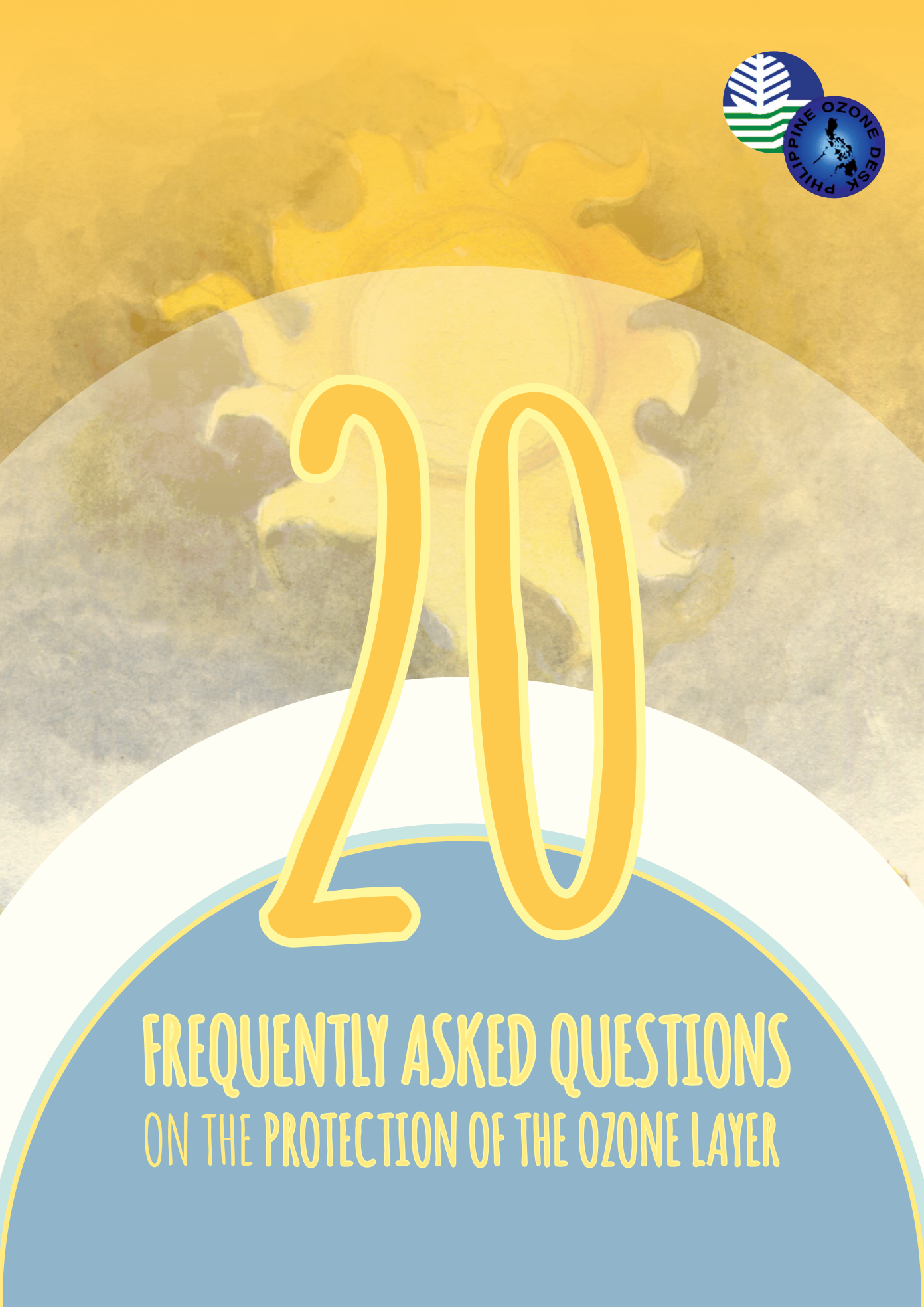

20

FREQUENTLY ASKED QUESTIONS
ON THE PROTECTION OF THE OZONE LAYER

20 FREQUENTLY ASKED QUESTIONS ON THE PROTECTION OF THE OZONE LAYER

Reprinted in 2014 in the Philippines.

This material was produced by the Philippine Ozone Desk which is funded by the Multilateral Fund for the implementation of the Montreal Protocol through the United Nations Environment Programme (UNEP).

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20 FREQUENTLY ASKED QUESTIONS ON THE PROTECTION OF THE OZONE LAYER

FREQUENTLY ASKED QUESTIONS

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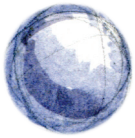
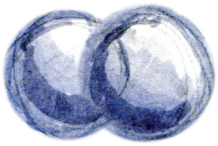
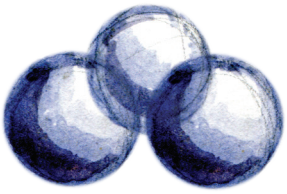


Atomic Oxygen



Molecular Oxygen

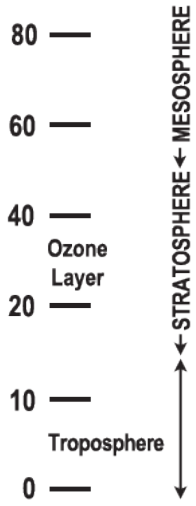


Ozone Molecule

Ozone is a gas that is naturally present in our atmosphere. Because an ozone molecule contains three oxygen atoms, its chemical symbol is O_3. The word "ozone" is derived from the Greek word *ozein*, meaning "to smell". Ozone has a pungent odor that allows it to be detected even in very low amounts. Ozone molecules have a relatively low abundance. **For every ten million air molecules, there are only three ozone molecules.**

Ozone is poisonous, and once inhaled, may be fatal. Fortunately, most ozone (about 90%) is found in the stratosphere. The large amount of ozone in the stratosphere (also known as stratospheric ozone) is considered "good ozone" because it protects the earth from harmful ultraviolet (UV) rays.

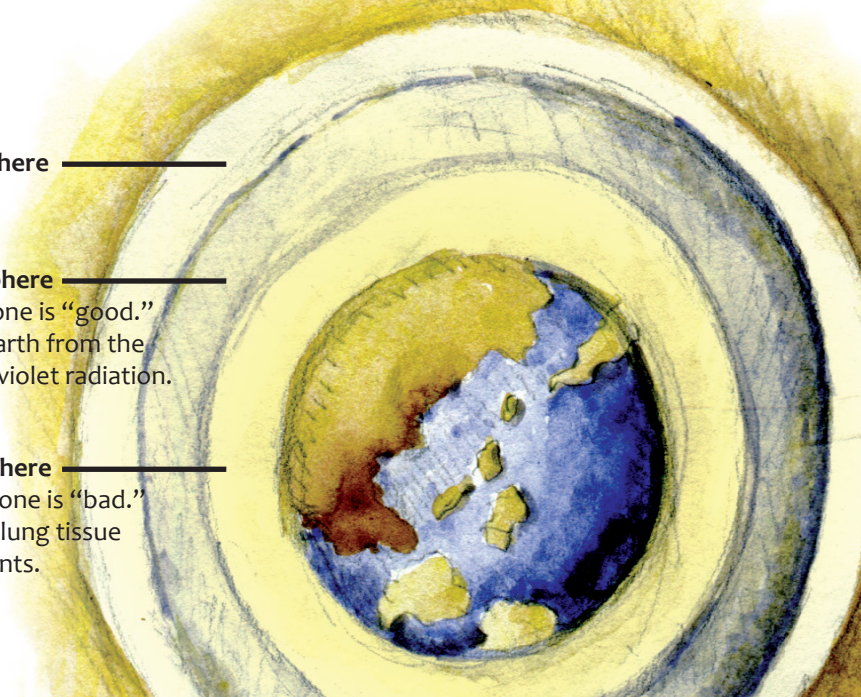
The remaining 10% of atmospheric ozone is in the troposphere, the region closest to earth. Ozone found in the earth's surface is formed from pollutants and is considered "bad ozone" because it is harmful to human, plant and animal life.



