

**Why this fact-sheet:**

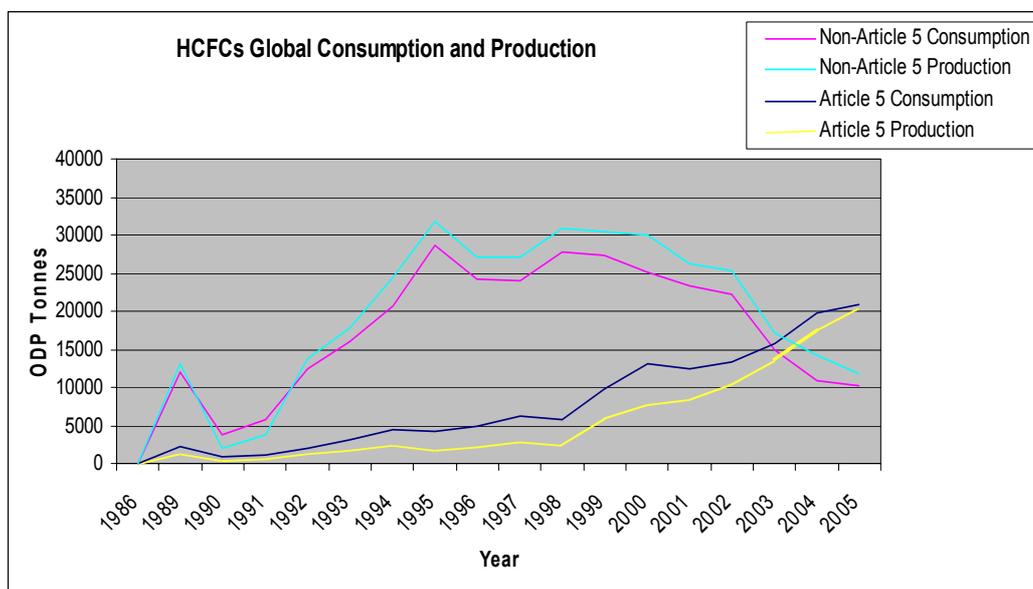
HCFC is a controlled substance under the Montreal Protocol and has been mainly used as refrigerant even before the Montreal Protocol; As the implementation of the Montreal Protocol, HCFC is now also widely used in the refrigeration, foam, solvent, aerosol and fire fighting sectors as a transitional substance to substitute CFCs due to its low ODP. HCFC is also used as feedstock for other chemical products.

This fact-sheet is aimed to brief the NOUs of Article 5 countries on the issues surrounding the HCFC. It would highlight the HCFC production and consumption trends in both Article 2 countries and Article 5 countries, summarize the study of environmental impacts it would pose, reflect the progress of alternatives development and highlight the need to take action.

