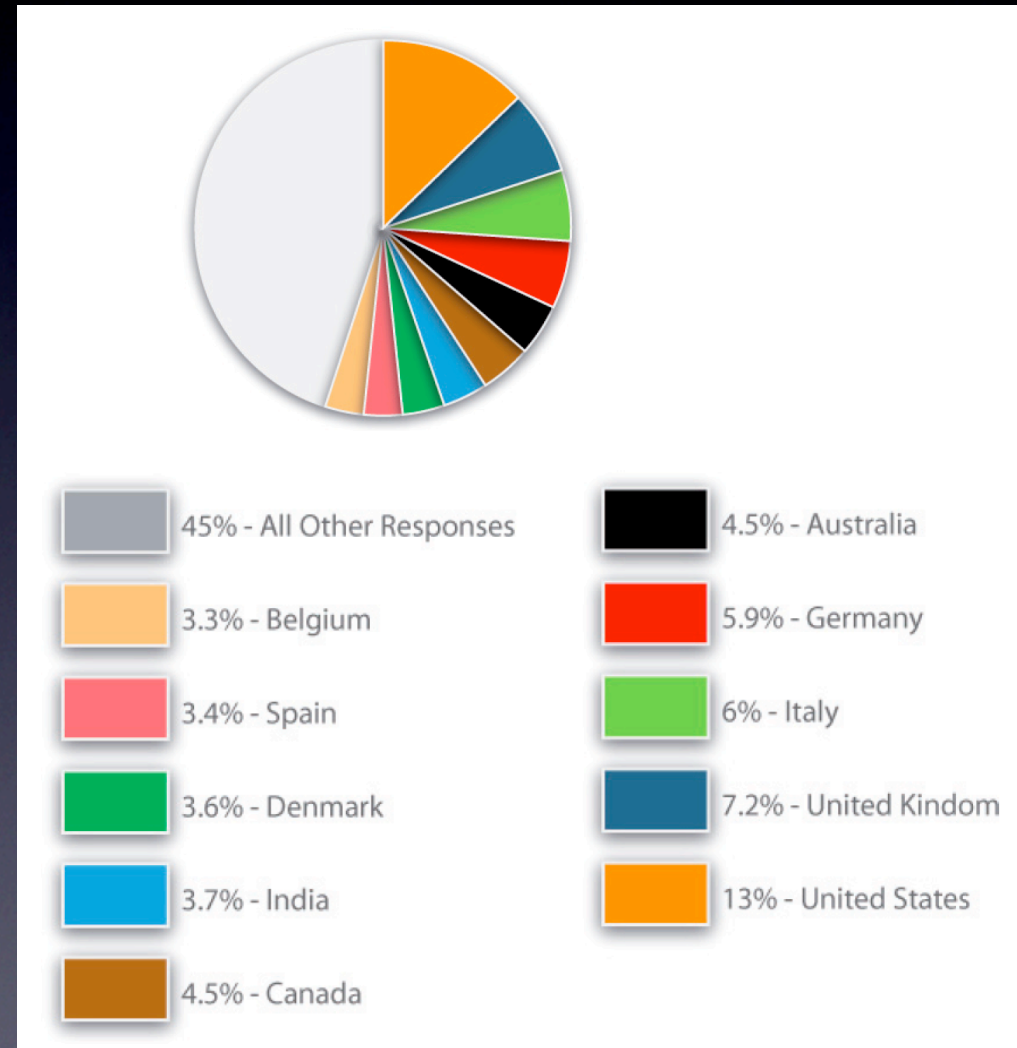


- ◎ the world's largest industry survey to illustrate + quantify the market potential of natural working fluids
- ◎ inform industry, end-users and policy about:
 - ◎ market state, trends & drivers + industry expectations
 - ◎ adoption potential per world region
 - ◎ barriers & opportunities to the use of CO₂, NH₃, HC
 - ◎ level of awareness & information sources
 - ◎ more...