Mesosphere

Stratosphere
In this region, ozone is "good." It protects the Earth from the Sun's harmful ultraviolet radiation.

Troposphere
In this region, ozone is "bad." It can damage lung tissue and plants.



FAQ 2

What is the Ozone Layer and Why is it Important?

The **ozone layer** is a thin, fragile shield that envelops the earth and effectively filters about 90% the sun's harmful ultraviolet-B radiation (UV-B) and completely screens out lethal ultraviolet-C radiation (UV-C). It is a region that begins about 10 to 16 kilometers above the earth's surface and extends up to about 50 kilometers.

Damage to the ozone layer will naturally mean the entry of harmful rays into the atmosphere. Without the ozone layer, there will be no life on earth.

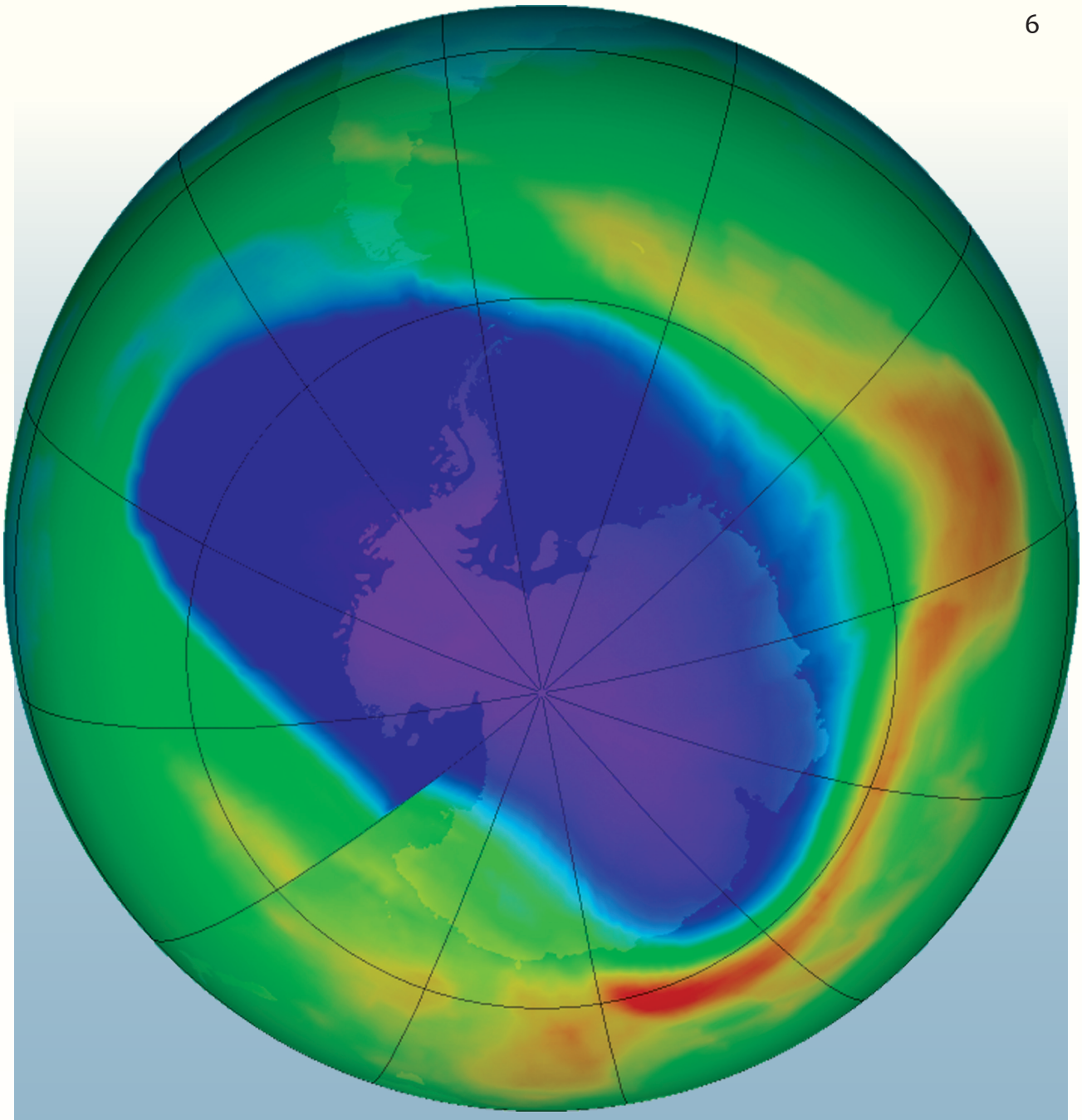
FAQ 3

What is the "Ozone Hole" and Where is it Located?

The **ozone hole** is not a literal hole in the atmosphere. It refers to the thinning of the ozone layer, or the loss of the blocking effect of ozone against ultraviolet rays. This allows the entry of greater concentrations of UV-B, putting all life forms at risk.

The ozone hole was first observed over the Antarctic region in the early 1980s. Antarctic ozone depletion is seasonal, occurring primarily in late winter and spring (August-November).

As of September 27, 2013, the size of the hole is about **21 million square kilometers**, which is almost as big as **North America**



Below is the table of geographic areas to be used as references in conceptualizing just how large the ozone hole can get.

Following are referable areas:

Australia	8,923,000 Sq Km
United States	9,363,130 Sq Km
Antarctica	13,340,000 Sq Km
North America	25,349,000 Sq Km

Source: National Oceanic and Atmospheric Administration (NOAA) Climate Prediction Center

FAQ 4

What are the effects of Ozone Depletion?

Ozone depletion allows the entry UV-B radiation from the sun. **The sun is the primary source of ultraviolet radiation.**

There are three categories of UV:

- **UV–A (wavelength range 320-400nm)** is only slightly affected by ozone levels. Most UV-A radiation is able to reach the earth's surface and can contribute to tanning, skin aging, eye damage, and immune suppression.

- **UV-B (wavelength range 280-320nm)** is strongly affected by ozone levels. Decreases in stratospheric ozone mean that more UV-B radiation can reach the earth's surface, causing sunburns, snow blindness, immune suppression, and a variety of skin problems including skin cancer and premature aging. UV-B is harmful.

- **UV-C (wavelength range 100-280 nm)** is very strongly affected by ozone levels, so that the levels of UV-C radiation reaching the earth's surface are relatively small. UV-C is lethal.

From the National Oceanic and Atmospheric Administration's Surface Radiation Research Branch http://www.srrb.noaa.gov/UV (access year: 2005)

In general, moderate exposure to UV radiation helps maintain an adequate level of vitamin D and is not detrimental. However, too much exposure to UV-B harms not just humans but all life forms.

On land, UV-B radiation endangers all life forms. The immune systems of humans exposed to high level of UV-B will deteriorate. Hence, they will become more prone to diseases and other disabilities such as skin cancer, eye cataract and blindness. Physically, they will age more rapidly. Further, their sources of food will become more limited since UV-B inhibits the growth of crops and trees.

UV radiation also degrades polymers used in buildings, paints, packaging and countless other substances. Plastics used outdoors are likely to be affected. Countries in tropical regions will be severely affected by the degradation of these building materials that may cost billions of dollars in damage.

