



**United Nations
Environment
Programme**

**Tenth meeting of the Conference of
the Parties to the Vienna Convention
for the Protection of the Ozone Layer**

**Twenty-Sixth Meeting of the Parties to
the Montreal Protocol on Substances
that Deplete the Ozone Layer**

Paris, 17–21 November 2014

**Issues for discussion by and information for the attention of the
Conference of the Parties to the Vienna Convention at its tenth
meeting and the Twenty-Sixth Meeting of the Parties to the
Montreal Protocol**

Note by the Secretariat

Addendum

I. Introduction

1. Section II of the present addendum summarizes further work completed since the preparation of the note by the Secretariat (UNEP/OzL.Conv.10/2-UNEP/OzL.Pro.26/2) and before 17 October 2014. It relates to the Montreal Protocol on Substances that Deplete the Ozone in the forthcoming combined tenth meeting of the Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer and the Twenty-Sixth Meeting of the Parties to the Montreal Protocol. It includes an update on issues related to the replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol, alternatives to ozone-depleting substances, essential-use and critical-use nominations and other issues.

2. Section III contains additional information on the high-level segment of the combined meeting and section IV presents updates on matters that the Secretariat would like to bring to the parties' attention.

**II. Overview of items on the agenda for the Twenty-Sixth Meeting of
the Parties to the Montreal Protocol**

**A. Replenishment of the Multilateral Fund for the Implementation of the
Montreal Protocol (item 4 (a) of the provisional agenda for the preparatory
segment)**

**Supplemental report of the Technology and Economic Assessment Panel replenishment task
force**

3. The replenishment task force of the Technology and Economic Assessment Panel has prepared a supplementary report to the Panel's May 2014 report on assessment of the funding requirement for the replenishment of the Multilateral Fund for the period 2015–2017, setting out indicative amounts of

funding needed for the trienniums 2018–2020 and 2021–2023. The supplementary report responds to the suggestions made by the Open-ended Working Group at its thirty-fourth meeting for further elaboration by the Panel.

4. The initial report of the replenishment task force, set out in volume 6 of the Panel's 2014 report, was presented to the Open-ended Working Group at its thirty-fourth meeting. The report is also available as a background document for the Twenty-Sixth Meeting of the Parties and an executive summary was included in annex II to the addendum to the note by the Secretariat on issues for discussion by and information for the attention of the Open-ended Working Group at its thirty-fourth meeting (UNEP/OzL.Pro.WG.1/34/2/Add.1). The advance version of the supplementary report was posted on the meeting portal of the Secretariat's website on 1 October 2014. The executive summary of the supplementary report is set out in annex I to the present addendum. The parties may wish to consider the information contained in the initial report as well as the supplemental report in their discussion on the replenishment.

B. Issues related to exemptions from Article 2 of the Montreal Protocol (item 4 (b) of the provisional agenda for the preparatory segment)

1. Nominations for essential-use exemptions for 2015 and 2016

5. After the thirty-fourth meeting of the Open-ended Working Group, China submitted additional information on its nomination for an essential-use exemption for the use of 90 tonnes of carbon tetrachloride for laboratory and analytical uses in each of 2015 and 2016. In the initial assessment, the Technology and Economic Assessment Panel was unable to recommend the exemption due to insufficient information to justify the essentiality of the requested amount of 90 tonnes.

6. The Technology and Economic Assessment Panel and its Chemicals Technical Options Committee reassessed the nomination taking into account the additional information submitted by China. China reduced the nomination for 2015 to 80 tonnes and for 2016 to 70 tonnes from the original amounts of 90 tonnes for each of those years. Although the full implementation of the "Water Pollution Prevention Action Plan" by 2015 was expected to necessitate the increase in the use of carbon tetrachloride to monitor water quality, China reduced its nomination to the average quantity of carbon tetrachloride used for the same purpose for the last three years and also stepped up efforts to revise the relevant standards and introduce new ones that would enable the country to transition away from carbon tetrachloride use. A detailed explanation of the reassessment is provided in the October 2014 report of the Panel entitled "Essential use nominations report: final evaluation".

7. Table 1 shows the nominated quantities and the final recommendations of the Panel on all the nominations submitted in 2014. The reasons given by the Panel for being unable to recommend the nominated amounts are briefly explained in footnotes to the table.

Table 1
Essential-use nominations for chlorofluorocarbons and carbon tetrachloride submitted in 2014 for 2015 and 2016

(Metric tonnes)

<i>Party</i>	<i>Approved for 2014</i>	<i>Nominated for 2015</i>	<i>Recommended for 2015</i>	<i>Nominated for 2016</i>	<i>Recommended for 2016</i>
Parties not operating under paragraph 1 of Article 5					
Russian Federation (aerospace)	85	75	75	–	
Subtotal		75	75		
Parties operating under paragraph 1 of Article 5					
China (metered-dose inhalers)	235.05	217.34	182.61 ^a	–	
China (laboratory and analytical uses)	–	80	80 ^b	70	Unable to recommend ^c
Subtotal		297.34	262.61	70	–
Total		372.34	337.61	70	–

^a The Panel was unable to recommend 34.73 tonnes of CFCs for the manufacture of metered-dose inhalers for the active ingredients beclomethasone, isoprenaline, salbutamol and sodium cromoglycate. Demand for CFC-based metered-dose inhalers was expected to increase in 2014 and 2015 because of the increased emphasis on inhaled therapy; only about 10 per cent of patients were found to be using metered-dose inhalers in 2012.

^b The Panel recommends an exemption of 80 tonnes, recognizing the difficulty in replicating the alternative technology due to solvent impurities in China; the fact that the Multilateral Fund agreement between China and the Executive Committee of the Multilateral Fund on phasing out CFCs did not include the phase-out of carbon tetrachloride in laboratory and analytical uses; consistency with decision XXIII/6; and the top-down approach used by China to estimate the amounts needed. The Panel commends China's commitment in reducing the amounts nominated.

^c The Panel believes that any essential-use nomination should be presented one year in advance of the year for which it is required and for a duration of no longer than one year. Given the expected timing required for approval and the introduction of the new testing standards, an update on the status of the approval process could be submitted in 2015 together with the nomination for an exemption in 2016.

8. The parties may wish to consider the reassessment by and the final recommendations of the Panel. The relevant draft decision as submitted by China during the thirty-fourth meeting of the Open-ended Working Group is set out as draft decision XXVI/[B] in section II of document UNEP/OzL.Conv.10/3-UNEP/OzL.Pro.26/3.

2. Nominations for critical-use exemptions for 2015 and 2016

9. In 2014, 10 nominations for critical-use exemptions for methyl bromide were submitted by three parties not operating under paragraph 1 of Article 5 of the Protocol – Australia, Canada and the United States of America – and three parties operating under paragraph 1 of Article 5 – Argentina, China and Mexico. The Methyl Bromide Technical Options Committee evaluated the nominations and presented its interim recommendations at the thirty-fourth meeting of the Open-ended Working Group, during which bilateral discussions took place. Discussions continued thereafter between the nominating parties and the Committee on the information needed for any re-evaluation of the nominations in order for the Committee to make final recommendations for consideration by the Twenty-Sixth Meeting of the Parties.

10. The Committee met in Frankfurt, Germany, from 18 to 22 August 2014 to, inter alia, re-evaluate the critical-use nominations taking into account additional information that was provided by the nominating parties. The final report of the Panel and the Committee, including the final recommendations, are set out in the October 2014 report of the Panel entitled “Final evaluation of 2014 critical-use nominations for methyl bromide and related matters”, which was posted on the Secretariat's website on 2 October 2014.

