



NATURAL REFRIGERANTS IN DEVELOPING COUNTRIES

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BACKGROUND

The policy of the Montreal Protocol in the past:

In almost all projects the CFCs are replaced with HCFC and HFC technologies.

Minor exceptions at domestic refrigerators and freezers.

The main reason: the lower first cost (named as cost effectiveness) which is not correct approach.

New approach: Life Cycle Cost; TEWI value; (CII); ...

In a first instance with the strategy until 2015 it can be expected that the management plans (HPMP) will use conversions to HFCs.



BACKGROUND

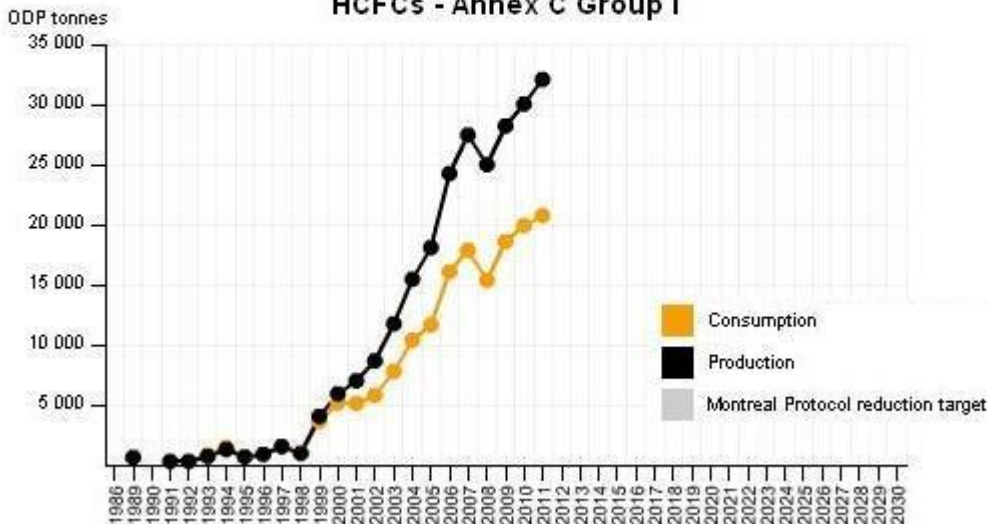


China



Trends Analysis of Production and Consumption of

HCFCs - Annex C Group I



Source: Article 7 Data reported from Ozone Secretariat updated on: 19/03/13

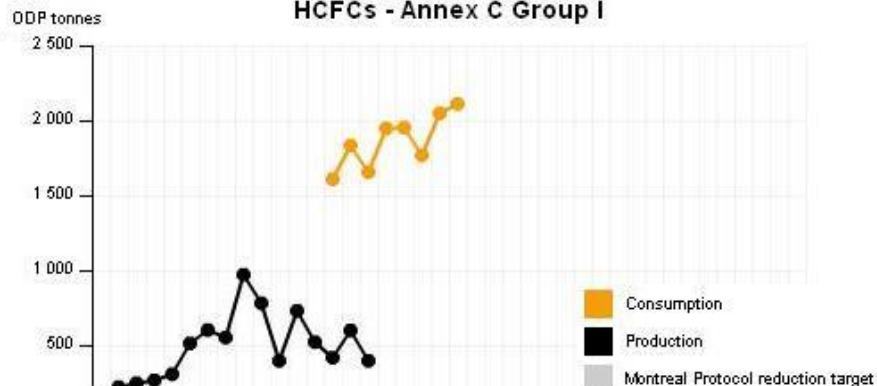


Korea, Republic of



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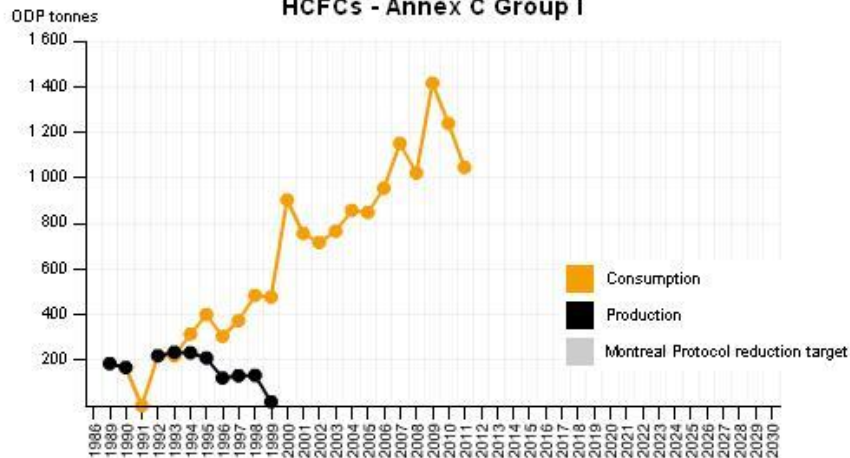


Brazil



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HCFCs production and consumption in China, Korea and Brazil



PROBLEMS AND BARRIERS IN DEVELOPING COUNTRIES

The biggest barrier to use natural refrigerants in developing countries: lack of information and proper information.

The first cost of equipment with ammonia and CO₂ is higher, this is a barrier at a global level.

In most developing countries:
there is a weak economy with a low purchase potential.

Technologies with NH₃ and CO₂ are a privilege of rich countries.

Facts:

- manufacturers and users of CO₂ equipment are in developed countries.
- new ammonia and NH₃/CO₂ cascade systems, supermarkets,
- IIR GL conferences, too expensive.
≈ 5% participants from developing world.

PROBLEMS AND BARRIERS IN DEVELOPING COUNTRIES

Almost all service companies in RAC sector are very small with one to five employed.

No budget for improvement neither time for further education;
no new information and better practice.

The priority of the companies in developing countries is how to survive, the type of refrigerant is not so important.

There are many service technicians who work without registration that reflects to the quality of servicing.



SUGGESTIONS

New strategy and measures must be undertaken to switch directly to technologies with natural refrigerants.

Dissemination of information on technologies and practices with natural refrigerants from developed to developing countries.

Approaching to new concepts of refrigeration and air conditioning systems with a low refrigerant charge.

Presentations of possibilities using natural refrigerants in various applications: commercial and industrial refrigerating systems, air conditioning and heat pumps.



TRAINING

In developing countries, most of service technicians have been trained since 2000 within the projects for the phase-out of CFC refrigerants.

Whether the already trained technicians need new training courses as it is in the EU, F-gas Regulation no. 842/2006?

In most developing countries, there are not training centers equipped with installation and units which use natural refrigerants NH₃, CO₂ and HCs.

To install demonstration units and systems with new technologies with ammonia and CO₂ in every developing country, supported by MLF and/or GEF.



TRAINING



Built in 2012



**A CO2 system is not used.
No trained personnel on CO2 system.**



SAFETY (standards)

The standards and regulations are very important for safe work of refrigerating systems, especially for NH₃ (toxic) and HCs (flammable).

The standards in the RAC sector in most ECA countries are old and are not adapted to new products and technologies. For example, in the past, working pressures up to 20 bar were, and they are now well over 100 bar.

To introduce standards and regulations for design and safe operation of the refrigerating systems, using the positive experiences of the EU standard EN378.



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

Thank you.