

CONSUMPTION OF OZONE DEPLETING SUBSTANCES	
Atmosphere	Ozone Layer Depletion

## 1. INDICATOR

- (a) **Name:** Consumption of Ozone Depleting Substances (ODSs).
- (b) **Brief Definition:** This indicator will show the consumption trends for ODSs controlled under the Montreal Protocol on Substance that Deplete the Ozone Layer, thereby allowing inference of the amounts of Ozone Depleting Substances being eliminated as a result of the protocol.
- (c) **Unit of Measurement:** ODP Tonnes, which is defined as the Metric Tonnes of ODSs weighted by their Ozone Depletion Potential (ODP).
- (d) **Placement in the CSD Indicator Set:** Atmosphere/Ozone layer depletion.

## 2. POLICY RELEVANCE

- (a) **Purpose:** This indicator depicts the progress towards the phase out the ODSs by the countries which have ratified the Montreal Protocol on Substances that Deplete the Ozone Layer and its Amendments of London (1990), Copenhagen (1992), Montreal (1997) and Beijing (1999).
- (b) **Relevance to Sustainable/Unsustainable Development (theme/sub-theme):** The phase-out of ODSs, and their substitution by less harmful substances or new processes, will lead to the recovery of the ozone layer. Stratospheric ozone absorbs most of the biologically damaging ultraviolet radiation (UV-B). Without the filtering action of the ozone layer, more UV-B radiation can penetrate the atmosphere to have adverse effects on human health, animals, plants, micro-organisms, marine life, materials, biogeochemical cycles, and air quality.
- (c) **International Conventions and Agreements:** The Vienna Convention for the Protection of the Ozone Layer and its Montreal Protocol on Substances that Deplete the Ozone Layer and the London, Copenhagen, Montreal and Beijing Amendments to the Protocol.
- (d) **International Targets/Recommended Standards:** The international target under the agreements listed in 2 (c) is the gradual (but ultimately complete) phase-out of use/consumption of ODSs.  
The indicator is also used to measure progress towards the Millennium Development Goal Nr. 7 (Ensure environmental sustainability) and the associated target "Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources".

(e) **Linkages to Other Indicators:** This indicator has links to other environmental and institutional indicators, such as number of chemicals banned or restricted and ratification of international agreements. It has significant implications to human health and natural resources.

### 3. METHODOLOGICAL DESCRIPTION

(a) **Underlying Definitions and Concepts:** **Ozone Depleting Substance (ODS)** means any organic substance containing chlorine or bromine, which destroys the stratospheric ozone layer. **Controlled substance** means a substance in Annex A, Annex B, Annex C or Annex E of the Montreal Protocol, whether existing alone or in a mixture. It includes the isomers of any such substance, except as specified in the relevant Annex, but excludes any controlled substance or mixture which is in a manufactured product other than a container used for the transportation or storage of that substance. **Production** means the amount of listed, controlled substances produced, minus the amount destroyed by technologies to be approved by the Parties to the Montreal Protocol and minus the amount entirely used as feedstock in the manufacture of other chemicals. The amount recycled and reused is not to be considered as "production". **Consumption** is the sum of production plus imports minus exports of controlled substances. We are addressing apparent consumption. **Weighted tonnes of ODSs** means the amount of ODSs in tonnes multiplied by their ozone depleting potential. **Ozone depleting potential (ODP)** is a relative index of the ability of a substance to cause ozone depletion. The reference level of 1 is assigned as an index to CFC-11 and CFC-12. If a product has an ODP of 0.5, a given weight of the product in the atmosphere would, in time, deplete half the ozone that the same weight of CFC-11 or CFC-12 would deplete. ODPs are calculated from mathematical models which take into account factors such as the stability of the product, the rate of diffusion, the quantity of depleting atoms per molecule, and the effect of ultraviolet light and other radiation on the molecules.

(b) **Measurement Methods:** Weighted Tonnes of ODSs for production are the sum of national annual production (in tonnes) of each controlled substance (as reported to the Ozone Secretariat in accordance with Article 7 of the Montreal Protocol) multiplied by the ozone depleting potential of that substance (as listed in Annexes A, B, C and E of the Montreal Protocol, whose text can be found in the Handbook for the International Treaties for the Protection of the Ozone Layer, 2003 [NB: A new edition is coming out in 2006]). It can be found at: <http://ozone.unep.org/>, <http://www.unep.ch/ozone> or <http://www.unep.org/ozone>. Weighted Tonnes of Ozone Depleting Substances for consumption are obtained through a similar calculation using national annual consumption values (in tonnes).