11. The final recommendations of the Panel are set out in table 2. The reasons given by the Committee for not recommending the nominated amounts are summarized in the footnotes to the table where relevant. The parties may wish to consider the final recommendations and prepare a draft decision for consideration by the Twenty-Sixth Meeting of the Parties.

Table 2

Summary of the nominations and final recommendations on the 2015 and 2016 critical-use exemptions for methyl bromide submitted in 2014

(Metric tonnes)

<i>Parties not operating under paragraph 1 of Article 5 and sector</i>	<i>Nominated for 2016</i>	<i>Recommended for 2016</i>
1. Australia Strawberry runners	29.760	[29.760]
2. Canada Strawberry runners	5.261	[5.261]
3. United States of America Strawberry fruit	231.540	[231.540]
Cured pork	3.240	[3.240]
Total	269.801	[269.801]
<i>Parties operating under paragraph 1 of Article 5 and sector</i>	<i>Nominated for 2015</i>	<i>Recommended for 2015</i>
4. Argentina Strawberry fruit	100.000	[0] ^a
Green pepper and tomato	145.000	[0] ^b
5. China Ginger open field	90.000	[90]
Ginger protected	30.000	[24] ^c
6. Mexico Raspberry nursery	70.000	[41.418] ^d
Strawberry nursery	70.000	[43.539] ^e
Total	505.000	[198.957]

^{a, b} After the reassessment of additional information submitted by the party the Committee considered that there was still insufficient information, including evidence and references to show that the available alternatives were not effective for the circumstances of the nomination, to enable it to make a complete assessment.

^c The quantity of 24 tonnes has been recommended using the rate of 40g/m², which is used by China for open field ginger, rather than 50g/m² as the party proposed. Although several chemical alternatives have been shown to be effective, those alternatives are not registered for the particular application and other non-chemical alternatives and barrier films are not technically and economically feasible at this time.

^{d, e} The recommended amounts in both cases are less than the nominated amounts because they do not include the contingent amount for potential growth in the industries in 2015 due to the fact that the rapid adoption of alternatives could be expected to occur in view of positive test results.

C. Releases, breakdown products and opportunities for reduction of releases of ozone-depleting substances (item 4 (e) of the provisional agenda for the preparatory segment)

12. As mentioned in the note by the Secretariat on issues for discussion by and information for the attention of the Conference of the Parties to the Vienna Convention at its tenth meeting and the Twenty-Sixth Meeting of the Parties, at the thirty-fourth meeting of the Open-ended Working Group the European Union introduced a draft decision on releases, breakdown products and opportunities to reduce releases, to address concerns regarding the discrepancies between the reported consumption of some ozone-depleting substances and their measured concentrations in the atmosphere, including newly detected ozone-depleting substances. Following informal consultations among interested parties, the European Union reported that the discussions had been wide-ranging. It was suggested that the draft decision might require revision in the light of a synthesis report to be released by the Environmental Effects Panel and the Scientific Assessment Panel. The draft decision was set out for further consideration by the Twenty-Sixth Meeting of the Parties as decision XXVI/[F] in section II of document UNEP/OzL.Conv.10/3-UNEP/OzL.Pro.26/3.

12. In the light of the scientific evidence provided by the Scientific Assessment Panel, and specifically from the "Assessment for decision-makers", which summarizes the *Scientific Assessment of Ozone Depletion, 2014* launched on 10 September 2014, the European Union has decided that the releases of halogenated substances and co-products and by-products of their production and use, and the breakdown products of ozone-depleting substances and their alternatives should be treated separately. The emissions and concentrations of those substances in the atmosphere as well as associated actions to address them have varying degrees of significance and urgency.

13. Accordingly, the original draft decision XXVI/[F] has been split into two new decisions: draft decision XXVI/[H] on releases of halogenated substances from production, including co- or by-production, and opportunities for the reduction of releases; and draft decision XXVI/[I] on breakdown products and their effects. Both draft decisions are set out in an addendum to the compilation of draft decisions (UNEP/OzL.Conv.10/3/Add.1-UNEP/OzL.Pro.26/3/Add.1) to enable parties to consider the draft decisions in advance of the Twenty-Sixth Meeting of the Parties.

D. Issues related to alternatives to ozone-depleting substances (item 4 (f) of the provisional agenda for the preparatory segment)

1. Final report by the Technology and Economic Assessment Panel on alternatives to ozone-depleting substances

14. At the thirty-fourth meeting of the Open-ended Working Group, the initial report of the Technology and Economic Assessment Panel on alternatives to ozone-depleting substances, prepared in accordance with decision XXV/5, was presented and discussed. The report, which was set out in volume 4 of the Panel's 2014 report, is also listed as a background document for the Twenty-Sixth Meeting of the Parties and the executive summary of that report was included in the addendum to the note by the Secretariat on issues for discussion by and information for the attention of the Open-ended Working Group at its thirty-fourth meeting (UNEP/OzL.Pro.WG.1/34/2/Add.1). An informal group was established to provide further guidance to the Panel on the finalization of its report for consideration by the Twenty-Sixth Meeting of the Parties.

15. The task force of the Panel took into consideration the further guidance as well as written comments and inputs provided by the parties in August 2014 and produced a final report, an advance version of which was posted on the Secretariat's website on 10 October 2014. The executive summary of the final report is set out in annex II to the present addendum. The parties may wish to consider the final report of the Panel and discuss any appropriate action.

2. Information submitted by parties on their implementation of paragraph 9 of decision XIX/6 to promote a transition from ozone-depleting substances that minimizes environmental impact

16. In accordance with paragraph 3 of decision XXV/5, 14 parties had submitted information on their implementation of paragraph 9 of decision XIX/6, pertaining to the promotion of a transition from ozone-depleting substances that minimizes environmental impact wherever the required technologies are available, by the time of the thirty-fourth meeting of the Open-ended Working Group. The Secretariat compiled the information received in an information note and two addenda (UNEP/OzL.Pro.WG.1/34/INF/4 and Add.1 and Add.2). At the thirty-fourth meeting, the parties considered the submissions and requested the Secretariat to prepare a summary of all the submissions using the latest information provided by the parties and including any additional information received by 30 August 2014.

17. The Secretariat has prepared the requested summary, including the additional information from six parties, two of which provided updates to their earlier submissions. One of those six parties was the European Union, which submitted information on regulatory measures applicable to its 28 member States and more specific information on behalf of five member States. In total, therefore, 23 parties provided information in response to decision XXV/5.

18. In addition, the United States of America, through a study conducted by the United States Environmental Protection Agency, provided information pertaining to a large number of parties. That information is also reflected in the summary, as appropriate. The report by the secretariat on the summary of the information submitted by parties on their implementation of paragraph 9 of decision XIX/6 to promote a transition from ozone-depleting substances that minimizes environmental impact (decision XXV/5, paragraph 3) is set out in document UNEP/OzL.Pro.26/9 and the additional information received has been compiled in document UNEP/OzL.Pro.26/INF/4.

19. The parties may wish to consider the summary document as well as associated information documents, including UNEP/OzL.Pro.WG.1/34/INF/4 and its two addenda, and discuss any appropriate action.

E. Renomination and reappointment of co-chairs and members of the Technology and Economic Assessment Panel and its technical options committees (item 4 (h) of the provisional agenda for the preparatory segment)

20. In accordance with decision XXIII/10, as well as the new terms of reference of the Technology and Economic Assessment Panel and its technical options committees and temporary subsidiary bodies adopted by the parties in decision XXIV/8, the Panel and its technical options committees have been working on the renomination and reappointment of existing members as well as on new nominations and appointments, as necessary. Sections 2.3 and 2.5 of the terms of reference provide that each appointment of co-chairs and members of the Panel and its committees should be for a period of four years with possibilities to be reappointed for further four-year periods. In a number of decisions on appointments of co-chairs of the Panel and its committees, and senior experts of the Panel,¹ parties have specified the periods of appointment. [The Panel reports that the renomination and reappointment process is still ongoing.] In paragraphs 21 to 23 of the present note, the Secretariat summarizes existing information that may be of use to the parties for their deliberations.

