

Natural Solutions

Market Potential in Developing Countries & Beyond



 **ATMO**
sphere
UN technology summit
natural solutions
3 - 4 June 2013 in Vienna

Vienna, 3 June 2013

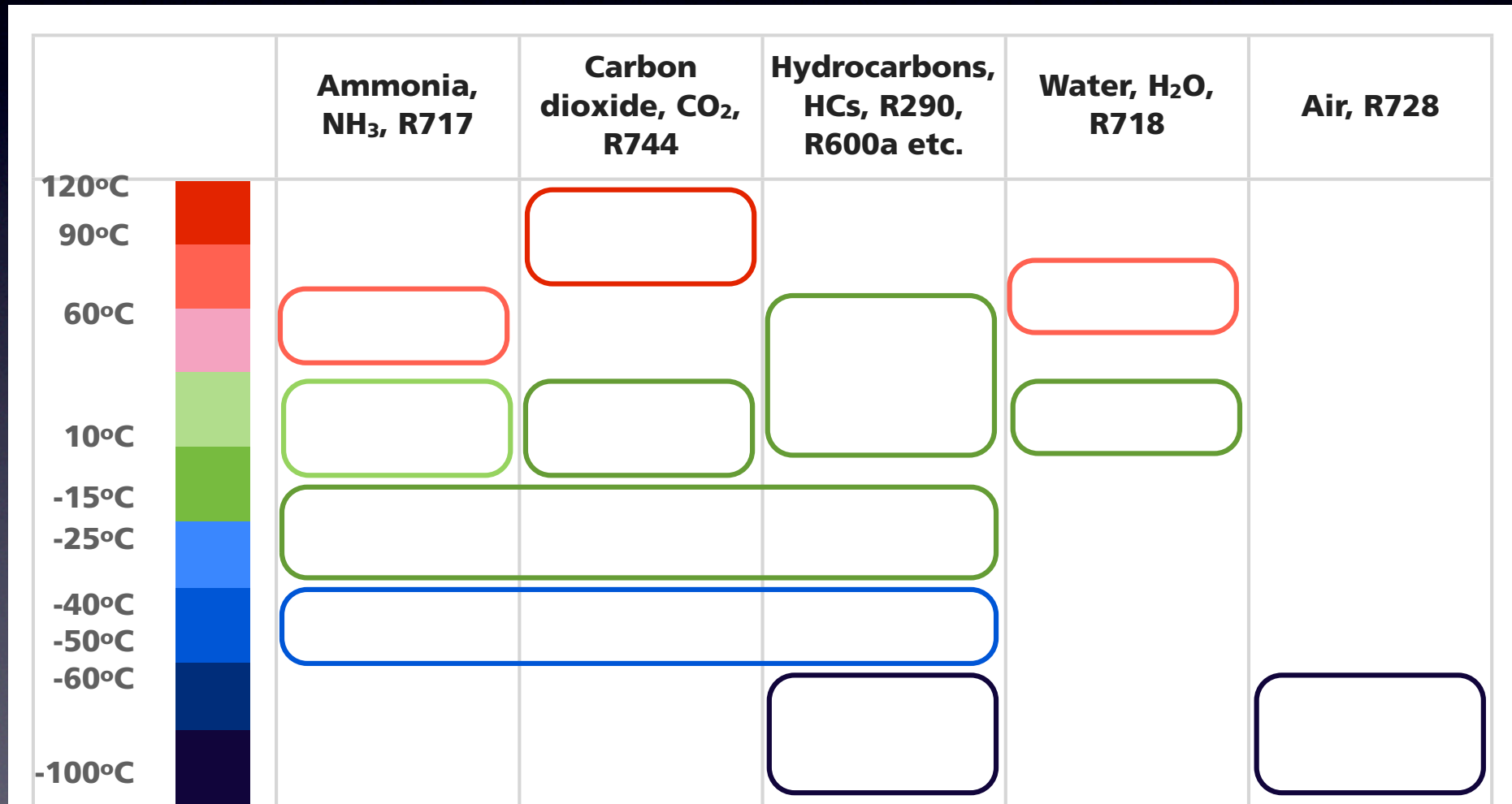
Nina Masson, Head of Market Research

shecco

technology: the application potential...



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



... in transport

NORTH AMERICA

- ▶ transport refrigeration, passenger car and bus air-conditioning, fishing vessels and reefers refrigeration