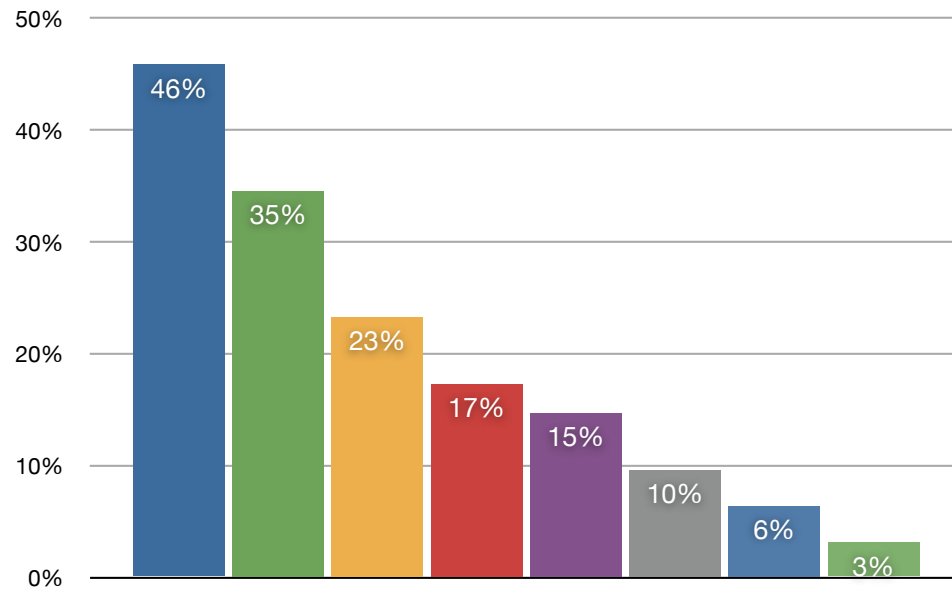
global survey - methodology



- online survey with up to 28 closed and open-type questions
- March - July 2011
- invitations sent + calls made to 6,500 HVAC&R professionals & associations
- total number of responses (July 2011): 1,136 individuals
- 92 countries represented
 - 53.9% EU
 - 18.2% North America
 - 14.6% Asia

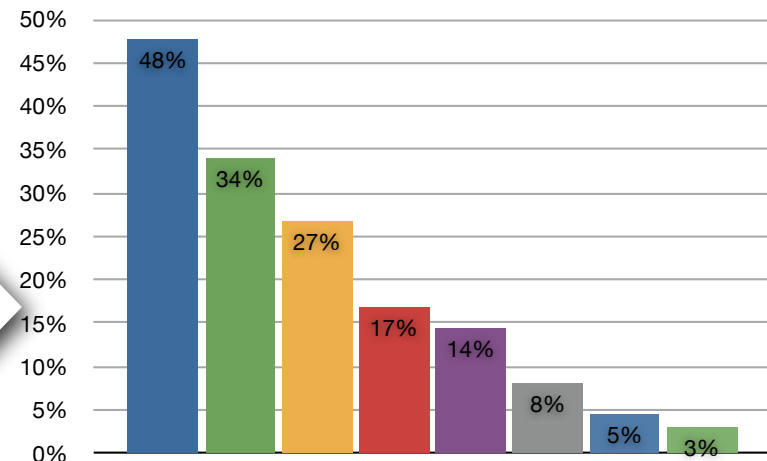


respondents - TYPE

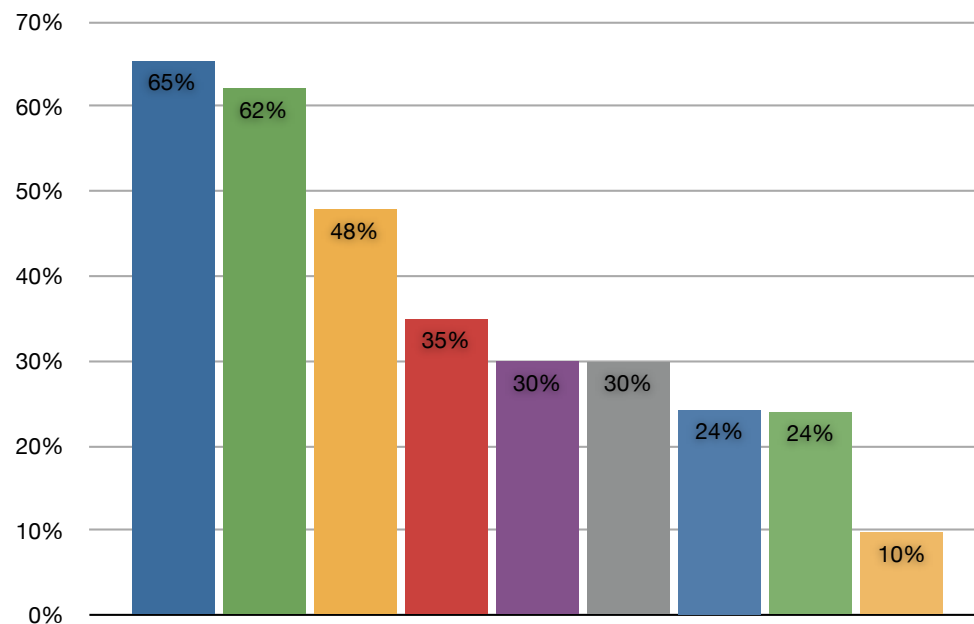


- Manufacturer
- Engineering / Contractor
- Supplier
- Training / Research
- Consultancy / Marketing
- Other
- End-User
- Association

