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Proposal for a
COUNCIL REGULATION (EC)
on substances that deplete the ozone layer

(presented by the Commission)

EXPLANATORY MEMORANDUM

This proposal for a new Regulation on substances that deplete the ozone layer would replace Council Regulation (EC) No 3093/94. It reflects the rapid increase in availability of alternatives to ozone depleting substances such as HCFCs and methyl bromide. There is strong political support throughout the European Community for further action to reduce the production and use of ozone depleting substances to provide additional protection for the ozone layer.

SUMMARY

This proposed revision of Council Regulation (EC) No 3093/94 was requested by the Council following the Vienna Meeting of the Parties to the Montreal Protocol on substances that deplete the ozone layer in December 1995. The new Regulation would implement further amendments and adjustments to the Protocol agreed at the Ninth Meeting of the Parties in September 1997. Furthermore, the proposal reflects progress in the development and the market availability of alternatives to ozone-depleting substances, and experience made with the operation of Regulation (EC) No 3093/94. In some respects, the proposed measures go further than the obligations imposed at present under the Montreal Protocol for industrialised countries. This is already the case with the existing Regulation, under which in particular the production of chlorofluorocarbons (CFCs) was phased out by January 1995, one year ahead of Montreal Protocol obligations. The phaseout included an exemption for production for limited "essential uses" and to satisfy basic domestic needs of developing countries.

Although a lot has been achieved at international level and in terms of the Community's contribution to protecting the ozone layer, the task is far from accomplished. Recent measurements indicating record low levels and extent of ozone depletion show that further protection of the ozone layer is essential especially within the next ten years when ozone depletion is expected to peak. The Scientific Assessment Panel of the Montreal Protocol concluded that the most effective measures capable of reducing the extent of ozone depletion, next to phasing out the use of CFCs, are tighter controls on hydrochlorofluorocarbons (HCFCs) and methyl bromide. There are also strong political arguments for the Community to take the lead in this decisive final phase towards the total phaseout of ozone-depleting substances, a result to which both industrialised and developing countries are committed under the Montreal Protocol. The measures proposed here have been based on thorough evaluation of the availability of alternatives to both HCFCs and methyl bromide. They are shaped in a way to provide a balance between environmental impact and costs for the economic operators concerned and to give them enough time to make the transition. They should enable Europe to take the lead in developing and implementing alternatives in a context where global phaseout of ODS has already been agreed under the Montreal Protocol.

The main elements of the proposal are as follows:

(i) Further action on hydrochlorofluorocarbons (HCFCs)

- **reduction of the HCFC cap placing on the market "cap" from 2.6% to 2%**

The Council of Environment Ministers agreed to a 2% cap as a negotiating mandate for the 1995 Meeting of the Montreal Protocol, and repeated its call for a 2% cap in the mandate for the Ninth Meeting of the Parties, in September 1997 in Montreal.

- **tighter HCFC end use controls in Article 5 of the Regulation**

The proposal is to phaseout HCFCs where alternatives exist. This would give effect to Article 2F (7) of the Montreal Protocol, to limit *"the use of [HCFCs] to those applications where other more environmentally suitable alternative substances or technologies are not available"*.

- **production freeze and production phaseout schedule for HCFCs**

The introduction of production controls for HCFCs, as is already the case for all other controlled substances, is a measure the Community strongly supports under the Montreal Protocol. The proposed schedule is designed to avoid imposing unfairly disadvantages to European producers on the international market.

(ii) **Phaseout for the production and consumption of methyl bromide by 1 January 2001, with exemptions for "critical uses"**

The proposed phaseout date 2001 is based on the availability of good alternatives to replace methyl bromide, while providing the necessary flexibility of a "critical use exemption" to respond to those situations where particular problems are encountered by farmers in making this transition.

(iii) **General prohibition of the placing on the market and use of CFCs and other fully halogenated substances**

Given that the production prohibition for CFCs has been in place in the Community since 1995, and that for halons since 1994, and that numerous alternatives exist, it is now appropriate to prohibit the marketing of these substances, subject to the possibility of 'essential uses', and some limited exemptions to ease transition.

(iv) **Controls of trade**

The proposal includes provisions for the authorisation of exports of ozone-depleting substances, in order to implement the export licensing requirements introduced into the Montreal Protocol in September 1997. This is an important measure to allow cross-checking of information with other Parties, and ultimately contribute to eliminating the risk of illegal trade in ozone-depleting substances.

1. NEED FOR AND OBJECTIVE OF THE PRESENT PROPOSAL

1.1 Legal considerations

1. The purpose of the present proposal is to replace the existing Regulation (EC) No 3093/94 in order to take into account:

- * changes to the Montreal Protocol, the international convention on ozone depleting substances (ODS), to which the Community is Party,

- * technical progress, particularly by EC industries, in the development and implementation of alternatives to substances which damage the ozone layer,
 - * experience with the operation of Regulation (EC) No 3093/94 and the fact that some existing provisions have become redundant.
2. As significant changes are being proposed to the existing Regulation, it is appropriate to replace it by this new proposal. This will enhance legal clarity and transparency.
 3. The proposed regulation is based on Article 130s(1) of the EC Treaty, as is Regulation (EC) No 3093/94. The aim of the Regulation is the phaseout of ozone-depleting substances. The main content of the proposal is to prohibit, as a rule, the production, placing on the market and use of controlled substances according to the fixed schedule and modalities. It also contains provisions on exports, the recovery of used controlled substances, the control of leakages and reporting. The present proposal reinforces existing control measures, but does not enlarge the scope as compared to Regulation (EC) No 3093/94.
 4. The depletion of the ozone layer being one of the most serious global environmental issues, the international community considers ozone depletion a sufficient threat to warrant completely phasing out the production and consumption of ozone-depleting substances, through the 1987 Montreal Protocol on substances that deplete the ozone layer, and its subsequent adjustments and amendments.

The new Regulation is necessary to implement the commitments, which the Community has accepted under the 1995 Vienna adjustment and the 1997 Montreal adjustments and amendments to the Montreal Protocol. These include a final phaseout date and reduction schedule for methyl bromide and the introduction of a licensing system for imports and exports of ozone-depleting substances, which requires additional measures on export authorisation and notification to be established within the Community. A number of other decisions of the Meetings of the Parties also require to be implemented, *inter alia* on reporting requirements.

5. In some aspects, the present proposal goes further than the Montreal Protocol as last amended, or contains more detailed provisions. The possibility for Parties to adopt more stringent control measures is recognised in the Protocol, and applied by a number of Parties. For example, the Community phaseout date of CFCs was one year ahead of the 'industrialised countries' obligation under the Protocol (1995 as compared to 1996). The overall approach followed by the Protocol is expressed in its preamble: "*Determined to protect the ozone layer by taking precautionary measures to control equitably the total global emissions of substances that deplete it, with the ultimate objective of their elimination on the basis of developments in scientific knowledge, taking into account technical and economic considerations and bearing in mind the developmental needs of developing countries.*" For the Community, this precautionary principle is defined as a basis of its environmental policy in Article 130r(2). Recent measurements indicating record levels and extent of

ozone depletion show that further protection of the ozone layer is essential (see below). Furthermore, technical and economic developments in the market availability of alternatives in particular to HCFCs and to methyl bromide put the Community in a position where the proposed measures can be taken at reasonable cost.

6. In relation to HCFCs, the proposed measures should be seen in the context of Article 2F (7) of the Montreal Protocol, which requires each Party to endeavour to ensure that "*the use of [HCFCs] is limited to those applications where other more environmentally suitable alternative substances or technologies are not available*". In implementing this Article, the Community has agreed controls on the use of HCFCs in Article 5 of Council Regulation 3093/94. In order to be able to take account of the development and availability of alternatives, already the existing Regulation foresees the possibility of this Article to be modified '*in the light of technical progress*'. Since the adoption of this Regulation, there has been considerable progress and a number of alternatives have come on the market quicker than expected at that moment, and the present proposal responds to this situation in implementation of Article 2 F (7). This is directly the case with the reinforced use controls proposed in Article 5, and by consequence, also reflected in the proposed reduction of the cap for the placing on the market of HCFCs.

1.2 Environmental considerations

7. Ozone levels in the stratosphere have decreased by 6 to 10% compared to 1980. The World Meteorological Organisation (WMO) has reported that in 1996 the Antarctic ozone hole covered 20 million km² for over 40 days and that depletion over Scandinavia, Greenland and Siberia reached an unprecedented 45%.
8. The following results obtained by the EC's stratospheric ozone research within the Environment and Climate Programme, particularly through major European campaigns EASOE 1991/92, SESAME 1994/95, APE 1996/97, strongly support and scientifically endorse the need for renewed and stronger action for the protection of the ozone layer:
 - * Further decreases in the lower stratospheric ozone concentrations have been consistently observed during the last decade not only in Antarctica, but also in the Arctic polar regions. In the Antarctic spring, effectively all the ozone is destroyed at altitudes between 16 and 20 km ('ozone hole'), while losses of 50% have been seen at the same altitudes in the Arctic during the last three winters 1994-1997.
 - * Over the Northern hemisphere mid-latitudes, the trend in total column ozone are largest in winter and spring, and current spring levels are more than 10% below those in the 1970s.
 - * The record low temperatures in the Arctic stratosphere during the last years are likely to be part of a longer trend induced by climate change mechanisms. These low temperatures can amplify the mechanisms behind the ozone depletion in the future.

- * UV radiation measurements carried out in Europe during the last decade show that spectral UV-B levels continued to increase at rates close to about 2% per year.

9. The 1994 UNEP Assessment of the Environmental Effects of Ozone Depletion described the profound effects of increased UV-B radiation on human health, animals, plants, micro-organisms, materials and air quality. A 1996 UNEP report noted:

- * further evidence of health effects (skin cancers, cataracts, immune deficiency defects);
- * new evidence of effects on terrestrial ecosystems (altered growth and physiological processes);
- * additional evidence of widespread damage to aquatic ecosystems, including those supporting food chains;
- * effects on biogeochemical cycles;
- * materials damage (reduced tensile extensibility of many plastics).

Summary of direct and indirect effects of increased UV-B

Productivity	Health	Amenity	Existence
Impact on crops, phytoplankton, plastics, tourism, encourages monoculture	Immune system disorders, cataract, skin cancer	Full use of outdoors (tourism, sport, recreation)	Certain marine Organisms and their Food chain

10. The currently used ODP ("ozone-depleting potential") values (suggesting, for instance, an ODP of 0,11 for HCFC 141b) are calculated on a very long time scale. According to the UNEP Assessment, however, HCFC 141b, for example, destroys roughly 2/3 as much ozone as CFC-11 during the ten years immediately after emission. Similar figures apply to other HCFCs and methyl bromide. Bromine is estimated to be about 50 times more efficient than chlorine in destroying stratospheric ozone on a per-atom basis. On the basis of these calculations, the Scientific Assessment Panel concluded in 1994 that elimination of global methyl bromide emissions from agricultural, structural and industrial activities by 2001 would reduce future ozone losses by 13% over the next 50 years, relative to full compliance with the provisions of the Protocol at that time. The Panel furthermore concluded that the elimination of emissions of HCFCs by 2004 would reduce ozone losses over the next 50 years by 5%, with a significant share of the benefits in the near future.

11. Additional measures on HCFCs and methyl bromide, which have short atmospheric lifetimes are therefore the most effective way to reduce the peak chlorine and bromine loading in the stratosphere, thus allowing for a less severe ozone depletion during the next few decades. Moreover, a quicker

phase-out will accelerate the recovery of the ozone layer and will shorten the period of the most serious ozone depletion. It is important to recognise that only by taking all the measures in the present proposal can the full environmental benefit be obtained. These steps would also provide "secondary effects", through the promotion of non-ODS alternatives, in particular to developing countries. These countries would thus be discouraged from investing in new ozone-depleting industries relying on HCFCs.

1.3 Political considerations

12. The potential extent of ozone damage from HCFCs and methyl bromide has led a number of Parties, including the Community and Member States, to commit themselves to going beyond the measures adopted in Vienna in 1995 and Montreal 1997. In Vienna, twenty-one Parties, including ten Member States, signed a voluntary Declaration on methyl bromide, encouraging the adoption of alternatives and stating their determination to take all appropriate measures to limit methyl bromide consumption to strictly necessary applications, and to phase it out as soon as possible. While the Montreal meeting advanced the phaseout date for developed countries from 2010 to 2005, and agreed upon 2015 as a phaseout date for developing countries, large users of methyl bromide provide for more advanced dates in their domestic legislation. Faced with the lack of progress in Montreal on tightening HCFC controls, the European Community and all Member States, together with 22 other Parties, signed a declaration calling for further action on HCFCs under the Protocol.
13. A number of Member States have already introduced more advanced national legislation on methyl bromide and HCFCs as compared to Regulation (EC) No 3093/94 and considerable pressure is resulting for the revision of Community legislation in this direction.
14. The present proposal responds to the Council's request to strengthen the Regulation, expressed in its conclusions adopted following the Vienna Meeting of the Parties: "...that after the Vienna meeting, the conditions exist to further strengthen the regulation taking into account *inter alia* the results of that meeting".
15. The proposals are consistent with the Community's position agreed since long on the HCFC cap of 2%: negotiating position already for the Seventh Meeting of the Parties to the Montreal Protocol in Vienna in 1995, this was confirmed for the Montreal Protocol's "Tenth Anniversary" meeting.
16. The proposal complements the phaseout of the HCFC *use* in Europe by providing progressive phaseout of HCFC *production* in the perspective of the global consumption phaseout stipulated by the Protocol. This is an effective step in encouraging the greater take-up of the alternatives already available, not only within the Community but in particular also with a view to developing countries. At the Montreal Ninth meeting of the parties, the European Community advocated HCFC production controls to be introduced

into the Protocol. Given the non-success of these proposals, the Community and all the Member States have placed their determination on record to continue leading the way on HCFCs and on production controls more specifically.