TRANSPORT REFRIGERATION



CO₂ HC NH₃



PASSENGER CARS



CO₂ HC NH₃



BUSES



CO₂ HC NH₃



FISHING VESSELS / TRAWLERS



CO₂ HC NH₃



CARGO SHIPS / REEFERS

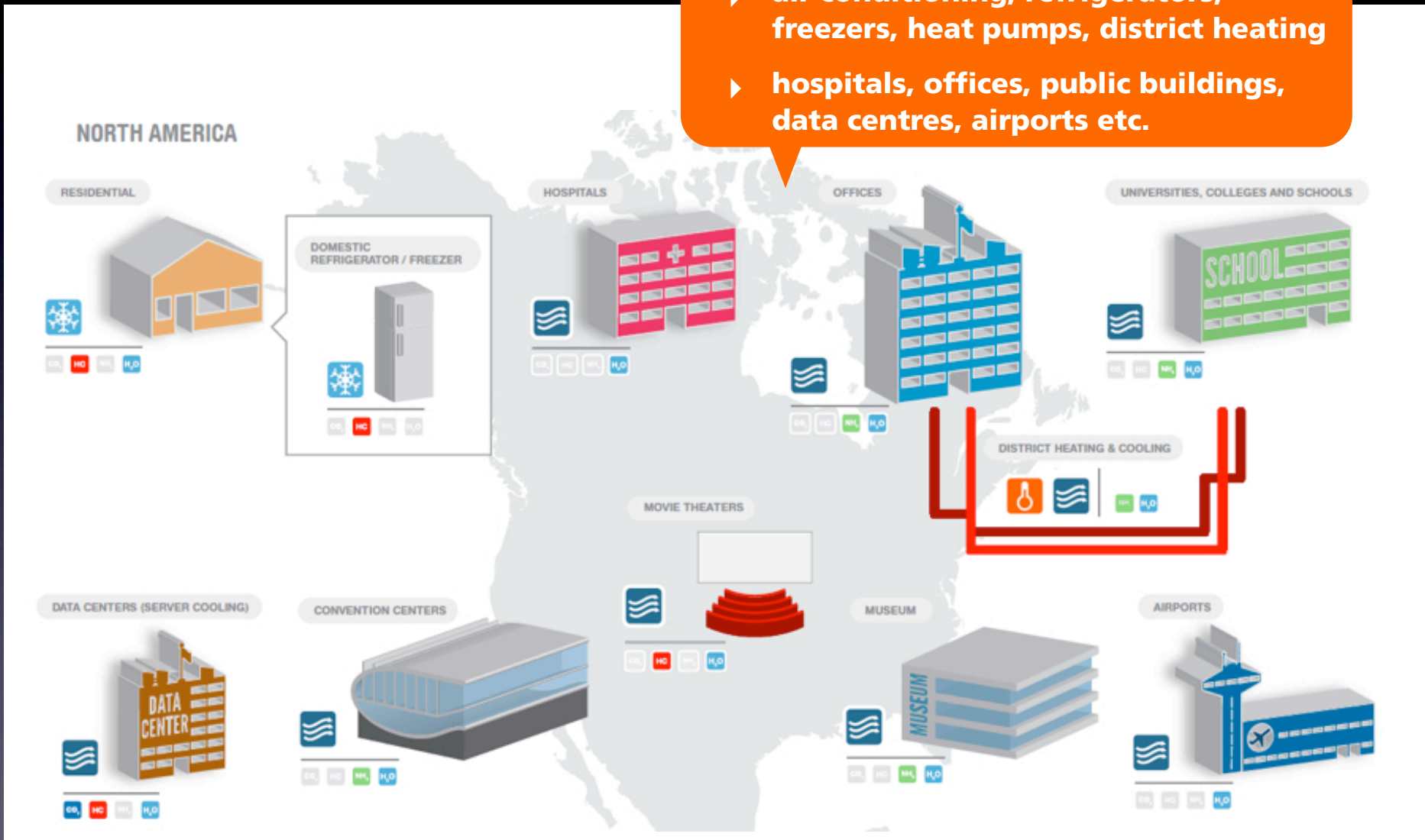


CO₂ HC NH₃



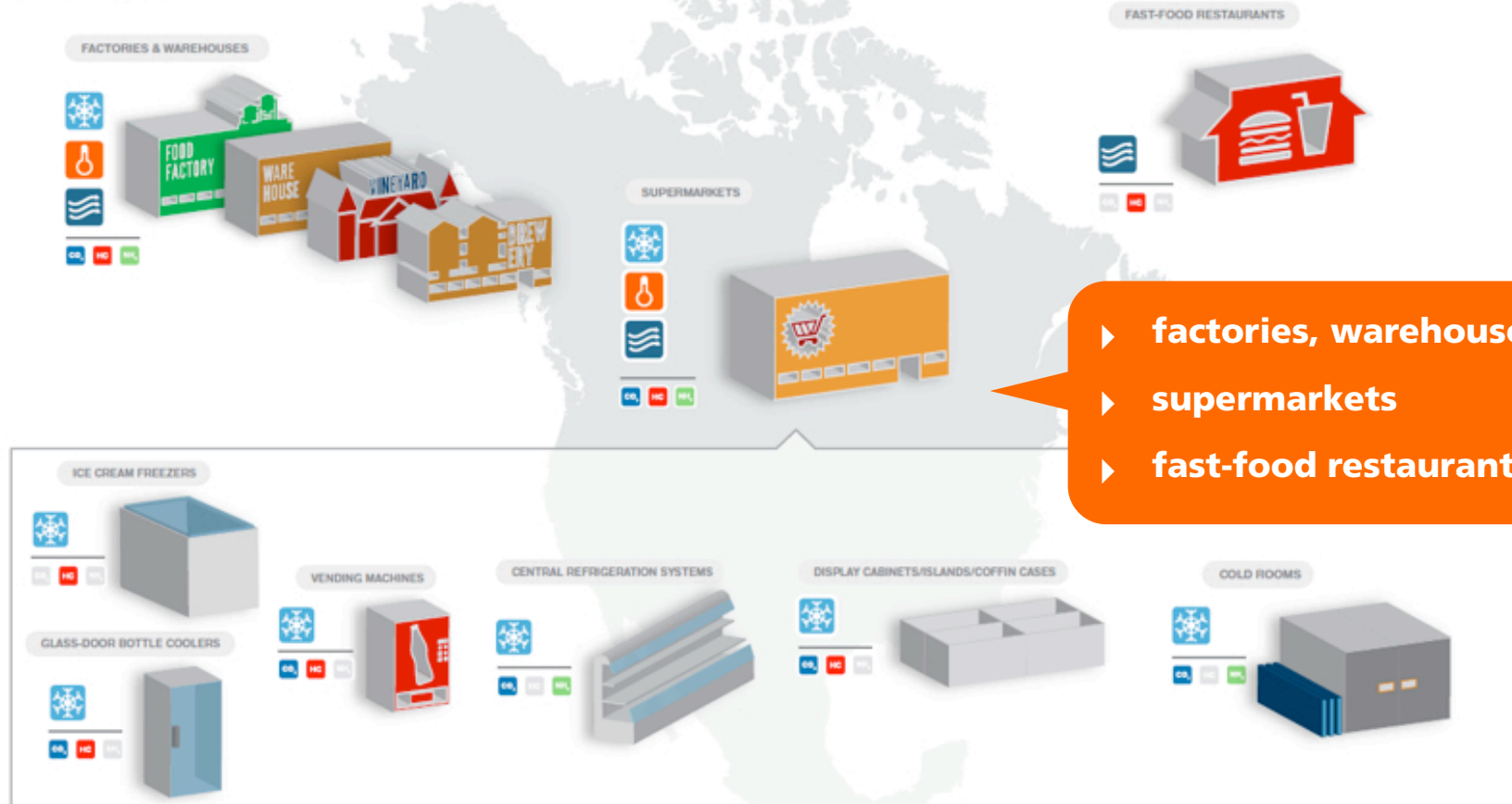
... in buildings

- ▶ air-conditioning, refrigerators, freezers, heat pumps, district heating
- ▶ hospitals, offices, public buildings, data centres, airports etc.



... in the food retail chain

NORTH AMERICA



- ▶ factories, warehouses
- ▶ supermarkets
- ▶ fast-food restaurants etc.

... in special applications

- ▶ deep mining, ski slopes & ice rinks
- ▶ industrial & chemical plants
- ▶ research labs freezing & cooling