(European respondents)



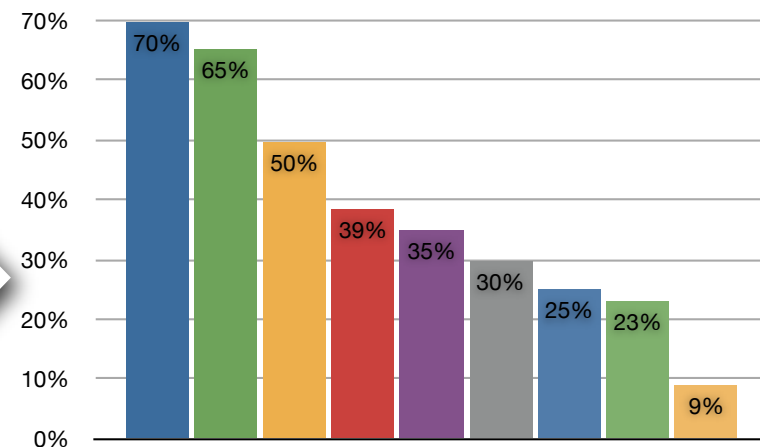
respondents - ACTIVITY



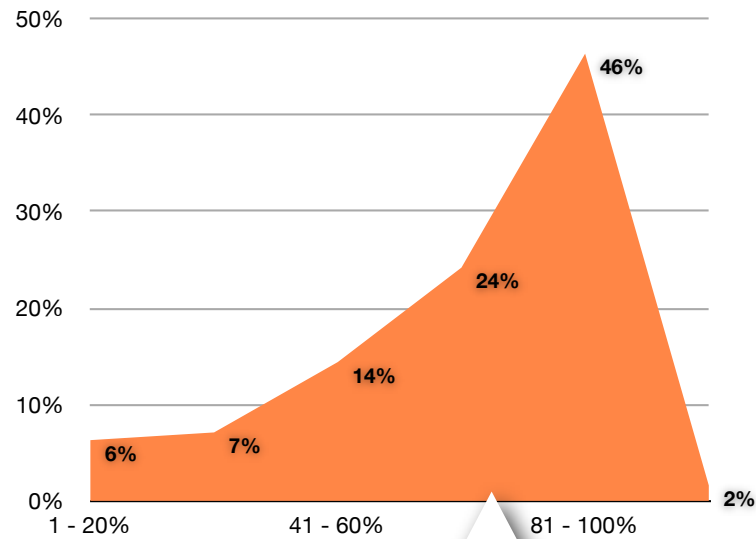
- Refrigeration - Commercial
- Refrigeration - Industrial
- Air Conditioning - Stationary
- Heating - Industrial & Commercial
- Heating - Residential & Building
- Refrigeration - Domestic
- Refrigeration - Transport
- Air Conditioning - Mobile
- Other

- Refrigeration: 54%
- Air-Conditioning: 22%
- Heating: 20%

(European respondents)

