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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
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FURTHER ELABORATION AND ANALYSIS OF ISSUES PERTAINING TO THE PHASE-OUT OF THE HCFC PRODUCTION SECTOR (DECISION 53/37(g))

Background

1. Decision XIX/6 of the 19th Meeting of the Parties held in September 2007 made reference to the accelerated phase-out of HCFCs (see Annex I, Decision XIX/6: Adjustments to the Montreal Protocol with regard to Annex C, Group 1, substances (hydrochlorofluorocarbons)). It also directed the Executive Committee to take various actions to assist Article 5 countries to meet the new phase-out schedule. The Executive Committee took up the issue of funding HCFC phase-out at its 53rd Meeting in November 2007 when it requested the development of guidelines for HCFC management plans (HPMPs), which were approved at the 54th Meeting. The HPMPs are intended to develop a programme of action to enable compliance with the freeze in 2013 and the 10 per cent reduction in 2015, which should include among other things, surveys (where necessary), strategies, required changes in legislation, project preparation activities, and schedules of implementation.

2. In order to assist Article 5 countries in phasing out the HCFC production sector, at its 53rd Meeting the Executive Committee requested the Fund Secretariat to prepare a paper for consideration at the 55th Meeting, which addressed the following issues taken from decision 53/37, paragraph (g):

(a) The continued applicability of the current approach to funding HCFC production phase-out being based on the assumption of plant closures;

(b) The timing of funding HCFC production phase-out in view of the long duration between the HCFC freeze in 2013 and the final phase-out in 2030, taking into consideration that the phase-out of production and consumption could be undertaken simultaneously;

(c) The eligibility of the CFC/HCFC-22 swing plants in view of the commitment in the CFC production phase-out agreement not to seek funding from the Multilateral Fund for closing down HCFC facilities that use existing CFC infrastructure;

(d) The cut-off date for funding eligibility of HCFC production phase-out;

(e) Other issues related to the HCFC production sector, taking in account subparagraph (b) above (decision 53/37, paragraph (g)).

3. This document is organized according to the issues identified above. It includes data provided at a production sector experts' group meeting held in Montreal from 12 to 13 June 2008 as well as data provided by Sherry Consulting, a private consulting firm from the United Kingdom. It concludes with comments and recommendations from the Fund Secretariat.

The continued applicability of the current approach to funding HCFC production phase-out based on the assumption of plant closures

4. The following five Article 5 countries have HCFC production facilities: Argentina, China, India, Mexico, and Venezuela. China (followed by India) is the dominant producing country in terms of production capacity, the number of plants and the number of HCFCs produced.

5. Decision 19/36 (see Annex II) represents the basic guidelines for the production sector. It includes requirements for the initiation of the process of seeking support from the Multilateral Fund. The decision requires a country to indicate its desire to move forward on the production sector phase-out by requesting the Executive Committee to conduct a technical audit of the production facilities. The results of the audit are used in the preparation of the production phase-out plan and the consideration of the proposed sector plan by the Executive Committee. It also addresses issues such as exports to non-Article 5 countries and environmental cleanup.

6. The Indicative List of Categories of Incremental Costs (decision IV/18, paragraph 6, Annex III) includes the following three options for funding: closure, conversion, or new HCFC replacement facilities.

HCFC 141b

7. HCFC-141b is used mainly as a blowing agent and is not used for any feedstock application. It is relatively straightforward to phase out and production closure could be a logical way of phasing out production. There are six or seven HCFC-141b producers globally. China, the only Article 5 country producer of HCFC-141b, produced 87,000 metric tonnes of this substance in 2007.

8. It is possible, but expensive, to convert HCFC-141b facilities to produce HCFC-142b because HCFC-142b requires higher pressure in the process equipment. The way that the HCFC-141b plants in China are designed makes their conversion a more expensive option than closure. There are a small number of producers in China, but a very large number of small HCFC-141b consumers, so pressure could come from the consumption side to continue the availability of HCFC-141b and slow down the HCFC-141b production phase-out.

