MONTREAL PROTOCOL

ON SUBSTANCES THAT DEPLETE

THE OZONE LAYER

UNEP

REPORT OF THE
TECHNOLOGY AND ECONOMIC ASSESSMENT PANEL

MAY 2013

VOLUME 3

DECISION XXIV/8 TASK FORCE REPORT
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The text of this report is composed in Times New Roman.

Co-ordination:	TEAP and its XXIV/8 Task Force
Composition of the report:	TEAP and its XXIV/8 Task Force
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Date:	May 2013

Under certain conditions, printed copies of this report are available from:

UNITED NATIONS ENVIRONMENT PROGRAMME
Ozone Secretariat, P.O. Box 30552, Nairobi, Kenya

This document is also available in portable document format from the UNEP Ozone Secretariat's website:

http://ozone.unep.org/new_site/en/assessment_panels_main.php

ISBN: 978-9966-20-015-0

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Acknowledgements

The Technology and Economic Assessment Panel and the XXIV/8 Task Force Co-chairs and members acknowledge with thanks the outstanding contributions from all of the individuals and organisations that provided support to complete the work on this report.. The opinions expressed are those of the Panel and its XXIV/8 Task Force and do not necessarily reflect the reviews of any sponsoring or supporting organisation. The XXIV/8 Task Force also thanks the Academy of Fire and Rescue Service in Moscow, Russian Federation, for hosting the Task Force meeting, 14 April 2013.

Foreword

The May 2013 TEAP Report

The May 2013 TEAP Report consists of three volumes:

Volume 1: May 2013 TEAP Progress Report

Volume 2: May 2013 TEAP XXIV/7 Task Force Report

Volume 3: May 2013 TEAP XXIV/8 Task Force Report

Volume 1
Volume 1 contains the MTOC essential use report, progress reports, the MB CUN report etc.

Volume 2
Volume 2 is the Assessment Report of the TEAP XXIV/7 Task Force on additional information on alternatives to ozone-depleting substances.

Volume 3
The separate Volume 3 of the TEAP Progress Report contains the report of the Task Force responding to Decision XXIV/8.

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DECISION XXIV/8 TASK FORCE REPORT

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1 EXECUTIVE SUMMARY

The history of the Montreal Protocol, its success as a global environmental treaty as well the challenges Parties face in its implementation over 25 years, is inextricably linked to the history of the Technology and Economic Assessment Panel (TEAP) and its Technical Options Committees (TOCs). Since their creation in 1989, TEAP and its TOCs have provided advice that has mostly been proven both accurate and timely: innovation and emerging technologies have received objective review, Essential Use Nominations (EUNs) and Critical Use Nominations (CUNs) have been reviewed and approved after thorough evaluation, and nominations have decreased from year to year.

Historical membership in TOCs show spikes in numbers of members reflecting critical decision periods of the Parties (i.e., amendments under the Protocol) but have remained essentially unchanged since 2006. Today, over 150 experts serve on the TEAP, its six TOCs, and Temporary Subsidiary Bodies (TSBs). Since its creation, over 900 experts from about 65 countries have participated in the assessment process. With expertise being the priority consideration in its membership, TOCs have generally been successful in recruiting and retaining the balance of expertise needed to address the issues facing Parties. Co-chairs of each TOC continually strive to maintain and strengthen the relevant expertise within its membership while making every effort to also reach the goals of geographical distribution, A5/non-A5 and gender balance.

Over this period, TEAP and the TOCs invariably faced the challenge of retaining the needed expertise and balance as its working environment has changed. As noted in the previous Decision XXIII/10 report, as the Montreal Protocol has matured in its implementation, there have been changes in both emphasis and focus, particularly over the past ten years. The shift from a mix of transition activities in Non-Article 5 and Article 5 Parties to transition activities predominantly by Article 5 Parties has had a particular bearing on the issues that TEAP and its TOCs have been asked to address. However that shift has not been reflected in the TEAP and its TOCs, as membership of needed expertise from Article 5 Parties remains a challenge for TOC co-chairs seeking qualified new members with required expertise for balance.

In Decision XXIV/8, TEAP takes the opportunity to consider the near- and long-term issues related to the on-going transition under the Protocol and recommend a re-configuration of its TOCs to support Parties' deliberations and decisions on these issues. The recommendations are as follows:

- For the period 2013-2014, TEAP suggests that the TOCs membership generally remain at their current numbers to meet the need for required expertise, and because 2014 is an Assessment year; regional and A5/non-A5 balance has been achieved by some TOCs but still challenging to the majority of TOCs; gender balance remains a significant, continuing challenge to all TOCs;

- For the period 2014-2018, the TOCs membership numbers are anticipated to remain the same or decrease from the 2013-2104 period due to anticipated attrition during the 2014 reappointment process and some anticipated decrease in workload in this period; the exception is RTOC which is likely to retain its previous membership numbers based on anticipated, continuing work on issues related to transition in its sectors of use; and

- For the period beyond 2018, there is significant uncertainty in the likely TOC membership numbers, although significant reductions are anticipated for CTOC and MTOC based on the anticipated workload after 2018; that the need for retention of the necessary expertise from these committees beyond this date must be considered.

These recommendations for TOC configurations are made under the current Protocol phase out; any significant changes to that would necessitate a re-evaluation of these recommendations. The challenge remains in ensuring that the TOCs are structured in size and expertise to continue supporting the future efforts of the Parties.

As requested by the decision, TEAP is also providing in this report its operating procedures, including organization and logistics and the process of achieving consensus.

2 INTRODUCTION

2.1 Mandate and scope of the report

Decision XXIV/8 from the 24th Meeting of the Parties requests the TEAP to,

> *"…make recommendations on the future configuration of its technical options committees to the Open-Ended Working Group at its thirty-third meeting, bearing in mind anticipated workloads;"*

Further, it requests the TEAP and its TOCs to,

> *"…make available to the parties their standard operating procedures;"*

The full text of the Decision appears in Annex 1 at the end of this report. The TEAP Terms of Reference, as adopted by the Decision, appears in Annex 2.

2.2 Organisation of work

In response to Decision XXIV/8, TEAP set up a balanced task force (TF) of nine members, which included members of all TOCs plus two TEAP senior experts and one additional member, as follows:

Co-chairs

Bella Maranion	*TEAP co-chair (non-A5)*
Marta Pizano	*MBTOC (and TEAP co-chair) (A5)*

Members

Paul Ashford	*FTOC (non-A5)*
Alistair McGlone	*TF member (non-A5)*
Roberto Peixoto	*RTOC (A5)*
Helen Tope	*MTOC (non-A5)*
Dan Verdonik	*HTOC (non-A5)*
Masaaki Yamabe	*TEAP Senior Expert, previously CTOC (non-A5)*
Shiqiu Zhang	*TEAP Senior Expert (A5)*

In considering the composition of the Decision XXIV/8 TF, TEAP co-chairs discussed and agreed that there would be benefits to reconstituting the previous Decision XXIII/10 TF to carry out this further work. That group was balanced, providing coverage across all TOCs, and had developed experience in addressing the topic and in working together to prepare a response to that decision. All previous members expressed their interest and willingness to serve on the new TF. As required by the TEAP Terms of Reference (2012), the formation of the new TF was communicated, via the Ozone Secretariat, to the national focal points of the relevant parties.

TF work was conducted initially by electronic communication. Drafts were then circulated to all TEAP members, and discussed and reviewed during the TEAP meeting held in Moscow, April 9-13, 2013. The TF met for one day immediately after the TEAP meeting (April 14, 2013) to wrap-up conclusions and make progress towards the finalisation of the report.

3 TOC expertise and balance

3.1 Background of TOC composition and structure

In assessing recommendations for the future configuration of TOCs, the TF found it useful to review the historical conformation and configuration of the TOCs that have operated over the years.

3.1.1 A retrospective: 1989 - 2012

Once the Montreal Protocol was agreed to in 1987, preparations were made to establish Assessment Panels to support the critical decisions facing Parties as scientific measurements of severe ozone destruction increased the pressure for concerted, global action on ozone depletion on even faster timeframes than agreed. Four Montreal Protocol panels were informally organized in The Hague at the October 1988 "UNEP Conference on Science and Development, CFC Data, Legal Matters, and Alternative Substances and Technologies." In 1989, at the first Meeting of the Parties to the Montreal Protocol (MOP), the Parties decided in Decision I/3: Establishment of Assessment Panel, to endorse the creation of four "Review Panels" in accordance with Article 6[1] of the Montreal Protocol: 1) the Panel for Scientific Assessment, 2) the Panel for Environmental Assessment, 3) the Panel for Technical Assessment, and 4) the Panel for Economic Assessment.

The technical assessment was then done under the Technology Review Panel, which consisted of the co-chairs of the Panel for Technical Assessment and four chairs and two co-chairs for each of the initial TOCs based on industry sectors of ozone depleting substance (ODS) use: Aerosols, Sterilants, and Miscellaneous Uses[2]; Flexible and Rigid Foams; Halons Fire Extinguishing Agents; Refrigeration, Air Conditioning and Heat Pumps; and Solvents, Coatings, and Adhesives.

The first 1989 assessment was based on work by the Technical Review Panel and the specific TOCs to support the discussions and decisions taken at the second MOP in London in 1990. An "Inter-Governmental Panel" (IGP) as the political supervisory body managed the first assessment. The IGP was minimally involved in the drafting of the first Synthesis Report and mentioned at the Second Meeting of the Open-Ended Working Group in November 1989. The Parties did not appoint a supervisory body for the subsequent assessment reports of the panels. The reports of the panels are published and distributed to Parties without any change or political review.

After 1990, the Technology and Economic Panels were united into the TEAP, and the other panels re-labelled themselves the Scientific Assessment Panel (SAP) and the Environmental Effects Assessment Panel (EEAP). The next assessment supported the decisions taken at the 4th MOP in Copenhagen in 1992 (e.g., earlier phase-out dates, the inclusion of hydrochlorofluorocarbons (HCFCs), the assessment of methyl bromide issues). By this time, the TOCs already had a substantially increased membership in response to the requested work from the Parties. Also at that time, normal procedures for several TOCs included having a co-chair from a developing country. In 1992, when methyl bromide was listed as an ozone-depleting substance, a special Integrated Scientific and Technical Assessment of Methyl Bromide was written based on the outcome of a workshop in Washington D.C. Subsequently, the Methyl Bromide TOC was formed drawing many members from the workshop.

As of 1993, seven TOCs were established with the addition of the Economics Options Committee in 1990 and the Methyl Bromide TOC in 1993. Typical procedures included TOC co-chairs seeking out experts or Parties nominating experts to the TOCs, with TOC co-chairs making final decisions on their TOC's membership. In 1994, the sizes of the TOCs varied widely (including all corresponding

[1] Article 6 of the Montreal Protocol states "[beginning] in 1990, and at least every four years thereafter, the Parties shall assess the control measures…on the basis of available scientific, environmental, technical and economic information…the Parties shall convene appropriate panels of experts qualified in the fields mentioned and determine the composition and terms of reference of any such panels…the panels will report their conclusions, through the Secretariat, to the Parties."

[2] Renamed in 1991 to Aerosols, Sterilants, Miscellaneous Uses and Carbon Tetrachloride Technical Options Committee (ATOC)

members). In this way, assessment reports were prepared and published in 1994 (and every four years thereafter).

Based on a proposal by Switzerland, the Seventh MOP in 1995 appointed an informal advisory group on the organization and functioning of the TEAP. This group recommended that the number of experts from Article 5 Parties and countries with economies in transition (CEITs) on the panels and the TEAP's TOCs should be increased to 50 per cent. It also recommended detailed terms of reference for the TEAP and its TOCs.

The 1996 Terms of Reference (TOR) for TEAP and TOCs established the structure, working procedures and gave indications for the size of the TEAP and for the different TOCs. The new TOR were adopted as Annex V of the report of the Eighth MOP, as amended by Decision XVIII/19. The new TOR guided TEAP and TOC operations and effectively kept the sizes of the various TOCs over the years to about 25-35 (with the Economics Options Committee being much smaller). A summary of historic TOC membership at the time of the publication of the assessment reports is provided in Table 1-1 below.

Table 1-1: Historic TOCs membership per assessment

TOCs	TOC Membership per Assessment															
	1989		1991		1994		1998		2002		2006		2010		2014	
	A5/CEIT	NA5	A5/CEIT	NA5	A5/CEIT	NA5	A5/CEIT	NA5	A5/CEIT	NA5	A5/CEIT	NA5	A5/CEIT	NA5	A5/CEIT	NA5
STOC/CTOC*	0	17	5	30	8	34	10	21	7	17	9	12	8	8	7	8
Subtotal	**17**		**35**		**42**		**31**		**24**		**21**		**16**		**15**	
FTOC		15	2	26	4	24	6	15	5	19	6	14	5	13	7	11
Subtotal	**15**		**28**		**28**		**21**		**24**		**20**		**18**		**18**	
HTOC	7	12	4	22	9	24	7	12	5	13	9	10	8	12	10	11
Subtotal	**19**		**26**		**33**		**19**		**18**		**19**		**20**		**21**	
ATOC/MTOC**	3	10	5	16	4	28	10	24	9	23	7	17	11	17	11	18
Subtotal	**13**		**21**		**32**		**34**		**32**		**24**		**28**		**29**	
MBTOC					11	56	13	26	11	22	15	30	12	27	13	18
Subtotal					**67**		**39**		**33**		**45**		**39**		**31**	
RTOC	5	43	12	94	15	95	12	36	12	25	13	20	7	20	13	25
Subtotal	**48**		**106**		**110**		**48**		**37**		**33**		**27**		**38**	
EOC***			6	10	6	7	6	8								
Subtotal			**16**		**13**		**14**									
TOTAL	**112**		**232**		**325**		**206**		**168**		**162**		**148**		**152**	

*Solvents, Coatings, and Adhesives TOC (STOC) then in 2005 became the Chemicals TOC (CTOC)

**Aerosols, Sterilants and Miscellaneous Uses TOC renamed in 1991 to Aerosols, Sterilants, Miscellaneous Uses and Carbon Tetrachloride TOC (ATOC), then in 2004-5 became the Medical TOC (MTOC)

***Economics Options Committee (EOC) dissolved in 2001 and expertise since represented on TEAP through a Senior Expert Member

As the table shows, additional changes in the TOCs structures have taken place as TEAP and its TOCs have conducted on-going review of its membership and needed expertise over the years. Spikes in membership numbers have necessarily come at key times of decision making by the Parties or critical compliance periods for phase out under the Protocol. Such events include preparing for the early phase out of halon production, the adoption of phase out dates for methyl bromide, the initial rounds of CUN assessments, or the accelerated phase-out of HCFCs.