On water, UV-B radiation reaches the ocean floor damaging the propagation of phytoplankton organisms, the primary food source of most marine life. This affects the marine food chain which also involves humans at the end of the food chain. Many marine species are humans' main source of food. Fish eggs and young plants with developing leaves are also particularly susceptible to damage from overexposure to UV.

What are the causes of Ozone Depletion?

FAQ 5

The depletion of the ozone layer is caused by certain man-made chemicals called **Ozone-Depleting Substances or ODS.**

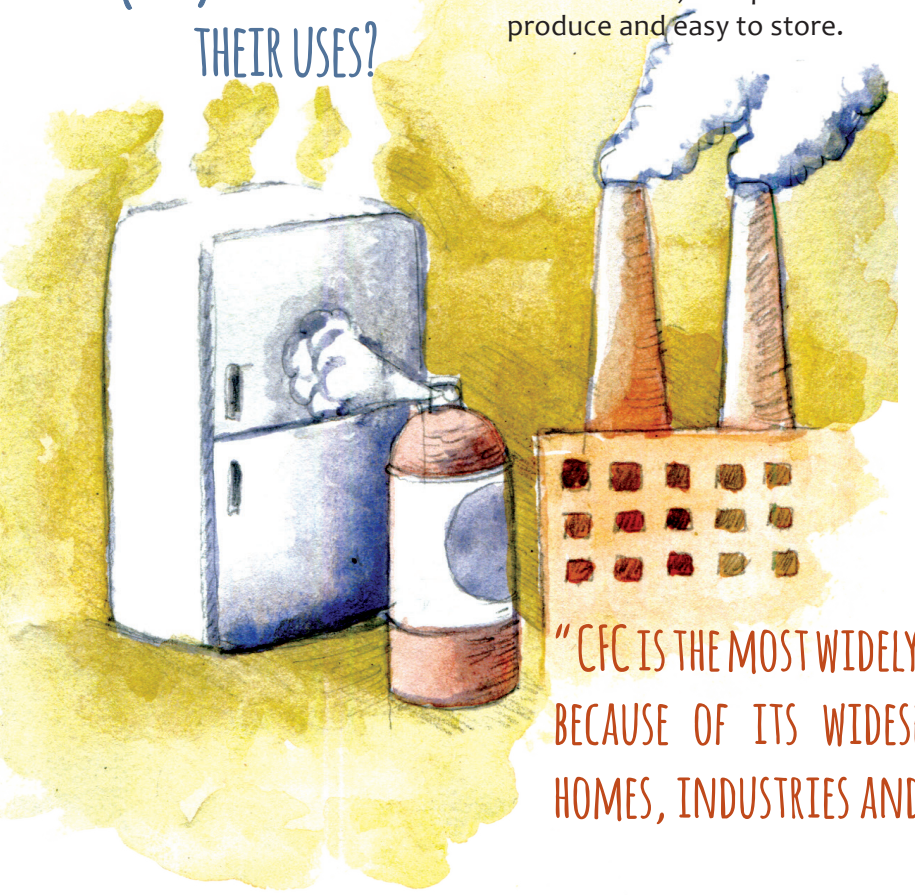
FAQ 6

What are Ozone-Depleting Substances (ODS) and what are their uses?

Based on the historical production and consumption, the most widely used ODS are **chlorofluorocarbons or CFCs.** Discovered in 1928 by Thomas Midgely and considered as "miracle compounds" in the 1930s, CFC had all the qualities of an ideal chemical: seemingly harmless to humans and the environment, inert and immensely stable, odorless, nonflammable, non-corrosive and nontoxic, inexpensive to produce and easy to store.

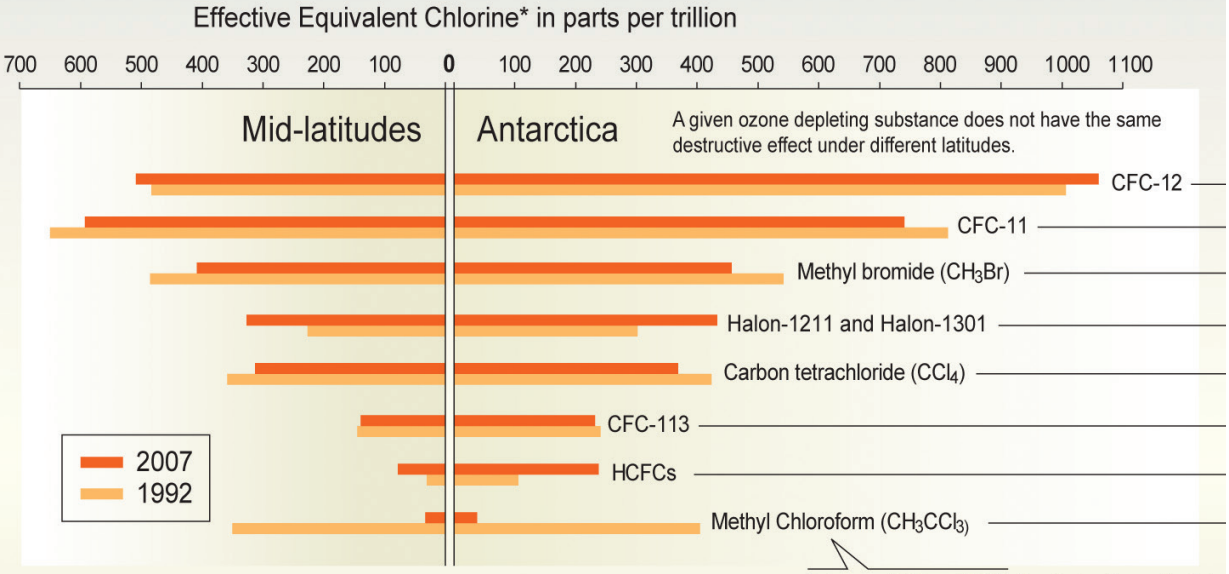
CFC is the most widely used ODS in the country because of its widespread applications in homes, industries and the servicing sector. They are used as cooling agent in refrigerators, freezers and air-conditioners, as propellant in spray cans, aerosols and metered-dose inhalers, solvents in computer and electronic circuits, blowing agent for making foam and other industrial applications. Carbon tetrachloride (CTC) and methyl chloroform or 1,1,1 trichloroethane are also used as solvents for cleaning precision parts.

Halon, on the other hand, is a chemical used in fire extinguishers. Methyl bromide is a broad spectrum pesticide used in the control of various insects, pests, nematodes, weeds, pathogens and rodents.



"CFC is the most widely used ODS in the country because of its widespread applications in homes, industries and the servicing sector."

DESTRUCTIVE POTENTIAL OF OZONE DEPLETING SUBSTANCES



* Chlorine and bromine are the molecules responsible for ozone depletion. "Effective chlorine" is a way to measure the destructive potential of all ODS gases emitted in the stratosphere.