(c) **Limitations of the Indicator:** Availability and accuracy of data and timely reporting will determine the country's ability to use the indicator. The indicator by itself does not reveal much about current trends in the deterioration of the ozone layer because of delays in ecosystem response.

(d) **Status of the Methodology:** For more information, please consult the Reports of the Secretariat on information provided by the Parties in accordance with Article 7 of the

Montreal Protocol or the Home Page at: <http://ozone.unep.org/>,  
<http://www.unep.ch/ozone> or <http://www.unep.org/ozone>.

**(e) Alternative Definitions/Indicators:** An alternative indicator could focus on emissions of ODSs. However, such information is not available, hence the use of the consumption data as a proxy for indicating possible levels of emissions since most of the usage of ODSs is ultimately emitted to the atmosphere. Another possible indicator is the concentration levels of ODSs in the atmosphere.

#### **4. ASSESSMENT OF DATA**

**(a) Data Needed to Compile the Indicator:** Data on production, imports and exports of controlled substances by the Parties to the Montreal Protocol.

**(b) National and International Data Availability and Sources:** The data are available for most countries, on a national level, on a regular annual basis, as part of their reporting obligations under the Montreal Protocol. The data are more centrally available at the international level from the Ozone Secretariat in Nairobi and from the Multilateral Fund Secretariat in Montreal (as Parties to the Protocol report to these Secretariats). The data sources are the Ozone Secretariat and the national government ministry responsible for reporting under the Montreal Protocol.

**(c) Data References:** UNEP, Production and Consumption of Ozone Depleting Substances, 1986-2004, United Nations Environment Programme, pp. 41, 2005. Web site: <http://ozone.unep.org/>, <http://www.unep.ch/ozone> or <http://www.unep.org/ozone>. Data on this indicator is also included in the MDG database, see <http://mdgs.un.org/>

#### **5. AGENCIES INVOLVED IN THE DEVELOPMENT OF THE INDICATOR**

**(a) Lead Agency:** The lead agency is the United Nations Environment Programme (UNEP)/Ozone Secretariat. The contact point is the Executive Secretary of the Ozone Secretariat, fax no. (254-2) 762-4691/2/3.

**(b) Other Contributing Organizations:** Other organizations interested in the further development of this indicator would include: The Multilateral Fund Secretariat, the Global Environment Facility (GEF) Secretariat, United Nations Development Programme (UNDP), UNEP Division of Technology, Industry & Economics (UNEP DTIE), United Nations Industrial and Development Organization (UNIDO), the World Bank, the Technology and Economic Assessment Panel to the Montreal Protocol, the Parties to the Montreal Protocol, the Organisation for Economic Co-operation and Development (OECD), and members associated with the Alternative Fluorocarbon Environmental Acceptability Study (AFEAS).

#### **6. REFERENCES**

**(a) Readings:**

Ozone Secretariat, UNEP, Handbook for the International Treaties for the Protection of the Ozone Layer (Sixth Edition), pp.398, 2003. (ISBN: 92- 807-2316-2).

UNEP, Synthesis of the Reports of the Scientific, Environmental Effects and Technology and Economic Assessment Panels of the Montreal Protocol. A Decade of Assessments for Decision Makers Regarding the Protection of the Ozone Layer: 1989-1998, United Nations Environment Programme, pp. 161, 1999. (ISBN: 92-807- 1733-2).

UNEP, Reports of the Technology and Economic Assessment Panel of the Montreal Protocol.

Reporting of Data by the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer.

**(b) Internet sites:**

<http://ozone.unep.org/>

<http://www.unep.ch/ozone>

<http://www.unep.org/ozone>

<http://www.unmfs.org>

<http://www.uneptie.org/ozonaction.html>

<http://www.undp.org/seed/eap/montreal/index.htm>

<http://www.unido.org>

<http://www-esd.worldbank.org/mp>