

Mr. Jean-Jacques Becker, Chair  
CDM Methodology Panel  
c/o CDM Secretariate  
UN Framework Convention on Climate Change  
*sent by email*

20 Sept 2004

Dear Mr. Becker

## **Comments on Leakage Concern for AM0001**

Ineos Fluor is a Participant in the two projects using AM0001 submitted for the Registration Process. Although these projects should not be affected by the review of AM0001, since they were duly validated and registration requested before AM0001 was put on hold, we believe it is important that the Methodology Panel have sufficient information for the review process. Therefore we are submitting comments in this letter.

We are aware that a number of stakeholders have already raised concerns about the validity of the process for this review for AM0001, and while we support these concerns, in this letter we intend to concentrate on the issue of leakage.

As you will be aware we submitted a letter on 5 July 2004 to the Methodology Panel in response to the letter from DuPont, and if these matters are to be discussed further then we would hope to be able to submit further comments.

We understand that the leakage issue can be summarised as follows:

- Will the generation of CERs from HFC 23 abatement drive increase in HCFC 22 production beyond business-as-usual leading to increased emissions of HCFC 22?
- Further, HCFC 22 is considered a greenhouse gas under the UNFCCC, even though it is not included in the basket of gases under the Kyoto Protocol.
- Finally leakage has to be measurable and attributable - measurable means 'can be measured' and attributable means 'directly attributable.'

## **In summary**

We conclude that there should be no global or regional change in the demand for HCFC 22 driven by CERs, and therefore there will be no leakage of HCFC 22 emissions.

Even if such effect did occur, in our opinion they would not be measurable or directly attributable to a particular project.

The key issue is to determine any incremental HCFC22 production attributable to a CDM Project. Business-as-usual HCFC 22 production forecasts for a plant in the absence of a CDM project would be one of the ways to address this issue, and where formal business plans do not exist, past production and growth trends can be looked at.

## Detailed Comments

### The generation of CERs and HCFC 22 production

#### *Generation of CERs from Industrial projects*

When the Kyoto project was agreed, the basket of gases and industrial abatement were included as activities suitable for CDM projects. Industry will seek to reduce GHG emissions through the implementation of CDM projects across a range of sectors, using technologies that are reliable, effective and established in Annex 1 Parties. Such projects implemented in partnership with the chemical industry in non-Annex 1 Parties will improve the sustainability of the chemical industry, by reducing environmental burden, improving economic performance of the regions where the chemical industry is based, and providing employment, and local investment.

It is clear that there will be other industrial abatement CDM projects particularly for nitrous oxide from nylon and nitric acid plants. Some of these projects are expected to be of a similar scale to HFC 23 abatement projects<sup>1,2</sup>.

#### *HCFC 22 production*

HCFC 22 used for PTFE production does not result in HCFC 22 emissions. There are no controls on production for feedstock use and production of HCFC 22 will continue beyond 2040 if there is a demand for PTFE. In fact PTFE production is increasing at about 3 to 4% annually globally<sup>3</sup> and is forecast to require over half the global capacity of HCFC 22 by 2010 to satisfy demand<sup>4</sup>. In terms of demand for HCFC 22, PTFE is already the lowest price fluoropolymer derived from TFE (and therefore from HCFC 22), so lower HCFC 22 prices might be expected to have only limited impact on demand. Even so this would not lead to increased HCFC 22 emissions, as it is a feedstock use.

The important consideration is HCFC 22 for non-feedstock use, as production and consumption are controlled by the Montreal Protocol.

The recent TEAP report on HCFC availability for developing countries forecast a potential shortfall in production of HCFC 22 in 2010 and 2015. This is in part due to the phase-out schedule in the EU, which has a 65% reduction in 2008. In addition, the EU Regulations under the Montreal Protocol could irrespective of CDM, make a number of plants, in the EU, uneconomic from 2008 due to the limitation on production of HCFC 22 for non-feedstock use.