**Production and Consumption of HCFCs**

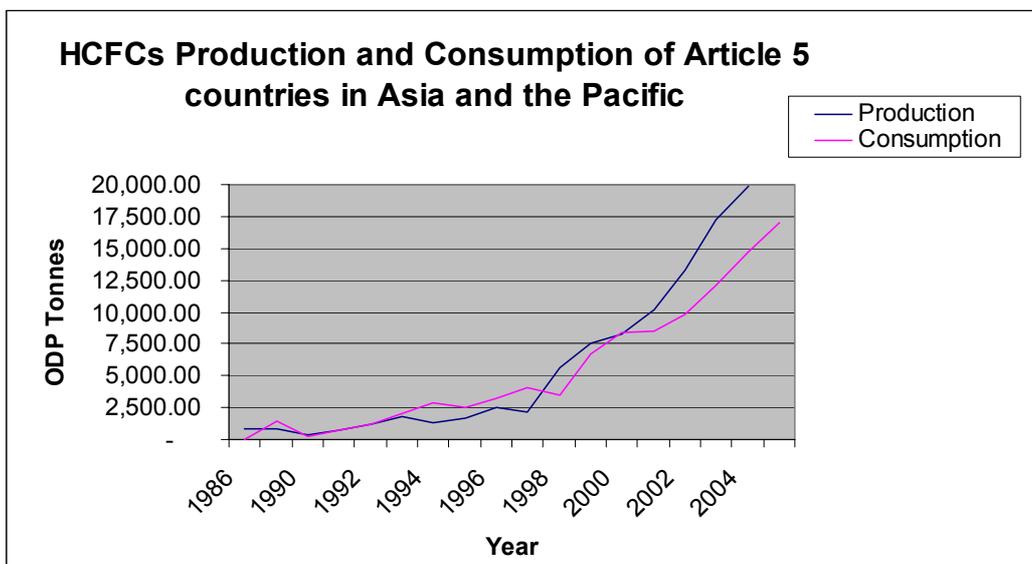
HCFCs are mainly used in air-conditioning and refrigeration equipment. The TEAP estimates that approximately 75% of global HCFC use is in air-conditioning and refrigeration sectors and is predominantly HCFC-22. The analysis of Article countries' Article 7 data in this region confirmed that more than 80% of HCFCs are HCFC-22, which mostly used in the air-conditioning and refrigeration sector. In addition, HCFC-141b/142b is widely used as foaming agent and solvents. HCFC-123, 124 and others are used as refrigerant, solvents and fire suppressants.

The production and consumption of HCFCs trends in both Article 5 and non-Article 5 countries (see graph) is summarized as below based on the Article 7 data (as of March 2007):



- Since 2000 on an average, HCFC consumption and production in Article 5 countries has been increasing at an annual rate of 17%, and 28%, respectively;
- Since 2000 on an average, HCFC consumption and production in non-Article 5 countries has been decreasing at an annual rate of 17% and 17%, respectively;
- In the year 2003, the consumption of Article 5 countries is more than non-Article 5 countries;
- In the year 2004, the production of Article 5 countries is exceeding non-Article 5 countries.

In the Asia and the Pacific region, the increase in HCFC consumption and production of Article 5 countries is at a higher rate than the average of the same period, i.e. 21% and 29% annually on average as per the Article 7 data (as of March 2007).



### Future Trend

The results from HCFC surveys conducted in Argentina, Brazil, Colombia, India, Indonesia, Islamic Republic of Iran, Lebanon, Mexico, Venezuela (UNEP/OzL. Pro/ExCom/51/Inf.2) presented by UNDP, confirmed that HCFC consumption would keep increasing in the coming years. Compared with the 2005 consumption of 52,248 metric tons, the 2015 forecasted unconstrained consumption would more than double to 117,450 metric tons. Another independent study on the strategy for the long term Management of HCFCs in China presented (UNEP/OzL. Pro/ExCom/51/Inf.3) by Germany also concludes similar results, i.e. the consumption of HCFC-22 and HCFC 141b in China would increase from 140,000 metric tons in 2003 to 300,000 metric tons in 2015. These sample studies would, to some extent represent HCFC development trends of Article 5 countries in the coming years.

### Environmental Concerns:

- 2006 World Metrological Organization/United State Environment Programme (WMO/UNEP) Scientific Assessment of Ozone Depletion concludes that recovery of the ozone layer will take longer than expected, well into the second half of this century, largely because of "an increase in HCFC-22 emissions due to larger estimated future production." The Antarctic ozone hole is not expected to be eliminated until around 2065.
- The joint Intergovernmental Panel on Climate Change (IPCC)/Technical and Economic Assessment Panel (TEAP) Special Report "Safeguarding the Ozone Layer and the Global Climate System: Issues Related to Hydrofluorocarbons and Perfluorocarbons, Summary for Policymakers" noted that the continued production of HCFCs (the majority of which is HCFC-22) would add nearly one billion carbon dioxide equivalent tonnes of greenhouse gases to the atmosphere in 2015.

## Alternatives of HCFCs

Alternative technologies are commercially available for most applications that currently use HCFCs. The major challenge for developing countries will be how to access the cost-effective and environment-friendly substitutes. A proper funding mechanism may need to be developed.