17. In relation to methyl bromide, the Community needs to respond to the 2001 phaseout already agreed in USA/Canada and a number of Member States. The proposed phaseout will not endanger European farming which might still need methyl bromide because it provides a flexible procedure for critical use exemptions.
18. In addition, in the light of illegal imports of CFCs into the Community, there is strong political argument to take further measures in relation to removing the market for CFCs, the production of which is already phased out in the Community. The proposed ban on the placing on the market and use of CFCs is an effective means to this end, which has also been advocated by the European Parliament, in a Resolution in September 1997.
19. Lastly, the present proposal is fully consistent with the proposal for a European Parliament and Council Decision on the review of the European Community Programme of policy and action in relation to the environment and sustainable development ("Towards Sustainability") which stipulates, in relation to ozone layer depletion, the need for the Community to give particular attention to *"strengthening its control measures on HCFCs and methyl bromide, as well as on CFCs and halons...."*
20. The proposal contributes to triggering the development of long-term environmentally sustainable production among European companies. A wide range of alternatives to ozone depleting substances has been developed in recent years, not least by European industry. The Community should act as quickly as possible to realise its environmental commitment under the Protocol to foster the application of these new technologies, and to set an example to the international community, particularly to developing countries, in the protection of the ozone layer. A recent policy on funding adopted under the framework of the Montreal Protocol, discouraging the conversion to HCFC technology in developing countries, will provide further market opportunities to Community producers of non-HCFC technologies for sales, servicing and technical advise.

2. MAIN ELEMENTS OF THE PROPOSAL

2.1 General economic considerations

21. In view of the environmental urgency, the objective of the present proposal is to advance some of the dates to reflect technical development. When addressing the costs and benefits of the proposal, it is necessary to recall that phaseout is already agreed for the substances concerned and for HCFCs, the phase-out date in Regulation (EC) No 3093/94 (2015) would remain unchanged. For methyl bromide a phase-out date is introduced somewhat earlier than in the Montreal Protocol. The cost/benefit justification of phasing out the substances concerned is already implicit in the Montreal Protocol itself.

For HCFCs, the environmental assessment under the Montreal Protocol has resulted in their unambiguous listing as controlled transitional substances. The questions of the availability of alternatives and cost considerations are dealt with below in relation to the individual measures proposed.

22. With respect to the investment costs, which will be incurred in changing to alternatives, it is important to stress the following facts in general terms:

- * Changes which incur costs for some sectors of the Community's industry will produce profits for other sectors such as producers of alternative substances. Producers of ODS and equipment or products using these substances are frequently also producing alternatives.
- * Up-front costs for conversion to alternatives may be higher but such costs only represent a minor part of the total costs. Benefits from reduced energy consumption, lower operating costs and other benefits resulting from the replacement of old techniques with newly developed ones may in many cases offset the investment costs.

23. Limited evidence is however available to illustrate the overall economic benefits of controlling ozone-depleting substances. Although no precise figure can be attached to the effects caused by increased amounts of UV-B reaching the Earth's surface, the impact of such radiation increases is becoming increasingly well understood and the environmental and economic implications becoming increasingly clear.

- * Each% increase in UV-B radiation has produced a 2% increase in skin cancer in light-skinned populations, resulting in significant medical costs. Those costs are not confined to skin cancer, but are also linked to other health effects.
- * Damage to aquatic ecosystems strikes at the heart of the human food chain, and alterations in plant growth disturb the proper functioning of terrestrial ecosystems.
- * Accelerated weathering of outdoor materials (degradation of a number of common polymers by increased UV-B radiation) will give rise to significant expense on a worldwide basis.

We know that the costs of not taking further action would be high. A number of studies have shown that the benefits of phasing out ODSs are clearly greater than the transition costs. For instance, in 1993, the US Environmental Protection Agency conducted an extensive review of the costs and benefits of its final action on methyl bromide. It estimated, for the United States, the total cost of phaseout from 1994 to 2010 to be USD 1.7 - 2.3 billion, compared to the benefits calculated to be between USD 14 and 56 billion for that period (in total between USD 244 and USD 952 billion). These benefits result primarily from avoided cases of non-melanoma skin cancer (the range in values resulting from different estimates for the value associated with human life).

2.2 HCFCs

24. The proposed measures on HCFCs are based on the market availability of alternatives for present HCFC uses. These additional use controls have consequences for the quantities of HCFCs which will be needed on the Community market and hence for the "cap". While the final phaseout date of 2015 for the placing on the Community market remains unchanged, the proposed interim cuts reflect the use bans. Furthermore, the proposed production controls should draw the political consequence of the availability of alternatives to HCFCs.

(i) Availability of alternatives/End use controls

25. The main uses of HCFCs are in the refrigeration and air conditioning, solvents and foams sectors as a substitute for CFCs. The proposed end-use controls in Article 5 are based on the fact that environmentally suitable and technically viable alternatives to HCFCs for almost all HCFC applications are now available at reasonable cost throughout the Community (*see Technical annex*). Most of them are produced by EC firms (*see Business impact assessment on individual sectors*). The availability of HCFC alternatives has repeatedly been demonstrated (e.g. in UNEP reports and its "OzonAction newsletter", in studies on specific sectors by the environment agencies of Member States and at conferences). Recently, the results from a study on alternatives to ozone-depleting substances, carried out by 'Prospect Consulting and Services' for the European Commission, provided further evidence that alternatives to HCFCs exist for almost all uses.

26. Another study for the European Commission, undertaken by "March Consulting Group" on HCFCs and their alternatives ("the March study"), also supports the feasibility of introducing new end use controls: "*it is reasonable to modify the current regulation providing that the measures proposed provide a balance between environmental impact and cost.*" The authors of the study state that they favour a number of new end use controls as compared to the existing Regulation, arguing that "*such controls will ensure a faster phaseout of HCFCs, will provide a greater degree of fairness between competing end user companies and will help chemical manufacturers define their future investment programmes.*"

27. Notwithstanding the availability of alternative substances, the shift to non HCFC-technologies has not yet taken place in many European markets and industries and additional regulatory incentives to cease HCFC use are needed. The proposed end use controls in Article 5 set out to achieve this while reflecting variations in the availability of alternatives for different applications. The dates proposed are to a large extent congruent with the dates identified in the study by March referred to above. They provide reasonable time for HCFC-using industries to change to alternatives. The provisions also take into account specific problems in switching to non-ozone depleting substances, which might be encountered for certain applications (*see Business impact assessment and Technical Annex*).

(ii) Economic implications

28. As regards the costs for the transition, some investment costs are unavoidable when making a change to non HCFC-technology. However, in many cases, the main reason for choosing an HCFC is that it is essentially a low cost drop-in replacement allowing companies to postpone the capital investment required for a longer term change of process. Hence, amortisation of HCFC costs should not pose a serious problem to HCFC-users.
29. The March study in 1997 endeavoured to assess the direct conversion costs for *a total ban on HCFC use by 1999* (2000 for refrigeration). However, savings due to lower operating costs, particularly likely to occur in the solvents sector, have not been taken into account, nor have the increased market shares of producers of alternatives been addressed. The costs in the *refrigeration sector* were estimated to be less than ECU 100 million (or under 2% of the annual turnover of the sector). The costs in the *solvents sector* were expected to be around ECU 150 million (<5% of annual turnover). The *foams sector* would face a conversion cost of about ECU 160 million or 15% of annual turnover.
30. To respond to this assessment, the proposal provides significantly more time for phaseout for those industries, where particularly high conversion costs are likely to occur. For example the March study suggested that a phaseout in the foams sector largely in line with the current proposal would cut costs to around ECU 40 million or around 4% of annual turnover. Furthermore, essential use exemptions are foreseen for specific end-use areas where phaseout may be particularly problematic and costly. It should be mentioned that a questionnaire to companies in an important sub-sector of the foam industry (sandwich panel production), which have already made the transition away from HCFCs showed that the conversion costs may be lower than estimated by the March study. Conversion costs below 2% of annual turnover were reported by a majority of those responding.

(iii) Placing on the market limits on HCFCs

31. The Regulation proposes a cap of 2.0% for the placing on the market of HCFCs, to apply from the 1 January 2001, rather than the existing 2.6%. Setting the cap at 2.0% would provide more than enough HCFCs where they are still required while reflecting the widespread availability of alternatives. There is strong political support for reducing the cap to 2.0% (see above 1.3). As a consequence to the proposed use controls, the reduction schedule for the placing on the market of HCFCs will be adjusted, without however changing the final phaseout date of 2015.

(iv) Production controls

32. The progressive phaseout of HCFC production, along with the proposed reductions in the placing on the market, is an effective means to encourage the greater take-up of alternatives already available. It would set an example to the international Community and help prevent HCFCs from being overly promoted in developing countries. As the production of all other ozone depleting substances is already controlled under the Montreal Protocol and

Regulation (EC) No 3093/94, there is no reason why HCFCs should continue to be an exception, particularly as they are only transitional substances. The European Community proposed production controls for introduction into the Montreal Protocol at the Ninth meeting of the parties in Montreal 1997 and there is a strong political argument for taking this measure at Community level (see 1.3).

The proposed schedule would allow Community producers to retain their current production level until 2008. Thereafter cuts would reflect the phase-down of consumption within the Community, in industrialised and later in Article 5 countries, with a total production phaseout in 2025. The proposal should therefore have no adverse economic impact on producers. In the case of HCFC-production most producers also produce alternatives. A shift of their production towards these alternatives may induce some initial costs but these should be offset in the longer term by increased marketing possibilities for alternatives.

It is foreseen that the Commission reviews the situation before 31 December 2002, to decide whether production cuts ahead of the year 2008 should be proposed for the Community. This review will be made in the light of the technical and economic availability of alternatives, the development of HCFC consumption worldwide and HCFC exports from the Community.

2.3 Methyl bromide (MBr)

33. The 1994 UNEP/WMO Report of the Montreal Protocol's Scientific Assessment Panel concluded that phasing out the production and consumption of methyl bromide by the year 2001 was the single most effective additional step the Parties could take to reduce ozone depletion during the next few decades.

34. The proposed Regulation would:

- * phaseout the production and consumption of MBr in 2001, with an exemption for critical uses.

This would be earlier than the 2005 phaseout agreed in Montreal for developed countries, but consistent with the 2001 phaseout recommended by the Science Assessment Panel. Other countries which have already agreed to phaseout MBr by 2001 include USA (the world's largest user of MBr), Canada, Austria, Denmark, Finland, Germany, Netherlands, Norway, Sweden, Indonesia and Colombia.

- * provide a critical use exemption such that methyl bromide would continue to be available where no technically or economically feasible alternative substance or technique had been identified.

This reflects the fact that not all current uses of methyl bromide are likely to be replaced by 2001. The Montreal Protocol's MBr Technical Options Committee estimates that good alternatives already exist for around 90% of current methyl bromide use. The proposed Regulation provides a flexible procedure whereby

critical use exemptions can be authorised by the competent authorities of the Member States, applying criteria laid down in the regulation. This recognises that Member States will be in the best position to know what alternatives work successfully in their local circumstances.

(i) What is methyl bromide?

35. Methyl bromide is an extremely efficient broad-spectrum pesticide gas. In addition to being a serious ozone-depletor, it is classified by the World Health Organisation as "highly toxic". Following several poisoning incidents, most countries now have strict controls on its use and require it to be applied by licensed fumigators. Many countries have also introduced measures to prevent contamination of the surrounding air and water during fumigation. For example Italy has banned the use of MBr in intensive horticulture around Lake Bracciano following concerns about contamination of the lake. When applied to soil, MBr kills all soil organisms, including those favourable to maintaining the health of the soil. The possibility of residues has led several supermarket retailers to require that their suppliers use Integrated Pest Management (IPM) to control soil-borne pests rather than MBr. This is consistent with the Community's Fifth Action Programme on the Environment, which includes provisions for conversion to IPM and a significant reduction in pesticide use by the year 2000.

(ii) Uses of methyl bromide in the European Community

36. The European Community is the world's second largest consumer of methyl bromide. It is used primarily for soil fumigation (90%), but also for commodity fumigation (3%), space fumigation of buildings such as flour-mills (3%) and as a chemical feedstock for pharmaceuticals and other products (4%). The total quantity which may be placed on the Community market is limited by Regulation (EC) No 3093/94 to 16 472 tonnes in 1997 to be reduced by 25% to 12 353 tonnes in 1998.
37. The use of MBr for soil fumigation is limited to high-value monoculture crops such as tomatoes, strawberries, melons, cucumbers and cut flowers. Italy consumes over 50% of the Community's MBr, but use has varied significantly over recent years, falling by 48% in Belgium, 73% in Denmark and 100% phaseout in Netherlands and Germany. By contrast, use has increased by 50% in Spain, and even more in Sicily, which now accounts for over 20% of the Community's total MBr consumption.

(iii) Options for methyl bromide control

38. The proposal is to phaseout the production and consumption of MBr in 2001, with an exemption for critical uses. This approach is consistent with the Montreal Protocol, under which emissions of ozone depleting substances are eliminated by phasing out their *production and consumption (defined as production + imports - exports)*. The proposal is also consistent with current Regulation (EC) No 3093/94 which controls production and placing on the market of MBr.

39. An alternative approach has been suggested by the fumigation industry. They propose simply to reduce emissions through the use of virtually impermeable plastic film and reduced doses, leaving production and consumption untouched. This proposal, while welcome as a means to limit emissions, would not meet the Community's obligations under the Protocol which has recognised from the beginning that reductions in emissions are impossible to monitor and therefore an insufficient basis on which to protect the ozone layer. Where MBr continues to be used, for example under the critical use exemption, reducing emissions will be important. The proposed Regulation would require fumigators to take precautionary measures to prevent leakage of methyl bromide during fumigation, and to report to the Commission on these measures and estimated emissions.

(iv) Alternatives to methyl bromide

40. While there is no single alternative which could replace methyl bromide in all its current applications, a number of alternative approaches to the control of soil pests have been successfully introduced into commercial horticulture. These include crop rotation, use of combined pesticides, the use of natural and artificial substrates, steam sterilisation, solarisation, biological controls, change of cultivar and deep ploughing. These have been successfully used in a number of Member States in place of methyl bromide, with no reduction in yield, economic return or employment. Similar experiences have been reported from the USA, Canada and Latin America. Technically and economically feasible alternatives now exist for the majority of current MBr uses so it is now possible to envisage phaseout in 2001 with the important safeguard of a critical use exemption for the few remaining uses for which alternatives have not yet been identified.

