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AN UPDATE OF THE REPORT ON THE STUDY ON ALTERNATIVES TO CFCS IN RIGID FOAM APPLICATIONS
(Decision 36/56 (b))

Introduction

1. A report on the study on alternatives to CFCs in rigid foam applications was presented at the 36th Meeting of the Executive Committee in document UNEP/OzL.Pro/ExCom/36/34. The Study provided an analysis of factors leading to the selection of alternative technologies in rigid foam applications in Article 5 countries, and identified the two primary alternatives, based on HCFC-141b (transitional technology) and cyclopentane as blowing agents (zero-ODP solution). The study demonstrated that the local availability of alternatives and the cost of conversion to alternatives were among the most important factors in determining the choice of technology by enterprises in Article 5 countries. Subsequently, the Executive Committee took Decision 36/56 which inter alia requested the Multilateral Fund Secretariat to update the study as contained in document UNEP/OzL.Pro/ExCom/36/34 with new costs for various options and to investigate the availability of non-ODS pre-blended polyol, and to submit the updated document and its findings for its consideration at the 39th Meeting.

2. The study assessed and compared costs of the transition to zero-ODP technology through conversion to HCFC-141b followed by conversion to the zero-ODP alternative HFC-245fa blowing agent (two-stage conversion) versus one-stage conversion to cyclopentane (including capital and operating costs). Since the timing of second conversion could not accurately be determined the following assumptions were used in the analysis:

- The conversion from HCFC-141b to HFC-245fa occurs 5 years after the first conversion.
- The enterprise pays the actual capital cost, less Multilateral Fund grant.
- The enterprise pays the total cost of conversion from HCFC-141b to HFC-245fa.
- The enterprise pays the net present value (NPV) of incremental operating costs (IOC) in the first 5 years, less the portion paid by the Multilateral Fund; typically 2 years.
- The enterprise pays the total NPV of IOC from year 6 to 10.
- The NPVs are calculated using a 12% discount rate.
- The cost of the HFC-245fa system is 15% higher than the cost of HCFC-141b system starting from the first year.

3. On the basis of the above parameters, the NPV of cash flows for single-stage and two-stage conversion were compared. It was shown that the enterprise would have paid an additional US $259,000 of its own resources for one-stage conversion to cyclopentane rather than for the two-stage conversion to HCFC-141b followed by conversion to HFC-245fa. The Multilateral Fund contribution for the total costs to the enterprise would have been the same regardless of whether the enterprise proceeded with a one-stage or two-stage conversion from CFC-11.

4. In response to Decision 36/56, the Secretariat, in consultation with foam experts has analyzed the most recent technical information to update the costs of alternatives and availability of hydrocarbon-based pre-blended polyols.

Availability of hydrocarbon pre-blended systems

5. The large majority of foam producing companies in Article 5 countries especially small-and medium-size enterprises use pre-blended foam systems. A small percentage of foam manufacturers purchase component chemicals including blowing agents and blend their systems on-site using their own mixing equipment. Pre-blended polyols are widely commercially available both for CFC-11- and HCFC-141b-based systems. The supply of pre-blended polyols from system houses in Article 5 countries allows SMEs to reduce capital costs associated with installation and maintenance of pre-mixing equipment. However, enterprises that use pentane or other hydrocarbons always purchase the blowing agents separately and add them to the polyurethane system on-site using expensive pre-mixing equipment designed to handle flammable material. The study indicated that the non-availability of hydrocarbon-based pre-blended polyols in Article 5 countries was related to existing national regulations prohibiting the transportation of flammable chemicals. Had hydrocarbon-based pre-blended polyols emerged in Article 5 country markets, pre-mixing equipment would not have been necessary, thus reducing the capital cost of conversion.

6. The Secretariat has investigated the current situation regarding the availability of hydrocarbon-based pre-blended polyols. A survey undertaken by a foam expert indicates that a limited supply of pre-blended hydrocarbon systems is available in some European countries under carefully controlled conditions. However, no supply of pre-blended hydrocarbon systems is available in Article 5 countries. On the basis of this information, the conclusions reached in the Study regarding comparison of capital cost of conversion to various alternatives remain unchanged.

Updated costs of alternative chemicals and technologies

7. The study provided a comparison of the incremental operating costs of alternative technologies available at domestic markets in some Article 5 countries. The incremental operating costs of alternatives is an important factor in making the selection of a specific technology by an enterprise. The operating costs are affected mostly by the prices of the chemicals purchased by the enterprises. A survey of prices for blowing agents (CFC-11, HCFC-141b, cyclopentane, HFC-245fa) made by the Secretariat indicates that current prices of CFC-11, cyclopentane and HFC-245fa are not markedly different from prices used in the study. However, there has been a reduction in the price for HCFC-141b, which currently varies from US $1.50/kg to US $2.50/kg in different geographical regions in comparison with the US $3.50/kg used in the Study.

8. The cost of two-stage transition to zero-ODP technology (from CFC-11 to HCFC-141b and to HFC-245fa) can be compared once again with the cost of one-stage conversion to cyclopentane (including capital and operating costs). If the same parameters as listed in paragraph 2 above and a current average price of HCFC-141b at US $2.00/kg are applied, an enterprise would have to pay an additional US $321,000 (or about 24% higher than it was calculated in the study) for one-stage conversion to cyclopentane in comparison with the two-stage conversion to HCFC-141b followed by conversion to HFC-245fa.

Future availability of HCFC-141b

9. Non-Article 5 countries continue to reduce their consumption of HCFCs to comply with the Montreal Protocol control schedule and, in several cases, go beyond the Montreal Protocol requirements for compliance. Thus, the implementation of the accelerated European HCFC phase-out schedule has already drastically reduced global HCFC demand. In accordance with Decision XI/28 of the 11th Meeting of the Parties, the TEAP prepared a report on HCFC, which was presented at the 23rd Meeting of the Open-Ended Working Group in July 2003 in Montreal. The report analyzed global supply and demand and concluded that there will be sufficient production capacity for HCFC-141b to meet the needs of both Article 5 and non-Article 5 countries in the period until 2015. It might be considered as an indication of stability in HCFC-141b prices on the global market in near future.