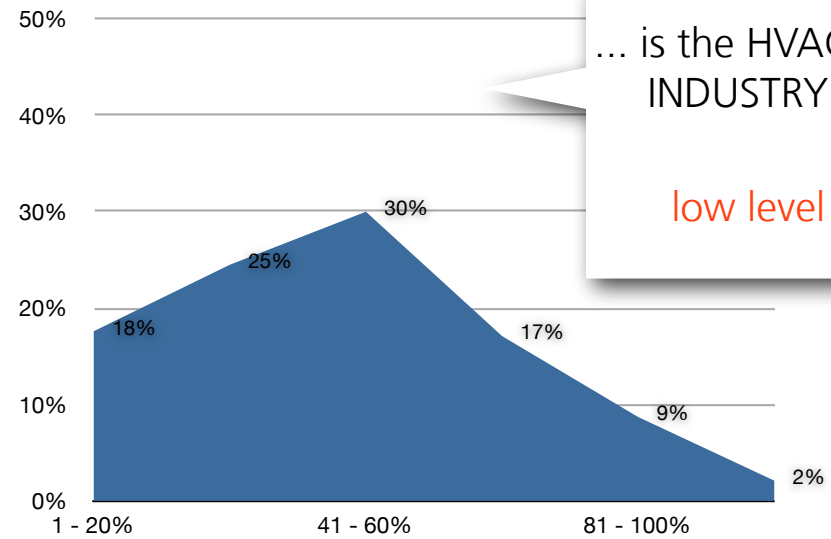


AWARENESS LEVEL



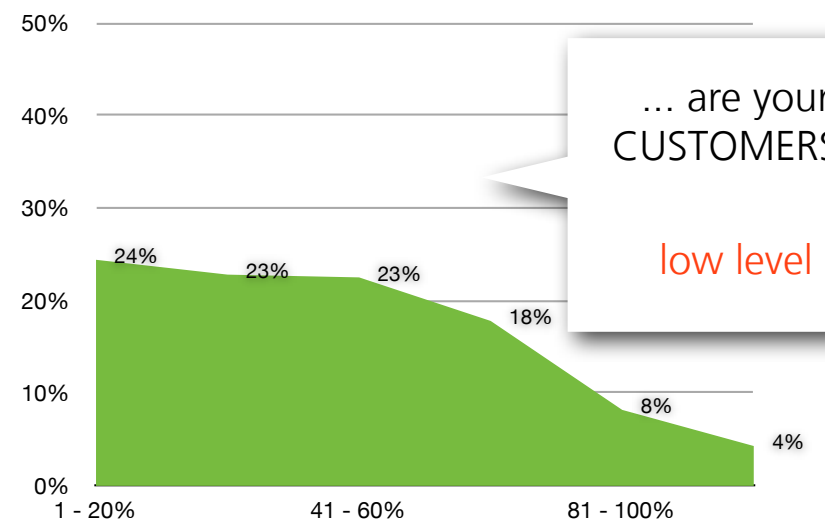
How informed ... are YOU about Natural Refrigerants (100% = highly informed)?

medium level



... is the HVAC&R INDUSTRY?

low level



... are your CUSTOMERS?