9. With respect to HCFC-141b, it would be more effective to address consumption and production together. On the consumption side this would involve phasing out the use of HCFC-141b in the manufacture of foam (which would reduce demand), while on the production side it may require providing producers with incentives to close production. Assuming that phasing out HCFC-141b production would assist China to achieve the 2013 HCFC production freeze and the 10 per cent reduction in 2015, it seems logical to address HCFC-141b first. This is consistent with the mandate of the Parties, “to agree that the Executive Committee, when developing and applying funding criteria for projects and programmes, and taking into account countries with low volume and very low volume consumption of HCFCs, give priority to cost-effective projects

and programmes which focus on *inter alia*: phasing-out first those HCFCs with higher ozone-depleting potential, taking into account national circumstances" (decision XIX/6, paragraph 11(a)). The early phasing out of HCFC-141b would maximize the environmental impact in terms of ODP value and would facilitate a timely reduction without the complications associated with issues of feedstocks and CDM impact.

HCFC-142b

10. HCFC-142b is a substance with dual uses. As a controlled substance, it is used as a blowing agent for XPS foam production. HCFC-142b is also used as a feedstock for the production of polyvinylidene fluoride (PVDF), a chemical which is used in several industrial applications. Two new plants are being constructed in China during 2008. In 2007 China had a capacity of 28,000 metric tonnes of HCFC-142b, of which 23,000 tonnes was used as a foam blowing agent and 5,000 tonnes was for intermediate use.

11. It is not clear whether firms would wish to transfer production from HCFC-141b to HCFC-142b. The primary emissive use for HCFC-142b as a blowing agent is not subject to large increases in demand (XPS foam is not as efficient as PU insulation). China already has a large production of HCFC-142b as indicated in paragraph 10 above, and would not need to convert HCFC-141b capacity to produce more. Finally, converting HCFC-141b to HCFC-142b results in the production of HFC 143a, which has a high global warming potential (GWP) and would therefore not be a desirable option given decision XIX/6 of the 19th Meeting of the Parties with respect to addressing GWP.

12. There appears to be more than enough capacity in Article 5 countries for HCFC-142b. In non-Article 5 countries, most HCFC-142b is used to make polymers. That is, most HCFC-142b globally is not for emissive uses, but is produced for feedstock to make PVDF, a substance for which robust growth is expected to continue.

13. Funding of HCFC-142b production should take into consideration the demand for controlled use as well as the potential growth for feedstock requirements. In 2007 PVDF demand consumed between 80,000 and 90,000 tonnes of HCFC-142b globally, and China used 5,000 tonnes of this amount. Two new plants are coming on-line in China that will use HCFC-142b as feedstock.

HCFC-22

14. While HCFC-22 use as a controlled substance is well-known, its intermediate use in the production of polytetrafluoroethylene (PTFE) has been growing steadily on a global basis. PTFE is used in several industrial and commercial applications. For HCFC-22, it is important to distinguish between production for intermediate use and production for emissive use. A global breakdown of HCFC production by usage is provided in Table 1.

Table 1

GLOBAL USE OF HCFC-22

Year	Emissive use (metric tonnes)	Intermediate use (metric tonnes)
2005	420,000	264,000
2006	425,000	290,000
2010 (assumption of accelerated Montreal Protocol)	375,000	380,000
2015	245,000	495,000

Source: Sherry Consulting.

15. Roughly 85 percent of the feedstock use for HCFC-22 is to make the derivative PTFE. PTFE output in China in 2005 was 33,000 tonnes and in 2006 it was 37,000 tonnes.

16. There are between 13 to 19 HCFC-22 producers in China with a capacity in 2007 of just under 500,000 tonnes/year.[1] Besides those in China, there are four HCFC plants in India, two at the same site in Mexico, and one each in Argentina and Venezuela. The plants outside China and one in China are swing plants by design.

17. For phasing out HCFC-22 production, there could be three options: closure, conversion to HFC-32, or use for feedstock production. In terms of financial impact on the Multilateral Fund, the option of moving to feedstock production would be a preferred one, because it removes the emission from production for controlled uses since the HCFC is completely transformed as a result of the feedstock process. At the same time, the liability of the Fund would be reduced. It is projected that the demand for HCFC-22 for feedstock applications is likely to continue, however, it is also known that the growth of feedstock use is restricted by the quality of HCFC-22 required for PTFE production. In other words, any lower quality HCFC-22 would only be sold as refrigerant for controlled uses.

