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## United Nations Environment Programme

**Ozone Research Managers of the  
Parties to the Vienna Convention for the  
Protection of the Ozone Layer  
Tenth meeting**  
Geneva, 28–30 March 2017

### **General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention**

#### **Note by the Secretariat**

##### **Introduction**

1. The present note provides an overview of issues related to the General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention for the Protection of the Ozone Layer (hereinafter the “Trust Fund”). It presents background information on the establishment and institutional arrangements of the Trust Fund and provides an update on the current status of the Trust Fund and the activities under its purview. The note also highlights other key issues addressed by the Conference of the Parties to the Vienna Convention at its tenth meeting, which was held jointly with the Twenty-Sixth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer in November 2014.

2. The objectives and activities of the Trust Fund pertaining to research and systematic observation are central to the work of the Ozone Research Managers of the Parties to the Vienna Convention, not only to their mandate under the Vienna Convention, but also to their domestic responsibilities. The Ozone Research Managers may therefore wish to consider the present note and make appropriate recommendations, for further consideration by the eleventh meeting of the Conference of the Parties to the Vienna Convention, to be held jointly with the Twenty-Ninth Meeting of the Parties to the Montreal Protocol, in Montreal, Canada, from 20 to 24 November 2017.

#### **A. Establishment of the Trust Fund and institutional arrangements**

3. By decision VI/2 of the Conference of the Parties to the Vienna Convention, the United Nations Environment Programme (UNEP) was requested, in consultation with the World Meteorological Organization (WMO), to establish an extrabudgetary fund for receiving voluntary contributions from the parties and international organizations for the purpose of financing certain research and systematic observation activities related to the Convention in developing countries and countries with economies in transition.

4. The decision also stated that the primary aim of the Trust Fund should be to provide complementary support for the continued maintenance and calibration of the existing WMO Global Atmospheric Watch ground-based stations for monitoring column ozone, ozone profiles and ultra-violet radiation in the developing countries and in the countries with economies in transition, to address balanced global coverage. It further stated that consideration should be given to supporting other activities identified by the Ozone Research Managers and in consultation with the co-chairs of the UNEP Scientific Assessment and Environmental Effects Assessment Panels, for the improvement of the observation network and relevant research.

5. In September 2005, UNEP, represented by the Ozone Secretariat, and WMO signed a memorandum of understanding on the institutional arrangements for making decisions on the allocation of funds in the Trust Fund, and presented it to the Conference of the Parties to the Vienna Convention at its seventh meeting in 2005. The parties requested UNEP and WMO to continue their cooperation with regard to the Trust Fund pursuant to the terms set out in that memorandum and on the understanding that the agreement could be changed as necessary to meet evolving needs and conditions.
6. The Trust Fund was initially established in February 2003 with a five-year term ending on 31 December 2007. In accordance with the request set out in decision VII/2, in 2005 UNEP extended the life of the Trust Fund to 31 December 2015, which was approved by the Governing Council of UNEP in 2007. By decision X/3, the Conference of the Parties requested the Executive Director of UNEP to further extend the life of the Trust Fund up to 31 December 2020; that further extension was approved until 31 December 2019 by the United Nations Environment Assembly at its second session in May 2016 in resolution 2/23.<sup>1</sup>
7. In decision X/3, the Ozone Secretariat was requested to coordinate with the World Meteorological Organization to establish a small advisory committee for the Trust Fund, with a mandate:
- (a) To develop a long-term strategy and implementation objectives and priorities in the light of the four overarching goals identified by the Ozone Research Managers at their ninth meeting;
  - (b) To develop a short-term action plan that would take into account the most urgent needs of the Global Ozone Observing System and which would make the best possible use of the resources available in the Trust Fund;
  - (c) To ensure quality control of the individual project proposals developed under the Trust Fund, striving for regional balance in the projects supported by the Fund and identifying possibilities for complementary funding to maximize its resources.
8. The decision further provided that the advisory committee would consist of not more than 10 members, including two co-chairs of the Scientific Assessment Panel, the two co-chairs of the Ozone Research Managers, one representative of the Ozone Secretariat and up to five scientists and experts in ozone observations, as well as one representative of WMO as an observer, striving for equitable geographical and gender representation. The Committee would convene electronically or in the margins of other relevant meetings.
9. In response to that request, the advisory committee of the Trust Fund was established<sup>2</sup> and has met twice in the margins of the Twenty-Seventh Meeting of the Parties, in Dubai, United Arab Emirates, on 31 October 2015, and the Twenty-Eighth Meeting of the Parties, in Kigali on 9 October 2016. A third meeting of the advisory committee is scheduled to take place at the headquarters of WMO in Geneva on 27 March 2017, before the tenth meeting of the Ozone Research Managers.
10. In accordance with its mandate, and taking into account paragraph 3 of decision X/2,<sup>3</sup> the advisory committee has considered the status of the activities identified for priority funding at the ninth meeting of the Ozone Research Managers along with six proposals submitted by parties in response to the Ozone Secretariat's 2016 invitation to developing countries and countries with economies in transition for the submission of project proposals. A list of all the activities funded to date as well as the activities that have been granted funding by the committee and those under consideration is provided in section C below.
11. The committee adopted its terms of reference at its second meeting in 2016 (annex I) and set out initial thoughts on the long-term strategy of the Trust Fund (annex II). The committee will deliberate further on this issue at its third meeting in Geneva with a view to supporting discussions at the relevant session of the tenth meeting of the Ozone Research Managers.