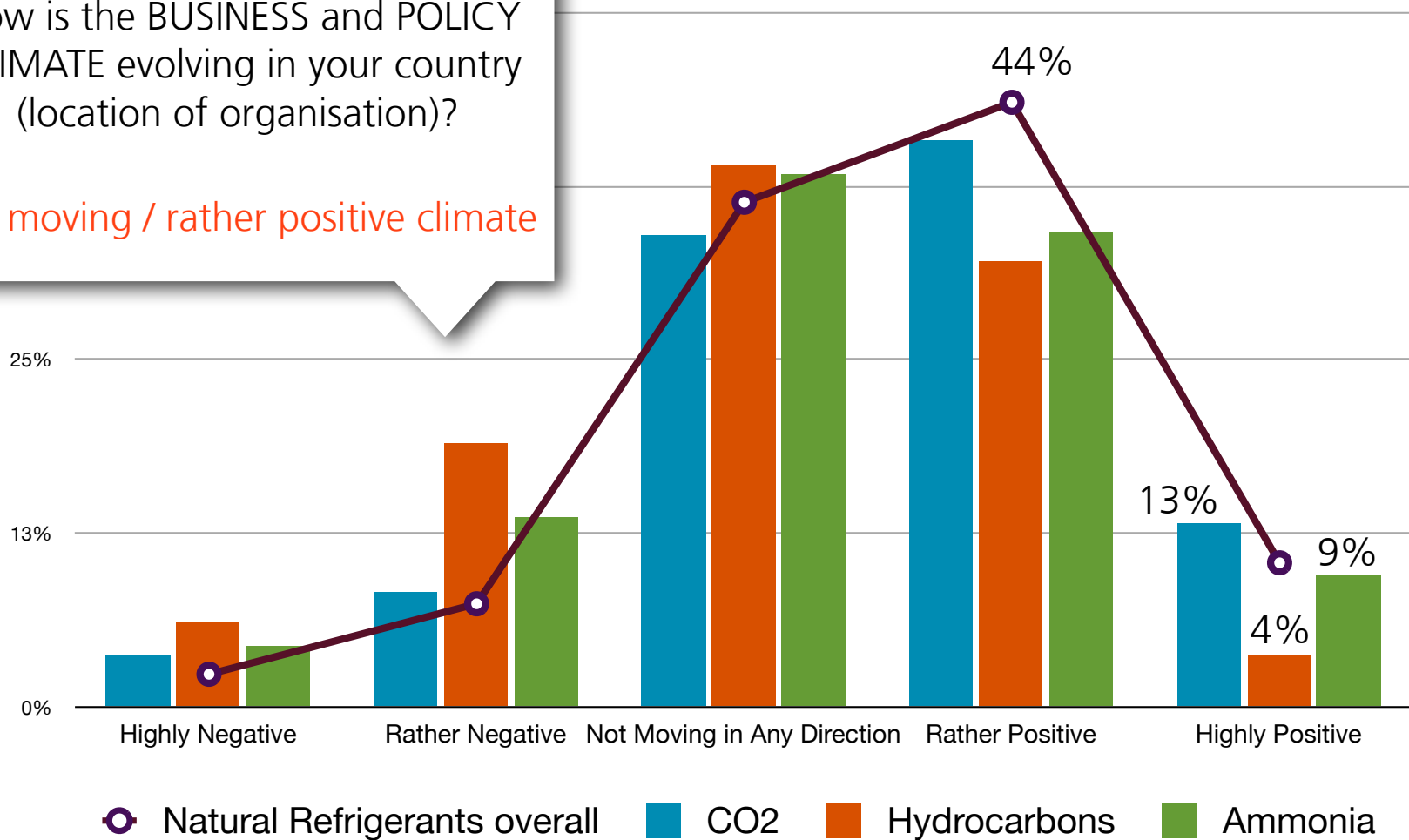
low level

POLICY & BUSINESS CLIMATE

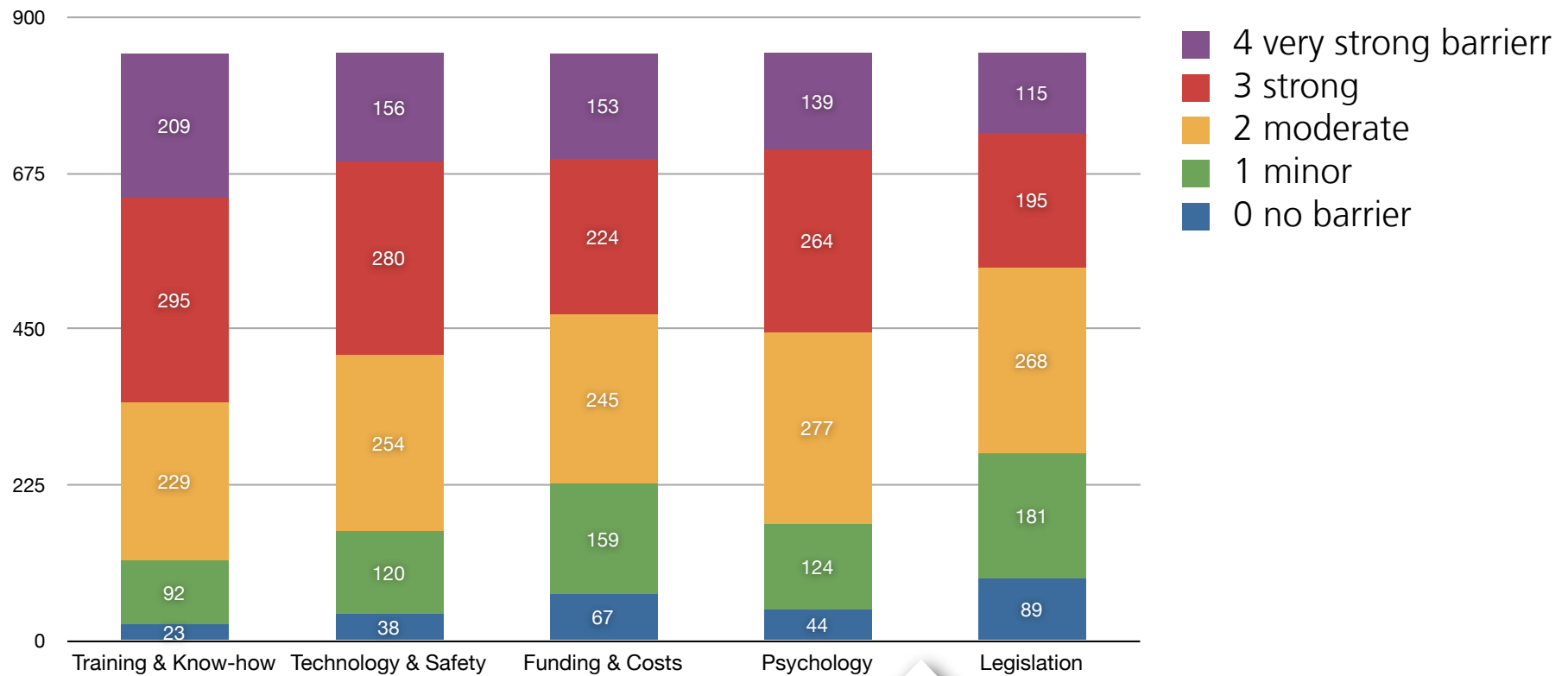


How is the BUSINESS and POLICY CLIMATE evolving in your country (location of organisation)?