18. HCFC-22 production could also be converted to HFC-32, which is further blended for production of HFC-410a. However, since HFC is a flammable product any conversion would involve significant retrofitting to address safety issues. It is also a greenhouse gas falling under the Kyoto Protocol. Moreover, there is already excess capacity to produce HFC which has a very limited market given that its only use is as part of the blend to make HFC-410a, which itself has a very high GWP.

19. The closure of HCFC-22 production will have to be considered in comparison with the option of switching to feedstock productions that was discussed earlier. The funding of HFC-23 destruction from CDM and its likely impact on the phasing out of HCFC-22 is also an issue. Several of the HCFC plants in China have approved CDM projects, as do most of the other HCFC producing countries (Argentina, India and Mexico).

[1] The estimated number of HCFC plants in China is between 13 (from experts) and 19 (from SEPA).

20. It has been suggested that the CDM funding has subsidized the production of HCFC-22, and has resulted in an increase in HCFC-22 production whilst depressing the price of HCFC-22 on the global market. The incentive cited for increasing HCFC-22 production has been the CDM credits from the destruction of HFC-23 (which is a by-product of the production process for HCFC-22), which represents approximately 3 per cent of the HCFC-22 production. This raises the question of whether the credit system under the CDM is linked to HFC-23 co-production levels and therefore the production level of HCFC-22. Since the CDM was introduced in 2003, and if it has led to an artificial increase in HCFC-22 production and lower prices of HCFC-22, an examination of HCFC-22 production and prices before and after 2003 should provide an indication of its impact, taking into account the prices of HCFC-22 as a raw material, HF and chloroform. Because of the complication of the feedstock use and the likely impact of the CDM on HCFC production, there is a need to examine these issues further.

Methodology for calculating closure costs

21. The methodology for determining plant life in CFC production can be applied to HCFCs. The lifespan of a plant should be verified through careful on-the-ground audits to assess issues related to the quality of technology used (e.g., carbon steel vs. stainless steel) and service records (maintenance spending as a percentage of initial capital investment). While a carbon steel reactor may need to be replaced every three to four years, the life span of a stainless reactor is approximately seven years and some plants are effectively re-built every five years through maintenance.

22. New firms employing state-of-the art technology generally have better yields, fewer leaks and lower emissions than older enterprises. It is also useful to consider the residual use value of the infrastructure associated with HCFC-22 plants that might be used for blending, storage or other uses once the plants are no longer producing HCFC-22. To prevent further HCFC production in plants, the liquid phase reactor system and distillation equipment should be destroyed. However, while a plant's production might be a candidate for closure the additional infrastructure at the site could be used to store, blend and use alternatives.

23. Scrap value was also taken into account by the Executive Committee in estimating the costs for CFC production closure. Moreover, closure also implies the need for clean-up. Decision 19/36 states that "the environmental clean-up of the ODS-producing facility should not constitute an incremental cost; however, it should be done in an environmentally responsible manner" (decision 19/36, paragraph (a)(iv)). The environmental hazards associated with closing plants and cleaning up sites depends on national legislation. Because of the high costs involved, some producers might not wish to dismantle equipment that is not used directly in the manufacturing process and that could be used for storage and handling of alternatives and imported supplies. If a facility continued to supply HCFC-142b and HCFC-22 for feedstock, funding for the cleanup of dismantled sites may not be necessary.

24. The Fund's guidelines allow for the deduction of costs associated with the export component of production to non-Article 5 countries and for foreign ownership of the facilities. The guidelines for foreign ownership were applied in the estimates for CFC production. The only foreign ownership associated with swing plants is in Mexico where 49 per cent of Quimobasicos is owned by a foreign company.

25. With respect to exports to non-Article 5 countries, decision 19/36 enables the Executive Committee "to approve the collection of quantities of exported CFCs" called for in item 3.3 on page 2 of Annex VI to the Report of the 19th Meeting of the Executive Committee, where countries were willing to provide such data, but not to insist on such collection if countries regarded the export data as confidential (decision 19/36, paragraph (c)).

The timing of HCFC production phase-out

26. In considering the phase-out of HCFC production, especially in countries that produce multiple HCFCs, there should be assurance that any phasing out of HCFCs with higher ODP values first, such as HCFC-141b (ODP value of .11)[2], should not result in an increase in production of HCFC substances with lower ODP values, such as HCFC-22 (ODP value of .055). This could happen since ODS phase-out under the Montreal Protocol is measured by groups of substances and not by individual chemicals within a group.