NORTH AMERICA

DEEP MINING



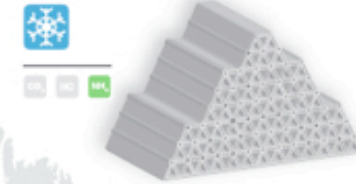
SKI SLOPES / BOBSLEIGH



ICE RINKS



BIOSPHERES



INDUSTRIAL AND CHEMICAL PROCESSES



PETROCHEMICAL PLANTS



PHARMACEUTICAL PROCESSES AND LABORATORIES



CONSTRUCTION



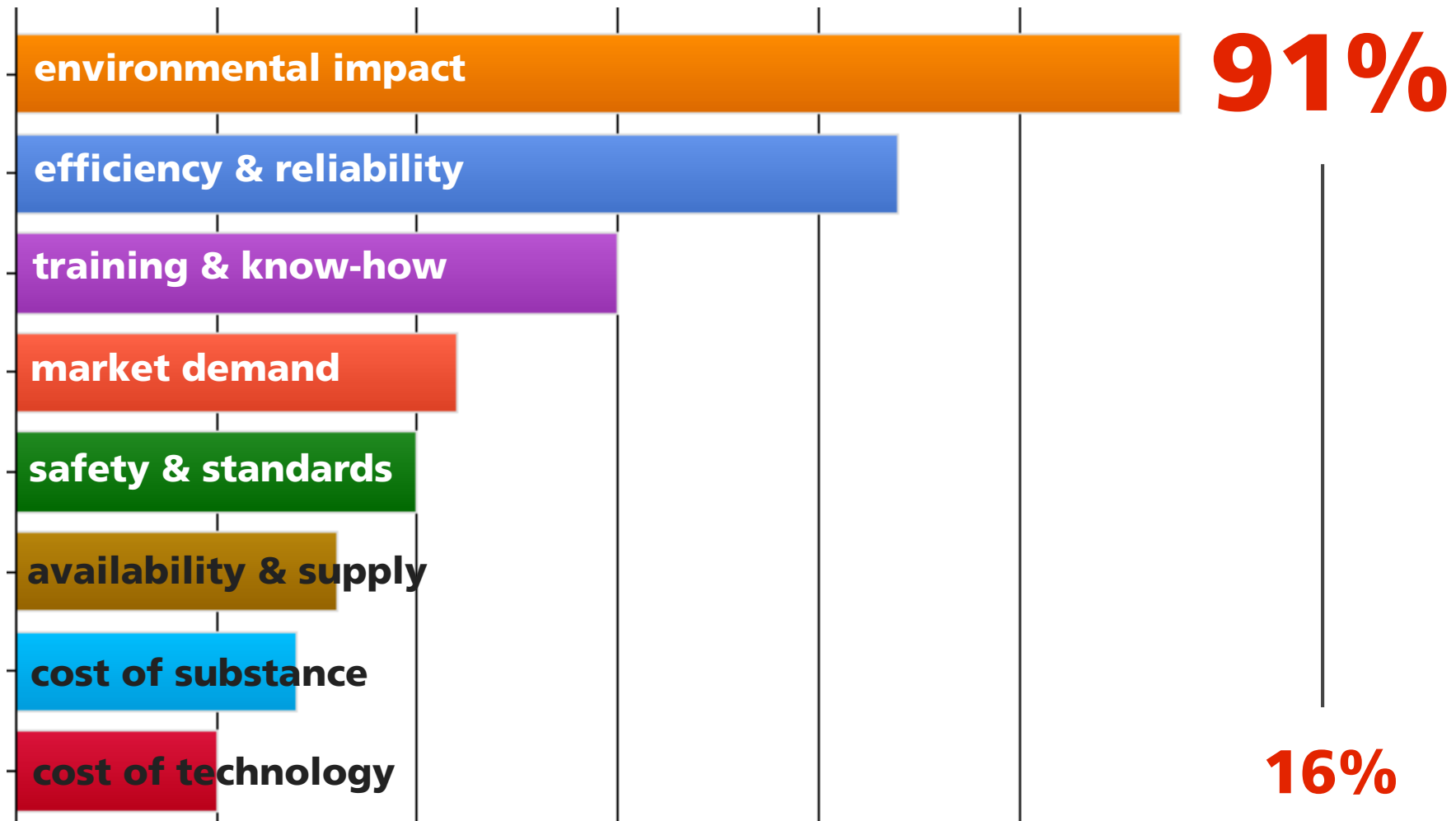
GUIDE UNIDO Survey



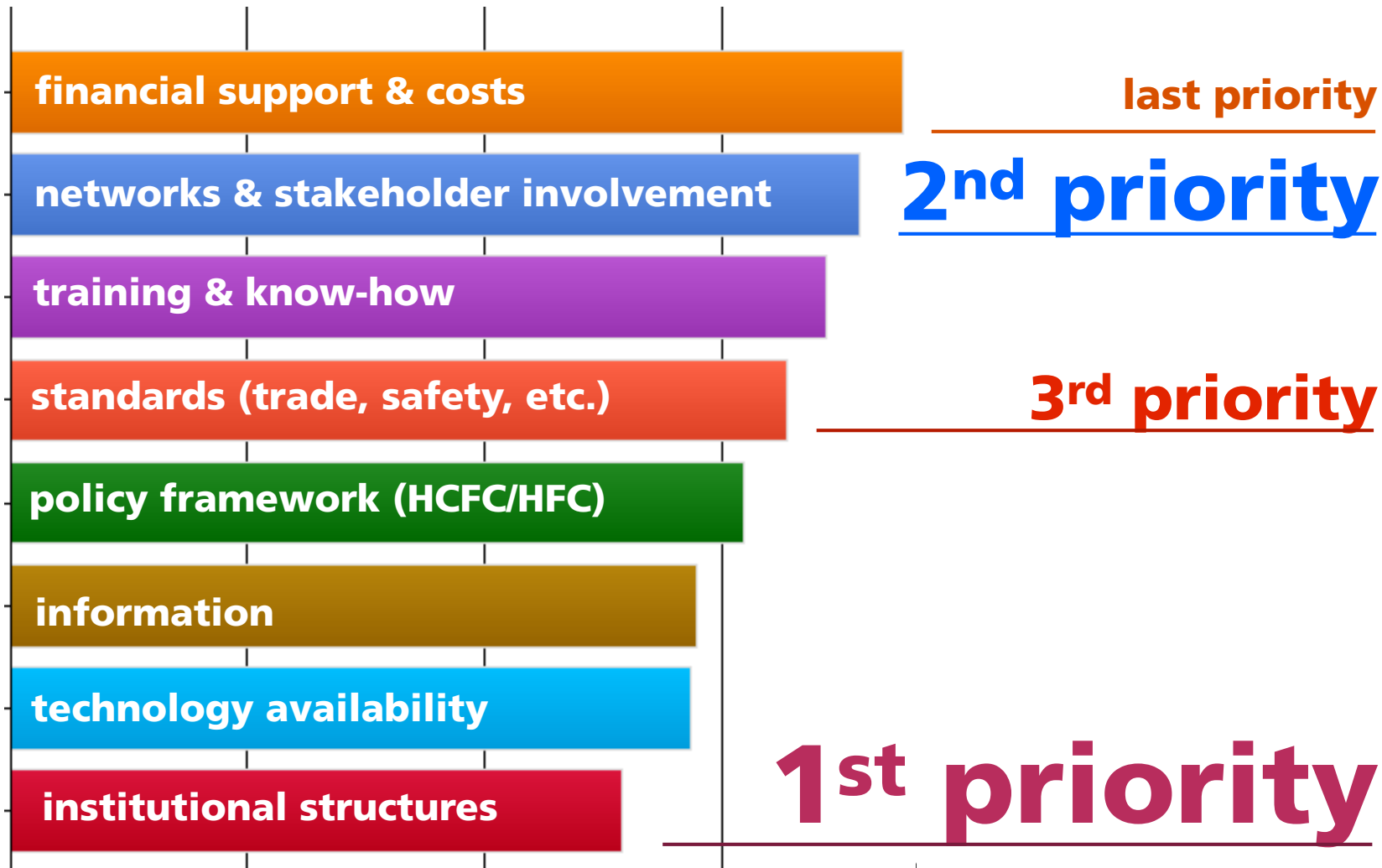
**65 responses so far
(1 week)**

- done in collaboration with UNIDO
- final report: Aug / Sep 2013
- objectives:
 - identify current market share for natural refrigerants & foams in developing countries
 - market trends in the next 5 years
 - main barriers and priority in addressing them
 - importance & current contribution of main stakeholders groups