(v) The effects of early phaseout with a critical use exemption

41. A phaseout of MBr in 2001 will encourage the rapid take up of alternatives which are already available, while the exemption for critical uses will ensure that no farmer will be deprived of MBr before a good alternative is available. The exemption will be authorised by the Member States to reflect different crops and local conditions such as climate and soil type. These critical use exemptions will be limited to certain well-defined applications and areas within a particular Member State and thus have no potential impact on the functioning of the Internal Market. While these derogations might be more important in the beginning, they will be regularly assessed and reduced in line with progress in the development and economic availability of alternatives. Each Member State will report to the Commission on the exemptions it authorises and the criteria for determining critical uses will be reviewed regularly in the light of these reports, technical progress and the availability of alternatives.

(vi) Economic implications of replacing methyl bromide

42. The methyl bromide industry has claimed that phasing out MBr will reduce yields, damage profitability and increase unemployment. While it is possible to create a scenario along these lines, assuming for example that methyl bromide is removed suddenly without there being technically and economically feasible alternatives available, this is not what is being proposed. The encouraging results seen in many cases where MBr has already been replaced, together with the safety-net of the critical use exemption, make it possible to phaseout MBr without damaging the farmers who currently use it.
43. A study for the European Commission on the costs and implications of phasing out MBr in the Community was completed in May 1997. It describes many examples of the successful replacement of MBr with alternatives without damaging yields or profits:
- strawberries grown in natural soil substitute in Italy produce yields of 4.8 kg/m² compared to an average of 3.0 kg/m² in Italy and Spain using MBr;
 - solarisation of open-field pepper crops in Italy gave a 20% increase in yield compared with MBr;
 - moving from MBr to artificial substrates in the Netherlands increased yields of tomatoes by 10% to 52 kg/m²;
 - at Ragusa in Italy, replacing MBr by a combination of solarisation and IPM resulted in increased profit of USD 2000/ha.
44. Experience shows that these alternatives work best when they are integrated into the farming system and directed at specific pests and specific crops. While MBr will indiscriminately kill everything on any kind of crop, using alternatives demands a more informed, intelligent approach to find the best treatment for a particular pest on a particular crop in a specific local circumstance. In this way, using alternatives may require more highly skilled agricultural workers than MBr. While this has cost implications, it also has employment and training possibilities which would be beneficial to the agricultural sector. Rapid adoption of alternatives could benefit the competitiveness of Community agriculture by:
- * contributing to the longer-term sustainability of Community agriculture;
 - * creating export markets for environmentally friendly pest-control technologies;
 - * meeting the growing demand for pesticide-free agricultural produce.

45. It has been argued that the Community should not phase out MBr while it remains in use in North African countries. There are fears that produce grown with MBr in Morocco and Tunisia would replace home-grown produce on the Community market. This fear is based on the belief that using alternatives inevitably leads to higher-priced or lower quality produce than using MBr, but this is not supported by the facts. It is much more likely that the adoption of alternative systems which improve profitability could allow Community farmers to undercut competitors. For example the Netherlands, after phasing out MBr, successfully developed the use of high-yield substrates and maintained its predominant position in crops such as tomatoes. This experience and similar techniques could be adapted for use throughout the Community on crops which are being grown using methyl bromide.

46. In recognition of the particular problems faced by Southern European farmers, the Commission organised a workshop "Alternatives to methyl bromide for Southern European Countries" in Tenerife in April 1997. The conclusions state: *"The existence of a great many alternatives to the use of MBr for soil fumigation was amply demonstrated, both from presentations and from visits to producers' fields. Many of these methods are directly applicable to Southern European Countries."*

2.4 Phaseout of placing on the market and use of CFCs and other fully halogenated substances

47. Under the existing Regulation (EC) No 3093/94, the Community has achieved the general phaseout of the production of CFCs and other fully halogenated controlled substances. However, while CFCs were phased out already in 1995 (and halons in 1994), there are still too many cheap CFCs on the European market, a situation which is delaying the switch to alternatives. CFCs from existing stocks and from recycling explain the continued availability to some extent. Also illegal imports are believed to contribute significantly.

48. In light of the overall objective of the Montreal Protocol and the Regulation to eliminate ozone-depleting substances, and with a view to the time span that has already passed since the production prohibition, it is now justified to prohibit the sales and use of CFCs, halons and other fully halogenated controlled substances. The term "use" is defined to cover their utilisation in the production or maintenance of products or equipment (e.g. refilling of refrigeration equipment), or in processes. The proposed prohibition is subject to some limited exemptions to ease transition, and the possibility of "essential uses". By this measure, the market for the substances concerned will be removed, which is the most efficient means to cut illegal imports.

49. In relation to *essential uses* of CFCs, the Commission is at present developing a transitional strategy for the reduction of those uses for medical inhalers, following the mandate to Parties under the Montreal Protocol. A "strategic plan" is at present being finalised, with the involvement of the Member States and all the operators concerned, to work towards a rapid changeover to non-CFC products in the medical sector.

2.5 Trade in ozone-depleting substances - licensing requirements

50. The Montreal Protocol was amended at the Ninth Meeting of the Parties by the new requirement for Parties to establish a system for licensing the import and export of ozone-depleting substances. Proper monitoring through licensing and reporting requirements on trade in controlled substances is an important tool for Parties to evaluate their performance in eliminating ozone-depleting substances. It furthermore significantly enhances the efforts to curb illegal trade in these substances, in particular as these obligations are now incumbent upon all Parties to the Montreal Protocol.
51. Under Regulation (EC) No 3093/94, the Community already has an import quota and licensing requirement which has been maintained in the current proposal. This licensing requirement also extends to "inward processing operations", i.e. controlled substances which enter the Community for reprocessing/repackaging, following which there are to be re-exported. In addition to the existing system for imports, it is proposed also to establish a system providing for the authorisation of exports of ozone-depleting substances, completed by more adequate reporting requirements for companies trading in ozone-depleting substances. As compared to the import licensing requirement for each individual shipment, the proposal provides for a general authorisation of exports on application to be made to the Commission at the beginning of the year. The system is shaped in a way to fulfil the Montreal Protocol requirement, in particular to allow cross-checking of information with other Parties, without imposing unnecessary administrative burden on the operators and control authorities.

Business impact assessment with particular reference to SMEs

Title of proposal: Draft proposal for a Regulation on substances that deplete the ozone layer

Document: *Ref. No:* 98003

1. Who will be affected by the proposal?

The proposal will affect:

I. Producers

- A. of ozone-depleting substances (ODS) and their alternatives
- B. of equipment and products using these substances and/or their alternatives, including manufacturers of foam and refrigeration equipment

II. Users

- A. of ozone-depleting substances as solvents and in agriculture (MBr)
- B. of refrigeration and solvent equipment and insulation products

III. Methyl bromide fumigators

The eight European producers of ODS are all large companies or their subsidiaries. This proposal restricts their possibility to increase overall sales in the near future and could eventually cause their HCFC sales to fall. However, as HCFC consumption in any case is already controlled under the Montreal Protocol, any negative impact on producers is likely to be minor. The proposal will also have a positive impact on the sales of alternatives. As most producers also produce the alternative substances, the overall implications for them may even be positive.

The proposal will have advantages for Community producers and consumers of non-ODS technologies and substances by stimulating their markets. Any negative effects on producers of equipment or on users of ODS (HCFCs and methyl bromide in particular) should be limited because:

1. there is a large number of reasonably priced alternatives available;
2. further price reductions can be expected with economies of scale;
3. the proposal deliberately provides more time to move to alternatives where particular difficulties exist, for example in converting certain foam manufacturing facilities;
4. the initial conversion costs of production facilities will in many cases be offset over time by lower operating costs, for example using aqueous cleaning instead of HCFC-solvents;
5. the proposal includes scope for further exemptions in specific cases where alternatives have not been identified or do not work successfully.

2. What will business have to do to comply with the proposal?

Compliance will require both producers and users of refrigeration, solvent and insulating equipment and products to change to an ozone-friendly alternative. Companies will have to:

1. acquire information on the availability of alternatives;
2. decide which solution is most suitable to their business;
3. make certain investments in new ODS-free technology;
4. in some cases adapt facilities and practises to handle the alternatives (which are sometimes flammable or toxic) properly.

A familiar problem for SMEs in moving out of ODS is insufficient information about alternatives. This need not be a problem: UNEP's office of Industry and Environment in Paris issues regular newsletters on alternatives, and the information is also available on a computer database. In addition, the Commission is currently preparing a database of information on alternatives available in Europe.

3. What economic effects is the proposal likely to have?

Under existing legislation, investment in alternatives to ODS has to occur anyway. The effect of this proposal will be to accelerate these changes in certain sectors. For ODS producers, the economic impacts are expected to be limited or even positive where sales of alternatives pick up strongly.

Foam manufacturers and producers of refrigeration equipment and products will have to move to alternative substances, but much of the work to develop alternatives has already been done. Costs are therefore likely to be limited. The March study estimated the immediate costs to the refrigeration sector as less than 2% of annual turnover. For the foams sector, the same study concluded that total conversion costs would be approximately 15% of annual turnover if all ODS were phased out by 2000. However the current proposal allows a significantly longer time for conversion for those parts of the foams sector where a very quick phaseout would incur relatively high costs. Thus, the costs can most likely be cut to around 4% of annual turnover. It should also be noted that most of these costs would be passed on to users, thus spreading the investment costs among a large number of users.

The proposal may also enhance export opportunities for companies that are developing alternatives when the phase-out starts to raise demand for alternative substances and technology overseas. This would benefit in particular producers of alternatives to HCFC-using equipment as Europe would be taking the world lead. As alternatives will have been commercialised for the European market under the Regulation, EU-producers would have a competitive advantage when demand for non-HCFC products begins to rise elsewhere. This can already be seen in the cases of hydrocarbon refrigerators with hydrocarbon-blown foams being exported from Germany and Sweden, hydrocarbon and ammonia air-conditioning (UK and Italy), non-ODS insulated district heating pipes (Denmark, Sweden), and ammonia commercial refrigeration systems (Denmark). SMEs may also find additional opportunities in ODS recovery and recycling operations.

As regards methyl bromide, it is clear that the careful use of properly chosen alternative substances and techniques can produce yields and profits equal to or greater than using MBr. For example, the Italian Fumigators' Association has noted that solarisation is cost-effective for certain crops. They state that using crop rotation would reduce the number of soil-borne pathogens, allowing the use of lower doses of alternative fumigants. Their report suggests solarisation in combination with biological controls/low doses of fumigants as good alternatives to chemical soil disinfestation with MBr, particularly in southern Italy and this could apply throughout the Mediterranean area.

4. Does the proposal contain measures to take account of the specific situation of SMEs?

The proposal applies specifically to SMEs in that many producers and users of alternatives are SMEs rather than large firms, although the majority of producers of ODS-technology are large companies. In the case of commercial air-conditioning equipment, most of the equipment using ODS originates from larger producers based outside Europe, whereas the alternatives mostly originate from small companies based within the Community.

Products containing HCFCs are currently used by many SMEs, but the proposal does not require that existing equipment is converted. When new HCFC-free equipment needs to be purchased, its cost in most cases will not be significantly higher than for HCFC-products. In parts of the foams sector where most producers are SMEs, and for solvents users (many of which also SMEs), the proposal allows a relatively long time to complete the phase-out of HCFCs. In addition where particular economic or technical difficulties remain, SMEs will be assisted by the essential use or critical use exemptions.

Most of the firms supplying MBr fumigation treatment in the EU are SMEs. These firms, through their associations, have stated that they expect to suffer economic damage from an accelerated phaseout of MBr. This could be true, but only where fumigators specialise in methyl bromide and do not offer other solutions to control particular pests or diseases. Methyl bromide fumigators who fail to diversify will in any case go out of business in a few years because of international phaseout of MBr under the Montreal Protocol. An earlier phase-out date in the Community, accompanied by a flexible exemption system, could help encourage these companies to diversify and therefore stay in business. At the same time, a move away from MBr will create employment opportunities for SMEs providing services such as solarisation and steam treatment, and for manufacturers of substrates.

The proposal provides that the use of methyl bromide can continue for critical agricultural uses. Therefore some fumigation with methyl bromide will continue, using the new emissions reduction technologies such as thicker plastic sheets. This will make methyl bromide fumigation a more specialised activity, for which the fumigators may well be able to charge a premium.

5. Views of companies affected and business organisations

There are many different views on what impact this proposal will have on business. This is not surprising given the wide range of sub-sectors affected. Business associations in particular have claimed that advancing the phaseout of HCFCs further ahead than the current proposal would have adverse economic effects on them. However, a number of submissions from individual companies support even stricter controls than currently proposed. National business associations in Member States which have already phased out HCFCs also agree that a stricter proposal would be realistic and achievable.

6. Consultation

Both ODS and non ODS producers and consumers have been consulted through regular meetings between IGPOL and the Commission services. They have also input directly or indirectly to a study on ODS alternatives for the Commission's Directorate General for the Environment or to UNEP Technical Committee reports.