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<sup>1</sup> United Nations Environment Assembly resolution 2/23, management of trust funds and earmarked contributions, section II, paragraph 6 (bb).

<sup>2</sup> The current composition of the advisory committee may be found on the Ozone Secretariat's website at: <http://ozone.unep.org/en/advisory-committee-vienna-convention-trust-fund-research-and-systematic-observation>.

<sup>3</sup> Decision X/2, para. 3: "To accord priority to capacity-building activities, in particular the specific projects identified for priority funding under the General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention, related to the inter-calibration of instruments, the training of instrument operators and increasing the number of ozone observations, especially through the relocation of available Dobson instruments".

## B. Contributions to the Trust Fund

12. In accordance with the memorandum of understanding between the Ozone Secretariat and WMO, the Conference of the Parties requested the Secretariat, in decision X/3, to continue inviting parties, and relevant international organizations as appropriate, to make financial and/or in-kind contributions towards well-defined and well-budgeted project proposals developed under the Trust Fund. In 2016, such letters inviting contributions were sent out by the Secretariat in consultation with the advisory committee.

13. Annual contributions to the Trust Fund and expenditures from its inception in 2003 until February 2017 along with the current balance are shown in the table. The table also includes a pledge of €9,000 received from France in February 2017. Information on any additional contributions that may be received after February 2017 will be provided at the eleventh meeting of the Conference of the Parties to be held in November 2017.

## C. Activities and associated costs

14. Since its inception in 2003, the Trust Fund has provided support for nine activities, which were completed by February 2017. Four additional activities were approved for funding by the advisory committee in 2016 and are scheduled to take place in 2017 and 2018. Brief summaries of all the activities completed by February 2017 are set out in annex III to the present report for information purposes. In addition, in response to the Secretariat's invitation to all developing countries and countries with economies in transition for the submission of project proposals, six proposals were received in 2016 and are under consideration by the advisory committee, pending the availability of funds.

15. The above-mentioned activities and associated costs are listed below. A list of those activities may also be found on the website of the Ozone Secretariat.<sup>4</sup>

### Completed activities

16. Activities 1–8 are listed below along with the associated expenditure (including administrative costs). Given that activity 9 was completed at the end of February 2017 and an expenditure report has not yet been made available to the Secretariat, the associated cost refers to the amount advanced by the Secretariat to WMO for the implementation of the activity.<sup>5</sup>

**Activity 1:** Dobson intercomparison, Dahab, Egypt, 23 February–12 March 2004 (\$16,950);

**Activities 2 and 3:** Calibration of Brewer instrument no. 116 in Bandung, Indonesia, 5–9 September 2006 and no. 176 in Kathmandu, 20–26 September 2006 (\$18,193);

**Activity 4:** Dobson intercomparison, Irene, South Africa, 12–30 October and 15–26 November 2009 (\$26,839);

**Activity 5:** Workshop on data quality in the total ozone network, Hradec Králové, Czechia, 14–18 February 2011 (\$40,903);

**Activities 6 and 7:**<sup>6</sup> Relocation of Dobson no. 14 (formerly deployed in Tromsø, Norway) to Tomsk, Russian Federation, and Dobson training courses in Hradec Králové, Czechia, 7–14 April 2015 and Amberd, Armenia, 28 September–4 October 2015 (\$14,544);

**Activity 8:**<sup>7</sup> Dobson intercomparison campaign for Asia, hosted by the Japanese Meteorological Agency, 7–25 March 2016 (\$29,373).

**Total expenditure: \$146,802**

**Activity 9:**<sup>8</sup> Dobson intercomparison campaign for Australia and Oceania, hosted by the Australian Bureau of Meteorology (\$29,986 – amount advanced in February 2017).

**Total costs** (total expenditure for activities 1–7 plus amount advanced for activity 9): **\$176,788.**

<sup>4</sup> <http://ozone.unep.org/en/activities-under-vienna-convention-trust-fund-research-and-systematic-observation>.

<sup>5</sup> The lack of new activities between 2011 and 2015 was due to the fact that it took time to repair and refurbish the Dobson instruments destined for relocation.

<sup>6</sup> The activities were listed for priority funding at the ninth meeting of Ozone Research Managers in 2014.

<sup>7</sup> The activity was listed for priority funding at the ninth meeting of Ozone Research Managers in 2014.

<sup>8</sup> The activity was listed for priority funding at the ninth meeting of Ozone Research Managers in 2014.