It might be argued that this will drive demand for alternatives to HCFC 22, however at present there is very little capacity in developing countries to produce alternatives to HCFC 22 and refrigeration and air-conditioning equipment based on alternatives.

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<sup>1</sup> In USA in 2002, the total industrial nitrous oxide emissions are reported as 22.6 million tonnes CO<sub>2</sub>e from nitric acid and adipic acid production, and HFC 23 emissions were reported as 19.8 million tonnes CO<sub>2</sub>e, from USA EPA inventory of U.S Greenhouse Gas Emissions and Sinks.

<sup>2</sup> NM0061 is a submitted methodology for nitrous oxide emission reduction from adipic acid production, and indicates annual emission reductions of 10.5-11.7 million tes CO<sub>2</sub>e from one project.

<sup>3</sup> see for example ECN, 10-16 May 2004 page 16.

<sup>4</sup> UNEP Report of the Technical and Economic Assessment Panel, May 2003, HCFC Task Force Report.

## HCFC-22 Demand and Production<sup>5</sup>

HCFC-22	Demand and Production (ktonnes)			
	(year)			
	2002	2005	2010	2015
Market Demand non-A5(1)	189	180	99	37
Market Demand A5(1)	104	132	212	305
Market Demand, total	293	312	311	342
Prod. Capacity: non-A5(1)	440	410	353	335
Prod.Capacity:A5(1)	166	181	205	230
Prod. Capacity: total	606	591	558	565
Feedstock Requirement	212	239	290	337
Available Market Capacity	394	352	268	228
Unused Capacity/Insufficient production capacity (negative)	101	40	-43	-114
Capacity Utilisation	83%	93%	100%	100%

However, the TEAP report has lower HCFC 22 production forecasts than other sources<sup>6</sup>, so it is possible that a shortfall in HCFC 22 production will not occur.

Article 5 Parties have in the past raised concerns about HCFC 22 availability at Montreal Protocol meetings in the context of EU proposals for interim cuts between 2016 and 2040. Parties stressed the need for time for their industries to phase out CFCs and the need for all options to be available.

*'In Decision XI/28, the 11th Meeting of the Parties requested the Technology and Economic Assessment Panel to study and report by 30 April 2003 at the latest on the problems and options of Article 5(1) Parties in obtaining HCFCs in the light of the freeze on the production of HCFCs in non-Article 5(1) Parties in the year 2004. This report should analyse whether HCFCs are available to Article 5(1) Parties in sufficient quantity and quality and at affordable prices, taking into account the 15 per cent allowance to meet the basic domestic needs of the Article 5(1) Parties and the surplus quantities available from the consumption limit allowed to the non-Article 5(1) Parties. Parties would consider this report at their 15th Meeting in the year 2003.'*<sup>4</sup>

One of the conclusions reached for the on-going role of HCFCs under the Montreal Protocol was that *'HCFCs are, and are likely to remain, important as "transitional substances" in the replacement of CFCs in refrigeration and air conditioning, insulating and integral skin foams, cleaning, and in speciality uses. They are also substitutes for halons in some fire protection applications.'*

If interim phase-down cuts were to be considered in the future for the Montreal Protocol then it appears unlikely that interim cuts would occur before 2024. This is based on a comparison to the phase-out schedule for non-Article 5 Parties, which required a 35% cut 8 years after the freeze in 1996.

CDM projects will have a 10 year or 3 times 7 year lifetime. CDM projects in the next 2-3 years will be complete by 2017 (for 10 year projects) or 2028 for 21 year projects. It seems likely that most if not all HFC 23 projects will be complete by 2028, considerably in advance of final phase-out. Therefore it appears unlikely that CDM projects would influence the final transition to alternatives.

<sup>5</sup> UNEP Report of the Technical and Economic Assessment Panel, May 2003, HCFC Task Force Report, Table ES -2, page 6.

