



Ministerio de Ambiente, Vivienda y Desarrollo Territorial
República de Colombia



COLOMBIA'S POSITION ON THE HCFCs PHASE OUT AND PERSPECTIVES FOR NATURAL REFRIGERANTS

MINISTRY OF ENVIRONMENT, HOUSING AND TERRITORIAL DEVELOPMENT

DIRECTION OF SUSTAINABLE DEVELOPMENT

NATIONAL OZONE UNIT

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OBJECTIVE OF COLOMBIA'S PARTICIPATION

To make a presentation about Colombia's position on HCFCs phase out and natural refrigerants and the way the HPMP is being drafted.





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CONTENTS

1. HCFCs phase out management plan – Colombia's HPMP proposal.
2. Colombia's position on natural alternatives for the R & AC sector.





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1. HCFCs phase out management plan

COLOMBIA'S HPMP PROPOSAL





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CHARACTERISTICS OF THE HCFCs CONSUMPTION



- ✓ Situated in the north-western extreme of South America.
- ✓ Colombia is the only country on the sub-continent with coasts on both the Atlantic and Pacific oceans.
- ✓ With a land surface of 1,141,748 km².
- ✓ In 2009, Colombia had 45.1 million inhabitants.



UNEP
UNITED NATIONS
ENVIRONMENTAL
PROGRAMME



CHARACTERISTICS OF THE HCFCs CONSUMPTION

- ✓ There is no HCFCs production.
- ✓ In the period 2004-2009 the only registered exports were 16,420 kg of HCFC-141b, 400 kg of HCFC-123 and 1,690 kg of HCFC-22. There have not been exports of HCFCs since 2005.
- ✓ Colombia defined the starting point for aggregate reduction as the average between the 2009 and 2010 consumptions. The HCFCs consumption by market segment is as follows:

Market Sector	HCFC	% (ODP Tons)
Polyurethane Foam: Domestic Refrigeration, Commercial Refrigeration, Continuous Panels, Industrial Refrigeration & Construction, Spray foam , Integral Skin and Polyol formulation.	141b, 22	66.27
Refrigeration and Air Conditioning: Cold rooms manufacture and Maintenance.	22, 123, 142b, 124	30.14
Solvents and aerosols: Flushing, Cleaning of electronic equipment, Silicon coating process of needles and Aerosols.	141b, 22	2.82
Fire extinguishing	123	0.77
TOTAL CONSUMPTION		100.00



CHARACTERISTICS OF THE HCFCs CONSUMPTION

- ✓ Substances: HCFC-141b is first in the rank with 63.8% of the total ODP consumption, followed by HCFC-22 with 34.9%. HCFC-123 and HCFC-142b only contribute with 1.1 and 0.2% respectively.
- ✓ In the period 2004-2009 the HCFCs consumption in ODP tons grew an average rate of 11.12% per year.



AVAILABILITY AND SELECTION OF TECHNOLOGY OPTIONS TO REPLACE HCFC_s

- ✓ In the case of foams, the use of hydrocarbons as blowing agents is a well proven technology for the applications existing in the country except for spray (the barrier for this application is safety during foaming). Unfortunately, the significant incremental capital cost required for the conversion makes this technology only economically effective for relatively large factories.



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AVAILABILITY AND SELECTION OF TECHNOLOGY OPTIONS TO REPLACE HCFCs

- ✓ For small and medium companies there are several emerging technologies (methyl formate, methylal, pre-blended hydrocarbons, short-lived HFCs, Supercritical CO₂ for spray) that are being evaluated in pilot projects supported by the Multilateral Fund. The complete results are expected by the middle of next year.





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AVAILABILITY AND SELECTION OF TECHNOLOGY OPTIONS TO REPLACE HCFCs

- ✓ Based on above considerations Colombia selected hydrocarbons (cyclopentane or cyclopentane/isopentane blend) as HCFCs replacement candidates for the domestic refrigeration sub-sector, the largest producers in the commercial refrigeration sub-sector and the manufacture of continuous panels.





AVAILABILITY AND SELECTION OF TECHNOLOGY OPTIONS TO REPLACE HCFC_s

- ✓ For the remaining sub-sectors (discontinuous panels, spray and integral skin), consisted of small and medium enterprises attended by local system houses, the country will select a low GWP alternative from the mentioned emerging options once the pilot projects being currently carried out provide a better insight on the sustainability and impact of these technologies.