After the 2001 TEAP meeting, the Economics Options Committee was dissolved as a committee with the resident expertise now on the TEAP through senior expert member(s) that could advise all TOCs as needed. In 2005, the current Chemicals TOC and in 2006 the Medical TOC were formed from the former Solvents and Aerosols TOCs respectively to provide the six current TOCs: Chemicals

(CTOC), Flexible and Rigid Foams (FTOC); Halons (HTOC); Medical (MTOC); Methyl Bromide (MBTOC); and Refrigeration, Air Conditioning and Heat Pumps (RTOC).

3.1.2 Reviewing progress and looking forward

TEAP and its TOCs were organized to determine how to phase out ODS in the various sectors of use. Founding members were recruited and selected carefully: qualified, respected, influential, independent, and motivated to achieve the phase-out of ODSs. Structured differently from the IPCC and other UN panels, TEAP was provided significant flexibility to assess and describe the technology way forward[3].

Parties to the Montreal Protocol and founding members of TEAP and its TOCs shared a common interest on actions to protect the ozone layer. Founding members were drawn primarily from government agencies and NGO associations and research institutes committed to ozone layer protection, from companies pledged to phase out ODS, and from standards and military organizations that would need to remove barriers and construct bridges to the new technology. Outside of their TEAP/TOC work, some members were instrumental in crafting regulations, standards, and global partnerships. Some members were instrumental in on-the-ground phase-out technology demonstration and training activities.

In 25 years, the advice of TEAP and its TOCs has mostly been proven both accurate and timely: innovation and emerging technologies received objective review, EUNs and CUNs have been approved after thorough evaluation and nominations have decreased from year to year. The transition has been relatively smooth from the perspective of consumers. Over time, TEAP and the TOCs invariably faced the challenge of retaining the needed expertise and balance as some of their members became less directly engaged to the sectors and emerging technologies that originally qualified and sponsored their TEAP and/or TOCs membership. Fewer are now developing and implementing the latest technology directly. All of which makes consideration of the wider use of corresponding members and/or consulting experts important to retaining the needed expertise. The shift to transition activities to Article 5 Parties has not been reflected in the TEAP and its TOCs, as membership of needed expertise from Article 5 Parties remains a challenge.

The common interest and goal of the Parties and the members of TEAP and its TOCs remains the completion of the phase-out of ODSs under the Montreal Protocol and ensuring the recovery of the ozone layer, while minimizing other impacts to human health and the environment. The challenge is ensuring that the TOCs are structured in size and expertise to continue supporting these future efforts of the Parties.

3.2 Expertise

As discussed in the previous TEAP Decision XXIII/10 Task Force Report, TOC co-chairs are continually reviewing and recruiting new members to satisfy TOC requirements for expertise and balance. TOC co-chairs solicit widely for new members. Parties are an important source of nominations, and TOC co-chairs also look for qualified candidates through recommendations from existing TOC members, presentations at research conferences, recommendations from experts, professional and academic organizations, and other sources. Appointments can happen throughout the year, particularly when existing members retire from a TOC, or when a lack of expertise is identified. More commonly, this review of TOC membership balance is done after the completion of a TEAP progress report or task force report. The TOC co-chairs refresh their TOC membership in preparation for Assessment Reports, undertaken every four years, by managing the addition or removal of experts as assessment needs change.

[3] UNEP, "Report of the Task Force on Continuing TEAP Legacy," April 2007.

In response to the challenge of ensuring that the TOCs are structured in size and expertise to continue supporting the future efforts of the Parties, the TEAP has used Corresponding Members and Consulting Experts as a means to obtain and/or retain the needed expertise. Over the years, various TOCs have had experience with committee members that have participated as Corresponding Members only and also with the use of Consulting Experts on their Committees. Both positions are described in further detail below. The experiences with these positions are further discussed in Chapter 4 on TOC configurations.

3.2.1 Corresponding Members and Consulting Experts

A Corresponding Member is a member of the committee (i.e., nominated in full consultation with the national focal point of the relevant party and appointed by the TOC co-chairs for a period of no more than four years) who participates solely by electronic/telephonic means and will not attend any physical meetings of the TOC. This is not to diminish or reduce their role in comparison with members that can attend physical meetings. Instead it is a means to maintain the needed expertise on the TOCs while minimizing time and other costs associated with their work.

As has been reported previously, it is increasing difficulty for non-Article 5 TOC members to get support to attend meetings of the TOCs. In addition, the workload of some TOCs is also expected to significantly decrease, for example as CUNs and EUNs decrease over the next few years. In both these cases, it is becoming beneficial to consider alternatives means of TOC member participation to ensure retaining adequate expertise on the committees. One way is to expand the use of Corresponding Members, who would, except for not attending physical meetings, be in all other ways the same as any other committee member.

An important consideration with using Corresponding Members is to ensure that they are able to participate fully in the deliberations of a physical committee meeting. Full participation is a prerequisite in order to participate in developing or blocking a consensus. There are some electronic means that may allow participation such as Skype and conference calls and these are being used by some TOCs as well as the TEAP. It is recognized, however, that these technologies are not nearly the same as being present at a meeting. Therefore, it is necessary for the co-chairs to ensure that each Corresponding Member is both able to fully participate and is fully participating in the discussions/deliberations. Decisions on full participation need to be made by consensus of the co-chairs.

A Consulting Expert, on the other hand, is not a member of the committee and is generally available or may be called upon to participate in committee discussions or activities as needed. They may participate in physical meetings or they may participate through electronic/telephonic means only. Consulting Experts do not participate in decision-making. As much as possible, TOC co-chairs strive to recruit and retain the needed expertise as members of the committee but when that is not possible, they may supplement the expertise with Consulting Experts.

3.2.2 Update of matrices of current and needed expertise

As required in the TEAP TOR, the matrices of current and needed expertise of the TEAP and its TOCs is updated annually and provided on the TEAP website[4]. For the information of Parties, the updated matrix of needed expertise (as of April 2013) is highlighted below in Table 1-2.

[4] http://montreal-protocol.org/new_site/en/teap_experts_required.php

Table 1-2: TOC current openings for qualified experts valid to 2013

Body	Required Expertise	Position(s)
Chemicals TOC	Experts in destruction technologies	A5 and non-A5
	Experts in industrial chemistry or chemical engineering	A5 and non-A5
Foams TOC	Regulatory expertise and additional polyurethane foam expertise from North America (both in appliances and PU Spray Foam)	Members, from North America particularly from CEIT , Asia, Japan and Africa
	XPS representation from Europe	From Europe
	South Asia representation on PU and/or XPS foam representation	From South Asia
	Japan PU and/or XPS representation	From Japan
	South East Asian representation on PU foams representation	From South East Asia
	Sub-Saharan Africa representation on PU representation foams	From Sub Saharan Africa
Halons TOC	Aviation User - China Airframe manufacturer; Airline from other highlighted regions	A5 and non-A5
	General Fire Protection New Chemical Alternatives – China and/or India	A5
	Banking Inventories - Particularly China and other Asia; Northern Africa also helpful	A5
	China - Regional knowledge (ties to Inventories and New Chemicals)	A5
	Defence / Space Users - Europe	Non-A5
	Environmental Regulatory / Policy - One A5 or if two: one A5 and one non-A5	A5 (and non- A5)
Medical TOC	Additional sterilants expert from the suppliers of ethylene oxide, with experience in usage and demand.	Member probably from non-A5 where this specific expertise is concentrated.

Body	Required Expertise	Position(s)
Methyl Bromide TOC	Quarantine and pre-shipment Issues related to the validation of alternatives to MB for certification of nursery plant materials related to movement across state and international boundaries and related risk assessment Expert on strawberry fruit production with MB alternatives Expert on alternatives to MB for pre-plant treatment in A5 Parties Expert in economic assessment of alternatives to MB Postharvest entomologist	A5 particularly for QPS from Asia. Non-A5 from EU Alts for Soil preplant fumigation expertise Economist A5
Refrigeration TOC	Low Global Warming Potential (GWP) Alternative Refrigerants application in RAC equipment (mainly commercial refrigeration and unitary air conditioning) Technical risk assessment, product safety and product technical regulatory compliance related to the use of flammable refrigerants Equipment design and testing using low-GWP refrigerants	Members from A-5 and preferably from non-A5 Parties (because the expertise is being built up now, and balance needed)

3.3 Geographical and gender balance

As TOC co-chairs continue reviewing and recruiting new members to satisfy TOC requirements for expertise, TOC co-chairs strive to achieve a 50:50 balance between experts from A5 and non-A5 Parties, as well as gender and regional balance. Parties can assist TEAP and the TOCs in achieving geographical and gender balance through nominating qualified new experts.

Present membership of the TOCs is presented in tables 1-3 and 1-4 below.

Table 1-3: Regional Distribution of TOCs in 2013

	Non-A5	A5/ CEIT*	Regional Distribution**							
			NAM	LAM	E	AF	MEA	EE	A	O
CTOC	8	7	3	1	2	1	1	1	5	1
FTOC	11	7	4	2	5	1	1	1	2	2
HTOC	11	10	4	2	6	1	3	1	4	0
MTOC	18	11	7	3	8	1	1	0	7	2
MBTOC	18	13	7	4	6	4	1	1	5	3
RTOC	25	13	8	4	17	1	2	0	6	0
Total	**90**	**61**	**33**	**16**	**43**	**9**	**9**	**4**	**29**	**8**

* CEIT – (former) Countries with Economies in Transition. We are aware that some former CEIT Parties have been reclassified as A5 Parties, some have joined the EU, and others are in various candidate statuses for EU membership; for the purposes of this report, we are following historical precedent to group former CEIT and A5 Parties together and will follow the revised classifications of former CEIT Parties in future reporting.

** NAM: North America, LAM: Latin America, E: Europe, AF: Africa, MEA: Middle East Asia, EE: Eastern Europe, A: Asia, and O: Oceania

Table 1-4: Gender Distribution of TOCs in 2013

	CTOC	FTOC	HTOC	MTOC	MBTOC	RTOC
Total members	15	18	21	29	31	38
Female	4	1	2	4	5	0
Male	11	17	19	25	26	38

4 On the future configuration of TOCs

4.1. Mandate

Decision XXIV/8 requests the Technical and Economic Assessment Panel (TEAP) to,

> *"…make recommendations on the future configuration of its technical options committees to the Open-Ended Working Group at its thirty-third meeting, bearing in mind anticipated workloads;"*

In addition, requirements for the configuration of TOCs are contained in TEAP's TOR. With regard to size and balance, paragraph 2.1.0 states,

> *"The overall goal is to achieve a representation of about 50 per cent for Article 5(1) Parties in the TEAP and TOCs and appropriate representation of expertise in the different alternatives."*

Paragraph 2.1.2 of the TOR gives further instructions to TEAP on the composition and balance of its TOCs as follows:

> *"Each TOC should have two co-chairs. The positions of TOC co-chairs must be filled to promote a geographical, gender and expertise balance. TEAP, through its TOC co-chairs, shall compose its TOCs to reflect a balance of appropriate and anticipated expertise so that their reports and information are comprehensive, objective and policy-neutral".*

Also, Paragraph 2.5 addresses TOC size and duration of appointment of TOC members:

> *"Each TOC should have about 20 members. The TOC members are appointed by the TOC co-chairs, in consultation with TEAP, for a period of no more than four years. TOC members may be re-appointed following the procedure for nominations for additional periods of up to four years each".*

4.2 Assumptions and issues considered

The Task Force considered the following as the basis for its response to this request by the Parties:

- The term "future configuration" left it to TEAP and its TOCs to consider the applicable periods when likely changes in configuration of each TOC would occur;
- The term "configuration" could be applied to the membership as well as operation of a TOC;
- TEAP believes that A5 and non-A5, gender, and regional balance can be improved to comply with the Decision of Parties while retaining and recruiting the needed technical expertise based on anticipated issues to come before the Parties;
- Recommendations for future TOC configurations are based on the current phase out scenario under the Protocol; any significant changes would necessarily require a re-evaluation of these recommendations.

The framework of the Montreal Protocol is unique in its focus and success in addressing the global environmental threat of ozone depletion. A significant part of this success has been the sound science- and technology-based decision making of the Parties. This has allowed timely adjustments and amendments to the Protocol when emerging threats as well as opportunities present themselves.

For over 25 years, the Parties have relied on TEAP and its TOCs of renowned experts in all sectors of use, from many countries around the world, volunteering their time, knowledge, and experience to the goals and the work of the Protocol. Today, over 150 experts serve on the TEAP and its TOCs and

subsidiary bodies. Since its creation, over 900 experts from about 65 countries have participated in the assessment process[1]. In producing their quadrennial assessment reports for Parties, the members of these TOCs have documented the successes and challenges of the Protocol, sector by sector. In its reports to Parties, the TOCs provide objective, policy-neutral, technical and economic review of issues.

The mission of each TOC has evolved as the phase-out under the Protocol has progressed. In the same way, each TOC's membership has also evolved over the years reflecting the issues faced by that TOC and the expertise needed to address these. The challenges to both retain, and to recruit the needed expertise of these volunteers on the TOCs continues as TOC co-chairs consider future workload.

Below are narratives for each of the TOCs describing their mission, challenges, and recommendations for future configurations to best address their envisioned workload and their continued ability to address issues important to the decisions of the Parties under the Protocol.

4.3 Recommendations for future configuration

Table 1-5: Summary of estimated future TOCs membership

	2013/2014	2014-2018	Post-2018
CTOC	15	~17	~5
FTOC	18-24	18-24*	12-18**
HTOC	21	~15	~10-15
MTOC	28-29	~10-14***	~1-4
MBTOC	31	~20 – 25	~20 – 25
RTOC	38	35-40	35-40

* One third Corresponding Members

** Two thirds Corresponding Members

*** Four corresponding sterilants members, 21-22 metered dose inhalers (MDI) members (one Article 5 member has retired immediately after 2013 MTOC meeting), and three co-chairs, decreasing to a total of 10-14 corresponding members, including four sterilants members, early during this period around 2014-2015.