27. There should be some consideration of close synchronization (e.g., one to three years) between phase-out of consumption and production. This would help to avoid the negative incentive which led CFC producers to resist closure once prices had risen as a result of a decrease in supply and benefit from the profits generated from scarcity. Steps could be taken in advance of the Montreal Protocol schedule to reduce production ahead of consumption. Because of excess capacity there is enough continued availability of HCFCs to deal adequately with domestic consumption for servicing needs. There should also be measures (such as tracking) put in place to deal with illegal trade, which will be complicated due to the likely continued production of HCFC-22 as feedstock. The trend could be towards an increase in demand for HCFC-22 as feedstock.

Swing Plants

28. Under the agreements for CFC closure, countries with swing plants are not permitted to return to the Executive Committee to seek funds to phase-out production of HCFCs. The standard clause in CFC agreements states that, "no additional Multilateral Fund resources will be forthcoming for related activities including the development of infrastructure for the production of alternatives, the import of alternatives, or the eventual closure of any HCFC facilities that use existing CFC infrastructure". However, there may be technical reasons for the Executive Committee to reconsider that clause in the CFC production phase-out agreements as it applies to HCFC-22 production. In terms of compensation, this could be funded on the basis of closure costs for the controlled use production, but if the plant continues to produce for feedstock uses, the calculated costs would not include the typical costs to cover closure including the costs of the destruction of equipment, foregone profit or labour displacement.

[2] This is also the case for HCFC-142b, but to a less extent because the ODP value of HCFC-142b is 0.65.

29. Swing plants exist in Argentina (one), India (four), Venezuela (one) and Mexico (two). There are two HCFC plants at the same site in Mexico, both of which were designed to be swing plants, but only one of which received funding as it was the only one that had produced CFCs. Swing plants provide a relatively inefficient means of moving from CFC to HCFC production because the resulting production capacity for HCFCs is half of that for CFCs. China has one swing plant but all other CFC production plants were dismantled and new plants were built to produce HCFCs. The one swing plant had been used for CFC production until 2005 and will be used for CFC campaign production for MDI use and HCFC-22.

30. One argument for considering funding for swing plants might be that swing plants are eligible for compensation because these producers are being asked to phase-out HCFCs on an accelerated timetable based on decision XIX/6. Prior to September 2007, producers could have continued to produce at their baseline levels until 2040. Since the 19th Meeting of the Parties, producers in Article 5 countries must phase-out at a graduated rate from their baselines starting with the 10 per cent reduction in 2015. It might also be argued that HCFC-22 is required for a country's national industrial strategy as countries may have policies in place to minimize imports and use their own supply.

The cut-off date for funding eligibility

31. At its 17th Meeting, the Executive Committee decided "in light of technological advances, not to consider any project to convert any ODS-based capacity installed after 25 July 1995" (decision 17/7).

32. The date a plant was initially commissioned has generally been accepted as the initiation date of its lifetime. This should be adjusted for various factors, such as equipment and maintenance, which involves taking into account the capital investment, timing and significance of upgrades. This information is used to help calculate the remaining life of a plant, on a plant-by-plant basis.

33. The cut-off date for funding eligibility is largely a policy issue. The alternatives that have been proposed for cut-off dates have been premised on the state of technology at the time of the proposed cut-off date. This is consistent with the Executive Committee's cut-off date policies with respect to CFCs and other non-HCFC ODS. In 1995, the HCFC alternative technology was not well-developed and there was very limited availability of substitutes.

34. Experts consulted by the Secretariat indicated that, as of 2008, there is still insufficient availability of viable alternatives to HCFCs being produced to meet the demand even in non-Article 5 countries, so the level of availability is still too low to convert developing countries in 2008. There may be an issue of insufficient global capacity to currently produce HFC-245fa, which is an alternative blowing agent for HCFC-141b. In particular, there is also a lack of availability of alternatives to service the HCFC-22 market. Another aspect to consider is the potential difficulty in obtaining adequate audit information for a cut-off date prior to 2007 due to lack of record keeping, and the earlier the cut-off date the more difficult it would be to obtain relevant data.