21. Two co-chairs of the Technology and Economic Assessment Panel, Mr. Lambert Kuijpers and Ms. Marta Pizano, will be finishing their current appointments as co-chairs at the end of 2014. Mr. Kuijpers' term as co-chair of the Refrigeration, Air-conditioning and Heat Pumps Technical Options Committee will also expire at the end of 2014 and Ms. Pizano's appointment as co-chair of the Methyl Bromide Technical Options Committee will continue until 2017. It is therefore expected that the parties will take a decision on appointing one or two Panel co-chairs and the two committees' co-chairs, as appropriate, in addition to taking any decisions that they may wish to take on the appointment of the technical options committees' members in line with paragraphs 9, 10 and 11 of decision XXIII/10.

22. Relevant historical information, practice, current situation and sections of the terms of reference that the parties may wish to take into account in (re)nominating and (re)appointing Panel co-chairs include the following:

(a) At the Fourth Meeting of the Parties to the Montreal Protocol in 1992, the parties noted that each assessment panel was to have three co-chairs, of which one should be from a developing country. Accordingly, the Technology and Economic Assessment Panel has had two co-chairs from parties not operating under paragraph 1 of Article 5 (United States and the Netherlands) and one co-chair from the Latin American and the Caribbean region (currently Colombia) since its inception. The Scientific Assessment Panel has three co-chairs from parties not operating under paragraph 1 of Article 5 (currently two from the United States and one from the United Kingdom of Great Britain and Northern Ireland) and a co-chair from a party operating under paragraph 1 of Article 5 from the African region (currently Togo), and the Environmental Effects Assessment Panel has two co-chairs from parties not operating under paragraph 1 of Article 5 (currently New Zealand and United Kingdom) and one co-chair from the Asian and the Pacific region (currently China). The regional balance has been maintained since 1992.

(b) Section 2.1.1 of the terms of reference specifies that the membership size of the Panel should be about 18–22 members, including 2 or 3 co-chairs to allow it to function effectively. It should include the co-chairs of the technical options committees; 2 co-chairs per committee and 2–4 senior experts for specific expertise not covered by the Panel or committees' co-chairs, taking into account gender and geographical balance. The Panel currently has 19 members, including 3 co-chairs and 3 senior expert members. The chemicals, and the foams and refrigeration technical options committees have 2 co-chairs each and the halons, medical and methyl bromide technical options committees have 3 co-chairs each.

(c) Section 2.3 of the terms of reference provides for renomination and reappointment. Renomination should be undertaken in full consultation with the relevant national focal points and reappointment may be for a period of 4 years (maximum) or less at this time.

(d) Section 2.4 of the terms of reference states that in nominating and appointing co-chairs of the Panel, its committees and other temporary subsidiary bodies, parties should consider the following factors:

- (i) Co-chairs should have experience or skills in managing, coordinating and building consensus in technical bodies, in addition to possessing technical expertise in relevant areas;

¹ Relevant decisions include XXII/22(2010), XXIII/21(2011), XXIV/19(2012), and XXV/7(2013).

- (ii) The co-chairs of a technical options committee should not normally act as co-chairs of another technical options committee; and
- (iii) The co-chairs of the Panel should not be co-chairs of a technical options committee;
- (iv) The Panel and the technical options committee co-chairs may suggest to individual parties experts to consider nominating.

(e) The work of the co-chairs involves administrative, management and technical work that is demanding and complex as well as administrative and detailed. Not only do they play a key role in building consensus among strongly opinionated experts on difficult issues, they also need to carry out a lot of research themselves, draft reports and ensure coordination of inputs and reviews of those reports, and reflect a balanced assessment in the final reports. The reports of the Panel also include the reports of the technical options committees and task forces, responding to several requests of the parties, and comprising a number of volumes amounting to several hundreds of pages annually. Moreover, the co-chairs are also responsible for organizing their meetings. As such, the co-chairs need to devote considerable time to ensuring that the work of the Panel is of the highest quality, as expected by the parties, and is delivered in a timely manner for consideration at the relevant meetings of the parties.

23. Currently, the Panel's co-chairs, Mr. Lambert Kuijpers and Ms. Marta Pizano, are also co-chairs of the Refrigeration, Air-conditioning and Heat Pumps Technical Options Committee and the Methyl Bromide Technical Options Committee, respectively. In addition to the above-mentioned paragraph (c) of section 2.4 of the terms of reference, section 2.1.1 also states that at least one and preferably all of the Panel's co-chairs should not simultaneously serve as a technical options committee co-chair, in recognition of the fact that there may be situations in which a co-chair of the Panel might be required to serve as co-chair of a committee simultaneously.

24. Another important consideration for the parties in (re)nominating and (re)appointing co-chairs as well as members of the Panel and its committees is the funding situation. It has been brought to the attention of the parties by the Panel and the Secretariat that several co-chairs and members were facing difficulties in obtaining financial support for their work, including those from parties not operating under paragraph 1 of Article 5 who were also having problems in having their travel to relevant meetings funded. It is imperative that the parties ensure that the experts nominated and appointed to serve on the Panel and its committees (as well as the other assessment panels) have the necessary financial backing of the relevant Governments or organizations to which they are affiliated.

III. High-level segment (20 and 21 November 2014)

Statements by heads of delegations and discussion on key topics (item 5 of the provisional agenda for the high-level segment)

25. Under this agenda item, a 90-minute ministerial round-table discussion will be held on issues that constitute the main challenges in the context of the Montreal Protocol to be addressed by countries during the coming decade.

26. The objective of the ministerial round-table discussion is to enable an open dialogue among parties to the Montreal Protocol on various challenges that they would like to see addressed in the coming decade from 2015. The discussion may help to identify specific issues or questions that parties might wish to take up in their subsequent meetings. The session will include discussants from a number of countries, a moderator and a rapporteur. Each discussant will deliver a five-minute statement on the issues that they believe constitute the main challenges in the context of the Montreal Protocol for the coming decade. Following the observations, the moderator will invite participants to contribute in the ensuing interactive discussion. At the end of the round-table session, the rapporteur will present a summary of the main discussion points for future consideration.

27. Ms. Sanjaasuren Oyun, Minister of Environment of Mongolia and President of the United Nations Environment Assembly, will deliver brief opening remarks focusing on the achievements of the Montreal Protocol to date. She will also serve as the moderator of the round-table discussion. Mr. Fernando Luginis, Ambassador and Deputy Director General of the Ministry of Foreign Affairs of Uruguay will serve as rapporteur.

IV. Matters that the Secretariat would like to bring to the parties' attention

A. Launch of the assessment for decision makers: scientific assessment of ozone depletion 2014

28. The "Assessment for decision makers" summarizes the key messages and findings of the *Scientific Assessment of Ozone Depletion, 2014*, the quadrennial report of the Scientific Assessment Panel, which was launched at a press conference in New York on 10 September 2014 by Mr. Achim Steiner, Executive Director of UNEP, also on behalf of Mr. Michel Jarraud, Secretary-General of the World Meteorological Organization. Mr. Steiner was accompanied by the Co-Chairs of the Scientific Assessment Panel, Mr. Paul Newman and Mr. A.R. Ravishankara, who provided a briefing about the report and answered questions from journalists during the event, which was broadcast live online to a broader audience.