4.3.1 Chemicals Technical Options Committee

4.3.1.1 Current composition

Current membership is 15 (8 from non-A5 and 7 from A5 Parties and CEIT), with a fairly good regional spread as shown in Table 1-6.

[1] UNEP, "Report of the Task Force on Continuing TEAP Legacy," April 2007.

Table 1-6: CTOC 2013 membership profile

	Non-A5	A5*	Gender		Regional Distribution**							
			M	F	NAM	LAM	E	AF	MEA	EE	A	O
CTOC	**8**	**7**	**11**	**4**	**3**	**1**	**2**	**1**	**1**	**1**	**5**	**1**

* A5 including CEIT, **NAM: North America, LAM: Latin America, E: Europe, AF: Africa, MEA: Middle East Asia, EE: Eastern Europe, A: Asia, O: Oceania

4.3.1.2 Mission and general scope of work

In early 2005, TEAP completed the organization of the CTOC to integrate topics including process agents, feedstock, laboratory and analytical uses, non-medical aerosol products, solvents, carbon tetrachloride (CTC) issues, and destruction. The starting members were selected from former Solvents TOC, Aerosols TOC and Process Agent Task Forces. They consisted of four from A5, and 12 from non-A5 Parties including two co-chairs from non-A5 Parties.

In 2005, five new A5 members were recruited including a new co-chair from an A5 Party. Over the next few years, four non-A5 members resigned and one was unable to attend meetings due to funding problems. One A5 member resigned and another passed away. In 2012, a new non-A5 member was appointed. CTOC also includes Consulting Experts who are retired, former members of the CTOC. Although they are no longer members, the Consulting Experts of CTOC are an important resource, providing their expertise and contributions to the activities of CTOC as requested by the Committee.

The current assignments of the CTOC include:

- Reviewing ODS process agent uses and emissions (mainly carbon tetracholoride (CTC));
- Reporting on feedstock uses and emissions of ODSs;
- Assessing EUNs for solvents; surveying ODS solvents including n-Propyl Bromide;
- Studying discrepancy between top-down and bottom-up CTC emission estimates;
- Reviewing laboratory and analytical uses of ODS; and
- Assessing destruction technologies.

As CTOC covers a wide range of application fields, various kinds of expertise are necessary even though each field is not so significant. Table 1-7 summarises the expertise required for CTOC.

Table 1-7: Required expertise for CTOC

Expertise	Solvent	Process Agents & Feedstock	Propellant	Laboratory & Analytical uses	Destruction
ODS & Alternatives	AA		AA	AA	
Applications	AA		AA		
Organic Chemistry		AA		AA	
Analytical Chemistry				AA	
Engineering		AA			AA
Manufacturing Process	AA	AA			
Destruction Technology					AA
Environmental Chemistry	A	A	A	A	A
Regulation	A	A	A	A	A
Economics	A	A	A	A	A

AA: Higher level, A: Medium level

4.3.1.3 Expected workload – 2013/2014

The current configuration of CTOC meets well for the present and anticipated workload in 2013/2014 Assessment. The number of members remains smaller than the suggested minimum number of 20 in the TOR but the current membership could fully respond to the requested missions.

Most members wish to renew their appointments by 2014. A member from India will need to be replaced, and the Indian government has been contacted about a successor. One of the co-chairs from a non-A5 Party is unlikely to continue beyond 2013. The third co-chair would be desirable taking into account of regional and expertise balance.

4.3.1.4 Expected workload – 2014- 2018

The future workloads of CTOC could be focused as follows:

- Solvents
  - To assess the technical and economic feasibility of the phase out of HCFC solvents in A5 Parties
  - To review low and ultra-low GWP alternatives
- Process Agent & Feedstock
  - How to handle CTC technical and economic issues
  - To assess the technical feasibility of phasing out process agent and feedstock uses

- Laboratory & Analytical Use
  - To review of alternative methods and their promotion if Parties request
- Destruction
  - To assess emerging technologies

It is desirable to get more members with industry experience for the future workloads. However, it seems hard to recruit members from non-A5 Parties, partly because of their need to gain financial support. Members could be sought from A5 Parties where there is chemical industry, such as Republic of South Africa, Republic of Korea, Brazil and others in consideration of gender balance.

4.3.1.5 Expected workload – post 2018

It is difficult to anticipate the future missions of TOCs in post 2018, but the EUNs will be getting smaller and smaller as environmentally friendly and economically feasible alternatives including low GWP hydrofluorocarbons (HFCs) will be introduced into markets in the near future.

The assessment of emerging destruction technologies as well as issues related to CTC will remain as key issues under the Montreal Protocol. Taking these trends into consideration, estimated CTOC membership will be within 5 in the post-2018 period.

4.3.2 Flexible and Rigid Foams Technical Options Committee

4.3.2.1 Current Composition

As noted in Section 3.1, the FTOC is activity seeking to broaden its membership at this current time. At least six specific gaps have been identified and, if filled would essentially increase the membership from 18 to 24. This has been reflected in Table 1-5 (above). The configuration of the current FTOC is as follows:

Table 1-8: FTOC 2013 membership profile

	Non-A5	A5*	Gender		Regional Distribution**							
			M	F	NAM	LAM	E	AF	MEA	EE	A	O
FTOC	11	7	17	1	4	2	5	1	1	1	2	2

*A5 including CEIT, **NAM: North America, LAM: Latin America, E: Europe, AF: Africa, MEA: Middle East Asia, EE: Eastern Europe, A: Asia, O: Oceania

There is on-going concern about the gender balance within the Committee, but it largely reflects the scarcity of expert females within the foam sector. One potential way to redress this balance could be through the addition of regulatory expertise, which has been missing for some years.

4.3.2.2 Mission and General Scope of Work

The FTOC is only rarely confronted with the need to assess specific applications and has never been asked to consider a formal Essential Use Nomination. Consequently, the FTOC has been focused throughout its history on the provision of technical and economic information on the foam sub-sectors in question, the alternatives available to support transitions away from ODS and, more latterly, the avoidance of other high-GWP greenhouse gases as long-term blowing agents.

Foams made with ODS blowing agents have been used historically for a wide variety of applications including flexible foams for furniture and automotive uses, as well as for insulation applications. As transitions have taken place, the use of high-GWP ODS-substitutes has become more focused on areas

where the physical properties impart performance benefits – most notably improved thermal performance in insulation foams.

In view of the energy efficiency dimension of foam use as a thermal insulation material, the environmental assessments have often needed to be holistic, both with domestic appliances and buildings. In addition, because of the low emission of blowing agents from foams and their long lifetimes, the issue of ODS and greenhouse gas (GHG) banks has become an increasing focus of attention for the Committee over time. This has also led to greater consideration of end-of-life management options and increasing overlaps with TEAP Task Forces working on collection, recovery and destruction activities.

The foam sector continues to grow in both size and complexity as the emphasis in buildings increasingly shifts towards renovation measures to complement insulation in new constructions. The drivers for growth are energy security and climate change mitigation. With ODS use completely phased out in non-Article 5 Parties, there is likely to be little focus on these regions within future FTOC activities (other than to track growth in banks and emissions) unless the TEAP is asked to assess the technical and economic feasibility of potential saturated-HFC phase-down measures. Until such time, the focus of the FTOC will be on the remaining transitions from ODS to be conducted in Article 5 Parties under the various HCFC Phase-out Management Plans. This will also involve the monitoring and assessment of new alternatives being introduced into the market, some of which may not have been substantially commercialised in non-Article 5 Parties prior to their use in Article 5 regions. Amongst the most significant of these is likely to be the unsaturated HFCs (HFOs).

This scenario heightens the need for a more comprehensive representation of Article 5 experts within the Committee. It also confirms that non-Article 5 experts might be able to take a less active role. This will be particularly appropriate since travel funding for non-Article 5 participants has become an increasing burden over recent years. However, the FTOC co-chairs are particularly keen to see that the expertise of the non-Article 5 members is not lost and would actively encourage their retention as Corresponding Members, with appropriate reference to guidance on consensus procedures and other related governance factors.

4.3.2.3 Expected workload – 2013/2014

The workload for this period is already characterized by two important reports. The first is the foam sector input into the TEAP Task Force Report in response to Decision XXIV/7. This is already involving a significant sub-set of the FTOC and work is expected in finalisation and follow-up for the remainder of 2013. This also will provide important further preparatory materials for the 2014 Assessment Report. This Assessment Report is expected to follow the outline of earlier Reports in that it will review the alternatives available (both current and emerging), the progress in HCFC phase-out and any barriers to transition, the patterns of alternative selection and the impacts of these selections on future banks and emissions. The best outcomes will arise from this Report if the FTOC co-chairs can be successful in securing the additional members highlighted in Section 3.1.

4.3.2.4 Expected workload – 2014-2018

The commercialisation of a number of key alternatives is currently planned for the 2014-2015 period and the implications for HPMP implementation will be a critical area for further input to the Parties from the FTOC in the 2014-2018 timeframe. During this period, the input from non-Article 5 Parties will be important, but is anticipated to be managed from distance via Corresponding Members. These will typically be members whose ability to travel has been eroded or who are entering a stage of (semi) retirement. It will remain difficult to recruit any new non-Article 5 members (corresponding or not) unless their sponsors have a direct interest in technology solutions. Such an interest, if fully disclosed and managed, is not seen to act as a barrier to membership, subject to the agreement of the relevant Party.

4.3.2.5 Expected workload – post 2018

There is an understanding that the majority of foam transitions will take place in the first phase of most HPMPs as HCFC-141b use is targeted first. This means that only the more challenging sectors will be left for the second phase (post 2015). It is expected that the structure of the FTOC will need to be retained in the post-2018 period, although it may be possible to increase the proportion of Corresponding Members still further. This is reflected in Table 1-5. It may even be possible to focus foam representation within TEAP at the TOC co-chair level at that time and have the total FTOC membership as Corresponding Members. All significant transitional issues would be expected to be complete by 2022 unless there are further changes to the scope of the Montreal Protocol requiring additional steps.

4.3.3 Halons Technical Options Committee

4.3.3.1 Current composition

The current configuration of the HTOC is 21 members as shown in Table 1-9.

Table 1-9. : HTOC 2013 membership profile

	Non-A5	A5*	Gender		Regional Distribution**							
			M	F	NAM	LAM	E	AF	MEA	EE	A	O
HTOC	**11**	**10**	**19**	**2**	**4**	**2**	**6**	**1**	**3**	**1**	**4**	**0**

*A5 including CEIT, **NAM: North America, LAM: Latin America, E: Europe, AF: Africa, MEA: Middle East Asia, EE: Eastern Europe, A: Asia, O: Oceania

As discussed in Section 3.1, HTOC is seeking to strengthen its expertise related to civil aviation uses and at least maintain its current capabilities for global and regional banking issues of supplies, availability and quality, which may alter the configuration from that provided in Table 1-9.

The HTOC is aware of the disparity in gender representation on the committee. In a large part, this is a result of a gender bias within the industry itself. The HTOC co-chairs have continuously sought to reduce the disparity.

4.3.3.2 Mission and general scope of work

As the first sector to phase out of production and consumption in non-Article 5 Parties, the HTOC was intimately involved in developing and then applying the Essential Use criteria in Decision IV/25. The committee evaluated the first set of EUNs submitted and was able to recommend not approving any of them owing to the existence of sufficient quantity and quality of recycled halons. This was a direct result of the efforts of many committee members to make banking and the re-use of halons a viable option in lieu of essential use production. The committee remains dedicated to the goal of avoiding EUNs of halon and continues its efforts to ensure that banking and the re-use of halons remain a viable path forward while finishing the transition to alternatives. It is the opinion of the committee that that there remains a number of significant issues that will need to be tracked over the next 10 or more years.

The HTOC recognizes and has informed Parties that there remain unresolved issues in banking quality control, assessment of new technologies and civil aviation that will require substantial effort and evaluation for the foreseeable future.

The HTOC has had three co-chairs for much of its existence. In 1996, the HTOC appointed its first co-chair from a country with economy in transition (CEIT) in recognition of the unique needs and

issues of users of halon 2402. These users were mainly from within the former Soviet Union or countries that obtained military equipment and merchant ships from them. The committee is of the opinion that there remains a need to retain a co-chair with specific halon 2402 knowledge and contacts to ensure adequate coverage of the needs of those Parties still relying on halon 2402 for important uses including aviation and military. While the committee believes that its size could be reduced after the 2014 assessment, the committee also believes that there remains considerable workload in the future to ensure adequate quantity and quality of halon in the future, particularly for the aviation sector, to avoid Essential Use of halon. As such, the committee is mindful of the workload on its co-chairs and recognizes the need to either adequately fund two co-chairs or retain three co-chairs in order to spread out the management and administrative tasks that are the necessary for the committee to function, as it remains increasingly difficult to obtain adequate funding to support such activities.

The HTOC has used Consulting Experts for many years. Their purpose is to provide additional or non-routine expertise for the committee that may not otherwise be available through the committee membership. Consulting Experts are not members and do not need to be nominated by a Party. To manage potential conflicts of interest (COI), they are required to provide a Disclosure of Interests (DOIs) just like members, so that their potential COIs are known. The HTOC has always included them with the members' DOIs for posting to the UNEP/Ozone website, which is the recommended process should other TOCs begin to use them.

Generally, Consulting Experts are expected to provide inputs to reports by correspondence however, they would not necessarily be excluded from attending meetings if they can. If they do attend a meeting, they participate like a member in the discussions, but they do not participate in decision-making. In managing their participation, it is routine to copy them on all committee documents being worked on and to seek their input except where there is a potential COI. As is also true for members, the co-chairs need to manage potential COIs and fully or partially recuse the Consulting Expert(s) from participation if needed. At the discretion of the TOC co-chairs, Consulting Experts may serve only for a specific product/report or they may operate on a voluntary 'retainer' basis ready to support the TOC if needed. In compliance with the Parties wishes for term limits, Consulting Experts need to be agreed by the TOC co-chairs annually coinciding with the submission of their DOI.