In 1999, UNEP OzonAction started informing National Ozone Units about such options when it developed and distributed "Avoiding a Double Phase-out: Alternative Technologies to HCFCs in Refrigeration and Air Conditioning" a case study booklet about how companies and organizations in other countries have successfully identified, evaluated and adopted alternatives, non-HCFC refrigerants. ([http://www.unep.fr/ozonaction/information/mmc/lib\\_detail.asp?r=2428](http://www.unep.fr/ozonaction/information/mmc/lib_detail.asp?r=2428))

## Actions taken by EU and US in phasing out HCFCs

As of January 1, 2003, USEPA banned production and import of HCFC-141b.

On March 19, 2007, the USEPA finalized a rule determining that HCFC-22 is unacceptable to use as a foam blowing agent. The use of HCFC-22 in rigid PU foam applications other than marine flotation foam will not be allowed after March 1, 2008.

USEPA will ban on production and import of HCFC-22 and HCFC-142b except for on-going servicing needs in equipment manufactured before January 1, 2010.

From 1 January 2010, the use of virgin HCFCs is prohibited in maintenance and servicing of refrigeration and air-conditioning equipment in EU countries. Therefore, the consumption of HCFCs in EU countries would be zero from 2010.

The EU prohibited HCFC use in aerosols, solvents (except for precision cleaning in aerospace and aeronautics applications until 1 January 2008), and in new refrigeration and air conditioning equipment manufacture and in foam production.

## Future for Article 5 countries

In 2005, the consumption of HCFCs in Article 5 countries was around 20,972 ODP tonnes, the second highest group in terms of ODP amount after CFCs. But if the HCFCs consumption is measured in metric tons, the consumption in 2004 would be as high as 280,000, almost double the historic peak consumption level of CFC of the Article 5 countries. Therefore, it might be reasonable to assume the phase-out HCFC process would not be a simple, but rather, at least as complicated as CFC phaseout process.

In the case of CFCs, the freeze target for developing countries was decided in 1987 when the Montreal Protocol was first adopted. Then, with the Multilateral Fund assistance since 1991, it took Article 5 countries 8 years to be in compliance with the first control target, i.e. the 1999 freeze of CFC consumption and production. Assuming that the phase out of HCFCs will follow a similar pattern to that of CFCs, Article 5 countries may need to consider their strategies long before the freeze target approaches.

Some Article 5 countries, e.g. Argentina and Brazil, have recognized that reducing the current significant growth rates in HCFC consumption to zero growth in 2016 cannot be achieved without addressing HCFC use patterns early on<sup>1</sup>. This implies that actions to control and reduce HCFC consumption to ensure compliance with the 2016 freeze would need to be initiated well in advance of that date.

The 2006 WHO/UNEP Scientific Assessment highlights the phase-out of HCFCs as one of the most important actions the Parties can take to reduce the risk of future ozone depletion, followed by recovery and destruction of halons and chlorofluorocarbons (CFC) banks and the phase-out of methyl bromide (MeBr) and carbon tetrachloride (CTC).

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<sup>1</sup> UNEP/OzL.Pro.WG.1/27/8/Rev.2: Proposed adjustments to the Montreal Protocol.

## Next Step

With the current thinking on HCFC, several proposals from both Article 5 and non-Article 5 countries have been put forward to the 27th meeting of the Open-Ended Working Group to be held in Nairobi during 4-7 June 2007 for consideration. The proposed adjustments include:

- advancing of the freezing year with different base lines;
- setting up step wise target;
- accelerating the phaseout process;
- allowing essential use exception;
- Funding mechanism under the Multilateral Fund: Review decision 17/7 concerning the funding eligibility for ODS relevant facilities installed after cut-off date of July 1995 and the decision concerning funding double transition.

All Article 5 countries may consider reviewing their national policy and regulation and institutional arrangements for its applicability to HCFC control and phaseout. It would be also important for the NOUs to secure political commitment at the national level to support the important movement in the ozone layer protection in the 20<sup>th</sup> anniversary of the Montreal Protocol.