29. The assessment's findings show that the ozone layer is well on track to recovery in the coming few decades thanks to concerted international action against ozone-depleting substances. These encouraging findings received extensive media coverage, with print, broadcast and online media outlets across the world devoting substantial space and time to enlightening their audiences regarding this positive development and ozone protection efforts in general. The widespread positive media coverage provided good visibility for global ozone protection efforts and also built momentum on ozone-related issues in the run-up to the International Day for the Preservation of the Ozone Layer, marked on 16 September 2014.

B. International Day for the Preservation of the Ozone Layer, 16 September 2014

30. Parties to the Montreal Protocol celebrated the 2014 International Day for the Preservation of the Ozone Layer on 16 September under the theme "Ozone layer protection: the mission goes on" by organizing various events, including award ceremonies to recognize individuals and organizations for their efforts in the protection of the ozone layer, art competitions among students, training workshops and panel discussions on radio and television stations, among other activities.

31. The Ozone Secretariat participated in Ozone Day celebrations in China, India and Mauritius. Various parties have submitted reports and other material regarding their 2014 International Day for the Preservation of the Ozone Layer commemorations, which have been posted on the Secretariat's website for wider dissemination. Other parties are invited to share any reports, publications, pictures, videos or media coverage of such activities with the Secretariat by submitting them via e-mail to ozoneinfo@unep.org.

Annex I

Executive summary of the supplement to the May 2014 Technology and Economic Assessment Panel XXV/8 task force (replenishment) report: assessment of the funding requirement for the replenishment of the Multilateral Fund for the period 2015–2017

1. A supplementary report has been prepared by the XXV/8 task force on replenishment to address the issues presented in annex II of the report of the Open-ended Working Group at its thirty-fourth meeting. The investigations reported in the report have no impact on the overall replenishment requirement; it remains the same as indicated in the May 2014 XXV/8 task force report:

(Millions of United States dollars)

Total funding requirement for the replenishment of the Multilateral Fund	2015–2017	2018–2020	2021–2023
Case 1 (commitment-based phase-out)	609.5	550.6	636.5
Case 2 (unfunded phase-out)	489.7	485.8	636.5

Case 1 and case 2

2. Additional narrative and explanation concerning the case 1 and case 2 scenarios for determining the replenishment requirements of non-low-volume consuming (LVC) countries to meet the 2020 35 per cent Protocol reduction target has been provided, as requested in paragraph 1 of annex II. All consumption levels and reductions for non-LVC countries as studied in the May 2014 task force report have again been examined and the results presented in chapter 3 of the May 2014 report remain valid. They are presented for information in the table below.

(Millions of United States dollars)

New commitments non-LVCs (for stage II HPMPs only)	2015–2017	2018–2020	Total
Case 1 (commitment based phase-out)	334.0	180.3	514.3
Case 2 (unfunded phase-out)	214.4	115.5	329.5

Requests listed in paragraph 2 of annex II

3. The Task Force studied the various requests listed in paragraph 2 in annex II and decided to group together a number of requests dealing with more or less the same issues. This report does not therefore deal with the issues in the same sequence as listed in paragraph 2, in particular:

- Funding examples have been presented using an extra funding disbursement schedule of an equal 25 per cent of project costs for stage II Hydrochlorofluorocarbon Phase-out management Plans (HPMPs) four years after project approvals. However, this disbursement schedule is not consistent with normal project implementation modalities.
- A variation in the percentages of foam projects in the sectoral mix of stage II HPMPs will affect the funding levels for non-LVCs; these funding levels have been determined for the next two triennia (2015–2020). A 10 per cent increase or decrease from a 50 per cent foam percentage would imply a cost increase or decrease of about \$59 million and \$53 million respectively for case 1, and of about \$38 million and \$33 million respectively for case 2. For case 1 and case 2, and with varying percentages of foam in the ozone-depleting substance reductions addressed, the climate cost-effectiveness of stage II HPMPs in non-LVC countries varies only between \$4.88 and \$4.65 per tonne CO₂-eq. No change in the funding requirement is recommended.

4. Additional descriptive information has been provided on the distribution of funding across the trienniums and in particular whether part of the funding requirement for stage III HPMPs appears in the year 2020, i.e., in the second triennium, or in 2021, the third triennium. Four options are discussed, three of which appeared in the May 2014 report. The additional option splits the funding for the 2020 target equally across the first two trienniums and adds the first year of potential stage III HPMP funding into the second triennium (2020). While funding for the third triennium is indicative only, in a business-as-usual situation the phase-out quantities involved give rise to significantly higher levels of funding.

5. The report also gives (1) an analysis of the ozone-depleting substance amounts to be phased out in the first two trienniums from existing commitments, (2) a commentary on the special needs of the servicing sector, (3) a further assessment of the impact on the funding assessment of multinationals and non-eligible enterprises, and (4) a further consideration of cost-effectiveness values, including in the longer term. None of these issues has a significant additional effect on the funding assessment presented in the May 2014 task force report.

Requests listed in paragraph 3 of annex II

6. The requests listed in paragraph 3 of annex II are being dealt under high-global warming potential (GWP) issues in this report, as indicated below, except for the elaboration on avoiding high-GWP alternatives, which was done in relation to the variation of the foam percentage in stage II HPMPs, a request made under paragraph 2 of annex II. The costs derived in the May 2014 report of \$138 million for avoiding a certain amount (10,000 tonnes) of high-GWP alternatives remain valid.

7. An initial broad estimate to conduct surveys of high-GWP alternatives to ozone-depleting substances and to prepare projects has been prepared after consideration of the funding levels provided in decision 71/42 of the Executive Committee for the preparation of stage II HPMP proposals. A total funding allocation of some \$10.45 million might be required. Such a survey could also address the current consumption of low-GWP substances.

8. The funding for stage II HPMPs (during the two trienniums 2015–2017 and 2018–2020) depends to a large degree on the cost-effectiveness values used. Assuming avoidance of 50 per cent of high-GWP alternatives in refrigeration and air-conditioning (RAC) conversions would be equal to avoiding 87.5–102.9 Mt CO₂-eq. for case 1, to avoiding 57.5–67.8 Mt CO₂-eq. for case 2. The climate cost effectiveness would be around \$5.9 per tonne CO₂ for both case 1 and case 2 (at a cost effectiveness of \$10.1/kg). Assuming avoidance of 100 per cent of high-GWP alternatives in RAC conversions obviously leads to an increase of the amounts expressed in Mt CO₂-eq. The climate cost effectiveness would then be around \$4.8 per tonne CO₂ for a cost effectiveness (RAC) of \$ 10.1/kg and \$ 5.5 per tonne CO₂ for a cost-effectiveness (RAC) of \$13.35/kg.

9. The production capacity for hydrofluorocarbons (HFCs) is estimated to grow by a factor of 2 in the next 5–10 years, principally to supply the HFCs required by new production lines not associated with conversion from production of HCFC-based equipment. The only practicable alternative might be to moderate the growth in production by supporting the maximum possible phase-in of low-GWP alternatives to high-GWP ozone-depleting substance alternatives (including HFCs). It is too early to attempt assessment of either the feasibility or costs of not-in-kind conversions.

Additional funding for swing plant production phase-out

10. Production in swing plants in all countries other than China reached a total of about 66,000 tonnes of HCFC-22 in the peak year 2009, lowering to around 40,000 tonnes in the year 2012. If funding was based on a production level of 50,000 tonnes per year, spread over 15 years at a cost of \$1–1.5/kg, this would imply adding \$9.5–14.5 million per triennium to the replenishment. Total funding for production phase-out (seen as new funding for the next two trienniums, even when it is committed for 2015–2016), as given in the May 2014 report (\$72.6 and \$65.6 million for the next two trienniums), would then increase to \$82.1–87.1 million and \$75.1–80.1 million for the first and the second triennium, respectively.