4.3.3.3 Expected workload – 2013/2014

The civil aviation sector continues to rely on halon for all in-production aircraft. While some small success is being made in eliminating the use of halon in lavatory waste receptacle systems, the transition out of halon has a long way to go. In light of the recent failures in identifying suitable, low GWP alternatives to halon in engine /auxiliary power unit applications, the HTOC will need to continue to work with the Civil Aviation Organization (ICAO) to monitor and affect the progress in the aviation sector.

While on a global basis, the committee believes that there could be sufficient supplies of halon to meet the civil aviation sector needs for the economic lifetimes of aircraft designed and produced with halon as well as other on-going uses such as oil and gas production in arctic regions, there is growing evidence that much of the halon may be too contaminated to use economically locally. For example, it may be so contaminated that it requires an expensive, sophisticated distillation process to bring it back to the purity necessary for re-use. Such equipment is very limited in geographic availability. In addition, there is also growing evidence that some countries are prohibiting the export of halons thereby reducing its value and increasing the chance that it will get emitted to the atmosphere. The committee recognizes that without continued care of the halon bank, it is still possible that Essential Use of halons will be needed to support on-going, long-term uses. In addition to the current work with ICAO, HTOC members continue to assess and work actively within fire protection, consensus organizations, environmental regulatory bodies, etc., to resolve supply and quality issues. The committee will continue to monitor and report on these issues.

4.3.3.4 Expected workload – 2014- 2018

The HTOC foresees a need to retain a significant portion of the current expertise but also sees opportunities to reduce the overall size of the committee. There are three new low-GWP agents that are currently in various states of development: two for streaming agents to replace halon 1211 and one total flooding agent to replace halon 1301. Owing to the lengthy process of testing, approval, and market acceptance of new fire protection equipment types and agents, it is anticipated that the effect of these new agents will just begin to be observed within this time period and that the committee could begin but not yet fully assess their viability as halon alternatives. The committee will need to continue to work with the ICAO to monitor and affect progress in the civil aviation sector. Since the ICAO General Assembly occurs only once per three years, it is anticipated that the HTOC will be needed to provide technical assessment and assistance to develop additional changes to the Chicago Convention during 2015 – 2016 for consideration during the 2016 ICAO General Assembly. As previously reported to the Parties, the HTOC is concerned that the civil aviation sector does not possess the halon that they will need to support aircraft that will continue to rely on halons for the foreseeable future. The HTOC will continue to work with the ICAO and its stakeholders to reduce the likelihood of a shortage of halon for the civil aviation fleet. Additionally, HTOC will continue to assess and work actively within fire protection, consensus organizations, environmental regulatory bodies, etc., to resolve supply and quality issues in order to avoid the likelihood of an Essential Use of halons.

The issue of halon quality is becoming more important. As the banks become older, the likelihood of significant contamination is increasing. Although, with the proper equipment, almost all halon can be reclaimed to adequate purity levels, the equipment and infrastructure required to reclaim a significantly larger percentage of the available halon is very expensive and not available in most regions of the world. The committee plans to increase its capabilities within the civil aviation sector and to retain adequate expertise in agent/system technologies, standards, halon distribution, banking options, global, regional, and local markets, emissions and regulations. Even so, the committee believes that after the 2014 assessment, the needed membership level will decline over the following few years by approximately 25%.

4.3.3.5 Expected workload – post 2018

The committee foresees much of the same type of work post 2018 as for the 2014-2018 period. In this regard, the halon sector is quite different than the other sectors. It is foreseeable that aircraft will continue to be produced that require halon for the initial and lifetime support well beyond 2018. Due to a lack of halon of sufficient quality, it is possible that an EUN will be submitted that the Parties may wish the HTOC to review and assess. The likelihood of an EUN will increase as the age of the halon bank increases. HTOC is working with the civil aviation sector to try to prevent this. It will likely need to continue to work with the ICAO to monitor and affect the progress in the aviation sector, and to help develop and defend additional changes to the Chicago Convention during 2018 – 2019 for consideration during their 2019 General Assembly. HTOC will also monitor progress on the new low-GWP agents to assess their impact. The committee believes that after the 2018, the needed membership level may be able to decline further, closer to its original size in 1989. The HTOC anticipates the use of Consulting Experts should unpredicted issues become important and for topics infrequently needing assessment.

4.3.4 Medical Technical Options Committee

4.3.4.1 Current composition

Current composition of the MTOC appears in Table 1-10 below.

Table 1-10: MTOC 2013 membership profile

	Non-A5	A5*	Gender		Regional Distribution**							
			M	F	NAM	LAM	E	AF	MEA	EE	A	O
MTOC	**18**	**11**	**25**	**4**	**7**	**3**	**8**	**1**	**1**	**0**	**7**	**2**

*A5 including CEIT, **NAM: North America, LAM: Latin America, E: Europe, AF: Africa, MEA: Middle East Asia, EE: Eastern Europe, A: Asia, O: Oceania

4.3.4.2 Mission and general scope of work

The MTOC evolved from the Aerosols, Sterilants, Miscellaneous Uses and Carbon Tetrachloride Technical Options Committee (and the Aerosols, Sterilants and Miscellaneous Uses Technical Options Committee beforehand), when ODS were no longer consumed for many miscellaneous uses, and laboratory and analytical uses and carbon tetrachloride was reconfigured into the CTOC in 2005. The committee has since focused on medical uses only (metered dose inhalers, other medical aerosol products and sterilants). Since 1994, the committee has annually reviewed nominations for essential uses of CFCs for MDIs, firstly for non-Article 5 Parties and CEIT, and since 2009 also for Article 5 Parties.

Many non-Article 5 Parties phased out the use of CFCs for MDIs in the early-mid 2000s. Large markets in Europe and the United States took longer to phase out than expected, with some companies still manufacturing CFC MDIs from stockpile in small quantities in 2013. Article 5 Parties have been much faster to phase out CFCs from MDIs, taking advantage of the lessons learned and access to intellectual property.

The committee has aimed to provide a consistent approach to its assessments of EUNs across nearly two decades of technical review. Consistency is considered important, especially in the shift from non-Article 5 to Article 5 Parties EUN assessments. Face-to-face meetings to consider nominations have proved to be the most efficient approach to assessments and for preparing consensus recommendations. The accumulated experience of the committee with EUN assessments is extensive, and an invaluable resource to Parties. The lessons learned by the committee in assessing nominations and understanding stockpile management in the final stages of phase-out are important factors in ensuring consistency during these last few years of transition from CFC MDIs to CFC-free inhalers. A consistent approach to assessments will keep the transition moving forwards steadily, without potential disruptions and delays caused by revisiting old issues in different ways, and by making confusing and/or inconsistent recommendations.

CFC MDI phase-out is expected to conclude around 2015-2016, with China expected to be the last Party to complete transition. EUN assessments are likely to conclude a year or so earlier in 2014 (or at the very latest 2015).

HCFC phase-out in sterilants is expected to take a little longer, until the end of this decade in non-Article 5 Parties and possibly a little longer in Article 5 Parties. Sterilants membership has operated as a wholly corresponding sub-group of MTOC since about 1996, contributing mainly to 4-yearly assessment reports.

As of April 2013, MTOC membership consists of 28 members, including three co-chairs, 21 MDI members (10 A5, 12 non-A5), four sterilants (four corresponding non-A5), and zero medical aerosols members (covered within existing membership). To date, one member (MDIs) has announced his retirement in March 2013, and two members have announced their retirement (MDI and sterilants) at the end of 2014.

As has been discussed, it is increasingly difficult for non-Article 5 TOC members to get support to attend meetings of the TOCs. In addition, the workload of MTOC is expected to significantly decrease as EUNs decrease over the next few years. MTOC has found it beneficial to consider alternatives means of member participation to ensure retaining adequate expertise and the most efficient methods of working. For example, MTOC's sterilants members are wholly corresponding members, working only electronically. They do not participate in physical meetings and still fulfil the functions requested by the Parties, as evidenced by the fact that they have worked effectively in this manner for about 15 years. They usually only participate in the quadrennial reports, although occasionally participate in special requests such as task force reports via correspondence. In addition, MTOC, as a whole, has managed to prepare quadrennial reports entirely via correspondence for the last two assessments, without the need for a physical meeting.

In the shorter term, MTOC aims to see through to completion global CFC MDI phase-out, which requires maintaining the accumulated wisdom and balance of the current membership to ensure a consistent approach. Once essential use assessments are concluded, the committee can operate entirely via correspondence. In the medium term, conclusion of the global CFC MDI phase-out will allow the committee to rationalize and reduce its MDI membership, with a refocus on sterilants and any continuing reporting on MDI issues. In the longer term, a smaller monitoring role is likely to be adequate in providing advice to Parties on any remaining topics (sterilants and continuing MDI issues).

In the medium term, during the period 2014-2015, amalgamation of MTOC with another TOC, such as CTOC, could be considered to manage a smaller group of corresponding sterilants and MDI experts. In the longer term, Parties may wish to consider the option of a Senior Expert Member for advice on sterilants and MDIs. Given the coverage of expertise, this option may require a few corresponding members to support the work of a Senior Expert Member. This would create a category of corresponding member who is unaffiliated with a TOC, which may require changes to TEAP's TOR.

4.3.4.3 Expected workload – 2013/2014

In 2013, MTOC met once to consider two EUNs and to plan its 2014 assessment. From 2014 onwards, the annual workload of MTOC is likely to be reduced with only one country likely to be nominating essential use exemptions for CFCs for MDIs. It is probable that MTOC will meet only once more in 2014 to review any EUNs, and to progress preparation of its 2014 Assessment report. A meeting may not be necessary if the workload can be managed electronically, which will be decided in early 2014.

Sterilants and medical aerosols other than MDIs are reviewed only at the quadrennial assessment via correspondence. MTOC plans a briefer 2014 Assessment compared with 2010, due to the maturity of alternative technologies for MDIs, sterilants, and medical aerosols.

Current expertise for CFC MDIs is adequate and remains necessary for this period. To ensure a consistent approach until CFC MDI phase-out in 2015-2016, during 2013-2014 MTOC will seek re-nomination and appointment of existing members that have indicated the willingness and capacity to continue. This level of MDI membership may only be required for a year or so while CFC MDI phase-out is concluded and a consistent approach is desirable. Some members are retiring already, which will reduce numbers slightly by the end of 2014. MTOC will also seek a sterilants expert from the suppliers of ethylene oxide, with experience in usage and demand.

4.3.4.4 Expected workload – 2014-2018

CFC MDI phase-out is expected to conclude during this period (2015-2016). Non-Article 5 Parties are likely to continue the phase-out of HCFCs in sterilisation. These changes would allow wholly corresponding membership from 2014-2015 onwards. Only a brief 2018 assessment report would be required to update progress with ODS phase-out in sterilisation, and document global CFC MDI phase-out.

A membership review would be launched to rationalise expertise and reduce membership in MDIs. One option would be to amalgamate membership into another TOC, such as CTOC, for example maintaining two sitting members on this committee who could be responsible for coordinating a small group of corresponding MDI and sterilants membership. However, the broad expertise required to service an amalgamated CTOC and MTOC might put pressure on total membership numbers. Transition to new arrangements might be appropriate during the period 2014-2015.

4.3.4.5 Expected workload – post 2018

Towards the end of this decade, HCFC phase-out in sterilisation will be completed in non-Article 5 Parties. The transition to ODS-free technologies in Article 5 Parties will depend on existing HCFC equipment lifetimes. During this period, Parties may wish to consider the option of a Senior Expert Member for advice on sterilants and continuing MDI issues. Given the coverage of expertise, this option may require a few corresponding members to support the work of a Senior Expert Member. This would create a category of corresponding member who is unaffiliated with a TOC, which may require changes to TEAP's TOR.

4.3.5 Methyl Bromide Technical Options Committee

4.3.5.1 Current composition

MBTOC consists of two clear technical disciplines with entomology and pathology skills, which are important for both controlled and exempted (QPS) uses of methyl bromide.

MBTOC was established in 1993 and by 1994 had a record high membership of 77. Since 1998 however, membership has been kept between 35 and 45 members. Recently, MBTOC numbers have decreased from a maximum of 43 in 2009 to the present 31 members. MBTOC has three distinct subcommittees, but all members can contribute to any subcommittee and only one report is signed by consensus of all members. Present Membership and A5/non-A5 balance appear in Table 1-11 below. MBTOC presently operates under the coordination of four co-chairs, two for Soils, one for QPS and one for SC.

Table 1-11: MBTOC 2013 membership profile

	Non-A5	A5*	M	F	Regional Distribution**							
					NAM	LAM	E	AF	MEA	EE	A	O
MBTOC– S	6	6	10	2	4	2	0	2	1	0	2	1
MBTOC – QPS	4	3	6	1	1	2	0	1	0	0	1	2
MBTOC - SC	8	3	9	2	2	0	6	0	0	1	2	0
Economist	0	1	1	0	0	0	0	1	0	0	0	0
TOC Total	**18**	**13**	**26**	**5**	**7**	**4**	**6**	**4**	**1**	**1**	**5**	**3**

*A5 including CEIT; ** NAM: North America, LAM: Latin America, E: Europe, AF: Africa, MEA: Middle East Asia, EE: Eastern Europe, A: Asia, and O: Oceania

MBTOC is aware of the fact that geographical and gender balance need addressing, and its co-chairs continually work on improving this; however, given that MBTOC is a committee providing technical advice, ensuring the best expertise as required for the appropriate completion of its tasks is the upmost priority.

4.3.5.2 Mission and general scope of work

MBTOC was established in 1993 to address issues related to MB phase-out, particularly technically and economically feasible alternatives to MB that could be adopted in both A5 and non-A5 Parties.

Over the years, MBTOC has been instrumental in providing the Parties with reliable and updated information on a wide range of issues relating to both controlled and exempted methyl bromide uses including research developments; issues related to the adoption and adaptation of alternatives (chemical and non-chemical); specific issues relating to A5 and non A5 Parties; MB consumption and production trends on a global and regional basis; registration of alternatives; and other important matters.

MBTOC members are active as researchers, academic faculty, technical consultants, commercial fumigators, trainers and speakers in countries and regions around the globe, who keep permanently abreast of new developments and trends. Through its wealth of expertise, MBTOC has decidedly contributed to the present state of reduced global MB consumption for controlled uses - which is about 12% of the global estimated 1991 baseline. Reported controlled consumption in A5 Parties at the end of 2011 was about 20% of the baseline, three years ahead of the phase-out deadline.