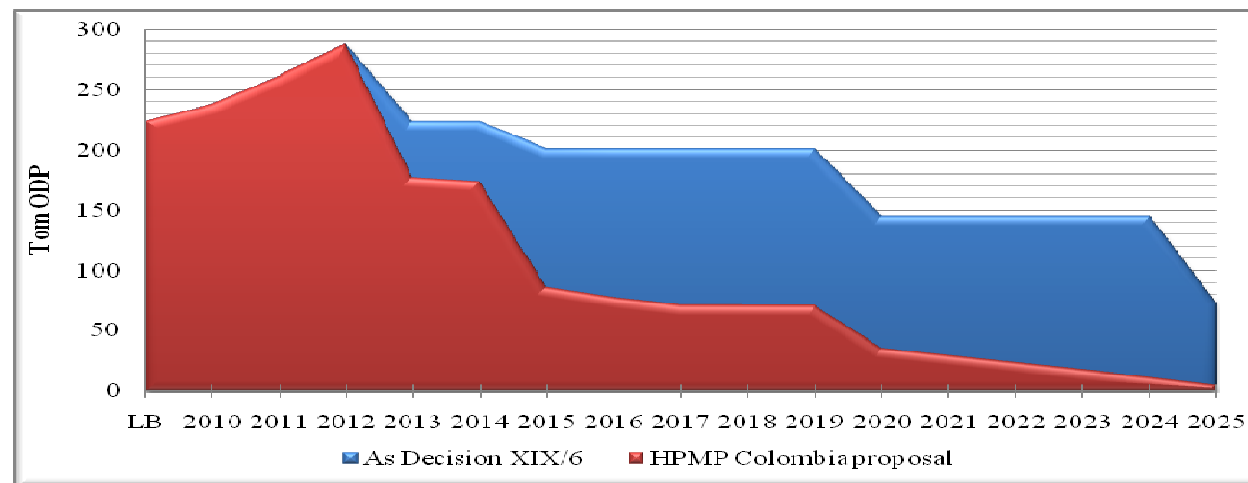
AVAILABILITY AND SELECTION OF TECHNOLOGY OPTIONS TO REPLACE HCFC_s

- ✓ Regarding Refrigeration & A/C the situation is complex because of the high GWP of several of the drop-in substitutes for HCFC-22. Natural refrigerants (hydrocarbons, carbon dioxide and ammonia) and some HFCs (GWP < 10) have been successfully evaluated but in some existing applications they have not been proven enough or are not cost-effective.



STRATEGY STATEMENT

- ✓ The government has designed a two-steps strategy to achieve an accelerated HCFCs phase out by the year 2025 with half way reductions in HCFCs consumption of 60% in 2015 and 85% in 2020.
- ✓ A 2.5% of the HCFC consumption will be allowed in the period 2025-2030 for maintenance in the refrigeration sector.
- ✓ In 2015 the country will review the progress of the strategy implementation to analyze the possibility of a more drastic reduction to achieve a complete phase-out by 2020.



HCFCs Phase-out in Colombia



STRATEGY STATEMENT

Stage 1. Period 2011-2015

At the end of the stage 1, period 2011-2015, Colombia is committed to achieve the following goals:

- ✓ HCFC-141b and HCFC-22 phase-out in the domestic refrigeration sub-sector.
- ✓ HCFC-141b phase-out in the three largest producers of commercial refrigeration equipment.
- ✓ HCFC-141b phase-out in the manufacture of continuous panels.
- ✓ 80% reduction in HCF-141b consumption for the industrial refrigeration and construction sectors and the remaining commercial refrigeration manufacturers.



STRATEGY STATEMENT

Stage 1. Period 2011-2015

- ✓ HCFC-141b and HCFC-22 phase-out in emissive uses (cleaning of electronic equipment, aerosols and silicon coating process for needles).
- ✓ HCFC-141b phase out used in flushing pipes.
- ✓ 40% reduction in HCFC-22 consumption for the maintenance of the Refrigeration & A/C equipment (compared to the average between 2009 and 2010).
- ✓ 10% reduction in HCFC-123 consumption in the fire extinguishing sector.





STRATEGY STATEMENT

Stage 2. Period 2015-2025

At the end of the stage 2, Colombia is committed to achieve the following goals:

- ✓ Entire HCFC phase-out in all applications. 2.5% of total ODS consumption will be allowed for maintenance in the refrigeration sector in the period 2025-2030.
- ✓ Imports of all HCFC (excepting the 2.5% quota for the refrigeration maintenance) will be banned since January 1st of 2025.
- ✓ Imports of HCFC-141b will be banned since January 1st of 2020.
- ✓ Imports of HCFC based blends for refrigeration & air conditioning will be banned since January 1st of 2020.



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2. Colombia's position on natural alternatives for the R & AC sector



PROGRAMME FOR THE ELIMINATION OF CONSUMPTION OF HCFCs IN THE POLYURETHANE FOAM MANUFACTURING SECTOR

- ✓ In stage 1 of the HCFCs phase-out, Colombia will implement three conversion plans for the Foam Manufacturing Sector:
 - Conversion Plan for the entire domestic refrigeration producers (2011-2013)
 - Conversion Plan for the largest commercial refrigeration producers (2011-2013)
 - Terminal Conversion Plan for the Foam Sector

- ✓ For the first two plans, the technology of choice will be hydrocarbons (c-pentane, cyclo/iso-pentane blend for foam and in several cases iso-butane for refrigeration system). The objective of these conversion plans is to phase out the use of HCFCs for the production of rigid PU insulating foam at the largest HCFCs consumers in the country that can afford the conversion to hydrocarbons.