These companies include: GIFAS Aeronautique and Aerospatiale, GITEP, FIEE (Electric and Electronics Industries Federation), ORGALINE (European Liaison Group of the electrical; electronic; mechanical and metalworking industries), SURCHIM, GRAINDORGE, ELF Atochem, ICI, Rhone-Poulenc, OASI (Italian Metal Degreasing Industries), Solvay, ISOPA, BRUFMA, Eurovent, European Panels Federation, Exiba, Dehon, Knaut, Belgian Association of Refrigeration, Acrib, Eucrar, RFIC, CSDF, AREA, KTG, CECOMAF, ASERCOM, PANAMA, Linde Kaltetechnik, Dansk Teknologisk Institut, Danfoss, Sabroe Refrigeration, A'Gramkow, Dansk Ammoniafabrik, Gram Refrigeration, Soby Koleteknik, Danvalve, Retech Refrigeration Technologies, Calor Gas, University of Hannover-Refrigeration Institute, Electrolux, AEG, Integral, Siemens, Tesco, Sainsbury, Cactus, Migros, Bosch, DeLonghi, York International, ABB Stal, Star Refrigeration, ALDI, Liebherr, Frigoscandia, Pilkington, Pittsburgh Corning, Robur, Thanex, Zeo-tech, Birdsall, Ecozeo, Whitbread, Morris and Young, APV Baker, Carrier Air Conditioning, Copeland, Eaton Williams, Mitsubishi, Munters Ltd, Toshiba, Armstrong, BASF, Bayer, Lematic, nmc Kenmore, Recticel, Rockwool, AKA Kyla, EUROFEU.

Technical and economic feasibility of the proposed HCFC-controls

Producers of HCFCs

There are 8 HCFC producers in the Community. They are all large chemical producers or their subsidiaries, supplying a wide range of products including major alternatives to HCFCs. Thus, any provision leading to reduction in HCFC production will give rise to new markets for other parts/divisions of the same companies.

HCFC use-bans will force producers to cut down production for the European market. This market, however, only represent a minor part of the total HCFC-market which also comprises production for feedstock use (not covered by the regulation) and for export.

Under the production controls now proposed, producers are allowed to continue production of HCFCs at current levels until 2008. Thereafter they could maintain export at 1997 levels until 2014. The important US market for HCFC 141b will be lost in any case by 2003 due to a US ban of that substance. Japan is also banning HCFC 141b by 2004. The "March Study", based on an assessment of the market demand, has stated that "it *may* be possible to maintain HCFC export levels on the 1993 level until 2009". The 1993 level is 35% below the current export level. This clearly suggests that restricting HCFC production as proposed will have no impact on the competitiveness of Community HCFC producers.

HCFC product and equipment producers and end users

The 1996 European HCFC use in the three main sectors is depicted in the table below.

	1996 HCFC use (ODP-tonnes)	1996 HCFC use (%)
Refrigeration	2 350	32%
Solvents	650	10%
Foams	4 220	57%

Refrigeration

A major part of the HCFCs is used for maintenance, i.e. refilling refrigeration equipment due to leakage.

The use of HCFCs in several types of refrigeration and air-conditioning systems is already banned by Council Regulation (EC) No 3093/94. The new Article 5 would extend the prohibition from 1 January 2001 to all new refrigeration and air conditioning systems, except for reversible air conditioning/heat pump systems where HCFCs would be allowed until 2004 because suitable alternatives are not yet available.

Existing refrigeration equipment will be affected by the proposal only to the extent that the use of virgin HCFC will be prohibited for maintenance from 2008. This is not expected to pose a problem as recycled HCFCs could still be used and leakages could be significantly reduced. There would also be plenty of time to develop new alternatives for refilling.

Refrigeration in a number of applications (e.g. in retail stores, shopping malls, restaurants, food processing and comfort air-conditioning) is now largely based on HCFC 22. Prohibition of HCFC-use in refrigeration would obviously reduce market share for any producer of equipment who has not yet introduced or planned to introduce alternatives. At the same time, however, it would benefit the producers of alternative fluids and producers of equipment designed for alternative substances, of which there are many in the Community.

Hydrocarbon (HC) refrigerants can be used alone (in small systems) or as part of secondary systems for larger scale refrigeration and air-conditioning. Low charge requirements, improved engineering, service practices and better monitoring systems have made HCs safe for use in public places, despite their flammability. HC refrigeration systems are already used for commercial refrigeration including small retail stores, supermarkets, pubs, restaurants, petrol stations and food franchises. HCs are also gaining market shares in air-conditioning equipment. According to hydrocarbon commercial systems manufacturers and distributors, the majority of HC users are SMEs. HCs are energy efficient and compatible with most compressor oils and materials. It has been confirmed by producers of refrigeration equipment that, at least for smaller systems, a hydrocarbon system rarely costs more than any other system, both in the short and in the longer term.

Ammonia is a natural but toxic substance that has been widely used in industrial refrigeration for several decades with an excellent safety record worldwide. In both the USA and Germany ammonia accounts for more than 70% of the industrial refrigeration. Traditionally the use of ammonia outside industrial refrigeration has been limited, though its use is now increasing in applications such as air-conditioning and supermarkets. Other users include large food processors, pharmaceutical firms and breweries. Ammonia in most cases requires the use of a secondary refrigerant in an indirect system. This makes ammonia suitable for large systems although the lower size limit for a technically and economically feasible ammonia system has recently been reduced. Prices for ammonia components, which have to be based on steel instead of copper, at present range from 0-50% higher than those for HCFC components. The price difference would decrease with economies of scale. Over the medium and long term, the high energy efficiency and low operating costs of ammonia systems should in many cases offset the higher capital investment. The price of ammonia itself is about 20% that of HCFC-22.

HFC-based refrigeration or air-conditioning systems are already available for virtually all applications. HFCs encompass a wide range of substances (and their blends) with slightly different properties. Some of the substances require a different system design than HCFCs. According to equipment manufacturers, this may lead to an initial increase in manufacturing costs of the order of 5%. This initial cost increase is unlikely to persist when HFC-based systems become more common. In most cases the performance of refrigeration systems (i.e. cooling capacity and energy efficiency) is not affected significantly by using HFCs instead of HCFCs. However, HFCs are

substances with very long atmospheric life-times. This and the fact that they are also potential greenhouse gases requires measures to control emissions. According to the Kyoto Protocol, agreed in December 1997, HFCs are included in the basket of climate gases for which the EU is obliged to decrease its emissions by 8% in the period 2008-2012 compared to 1990. Thus, any use of HFCs will have to be accompanied with strict emission control measures.

Other refrigerants including water and water mixture, carbon dioxide, air and other types of air-conditioning and refrigeration systems (e.g. absorption systems) are being developed, or are currently being used to a limited extent. Indications are that these may soon be more widely applicable.

Notwithstanding the demonstrated widespread availability of alternatives, associations of HCFC producers and users, in consultations on this proposal have claimed that HC are suitable only for domestic refrigerators, and ammonia systems only for industrial refrigeration. The refrigeration industry seems reluctant to increase the use of HFCs fearing future regulatory measures. Thus, different refrigeration associations have claimed that the phase-out dates for HCFCs cannot be tightened, while conceding that, from a technical point of view, alternatives are available for new refrigeration equipment. However, the Swedish Association of Commercial refrigeration equipment manufacturers as well as some producers of equipment (e.g. Electrolux, Siemens) have indicated that they support a rapid phase-out of HCFCs.

Solvents

Major solvent applications include electronics cleaning, precision cleaning, and metal degreasing; a wide range of firms is involved, including many SMEs.

The proposed Regulation would prohibit the use of HCFCs as solvents from 1 January 2003, with the exception of precision cleaning in the aerospace-industry, where alternatives are not yet proven. Given that the solvents sector is extremely diverse and comprises a number of sub-sectors with many different applications, a few exemptions under the proposed essential use regime may be given for uses where there are problems in finding technically or economically feasible alternatives.

A number of alternatives in this sector have been in widespread use in most developed countries for a long time. They include aqueous and semi-aqueous systems, no-clean technologies, and a number of other solvent and non-solvent cleaning processes. In their 1995 assessment, the UNEP's Solvents Technical Options Committee stated the following about ozone depleting solvents: "There is no technical reason why any company, large or small, in a developed or developing country should not be able to move away from such solvents immediately". The committee also specifically recommended against the use of HCFC 141b for solvent use because of its high ozone depletion potential and its unsuitability for many cleaning applications. Despite this, HCFC 141b has been used as a drop-in substitute to replace CFC or 1,1,1-Trichloroethane cleaning systems because investment costs for this change are low and HCFC 141b has been heavily marketed in some Member States.

The first HCFC 141b sales into the solvents sector in Europe were in 1990, with sales quadrupling between 1992-1993 and more than doubling again from 1993-1994 despite the substance being included in the Montreal Protocol in 1992. The "March Study" concluded that about 30% of the current HCFC use is best described as "excess consumption" and that only 10% is difficult to phase out. "Lack of a clear focus" in the sector is mentioned as the reason why alternatives identified by some users are not taken up more widely.

There is ample evidence from Member States which have already moved away completely from ODS-solvents that this can be done without adverse effects on businesses. Operating costs in many cases are considerably lower (e.g. non-ODP alternatives in electronics cleaning) and the initial investment costs are therefore offset.

Some companies and industry associations have stated that no real alternatives exist at present for several solvent uses of HCFCs. Industry associations have also told the Commission, they consider one of the main alternative cleaning methods available (aqueous cleaning systems) requires excessive investment and high levels of technical expertise, although it is widely and successfully used in the USA. For these reasons, industry associations consider a very quick phaseout to be unrealistic and have suggested:

- * 2015 for the aerospace industry
- * 2002-2003 for the electronics industry.

The proposal addresses these concerns through the exemption until 2015 for the aerospace industry and the general phase-out of solvents by 2003. Moreover the proposal provides a possibility of an "essential use" exemption for specific cases where an alternative is neither technically nor economically feasible.

Foams

Under Regulation (EC) No 3093/94, the use of HCFCs is already banned for some types of foams, such as flexible foams. The proposed Regulation would progressively ban the use of HCFCs in rigid insulating foams where HCFCs are still being used. Hydrocarbons (HCs), HFCs and carbon dioxide (CO₂) are the main alternative blowing agents. In many applications, foams may also be replaced by non-foam insulating materials (mineral wool, rock wool, vacuum panels, cellular glass). Overall, such not-in-kind alternatives currently dominate the market for insulation material.

Rigid insulating foams can be separated either by chemical origin. Polyurethane (quantitatively the most important type), extruded polystyrene (XPS), phenolic foam and PIR-foam, or by application (e.g. board-stock, sandwich panels, appliance foams).

Integral skin foams are not strictly speaking insulating foams. They are used for steering wheels, headrests, shoe soles etc and represents about 2% of the current HCFC use in the foams sector. Several alternatives to HCFCs are available (e.g. water and CO₂). Industry itself, in meetings with the Commission services, has agreed to a

quick phase out of HCFCs for this type of foam. It is proposed to ban HCFCs for this use by 1 January 2000. The same date would apply to *polyethylene foams* for which the situation is similar.

For *XPS foams*, CO₂ and other (currently available) HFCs have already been adopted as blowing agents in Germany, The Netherlands and Sweden. These substances are not flammable and provide sufficiently good insulating value. However, the conversion of production facilities is time-consuming and smaller companies in particular may need a few more years to complete conversion of their production facilities.

For a majority of the *Polyurethane (PU)* foam applications, the use of HCs or other alternatives is already common in the European Community. In some Member States, manufacturers are hesitant to move to alternatives because of fears of reduced insulating value, which would lead to a need for thicker insulation. Furthermore, they claim that the flammability of HCs would incur cost increases and that national building standards might be an obstacle for their use in certain applications in some countries.

However, PU foams are flammable even if non-flammable blowing agents are employed and in general the use of a flame-retardant is required. The use of HCs or CO₂/water in *boardstock/flexible faced laminate sandwich panels* for construction purposes and *appliance foam* applications is already established. The insulation value may be 5-10% inferior to that of HCFC-blown foams. However, such a loss could in many cases be made up for by increasing the insulation thickness or other minor design changes. A quick conversion of existing facilities would however be relatively costly and consequently it is proposed that HCFC be banned from 1 January 2003 for these categories.

Using CO₂ or hydrocarbon based foams with slightly inferior insulation performance may be somewhat more problematic in XPS- and PU foams for *insulated transport*, where traffic regulations and sizes of European pallets dictate the wall thickness of vehicles. Similar constraints apply to a few other "specialised" PU foams such as *PU-block foams*. *Phenolic* and *PIR* foams are marketed as non-flammable foams and are mainly used where fire resistance is of paramount importance. The use of flammable blowing agents has nevertheless been considered but is not yet well established. A phaseout before non-flammable blowing agents are available would penalise PIR and phenolic foam producers disproportionately. It is therefore proposed to allow the use of HCFCs for these types of foams until 1 January 2004 when alternative blowing agents (liquid HFCs) providing at least the same insulating properties as HCFCs are expected to be available.

Liquid HFCs (e.g. HFC 245fa) are by many industry representatives seen as the most important future non-flammable foam blowing agents for very many foam types. Industry associations, which are dominated by those who have not moved to alternatives currently available await the projected availability of liquid HFCs and have said that, consequently, they need to continue using HCFCs until 2004. However, these substances may not be the best option for many foam types since HFCs are powerful greenhouse gases and the price of the blowing agents is expected to be up to four times higher than for HCs.