Continuing tasks that the MBTOC undertakes can be summarised as follows:

1. Produce a sound and relevant quadrennial Assessment Report on current uses of MB and alternatives, with updated data and analysis on production/consumption and efforts to achieve phase-out and elimination of emissions;

2. Report on progress in eliminating MB usage in all forms, including QPS;

3. Provide technical guidance to the Parties on CUNs; and

4. Provide technical guidance to the Parties on any issues that they deem to be relevant in relation to MB reduction and phase-out.

4.3.5.3 Expected workload – 2013/2014

Since 2003, when the first CUNs were submitted for MBTOC's consideration, reviews (which often include re-reviews after the Open-ended Working Group meeting (OEWG)) have decreased:

- In 2003, 116 CUNs were submitted for soils and structures and commodities (SC) uses combined, amounting to 16,700 t of MB.)
- In 2013 there are 3 CUNs under evaluation for soils (total of 409t requested) and 2 for SC (3.5t of MB.)
- A5 Parties submitted no CUNs in 2013 for MB use in 2015, but these can still be submitted one year in advance of phase-out, in 2014.

However, there is no deadline for ending CUNs under the Montreal Protocol and remaining issues with existing nominations tend to be very complex, demanding very thorough assessment. In addition, the requirements and tasks set out through past and present decisions of the Parties (including QPS) have increased the length and complexity of reports to Parties (150 – 600 pages per year). This has considerably increased MBTOC's workload.

The next quadrennial assessment is due in 2014 and MBTOC is already undertaking preliminary analysis with respect to its scope and focus. Two CUN Reports are required per year plus a Progress Report from each sub-committee (Soils, QPS and SC). MBTOC has no certainty of the workload from 2014 onwards in relation to CUNs but by early 2014 a clearer picture should be available particularly in relation to CUNs from A5 Parties. Present tasks require retention of experts in Soils, QPS and SC.

A reduction in membership has recently occurred with the resignation of four members, but a major review of membership is expected starting January 2014, when membership could be further reduced from 31 to around 25 in view of the reduced workload; expertise will be maintained and strengthened and efforts will be made to reach the goals of balanced geographical distribution and A5/non-A5 balance.

In doing this, MBTOC proposes to merge back into two sub-committees of about 10 – 12 members each: Soils and QSC (Quarantine, Structures and Commodities), under the coordination of three co-chairs. This is a reduction from the present number of four co-chairs; the number of co-chairs may be further revised down to two according to the workload resulting after 2014.

MBTOC-S co-chairs consider that about 75% of the existing expertise is suitable for preparing the 2014 Assessment report and the CUN review phase coming up in 2014, with some new members required once the sectors seeking CUNs are known. Expertise in pathology issues related to the strawberry fruit and general nursery production sectors (ornamentals, fruit trees and others besides strawberries) needs to be strengthened, including in the regulatory and phytosanitary requirements of nursery industries. According to CUNs received, additional experience may be needed in some specific sectors in A5 Parties including strawberry fruit and nurseries, ginger and melons.

In the SC sectors, an entomologist with A5 expertise from the Asia Pacific region may be required depending on CUN demands. Similarly, an A5 member from Asia with specific expertise on QPS issues and trade is desirable. There may be further Decisions asking for QPS information, which could increase the current workload of the proposed QSC subcommittee.

According to the nature of the CUNs submitted, MBTOC may need another economist in the future.

4.3.5.4 Expected workload – 2014-2018

It is extremely difficult to predict the workload in the period of 2014 to 2018. Progress Reports and the 2018 Assessment Report will most probably be required work from MBTOC, but it is virtually impossible to envision the CUN or QPS scenarios occurring at that time.

4.3.5.5 Expected workload – post 2018

As with section 4.3.4.4 above, it is impossible at this time to predict MBTOC's workload or scope of work after 2018.

4.3.6 Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee

4.3.6.1 Current composition

Table 1-12: RTOC 2013 membership profile

	Non-A5*	A5	Gender		Regional Distribution**							
			M	F	NAM	LAM	E	AF	MEA	EE	A	O
RTOC	**25**	**13**	**38**	**---**	**8**	**4**	**17**	**1**	**2**	**---**	**6**	**---**

*Non-A5 including CEIT, **NAM: North America, LAM: Latin America, E: Europe, AF: Africa, MEA: Middle East Asia, EE: Eastern Europe, A: Asia, O: Oceania

The current RTOC membership consists of 38 members (13 A5 and 25 non-A5 Party members), including two co-chairs (one A5 and one non-A5), distributed over 10 chapters, each of which deals with the several different refrigeration and air conditioning (RAC) applications. There have been a number of new nominations for experts to the RTOC over the last year(s). During the past two years, since the 2010 assessment, some members have resigned and new nominations (six of which are from A5 Parties) have been approved for RTOC membership. The RTOC membership consists of CLAs (Chapter Lead Authors) and co-author members, a choice independently (from TEAP procedures) made by the RTOC in the 1990s already.

In the TEAP TOR, the Parties have indicated that a goal of TOCs is to achieve a 50:50 balance between Article 5 and non-Article 5 members. The overall geographical balance may be important, however, RTOC (co-chairs and members) believes that the non-Article 5 - Article 5 expertise balance within the separate chapter groups is more important to its work for the Parties.

There has been no Chapter Lead Author (CLA) from an A5 Party for the 2010 Assessment, and this has now changed for the 2014 Assessment (two chapters have now an A5 CLA).

Decision criteria used for consideration of nominations received, included, besides the gender and regional balance, the analysis of candidate past and present activities, related to refrigeration and air conditioning sector (CV), and the investigation whether the specific knowledge and experience presented by the candidate conforms to the RTOC lack of expertise and its requirements for developing a comprehensive 2014 Assessment Report regarding the adequate consideration of all ODS replacement technical options.

4.3.6.2 Mission and general scope of work

Refrigeration, air conditioning and heat pump applications represent more than 70% of the ODS and replacement substances used; it is also one of the most important energy using sectors in the present day society. This is one of the reasons that economic impacts of the phase-out of refrigerant chemicals

(such as CFCs in the past, and HCFCs in Article 5 Parties in the foreseeable future) have been and still are difficult to estimate.

CFC production has been phased out since fifteen years in the developed countries, and the CFC phase-out in the developing countries has been completed by 2010. Where HCFCs have been largely phased out in the developed countries, the phase-out in the Article 5 Parties is now, and it will be in the near medium term, asking full attention. In many applications, alternatives to HCFCs have become commercially available, as pure HFCs, as blends of HFCs or, increasingly, as non-HFC alternatives.

In this scenario, the RTOC has been providing important information to the Parties related to the use of a refrigerant for the vapour compression cycle in the equipment associated with several refrigeration and air conditioning applications, including, among other aspects:

- compressor requirements;
- material and oil compatibility;
- health, safety and flammability aspects;
- refrigerant environmental parameters such as ozone depletion potential, GWP and atmospheric lifetime.

Additionally, options for energy efficient operation of equipment form an important issue in present and future RTOC Assessment reports, as energy efficiency is partly spurred by the role of energy production in carbon dioxide emissions.

The RTOC Assessment Reports have been written using a structure of 11 chapters:

- *Introduction*
- *Refrigerants*
- *Domestic refrigeration*
- *Commercial refrigeration*
- *Industrial systems*
- *Transport refrigeration*
- *Air-to air air conditioners and heat pumps*
- *Water heating heat pumps*
- *Chillers*
- *Vehicle air conditioning*
- *Refrigerant conservation*

Since its creation, the RTOC has had two co-chairs, one from an Article 5 and the other from a non-Article 5 Party. Representatives from companies, universities and governments, as well as independent experts have formed the RTOC. These representatives have been full (reporting) members; as resource persons the RTOC also has had a small number of reviewing members. Two to six members in a specific sector develop each of the chapters, and a Chapter Lead Author - who does the larger part of the drafting and the co-ordination, chairs each chapter. Several drafts of the report are made, reviewed by the separate chapter members and discussed in RTOC meetings.

RTOC reports have been peer reviewed by a number of institutions and associations, each of them reviewing the different chapters sections in a co-ordinated effort in a tight timeframe. Comments have been discussed in full RTOC meetings, were accepted or not, and have contributed significantly to the quality of the reports. The final report is put together including Key Messages and an Abstract Executive Summary upfront, as well as Executive Summaries for all chapters. UNEP's Ozone Secretariat assists in final formatting and heading style insertions. The report is then once more circulated to all RTOC members for a final check.

RTOC members have taken part in several Task Forces for the development of special studies and reports required by the Parties. Very seldom the RTOC has been requested to address EUNs.

4.3.6.3 Expected workload – 2013/2014

Some changes related to the past (2010) Assessment have now been made mandatory in the present Assessment efforts, such as new report formatting, a chapter template, and the inclusion of a new chapter on "Sustainable Refrigeration" replacing the former "Refrigerant Conservation" chapter.

For the 2014 Assessment, it has been agreed by the full committee that a chapter group should not be larger than six members (this would include the CLA and the co-authors). Other RTOC members should always be given the opportunity to review the chapters, but cannot be listed in the report as co-author.

The option to include the latest information about refrigerant properties may push the final submission date of the report to January-February 2015. Some of the topics the 2014 Assessment will be dealing with are: conversions to low GWP substances, servicing issues, hot climate specific needs, diversity of the market size, current low GWP HFCs developments; emissions and banks with expanded sources of information.

4.3.6.4 Expected workload – 2014- 2018

Considering possible future Assessments, it cannot be predicted that the RTOC will introduce many additional changes in its organization and in the form the Assessment reports are (and have been) developed. Some adjustments, if needed, will be made when the 2014 Assessment will have been completed and evaluated.

In terms of technical aspects, commercial refrigeration is one possible area where future lack of expertise can be expected. Some actions regarding the establishment of contacts with important companies to involve employees as RTOC members in the US and Japan have already started.

Emissions and banks of refrigerants from the different applications have been addressed in the last Assessment report but this is an area where further expertise may be needed. Costs are an important element in the conversions, in particular the manufacturing conversion costs. This has never been really considered in the RTOC Assessment reports, (has been an important item in many RTOC discussions with many people objecting) and should in fact be further discussed for future Assessments.

Regarding the present structure based on chapters related to applications, one possible change could be the elimination of the chapters related to domestic and mobile air conditioning, where there is not the HCFC replacement challenge. These applications have replaced CFC-12 refrigerant by HC-600a and HFC-134a (in the case of domestic refrigeration), and by HFC-134a (in mobile air conditioning equipment). But, the situation is not static inside these sub-sectors. Several companies manufacturing domestic refrigeration appliances are replacing HFC-134a by HC-600a, and in the case of mobile air conditioning, due to legislation of certain regions HFC-134a has to be substituted in the near term. CO_2, initially and now lately, and non-saturated HFCs, such as HFC-1234yf, are the options being considered. The development of HFC-1234yf and its likely use by some car manufacturers will impact also other refrigeration and air conditioning applications, which are also considering the use of this refrigerant. One of the applications is domestic refrigeration.

In this way, one could say that these two applications (chapters) do not need to replace HCFCs, do not need to replace ODSs (the mandate of TEAP as established by Montreal Protocol), but as they will be in a dynamic situation experiencing technology changes during this period, it would be prudent to keep them in the RTOC Assessment. One could also mention that these technology changes are caused by the original need of an ODS (CFC-12) replacement, ruled by the Montreal Protocol, and

this is one additional reason to maintain these chapters in possible future RTOC Assessments. This will be one of the focuses of the evaluation to be developed of the 2014 Assessment, and also will be part of the discussion of a possible 2018 Assessment.

4.3.6.5 Expected workload – post 2018

Bearing in mind that:

- HCFCs phase out schedule for developing countries predicts 35% consumption reduction in 2020;
- most of HCFC phase-out plans will be in the second phase of their implementation where the refrigeration and air conditioning sector will be targeted (the first phase considered basically the foam sector for most of the countries);
- for several refrigeration and air conditioning applications, no new refrigerants or alternative technologies are likely to enter the market in the near future..

The RTOC probably will continue to play an important role to the Parties of the Montreal Protocol providing technical information in order to help the Parties (mainly A5) to achieve the goals of HCFC phase-out schedule.

5 Standard Operating Procedures of the TEAP and its TOCs

5.1 Mandate

Decision XXIV/8 requests the TEAP and its TOCs to,

"…make available to the parties their standard operating procedures;"

Paragraph 3.3 of the TEAP Terms of Reference states:

> *"The rules of procedure of the Montreal Protocol for committees and working groups will be followed in conducting the meetings of the TEAP/TOCs/TSBs, unless otherwise stated in these terms of reference for TEAP/TOCs/TSBs or other decisions approved by a Meeting of the Parties."*

Further, Paragraph 3.2.3 requires the following with regard to the functioning of TOC meetings:

> *"Co-chairs of the TOCs should organize meetings in accordance with operating procedures developed by the TOCs in consultation with the Secretariat to ensure full participation of all members, sound and appropriate decision-making and record keeping. The procedures should be updated periodically and made available to the parties."*

Provided in the sections below are operating procedures of the TEAP/TOCs/TSBs in keeping with the above requirements. General operating procedures on meetings and reports are presented with more detailed guidance in Annex 3. Operating procedures on achieving consensus have been recently documented by TEAP, and these are summarized below with more detailed guidance provided in Annex 4.

5.2 TEAP/ TOC functioning and logistics

A general overview of operating procedures related to TEAP/ TOC functioning related to meeting logistics and reports preparation is included in this section. In conducting its work and preparing its reports, TEAP/TOCs ensure that appropriate procedures govern the preparation and conduct of its meetings. In addition, specific procedures are followed to prepare its draft and final reports. TEAP/TOC operating procedures related to its meeting logistics and preparation of reports is provided in Annex 3.