Annex II

Executive summary of the final report of the decision XXV/5 task force report additional information on alternatives to ozone-depleting substances

Overview

1. Decision XXV/5 is the first in a series of decisions on alternatives to ozone-depleting substances, requesting the Technology and Economic Assessment Panel to develop and assess the impact of specific mitigation scenarios as part of its reporting back to the parties. In responding to this mandate, the Panel has sought to draw from its earlier evaluations of alternatives (decisions XXIII/9 and XXIV/7) in order to provide a grounded basis for such mitigation scenarios. The information has been updated where appropriate, although the changes have generally been minor because of the short time period between the finalization of the Panel's report on decision XXIV/7 (September 2013) and the publication of the present report (May–October 2014).

2. It should be noted that quantitative information is only available for the refrigeration, air-conditioning and foam, and to a lesser extent, medical use sectors. Therefore, discussion on fire protection and solvents has remained qualitative, with the latter being added to the scope of such reports for the first time (chapter 9). Nevertheless, for each of these sectors, efforts have still been made to address the three major inputs requested of the Panel in decision XXV/5, namely:

(a) An update on alternatives available, highlighting significant differences between regions of parties not operating under paragraph 1 of Article 5 (non-Article 5 parties) and regions of parties operating under paragraph 1 of Article 5 (Article 5 parties) (element 1 (a));

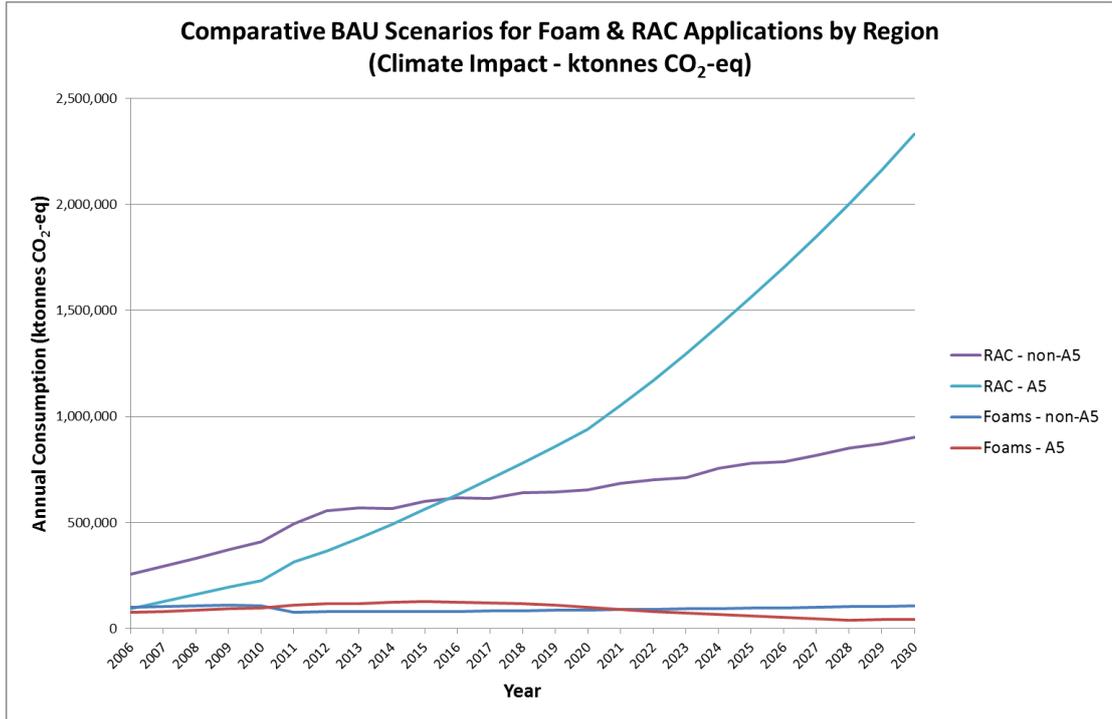
(b) A (qualitative/quantitative) discussion of future demand for alternatives to ozone-depleting substances (element 1 (b));

(c) A (qualitative/quantitative) discussion on the costs and environmental benefits of various mitigation scenarios (element 1 (c)).

3. Where quantitative information has been available, it has become self-evident that the refrigeration and air conditioning (RAC) sector is the dominant factor in the climate impact assessment even when existing regulatory measures are considered as part of the business-as-usual scenario (see figure ES-1).

Figure ES-1

Projection of business-as-usual climate impact to 2030 for refrigeration and air-conditioning and foams



Business-as-usual scenario

The make-up of the business-as-usual scenario for RAC is shown in figures ES-2 and ES-3:

Figure ES-2

Actual and projected business-as-usual demand of refrigerants in non-Article 5 regions

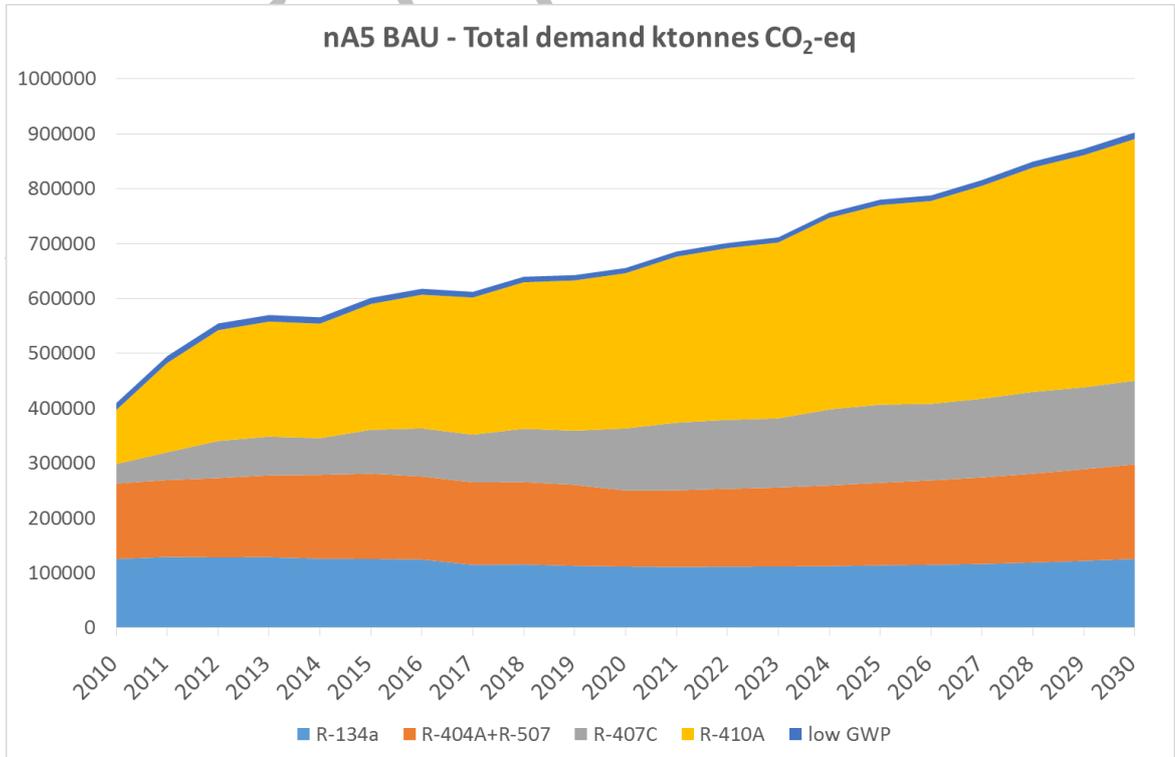
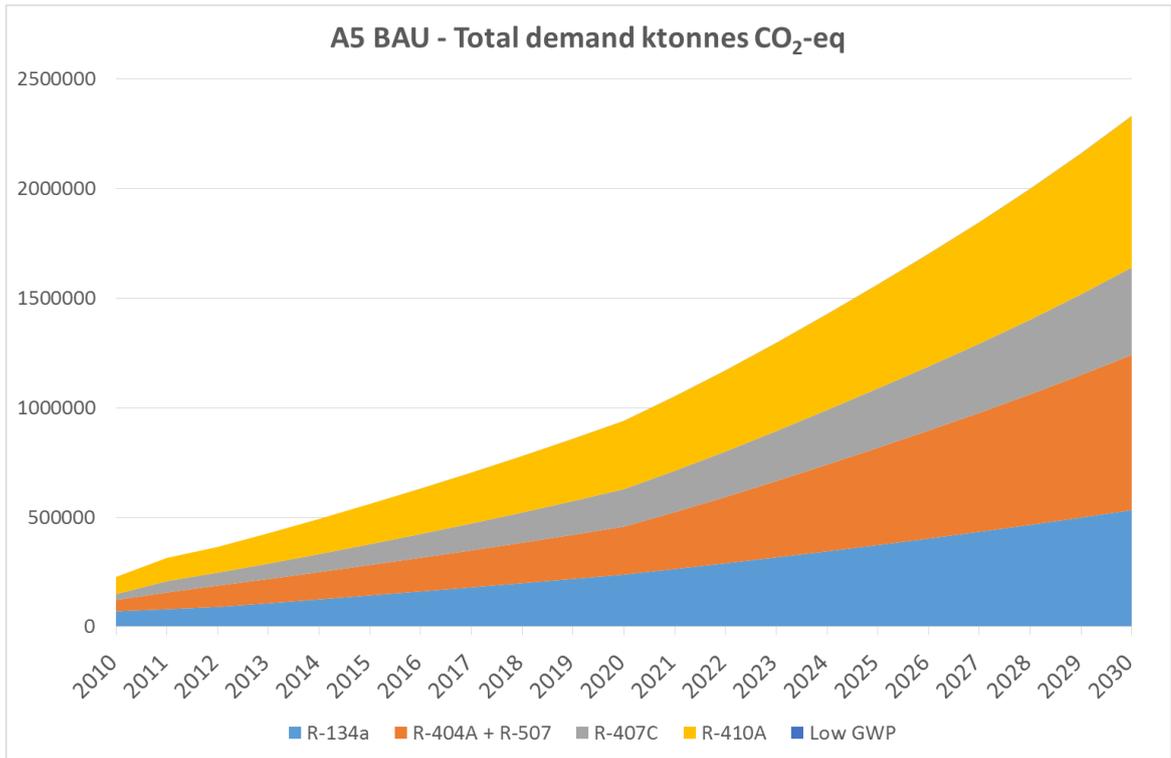