New use bans, HCFCs used and examples of HCFC substitutes

Use	Reference text in Article 5 of the Regulation	HCFCs used	Proposed HCFC-ban*	Substitute	Availability of substitute	Cost information (substitute)**	Global Environmental effects of the substitute***
Refrigeration Commercial and industrial systems	All other refrigeration and air-conditioning equipment [...] with the exception of reversible..	22, 123, 124	2001	Ammonia Hydrocarbons HFCs	Wide Developing Wide	1, 2, 3 1, 2, 3 2, 4	ODP 0, GWP 0 ODP 0, GWP < 10 ODP 0, GWP same range as HCFCs
Refrigeration Commercial air-conditioning	All other refrigeration and air-conditioning equipment [...] with the exception of reversible..	22, 123	2001	Ammonia HFCs Water	Wide Established Developing	1, 2, 3 2, 4, 5	As above As above ODP 0, GWP 0
Refrigeration Comfort air-conditioning	All other refrigeration and air-conditioning equipment [...] with the exception of reversible.	22	2001	Hydrocarbons HFCs	Established Wide	1, 2, 3 2, 4	As above
Refrigeration Comfort air-conditioning (reversible systems)	...reversible air-conditioning/ heat-pump systems...	22	2004	HFCs	Limited	2, 4	As above
Foams Integral skin/polyethylene	... integral skin foams and polyethylene foams	22, 141b, 142b	2000	HFC 134a Hydrocarbons CO2	Wide Wide Wide	4 1, 2, 3 2, 3	ODP=0, GWP same range as HCFCs ODP 0, GWP <10 ODP 0, GWP 1
Foams XPS	... extruded polystyrene except where used in insulated transport	22, 142b	2002	CO2 HFC134a/HFC 152	Established Established	2, 3 2, 4	As above GWP same range as HCFCs
Foams Polyurethane	... polyurethane foams for appliances, [...] flexible faced laminates and of polyurethane sandwich panels except where [...] used in insulated transport	22, 141b, 142b	2003	Hydrocarbons Non-foam insulation (Liquid HFCs)	Wide Wide None	1, 2, 3 comparable to foams 4, 5	As above ODP 0, GWP 0 ODP=0, GWP same range as HCFCs
Foams Polyisocyanurate/phenolic, special applications (Polyurethane and XPS)	... for the production of all foams	22, 141b, 142b	2004	Liquid HFCs Non-foam insulation 2-chloropropane	None Established Limited	4, 5 comparable to foams in some cases 5	As above As above Not available
Solvents	.. in all solvent uses with the exception of precision cleaning of electrical and other components in the aerospace and aeronautics industries	141b	2003	No-clean flux Aqueous and semi-aqueous systems. Hydrocarbons HFCs	Wide Wide Wide Limited	2, 3 2, 3 1, 2, 3 4	ODP 0, GWP 0 ODP 0, GWP 0 As above As above

Source: Information from International Institute of Refrigeration, UNEP, Danish EPA, German Umweltbundesamt, Nordic Council, industry documentation, March Consulting group

* All information on phaseout dates refer to the 1 January of the year in question.

** Cost information as follows:

1. Costs incurred due to flammability or changed product properties when engaging new substances.
 2. Appreciable conversion cost.
 3. Possibility of lowered operating costs.
 4. Possibility of double capital investment as the result of further international regulation of greenhouse gases.
 5. Insufficient experience for a reliable assessment.
- *** ODP: Ozone Depletion Potential; GWP: Global Warming Potential.

Note: The timing of the use bans reflect the technical and economical availability of alternatives.

Proposal for a
COUNCIL REGULATION (EC)
on substances that deplete the ozone layer

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 130s(1) thereof,

Having regard to the proposal from the Commission¹,

Having regard to the opinion of the Economic and Social Committee²,

Acting in accordance with the procedure laid down in Article 189c of the Treaty, in cooperation with the European Parliament,

- (1) Whereas Council Regulation (EC) No 3093/94³ must be modified substantially, whereas it is in the interest of legal clarity and transparency to revise that Regulation completely;
- (2) Whereas effective measures need to be taken in order to protect human health and the environment against adverse effects resulting from emissions of substances that deplete the ozone layer;
- (3) Whereas it is established that continued emissions of ozone-depleting substances at current levels continue to cause significant damage to the ozone layer; whereas it is therefore necessary to take further steps in order to ensure sufficient protection for human health and the environment;
- (4) Whereas in view of the responsibilities of the Community for the environment and trade, the Community, pursuant to Council Decision 88/540/EEC⁴, has become a Party to the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on substances that deplete the ozone layer, as amended by the Parties to the Protocol at their second meeting in London and at their fourth meeting in Copenhagen;
- (5) Whereas additional measures for the protection of the ozone layer were adopted by the Parties to the Montreal Protocol at their seventh meeting in Vienna in December 1995 and at their ninth Meeting in Montreal in September 1997, in which the Community participated;

¹ COM(1998) 398 of 1 July 1998.

² ...

³ OJ L 333, 22.12.1994, p. 1.

⁴ OJ L 297, 31.10.1988, p. 8.

- (6) Whereas it is necessary for action to be taken at Community level to carry out the Community's obligations under the Vienna Convention and the latest amendments and adjustments to the Montreal Protocol, in particular to phase out the production and the placing on the market of methyl bromide within the Community and to provide for a system for the licensing not only of imports but also of exports of ozone-depleting substances;
- (7) Whereas in view of the earlier than anticipated availability of technologies for replacing ozone-depleting substances, it is appropriate in certain cases to provide for phaseout schedules which are stricter than those provided for in Regulation (EC) No 3093/94 and which are stricter than those of the amended and adjusted Protocol;
- (8) Whereas under Regulation (EC) No 3093/94, the production of chlorofluorocarbons, other fully halogenated chlorofluorocarbons, halons, carbon tetrachloride, 1,1,1-trichloroethane and hydrobromofluorocarbons has been phased out; whereas the production of those controlled substances is thus prohibited, subject to possible derogation for essential uses and to meet the basic domestic needs of Parties pursuant to Article 5 of the Montreal Protocol; whereas it is now also appropriate to progressively prohibit the placing on the market and use of those substances and of products and equipment containing those substances;
- (9) Whereas the growing availability of alternatives to methyl bromide should be reflected in an accelerated phaseout of methyl bromide compared to the Montreal Protocol; whereas such an accelerated phaseout is also provided for by other Parties to the Protocol; whereas there might be specific critical agricultural uses and conditions for which the phasing out of methyl bromide would lead to severe technical or economic difficulties; whereas exemptions should be foreseen for those cases for which the production and placing on the market of methyl bromide may be permitted after phaseout;
- (10) Whereas Regulation (EC) No 3093/94 provides for controls on the production of all other ozone-depleting substances but does not provide for controls on the production of hydrochlorofluorocarbons (HCFCs); whereas it is appropriate to introduce such provision to ensure that HCFCs do not continue to be used where non-ozone depleting alternatives exist; whereas measures for the control of the production of HCFCs should be taken by all Parties to the Montreal Protocol; whereas a freeze on production of HCFCs would reflect that need and the Community's determination to take a leading role in this respect; whereas the quantities produced should be adapted to the reductions envisaged for the placing on the Community market of HCFCs and to the declining demand world-wide as a consequence of reductions in the consumption of HCFCs required by the Protocol; whereas HCFCs controls under the Montreal Protocol should be considerably tightened to protect the ozone layer and to reflect the availability of alternatives; whereas the Community will continue to press the Parties to the Protocol to accept tighter controls on HCFCs;

- (11) Whereas the Montreal Protocol, in Article 2F (7) requires the Parties to endeavour to ensure that the use of HCFCs is limited to those applications where other more environmentally suitable alternative substances or technologies are not available; whereas in view of the availability of alternative and substitute technologies, the placing on the market and use of HCFCs and products containing HCFCs can be further limited;
- (12) Whereas quotas for the release for free circulation in the Community of controlled substances should only be allocated for limited uses of controlled substances; whereas controlled substances and products containing controlled substances from States not Party to the Montreal Protocol should not be imported;
- (13) Whereas the licensing system for controlled substances should be extended to include the authorisation of exports of controlled substances, in order to monitor trade in ozone-depleting substances and to allow for exchange of information between Parties;
- (14) Whereas provision should be made for the recovery of used controlled substances, and to prevent leakages of controlled substances;
- (15) Whereas the Montreal Protocol requires reporting on trade in ozone-depleting substances; whereas annual reporting should therefore be required from producers, importers and exporters of controlled substances,

HAS ADOPTED THIS REGULATION:

CHAPTER I

INTRODUCTORY PROVISIONS

Article 1

Scope

This Regulation shall apply to the production, importation, exportation, placing on the market, use, recovery, recycling and reclamation of chlorofluorocarbons, other fully halogenated chlorofluorocarbons, halons, carbon tetrachloride, 1,1,1-trichloroethane, methyl bromide, hydrobromofluorocarbons and hydrochlorofluorocarbons (HCFCs), to the reporting of information on these substances and to the importation, exportation, placing on the market and use of products and equipment containing those substances.

Article 2

Definitions

For the purposes of this Regulation:

- "Protocol" shall mean the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer, as last amended and adjusted;

- "Party" shall mean any Party to the Protocol;
- "State not Party to the Protocol" shall, with respect to a particular controlled substance, include any State or regional economic-integration organization that has not agreed to be bound by the control measures applicable to that substance;
- "controlled substances" shall mean chlorofluorocarbons, other fully halogenated chlorofluorocarbons, halons, carbon tetrachloride, 1,1,1-trichloroethane, methyl bromide, hydrobromofluorocarbons and hydrochlorofluorocarbons (HCFCs), whether alone or in a mixture, and whether they are virgin, recovered, recycled or reclaimed. This definition shall not cover any controlled substance which is in a manufactured product other than a container used for the transportation or storage of that substance, or insignificant quantities of any controlled substance, originating from inadvertent or coincidental production during a manufacturing process, from unreacted feedstock, or from use as a processing agent which is present in chemical substances as trace impurities, or that is emitted during product manufacture or handling;
- "chlorofluorocarbons" shall mean the controlled substances listed in Group I of Annex I, including their isomers;
- "other fully halogenated chlorofluorocarbons" shall mean the controlled substances listed in Group II of Annex I, including their isomers;
- "halons" shall mean the controlled substances listed in Group III of Annex I, including their isomers;
- "carbon tetrachloride" shall mean the controlled substance specified in Group IV of Annex I;
- "1,1,1-trichloroethane" shall mean the controlled substance specified in Group V of Annex I;
- "methyl bromide" shall mean the controlled substance specified in Group VI of Annex I;
- "hydrobromofluorocarbons" shall mean the controlled substances listed in Group VII of Annex I, including their isomers;
- "hydrochlorofluorocarbons" or "HCFCs" shall mean the controlled substances listed in Group VIII of Annex I, including their isomers;
- "feedstock" shall mean any controlled substance that undergoes transformation in a process in which it is entirely converted from its original composition;

- "processing agent" shall mean controlled substances used as chemical processing agents in those applications listed in Annex VI, in installations existing at 1 September 1997, and where emissions are insignificant. The Commission shall, in the light of those criteria and in accordance with the procedure laid down in Article 17, establish a list of undertakings in which the use of controlled substances as processing agents shall be permitted. It may, in accordance with the procedure laid down in Article 17, amend that list in the light of new information or technical developments;
- "producer" shall mean any natural or legal person manufacturing controlled substances within the Community;
- "production" shall mean the amount of controlled substances produced, less the amount destroyed by technologies approved by the Parties and less the amount entirely used as feedstock or as a processing agent in the manufacture of other chemicals. No amount recovered, recycled or reclaimed shall be considered as "production";
- "ozone-depleting potential" shall mean the figure specified in the final column of Annex I representing the potential effect of each controlled substance on the ozone layer;
- "calculated level" shall mean a quantity determined by multiplying the quantity of each controlled substance by its ozone-depleting potential and by adding together, for each group of controlled substances in Annex I separately, the resulting figures;
- "industrial rationalisation" shall mean the transfer either between Parties or within a Member State of all or a portion of the calculated level of production of one producer to another, for the purpose of optimising economic efficiency or responding to anticipated shortfalls in supply as a result of plant closures;
- "placing on the market" shall mean the supplying or making available to third persons, against payment or free of charge, of controlled substances or products containing controlled substances covered by this Regulation with a view to their distribution or use on the Community market;
- "use" shall mean the utilisation of controlled substances in the production or maintenance of products or equipment or in other processes except for feedstock and processing agent uses;
- "reversible air-conditioning/heat pump system" shall mean a combination of inter-connected refrigerant containing parts constituting one closed refrigeration circuit, in which the refrigerant is circulated for the purpose of extracting and rejecting heat (i.e. cooling, heating), which are reversible in that the evaporators and condensers are designed to be inter-changeable in their functions;
- "inward processing" shall mean a procedure provided for in Article 114(1) point (a) of Council Regulation (EEC) No 2913/92 of 12 October 1992 establishing the Community Customs Code⁵;

⁵ OJ L 302, 19.10.1992, p. 1.

- "recovery" shall mean the collection and the storage of controlled substances from, for example, machinery, equipment and containment vessels during servicing or before disposal;
- "recycling" shall mean the reuse of a recovered controlled substance following a basic cleaning process such as filtering and drying. For refrigerants, recycling normally involves recharge back into equipment as is often carried out on site;
- "reclamation" shall mean the reprocessing and upgrading of a recovered controlled substance through such processes as filtering, drying, distillation and chemical treatment in order to restore the substance to a specified standard of performance, which often involves processing off site at a central facility;
- "undertaking" shall mean any natural or legal person who produces, recycles for placing on the market or uses controlled substances for industrial or commercial purposes in the Community, who releases such imported substances for free circulation in the Community, or who exports such substances from the Community for industrial or commercial purposes.

CHAPTER II

PHASE-OUT SCHEDULE

Article 3

Control of production of controlled substances

1. Subject to paragraphs 5 to 10, the production of the following shall be prohibited:
 - (a) chlorofluorocarbons;
 - (b) other fully halogenated chlorofluorocarbons;
 - (c) halons;
 - (d) carbon tetrachloride;
 - (e) 1,1,1-trichloroethane;
 - (f) hydrobromofluorocarbons.

In the light of the proposals made by Member States, the Commission shall, in accordance with the procedure laid down in Article 17, apply the criteria set out in Decision IV/25 of the Parties in order to determine every year any essential uses for which the production and importation of controlled substances referred to in the first subparagraph may be permitted in the Community and those users who may take advantage of those essential uses for their own account. Such production and importation shall be allowed only if no adequate alternatives or recycled or reclaimed controlled substances referred to in the first subparagraph are available from any of the Parties.

2. Subject to paragraphs 5 to 10, each producer shall ensure that:

- (a) the calculated level of its production of methyl bromide in the period 1 January to 31 December 1999 and in each 12-month period thereafter does not exceed 75% of the calculated level of its production of methyl bromide in 1991;
- (b) it produces no methyl bromide after 31 December 2000.

The competent authority of each Member State shall apply the criteria set out in Annex V to determine every year any critical uses of methyl bromide for which the production, importation and use may be permitted in the Community after 31 December 2000, the quantities to be permitted and those users who may take advantage of critical uses for their own account. Such production and importation shall be allowed only if no adequate alternatives or recycled or reclaimed methyl bromide are available from any of the Parties.