5.3 Achieving consensus

Paragraph 4.1 of TEAP's TOR requires that TEAP/TOC/TSB reports are developed through a consensus process, and that reports must reflect any minority views appropriately. Typically most, if not all, decision-making under the aegis of the TEAP will be by consensus. Similarly the Parties to the Montreal Protocol work by consensus

TEAP has operated by consensus since its inception, according to its terms of reference. Internal practices to manage consensus processes have developed over time, and continue to be developed to meet new challenges such as the increased use of electronic processes. Recognising the lack of implementing norms to supplement TEAP's TOR, the preparation of operating procedures was considered a useful internal exercise to provide clear procedures for reaching consensus according to UN norms.

The operating procedures developed are intended as a helpful best practice guide for co-chairs and members to manage consensus processes, to be improved over time and with new experience if considered necessary.

The operating procedures include sections describing:

- What is consensus;
- Consensus for reports, including:
    - Different types of processes for the development of reports (meeting, electronic etc.),
    - Powers of the chair(s),
    - Preparation for consensus,
    - Who participates in the process, including recusal requirements of the TOR, participation in good faith, exercise of self-control when expressing strong opinions,
    - Obstacles to participation of a member, e.g., inability to travel to a meeting, technical difficulties in electronic processes,
    - Confirming when a decision is made by consensus; and
    - Consensus based reports reflecting a range of views, including minority views.

During the development of the operating procedures on managing consensus processes, TEAP also explored the associated relationship between bias and conflict of interest, as provided in paragraph 3 of TEAP's TOR,

"*The role of the TEAP, TOCs and TSBs demands that they pay special attention to issues of independence and bias in order to maintain the integrity of, and public confidence in, their products and processes. It is essential that the work of TEAP and its TOCs and TSBs is not compromised by any conflict of interest*",

and also paragraph 12, "*A member's strong opinion (sometimes referred to as bias), or particular perspective, regarding a particular issue or set of issues does not create a conflict of interest. It is expected that the TEAP, TOCs and TSBs will include members with different perspectives and affiliations, which should be balanced so far as possible.*"

TEAP's operating procedures on consensus processes are included in Annex 4. In addition, TEAP's short note providing guidance on the relationship between strong opinion (sometimes referred to as bias) and conflict of interest is included in Annex 5 for information.

6 Adoption of the new TEAP TOR and Appointment/Re-appointment Process

TEAP and its TOCs have made good progress in adoption of its revised TOR. At all upcoming TEAP and TOC meetings, co-chairs are reviewing the revised TOR and informing all of its members of the requirement for complying with the TOR as a condition of membership. TEAP has also been working with the Ozone Secretariat to ensure timely updates of the TEAP website including postings of all of its reports, the availability of the revised TOR, updated matrices of current and needed expertise, a standardized nomination form for experts, and annual disclosure of interest statements for all members.

The process for the appointment of new members and re-appointment of existing members has been reviewed based on the relevant elements of Decision XXIII/10 (especially clause 9) and Decision XXIV/8 (notably clauses 2.1.2, 2.2.2 and 2.5). In order to provide a self-consistent approach across all of the TOCs, the following principles have been established:

- In order to be consistent with the Decisions, appointment and re-appointment are now seen as three step processes where the following are envisaged:
    - Proposal for nomination/re-nomination can be submitted to the national focal point of relevant Party by any proposer, but this will typically be by the relevant TOC co-chairs
    - The relevant Party will then decide whether to nominate/re-nominate the individual proposed or alternatively can make its own nomination at any time
    - The relevant TOC co-chairs receive the nominations/re-nominations and, if in agreement, make the appointments/re-appointments
- The TOC co-chairs will direct all correspondence on proposals for nomination/ re-nomination directly to the national focal point of the relevant party (with copy to the Ozone Secretariat and TEAP co-chairs) or, where appropriate, through the Ozone Secretariat in cases where there may be value in aggregation of a number of similar proposals from different TOCs to the same individual Party. Standardised letter formats will used wherever possible.
- Wherever possible, proposals for re-nomination by TOCs will be staggered to ensure that there is no risk of discontinuity if significant changes in TOC membership result from the re-nomination process. This will involve careful planning in the early period of the new regime.

The Ozone Secretariat will establish and maintain a limited access website to record the current appointments and their expiry dates in order that proposals for re-appointment can be initiated in good time.

Annex 1 - Decision XXIV/8

Decision XXIV/8: Terms of reference, code of conduct and disclosure and conflict of interest guidelines for the Technology and Economic Assessment Panel and its technical options committees and temporary subsidiary bodies

Taking note of paragraph 17 of decision XXIII/10, in which the parties requested the Technology and Economic Assessment Panel to revise its draft guidelines on recusal, taking into account similar guidelines in other multilateral forums, and provide them to the Open-ended Working Group for consideration at its thirty-second meeting,

Taking note also of the terms of reference of the Panel as set out in annex V of the report of the Eighth Meeting of the Parties, as amended by decision XVIII/19,

Taking note further of decision XXIII/10, in which the parties requested the Technology and Economic Assessment Panel to propose an update to its terms of reference,

Recalling decision VII/34 on the organization and functioning of the Panel and specifically on efforts to increase the participation of experts from parties operating under paragraph 1 of Article 5 in order to improve geographical expertise and balance,

Noting that the Intergovernmental Panel on Climate Change has established a conflict of interest committee and the Stockholm Convention on Persistent Organic Pollutants Review Committee has adopted a procedure for dealing with conflicts of interest,

Bearing in mind that the role of the Panel, its technical options committees and its temporary subsidiary bodies makes it essential to avoid even the appearance of any conflict between individual members' interests and their duties as Panel members,

Bearing in mind also that it is in the interest of the Panel, its technical options committees and its temporary subsidiary bodies to maintain public confidence in its integrity by adhering closely to its terms of reference,

1. To request the Technology and Economic Assessment Panel to make recommendations on the future configuration of its technical options committees to the Open-Ended Working Group at its thirty-third meeting, bearing in mind anticipated workloads;

2. To approve the terms of reference and the conflict of interest and disclosure policy for the Technology and Economic Assessment Panel, its technical options committees and any temporary subsidiary bodies set up by those bodies set out in the annex to the present decision in place of the terms of reference set out in annex V to the report of the Eighth Meeting of the Parties, as amended;

3. To request that the Technology and Economic Assessment Panel and its technical options committees make available to the parties their standard operating procedures;

Annex 2 Terms of Reference of the TEAP and its TOCs/ TSBs

Terms of reference of the Technology and Economic Assessment Panel and its technical options committees and temporary subsidiary bodies

1 Scope of work

The tasks undertaken by the Technology and Economic Assessment Panel (TEAP) are those specified in Article 6 of the Montreal Protocol in addition to those requested from time to time at Meetings of the Parties. TEAP analyses and presents technical information and recommendations when specifically requested. It does not evaluate policy issues and does not recommend policy. TEAP presents technical and economic information relevant to policy. Furthermore, TEAP does not judge the merit or success of national plans, strategies, or regulations.

To carry out its work programme, technical options committees (TOCs) are established and agreed to by a decision of the parties. TEAP may also establish temporary subsidiary bodies (TSBs), as needed. These bodies *generally* will not last for more than one year and are aimed at responding to specific requests made by the parties.

2.1 Size and balance

The overall goal is to achieve a representation of about 50 per cent for Article 5(1) Parties in the TEAP and TOCs and appropriate representation of expertise in the different alternatives.

2.1.1 TEAP

The membership size of the TEAP 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 TOCs; there should be two co-chairs per TOC and 2-4 Senior Experts for specific expertise not covered by the TEAP co-chairs or TOC co-chairs, taking into account gender and geographical balance.

At least one and preferably all of the TEAP co-chairs should not simultaneously serve as a TOC co-chair.

2.1.2 TOCs

Each TOC should have two co-chairs. The positions of TOC co-chairs must be filled to promote a geographical, gender and expertise balance. TEAP, through its TOC co-chairs, shall compose its TOCs to reflect a balance of appropriate and anticipated expertise so that their reports and information are comprehensive, objective and policy-neutral.

2.1.3 TSBs

TEAP, in consultation with the TSB co-chairs, shall compose its TSBs to reflect a balance of appropriate expertise so that their reports and information are comprehensive, objective and policy-neutral. TEAP, acting through the TSB co-chairs, shall provide a description in reports by TSBs on how their composition was determined. TSB members, including co-chairs, who are not already members of the TEAP, do not become members of the TEAP by virtue of their service on the TSB.

2.2 Nominations

2.2.1 TEAP

Nominations of members to the TEAP, including co-chairs of the TEAP and TOCs, must be made by individual Parties to the Secretariat through their respective national focal points. Such

nominations will be forwarded to the Meeting of the Parties for consideration. The TEAP co-chairs shall ensure that any potential nominee identified by TEAP for appointment to the Panel, including co-chairs of TEAP and the TOCs, is agreed to by the national focal points of the relevant party. A member of TEAP, the TOCs or the TSBs shall not be a current representative of a party to the Montreal Protocol.

2.2.2. TOCs and TSBs

All nominations to TOCs and TSBs shall be made in full consultation with the national focal point of the relevant party.

Nominations of members to a TOC (other than TOC co-chairs) may be made by individual parties or TEAP and TOC co-chairs may suggest to individual parties experts to consider nominating. Nominations to a TSB (including TSB co-chairs) can be made by the TEAP Co-chairs

2.3 Appointment of members of TEAP

In keeping with the intent of the parties for a periodic review of the composition of the assessment panel, the Meeting of the Parties shall appoint the members of TEAP for a period of no more than four years. The Meeting of the Parties may re-appoint Members of the Panel upon nomination by the relevant party for additional periods of up to four years each. In appointing or re-appointing members of TEAP, the parties should ensure continuity, balance as well as a reasonable turnover.

2.4 Co-chairs

In nominating and appointing co-chairs of the TEAP/TOCs/TSBs, parties should consider the following factors:

(a) 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;

(b) The co-chairs of a TOC should not normally act as co-chairs of another TOC; and

(c) The co-chairs of TEAP should not be co-chairs of a TOC;

(d) The TEAP and TOC co-chairs may suggest to individual parties experts to consider nominating.

2.5 Appointment of members of TOCs

Each TOC should have about 20 members. The TOC members are appointed by the TOC co-chairs, in consultation with TEAP, for a period of no more than four years. TOC members may be re-appointed following the procedure for nominations for additional periods of up to four years each.

2.6 Subsidiary bodies

Temporary Subsidiary Technical Bodies (TSBs) can be appointed by TEAP to report on specific issues of limited duration. TEAP may appoint and dissolve, subject to review by the parties, such subsidiary bodies of technical experts when they are no longer necessary. For issues that cannot be handled by the existing TOCs and are of substantial and continuing nature, TEAP should request the establishment by the parties of a new TOC. A decision of the Meeting of the Parties is required to confirm any TSB that exists for a period of more than one year.

2.7 Termination of appointment

Members of TEAP, a TOC or a TSB may relinquish their position at any time by notifying in writing as appropriate the co-chairs of the TEAP, TOC or TSB and the relevant party.

TEAP can dismiss a member of TEAP, the TOCs and the TSBs, including co-chairs of those bodies, by a two-thirds majority vote of TEAP. A dismissed member has the right to appeal to the next Meeting of the Parties through the Secretariat. The TEAP co-chairs will inform the relevant party if TEAP is dismissing members.

2.8 Replacement

If a member of TEAP, including TOC co-chairs, relinquishes or is unable to function including if he or she was dismissed by TEAP, the Panel, after consultation with the nominating party can temporarily appoint a replacement from among its bodies for the time up to the next Meeting of the Parties, if necessary to complete its work. For the appointment of a replacement TEAP member, the procedure set out in paragraph 2.2 should be followed.

2.9 Guidelines for nominations and matrix of expertise

The TEAP/TOCs will draw up guidelines for nominating experts by the parties. The TEAP/TOCs will publicize a matrix of expertise available and the expertise needed in the TEAP/TOCs so as to facilitate submission of appropriate nominations by the parties. The matrix must include the need for geographic and expertise balance and provide consistent information on expertise that is available and required. The matrix would include the name and affiliation and the specific expertise required including on different alternatives. The TEAP/TOCs, acting through their respective co-chairs, shall ensure that the matrix is updated at least once a year and shall publish the matrix on the Secretariat website and in the Panel's annual progress reports. The TEAP/TOCs shall also ensure that the information in the matrix is clear, sufficient and consistent as far as is appropriate between the TEAP and TOCs and balanced to allow a full understanding of needed expertise.

3. Functioning of TEAP/TOCs/TSBs

3.1 Language

TEAP/TOCs/TSBs meetings will be held and reports and other documents will be produced only in English.

3.2 Meetings

3.2.1 Scheduling

The place and time of the TEAP/TOCs/TSBs meetings will be fixed by the co-chairs.

3.2.2 Secretariat

The Ozone Secretariat should attend the meetings of the TEAP whenever possible and appropriate to provide ongoing institutional advice on administrative issues when necessary.

3.2.3 Operating procedures

Co-chairs of the TOCs should organize meetings in accordance with operating procedures developed by the TOCs in consultation with the Secretariat to ensure full participation of all members, sound and appropriate decision-making and record keeping. The procedures should be updated periodically and made available to the parties.

3.3 Rules of procedure

The rules of procedure of the Montreal Protocol for committees and working groups will be followed in conducting the meetings of the TEAP/TOCs/TSBs, unless otherwise stated in these terms of reference for TEAP/TOCs/TSBs or other decisions approved by a Meeting of the Parties.

3.4 Observers

No observers will be permitted at TEAP, TOC or TSB meetings. However, anyone can present information to the TEAP/TOCs/TSBs with prior notice and can be heard personally if the TEAP/TOCs/TSBs consider it necessary.

3.5 Functioning by members

The TEAP/TOCs/TSBs members function on a personal basis as experts, irrespective of the source of their nominations and accept no instruction from, nor function as representatives of Governments, industries, non-governmental organizations (NGOs) or other organizations.

4. Report of TEAP/TOCs/TSBs

4.1 Procedures

The reports of the TEAP/TOCs/TSBs will be developed through a consensus process. The reports must reflect any minority views appropriately.

4.2 Access

Access to materials and drafts considered by the TEAP/TOCs/TSBs will be available only to TEAP/TOCs members or others designated by TEAP/TOCs/TSBs.