not moving / rather positive climate



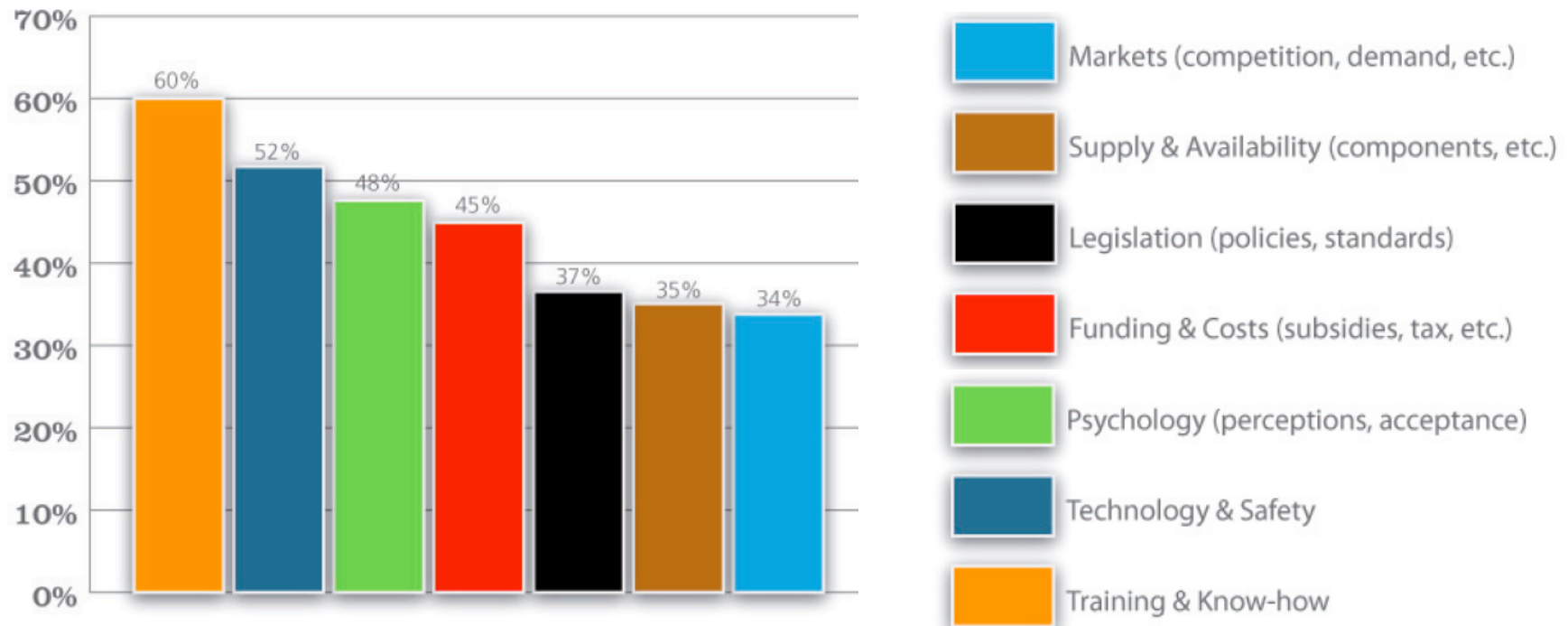
BARRIERS



What are the biggest BARRIERS in adopting Natural Refrigerants?