Each Member State shall report to the Commission by 31 January each year on the authorisations granted by its competent authority in respect of the period 1 January to 31 December of the preceding year, including the specific uses and quantities authorised, the reasons for those authorisations, efforts underway to identify and implement alternatives, measures taken to reduce emissions and an estimate of actual emissions.

Each year the Commission shall review the critical use exemptions authorised by the competent authorities of the Member States. In the light of that review and of technical and other information, the Commission shall take appropriate measures including, if necessary, proposing modifications to Annex V.

In an emergency, where unexpected outbreaks of particular pests or diseases so require, and by way of derogation from Annex V, the competent authority of a Member State may authorise the temporary use of methyl bromide. Such authorisation shall apply for a period not exceeding 60 days. Member States shall inform the Commission within one month of any emergency authorisation granted under this procedure.

3. Subject to paragraphs 8, 9 and 10, each producer shall ensure that:

- (a) the calculated level of its production of hydrochlorofluorocarbons in the period 1 January to 31 December 2000 and in each 12-month period thereafter does not exceed the calculated level of its production of hydrochlorofluorocarbons in 1997;
- (b) the calculated level of its production of hydrochlorofluorocarbons in the period 1 January to 31 December 2008 and in each 12-month period thereafter does not exceed 35% of the calculated level of its production of hydrochlorofluorocarbons in 1997;

- (c) the calculated level of its production of hydrochlorofluorocarbons in the period 1 January to 31 December 2014 and in each 12-month period thereafter does not exceed 20% of the calculated level of its production of hydrochlorofluorocarbons in 1997;
- (d) the calculated level of its production of hydrochlorofluorocarbons in the period 1 January to 31 December 2020 and in each 12-month period thereafter does not exceed 15% of the calculated level of its production of hydrochlorofluorocarbons in 1997;
- (e) it produces no hydrochlorofluorocarbons after 31 December 2025.

Before 31 December 2002, the Commission will review the level of production of hydrochlorofluorocarbons in the period 1 January 2003 to 31 December 2007 with a view to determining whether a production cut ahead of the year 2008 should be proposed. This review will take into account the development of HCFC consumption worldwide, the HCFC exports from the Community and other OECD countries and the technical and economic availability of alternative substances or technologies.

4. The Commission shall issue licences to those users identified in accordance with the second subparagraph of paragraph 1 and shall notify them of the use for which they have authorisation and the substances and quantities thereof that they are authorised to use.
5. A producer may be authorised by the competent authority of the Member State in which that producer's relevant production is situated to produce the controlled substances referred to in paragraph 1 for the purpose of meeting the demands licensed in accordance with paragraph 4, and to produce methyl bromide for the purposes of meeting critical uses authorised in accordance with paragraph 2. The competent authority of the Member State concerned shall notify the Commission in advance of its intention of issuing any such authorisation.
6. The competent authority of the Member State in which a producer's relevant production is situated may authorise that producer to exceed the calculated levels of production laid down in paragraphs 1 and 2 in order to satisfy the basic domestic needs of Parties pursuant to Article 5 of the Protocol, provided that the additional calculated levels of production of the Member State concerned do not exceed those permitted for that purpose by Articles 2A to 2E and 2H of the Protocol for the periods in question. The competent authority of the Member State concerned shall notify the Commission in advance of its intention of issuing any such authorisation.
7. To the extent permitted by the Protocol, the competent authority of the Member State in which a producer's relevant production is situated may authorise that producer to exceed the calculated levels of production laid down in paragraphs 1 and 2 in order to satisfy any essential, or critical, uses of Parties at their request. The competent authority of the Member State concerned shall notify the Commission in advance of its intention of issuing any such authorisation.

8. To the extent permitted by the Protocol, the competent authority of the Member State in which a producer's relevant production is situated may authorise that producer to exceed the calculated levels of production laid down in paragraphs 1 to 7 for the purpose of industrial rationalisation within the Member State concerned, provided that the calculated levels of production of that Member State do not exceed the sum of the calculated levels of production of its domestic producers as laid down in paragraphs 1 to 7 for the periods in question. The competent authority of the Member State concerned shall notify the Commission in advance of its intention of issuing any such authorisation.
9. To the extent permitted by the Protocol, the Commission may, in agreement with the competent authority of the Member State in which a producer's relevant production is situated, authorise that producer to exceed the calculated levels of production laid down in paragraphs 1 to 8 for the purpose of industrial rationalisation between Member States, provided that the combined calculated levels of production of the Member States concerned do not exceed the sum of the calculated levels of production of their domestic producers as laid down in paragraphs 1 to 8 for the periods in question. The agreement of the competent authority of the Member State in which it is intended to reduce production shall also be required.
10. To the extent permitted by the Protocol, the Commission may, in agreement with both the competent authority of the Member State in which a producer's relevant production is situated and the government of the third Party concerned, authorise a producer to combine the calculated levels of production laid down in paragraphs 1 to 9 with the calculated levels of production allowed to a producer in a third Party under the Protocol and that producer's national legislation for the purpose of industrial rationalisation with a third Party, provided that the combined calculated levels of production by the two producers do not exceed the sum of the calculated levels of production allowed to the Community producer under paragraphs 1 to 9 and the calculated levels of production allowed to the third Party producer under the Protocol and any relevant national legislation.

Article 4

Control of the placing on the market and use of controlled substances

1. Subject to paragraphs 4 and 5, the placing on the market and the use of the following shall be prohibited:
 - (a) chlorofluorocarbons;
 - (b) other fully halogenated chlorofluorocarbons;
 - (c) halons;
 - (d) carbon tetrachloride;

(e) 1,1,1-trichloroethane; and

(f) hydrobromofluorocarbons.

2. Subject to paragraphs 4 and 5, each producer and importer shall ensure that:

(a) the calculated level of methyl bromide which it places on the market or uses for its own account in the period 1 January to 31 December 1999 and in each 12-month period thereafter does not exceed 75% of the calculated level of methyl bromide which it placed on the market or used for its own account in 1991;

(b) if does not place any methyl bromide on the market or use any for its own account after 31 December 2000.

The total quantitative limits for the placing on the market or use for their own account by producers and importers of methyl bromide are set out in Annex II.

3. Subject to paragraphs 4 and 5 and to Article 5(5):

(a) the calculated level of hydrochlorofluorocarbons which producers and importers place on the market or use for their own account in the period 1 January to 31 December 1999 and in the 12-month period thereafter shall not exceed the sum of:

- 2.6% of the calculated level of chlorofluorocarbons which producers and importers placed on the market or used for their own account in 1989, and

- the calculated level of hydrochlorofluorocarbons which producers and importers placed on the market or used for their own account in 1989;

(b) the calculated level of hydrochlorofluorocarbons which producers and importers place on the market or use for their own account in the period 1 January to 31 December 2001 shall not exceed the sum of:

- 2.0% of the calculated level of chlorofluorocarbons which producers and importers placed on the market or used for their own account in 1989, and

- the calculated level of hydrochlorofluorocarbons which producers and importers placed on the market or used for their own account in 1989;

(c) the calculated level of hydrochlorofluorocarbons which producers and importers place on the market or use for their own account in the period 1 January to 31 December 2002 shall not exceed 90% of the level calculated in application of point (b);

- (d) the calculated level of hydrochlorofluorocarbons which producers and importers place on the market or use for their own account in the period 1 January to 31 December 2003 shall not exceed 35% of the level calculated in application of point (b);
- (e) the calculated level of hydrochlorofluorocarbons which producers and importers place on the market or use for their own account in the period 1 January to 31 December 2004 and in each 12-month period thereafter shall not exceed 30% of the level calculated in application of point (b);
- (f) the calculated level of hydrochlorofluorocarbons which producers and importers place on the market or use for their own account in the period 1 January to 31 December 2008 and in each 12-month period thereafter shall not exceed 5% of the level calculated in application of point (b);
- (g) no producer or importer shall place hydrochlorofluorocarbons on the market or use any for its own account after 31 December 2014;
- (h) each producer and importer shall ensure that the calculated level of hydrochlorofluorocarbons which it places on the market or uses for its own account in the period 1 January to 31 December 1999 and in each 12-month period thereafter until 31 December 2002 shall not exceed, as a percentage of the calculated levels set out in (a) to (f), its percentage market share in 1996.

Before 1 January 2001, the Commission shall, in accordance with the procedure laid down in Article 17, determine a mechanism for the allocation of quotas to each producer and importer of the calculated levels set out in (a) to (f), applicable for the period 1 January to 31 December 2003 and for each 12-month period thereafter.

The total quantitative limits for the placing on the market or use for their own account by producers and importers of hydrochlorofluorocarbons are set out in Annex II.

4. Paragraphs 1, 2 and 3 shall not apply to the placing on the market and use of controlled substances if:
- (a) they are destroyed within the Community by technologies approved by the Parties;
 - (b) they are used for feedstock or as a processing agent; or
 - (c) they are used to meet the licensed demands for essential uses of those users identified as laid down in Article 3(1) and to meet the demands for critical uses authorised in accordance with Article 3(2).

Paragraph 1 shall not apply to the placing on the market and use of controlled substances for the maintenance or servicing of refrigeration and air-conditioning equipment until 31 December 1999.

Paragraph 1(c) shall not apply to the placing on the market and use of halons in existing fire protection systems until 31 December 2003 or to the placing on the market of halons for critical uses as set out in Annex VII.

5. Any producer or importer entitled to place controlled substances referred to in this Article on the market or use them for its own account may transfer that right in respect of all or any quantities of that group of substances fixed in accordance with this Article to any other producer or importer of that group of substances within the Community. Any such transfer shall be notified in advance to the Commission. The transfer of the right to place on the market or use shall not imply the further right to produce or to import.
6. The importation and placing on the market of products and equipment containing chlorofluorocarbons, other fully halogenated chlorofluorocarbons, halons, carbon tetrachloride, 1,1,1-trichloroethane and hydrobromofluorocarbons shall be prohibited, with the exception of products and equipment for which the use of the respective controlled substance has been authorised in accordance with the second subparagraph of Article 3(1). Products and equipment shown to be manufactured before the entry into force of this Regulation shall not be covered by this prohibition.

Article 5

Control of the use of hydrochlorofluorocarbons

1. Subject to the following conditions, the use of hydrochlorofluorocarbons shall be prohibited:
 - (a) in aerosols;
 - (b) as solvents:
 - (i) in non-contained solvent uses including open-top cleaners and open-top dewatering systems without refrigerated areas, in adhesives and mould-release agents when not employed in closed equipment, for drain cleaning where hydrochlorofluorocarbons are not recovered;
 - (ii) from 1 January 2003, in all solvent uses, with the exception of precision cleaning of electrical and other components in the aerospace and aeronautics industries;
 - (c) as refrigerants:
 - (i) in equipment produced after 31 December 1995 for the following uses:

- in non-confined direct-evaporation systems,
 - in domestic refrigerators and freezers,
 - in motor vehicle, tractor and off-road vehicle or trailer air conditioning systems operating on any energy source,
 - in road public-transport air conditioning,
- (ii) in rail transport air conditioning, in equipment produced after 31 December 1997,
- (iii) from 1 January 2000, in equipment produced after 31 December 1999 for the following uses:
- in public and distribution cold stores and warehouses,
 - for equipment of 150 kw and over, shaft input,
- (iv) from 1 January 2001, in all other refrigeration and air conditioning equipment produced after 31 December 2000, with the exception of reversible air-conditioning/heat pump systems where the use of hydrochlorofluorocarbons shall be prohibited from 1 January 2004 in all equipment produced after 31 December 2003,
- (v) from 1 January 2008, the use of virgin hydrochlorofluorocarbons shall be prohibited in the maintenance and servicing of refrigeration and air conditioning equipment existing at that date;
- (d) for the production of foams other than integral skin foams for use in safety applications and rigid insulating foams:
- (i) from 1 January 2000, for the production of integral skin foams and polyethylene foams,
 - (ii) from 1 January 2002, for the production of extruded polystyrene foams, except where used for insulated transport,
 - (iii) from 1 January 2003, for the production of polyurethane foams for appliances, of polyurethane flexible faced laminate foams and of polyurethane sandwich panels, except where these latter two are used for insulated transport,
 - (iv) from 1 January 2004, for the production of all foams;
- (e) as carrier gas for sterilisation substances in closed systems, in equipment produced after 31 December 1997;
- (f) in all other uses.

2. By way of derogation from paragraph 1, the use of hydrochlorofluorocarbons shall be permitted:
 - (a) in laboratory uses, including research and development;
 - (b) as feedstock in the manufacture of other chemicals; and
 - (c) as a processing agent.
3. The importation and placing on the market of products and equipment containing hydrochlorofluorocarbons for which a use restriction is in force under this Article shall be prohibited from the date on which the use restriction comes into force. Products and equipment shown to be manufactured before the date of that use restriction shall not be covered by this prohibition.
4. The use restrictions under paragraphs 1, 2 and 3 shall not apply to the use of hydrochlorofluorocarbons for the production of products for export to countries where the use of hydrochlorofluorocarbons in those products is still permitted.
5. The Commission may, in accordance with the procedure laid down in Article 17, in the light of experience with the operation of this Regulation or to reflect technical progress, modify the list and the dates set out in paragraph 1.
6. The Commission may, following a request by a competent authority of a Member State and in accordance with the procedure laid down in Article 17, authorise a temporary exemption to allow the use and placing on the market of hydrochlorofluorocarbons in derogation from paragraph 1 and Article 4(3) where it is demonstrated that, for a particular use, technically and economically feasible alternative substances or technologies are not available or cannot be used.

CHAPTER III

TRADE

Article 6

Licences to import from third countries

1. The release for free circulation in the Community or inward processing of controlled substances shall be subject to the presentation of an import licence. Such licences shall be issued by the Commission after verification of compliance with Articles 6, 7, 8 and 13. The Commission shall forward a copy of each licence to the competent authority of the Member State into which the substances concerned are to be imported. Each Member State shall appoint a competent authority for that purpose.