factors encouraging the use of NS



barriers to NS & priority in addressing them



barriers to NS & priority in addressing them



pioneering projects

training & know-how



Grenada: HC training workshops

Brazil: compressor & system training centre

Benin: training for A/C conversion

Ghana: HC training workshops

Central Asia: online training courses

Turkmenistan: NR workshop

Pakistan: Natural Fluids Refrigeration Center

India: AARI - new ammonia refrigeration association



safety standards



Chile: good practices manual for NH3 refrigeration system

India: AARI advising government on NH3 safety standards

India: safety standards for HC in production lines

China: national safety standards for flammable refrigerants

China: collaboration with EU, USA to develop CO2 compressor standards

China: safety standards for cold stores



pioneering projects



Brazil: CO2 cascade systems: 5-20% energy savings

South Africa: conversion of supermarkets to NR

Africa: plug & play NH3 chillers for A/C

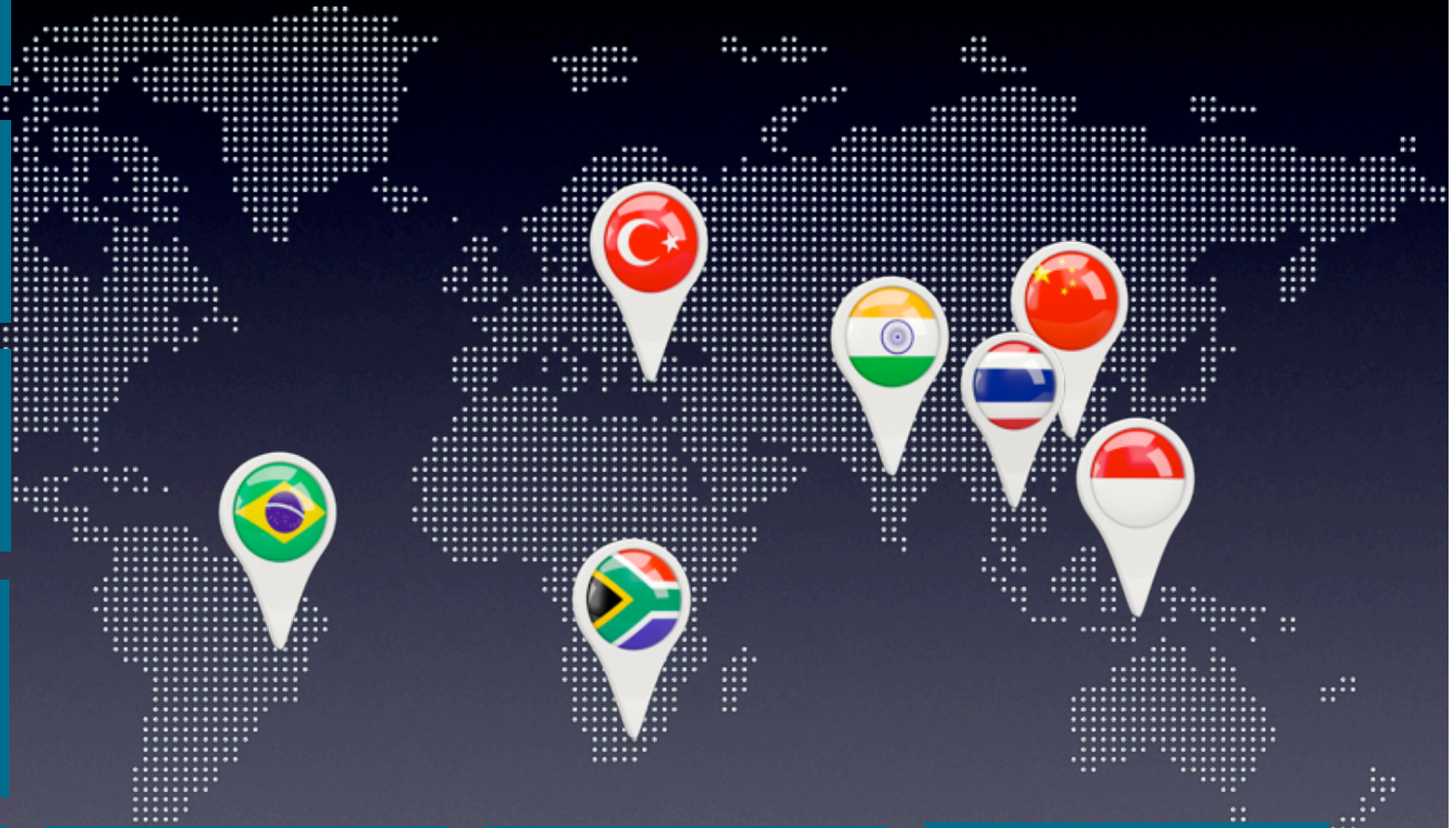
Turkey: transcritical CO2 system in warmer climate

Thailand: conversion of industrial A/C to HC + NH3/CO2 cascade system

China, India: production of R290 residential A/C

China: NH3/CO2 two-stage refrigeration system for cold storage

Indonesia: HC air-conditioning & refrigeration



HFC-free light-commercial refrigeration



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

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

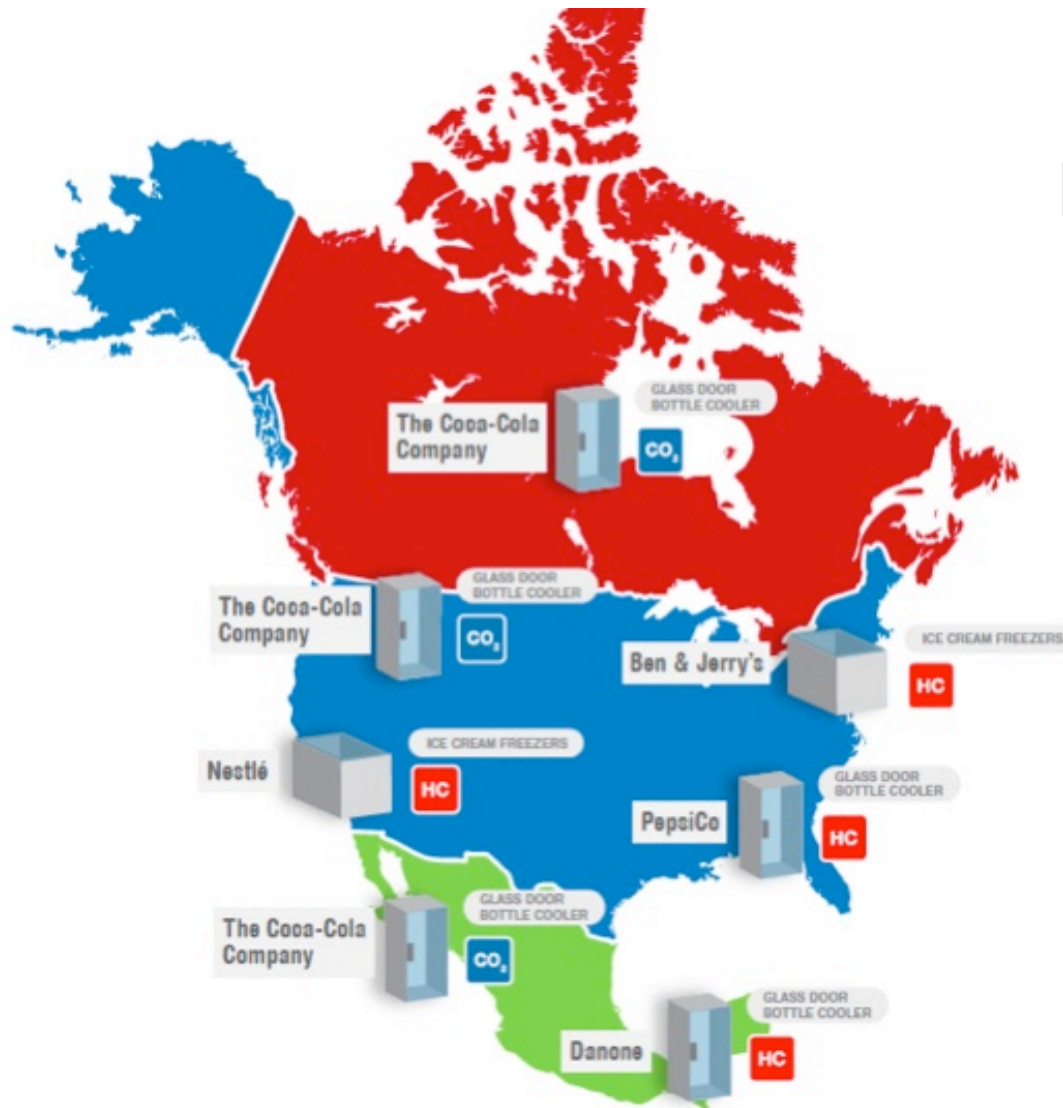
**313,000 HFC-free
bottle coolers (Red
Bull)**