PROGRAMME FOR THE ELIMINATION OF CONSUMPTION OF HCFCs IN THE POLYURETHANE FOAM MANUFACTURING SECTOR

- ✓ For the third plan, umbrella type projects around the main system houses will be implemented to convert the small and medium enterprises (discontinuous panels, commercial refrigeration and integral skin). One of the emerging options under evaluation with a positive impact on climate change will be applied.
- ✓ By Decision 60/30 the Executive Committee approved in its 60th meeting the project for the conversion plan in the domestic refrigeration sub-sector at a total cost of US\$5,621,483.
- ✓ Colombia in cooperation with Japan will develop a US\$400.000 demonstration project on Supercritical CO₂ technology for spray foam (2010 – 2011).





SOLAR CHILL PROJECT

- ✓ Colombia was selected in 2009 to participate in a new project demonstration to change old vaccine refrigerators for new with Solar Chill technology.
- ✓ The project will focus on three sets of activities:
 1. The first will involve the procurement of 100 Solar Chill A vaccine refrigerators for each partner country. These will be placed in solar clinic and will be carefully monitored to ensure that adequate data are available to verify the reliability of the product. UNEP, in consultation with Solar Chill International and local partners will ensure the scientific credibility of the data. These data will be critical to advertise the vaccine refrigerator around the world and stimulate the demand for the technology.



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SOLAR CHILL PROJECT

2. Second, a smaller number of Solar Chill B units will be procured for the country. This will be demonstrated in industry shows and placed in businesses and places where they can be monitored for reliability, but also marketed. Given the magnitude of the potential market for cold drink and fresh food refrigeration in the target countries, it is likely that the Solar Chill B may stimulate more commercial interest than Solar Chill A.





SOLAR CHILL PROJECT

3. The third major activity under the project will be a marketing and awareness raising campaign, again to be undertaken by UNEP in collaboration with local and international partners. The purpose of this is to raise awareness of Solar Chill products, stimulate market demand and pave the way for accelerated commercialization, production and technology transfer in the program countries.
- ✓ Budget (near to US\$2.5 million) will be evenly split between the three countries (Colombia, Kenya and India), and will include the process of prospecting for commercial partners for the technology. Funding is also made available for the actual development and provision of a technology transfer package, including legal agreements and licensing arrangements.





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PROGRAMME FOR THE ELIMINATION OF CONSUMPTION OF HCFCs IN THE REFRIGERATION AND AIR CONDITIONING SECTOR

- ✓ Colombia, in the short term, will not promote the substitution of HCFCs installed in equipment that still is operating adequately. Instead, it will work for the application of good practices in maintenance and the implementation of recovery and recycling procedures to minimize the escape of refrigerant into the atmosphere and reduction of the consumption of virgin gas.





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PROGRAMME FOR THE ELIMINATION OF CONSUMPTION OF HCFCs IN THE REFRIGERATION AND AIR CONDITIONING SECTOR

- ✓ In the search for possible substitutes for HCFCs, which can be implemented as long term solutions by end-users, Colombia considers important to explore the possibility of carrying out at least two demonstration projects on the replacement of HCFCs by 'natural refrigerants' in one of the end-user sectors with the highest installed loads of HCFC-22 – like shopping centers, hypermarkets or hotels.





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PROGRAMME FOR THE ELIMINATION OF CONSUMPTION OF HCFCs IN THE REFRIGERATION AND AIR CONDITIONING SECTOR

- ✓ Some end-users, cataloged as large-scale users of refrigeration, conscious of the energy savings and the reductions of greenhouse-effect gas emissions that can be achieved by using more energy-efficient technologies, are including in their programmes for the next 2 or 3 years, the substitution of the equipment based on HCFCs for equipment based on HCs.





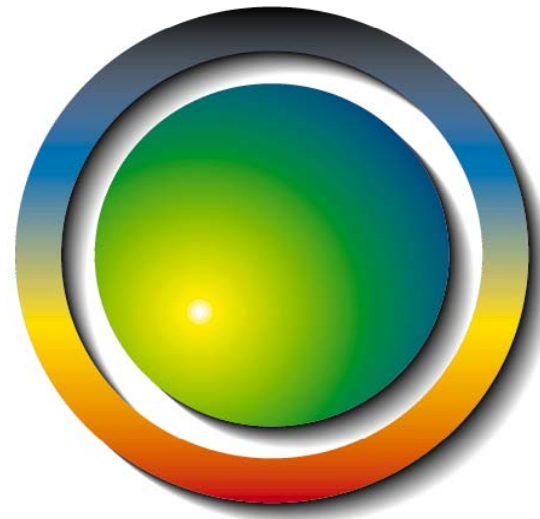
BARRIERS TO NATURAL REFRIGERANTS IN COLOMBIA

1. Training & Know-how (engineers education/certification, technical data, meetings, information campaigns).
2. Technology & Safety (technical challenges, safety issues).
3. Funding & Support (CDM/JI mechanisms, grants, subsidies, tax credits, direct investment).
4. Supply & Availability (materials, equipment, components, fluids).
5. Markets & Marketing (advertising, competition by chemical refrigerants).





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THANK YOU FOR YOUR ATTENTION!



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