Source: Stephen A. Montzka, David J. Hofmann, *The NOAA Ozone Depleting Gas Index: Guiding Recovery of the Ozone Layer*, 2008. (www.esrl.noaa.gov/gmd/odgi)

Listed CFCs and their uses:

CFC-12 - Refrigerant, aerosol propellant, air conditioning (Freon-12)

CFC-11 - Refrigerant, foam-blowing agent (Freon-11)

Methyl Bromide (CH3Br) - Soil sterilant in agriculture

Halon-1211 and Halon-1301 - Fire extinguishing agent

Carbon tetrachloride (CCl4) - Formerly used as fire extinguishing agent, refrigerant and dry cleaning agent

CFC-113 - Refrigerant

HCFCs - Refrigerant, aerosol propellant, air conditioning, foam blowing agent

Methyl Chloroform (CH3CCl3) - Solvent

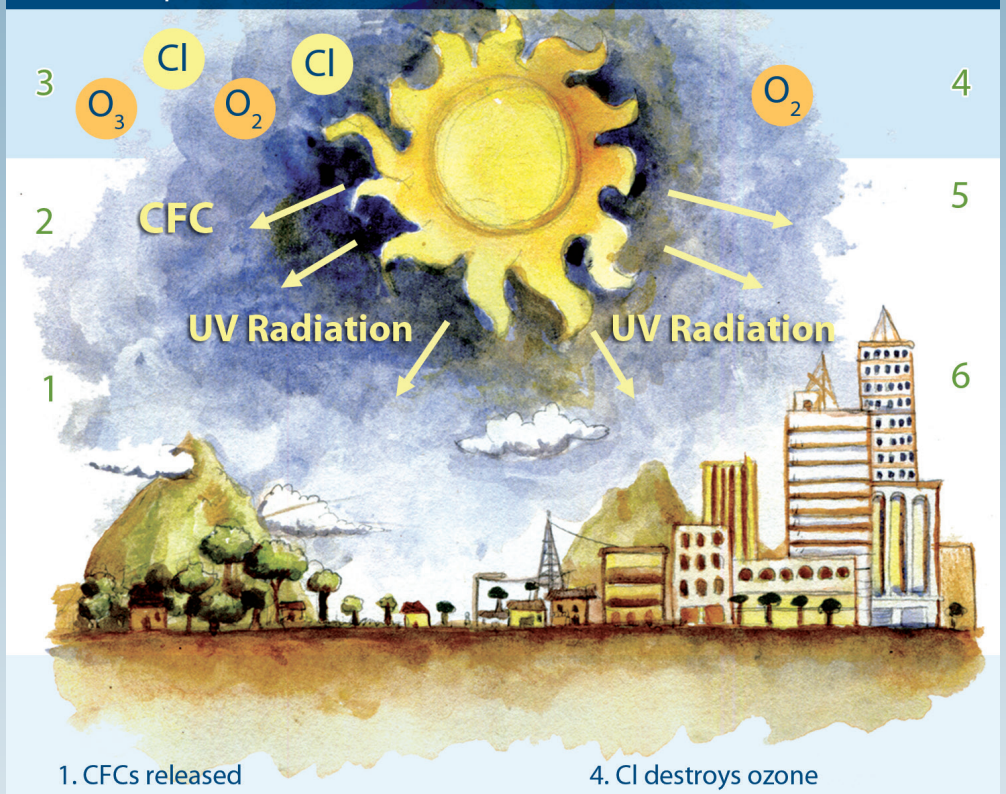
Different ODS have different impacts to the ozone layer, and ozone depleting potential (ODP) is the measure of destructive effects of a substance compared to a reference substance, trichlorofluoromethane (R-11 or CFC-11) being fixed at an ODP of 1.0. The graph above shows the ODP of the controlled substances, which has changed from 1992 to 2007. ODS also have different ODP or effects to the ozone layer in mid-latitudes versus the Antarctic region, where the impacts are greater.

FAQ 7

How do Ozone-Depleting Substances (ODS) destroy ozone molecules?

ODS released to the atmosphere sets off a complex chain reaction that leads to the destruction of ozone molecules. The process sets into motion a continuing cycle that results in the destruction of ozone. **One chlorine atom from an ODS molecule can destroy up to one hundred thousand ozone molecules.**

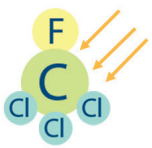
Ozone Depletion Process



1. CFCs released
2. CFCs rise into the ozone layer
3. UV releases Cl from CFCs
4. Cl destroys ozone
5. Depleted ozone -> more UV
6. More UV -> more skin cancer

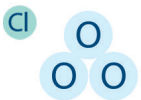
Ozone Destruction

1. Ultraviolet radiation strikes a CFC molecule...

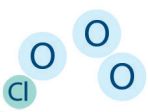


2. ...and causes a chlorine atom to break away

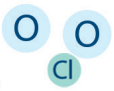
3. The chlorine atom collides with an ozone molecule...



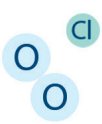
4. ...and steals an oxygen atom to form chlorine monoxide and leaves a molecule of ordinary oxygen



5. When a free atom of oxygen collides with the chlorine monoxide...



6. ...the two oxygen atoms form a molecule of oxygen. The chlorine atom is released and is free to destroy more ozone molecules.



FAQ 8

Can the ozone layer be saved?

Yes! By stopping the production and use, and by proper handling of HCFC, CFCs, methyl bromide, and other ODS, the ozone layer can be saved.

Ozone molecules making up the ozone layer are created and destroyed in a natural cycle. A balance in the cycle has been maintained for millions of years and was only disturbed by the release of ODS in the atmosphere beginning 1930s.

It is important to know that once ODS are phased out, the ozone layer will slowly repair itself.

FAQ 9

How can ordinary citizens help in saving the ozone layer?

People can help save the ozone layer by patronizing products and services that do not use ODS.

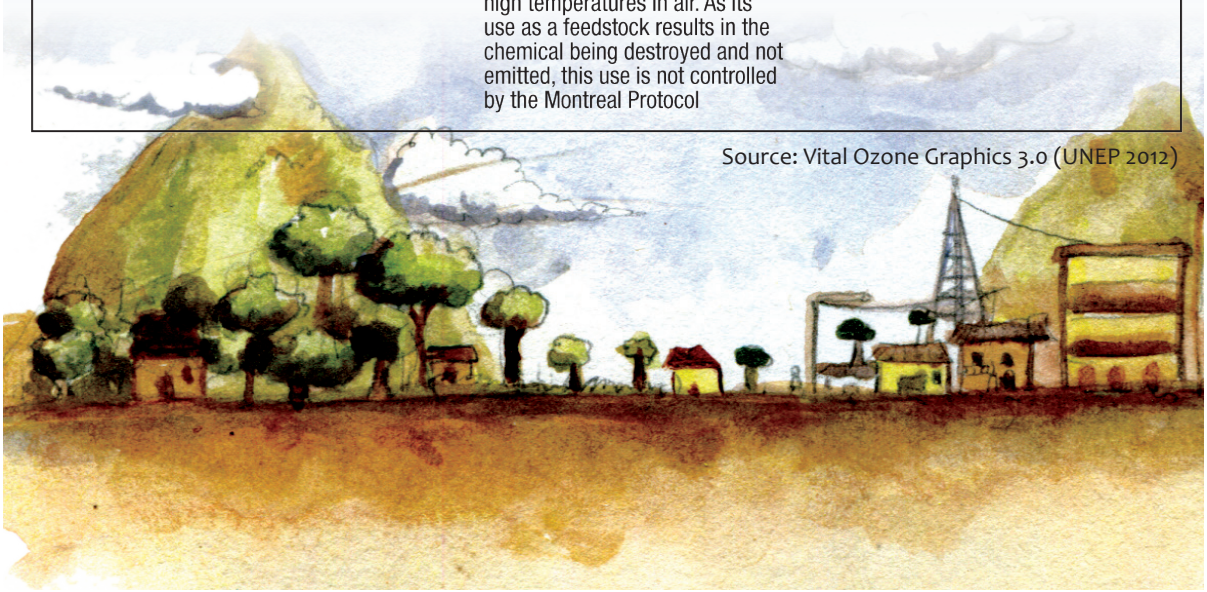
Advice for the General Public

- **Stop using ODS!** Patronize ODS alternatives or substitutes.
- **Check labels of consumer goods**, and make sure that you buy products that are ODS-free or ozone-friendly.
- **Choose HCFC-free air-conditioners!** They are more environmentally-friendly and usually more energy efficient, too!
- For those with asthma or chronic obstructive pulmonary disease, **choose CFC-free metered-dose inhalers (MDI)**.
- Have your home and car air-conditioner and refrigerators serviced at shops accredited by the Department of Trade and Industry (DTI). This ensures the presence of tools, equipment and a certified technician for environment-friendly servicing.