Additional issues: Incentives for early closure and carbon financing options

35. With respect to financing, it is important to adopt a formula to frontload compensation for plants that wish to move faster with greater incentives than those that wish to wait for closure in the future. Unlike with CFCs where most producers could convert to HCFC production, most HCFC producers for controlled uses could go out of business, and it is likely to be the larger players that are able to make the investments necessary to survive in the derivatives market that requires a higher quality HCFC.

36. Because of decision XIX/6 of the Nineteenth Meeting of the Parties there may be an opportunity to provide additional climate-related funding with Multilateral Fund support for the closure of HCFC production facilities. For example, the World Bank is developing such an approach through the Climate Investment Funds (CIF), which will be funded at a level of US$ 5.5 billion to support clean technology and strategic initiatives.

37. A major source of existing funding for mitigating greenhouse gas emissions in developing countries is the CDM (see Annex III for a brief description). At present, credits are issued to HCFC producers based on the amount of HFC-23 that is not emitted against actual HCFC-22 production, working with a baseline up to a maximum of 2.9 per cent of emissions being HFC-23. Based on this understanding, HCFC-22 production is capped, as well as the 2.9 per cent of HCFC-22 volume resulting in the by-product HFC-23.

38. As mentioned above, the extent to which CDM has impacted the market for HCFC-22 production depends upon whether the market is viewed as driven by demand or supply. Based on data provided by Wakim and Associates, the demand-driven perspective is based on the fact that while the average US import declined from 2001 to 2004, the price has increased since 2004.[3] The supply-driven perspective is that CDM credits could provide an incentive to initiate and continue production because it is more profitable for enterprises to receive credits than to sell the HCFC-22. Several new production plants have come on-line since 2001 and many HCFC-22 producers have already obtained CDM credits. These include plants in Argentina, Mexico, India (four plants) and China (nine of the 13 plants).[4] With respect to the capacity that is not receiving credits, this tends to be new and built to produce HCFC-22 as a feedstock.

39. There is much uncertainty with respect to the CDM process and its future. It is not clear the extent to which there would be further HFC-23 mitigation activities through the CDM during the current commitment period, if any. Moreover, some contracts are up for renewal, whilst others have credits extended until 2012 or until 2016. More information may be useful from CDM officials for further discussions of this matter by the Production Sector Sub-group.

40. Annex IV contains a brief description of the Chicago Carbon Exchange, which might be an additional source of funding for HCFC production phase-out.

[3] The increase in 2004 was largely attributed to an increase in the cost of chloroform, but increases were less impacted by chloroform in 2005 and 2006.

[4] The estimated number of HCFC plants in China is between 13 (from experts) and 19 (from SEPA). Information concerning those with CDM credits is based on a total of 13 plants instead of 19.

Comments

41. Decision 19/36 requires that countries request the Executive Committee to undertake technical audits and addresses issues related to environmental cleanup and exports. This system has worked well for the existing production sector agreements.

42. Options under the Indicative List of Categories of Incremental Costs were considered and it was found that the HCFC production sector phase-out could be funded on the basis of production closure costs as was done for the CFC sector.

43. The phase-out of the HCFCs could be more effective than that of CFCs if the phase-out of HCFC production is synchronized with the phase-out of HCFC consumption. However, the phase-out of HCFC production needs to be addressed differently to that of CFCs. This is because HCFC-141b and 142b have much higher ODP values than HCFC-22 and to avoid any increase in the production of HCFC-22.

44. The CFC phase-out resulted in an anomaly in that plants that phased out earlier received similar levels of funding to those that phased out later, but those that phased out later were able to profit from the scarcity of CFCs generated from the early closure of some plants. To avoid this, the Executive Committee might consider in its future deliberations incentives for those that choose to phase out earlier than those that choose to phase out later.

45. It is likely that several HCFC production plants may continue to produce HCFCs for feedstock after the closure of HCFC production for controlled uses. To ensure that HCFCs produced for feedstock are not diverted for controlled uses after the closure of production for such purposes, production sector agreements should include robust monitoring systems similar to those used for the CFC phase-out.

46. The Executive Committee has decided to consider the issue of the condition on funding swing plants set out in the CFC production phase-out agreements that specifically precludes such funding for HCFC production facilities that have already received Multilateral Fund assistance. Article 5 countries have noted that those agreements were made prior to the accelerated phase-out schedules agreed in September 2007 when HCFC producers could have continued to produce at baseline levels until the year 2040.