## Status of the General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention as at 28 February 2017 (in United States dollars)

| <i>Party</i>                      | 2003         | 2004          | 2005         | 2006          | 2007          | 2008          | 2009          | 2010         | 2011           | 2012           | 2013         | 2014         | 2015          | 2016          | <i>Feb-2017</i>    | <i>Total</i>     |
|-----------------------------------|--------------|---------------|--------------|---------------|---------------|---------------|---------------|--------------|----------------|----------------|--------------|--------------|---------------|---------------|--------------------|------------------|
| Andorra                           |              |               |              |               |               |               |               |              | 5 557          |                |              |              |               |               |                    | 5 557            |
| Australia                         |              |               |              |               |               |               |               |              |                |                |              |              | 28 011        |               |                    | 28 011           |
| Czechia                           |              |               |              | 8 000         |               | 10 000        |               |              |                |                |              |              |               |               |                    | 18 000           |
| Estonia                           |              |               |              | 2 000         |               |               |               |              |                |                |              |              |               |               |                    | 2 000            |
| Finland                           | 5 700        | 6 138         | -            |               |               | 7 776         | 6 603         | 6 050        | 7 190          |                | 5 498        | 4 535        |               | 6 276         |                    | 55 766           |
| France                            |              |               |              |               |               |               | 29 600        |              |                | 5 020          |              |              |               | 9 956         | 9 605 <sup>b</sup> | 54 181           |
| Kazakhstan                        |              | 1 500         | 1 500        | 1 500         | 1 500         | 1 500         | 292           | 1 500        |                |                | 2 069        |              |               |               |                    | 11 361           |
| South Africa                      |              |               |              |               | 30 000        | 30 000        |               |              |                |                |              |              |               |               |                    | 60 000           |
| Spain                             |              |               | 6 306        | 6 035         |               |               |               |              |                |                |              |              |               |               |                    | 12 341           |
| Switzerland                       |              |               |              |               | 20 677        |               |               |              |                |                |              |              |               |               |                    | 20 677           |
| United Kingdom                    |              | 17 538        |              |               |               | 23 449        |               |              |                |                |              |              |               |               |                    | 40 987           |
| <b>Subtotal</b>                   | <b>5 700</b> | <b>25 176</b> | <b>7 806</b> | <b>17 535</b> | <b>52 177</b> | <b>72 725</b> | <b>36 495</b> | <b>7 550</b> | <b>12 747</b>  | <b>5 020</b>   | <b>7 567</b> | <b>4 535</b> | <b>28 011</b> | <b>16 232</b> | <b>9 605</b>       | <b>308 881</b>   |
| Interest income                   | 16           | 431           | 911          | 2 757         | 5 494         | 7 326         | 4 686         | 1 597        | 1 844          | 1 082          | 765          | 693          | 201           | 781           |                    | 28 583           |
| Exchange gain/(loss)              |              |               |              |               |               | 196           | 2 989         | 7 013        | (7 013)        | (2 272)        | (865)        | (81)         | 1 449         | (342)         |                    | 1 074            |
| <b>Subtotal</b>                   | <b>16</b>    | <b>431</b>    | <b>911</b>   | <b>2 757</b>  | <b>5 494</b>  | <b>7 522</b>  | <b>7 675</b>  | <b>8 610</b> | <b>(5 169)</b> | <b>(1 190)</b> | <b>(100)</b> | <b>612</b>   | <b>1 650</b>  | <b>439</b>    | <b>-</b>           | <b>29 657</b>    |
| <b>Total income</b>               |              |               |              |               |               |               |               |              |                |                |              |              |               |               |                    | <b>338 539</b>   |
| Less expenditure ( <sup>a</sup> ) |              | (16 950)      |              | (18 193)      |               |               | (26 839)      |              | (40 903)       |                |              |              | (14 544)      | (29 373)      |                    | (146 802)        |
| Less advances ( <sup>a</sup> )    |              |               |              |               |               |               |               |              |                |                |              |              |               |               | (29 986)           | (29 986)         |
| <b>Total outflow</b>              |              |               |              |               |               |               |               |              |                |                |              |              |               |               |                    | <b>(176 788)</b> |
| <b>Balance available</b>          |              |               |              |               |               |               |               |              |                |                |              |              |               |               |                    | <b>161 751</b>   |

<sup>a</sup> The amount includes 13 per cent programme support costs charged by UNEP.

<sup>b</sup> Amount pledged but not received as of February 2017.

### Planned activities

17. The following activities were all listed for priority funding at the ninth meeting of the Ozone Research Managers in 2014.<sup>9</sup> They have been approved by the advisory committee and are in the pipeline for financing by the Trust Fund:

- Relocation of Dobson no. 8 (formerly deployed in Spitzbergen and the property of the Norwegian Polar Institute) to Singapore, following repair and calibration in Germany, and sending Dobson no. 7, currently out of order, to Germany for possible repair. The activity is tentatively scheduled to take place in the second half of 2017. Cost \$20,000.
- Training course on ozone measurements with the Brewer instrument in conjunction with a Brewer Users Group meeting to be held in Sydney, Australia, 4–9 September 2017. Cost \$40,000 to be shared between the Trust Fund and the Canadian Brewer Trust Fund, resulting in \$20,000 for the Trust Fund.
- Dobson intercomparison campaigns for Northern and Southern Africa. The campaign for Northern Africa is to be hosted by the Spanish State Meteorological Agency and will be held in El Arenosillo, Spain, 4–15 September 2017. The campaign for Southern Africa is to be hosted by the South African Weather Service and will be held in Irene, South Africa, in September/October 2018. Cost \$50,000.
- Dobson intercomparison campaign for South and Latin America, hosted by the National Meteorological Service of Argentina, scheduled to be held in Buenos Aires, 13 November–1 December 2017. Cost \$50,000.