Figure ES-3
Actual and projected business-as-usual demand of refrigerants in Article 5 regions



Mitigation scenarios

4. Understandably, the grounding of the mitigation scenarios for such large consuming sectors becomes critical to the outcome of the response to element 1 (c) of decision XXV/5 and a large part of this report addresses the technical capability and economic capacity of the RAC sector to respond. Two mitigation scenarios have been identified. One (MIT-1) is believed to be a relatively achievable scenario based on current technology options and potential trends. The other (MIT-2) is a more progressive “what if” assessment and is believed to be at the limit of what could be achievable in the period to 2030. The following two graphs illustrate the impact for non-Article 5 regions:

Figure ES-4
The climate impact of mitigation scenario 1 for refrigeration and air-conditioning in non-Article 5 regions

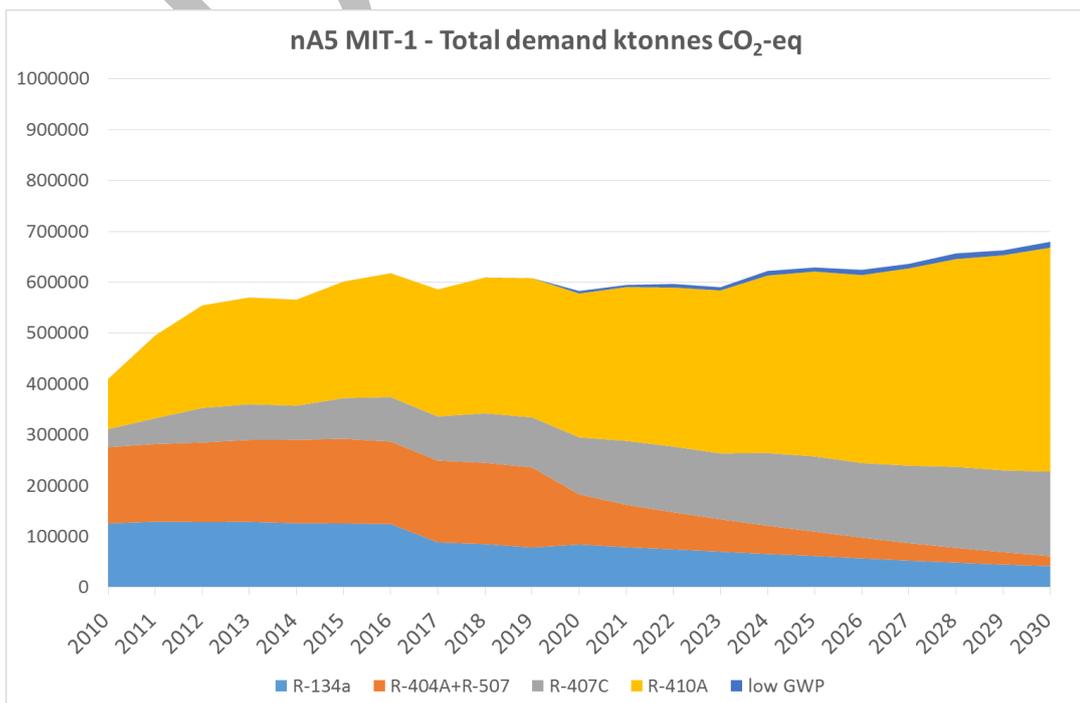
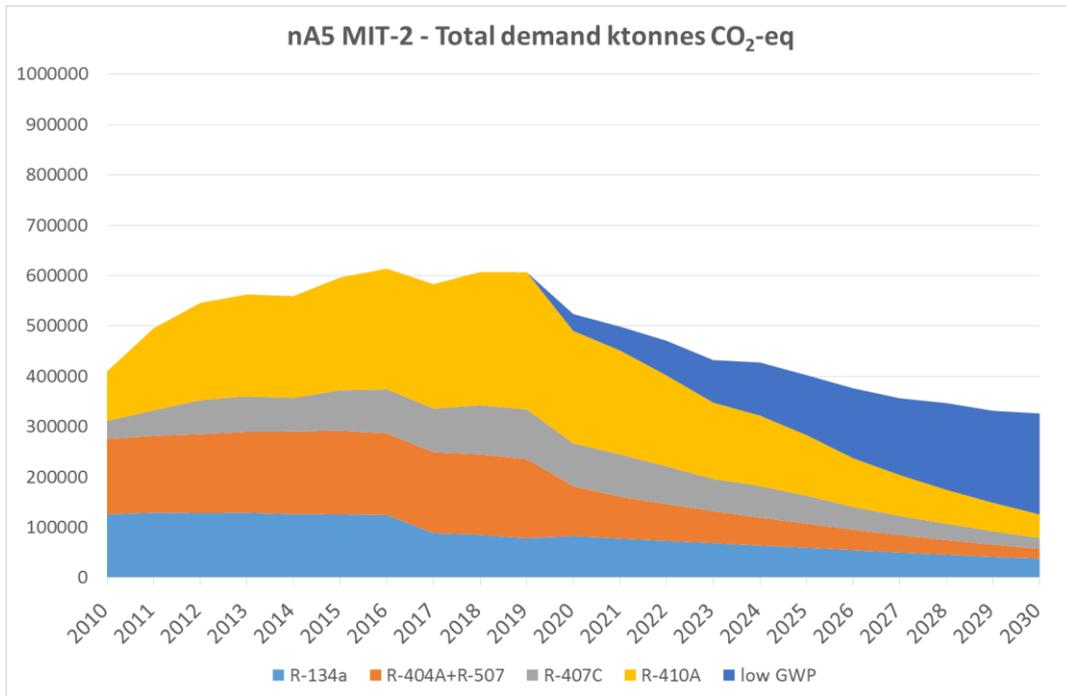


Figure ES-5
The climate impact of mitigation scenario 2 for refrigeration and air-conditioning in non-Article 5 regions



5. It is clear from both graphs that the impact of measures on low-global-warming potential (GWP) alternatives is unlikely to be felt in non-Article 5 regions until after 2020. This acknowledges the fact that additional regulatory measures, such as the revised F-Gas Regulation, will be necessary to trigger transitions.