4.3 Review by TEAP

The final reports of TOCs and TSBs will be reviewed by the TEAP and will be forwarded, without modification (other than editorial or factual corrections which have been agreed with the co-chairs of the relevant TOC or TSB) by TEAP to the Meeting of the Parties, together with any comments TEAP may wish to provide. Any factual errors in the reports may be rectified through a corrigendum following publication, upon receipt by TEAP or the TOC of supporting documentation.

4.4 Comment by public

Any member of the public can comment to the co-chairs of the TOCs and TSBs with regard to their reports and they must respond as early as possible. If there is no response, these comments can be sent to the TEAP co-chairs for consideration by TEAP.

5. Code of conduct for Members of the Technology and Economic Assessment Panel and its bodies

Code of Conduct

Members of TEAP, the TOCs and the TSBs have been asked by the parties to undertake important responsibilities. As such, a high standard of conduct defined in accordance with the principles of transparency, predictability, accountability, trustworthiness, integrity, responsibility and disclosure is expected of members in discharging their duties. In order to assist members, the following guidelines have been developed as a Code of Conduct that must be followed by the members of TEAP, the TOCs and the TSBs.

1. This Code of Conduct is intended to protect Members of TEAP, the TOCs and the TSBs from conflicts of interest in their participation. Compliance with the measures detailed in these guidelines is a condition for serving as a Member of TEAP, the TOCs or the TSBs.

2. The Code is to enhance public confidence in the integrity of the process while encouraging experienced and competent persons to accept TEAP, TOC and/or TSB membership by:

(a) Establishing clear guidelines respect to conflict of interest and disclosure while and after serving as a member; and

(b) Minimizing the possibility of conflicts arising between the private interest and public duties of members and by providing for the resolution of such conflicts, in the public interest, should they arise.

3. In carrying out their duties, members shall:

(a) Perform their official duties and arrange their private affairs in such a manner that public confidence and trust in the integrity, objectivity and impartiality of TEAP, the TOCs and the TSBs are conserved and enhanced;

(b) Act in a manner that will bear the closest public scrutiny, an obligation that is not fully discharged by simply acting within the law of any country;

(c) Act in good faith for the best interest of the process;

(d) Exercise the care, diligence and skill that a reasonably prudent person would exercise in comparable circumstances;

(e) Not give preferential treatment to anyone or any interest in any official manner related to TEAP, the TOCs or the TSBs;

(f) Not solicit or accept significant gifts, hospitality or other benefits from persons, groups or organizations having or likely to have dealings with TEAP, the TOCs or the TSBs;

(g) Not accept transfers of economic benefit, other than incidental gifts, customary hospitality or other benefits of nominal value, unless the transfer is pursuant to an enforceable contract or property right of the member;

(h) Not represent or assist any outside interest in dealings before TEAP, the TOCs or the TSBs;

(i) Not knowingly take advantage of, or benefit from, information that is obtained in the course of their duties and responsibilities as a member of TEAP, the TOCs and the TSBs, and that is not generally available to the public; and

(j) Not act, after their term of office as members of TEAP, the TOCs or the TSBs in such a manner as to take improper advantage of their previous office.

4. To avoid the possibility or appearance that members of TEAP, the TOCs or the TSBs might receive preferential treatment, members shall not seek preferential treatment for themselves or third parties or act as paid intermediaries for third parties in dealings with TEAP, the TOCs or the TSBs.

6. Conflict of Interest and Disclosure Guidelines for the Technology and Economic Assessment Panel, Its Technical Options Committees and Temporary Subsidiary Bodies

Definitions

1. For the purposes of these Guidelines:

(a) "Conflict of interest" means any current interest of a member, or of that member's personal partner or dependant which, in the opinion of a reasonable person does or appears to:

(i) Significantly impair that individual's objectivity in carrying out their duties and responsibilities for TEAP, the TOC or the TSB; or

(ii) Create an unfair advantage for any person or organization;

(b) "Member" means member including co-chairs of TEAP, the TOCs and/or the TSBs;

(c) "Recusal" means that a member does not participate in particular elements of TEAP, TOC or TSB work because of a conflict of interest; and

(d) "Conflict resolution advisory body" means the body appointed under paragraph 22.

Purposes

2. The overall purpose of these Guidelines is to protect the legitimacy, integrity, trust, and credibility of the TEAP, TOCS and TSBs and of those directly involved in the preparation of reports and activities.

3. The role of the TEAP, TOCs and TSBs demands that they pay special attention to issues of independence and bias in order to maintain the integrity of, and public confidence in, their products and processes. It is essential that the work of TEAP and its TOCs and TSBs is not compromised by any conflict of interest.

4. Written agreement to comply with these Guidelines is a condition for service as a Member.

5. These Guidelines are to enhance public confidence in the process, while encouraging experienced and competent persons to serve on the TEAP, TOC and/or TSB, by:

(a) Establishing clear guidance with respect to disclosure and conflict of interest while serving as a Member;

(b) Minimizing the possibility of conflicts of interest arising with respect to Members, and by providing for the resolution of such conflicts, in the public interest, should they arise; and

(c) Finding the balance between the needs:

(i) To identify the appropriate disclosure requirements, and

(ii) To ensure the integrity of the TEAP process.

6. These Guidelines are principle-based and do not provide an exhaustive list of criteria for the identification of conflicts.

7. TEAP, the TOCS, the TSBs and their members should not be in a situation that could lead a reasonable person to question, and perhaps discount or dismiss, their work because of the existence of a conflict of interest.

Disclosure

8. Members are to disclose annually any potential conflicts of interest. They must also disclose the source of any funding for their participation in the work of the TEAP, TOC and/or TSB. An illustrative list of other interests that should be disclosed is provided in Annex A to these Guidelines.

9. Members are to disclose any material change to previously submitted information within 30 days of any such change.

10. Notwithstanding paragraphs 8 and 9, a member may decline to disclose information related to activities, interests and funding where its disclosure would adversely and materially affect:

(a) Defence, national security or imminent public safety;

(b) The course of justice in prospective or current court cases;

(c) The ability to assign future intellectual property rights; or

(d) The confidentiality of commercial, government, or industrial information.

11. Members who decline to disclose information under paragraph 10 must declare that they are doing so in their disclosure of interest under paragraphs 8 or 9 and must be completely excluded from discussions and decisions on related topics.

Conflict of interest

12. A member's strong opinion (sometimes referred to as bias), or particular perspective, regarding a particular issue or set of issues does not create a conflict of interest. It is expected that the TEAP, TOCs and TSBs will include members with different perspectives and affiliations, which should be balanced so far as possible.

13. These Guidelines apply only to current conflicts of interest. They do not apply to past interests that have expired, no longer exist and cannot reasonably affect current assessment. Nor do they apply to possible interests that may arise in the future but that do not currently exist, as such interests are inherently speculative and uncertain. For example, a pending application for a particular job is a current interest, but the mere possibility that one might apply for such a job in the future is not a conflict of interest.

Procedures

14. All of the bodies involved in advising on and deciding conflict of interest issues under these Guidelines should consult the relevant member where the body has concerns about a potential conflict of interest and/or where it requires clarification of any matters arising out of a member's disclosure. Such bodies should ensure that the relevant individuals and, where appropriate, the nominating Party, have an opportunity to discuss any concerns about a potential conflict of interest.

15. In the event that an issue regarding a potential conflict of interest arises, the relevant member and co-chairs should attempt to resolve the issue through consultations, including consultations with the advisory body. If the consultations reach an impasse, TEAP could request the Executive Secretary to select an outside mediator to assist in resolving the matter. The mediator should not be a member and should not otherwise have any current affiliation with the relevant individuals, bodies or issues.

16. At any point, the conflict resolution advisory body may be consulted by members or potential members regarding issues related to:

(a) Member disclosures;

(b) Potential conflicts of interest or other ethics issues; or

(c) Potential recusal of members.

17. The conflict resolution advisory body must promptly inform a member if it has been asked to advise on an issue regarding the member. Any information provided to and any advice provided by the conflict resolution advisory body will be considered confidential and will not be used for any purpose other than consideration of conflict of interest issues under these Guidelines without the express consent of the individual providing the information or requesting the advice, as appropriate.

18. If an issue under these Guidelines cannot be resolved through the procedures in paragraphs 14 through 17:

(a) A TEAP member, including TEAP and TOC co-chairs, may be recused from a defined area of work only by a three-fourths majority of TEAP (excluding the individual whose recusal is at issue).

(b) A TOC or TSB member, excluding TEAP and TOC co-chairs, may be recused from a defined area of work by the co-chairs of the relevant TOC or, upon appeal, by a three-fourths majority of TEAP.

19. In the event of the procedure under the previous paragraph taking place, the Member whose recusal is at issue may not participate. In the event that the matter is brought to the TEAP consistent with paragraph 18, the Member whose recusal is under discussion, should be excluded from those discussions.

Recusal

20. When a conflict of interest is determined to exist with respect to a particular Member, the Member should, depending on what is appropriate in the circumstances, be:

(a) Excluded from decision-making and discussions related to a defined area of work;

(b) Excluded from decision-making but may participate in discussions related to a defined area of work; or

(c) Excluded from participation in the matter in any other manner deemed appropriate.

21. A Member who is recused completely or partially from an area of work may nevertheless answer questions with respect to that work at the request of the TEAP, TOC or TSB.

Conflict resolution advisory body

22. The conflict resolution advisory body is not envisioned as a body that will meet on any regular basis but will come together, physically or virtually, as needed to provide advice to members or potential members and assist with resolving issues. It shall consist of Co-Chairs of the Open-Ended Working Group and the President of the Bureau of the Meeting of the Parties, with the Ozone Secretariat providing logistical, technical legal and administrative support and advice to the body. No additional travel support or other financial support will be provided to members serving on the body.

Annex to the terms of reference

The following is an illustrative list of the types of interests that should be disclosed:

(a) A current proprietary interest of a member or his/her personal partner or dependent in a substance, technology or process (e.g., ownership of a patent) to be considered by the Technology and Economic Assessment Panel or any of its technical options committees or temporary subsidiary bodies;

(b) A current financial interest of a member or his/her personal partner or dependent, e.g., shares or bonds in an entity with an interest in the subject matter of the meeting or work (but not shareholdings through general mutual funds or similar arrangements where the expert has no control over the selection of shares);

(c) A current employment, consultancy, directorship or other position held by a Member or his/her personal partner or dependent, whether or not paid, in any entity which has an interest in the subject matter of the Technology and Economic Assessment Panel. This element of disclosure also includes paid consultancy efforts performed on behalf of an implementing agency to assist developing countries to adopt alternatives;

(d) The provision of advice on significant issues to a government with respect to its implementation of the Montreal Protocol or engaging in the development of significant policy positions of a government for a Montreal Protocol meeting;

(e) Performance of any paid research activities or receipt of any fellowships or grants for work related to a proposed use of an ozone-depleting substance or an alternative to a proposed use of an ozone depleting substance;

Annex 3 -TEAP Note #1: Operating Procedures - Meeting functioning and logistics

1 Organisation of meetings

1.1 Meeting venue and dates

As required by the TEAP Terms of Reference, the co-chairs of the relevant body fix the place and time of the TEAP/TOCs meetings. While co-chairs make the final selection of the venue and dates for a meeting, generally the time and place of a future meeting are discussed, at least in preliminary fashion, with members of the TEAP or relevant TOC during a given meeting. Venue and date selection should consider any issues that may prevent / make it difficult for members to attend (e.g., specific religious holidays, time clashes with other meetings, obtaining a visa, funding problems, etc.) or other factors (e.g., report deadlines and Parties' meeting schedules). Final selection of a meeting venue and dates should be notified to members at least three months in advance.

1.1.1 Meeting budget, travel arrangements, logistics and other issues requiring coordination with Ozone Secretariat as appropriate

One of the co-chairs of the relevant body normally takes responsibility for this task. This includes meeting logistics (selecting hotel and meeting venue, hotel bookings, electronic equipment and internet requirements, sending out practical information, organizing, etc.), arranging for invitation letters to be sent to members, assistance with visa applications, and travel arrangements for A5 members (via the Ozone Secretariat) and others. The co-chair in charge of meeting organization generally works with a hosting (local) member and/or organization in coordination with the Ozone Secretariat.

1.2 Tasks before meetings

1.2.1 Meeting agenda

The proposed agenda is agreed by the co-chairs and circulated for comment to members at least two weeks in advance of the meeting in order to get feedback or suggestions.

1.2.2 Assignment of tasks in preparation for the meeting

Co-chairs will normally set out tasks for members, such as reviewing documents, finding relevant papers, carrying out initial assessments (for example for CUNs or EUNs). This may include drafting sections before the meeting of reports due after the meeting.

1.3 Tasks during meetings

Members will be tasked with specific sections of reports, which are prepared as a result of discussions during the meeting.

TEAP and TOC co-chairs conduct the meeting in such a way as to ensure full discussion of relevant issues and strive to reach consensus. (See Annex 4 on consensus).

Co-chairs review compliance with disclosure of interest and conflicts of interest guidelines in the Terms of Reference and take action as appropriate (recusals) in the course of the meeting discussions.

A member (or co-chair) is assigned to record decisions and conclusions of the meeting, and/or the report acts as this record.

Any objections to the report, including contents of report/ TOC recommendations should be sought at the end of a meeting or at a time designated by the co-chairs as part of the consensus process.

1.4 Drafting and finalising reports

Co-chairs are in charge of finalising reports, formatting, proof reading and circulating to members for final agreement. TOC co-chairs should strive to allow a comment period of at least five working days before forwarding report to TEAP (and later to the Ozone Secretariat, according to deadlines set).

Co-chairs will prepare presentations based on reports, to be given at the OEWG meeting or Meeting of the Parties (MOP) as appropriate. These should be circulated to TOC members if the co-chairs consider it appropriate and to TEAP for comment.

ANNEX 4 - TEAP Note #2: Operating Procedures - Consensus

1. Introduction

1.1. This note is prepared to provide clear operating procedures for reaching consensus, within the TEAP and its TOCs and TSBs, according to UN norms.

1.2. Consensus is expressly required for the development of TEAP/TOC/TSB reports. Paragraph 4.1 of the TOR provides -

"The reports of the TEAP/TOCs/TSBs will be developed through a consensus process. The reports must reflect any minority views appropriately."

1.3. What is more, as a matter of practice, the TEAP agrees that it would be desirable[1] to default to decision making by consensus wherever feasible and regardless of the legal requirements[2]. Typically most, if not all, decision-making under the aegis of the TEAP will be by consensus. Similarly, the Parties to the Montreal Protocol work by consensus[3].