47. The Executive Committee also agreed to consider the cut-off date in the context of its discussions on the production sector. In this respect, the paper suggests that such dates might taken into account the availability of alternatives.

48. Several HCFC producers are also receiving credits for HFC-23 emission mitigation efforts. These credits are more valuable than the resulting HCFC production thereby making it difficult to provide an incentive for closure of production facilities. Carbon credit trading through the CDM and other mechanisms may have an impact on the timing of the phase-out of HCFC production for controlled uses and more information on CDM from the UNFCCC Secretariat officials might be necessary to make that assessment.

RECOMMENDATIONS

The Executive Committee may wish to consider:

(a) Maintaining paragraphs (a) to (d) of decision 19/36 for the HCFC production sector;

(f) Continuing to calculate production costs on the basis of closure taking into account foreign ownership and export to non-Article 5 components of facilities being closed;

(g) Encouraging the submission of a synchronized production/consumption phase-out as part of the first HPMP;

(h) Providing incentives for early phase-out of production facilities;

(i) Requiring a robust monitoring system during the control period with the verification report system used for CFC phase-out to monitor facilities that receive funding but continue to produce HCFCs for feedstock uses;

(j) The issues of:

(i) Cut-off dates; and

(ii) Swing plants;

(k) Inviting representatives of the UNFCCC Secretariat dealing with the CDM to the next Production Sector Sub-group meeting to provide information on the CDM process and its relation to HCFC production.

Annex I

DECISION XIX/6

ADJUSTMENTS TO THE MONTREAL PROTOCOL WITH REGARD TO ANNEX C, GROUP I, SUBSTANCES (HYDROCHLOROFLUOROCARBONS (DECISION XIX/6 (2007))

"The Parties agree to accelerate the phase-out of production and consumption of hydrochlorofluorocarbons (HCFCs), by way of an adjustment in accordance with paragraph 9 of Article 2 of the Montreal Protocol and as contained in annex III to the report of the Nineteenth Meeting of the Parties,[5] on the basis of the following:

1. For Parties operating under paragraph 1 of Article 5 of the Protocol (Article 5 Parties), to choose as the baseline the average of the 2009 and 2010 levels of, respectively, consumption and production; and

2. To freeze, at that baseline level, consumption and production in 2013;

3. For Parties operating under Article 2 of the Protocol (Article 2 Parties) to have completed the accelerated phase-out of production and consumption in 2020, on the basis of the following reduction steps:

(a) By 2010 of 75 per cent;

(b) By 2015 of 90 per cent;

(c) While allowing 0.5 per cent for servicing the period 2020–2030;

4. For Article 5 Parties to have completed the accelerated phase-out of production and consumption in 2030, on the basis of the following reduction steps:

(a) By 2015 of 10 per cent;

(b) By 2020 of 35 per cent;

(c) By 2025 of 67.5 per cent;

(d) While allowing for servicing an annual average of 2.5per cent during the period 2030–2040;

5. To agree that the funding available through the Multilateral Fund for the Implementation of the Montreal Protocol in the upcoming replenishments shall be stable and sufficient to meet all agreed incremental costs to enable Article 5 Parties to comply with the accelerated phase-out schedule both for production and consumption sectors as set out above, and based on that understanding, to also direct the Executive Committee of the Multilateral Fund to make the necessary changes to the eligibility criteria related to the post-1995 facilities and second conversions;

[5] UNEP/OzL.Pro.19/7.

6. To direct the Executive Committee, in providing technical and financial assistance, to pay particular attention to Article 5 Parties with low volume and very low volume consumption of HCFCs;

7. To direct the Executive Committee to assist Parties in preparing their phase-out management plans for an accelerated HCFC phase-out;

8. To direct the Executive Committee, as a matter of priority, to assist Article 5 Parties in conducting surveys to improve reliability in establishing their baseline data on HCFCs;

9. To encourage Parties to promote the selection of alternatives to HCFCs that minimize environmental impacts, in particular impacts on climate, as well as meeting other health, safety and economic considerations;