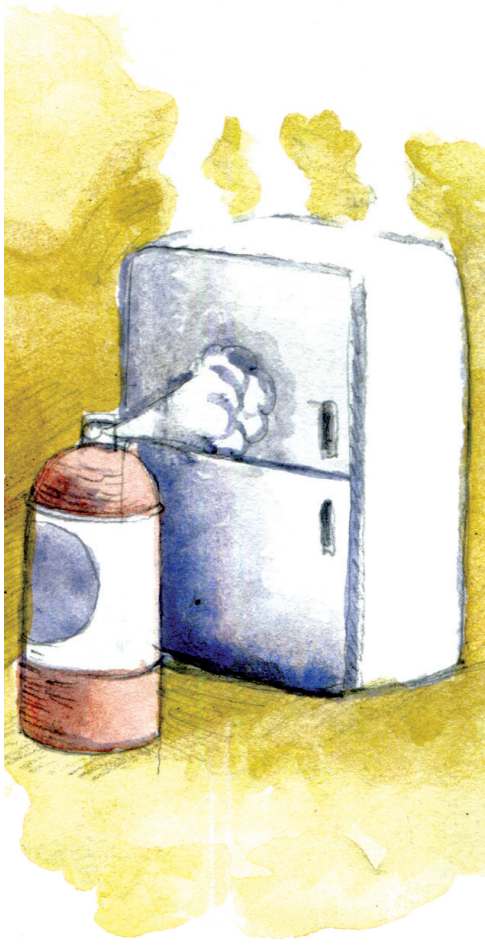
Most commonly used ozone depleting substances and their replacements

Use	ODS	Characteristics	Alternatives
Refrigeration and air conditioning	CFC 11, 12, 113, 114, 115	Long-lived, non-toxic, non-corrosive, and non-flammable. They are also versatile. Depending on the type of CFC, they remain in the atmosphere from between 50 to 1700 years	HFCs, hydrocarbons, ammonia, water Alternative technologies: gas-fired air conditioning, adsorption chillers
	HCFC 22, 123, 124	Deplete the ozone layer, but to a much lesser extent. They are being phased out as well.	HFCs, hydrocarbons, ammonia, water Alternative technologies: gas-fired air conditioning, adsorption chillers
Aerosols	CFC 11, 12, 114	*see above*	Alternative technologies: gas-fired air conditioning, adsorption chillers
Foam blowing/rigid insulation foams	CFC 11, 12, 113 HCFC 22, 141b, 142b	*see above*	Non-foam insulation, HFCs, hydrocarbons, CO_2, 2-chloropropane
Fire extinction	Halons (e.g. halon-1301, halon-1211)	Atmospheric lifetime of 65 years	Water, CO_2, inert gases, foam, HFCs, fluorinated ketone
Pest control/soil fumigation	Methyl bromide	Fumigant used to kill soil-borne pests and diseases in crops prior to planting and as disinfectants in commodities such as stored grains or agricultural commodities awaiting export. Takes about 0.7 years to break down.	No single alternative Integrated pest management systems Artificial substrates Crop rotation Phosphine, Chloropicrin, 1,3-dichloropropene, Heat, Cold, CO_2, Steam treatments and Combined/Controlled atmospheres
Solvents (used for cleaning precision parts)	CFC 113, HCFC 141b, 225 1,1,1 trichloroethane	*see above for CFC, HCFC*	Change to maintenance-free or dry processes, no-clean flux, aqueous and semi-aqueous systems Hydrocarbons Hydrofluoroethers (HFEs) Chlorinated solvents (e.g. trichloroethylene) Volatile flammable solvents (e.g.methyl alcohol)
	Carbontetrachloride	Close to zero flammability Toxic ODP 1.1 Low dissolving power Forms poisonous phosgene under high temperatures in air. As its use as a feedstock results in the chemical being destroyed and not emitted, this use is not controlled by the Montreal Protocol	*see above*

Source: Vital Ozone Graphics 3.0 (UNEP 2012)



Advice for industry



• If your equipment is old, consider replacing your existing CFC or HCFC technology with a new one that uses ozone- and climate-friendly alternatives

• Only select non-HCFC technology when purchasing new equipment

• Promote refrigerant recovery, recycling and reclamation

• Establish refrigerant emission controls and blowing agent emission controls in the production line

- ✓ Use leakage detectors (electronic leak detectors should not be used for hydrocarbon refrigerants)
- ✓ Establish equipment leak checking schedules
- ✓ Order immediate leak repairs by qualified or certified personnel

• Train/certify your personnel in safe management of blowing agents and refrigerants

• Introduce alternative technologies

• Keep equipment logbooks

FAQ 10

What has been done by the international community to save the ozone layer?

The alarming rate of ozone depletion has led developed and developing countries to draw up a multilateral environmental agreement known as the **Montreal Protocol on Substances that Deplete the Ozone Layer**. As of September 16, 2013, this agreement binds 197 member countries to take immediate steps towards ODS phase-out.

Parties to the Montreal Protocol have agreed **to gradually reduce and eventually phase out their production and consumption of ODS following an agreed timetable.** As of 1 January 2010, developing countries were successful in banning production and consumption of all ODS except for methyl bromide, methyl chloroform and hydrochlorofluorocarbons or HCFCs. **All developed and developing countries must completely phase-out methyl bromide (non-QPS uses) and methyl chloroform by 1 January 2015.**

Key Achievements of the Montreal Protocol to Date (2012)

The work of the Montreal Protocol is not done and much remains to be accomplished before the protection of the ozone layer can be assured for this and future generations. Nevertheless, the Parties to the Protocol have accomplished a great deal since the treaty was adopted in 1987.

Truly global participation: The Montreal Protocol is the only treaty ever to achieve universal ratification; it thus demonstrates the world's commitment to ozone protection and, more broadly, global environmental protection.

Healing the ozone layer: Results from continuing global observations have confirmed that atmospheric levels of key ozone depleting substances are going down and it is believed that with continued, full implementation of the Protocol's provisions the ozone layer should return to pre-1980 levels by the middle of this century.

Achieving major reduction goals: By 2010 virtually all Parties had reported compliance with their phase out obligations in respect of CFCs, halons, carbon tetrachloride, methyl chloroform, n-propyl bromide and chlorobromomethane. As a consequence, the Protocol has now led to the phase-out of 98 per cent of the historic levels of production and consumption of ozone-depleting substances.

Supporting developing countries: With the assistance of the Multilateral Fund for the Implementation of the Montreal Protocol developing countries had, by mid-2011, permanently phased out over 260,000 tonnes of ozone depleting substances that had been used to produce various products.

High rates of compliance: Taking into account all parties to the Protocol and all their phase-out commitments, the parties have achieved a compliance rate of over 98 per cent. Further, in the process of phasing-out many countries, both developed and developing, have met their phase-out targets well ahead of schedule.

Health benefits: Controls implemented under the Montreal Protocol have enabled the global community to avoid millions of cases of fatal skin cancer and tens of millions of cases of non-fatal skin cancer and eye cataracts. The United States estimates that by the year 2065 more than 6.3 million skin cancer deaths will have been avoided in that country alone and that efforts to protect the ozone layer will have saved it an estimated US$4.2 trillion in healthcare costs over the period1990–2065. In addition, in 2011 the United States Environmental Protection Agency estimated that more than 22 million Americans born between 1985 and 2100 would avoid suffering from cataracts thanks to the Montreal Protocol.