**Total funds allocated: \$140,000.**

### Project proposals submitted in 2016

10. In response to the Secretariat's invitation for the submission of project proposals, addressed to all developing countries and countries with economies in transition in March 2016, the following proposals were received (listed together with the amounts of funding requested).

- (a) **Belarus:** Preparing and realizing intercomparison sessions of three instruments engineered and currently operated at the National Ozone Monitoring Research and Educational Centre, Belarusian State University, to monitor total ozone and ultraviolet (UV) radiation in Belarus. Funds requested: \$50,000;
- (b) **Ecuador:** The Ecuadorian Highlands Ozonesondes (ECHOZ) project. Funds requested: \$49,824;
- (c) **Kenya:** Capacity-building on data management and instrument calibration. Funds requested: \$49,985;
- (d) **Oman:** Measurement of the diurnal and seasonal variation of ozone towards improving knowledge on ozone trend estimates: case study of Oman. Funds requested: \$50,000;
- (e) **Togo:** Construction and equipping of a laboratory for continuous measurement of the stratospheric ozone layer and atmospheric ozone. Funds requested: \$40,000;
- (f) **Joint project proposal by WMO/Global Atmosphere Watch and Southern Hemisphere Additional Ozonesondes (SHADOZ):** Jülich Ozone Sonde Intercomparison Experiment (JOSIE) 2017. Funds requested: \$42,660.

**Total funds requested: \$282,469.**

## D. Activities and availability of funds

18. On the basis of the information provided in sections B and C above, key points in relation to the status of the Trust Fund and its underlying activities can be summarized as follows:

- The total income of the Trust Fund from 2003 to February 2017 (14 years and 2 months), taking into account the interest accrued, fluctuations in exchange rates and funds pledged by the Government of France in February 2017, was \$338,539.

<sup>9</sup> Dobson no. 8, originally destined for Sri Lanka, is to be relocated to Singapore instead. The relocation of the Dobson observation hatch from Arosa, Switzerland, to Nairobi was cancelled because it emerged that it would cost less to have such a hatch made locally than to transport it from Switzerland to Kenya.

- The total disbursement from the Trust Fund for the same period, 2003 to February 2017, was \$176,788, comprising expenditures for eight activities completed by 2016 and advance payment for one activity completed in February 2017. Six of the completed activities involved calibration and intercomparison of Brewer or Dobson instruments from 19 countries, while the remaining three comprised a data archiving workshop, a Dobson training course and the relocation of a Dobson instrument. Altogether, 30 countries have participated in activities supported by the Trust Fund.
- Based on the total income and disbursement figures, the current available balance of the Trust Fund is: \$161,751.
- Four additional activities totalling \$140,000 have been approved for funding by the advisory committee of the Trust Fund and are expected to be implemented in 2017 and 2018. They comprise three Dobson intercomparison campaigns, two of which are to be held in Africa and one in South and Latin America, a Brewer training course and a relocation of a Dobson instrument.
- Once the funds allocated to the four above-mentioned planned activities are deducted from the current Trust Fund balance, the remaining available balance is: \$21,751.
- The total amount requested for the six new project proposals submitted in 2016 is: \$282,469.

19. It could be said that the Trust Fund's operation and performance has been low key. However, the activities that have been undertaken have been effective and important, yielding positive results for the continuation and enhancement of global systematic observation. Although it will be possible to support all the activities that had been prioritized for funding at the ninth meeting of the Ozone Research Managers, the balance available in the Trust Fund is not sufficient to cover costs associated with the project proposals submitted in 2016 or any proposals that may be submitted in the future. The Ozone Research Managers may wish to consider this situation and make appropriate recommendations.

## **E. Other key issues**

20. In addition to the status of the Trust Fund and related activities, the Ozone Research Managers are expected to consider the follow-up to key provisions set out in decision X/2 of the Conference of the Parties to the Vienna Convention, on the recommendations of the ninth meeting of the Ozone Research Managers, in particular paragraphs 2 to 5 of the decision, which read as follows:

- “2. To encourage parties to adopt and implement as appropriate the recommendations of the Ozone Research Managers under the topics of research, systematic observations, data archiving and capacity-building;
3. To accord priority to capacity-building activities, in particular the specific projects identified for priority funding under the General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention, related to the inter-calibration of instruments, the training of instrument operators and increasing the number of ozone observations, especially through the relocation of available Dobson instruments;
4. To encourage the Ozone Research Managers to review, at their tenth meeting, in 2017, the capacity-building activities that have been conducted, with a view to assessing their effectiveness, and to include further specific recommendations in their report to the Conference of the Parties;
5. To encourage the national ozone focal points, or other appropriate officials, to distribute information on, and coordinate where relevant, monitoring, research and scientific activities in their countries.”