HFC-free light-commercial refrigeration



► in North America, including Mexico: around 4,000 units (March 2013)



PEPSICO



DANONE

HFC-free light-commercial refrigeration



**approx. 2.5 m HFC-free
light-commercial units**

HFC-free domestic refrigeration



**about 50% of new
domestic refrigerators
use HCs**

HFC-free industrial refrigeration



**90% NH₃ use in
developed - 40% in
developing countries**

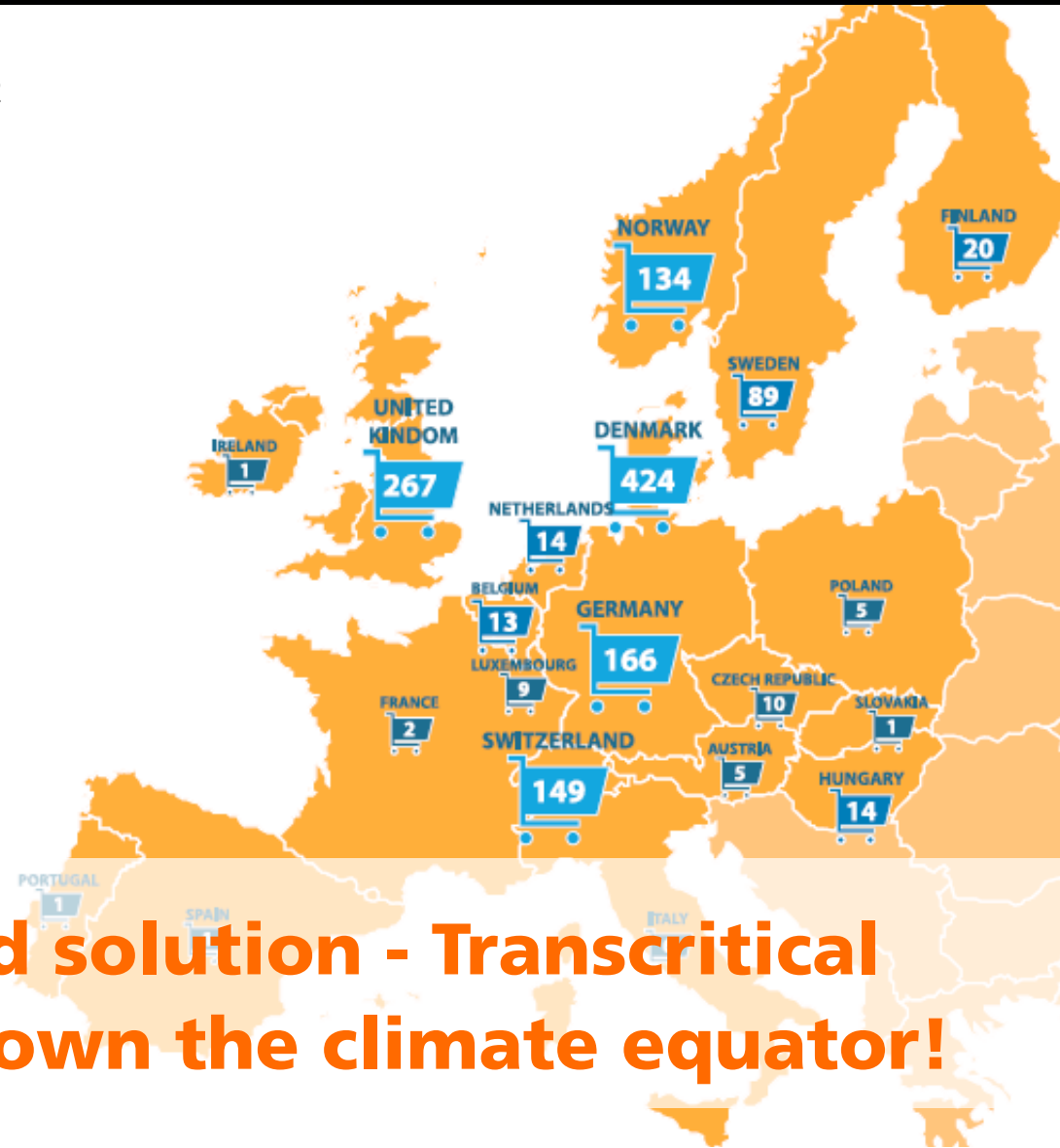
CO₂ TC supermarkets: europe (est.)