Climate benefits: The Protocol has also delivered substantial climate benefits. Because most ozone depleting chemicals are also greenhouse gases, the Protocol has already averted greenhouse gas emissions equivalent to more than 135 billion tonnes of carbon dioxide. These significant reductions make the Montreal Protocol one of the prime contributors to the fight against global warming.

Global recognition: In 1995, recognition of the importance of protecting the ozone layer and the contribution of science to doing so came in the form of the Nobel Prize for Chemistry, which was awarded to Sherwood Rowland, Mario Molina and Paul Crutzen for their pioneering work on ozone depletion. In addition, in 2003, political recognition of the Protocol came in the statement of then United Nations Secretary General Kofi Annan, who termed the Montreal Protocol "perhaps the single most successful international environmental agreement to date". More recently, the United Nations Secretary-General Ban Ki-moon said that "among the considerable number of multilateral agreements agreed between states over the past 40 years, the ... Montreal Protocol stands out. The manner in which this instrument for repairing and recovering the Earth's protective shield has been financed and implemented serves as an inspiring example of what is possible".

From "Key achievements of the Montreal Protocol to date" (Fact sheet, Ozone Secretariat 2012)

In 2007, the Meeting of the Parties to the Montreal Protocol decided to accelerate the phase-out of HCFCs (Decision XIX/6). On the right is the new Montreal Protocol HCFC consumption phase-out schedule for developing countries:

HCFC consumption = production + imports - exports
Base level : Average consumption for 2009 and 2010

1 January 2013	Freeze at the base level
1 January 2015	10% reduction
1 January 2020	35% reduction
1 January 2025	67.5% reduction
1 January 2030	100% reduction*

**while allowing for servicing an annual average of 2.5% of the baseline during the period 2030-2040*

FAQ 11

Is the Philippines a Party to the Montreal Protocol? What are its commitments as a Party?

The Philippines signed the Montreal Protocol on September 14, 1988 and ratified it on March 21, 1991. The **Philippine Ozone Desk (POD) of the Department of Environment and Natural Resources – Environmental Management Bureau (DENR-EMB)** is the national coordinator of programs for the implementation of the Montreal Protocol. It is also known as the country's National Ozone Unit (NOU).

The Philippines' commitment to the Montreal Protocol is to phase out its consumption of all ODS according to the agreed timetable for Article 5 or developing countries. Article 5 countries are given a grace period of 10 years, which means that developed countries must phase out ODS ahead of developing countries.

The Montreal Protocol defines consumption as production plus import minus export. Since the Philippines is neither a producer nor an exporter of ODS, its consumption is equal to its importation.

As part of its monitoring and regulatory function, DENR-EMB has been charged with issuance of clearances of all ODS importations. The import of pesticide methyl bromide is monitored/controlled by the Fertilizer and Pesticide Authority (FPA) of the Department of Agriculture (DA). The Bureau of Customs enforces the DENR and DA regulations on the import and export of ODS by checking if importers have the necessary permits from the DENR or DA to allow entry to the national territory.

Other obligations of the Philippines as a Montreal Protocol Party include:

• Article 4 bans imports/exports of ODS between Parties and non-Parties (i.e. countries that have not ratified the Protocol or relevant Amendments). The Article also provides for bans on imports from non-Parties of products made with or containing ODS, as decided by MOP. Annex D specifies a list of products containing CFCs and halons which cannot be imported from non-Parties.

• Article 4A controls trade between Parties, under certain specific circumstances.

• Article 4B makes it mandatory for all Parties to implement a system for licensing the import and export of ODS, for both new and used ODS.

• Article 7 requires all Parties to report ODS data to the Secretariat on an annual basis.

• Article 9 requires Parties to cooperate in promoting public awareness of the environmental effects of ODS, conduct research and development (R&D) and information exchange on technologies to reduce emissions and destroy ODS, ODS alternatives, and control strategies.

Table: Montreal Protocol Control Measures for Article 5/ Developing Countries

Substances / Base Level	1st July 1999	2002	2003	2005	2007	2010	2013	2015	2020	2025	2030	2040
A-I: CFC **BL = Avg. 95-97**	Freeze at BL			- 50% of BL	-85% of BL	- 100% of BL						
A-II: Halon **BL = Avg. 95-97**		Freeze at BL		- 50% of BL		- 100% of BL						
B-I: Other CFC **BL = Avg. 98-00**			- 20% of BL		- 85% of BL	- 100% of BL						
B-II: CTC **BL = Avg. 98-00**				- 85% of BL		- 100% of BL						
B-III: TCA **BL = Avg. 98-00**			Freeze at BL	- 30% of BL		-70% of BL		- 100% of BL				
C-I: HCFC **BL = Avg. 09-10**							Freeze at BL	-10% of BL	-35% of BL	-67.5% of BL	- 97.5% of BL	-100% of BL
E: MeBr **BL = Avg. 95-98**		Freeze at BL		- 20% of BL				- 100% of BL				

FAQ 12

What are the laws of the country on ODS?

Upon the Philippines' ratification of the Montreal Protocol through the Senate Resolution No. 25, the state as Party to the international agreement has committed to phase out ODS in the country.

Republic Act 6969, also known as the **"Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990"** provided for the DENR Administrative Order No. 2013-25 or Revised Chemical Control Order (CCO) for certain chemicals in the priority chemical list. The CCO for ODS covers the ban; limit; and/or regulate the use, manufacture, import, export, transport, processing, storage, possession, and sale of ODS. The CCO directs all ODS (except for methyl bromide) importers, dealers, re-sellers and retailers to register and apply for permits at EMB. Service providers that use ODS must also register with the EMB.

Presidential Decree 1464 as amended (Tariff and Customs Code of the Philippines) mandates the Bureau of Customs to enforce other allied regulations, such as the CCO for ODS.

DENR Memorandum Circular # 2005-23 mandates dealers, retailers and re-sellers of ODS, specifically HCFC and CFC, to register with EMB. Only those registered with the DENR-EMB and the DTI are permitted to purchase, re-sell, distribute and utilize for allowable uses of ODS. The registration is a system of accreditation created to define the capability of any person in handling and using said substances. The Fertilizer and Pesticide Authority (FPA) regulates methyl bromide. Presidential Decree (PD) 1144 mandates the FPA to regulate all pesticides which includes methyl bromide. All methyl bromide handlers must obtain license with the FPA pursuant to PD 1144 and Article III of FPA Rules and Regulations.

Pursuant to Section 6 of the PD 1144, the FPA issued **Memorandum Circular No. 02 s. 2007 – Consolidated Guidelines for Handlers of Methyl Bromide** in line with the implementation of the Philippine National Methyl Bromide Phase-out Strategy. It covers all handlers of MB to include importers, distributors, pest control operators, fumigators, in-house Certified Pest Applicators, importers/exporters engaging the services of fumigators for MB treatment and national plant, animal, environmental protection and health authorities.

Has the Philippines been able to comply with Montreal Protocol phase-out targets?

The major initiatives have enabled the Philippines to essentially comply with the schedule of the Montreal Protocol. The total consumption of ODS has steadily declined since 1992. Serious efforts had led to the total phase-out of methyl chloroform as of 1997 and CFC 113, 114 and 115 and halon 1301 and 1211 as of 1999. Importation of CFC-11 has also been banned as of 2005, while CFC-12 has been banned since 1 January 2010.