21. Capacity-building in developing countries and countries with economies in transition has always been a key issue for consideration by the Ozone Research Managers. With regard to the provision set out in paragraph 4 of decision X/2, it should be noted that at their eighth meeting, in 2011, the Ozone Research Managers recommended that a set of metrics be developed in order to assess the effectiveness of capacity-building activities and proposed that the metrics could consist of one or more of the following:

- (a) The number of refereed publications in peer-reviewed journals by scientists in developing economies;

(b) The quantity and quality of data submitted to the World Ozone and Ultraviolet Data Centre (WOUDC) or other appropriate archives;

(c) Increased involvement in the Ozone Assessment through publications used, authors, reviewers, etc.

22. When the issue of capacity-building was discussed by the Ozone Research Managers at their ninth meeting, in 2014, they concluded that extensive work had been carried out with regard to the quantity and quality of data submitted to WOUDC or other appropriate archives, which had revealed a considerable decline in the number of ozone observing stations submitting data to WOUDC. It was also reported that work was under way to identify the exact reason for that decline. Although it was assumed that the decline was partly due to station closures, delays in data submission were also suspected to be partly responsible. In that regard, it was reported that stations were being contacted and urged to submit data in a timely manner.

23. The Ozone Research Managers are expected to reconsider this issue at their tenth meeting in accordance with decision X/2.

## **F. The way forward**

24. The Ozone Research Managers are expected to consider the issues highlighted above and any other matters they may wish to bring to the attention of the participants in the tenth meeting. Of paramount importance will be the consideration of a long-term strategy for, and implementation objectives and priorities of, the Trust Fund which are expected to be developed by the advisory committee in the light of the four overarching goals identified by the Ozone Research Managers at their ninth meeting.

25. The outcomes of the tenth meeting along with any recommendations will be presented to the Bureau of the tenth meeting of the Conference of the Parties to the Vienna Convention for its consideration and subsequent presentation to the Conference of the Parties at its eleventh meeting to be held jointly with the Twenty-Ninth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer in November 2017.

## Annex I

### Terms of reference for the advisory committee for the General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention

#### 1. Scope

1. The advisory committee for the General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention for the Protection of the Ozone Layer (hereinafter referred to as the Trust Fund)<sup>1</sup> will advise the Ozone Secretariat and the World Meteorological Organization (WMO) on the activities of the Trust Fund. Such advice may include prioritization, planning, development and implementation of activities, as well as fundraising, taking into consideration the following:

- The resources available in the Trust Fund are not sufficient to enable substantial and sustainable improvements to be made to the Global Ozone Observing System. Therefore, the prioritization of strategically planned activities and associated fundraising are important aspects of the operation of the Trust Fund.
- The coming decade is a crucial time during which the status of the recovery of the ozone layer will become clearer, but such clarity will be dependent on continued high-quality observations.
- Improvements in ozone observations should take into account the existing strong and intricate linkages between ozone and climate. Furthermore, relevant observations and their analyses should focus both on ozone and climate changes wherever possible.

2. The activities of the Trust Fund are reported at the meetings of the Conference of the Parties to the Vienna Convention and also periodically to the Parties to the Vienna Convention, particularly in conjunction with invitations to contribute to the Trust Fund.

#### 2. Establishment

3. In decision X/3, the Conference of the Parties to the Vienna Convention requested the Ozone Secretariat to coordinate with WMO to establish a small advisory committee (hereinafter referred to as the "Committee") for the Trust Fund.

#### 3. Meetings

4. The Committee will convene via teleconferencing or videoconferencing, or in the margins of relevant meetings.

5. The Committee will meet at least once a year and more frequently when necessary.

#### 4. Membership

6. The Committee members will be selected by the Ozone Secretariat in consultation with WMO.

7. The Committee will consist of not more than 10 members, including:

- Two co-chairs of the Scientific Assessment Panel
- The two co-chairs of the meetings of the Ozone Research Managers
- One representative of the Ozone Secretariat

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<sup>1</sup> The General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention for the Protection of the Ozone Layer was established in pursuance of decision VI/2 of the Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer and became operational in 2003. The Trust Fund receives voluntary contributions from the parties and international organizations for the purpose of financing activities on research and systematic observation relevant to the Convention in developing countries and countries with economies in transition. The Ozone Secretariat and the World Meteorological Organization (WMO) agreed on a memorandum of understanding on the institutional arrangements for making decisions on the allocation of funds in the Trust Fund, which was presented to the Conference of the Parties at its seventh meeting. The parties endorsed the memorandum and requested UNEP and WMO to continue their cooperation with regard to the Trust Fund pursuant to the terms set out in the memorandum, on the understanding that that agreement could be changed as necessary to meet evolving needs and conditions.



- Up to five scientists and experts in ozone and ultraviolet (UV) observations
- One representative of WMO as an observer.

8. Equitable geographical and gender representation will be ensured as much as possible.

9. A chairperson will be selected by the Committee from among its members at the meeting of the Committee to be held in the year of, and after, the meeting of the Ozone Research Managers. The representative of the Ozone Secretariat will serve as secretary of the Committee.