verified: 1,331 transcritical CO₂ stores by mid-2011 for Europe

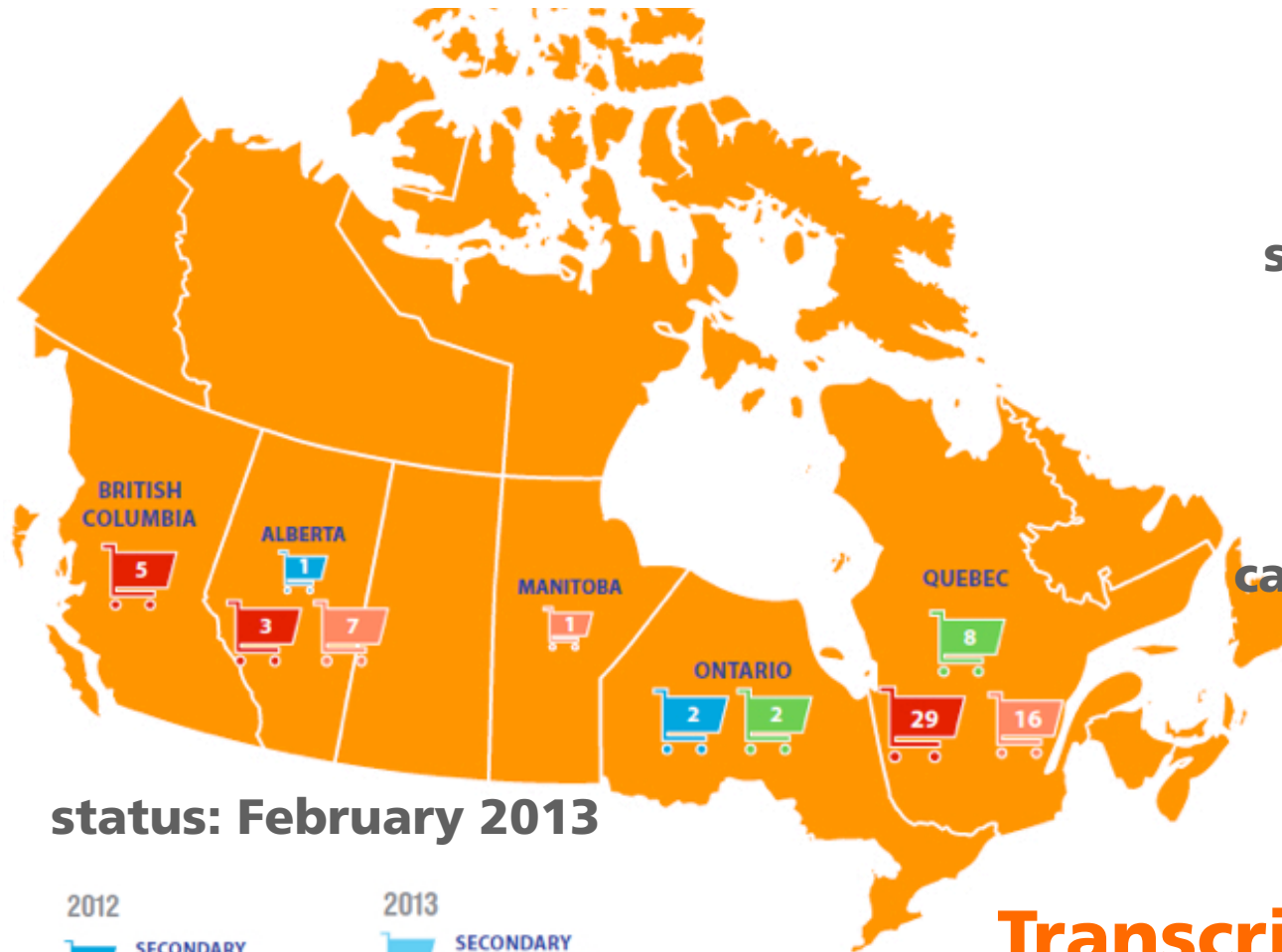
estimated: 1600+ CO₂ supermarkets by end-2012

estimated: 3000+ supermarkets using NR



Cascade a standard solution - Transcritical systems moving down the climate equator!

CO₂ refrigerant supermarkets: canada



status: February 2013



37 stores with transcritical CO₂ systems in 2012; 24 new ones already planned for 2013