2. The licence shall, when related to an inward processing procedure, be issued only if the controlled substances are to be used in the customs territory of the Community under the system of suspension, provided for in Article 114(2) point (a) of Regulation (EEC) No 2913/92, and under the condition that the compensating products are re-exported to a State where the production, consumption or import of that controlled substance is not prohibited. The licence shall only be issued following approval of the competent authority of the Member State in which the inward processing operation is to take place.
3. A request for a licence shall state:
 - (a) the names and the addresses of the importer and the exporter;
 - (b) the country of exportation;
 - (c) the country of final destination if controlled substances are to be used in the customs territory of the Community under the inward processing procedure as referred to in paragraph 2;
 - (d) a description of each controlled substance, including:
 - the commercial description,
 - the description and the CN code as laid down in Annex III,
 - the nature of the substance (virgin, recovered or reclaimed),
 - the quantity of the substance in kilograms;
 - (e) the purpose of the proposed import;
 - (f) the place and date of the proposed importation, if known.
4. The Commission may require a certificate attesting the nature of substances to be imported.
5. The Commission may, in accordance with the procedure laid down in Article 17, modify the list of items mentioned in paragraph 3 and Annex III.

Article 7

Imports of controlled substances from third countries

The release for free circulation in the Community of controlled substances imported from third countries shall be subject to quantitative limits. Those limits shall be determined and quotas allocated to undertakings for the period 1 January to 31 December 1999 and for each 12-month period thereafter in accordance with the procedure laid down in Article 17. They shall be allocated only:

- (a) for controlled substances of groups VI and VIII as referred to in Annex I;
- (b) for controlled substances if they are used for essential or critical uses;
- (c) for controlled substances if they are used for feedstock or as processing agents;
or
- (d) for recovered controlled substances if they are used for destruction in the Community by technologies approved by the Parties.

Article 8

Imports of controlled substances from a State not Party to the Protocol

The release for free circulation in the Community or inward processing of controlled substances imported from any State not Party to the Protocol shall be prohibited.

Article 9

Imports of products containing controlled substances from a State not Party to the Protocol

1. The release for free circulation in the Community of products and equipment containing controlled substances imported from any State not Party to the Protocol shall be prohibited.
2. A list of products containing controlled substances and of combined nomenclature codes is given in Annex IV for guidance of the Member States' customs authorities. The Commission may, in accordance with the procedure laid down in Article 17, add to, delete items from or amend this list in the light of the lists established by the Parties.

Article 10

Imports of products produced using controlled substances from a State not Party to the Protocol

In the light of the decision of the Parties, the Council shall, on a proposal from the Commission, adopt rules applicable to the release for free circulation in the Community of products which were produced using controlled substances but do not contain substances which can be positively identified as controlled substances, imported from any State not Party to the Protocol. The identification of such products shall comply with periodical technical advice given to the Parties. The Council shall act by a qualified majority.

Article 11

Export of controlled substances or products containing controlled substances

1. Exports from the Community of chlorofluorocarbons, other fully halogenated chlorofluorocarbons, halons, carbon tetrachloride, 1,1,1 trichloroethane and hydrobromofluorocarbons or products and equipment, other than personal effects, containing those substances shall be prohibited. This prohibition shall not apply to exports of controlled substances for which production has been authorised under Article 3(6) to satisfy the basic domestic needs of Parties pursuant to Article 5 of the Protocol and of controlled substances or products and equipment containing those substances authorised under Article 3(7) to satisfy essential uses of the Parties.
2. Exports from the Community of methyl bromide and hydrochlorofluorocarbons to any State not Party to the Protocol shall be prohibited.

Article 12

Export authorisation

1. Exports from the Community of controlled substances shall be subject to authorisation. Such export authorisations shall be issued by the Commission to undertakings for the period 1 January to 31 December 1999 and for each 12-month period thereafter after verification of compliance with Article 11. The Commission shall forward a copy of each export authorisation to the competent authority of the Member State concerned.
2. An application for an export authorisation shall state:
 - (a) the name and address of the exporter;
 - (b) a description of the controlled substance(s) intended for export, including:
 - the commercial description,
 - the description and the CN code as laid down in Annex III,
 - the nature of the substance (virgin, recovered or reclaimed);
 - (c) the total quantity of each substance to be exported;
 - (d) the country/countries of final destination of the controlled substance(s);
 - (e) the purpose of the exports.
3. Each exporter shall notify the Commission of any changes which might occur during the period of validity of the authorisation in relation to the data notified under paragraph 2. Each exporter shall report to the Commission in conformity with Article 18.

Article 13

Exceptional authorization to trade with a State not Party to the Protocol

By way of derogation from Articles 8, 9(1), 10 and 11(2), trade with any State not Party to the Protocol in controlled substances and products which contain or are produced by means of one or more such substances may be authorized by the Commission, to the extent that the State not Party to the Protocol is determined by a meeting of the Parties to be in full compliance with the Protocol and has submitted data to that effect as specified in Article 7 of the Protocol. The Commission shall act in accordance with the procedure laid down in Article 17.

Article 14

Trade with a territory not covered by the Protocol

1. Subject to any decision taken under paragraph 2, Articles 8, 9 and 11(2) shall apply to any territory not covered by the Protocol as they apply to any State not Party to the Protocol.
2. Where the authorities of a territory not covered by the Protocol are in full compliance with the Protocol and have submitted data to that effect as specified in Article 7 of the Protocol, the Commission may decide that some or all of the provisions of Articles 8, 9 and 11 of this Regulation shall not apply in respect of that territory.

The Commission shall take its decision in accordance with the procedure laid down in Article 17.

CHAPTER IV

EMISSION CONTROL

Article 15

Recovery of used controlled substances

Chlorofluorocarbons, other fully halogenated chlorofluorocarbons, halons, carbon tetrachloride, 1,1,1-trichloroethane, hydrobromofluorocarbons and hydrochlorofluorocarbons contained in:

- refrigeration equipment and air-conditioning equipment,
- equipment containing solvents,
- fire protection systems and fire extinguishers, and
- rigid foams

shall be recovered if practicable for destruction by technologies approved by the Parties or by any other environmentally acceptable destruction technology, or for recycling or reclamation during the servicing and maintenance of equipment or before the dismantling or disposal of equipment. Member States shall promote, as appropriate, the establishment of destruction, recycling and reclamation facilities. Member States shall define the minimum qualification requirements for the servicing personnel involved.

Member States shall report to the Commission by 31 December 2001 on the systems established to promote the recovery of used controlled substances, including the facilities available and the quantities of used controlled substances recovered, recycled, reclaimed or destroyed.

This provision shall be without prejudice to Council Directive 75/442/EEC⁶ or to measures adopted following Article 2(2) of that Directive.

Article 16

Leakages of controlled substances

1. All precautionary measures practicable shall be taken to prevent leakages of chlorofluorocarbons, other fully halogenated chlorofluorocarbons, halons, carbon tetrachloride, 1,1,1-trichloroethane, hydrobromofluorocarbons and hydrochlorofluorocarbons from commercial and industrial air-conditioning and refrigeration equipment, from fire-protection systems and from equipment containing solvents during manufacture, installation, operation and servicing. Member States shall define the minimum qualification requirements for the servicing personnel. They shall report to the Commission by 31 December 2000 on the schemes established concerning such qualification requirements.

The Commission shall promote, as appropriate, the preparation of European standards relating to technical requirements with respect to the leakproofness of refrigeration systems.

2. All precautionary measures practicable shall be taken to prevent leakages of methyl bromide from fumigation installations and operations in which methyl bromide is used. Member States shall define the minimum qualification requirements for the servicing personnel involved.
3. All precautionary measures practicable shall be taken to prevent leakages of controlled substances used as feedstock and as processing agents in chemicals.
4. All precautionary measures practicable shall be taken to prevent any leakage of controlled substances inadvertently produced in the course of the manufacture of other chemicals.

⁶ OJ L 194, 25.7.1975, p. 39.

CHAPTER V

COMMITTEE, REPORTING, INSPECTION AND ENFORCEMENT

Article 17

Committee

The Commission shall be assisted by a committee composed of the representatives of the Member States and chaired by a representative of the Commission.

The representative of the Commission shall submit to the committee a draft of the measures to be taken. The committee shall deliver its opinion on that draft within a time-limit which the chairman may lay down according to the urgency of the matter. The opinion shall be delivered by the majority laid down in Article 148(2) of the Treaty in the case of decisions which the Council is required to adopt on a proposal from the Commission. The votes of the representatives of the Member States within the committee shall be weighted in the manner laid down in that Article. The chairman shall not vote.

The Commission shall adopt measures which shall apply immediately. However, if these measures are not in accordance with the opinion of the committee, they shall be communicated by the Commission to the Council forthwith. In that event, the Commission may defer application of the measures which it has decided for a period of not more than one month from the date of such communication.

The Council, acting by a qualified majority, may take a different decision within the time-limit referred to in the previous paragraph.

Article 18

Reporting

1. Every year before 1 March, each producer, importer and exporter of controlled substances shall communicate to the Commission, sending a copy to the competent authority of the Member State concerned, data as specified below for each controlled substance, in respect of the period 1 January to 31 December of the preceding year.

(a) Each producer shall communicate:

- its total production of each controlled substance,
- any production placed on the market or used for the producer's own account within the Community, separately identifying production for feedstock, processing agent and other uses,
- any production to meet the essential uses in the Community, licensed in accordance with Article 3(4),

- any production authorised under Article 3(6) to satisfy basic domestic needs of Parties pursuant to Article 5 of the Protocol,
- any production authorised under Article 3(7) to satisfy essential, or critical, uses of Parties,
- any increase in production authorised under Article 3(8), (9) and (10) in connection with industrial rationalisation,
- any quantities recycled, reclaimed or destroyed,
- any stocks.

(b) Each importer, including any producers who also import, shall communicate:

- any quantities released for free circulation in the Community, separately identifying imports for feedstock and processing agent uses, for essential uses licensed in accordance with Article 3(4), for use in quarantine and pre-shipment applications and for destruction,
- any quantities of controlled substances entering the Community under the inward-processing procedure,
- any quantities of used controlled substances imported for recycling or reclamation,
- any stocks.

(c) Each exporter, including any producers who also export, shall communicate:

- any quantities of controlled substances exported from the Community, including substances which are re-exported under the inward-processing procedure, separately identifying quantities exported to each country of destination and quantities exported for feedstock and process agent uses, essential uses, quarantine and pre-shipment uses, to meet the basic domestic needs of Parties pursuant to Article 5 of the Protocol and for destruction,
- any quantities of used controlled substances exported for recycling or reclamation,
- any stocks.

2. Every year before the 31 December, Member States' customs authorities shall return to the Commission the stamped used licence documents.

3. Every year before 1 March, each user who has been authorised to take advantage of an essential use exemption under Article 3(1) shall, for each substance for which an authorisation has been received, report to the Commission, sending a copy to the competent authority of the Member State concerned, the nature of the use, the quantities used during the previous year, the quantities held in stock, any quantities recycled or destroyed, and the quantity of products containing those substances placed on the Community market and/or exported.
4. Every year before 1 March, each undertaking which has been authorised to use controlled substances as a processing agent shall report to the Commission the quantities used during the previous year, and an estimate of the emissions which occurred during such use.
5. The Commission shall take appropriate steps to protect the confidentiality of the information submitted to it.
6. The Commission may, in accordance with the procedure laid down in Article 17, modify the reporting requirements laid down in paragraphs 1 to 4, to meet commitments under the Protocol or to improve the practical application of those reporting requirements.

Article 19

Inspection

1. In carrying out the tasks assigned to it by this Regulation, the Commission may obtain all the information from the governments and competent authorities of the Member States and from undertakings.
2. When requesting information from an undertaking the Commission shall at the same time forward a copy of the request to the competent authority of the Member State within the territory of which the undertaking's seat is situated, together with a statement of the reasons why that information is required.
3. The competent authorities of the Member States shall carry out the investigations which the Commission considers necessary under this Regulation.
4. Subject to the agreement of the Commission and of the competent authority of the Member State within the territory of which the investigations are to be made, the officials of the Commission shall assist the officials of that authority in the performance of their duties.
5. The Commission shall take appropriate steps to protect the confidentiality of information obtained under this Article.

Article 20

Penalties

The Member States shall lay down the rules on penalties applicable to infringements of the provisions of this Regulation or of national provisions adopted in implementation thereof and shall take all measures necessary to ensure that they are implemented. The penalties provided for must be effective, proportionate and dissuasive. The Member States shall notify those provisions to the Commission by 30 June 1999 at the latest and shall notify it without delay of any subsequent amendment affecting them.

CHAPTER VI

FINAL PROVISIONS

Article 21

Repeal

Regulation (EC) No 3093/94 is repealed.

References to the repealed Regulation shall be construed as references to this Regulation.

Article 22

Entry into force

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Communities*.

It shall apply from [1 January 1999].