[1] This agreement is based on the practical advantages of decision making, which include

- lack of formality: the co-chair of a meeting can briefly and informally check whether consensus is there; and
- collaboration: over time participants develop the habit of working together and do not have to trigger manifestly divisive and time-consuming voting procedures.

[2] The legal requirements are complex. As we have seen, a consensus process is expressly required for the development of TEAP/TOC/TSB reports. Otherwise, the Montreal Protocol Rules of Procedure are to be followed by the TEAP/TOC/TSBs, unless otherwise stated in these terms of reference for TEAP/TOCs/TSBs or other decisions approved by a MOP (see paragraph 3.3 of the TOR). Moreover, there are three express provisions in the TOR for voting on certain matters. There is therefore a theoretical possibility of voting; in practice voting may be rare or even non-existent given the TEAP's preference for consensus.

[3] This is because of the political desirability of consensus decision making in the international community. Also there are sometimes legal requirements relating to consensus. So, for example, there may be

- a legal requirement to make every effort to reach consensus; see, for example, Articles 2(9)(c) and 10(a) of the Protocol or paragraph 7 of the TOR for the administration of the Protocol trust fund; or
- a requirement to act by consensus: see Articles 11(3)(a) and (b) and 13(2).

2. What is consensus?

2.1. International practice[4] establishes that a meeting may make a decision by consensus if no one participating in the meeting objects to the proposed decision[5]. The chair or the co-chair of a meeting needs only a light touch to discover whether anyone participating at the meeting objects.

2.2. Consensus merely requires the absence of formal objections, so –

- no vote should be taken during consensus decision-making;
- participants may make reservations and/or statements of position without undermining a consensus, provided they do not formally object to a decision; therefore;
- consensus does not require everyone participating in the decision to support every component of the decision; and it follows that
- consensus is quite different from unanimity. A decision is not taken unanimously unless all participants vote positively for the decision.

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[4] See, for example, Correspondence from Mr. Hans Corell, Under-Secretary-General for Legal Affairs, Legal Counsel of the United Nations, United Nations Office for Legal Affairs to the Secretariat of the Convention on Biological Diversity, June 2002.

"*What is the legal interpretation of the term "consensus"?*

In United Nations practice, the concept of "consensus" is understood to mean the practice of adoption of resolutions or decisions by general agreement without resort to voting in the absence of any formal objection that would stand in the way of a decision being declared adopted in that manner. Thus, in the event that consensus or general agreement is achieved, the resolutions and decisions of United Nations meetings and conferences have been adopted without a vote. In this connection, it should be noted that the expressions "without a vote", "by consensus" and "by general agreement" are, in the practice of the United Nations, synonymous and therefore interchangeable.

Adoption in this manner does not mean that every State participating in the meeting or conference is in favour of every element of the resolution or decision. States so participating have the opportunity, both prior to and after the adoption, to make reservations, statements of interpretation and/or statements of position. In so doing, a State may:

- *disassociate itself from the substance or text of parts of the document;*
- *indicate that its joining in the consensus does not constitute acceptance of the substance or text of parts of the document; and/or*
- *present any other restrictions on its Government's position on substance or text of parts of the document.*

Provided that the State concerned does not formally object to or challenge the existence of consensus or call for a vote on the resolution or decision, it is understood that consensus or general agreement is preserved."

[5] This is not only consistent with established practice, but also consistent with a number of treaty provisions. See, for example, the following -

- Article 161(8)(e) of the UN Convention on the Law of the Sea defines consensus (for the purposes of the Council of the International Seabed Authority) as "*the absence of any formal objection*";
- Rule 6(4) of the Organisation for Security and Co-operation in Europe Rules of Procedure defines consensus as "*the absence of any objection expressed by a Representative and submitted by him as constituting an obstacle to the taking of the decision in question*"; and
- Article IX.1 of the Agreement establishing the World Trade Organisation defines consensus by reference to the to the 1947 GATT Agreement as follows: "*The body concerned shall be deemed to have decided by consensus on a matter submitted for its consideration, if no Member, present at the meeting when the decision is taken, formally objects to the proposed decision.*"

2.3. Loosely speaking, consensus means nobody says "no", whilst unanimity means everyone says "yes".

2.4. The Parties to the Montreal Protocol have always acted by consensus. The Protocol's rules of procedure say that unless otherwise provided for, decisions of the Meeting of the Parties shall be taken by a two-thirds majority vote[6]; nevertheless no vote has ever been taken and Decisions have been put forward only when consensus has been reached. Similarly the TEAP has the option to vote on some matters, except in the development of reports for which there is an express requirement for consensus. But in practice, the Panel follows the Parties' example of decision making by consensus[7].

3. Consensus for reports

3.1. The different types of processes for the development of reports

3.1.1. Paragraph 4.1 of the TOR allows the TEAP/TOCs/TSBs a margin of discretion as to procedure: whilst there is an express requirement for a "consensus process", the TOR says little about what process is required. So the TEAP/TOCs/TSBs may develop reports

- at meetings where members are physically present;
- through electronic meetings – that is to say live electronic meetings, using Skype for example;
- through hybrid meetings – with some participants attending, and others in contact by telephone or Skype; and
- by exchange of emails.

3.1.2. As we have seen, the TEAP agrees to default to consensus. It follows that the Panel should resort to consensus not only for the development of reports, but also for all decision-making.

3.2. The powers of the chair

3.2.1. It would not be fruitful to constrain TEAP/TOC/TSB processes with rigid procedures or undue formality. Nevertheless it may be necessary for those chairing the processes to exercise their authority to lead colleagues to a conclusion, and in the course of that they may use the bundle of powers[8], including powers to -

- declare the opening and closing of a proceeding;
- announce decisions, (including when and how, and the contents of the decisions);
- control proceedings; and
- maintain order[9];

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[6] See rule 40.

[7] This resonates with paragraph 2.4(a) of the TOR, which requires co-chairs to "...have experience in managing, coordinating and building consensus in technical bodies.

[8] The TEAP/TOC/TSB chairs will enjoy not only the authority granted to them ad hoc by colleagues in the meeting, but also will have powers with respect to members similar to the powers conferred on the President of the Montreal Protocol MOP with respect to the Parties, for paragraph 3.3 of the TOR provides

> *The rules of procedure of the Montreal Protocol for committees and working groups will be followed in conducting the meetings of the TEAP/TOCs/TSBs, unless otherwise stated in these terms of reference for TEAP/TOCs/TSBs or other decisions approved by a meeting of the Parties.*

[9] See Rule 22 of the Rules of Procedure, Section 4, Handbook for the Montreal Protocol on Substances that

3.2.2. These powers must be used in good faith to facilitate decision making as effectively and efficiently as possible.

3.3. Preparing for a consensus

3.3.1. In order to pave the way for consensus decision making, it is important for the person chairing the process to make it clear -

- who participates;
- when a decision is to be made; and
- what are the contents of a proposed decision.

3.4. Who participates in the processes?

3.4.1. TEAP/TOC/TSB members may be recused completely or partly from an area of work[10]. Such recusal may involve exclusion from decision-making, in which case the recused member may not block consensus.

3.4.2. Apart from that, members should participate in meetings in good faith before they block consensus. Whilst some members will be expressly barred from decision- making by being recused, others will not be able to block consensus because they have not participated at all, or because they have not participated in good faith.

3.4.3. So, for example, it would not be open to a member to announce, at the beginning of a meeting, that they would block consensus on a decision with a particular effect, and then leave the meeting before any decision is made. Nor would it be open to a member to mandate a colleague to block consensus on the former's behalf.

3.4.4. Consulting Experts do not participate in decision-making.

3.4.5. As paragraph 3 of the TOR provides,

> "The role of the TEAP, TOCs and TSBs demands that they pay special attention to issues of independence and bias in order to maintain the integrity of, and public confidence in, their products and processes".
>
> "Therefore when preparing consensus reports, members – and in particular chairs - need to pay special attention to the way they express strong opinions[11], exercising self control and allowing a range of views to be heard.

3.4.6. Moreover it would not be in good faith for a member to be absent for nearly all of a process, only participating for the sake of blocking consensus at the very end of the meeting.

3.5. Obstacles to the participation of a member

3.5.1. There may be occasions when there are substantial obstacles to the participation of a member in a process. For example, it may be difficult for a member to travel to a

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Deplete the Ozone Layer (2012).

[10] See paragraphs 20 and 21 of the Conflict of Interest and disclosure guidelines at paragraph 6 of the TOR.

[11] Strong opinions are sometimes referred to as bias – see paragraph 12 of the TOR.

meeting. Or there may be technical difficulties that prevent participation in an electronic process. Indeed sometimes participation may be impossible.

3.5.2. In any event, whilst the non-participation of a member in a meeting may be regrettable or unfortunate, non-participation of any member will not require a decision to be postponed and cannot amount to an implicit objection to a decision.

3.5.3. Non-participation of a member will only prevent a decision if that failure to participate means there is no quorum[12].

3.6. Confirming when a decision is made by consensus

3.6.1. Those chairing processes need to make it very clear when and how a decision is made by consensus.

3.6.2. It will not be enough simply to infer from a wide-ranging discussion that consensus has been reached. A chair must make it clear to participants what the contents of a possible decision are, and that unless there is an objection to the decision it will be taken by consensus.

3.6.3. So, for example, if participants in a process are at a meeting and on the spot, a chair might say

"I will assume that this report may be adopted by consensus unless one of you objects. Does anyone object? No one objects so we have adopted the report by consensus."

3.6.4. Or if a decision is being made by consensus in an exchange of email a chair might forward a copy of a decision under cover of an email that says something along the following lines.

"The draft report will be adopted by consensus unless anyone objects by [date] and [time]."

4. Consensus based reports reflecting minority views

4.1. The current practice of issuing majority and minority reports is not the best way to comply with the TOR, which calls for a consensus process reflecting minority views appropriately.

4.2. The TOR recognise that there may be a minority view on some issues; indeed in the absence of complete certainty there is always a possibility that well-qualified people in good faith make take different views on the same matter. But it is difficult to see how issuing two reports is consistent with the requirement for a consensus process. Indeed it might be inferred that the existence of two reports indicates that there are two or more bodies of opinion that object to each other's reports.

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[12] Under rule 26(5) of the Rules of Procedure –

A majority of the Parties designated by the meeting to take part in the committee or working group shall constitute a quorum.....

Applying this provision to the TEAP/TOC/TSBs (as required by paragraph 3.3 of the TOR – see above) we find that a simple majority of TEAP/TOC/TSB members constitutes a quorum.

4.3. The better approach is for a TOC to write one consensus report, including a range of views and effecting both majority and minority views in a way that leads no one to object. This will require both more discipline and more flexibility within a TOC. A committee as a whole must be ready and willing to see the views of the minority expressed[13].

4.4. It would also ensure that all views, including minority views, are considered thoroughly throughout the development of the consensus report, and receive the same level of technical review.

4.5. For example, an elaboration to a consensus recommendation, where there had been some reservations raised within the TOC, might be along the following lines,

"While the majority of members believed on balance that the quantity of CFCs requested by [Party] might be considered essential according to Decision IV/25, a number of members were concerned about suitable CFC-free alternatives becoming available that might make the full quantity unnecessary in [year]. Nevertheless, the TOC recommended the nominated quantity in the understanding that [Party] would review the situation in [year] and only manufacture the minimum quantity of CFCs within its authorised allowance necessary to fulfil its actual requirements."

[13] E.g., *A minority considered that a lesser proportion of [substance] could be replaced with a particular technical alternative because....*

Annex 5 - TEAP Note #3: Strong Opinion (Bias) and Conflict of Interest

For some time, members of the TEAP have grappled with the relationship between strong opinion and conflict of interest. This brief note explores that relationship.

Our starting point should be paragraph 12 of the TOR, which provides -

A member's strong opinion (sometimes referred to as bias), or particular perspective, regarding a particular issue or set of issues does not create a conflict of interest. It is expected that the TEAP, TOCs and TSBs will include members with different perspectives and affiliations, which should be balanced so far as possible.

The terms of this paragraph were discussed at length by both the Parties and by the

TEAP and its Decision XXIII/10 task force, at and before MOP 24.

It is worth noting that –

- The TOR use "strong opinion" and "bias" as if they were interchangeable. It follows that "bias", within the meaning of the TOR, does not have negative connotations. Ordinarily "bias" *may* mean "prejudice" or "systematic distortion". This is *not* the case in the TOR where "bias" simply describes the strength of an opinion rather than suggesting that a biased individual's opinion is flawed.

- It is manifest that a strong opinion, in itself, does not create a conflict of interest.

If we turn to paragraph 3 of the TOR, we read -

The role of the TEAP, TOCs and TSBs demands that they pay special attention to issues of independence and bias in order to maintain the integrity of, and public confidence in, their products and processes. It is essential that the work of TEAP and its TOCs and TSBs is not compromised by any conflict of interest.

Key points to note here are –

- Notwithstanding the provisions of paragraph 5, special attention needs to be paid to independence and bias.

- The purpose of this is to maintain integrity and public confidence in the TEAP, TOCs and TSBs.

- There is a relationship between strong opinion/bias and conflict of interest, but this relationship is not expressly identified in paragraph 3.

What, then, is the relationship between strong opinion/bias and conflict of interest? We know from paragraph 1(a) of the TOR that -

(a) "Conflict of interest" means any current interest of a member, or of that member's personal partner or dependant, which in the opinion of a reasonable person does or appears to:

(i) Significantly impair that individual's objectivity in carrying out their duties and responsibilities for TEAP, the TOC or the TSB; or

(ii) Create an unfair advantage for any person or organization;

It is possible therefore that someone who has a strong opinion, or bias, *may* be conflicted *if and only if* their interest triggers the definition in paragraph 1(a). Whether an interest creates a conflict within the meaning of that provision will be a matter to be determined[14] on a case by case basis, taking into account all the circumstances and the TOR in their entirety.

[14] Procedures that describe, inter alia, how it may be determined that a member should be recused because of a conflict are set out in paragraphs 14 to 19 of the Conflict of Interest and Disclosure Guidelines for the TEAP, its TOCs and TSBs.