training, technology, costs

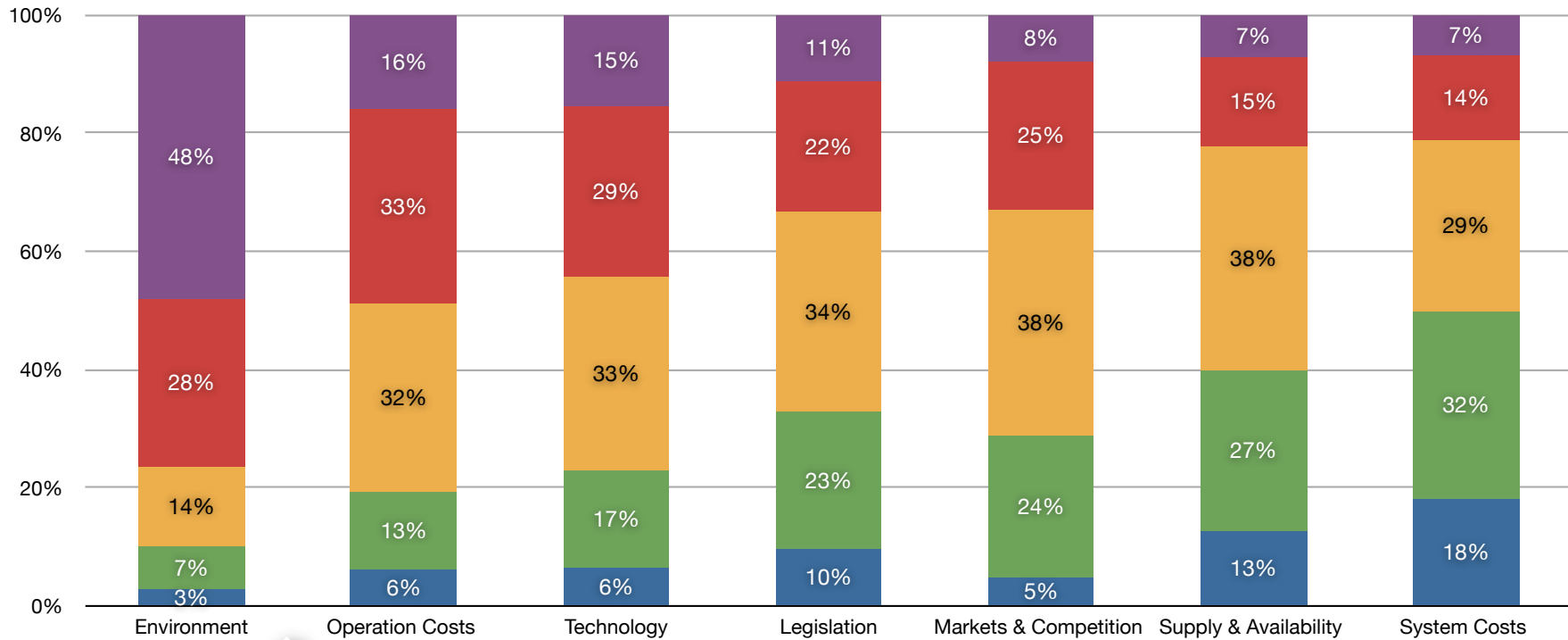
BARRIERS - weighted



What are the biggest BARRIERS in adopting Natural Refrigerants? (options: "high" / "very high" barrier)

training, technology, psychology

STRENGTHS

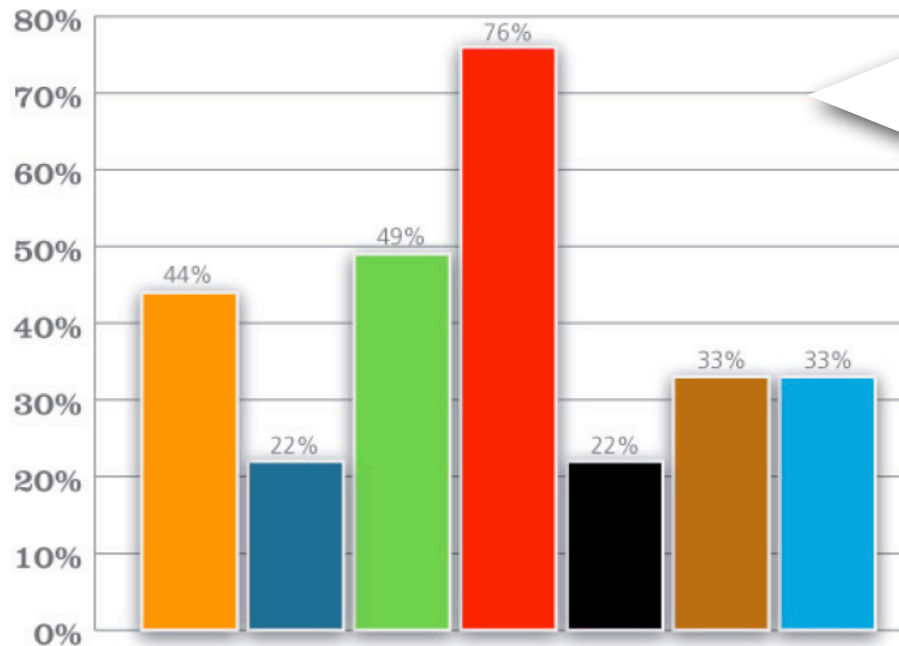


What are the biggest STRENGTHS of Natural Refrigerants?