Presently, the Philippines imports HCFC and methyl bromide (for QPS uses only). The importation of these ODS is being regulated through the Chemical Control Order for ODS and FPA Administrative Order #1 (for methyl bromide only). According to the country's commitment to the Montreal Protocol, methyl bromide (non-QPS only) should be phased out by the year 2015, and HCFC by the year 2040. However, the phaseout of methyl bromide has been accelerated to 2009 instead of 2015, based on the approved national strategy for the phaseout of the said substance implemented by the FPA/DA.

"Major initiatives have enabled the Philippines to essentially comply with the schedule of the Montreal Protocol. The total consumption of ODS has steadily declined since 1992."

"... the national strategy to phase out ODS is by managing importation and usage or simply striking a balance between the supply and demand of ODS in the country..."

What is the national strategy of the Philippines to facilitate an orderly and sustainable phase-out of ODS?

In cooperation with other government agencies, the POD had prepared the Philippine Country Program for the ODS Phase-out in 1993 (updated in 1999). This specified the schedules and laid out the plans, programs and activities expected to facilitate the phase-out of ODS. Knowing the importance and usefulness of ODS in our daily lives, the national strategy to phase out ODS is by managing importation and usage or simply striking a balance between the supply and demand of ODS in the country through a combination of several measures and programs.

The major programs include:

• Ratification of the Vienna Convention, Montreal Protocol and all amendments. The DENR assisted to expedite the ratification process in the Senate of the Philippines and deposition of diplomatic instruments on behalf of the country. The ratification of the Montreal Protocol and its amendments provided the government with the legal mandate to implement the control measures of ODS in the Philippines.

• Creation of the Philippine Ozone Desk (POD) under the DENR/EMB as the National Ozone Unit (NOU). It acts as the national coordinator of programs for the implementation of the Montreal Protocol. This unit implements, monitors and reports on the Montreal Protocol compliance status, represents the country at national, regional and international meetings of the Montreal Protocol, prepares and manages annual work plans/projects for the ODS Phase-out Projects and public education and awareness activities.

• Development and enforcement of policies and regulations such as the Chemical Control Order for ODS and the ODS import licensing and quota systems, to ensure the gradual reduction and eventual elimination of supply of ODS. Policies that regulate the demand for ODS have also been put in place.

• Partnership with national government agencies for the effective implementation of policies, regulations, projects and other activities aimed at ODS reduction in the different sectors that use ODS.

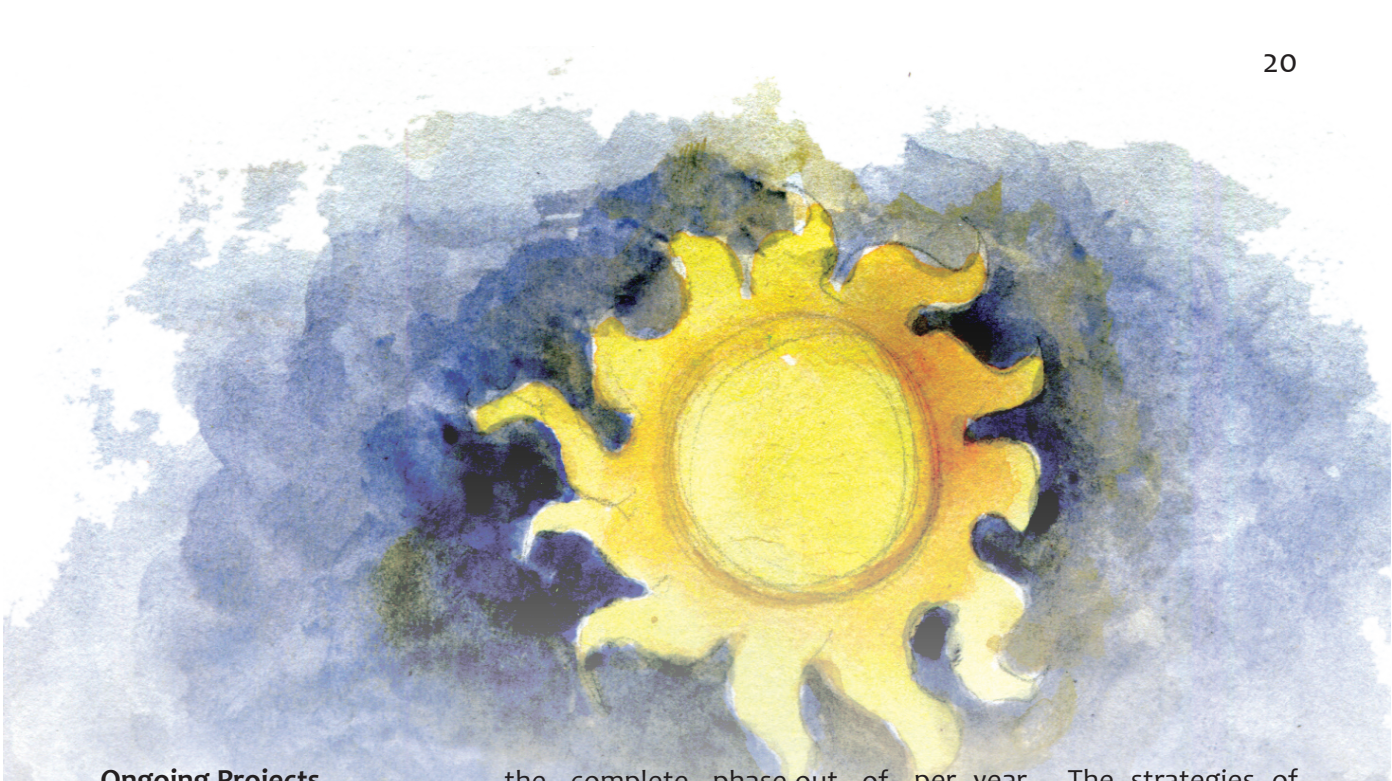
• Implementation of investment and non-investment projects to reduce the demand for ODS and eliminate the dependence of the industry in ODS and ODS-based products. Technical and financial assistance has been given to the industry with support from the Multilateral Fund (MLF) through provision of equipment and training. Non-investment projects funded by the MLF include policy and regulatory interventions, public awareness, monitoring feasibility studies, etc.

• Public awareness activities to educate the general public on the government programs related to the Montreal Protocol and the need to eliminate ODS use in the Philippines.

FAQ 15

What are the completed, ongoing and upcoming Projects and activities of the POD? Who are involved?

Since 1991, the Multilateral Fund has approved almost a hundred projects and activities for the Philippines with a total MLF funding of about US$ 33.9 million. A summary of the completed, ongoing and upcoming technical and financial assistance from the MLF can be found in Annex A of this brochure.



Ongoing Projects

HCFC Phase-out Management Plan (HPMP)
Stage 1 (2011 to 2015)

HCFCs are the predominant chemicals used in the foam blowing, refrigeration, and air conditioning end-use sectors in the Philippines. A significant amount of HCFCs are also used in the servicing end-use sectors. Since no HCFCs are produced within the Philippines and there are no reported exports, HCFC consumption is assumed to equal the total imported quantity of HCFCs.

A. **Overarching Strategy** -- Stage 1: Meeting 2013 and 2015 Phase-out Targets
Implemented by the United Nations Environment Programme (UNEP)

The strategy to meet the 2013 and 2015 phase-out obligations for the Philippines under the Montreal Protocol involves the complete phase-out of HCFC-141b in the foam sector as well as controlled growth in consumption of HCFC-22 in the refrigeration, air conditioning, and servicing sectors and consumption of HCFC-141b in solvent/servicing usages.