13 stores with CO₂ cascade & secondary systems in 2012

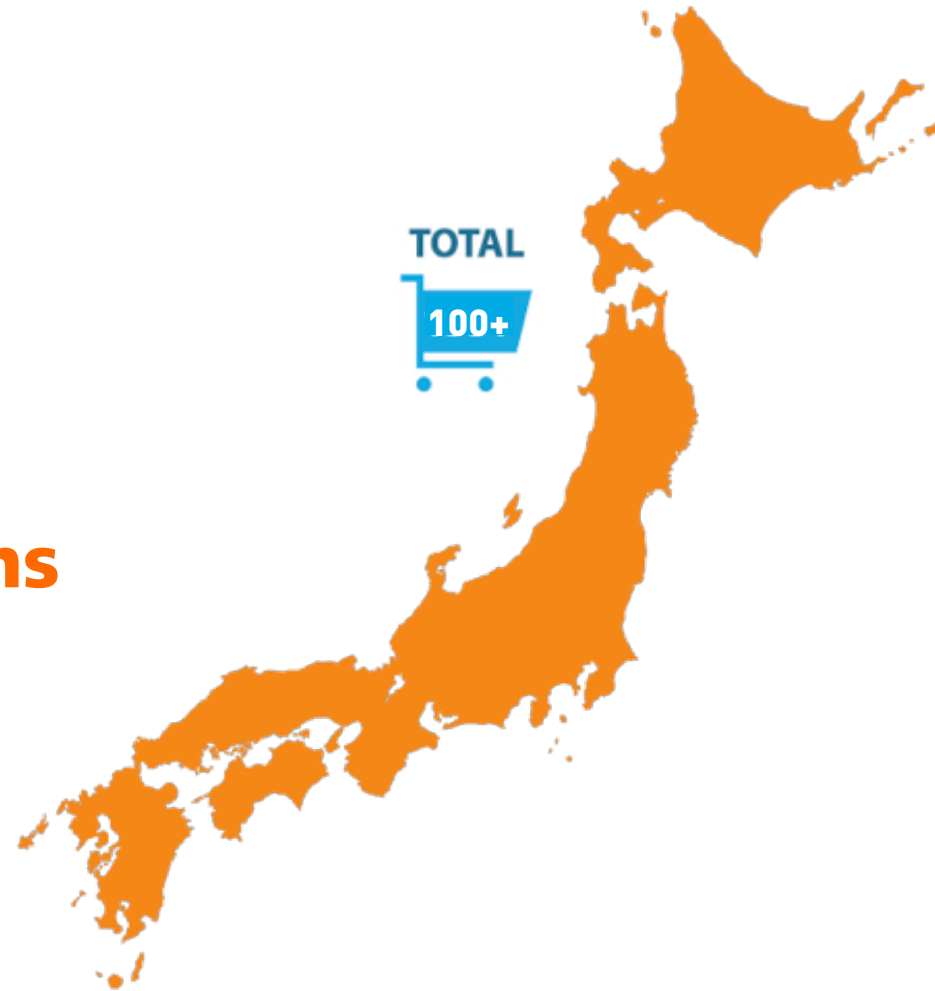
Transcritical systems dominate

CO₂ TC supermarkets: japan

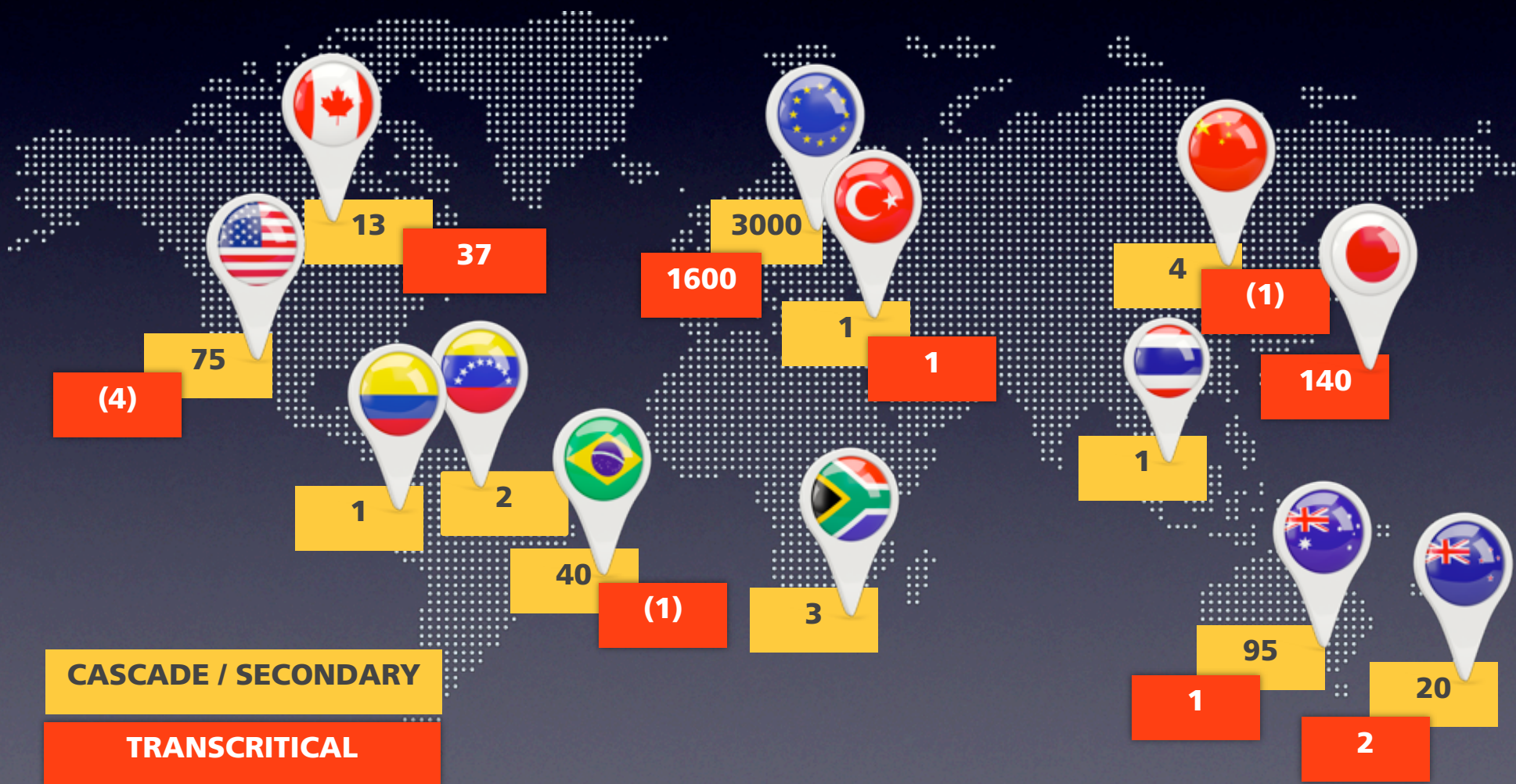


**140+ stores with
transcritical CO₂
systems today;**

**Transcritical systems
dominate**



estimated CO₂ systems in the world - status: May 2013 (incl. outlook for 2013)



global CO₂ transcritical stores



**approx. 1800 CO₂
transcritical stores**

technology moving from north to south

CO₂ refrigerant supermarkets: europe



CO₂ refrigerant supermarkets: europe



CO₂ refrigerant supermarkets: europe



min. 55 brands



CO₂ refrigerant supermarkets: usa



CO₂ refrigerant supermarkets: usa



CO₂ refrigerant supermarkets: canada



CO₂ refrigerant supermarkets: canada



METRO GROUP

Sobeys

Cooper's Foods

Walmart

IGA

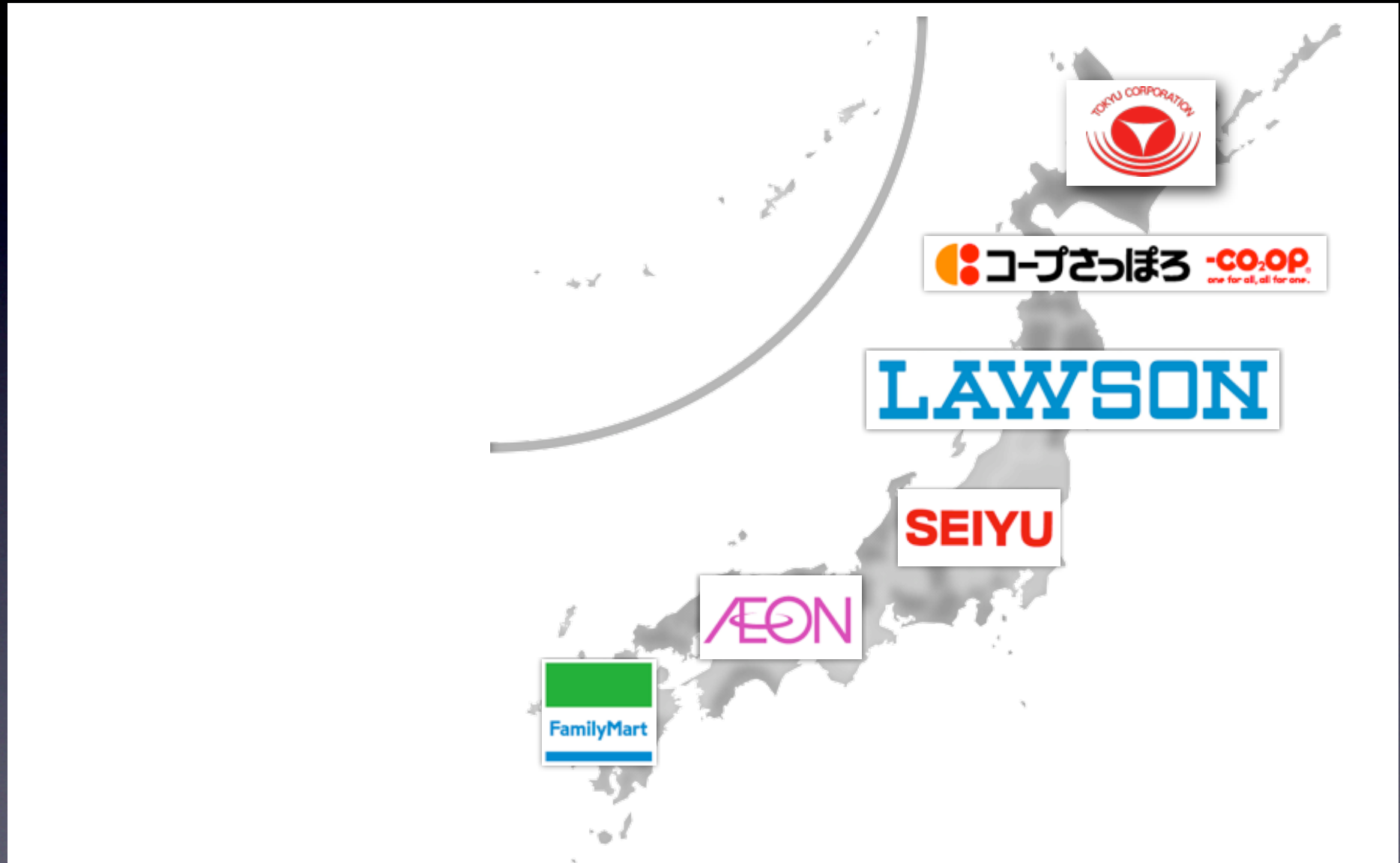
save on foods
SO MUCH more IN STORE

Loblaws

Overwaitea Food Group

min. 12 brands

CO₂ refrigerant supermarkets: japan



CO₂ refrigerant supermarkets: japan



6 brands



CO₂ refrigerant supermarkets: brazil



CO₂ refrigerant supermarkets: brazil



14 brands



food retail brands using CO₂ (May 2013)