10. Members will serve for a three-year term, starting immediately after a meeting of the Ozone Research Managers up until such time as the new members are selected in accordance with paragraph 7 above, within two months after the following meeting of the Ozone Research Managers. Membership of the advisory committee is both an honour and a responsibility. Members should be qualified as ozone and UV science experts, respected by the scientific community, and should have been or be members of coordinating research activities. Membership requires active participation in the work of the Committee. The smooth functioning of the Trust Fund depends on organizational memory or continuity and the overlap of the Committee with the membership of the teams developing the reports required under the Vienna Convention and Montreal Protocol. This continuity of experience and community leadership is explicitly taken into account in the Committee composition specified in paragraph 7 above. However, the Chairperson should be an individual who has previously served as a member of the Committee for at least one term.

## 5. Mandate

11. The main purpose of the Trust Fund is to improve ozone and UV science, which in itself provides some guidance on how to prioritize activities. However, there is a practical side to this prioritization in that the Trust Fund cannot fund satellites and major infrastructure. Currently, it appears that funding for activities costing more than about \$50,000 is probably not possible, while activities costing less than that amount do fall within the purview of the Trust Fund. There is a need to establish some priorities with respect to the main purpose. Owing to the decline in observational capabilities, high priority has to be given to those activities that increase and/or preserve ozone and UV observations. Further, high priority should be given to those activities that involve collaboration between parties operating under paragraph 1 of Article 5 (Article 5 parties) of the Montreal Protocol on Substances that Deplete the Ozone Layer and parties not so operating (non-Article 5 parties) – this would include both calibration and training activities. Lastly, close attention should be paid to measurement activities that allow us to interpret our ozone observations.

12. In the light of the four overarching goals identified by the Ozone Research Managers at their ninth meeting (Geneva, 14–16 May 2014), the Committee will develop a long-term strategy and implementation objectives and priorities for the Trust Fund. The overarching goals are:

(a) *Recognize that the issues of changes in climate and in the stratospheric ozone layer are intimately coupled.* The Montreal Protocol was instituted to protect the Earth's surface from the harmful UV radiation increases that could arise from the depletion of the ozone layer by ozone-depleting substances. Over the decades, research has clearly shown that ozone layer depletion, and its projected recovery, and changes in climate are intricately linked. Indeed, the Vienna Convention specifically referred to the climate change issue. Therefore, it is essential to encompass changes in climate in efforts to protect the ozone layer;

(b) *Existing observation capabilities for climate and ozone layer variables need to be maintained and enhanced.* Given the strong coupling between ozone layer depletion and changes in climate, the observations of climate and ozone layer variables should be carried out and analysed together whenever possible;

(c) *Continue, enhance, and target the Vienna Convention Trust Fund for Research and Systematic Observation<sup>2</sup> to better support the above goals.* In line with the above two goals, it is essential to continue and significantly enhance the Vienna Convention Trust Fund for Monitoring and Research<sup>2</sup> to make it more effective in addressing some of the issues that arise from the above. It is also essential to develop a strategic plan for the Fund and to request that the Ozone Secretariat and WMO set up a small working group to assist them in setting priorities and ensuring implementation;

(d) *Dedicate to build capacity to meet the above goals.* Given the above, it is very important to carry out capacity-building activities in the Montreal Protocol Article 5 parties to expand the

<sup>2</sup> Refers to the General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention.

scientific expertise, with the added benefit of expanding the geographical areas for the measurements and data archival of the key variables related to the ozone layer and changing climate.

13. The Committee will develop and maintain a short-term action plan that takes into account the most urgent needs of the Global Ozone Observing System and that will make the best possible use of the resources available in the Trust Fund.

14. The Committee will assess project proposals in terms of their ability to contribute to the overarching goals of the Trust Fund, striving for regional balance and identifying opportunities for complementary funding to maximize its resources. The Committee will also conduct periodic review of funded projects at timescales that are appropriate for each project. It will evaluate final project performance in order to ensure and implement quality control for activities carried out under, and provide accountability for, the Trust Fund.

15. A website will be established for the Trust Fund and maintained by the Ozone Secretariat, to provide up-to-date information about projects, progress in their implementation and completion.

## Annex II

### Long-term strategy for the General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention

In addition to the primary goal of providing complementary support for the continued maintenance and calibration of monitoring stations in Article 5 parties, the provision of information about the ozone layer and the provision of support to assist Article 5 countries in developing their ozone layer science capabilities have been recognized as important goals of the General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention (hereinafter the "Trust Fund"). In order to meet those goals, financing from the Trust Fund has been used to improve the quality of scientific measurements and enhance observational stations. In particular, the Trust Fund has been used to finance activities to intercalibrate instruments and augment certain country activities. Such decisions have been taken mostly as and when the opportunity has arisen.

The Montreal Protocol will celebrate its 30th anniversary in 2017 and is reaching maturity. About 99 per cent of ozone-depleting substances, in terms of ozone depletion potential (ODP)-weighted amounts, have been phased out and the remaining 1 per cent mainly comprises hydrochlorofluorocarbons. The atmospheric levels of ozone-depleting substances have peaked and are decreasing. The scientific findings suggest that the ozone layer will return to its pre-1980 levels during this century even in the absence of any further actions as long as the Montreal Protocol is adhered to. Therefore, looking to the coming decades, it is important to take stock of what has been achieved by the Trust Fund and what the relevant primary needs are now. To that end, a session at the tenth meeting of the Ozone Research Managers should be dedicated to discussion of the long-term objectives and strategies of the Trust Fund and an attempt to map out short-term strategies or action plans. In that regard, it will be important to have the insight of the scientific community, specifically the Intergovernmental Oceanographic Commission (IOC), Stratospheric Processes and their Role in Climate (SPARC) and International Global Atmospheric Chemistry Project (IGAC).