<sup>6</sup> personal communication from A. McCulloch, School of Chemistry, University of Bristol, UK, based on work carried out for the IPCC Special Report on Ozone Depletion and Climate Change to be published in 2005.

HCFC 22 is already a low priced material, with lower prices than HFC alternatives. Normally prices are to a large extent influenced by supply/demand. Currently, TEAP forecasts a possible shortfall in supply of HCFC 22 in 2010/2015 timeframe, which might be expected to have a dominant influence in price.

For use of HCFC 22 in air-conditioners, the already low HCFC 22 price means that the cost component of HCFC 22 in the final product is very small. Even lower prices of HCFC22 should not have any impact on increasing production air-conditioners based on HCFC 22. Eventually the advantages of alternatives to HCFC 22, and the considerable efforts to improve the energy performance of products based on alternatives will lead to an increased uptake of these alternative products.

### ***HCFC 22 Production and Business-as-usual forecasts***

One of the objectives set out for validation of CDM projects is to ensure that the baseline represents business-as-usual in the absence of CDM. It is therefore important to ensure that a reasonable basis of considering a business-as-usual situation is agreed upon. Where companies have formal business planning processes, business-as-usual production plans may be considered. For other companies, past production levels, growth trends, capacity and legislation may be indicators to determine a business-as-usual situation in absence of CDM.

However in Article 5 Countries, for those swing plants that currently produce significant quantities of CFCs, production of HCFC 22 will increase as the plants phase out CFCs.

For totally new plants or expansions, then the question of business-as-usual will need to be carefully considered at the validation stage. However, given the forecast increase in production, in the absence of CDM, between 2002 and 2015, it might be expected that a number of new plants and expansions would have been planned irrespective of CDM.

### **HCFC 22 as a greenhouse gas under UNFCCC**

The UNFCCC does not limit gases that can be defined as greenhouse gases

*"Greenhouse gases" means those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and re-emit infrared radiation.*

When considering leakage of emissions in the context of HCFC 22 emissions, it should also be recognised that the production of CFCs and HCFCs are linked for swing plants that can manufacture CFC 11, CFC, and HCFC 22.

The GWP of HCFC 22 is considerably lower than the GWP of CFCs (CFC 12 direct GWP 8100, in contrast to HCFC 22 GWP of 1500 according to IPCC SAR). The switch from CFCs to HCFCs has significantly reduced GHG emissions. In addition the capacity of a swing plant to produce HCFC 22 is typically less than its CFC capacity.

In the context of the Montreal Protocol, it is worth noting that the 2002 WMO Assessment shows a change of 1.6 years in the date at which the chlorine content of the Antarctic stratosphere returns to normal (equates to disappearance of the ozone hole) for a total ban on emissions of HCFCs starting in 2003.

### **HCFC 22 Leakage**

The use and subsequent emission of HCFC 22 is influenced by a range of complex factors. For the downstream purchaser, the price of HCFC22 has a small, probably insignificant effect on the purchase decision for an air-conditioner. In non-Annex 1 Countries the air-conditioner market is driven by window units which are hermetic and need little servicing to replace refrigerant.

Technology improvement for air-conditioners for the markets in Annex 1 Countries will focus on alternatives to HCFC 22. Many of the manufacturing plants for air-conditioners using alternatives are located in non-Annex 1 Countries. The influence of technology development in Annex 1 Countries is clearly illustrated by the use of HFC 134a in car air-conditioning, which was rapidly implemented in China, well in advance of the requirement to phase-out CFC 12, even though there was at that time no significant production of HFC 134a in China.

Therefore there is no evidence, in our opinion, to suggest that HCFC 22 demand will be increased due to CDM projects. For a particular CDM project it can be concluded that there is no leakage of HCFC 22 emissions at the global or regional level.

Furthermore even if there was leakage this would not be measurable or directly attributable to a project.

The issue to address is to ensure that the production of HCFC 22 from a particular project is business-as-usual.

Yours sincerely

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