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels,

For the Council
The President

ANNEX I

Controlled substances covered

Group	Substance	Ozone-depleting potential (1)
Group I	CFCl ₃ (CFC- 11)	1.0
	CF ₂ Cl ₂ (CFC- 12)	1.0
	C ₂ F ₃ Cl ₃ (CFC-113)	0.8
	C ₂ F ₄ Cl ₂ (CFC-114)	1.0
	C ₂ F ₅ Cl (CFC-115)	0.6
Group II	CF ₃ Cl (CFC- 13)	1.0
	C ₂ FCl ₅ (CFC-111)	1.0
	C ₂ F ₂ Cl ₄ (CFC-112)	1.0
	C ₃ FCl ₇ (CFC-211)	1.0
	C ₃ F ₂ Cl ₆ (CFC-212)	1.0
	C ₃ F ₃ Cl ₅ (CFC-213)	1.0
	C ₃ F ₄ Cl ₄ (CFC-214)	1.0
	C ₃ F ₅ Cl ₃ (CFC-215)	1.0
	C ₃ F ₆ Cl ₂ (CFC-216)	1.0
	C ₃ F ₇ Cl (CFC-217)	1.0
	Group III	CF ₂ BrCl (halon-1211)
CF ₃ Br (halon-1301)		10.0
C ₂ F ₄ Br ₂ (halon-2402)		6.0
Group IV	CCl ₄ (carbon tetrachloride)	1.1
Group V	C ₂ H ₃ Cl ₃ (2) (1,1,1-trichloroethane)	0.1
Group VI	CH ₃ Br (methyl bromide)	0.6
Group VII	CHFBr ₂	1.00
	CHF ₂ Br	0.74
	CH ₂ FBr	0.73
	C ₂ HFBr ₄	0.8
	C ₂ HF ₂ Br ₃	1.8
	C ₂ HF ₃ Br ₂	1.6
	C ₂ HF ₄ Br	1.2
	C ₂ H ₂ FBr ₃	1.1
	C ₂ H ₂ F ₂ Br ₂	1.5
	C ₂ H ₂ F ₃ Br	1.6
	C ₂ H ₃ FBr ₂	1.7
	C ₂ H ₃ F ₂ Br	1.1
	C ₂ H ₄ FBr	0.1
C ₃ HFBr ₆	1.5	

	C3HF2Br5		1.9
	C3HF3Br4		1.8
	C3HF4Br3		2.2
	C3HF5Br2		2.0
	C3HF6Br		3.3
	C3H2FBr5		1.9
	C3H2F2Br4		2.1
	C3H2F3Br3		5.6
	C3H2F4Br2		7.5
	C3H2F5Br		1.4
	C3H3FBr4		1.9
	C3H3F2Br3		3.1
	C3H3F3Br2		2.5
	C3H3F4Br		4.4
	C3H4FBr3		0.3
	C3H4F2Br2		1.0
	C3H4F3Br		0.8
	C3H5FBr2		0.4
	C3H5F2Br		0.8
	C3H6FBr		0.7
Group VIII	CHFCl2	(HCFC- 21) (3)	0.040
	CHF2Cl	(HCFC- 22) (3)	0.055
	CH2FCI	(HCFC- 31)	0.020
	C2HFCl4	(HCFC-121)	0.040
	C2HF2Cl3	(HCFC-122)	0.080
	C2HF3Cl2	(HCFC-123) (3)	0.020
	C2HF4Cl	(HCFC-124) (3)	0.022
	C2H2FCI3	(HCFC-131)	0.050
	C2H2F2Cl2	(HCFC-132)	0.050
	C2H2F3Cl	(HCFC-133)	0.060
	C2H3FCI2	(HCFC-141)	0.070
	CH3FCI2	(HCFC-141b) (3)	0.110
	C2H3F2Cl	(HCFC-142)	0.070
	CH3F2Cl	(HCFC-142b) (3)	0.065
	C2H4FCI	(HCFC-151)	0.005
	C3HFCl6	(HCFC-221)	0.070
	C3HF2Cl5	(HCFC-222)	0.090
	C3HF3Cl4	(HCFC-223)	0.080
	C3HF4Cl3	(HCFC-224)	0.090
	C3HF5Cl2	(HCFC-225)	0.070
	CF3CF2CHCl2	(HCFC-225ca) (3)	0.025
	CF2ClF2CHClF	(HCFC-225cb) (3)	0.033
	C3HF6Cl	(HCFC-226)	0.100
	C3H2FCI5	(HCFC-231)	0.090
	C3H2F2Cl4	(HCFC-232)	0.100
	C3H2F3Cl3	(HCFC-233)	0.230
	C3H2F4Cl2	(HCFC-234)	0.280
	C3H2F5Cl	(HCFC-235)	0.520
	C3H3FCI4	(HCFC-241)	0.090
	C3H3F2Cl3	(HCFC-242)	0.130
	C3H3F3Cl2	(HCFC-243)	0.120
	C3H3F4Cl	(HCFC-244)	0.140
	C3H4FCI3	(HCFC-251)	0.010
	C3H4F2Cl2	(HCFC-252)	0.040
	C3H4F3Cl	(HCFC-253)	0.030
	C3H5FCI2	(HCFC-261)	0.020
	C3H5F2Cl	(HCFC-262)	0.020
	C3H6FCI	(HCFC-271)	0.030

- (1) These ozone-depleting potentials are estimates based on existing knowledge and will be reviewed and revised periodically in the light of decisions taken by the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer.
- (2) This formula does not refer to 1,1,2-trichloroethane.
- (3) Identifies the most commercially-viable substance as prescribed in the Protocol.

ANNEX II

Total quantitative limits on producers' and importers' placing controlled substances on the market and using them for their own account in the Community
(calculated levels expressed in ODP tonnes)

Substance	Group I	Group II	Group III	Group IV	Group V	Group VI (1)	Group VII	Group VIII
For 12-month periods from 1 January to 31 December								
1999	0	0	0	0	0	7 412	0	8 079
2000						7 412		8 079
2001						0		6 678
2002								6 010
2003								2 337
2004								2 003
2005								2 003
2006								2 003
2007								2 003
2008								334
2009								334
2010								334
2011								334
2012								334
2013								334
2014								334
2015								0

(1) Calculated on the basis of ODP = 0.6.

ANNEX III

Groups, Combined Nomenclature 1997 (CN97) codes (1) and descriptions for the substances referred to in Annexes I and II

Group	CN 97 code	Description
Group I	2903 41 00	-- Trichlorofluoromethane
	2903 42 00	-- Dichlorodifluoromethane
	2903 43 00	-- Trichlorotrifluoroethanes
	2903 44 10	--- Dichlorotetrafluoroethanes
	2903 44 90	--- Chloropentafluoroethane
Group II	2903 45 10	--- Chlorotrifluoromethane
	2903 45 15	--- Pentachlorofluoroethane
	2903 45 20	--- Tetrachlorodifluoroethanes
	2903 45 25	--- Heptachlorofluoropropanes
	2903 45 30	--- Hexachlorodifluoropropanes
	2903 45 35	--- Pentachlorotrifluoropropanes
	2903 45 40	--- Tetrachlorotetrafluoropropanes
	2903 45 45	--- Trichloropentafluoropropanes
	2903 45 50	--- Dichlorohexafluoropropanes
2903 45 55	--- Chloroheptafluoropropanes	
Group III	2903 46 10	--- Bromochlorodifluoromethane
	2903 46 20	--- Bromotrifluoromethane
	2903 46 90	--- Dibromotetrafluoroethanes
Group IV	2903 14 00	-- Carbon tetrachloride
Group V	2903 19 10	--- 1,1,1-Trichloroethane (methylchloroform)
Group VI	2903 30 33	--- Bromomethane (methyl bromide)
Group VII	2903 49 30	--- Hydrobromofluoromethanes, -ethanes or -propanes

Group VIII	2903 49 10	---- Hydrochlorofluoromethanes, -ethanes or -propanes
	ex 3824 71 00	--- Mixtures containing one or more substances falling within codes 2903 41 00 to 2903 45 55.
	ex 3824 79 00	--- Mixtures containing one or more substances falling within codes 2903.46 10 to 2903 46 90
	ex 3824 90 95	----- Mixtures containing one or more substances falling within codes 2903 14 00, 2903 19 10, 2903 30 33, 2903 49 10 or 2903 49 30.

- (1) An "ex" before a code implies that other products than those referred to in the column "Description" may fall under that subheading.

**Combined nomenclature (CN) codes for products containing
controlled substances (1)**

(1) These customs codes are given for the guidance of the Member States' customs authorities.

1. Automobiles and truck air-conditioning units

CN codes

8701 20 10 - 8701 90 90
8702 10 11 - 8702 90 90
8703 10 11 - 8703 90 00
8704 10 11 - 8704 90 90
8705 10 00 - 8705 90 90
8706 00 11 - 8706 00 99

2. Domestic and commercial refrigeration and air-conditioning/heat-pump equipment

Refrigerators:

CN codes

8418 10 10 - 8418 29 00
8418 50 11 - 8418 50 19
8418 61 10 - 8418 69 99

Freezers:

CN codes

8418 10 10 - 8418 29 00
8418 30 10 - 8418 30 99
8418 40 10 - 8418 40 99
8418 50 11 - 8418 50 19
8418 61 10 - 8418 61 90
8418 69 10 - 8418 69 99

Dehumidifiers:

CN codes

8415 10 00 - 8415 83 90
8424 89 80
8479 60 00
8479 89 10
8479 89 95

Water coolers:

CN codes

8419 60 00
8419 89 95

Ice machines:

CN codes

8418 10 10 - 8414 29 00
8418 30 10 - 8418 30 99
8418 40 10 - 8418 40 99
8418 50 11 - 8418 50 19
8418 61 10 - 8418 61 90
8418 69 10 - 8418 69 99
8479 89 95

Air-conditioning and heat-pump units:

CN codes

8415 10 00 - 8415 83 90
8418 61 10 - 8418 61 90
8418 69 10 - 8418 69 99
8418 99 10 - 8418 99 90

3. Aerosol products, except medical aerosols

Food products:

CN codes

0404 90 21 - 0404 90 89
1517 90 10 - 1517 90 99
2106 90 92
2106 90 98

Paints and varnishes, prepared water pigments and dyes:

CN codes

3208 10 10 - 3208 10 90
3208 20 10 - 3208 20 90
3208 90 11 - 3208 90 99
3209 10 00 - 3209 90 00
3210 00 10 - 3210 00 90
3212 90 90

Perfumery, cosmetic or toilet preparations:

CN codes

3303 00 10 - 3303 00 90
3304 30 00
3304 99 00
3305 10 00 - 3305 90 90
3306 10 00 - 3306 90 00
3307 10 00 - 3307 30 00
3307 49 00
3307 90 00

Surface-active preparations:

CN codes

3402 20 10 - 3402 20 90

Lubricating preparations:

CN codes

2710 00 81
2710 00 98
3403 11 00
3403 19 10 - 3403 19 99
3403 91 00
3403 99 10 - 3403 99 90

Household preparations:

CN codes

3405 10 00
3405 20 00
3405 30 00
3405 40 00
3405 90 10 - 3405 90 90

Articles of combustible materials:

CN codes

3606 10 00

Insecticides, rodenticides, fungicides, herbicides, etc.:

CN codes

3808 10 10 - 3808 10 90

3808 20 10 - 3808 20 80

3808 30 11 - 3808 30 90

3808 40 10 - 3808 40 90

3808 90 10 - 3808 90 90

Finishing agents, etc.:

CN codes

3809 10 10 - 3809 10 90

3809 91 00 - 3809 93 00

Preparations and charges for fire-extinguishers; charged fire-extinguishing grenades:

CN codes

3813 00 00

Organic composite solvents, etc.:

CN codes

3814 00 10 - 3814 00 90

Prepared de-icing fluids:

CN codes

3820 00 00

Products of the chemical or allied industries

CN codes

3824 90 10

3824 90 35

3824 90 40

3824 90 45 - 3824 90 95

Silicones in primary forms:

CN codes

3910 00 00

Arms:

CN codes

9304 00 00

4. Portable fire extinguishers

CN codes

8424 10 10 - 8424 10 99

5. Insulation boards, panels and pipe covers

CN codes

3917 21 10 - 3917 40 90

3920 10 23 - 3920 99 90

3921 11 00 - 3921 90 90

3925 10 00 - 3925 90 80

3926 90 10 - 3926 90 99

6. Pre-polymers

CN codes

3901 10 10 - 3911 90 99

CRITERIA TO BE APPLIED IN DETERMINING CRITICAL USE EXEMPTIONS FOR METHYL PROMIDE AFTER PHASEOUT

1. The competent authorities of Member States shall authorise the critical use of methyl bromide only where it is demonstrated that all the following criteria are met:
 - (a) it is necessary to safeguard food and commodity supplies, or is critical to the functioning of certain types of production in agriculture or horticulture (including economic aspects);
 - (b) there are no available technically and economically feasible alternatives or substitutes that are acceptable from the standpoint of environment and health;
 - (c) work is underway to investigate, evaluate, field test, commercialise and, where necessary, facilitate regulatory approval for alternatives and substitutes, with a view to phasing out methyl bromide as soon as possible;
 - (d) the methyl bromide will be applied using best available technology to reduce emissions;
 - (e) methyl bromide has been regularly used as an integral part of fumigation operations in the crop and region concerned during the previous five years;

2. Critical use exemptions for the continued use of methyl bromide after phaseout shall:
 - (a) specify the maximum quantity of methyl bromide to be used, the maximum rate of application, the minimum time between fumigations and the precautions to be taken to minimise emissions;
 - (b) specify as precisely as possible the particular use which has been exempted, including details of the crop, cropping method, location(s) and the disease(s) which methyl bromide is required to eradicate;
 - (c) be reviewed by the competent authorities at least every two years to determine whether or not the use still meets these criteria, with a view to further stepwise reductions in the quantity of methyl bromide used under the critical use exemption.

PROCESSES IN WHICH CONTROLLED SUBSTANCES ARE USED AS
PROCESSING AGENTS

- use of carbon tetrachloride for the elimination of nitrogen trichloride in the production of caustic soda;
- use of carbon tetrachloride in the recovery of chlorine in tail gas from production of chlorine;
- use of carbon tetrachloride in the chlorinated rubber process;
- use of carbon tetrachloride in the production of pesticides;
- use of carbon tetrachloride in the production of pharmaceuticals;
- use of carbon tetrachloride in chlorosulfonated polyolefin (CSM) production;
- production of poly-phenylene-terephthal-amide with the aid of carbon tetrachloride in an intermediate raw product;
- use of carbon tetrachloride in styrene butadiene rubber (SBR) production;
- use of carbon tetrachloride in chlorinated paraffin production;
- use of CFC-113 in manufacturing a family of fluoropolymer resins;
- use of CFC-11 in manufacture of a fine synthetic fibre sheet structure.

CRITICAL USES OF HALON

use of halon 1301:

- in aircraft for the protection of engine nacelles, cargo bays and dry bays;
- in crew compartments of military vehicles
- for inerting of occupied spaces where flammable liquid release could occur;

use of halon 1211:

- in hand held fire extinguishers for use on board aircraft;
- in military and police fire extinguishers for use on persons.

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