As a basis for the discussion at the tenth meeting of the Ozone Research Managers, the advisory committee for the Trust Fund may work on a set of points that it would be important to include in the strategies. It may be recalled that the mandate of the advisory committee as defined by the Conference of the Parties to the Vienna Convention in decision X/3 included the development of a long-term strategy and implementation objectives in the light of four overarching goals\* identified by the Ozone Research Managers at their ninth meeting and included in the terms of reference of the Committee.

Once the goals and strategies are agreed to, it will be possible to estimate the resources needed to meet these goals. The total needed resources can be compared with the available resources to evaluate gaps in resources and identify gaps in knowledge that will persist, if the gaps are not filled. Such a document will clearly lay out the needs, resources and gaps, which can be presented to the parties together with the long-term strategy and action plans. The fundraising efforts may ensue on the basis of the resource needs.

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\* Four overarching goals identified by the Ozone Research Managers at their ninth meeting:

(a) *Recognize that the issues of changes in climate and in the stratospheric ozone layer are intimately coupled.* The Montreal Protocol was instituted to protect the Earth's surface from the harmful UV radiation increases that could arise from the depletion of the ozone layer by ozone-depleting substances. Over the decades, research has clearly shown that ozone layer depletion, and its projected recovery, and changes in climate are intricately linked. Indeed, the Vienna Convention specifically referred to the climate change issue. Therefore, it is essential to encompass changes in climate in efforts to protect the ozone layer;

(b) *Existing observation capabilities for climate and ozone layer variables need to be maintained and enhanced.* Given the strong coupling between ozone layer depletion and changes in climate, the observations of climate and ozone layer variables should be carried out and analysed together whenever possible;

(c) *Continue, enhance, and target the Vienna Convention Trust Fund for Research and Systematic Observation<sup>12</sup> to better support the above goals.* In line with the above two goals, it is essential to continue and significantly enhance the Vienna Convention Trust Fund for Monitoring and Research<sup>12</sup> to make it more effective in addressing some of the issues that arise from the above. It is also essential to develop a strategic plan for the Fund and to request that the Ozone Secretariat and WMO set up a small working group to assist them in setting priorities and ensuring implementation;

(d) *Dedicate to build capacity to meet the above goals.* Given the above, it is very important to carry out capacity-building activities in the Montreal Protocol Article 5 parties to expand the scientific expertise, with the added benefit of expanding the geographical areas for the measurements and data archival of the key variables related to the ozone layer and changing climate.

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<sup>12</sup> Refers to the General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention.

## Annex III

### Completed activities under the Trust Fund

1. **Activity 1: Dobson intercomparison, Dahab, Egypt, 23 February–12 March 2004**
  1. Nine Dobson spectrophotometers from Algeria, Botswana, Egypt, Kenya, Nigeria, Seychelles and South Africa were sent to Dahab, Egypt, for intercomparison under the leadership of the Egyptian Meteorological Agency. External experts from the United States of America National Oceanic and Atmospheric Administration, the German Weather Service and the Czech Hydrometeorological Institute participated. Eight of the nine instruments were calibrated and made capable of measuring total ozone with better than 1 per cent accuracy, while one instrument was sent to Germany for repair and calibration before being returned to service.
2. **Activity 2: Calibration of Brewer instrument no. 176 in Kathmandu, 20–26 September 2006**
  2. The calibration was completed at the Kirtipur campus of Tribhuvan University near Kathmandu by an expert from International Ozone Services Inc. with support from the General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention through WMO. The instrument was installed in early 2001 and operated for two years, but had then been out of service until the expert visit in September 2006. The instrument required a new main power supply and reprogramming of its new electronics.
3. **Activity 3: Calibration of Brewer instrument no. 116 in Bandung, Indonesia, 5–9 September 2006**
  3. The calibration was completed at the Indonesian National Institute of Aeronautics and Space facilities in Bandung by an expert from International Ozone Services Inc. with support from the General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention through WMO. The instrument was installed in early 1995 and last visited in 2001, but had been out of service for the past four–five years. The instrument required a new power supply, microboard and ultraviolet filter in front of the photomultiplier tube to return it to service. The Indonesian National Institute of Aeronautics and Space supported the work.
4. **Activity 4: Dobson intercomparison, Irene, South Africa, 12–30 October and 15–26 November 2009**
  4. An intercomparison exercise for the African Dobson instruments took place in Irene, South Africa, in October and November 2009. Eight important instruments were involved in that exercise, including those from Cape Town, Springbok and Irene in South Africa, Maun in Botswana and Seychelles. Another four instruments, from Botswana, Kenya, Nigeria and Seychelles, took part in the extension of the exercise from 15 to 26 November 2009. All the participating instruments are now well calibrated and in good operational condition, except for that from Seychelles, which has a marginal calibration error and may need better expert attention before the next intercomparison event, which is scheduled to take place in 2014 or 2015. In addition, as another extension of the calibration campaign, an instrument from Cairo was calibrated in Germany in May 2010.
5. **Activity 5: Workshop on data quality in the total ozone network, Hradec Králové, Czechia, 14–18 February 2011**
  5. A workshop was held from 14 to 18 February 2011 in Hradec Králové, Czechia, bringing together Dobson total ozone data managers and experts from the central facilities of the WMO Global Atmosphere Watch programme to discuss how to re-evaluate and reprocess some important past data sets. The workshop was organized by the Czech Hydrometeorological Institute and the Scientific Advisory Group on Ozone of the Global Atmosphere Watch provided expert guidance. The main goals of the workshop were to bring together managers of the archive data sets from the Dobson stations and provide guidance on how to re-evaluate and reprocess important past data; to collect the primary (0-level) Dobson data sets and calibration metadata from the stations to be archived in the World Ozone and Ultraviolet Radiation Data Centre; and to present themes and actual results in terms of the operation of the Dobson instruments and data quality assurance at the stations. The workshop was attended by 34 participants, including 21 station data managers from 51 Dobson stations representing some 70 per cent of the currently active Dobson stations. A unified template of the information held by the individual stations was developed for circulation to all stations in the network. The participants learned about problems with the earlier data, and methods of reprocessing data using the freeware developed by the regional Dobson calibration centres.