environment, cost savings, technology

- 4 very high strength
- 3 high
- 2 moderate
- 1 minor
- 0 no strength

STRENGTHS



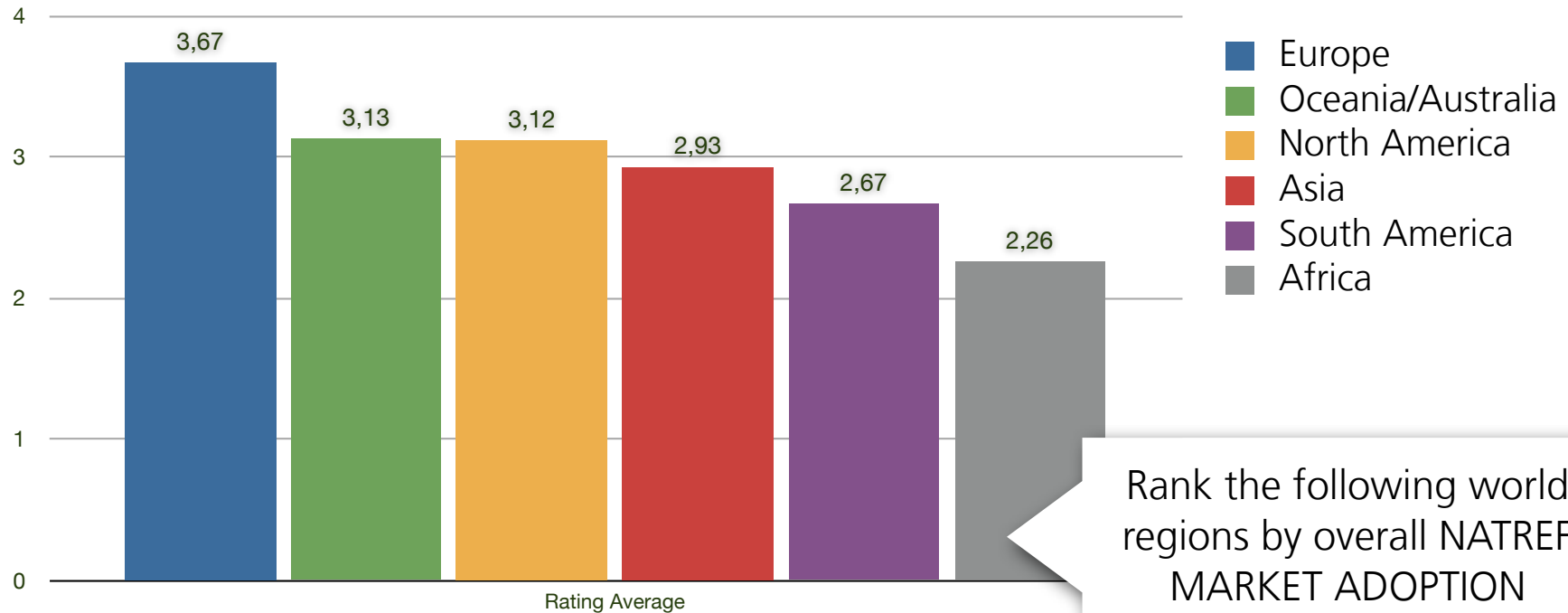
What are the biggest STRENGTHS of natural refrigerants?
(options: "high" / "very high" strength)

- Legislation (compliance with upcoming and current restrictions)
- Markets & Competition (marketing, CSR/green concept, competitive advantage, etc.)
- Supply & Availability (global availability of components, refrigerants, servicing)
- Environment (direct & indirect emissions, energy savings, etc.)
- Operation Costs (energy savings, operation, maintenance, end of life, etc.)
- System Costs (production, materials, refrigerants, installation, govt. support, etc)
- Technology (durability & reliability, compactness & weight, efficiency, etc.)

What are the biggest STRENGTHS of Natural Refrigerants?

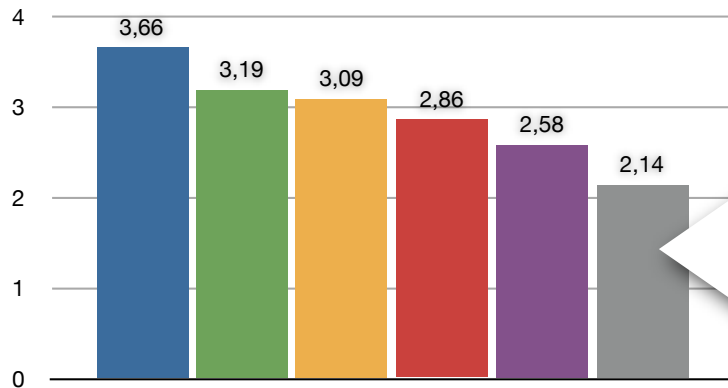
environment, cost savings, technology

MARKET ADOPTION POTENTIAL



Rank the following world regions by overall NATREF MARKET ADOPTION POTENTIAL

(all respondents)



(European respondents)

THE GUIDE'11



- the first easy-to-access and concise reference guide to the global market for CO₂, NH₃ & HCs
- first edition: European Union
- objective: illustrate + quantify the market potential through industry expectations, barriers & opportunities, policy analysis
- distributed FREE of charge to industry, end-users, policy

THE GUIDE'11 - content



- global user's guide:
 - applications worldwide today & tomorrow - value chains / ecosystems
 - %age of natural refrigerant products & services today and tomorrow
 - SWOT: information level, barriers & opportunities
- Europe - policy:
 - analysis of selected initiatives



THE GUIDE'11 - content



- Europe - market
 - market size, drivers, forecasts 2012-2020, SWOT
 - CO₂ supermarket map Europe
- Case studies
- Company directory

- **launch: October 2011**



contact



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