10. To request Parties to report regularly on their implementation of paragraph 7 of Article2F of the Protocol;

11. To agree that the Executive Committee, when developing and applying funding criteria for projects and programmes, and taking into account paragraph 6, give priority to cost-effective projects and programmes which focus on, *inter alia*:

(a) Phasing-out first those HCFCs with higher ozone-depleting potential, taking into account national circumstances;

(b) Substitutes and alternatives that minimize other impacts on the environment, including on the climate, taking into account global-warming potential, energy use and other relevant factors;

(c) Small and medium-size enterprises;

12. To agree to address the possibilities or need for essential use exemptions, no later than 2015 where this relates to Article 2 Parties, and no later than 2020 where this relates to Article 5 Parties;

13. To agree to review in 2015 the need for the 0.5 per cent for servicing provided for in paragraph 3, and to review in 2025 the need for the annual average of 2.5 per cent for servicing provided for in paragraph 4 (d);

14. In order to satisfy basic domestic needs, to agree to allow for up to 10% of baseline levels until 2020, and, for the period after that, to consider no later than 2015 further reductions of production for basic domestic needs;

15. In accelerating the HCFC phase-out, to agree that Parties are to take every practicable step consistent with Multilateral Fund programmes, to ensure that the best available and environmentally-safe substitutes and related technologies are transferred from Article 2 Parties to Article 5 Parties under fair and most favourable conditions."

Annex II

DECISION 19/36 OF THE 19TH MEETING OF THE EXECUTIVE COMMITTEE

"AGENDA ITEM 16: REPORT OF THE SECOND MEETING OF THE EXPERT GROUP ON THE PRODUCTION OF SUBSTITUTES FOR ODS

1. The Chief Officer introduced UNEP/OzL.Pro/ExCom/19/59, which was the report of the Production Sector Expert Group and reflected the opinions of the members of that Group. In addition to the experts commissioned by the Secretariat, both Article 5 and non-Article 5 countries had been represented at the Group's Second Meeting, with each group of countries being represented by two members. However, the country representatives had not reviewed the Report, which had been prepared by the Expert Group itself. Particular attention was called to paragraph 28, which summarized the results of the Group's discussions into two categories: Category 1, Recommendations for a possible decision by the Executive Committee; and Category 2, Guidance required from the Executive Committee.

2. Following a discussion of several issues, the Executive Committee decided:

(a) That:

(i) Each Article 5 producer country should complete the Preliminary Data on the Production Sector form in Annex VI to the present report and submit it to the Fund Secretariat by 31 December 1996;

(ii) The Article 5 producer country should inform the Executive Committee eight months before it is ready to submit its sector phase-out plan according to the format provided in Annex VII to the present report. The Executive Committee should commission a technical audit of the production sector of the country concerned in conjunction with the preparation of the sector plan. This will enable the results of the technical audit to be incorporated into the sector plan and serve as a reference point for reviewing the sector plan. The Executive Committee should approve funding for the preparation of the sector plan and the technical audit;

(iii) The technical audit should follow the terms of reference provided in Annex VIII to the present report and include a detailed questionnaire/check-list to be developed prior to the commencement of the audit;

(iv) The technical audit should be conducted by a combined team of local and international experts;

(v) Pending the completion of sector plans, the Executive Committee should focus on closure projects which could be considered according to interim guidelines with the understanding that guidelines on other types of projects, e.g. conversions and erecting ODS substitutes production, should be developed at a later date;

(vi) In general, the cost of dismantling the old plant should be offset by the scrap value of the old plant. However, this should be examined on a case-by-basis;

(vii) The environmental clean-up of the ODS-producing facility should not constitute an incremental cost; however, it should be done in an environmentally responsible manner;

(l) To approve the formats for preliminary data on the production sector and the form for the sector phase-out plan, included in Annexes VI-VII to the present report;

(m) To approve the collection of "Quantities of exported CFCs" called for in item 3.3 on page 2 of Annex VI to the present report, where countries were willing to provide such data, but not to insist on collection if countries regarded the export data as confidential;

(n) To approve the collection of data on "Total employees per CFC plant" called for in table 4.1 on page 4 of Annex VI to the present report; and

(o) To appoint a subgroup composed of the representatives of Australia, Chile, India, Philippines, the United Kingdom and the United States to study the non-approved parts of the report on the day prior to the next meeting of the Open-ended Working Group in Geneva, and submit a revised document to the Twentieth Meeting of the Executive Committee.