**6. Activity 6: Relocation of Dobson no. 14 (formerly deployed in Tromsø, Norway) to Tomsk, Russian Federation and Dobson training course, 7–14 April 2015.**

6. The relocation of Dobson no. 14 from Tromsø, Norway, to Tomsk in the Russian Federation was successfully carried out in July 2015 and the instrument was released from Customs in September 2015 and put into operation. A training course on the operation of the instrument was arranged for two Russian operators in Hradec Králové, Czechia, 7–14 April 2015. The instrument, which had been deployed in Tromsø for many years, was repaired and calibrated at the Hohenpeissenberg Observatory of the German Weather Service prior to its shipment to Hradec Králové. After the training course the Dobson instrument was shipped to Tomsk, Russian Federation. Two participants from the ozone observatory in Nairobi also took part in the training course.

**7. Activity 7: Dobson training course in Amberd, Armenia, 28 September–4 October 2015**

7. An experienced Dobson expert from the Czech Hydrometeorological Institute visited Amberd, Armenia, from 28 September to 4 October 2015 and provided training to the local staff on Dobson observations. New Dobson software was installed and some technical problems were solved so that the instrument delivers data of good quality.

**8. Activity 8: Dobson intercomparison campaign for Asia, hosted by the Japanese Meteorological Agency, 7–25 March 2016**

8. The WMO Global Atmosphere Watch regional Dobson intercomparison for regional association II (Asia) was held at the Aerological Observatory in Tsukuba, Japan, 7–25 March 2016, hosted jointly by WMO and the Japan Meteorological Agency, which serves as the regional Dobson calibration centre for Asia for total ozone. The purpose of the activity was to ensure traceability to the regional standard Dobson spectrophotometer (no. 116) through the intercomparison with those Dobson spectrophotometers (no. 75, Xianghe/China; no. 90, Bangkok/Thailand; and no. 100, Quetta/Pakistan) operated in regional association II member countries. Four experts from China, Pakistan and Thailand participated in the intercomparison, which was conducted under the direction of a skilful expert from the National Oceanic and Atmospheric Administration of the United States and a former ozone coordinator in the Japanese Meteorological Agency. The experts also instructed participants in the proper operation of the instruments and data processing in their home countries. Although the weather was changeable during the period, the intercomparison was successfully performed during clear days.

**9. Activity 9: Dobson intercomparison campaign for Australia and Oceania, hosted by the Australian Bureau of Meteorology, 13–24 February 2017**

9. The WMO Global Atmosphere Watch regional Dobson intercomparison campaign was held at the Bureau of Meteorology field annex outside Melbourne, Australia, 13–24 February 2017. The campaign was primarily for the intercomparison of the regional association V (South-West Pacific) Regional Standard Dobson (D 105) against the World Standard (D 083). Two additional Dobson instruments from the region's member countries also participated - D 072 from Lauder, New Zealand, operated by the National Institute of Water and Atmospheric Research and D 052 from Manila, operated by the Philippines Atmospheric, Geophysical and Astronomical Services Administration. Furthermore, the regional association II (Asia) Standard (D 116), operated by the Japanese Meteorological Agency, also took part in the intercomparison in order to provide traceability of Asian instruments to the World Standard. All the participating instruments were successfully calibrated against the World Standard during a short spell of sunny weather in the second week of the campaign. The General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention supported the travel costs of the two participants from the Philippines as well as the shipping of Dobson 052 from Manila to Melbourne, Australia. This support also enabled the extensive training provided by Dobson experts from Australia, Japan and the United States regarding Dobson operation and testing procedures, as well as the refurbishment and repair of the instruments. Together, these actions should ensure a high quality of ozone observations in the tropical western Pacific.