6. For the Article 5 “case”, the incursion of low-GWP alternatives is evident from the year 2000 onwards. However, the importance of guiding investment into low-GWP solutions wherever possible is clear in view of the anticipated rate of growth of the RAC sector in the period through to 2030. Figure ES-7 is particularly revealing in that the opportunity to major inroads exists beyond 2020.

Figure ES-6
The climate impact of mitigation scenario 1 for refrigeration and air-conditioning in Article 5 regions

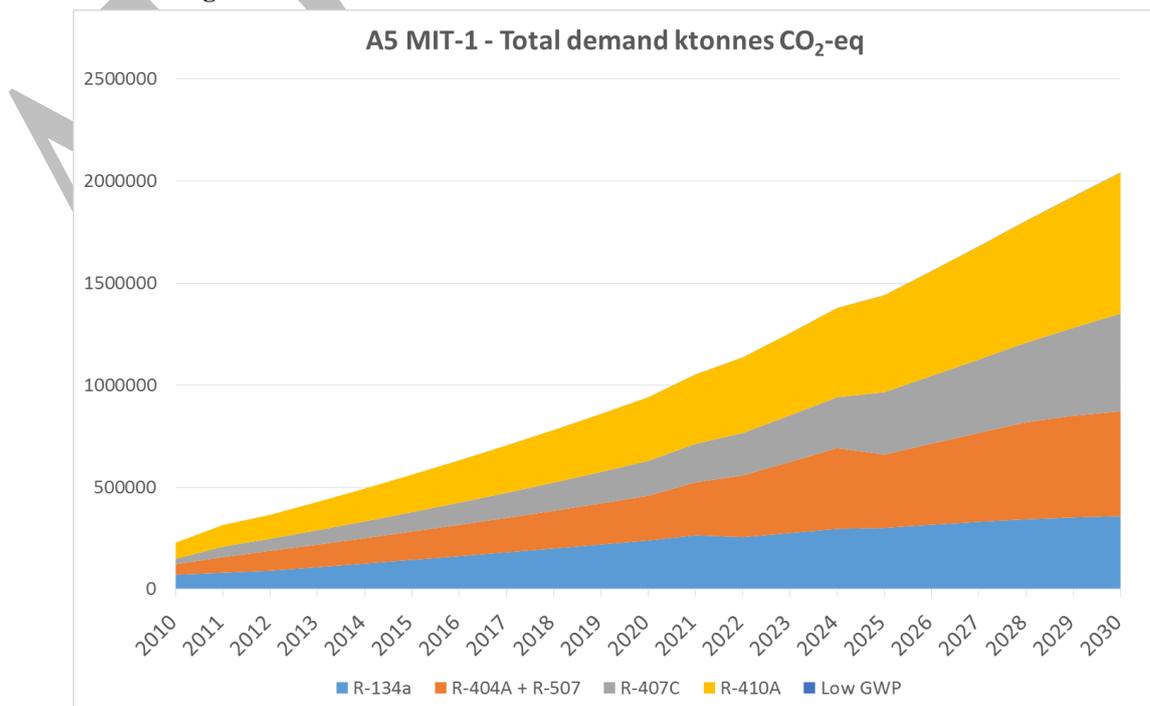
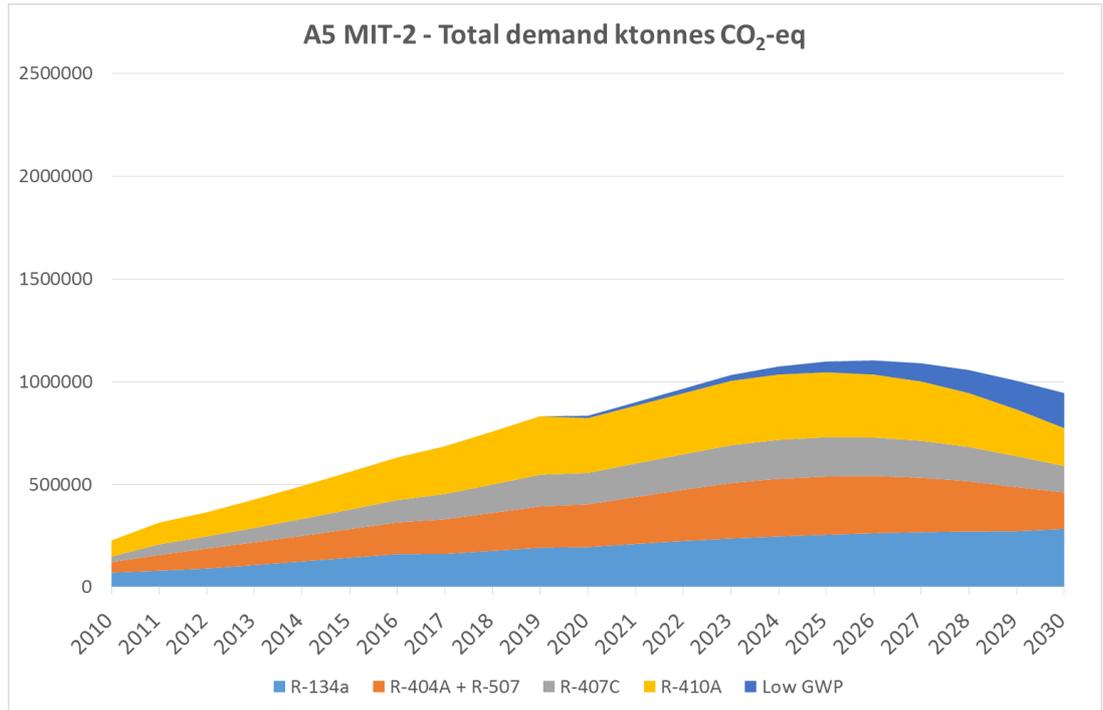


Figure ES-7
The climate impact of mitigation scenario 2 for refrigeration and air-conditioning in Article 5 regions



7. The task force has also made efforts to quantify the potential cumulative climate impact arising from mitigation activities in both the foam and RAC sectors. Although the foam contribution is modest, it is still believed to be desirable, especially since any measures to reduce reliance on high-GWP blowing agents will have an enduring effect beyond 2030. The most notable benefits are likely to come from the extruded polystyrene (XPS) foam sector in the period beyond 2025.