(Decision 19/36)"

Annex III

CLEAN DEVELOPMENT MECHANISM (CDM)

1. Reducing HFC-23 emissions is worth thousands of carbon credits and the destruction of HFC-23, in order to obtain the credits under the CDM, is a relatively cheap process. The former HFC-23 emitters (i.e., HCFC-22 producers) can largely compensate the cash costs of HCFC22 production (subject to RM costs, which have latterly increased hugely) by using CDM credits. Not all of the production of each producer is entitled to CDM benefits but in general it represents a large commercial advantage versus non-beneficiaries, including of course all producers in Article 2 countries. In 2007, almost 30% of the projects in the CDM pipeline were for destroying HFC-23.

2. China is currently the world leader in CDM supply with a 73% of market share in terms of 2007 transacted volume (compared to 54% market share in 2006). It is also the destination of choice for buyers of credits. Implementing these CDM projects provides China with significant resources. With the help of the World Bank, China has created a Clean Development Fund which retains 65% of all HFC-23 revenues and, according to the Bank, the Chinese authorities will use these resources for investment in clean development projects focused on climate change. According to one study compliance costs are high. Payments to refrigerant manufacturers, the Chinese government (which heavily taxes the CDM projects), and to carbon market investors by governments and compliance buyers have been estimated to be, in the end, approximately €4.7 billion, while estimated costs of abatement are likely less than €100 million.

3. As of April 2008, the CDM Executive Board had issued almost 130 million CERs, in response to slightly less than 550 individual requests for issuance. These issuances occurred over a period of approximately 2 years. Almost half of the CERs come from 11 HFC-23 reduction projects that request large blocks of credits every six weeks to two months. The remainder originated from a larger number of smaller projects.

Annex IV

CHICAGO CLIMATE EXCHANGE (CCX)

1. CCX is a self-regulating exchange that administers a voluntary, legally binding program for reducing and trading greenhouse gas (GHG) emissions in North America, with limited participation of Offset Providers from Brazil as well as in North America. It was conceived as a market-based solution to reducing GHG emissions. Members of the CCX make a voluntary but legally binding commitment to reduce GHG emissions. The CCX facilitates the trading of GHG allowances

2. Companies, universities and municipalities make up the membership. They join voluntarily and commit to GHG reductions. By the end of Phase I (Dec. 06) all members will have reduced direct emissions 4% below a baseline period of 1998-2001. Phase II, which extends the CCX reduction program through 2010, will require all Members to ultimately reduce GHG emissions 6% below baseline.

3. Those members that reduce their emissions below the required level can sell surplus emission allowances on the exchange or bank them. A member that cannot achieve the reduction target internally can meet its compliance commitment by purchasing emission allowances through CCX's electronic trading platform from other CCX Members that reduce their emissions beyond the reduction target, or purchase project-based offsets. Eligible offsets can come from methane collection and carbon sequestration projects.

4. Basically, each member has three options for achieving their annual compliance:

- Achieve their emission reductions internally at the facilities owned by the CCX Members. This option, which accounts for a large majority of verified emission reductions and annual compliance realized in CCX, can be achieved through fuel switching, energy efficiency improvements and managerial changes.
- Purchase extra emission reductions in the form of tradable "allowances", from other committed CCX Members who have reduced their own emissions by more than the annual CCX reduction requirement.
- Purchase "offsets" from CCX emission reduction projects that conform to CCX rules and are independently verified by a CCX-approved verifier. Initial CCX eligible offset projects include, *inter alia*: landfill and agricultural methane destruction; sequestration in reforestation and agricultural soil projects; energy, methane, forestry projects in Brazil.

5. In the US, membership of the CCX grew from 127 members in January 2006 to 237 members by the end of the year. The driving forces to join the CCX have been to achieve a competitive edge, enhanced brand, reduced costs and encouraged innovation.

6. The instrument traded is a Carbon Financial Instrument (CFI). CFI contracts are comprised of Exchange Allowances and Exchange Offsets. Allowances are issued to emitting Members in accordance with the Baseline and CCX Emission Reduction Schedule. Offsets are generated by qualifying offset projects. One CFI is equal to 100.