min. 113 brands

GUIDEs editions in 2013/14



**North
America
2014**

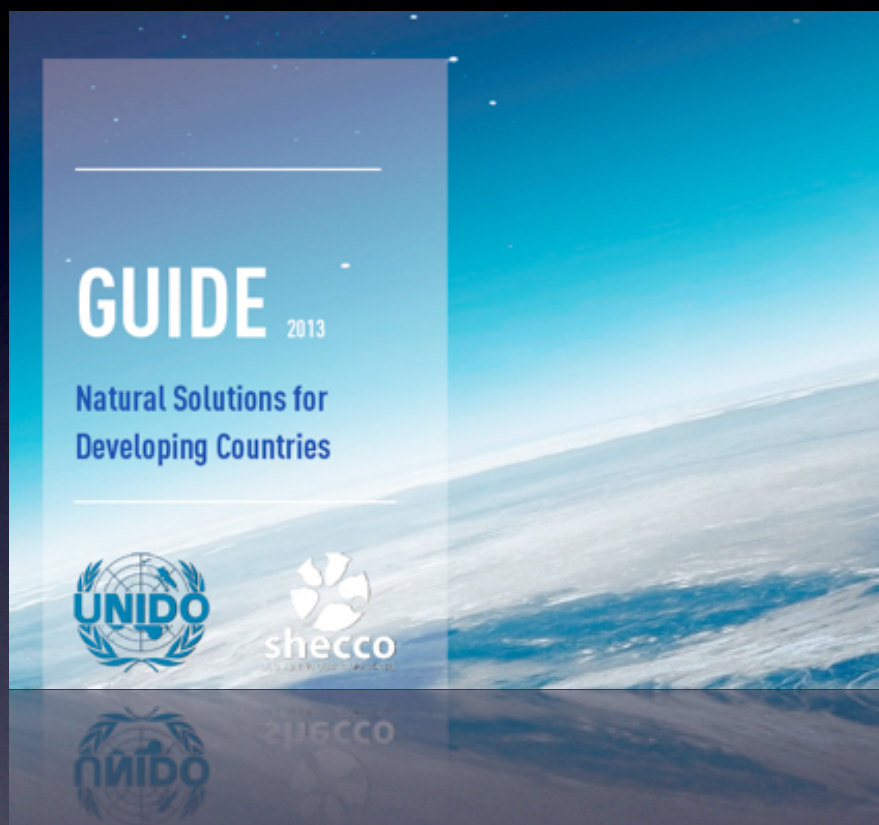
**Europe
2013**

**China
2014**

**Japan
2013**

**Developing
Countries
2013**

GUIDE UNIDO - Natural Solutions for Developing Countries



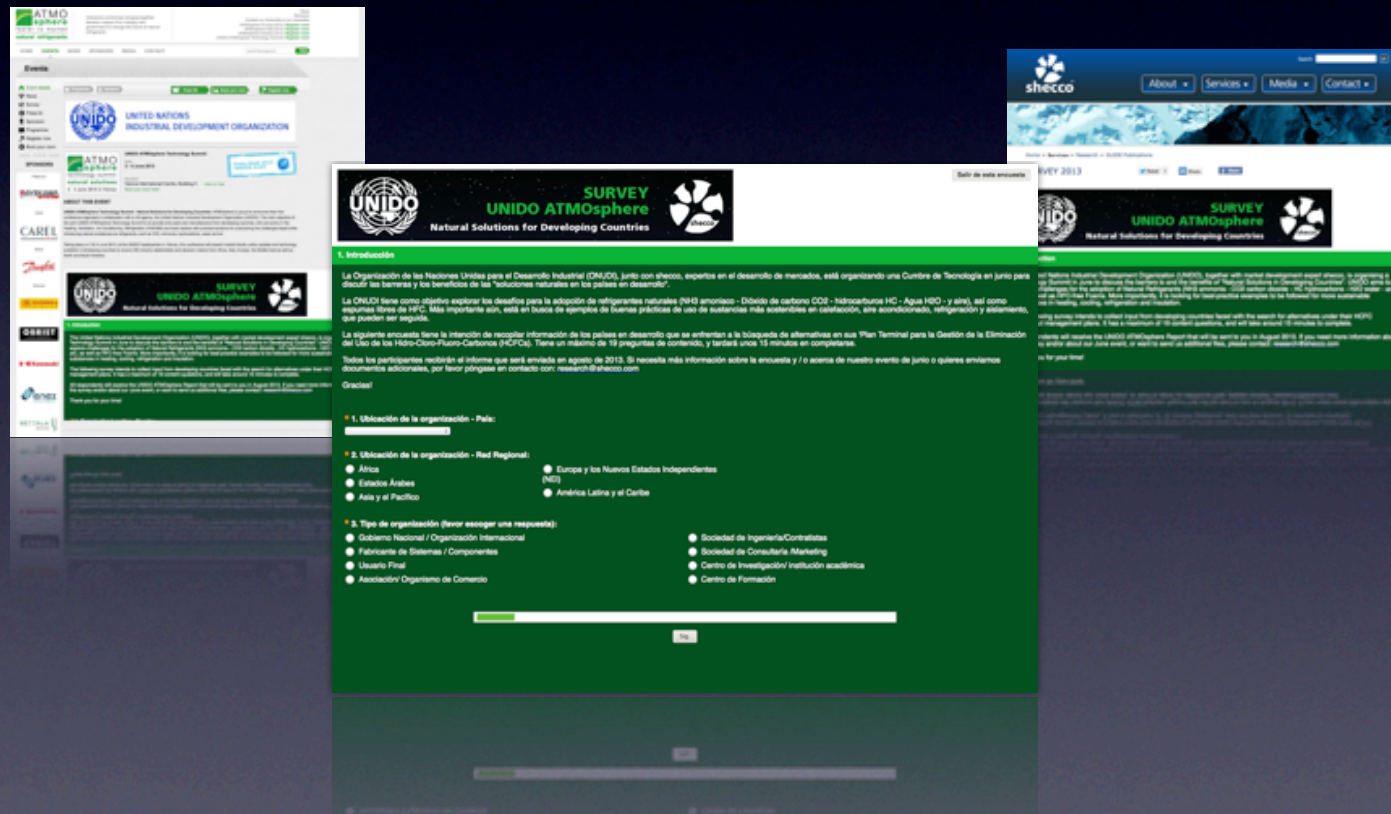
- launch: Aug / Sep 2013
- **highlights:**
- Introduction to Natural Substances
- Success Stories: applications of natural refrigerants & foams
- Global Survey results: market shares, trends, barriers, solutions
- Case studies: best practice examples

GUIDE UNIDO Survey



www.ATMO.org/UNIDO

www.shecco.com/SURVEY-UNIDO-Natural-Substances-2013.php



English: <https://www.surveymonkey.com/s/UNIDO-Natural-Substances-2013-EN>

Spanish: <https://www.surveymonkey.com/s/UNIDO-Natural-Substances-2013-ES>

French: <https://www.surveymonkey.com/s/UNIDO-Natural-Substances-2013-FR>

shecco - useful links



Industry Platforms:

<http://www.hydrocarbons21.com>

<http://www.R744.com>

<http://www.ammonia21.com>

<http://www.R718.com>

GUIDEs:

<http://guide.shecco.com>

ATMOsphere 2012 Report / ATMOsphere Europe 2013:

<http://www.ATMO.org>

contact details:

Nina Masson

nina.masson@shecco.com

+32 2 230 3700

+32 473 468 194

**DON'T FORGET TO
TAKE THE SURVEY +
SEND US INPUT !**