Figure ES-8
Cumulative climate savings compared with business as usual from mitigation scenario 1

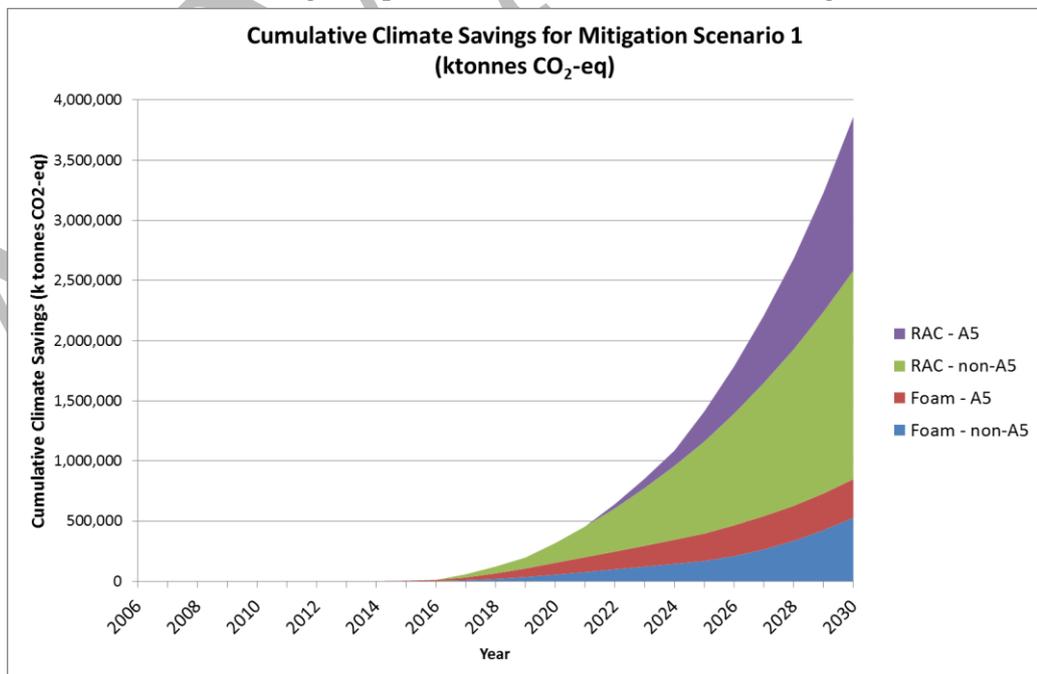
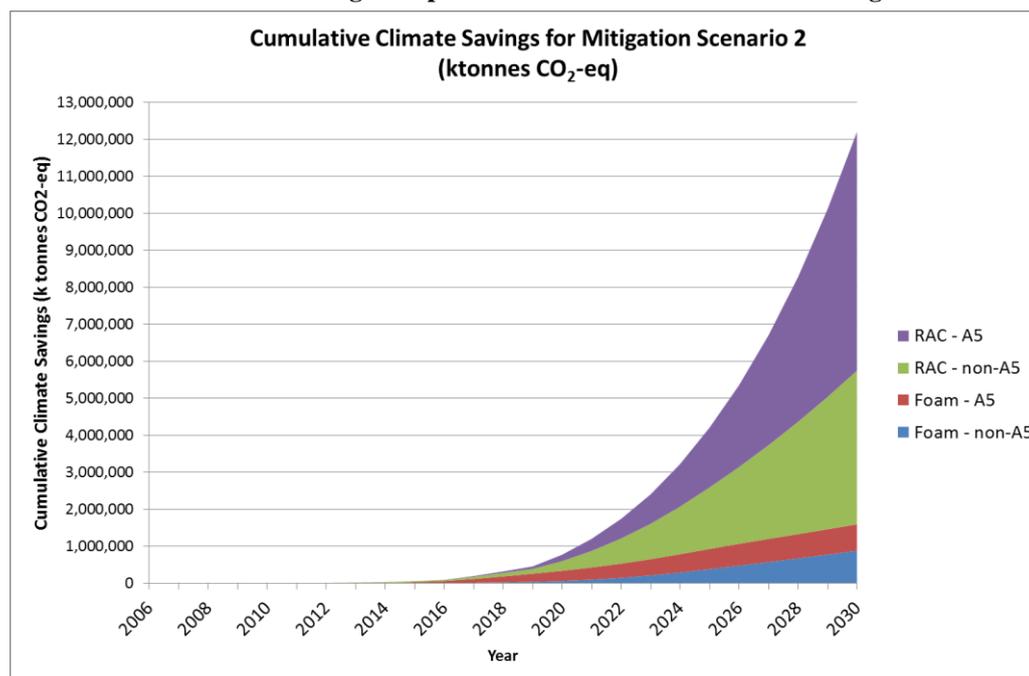


Figure ES-9

Cumulative climate savings compared with business as usual from mitigation scenario 2


8. It can be seen that the cumulative savings by 2030 from mitigation scenario 1 are approximately 3.8 billion tonnes CO₂-eq, while the delivery from mitigation scenario 2 is in the region of 12 billion tonnes CO₂-eq.

Cost assessment

9. With respect to cost, the ranges are inevitably wide because the circumstances surrounding any future transitions have a major bearing. It is clear that technology transitions that can coincide with other process upgrades will be more cost-effective than those that are forced to be implemented independently because of specific regulatory measures. Most importantly, the costs will be least where new RAC and foam manufacturing capacity investment is directed away from high-GWP options at the outset. Hence, efforts should be focused on ensuring that low-GWP options are well proven at the earliest opportunity in order to inspire investment confidence.

10. Within the RAC sector, the costs for mitigation scenarios 1 and 2 in Article 5 regions have been estimated and the ranges are shown in the following two tables.

Table ES-1

Costs for the MIT-1 scenario in Article 5 countries

<i>Sector</i>	<i>I. Conversion to</i>	<i>Amount (tonnes)</i>	<i>Manufacturing conversion (tonnes)</i>	<i>Cost (millions of United States dollars)</i>
MAC	Low GWP	75 000	45 000	405–810
Refr.sectors	R-407A/C/F	90 000	54 000	54–162
Stationary AC		135 000		0
Total				459–972

Table ES-2

Costs for the MIT-2 scenario in Article 5 countries

<i>Sector</i>	<i>II. Conversion to</i>	<i>Amount (tonnes)</i>	<i>Manufacturing conversion (tonnes)</i>	<i>Cost (millions of United States dollars)</i>
MAC	Low GWP	75 000	45 000	270–810
Refr.sectors	Low GWP	90 000	54 000	324–972
Stationary AC	Low GWP	135 000	81 000	486–1458
Total				1080–3240

11. Although there is considerable further information available on climate abatement costs, the whole life costing approach used is not particularly helpful in that it typically offsets investment costs against future energy efficiency gains. Often these cost and benefits are attributed to different parties.

Qualitative summaries

12. While the quantification of costs and savings has not been as possible, or as detailed, for other sectors, it is important to note the following conclusions for fire protection, solvents and medical uses:

(a) The process for assessing and qualifying new fire protection agents for use is long and is also application specific. Whilst the phase-out of ozone-depleting substances in this sector is well under way, there will be some reliance on high-GWP solutions for the foreseeable future. Control of avoidable emissions continues to improve, thereby minimizing impacts.

(b) In the solvents sector, there is still limited use of hydrochlorofluorocarbon (HCFC)-141b and HCFC-225ca/cb. However, there is increased interest in a number of the emerging unsaturated halogenated substances, since the range of halogens (chlorine, fluorine and/or bromine) provide a range of solvating capabilities which should address any shortcomings of currently available alternatives.

(c) Metered-dose inhalers use HFC-134a and HFC-227ea, with cumulative emissions in 2014–2025 estimated to have a climate impact of 173,000 ktonnes CO₂ equivalent under a business-as-usual scenario. Completely avoiding high-GWP (hydrofluorocarbon (HFC)) alternatives in this sector is not yet technically or economically feasible. In the sterilants sector, where there is almost non-existent use of HFCs and a wide variety of alternatives available, the impact of avoiding HFCs would be minimal.

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