Consumption of HCFC-141b by the foam sector will be completely eliminated by the end of 2013 while the remaining HCFC-141b consumption (in the solvent/servicing sector) will be allowed with controlled growth by no more than 3.3% per year after 2012. A condition to prevent diversion of imported HCFC-141b to the foam sector will be included in the Certificate of Registration (COR), and tracking and verification of HCFC-141b distribution will be implemented from 2014 onwards. In addition, consumption of HCFC-22 by the refrigeration, air conditioning, and servicing sectors is being contained after 2012 to ensure that the sector grows by no more than the historic 1.4% per year. The strategies of monitoring and controlling growth in HCFC-22 and HCFC-141b consumption prior to 2015 can be made through (i) the use of import quotas and (ii) technical assistance are recommended in order to more gradually transition the industry away from HCFCs. No reduction in HCFC-22 and HCFC-123 consumption relative to 2009-2010 levels is expected to be required in order to meet the 2013 and 2015 targets.

The overall phase-out plan to meet the 2013 and 2015 HCFC phase-out targets is summarized in the table on page 21.

B. Foam Sector Plan
Implemented by the United Nations Industrial Development Organisation (UNIDO)

In January 2011, the Philippines was granted US$2,088,000 by the MLF to implement the foam sector plan with technical assistance from

Stage 1 Phase-out Plan Summary

Date	Phase-out Target	Plan to Meet Target	Policies Put in Place
2012	None	-	• Ban new or expansion of existing foam production facilities using HCFC-141b. • Ban new or expansion of existing manufacturing facilities using HCFCs in the refrigeration and air conditioning sector. • Establish an import quota system. • No new registration of HCFC-22 importers.
2013	Freeze at baseline level	• Control growth in imports of HCFC-22 in the refrigeration and AC sector and HCFC-141b in solvent/ servicing uses.	• Begin issuing annual import quotas for HCFC-22, with 2013 consumption capped at a level not to exceed 1.4% growth relative to the 2012 level. • Begin issuing annual import quotas for HCFC-141b, with 2013 consumption capped at a level not to exceed 3.3% growth relative to the 2012 level.
2014		• Total phase-out of HCFC-141b in the foam sector. • Control growth of HCFC-22 in the refrigeration and AC sector and HCFC-141b in solvent/servicing uses.	• Ban bulk HCFC-141b imports for use in the foam sector and introduce a condition in the COR that imported HCFC-141b must not be diverted to the foam sector. • Ban the use of HCFC-141b in foam manufacturing. • Issue import quotas for HCFC-22, not to exceed a 1.4% increase against 2013 levels. • Issue import quotas for HCFC-141b, not to exceed a 3.3% increase against 2013 levels.
2015	10% reduction	• Control growth of HCFC-22 in the refrigeration and AC sector and HCFC-141b in solvent/servicing uses.	• Issue import quotas for HCFC-22, not to exceed a 1.4% increase against 2014 levels. • Issue import quotas for HCFC-141b, not to exceed a 3.3% increase against 2014 levels. • Ban the import of pre-blended polyols containing HCFC-141b.

Japan and UNIDO under the coordination of DENR-POD. Ten eligible companies with fixed foam machines are converting by 2014. Technical specifications for the procurement of new equipment and retrofitting of existing equipment were developed by UNIDO, based on the results achieved through the alternatives assessment, and in consultation with experts and in agreement with all beneficiaries. For this project, there are more than 10 company - beneficiaries: 4 manufacturers of poly-urethane (PU) insulation panels; 5 manufacturers of thermoware and commercial refrigeration equipment; 1 manufacturer of flexible molded foam; and 9 PU spray foam.

Through the involvement of major HCFC foam end-users in the preparation of the sector phase-out plan, these users were made aware of the scope of the plan, and also were found to have the technical capacity to undertake the task of phasing-out HCFC-141b. Some enterprises, however, including primarily small and micro enterprises, have limited technical, personnel, and financial capacity to cope with the introduction of the new alternative technologies. As a result, a technical workshop may be useful to raise awareness and knowledge on the

transition to alternatives in the foam sector, and to provide individual technical assistance to ensure that all enterprises will be able to successfully transition to the new technologies. In addition, chemical suppliers and distributors should be involved in phasing-out HCFC-141b from the foam sector by helping to raise awareness about the HCFC phase-out plan, available alternative technologies, properties of various products, and rules and regulations.

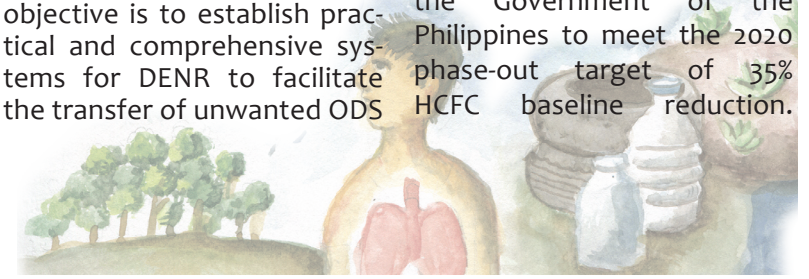
Other ODS Projects in the Philippines

The Chiller Energy Efficiency Project aims to reduce GHG emissions by replacing inefficient chillers including both old CFC-based chillers and non-CFC-based chillers. Four project components to achieve this objective include (i) investment in chiller replacement; (ii) measurement, monitoring and verification; (iii) performance standards and technical assistance; and (iv) project management.

Study on financing ODS disposal. The World Bank in cooperation with DENR is implementing a study on the establishment of a private-public financing system for disposal of ODS. The overall objective is to establish practical and comprehensive systems for DENR to facilitate the transfer of unwanted ODS and carbon benefits between owners of unwanted ODS and potential buyers. Specifically, the study would (i) develop an inventory system for unwanted ODS; (ii) prepare guidelines for collection, handling, packaging, transport, and procedure of final disposal consistent with existing protocols and criteria of the major voluntary carbon markets; (iii) recommend detailed procedures on engaging the private sector in pre-financing ODS disposal and for determining equitable sharing of the revenues generated from ODS disposal credits between private and public, and private and private, with the governments acting as intermediaries; (iv) recommend a control and monitoring scheme consistent with relevant international environmental treaties, carbon registry Climate Action Reserve (CAR)'s ODS disposal protocols and protocols adopted by other markets; (v) compile a list of project developers; and, (vi) organize country-specific stakeholder workshops to present the transfer system for unwanted ODS and carbon benefits, and launch the national auction process to initiate disposal of unwanted ODS.

List of Projects in the Pipeline

• HCFC Phase-out Management Plan – Stage 2, which is aimed at assisting the Government of the Philippines to meet the 2020 phase-out target of 35% HCFC baseline reduction.



Continuous Monitoring of Quarantine and Pre-Shipment (QPS) Uses of Methyl Bromide

The **National Methyl Bromide Phase-out Strategy (NMBPS)** is a completed project that aimed to gradually reduce and eliminate a total 10.3 ODP tons of methyl bromide (non-Quarantine and Pre-Shipment use only). It also aimed to ensure that there are viable and permanent alternatives and alternative approaches to maintain this phaseout. However, uses of MB for quarantine and pre-shipment (QPS) are currently exempt from the reduction and phase-out. The project was implemented by the Fertilizer and Pesticide Authority (FPA) of the Department of Agriculture (DA) in coordination with the POD from 2005 to 2010.

QPS versus non-QPS

Quarantine applications are MB treatments to prevent the introduction, establishment and spread of quarantine pest and diseases, to ensure official control, that is performed or authorized by a national plant, animal, environmental protection or health authority.

Pre-shipment applications are treatments other than quarantine applications applied within 21 days prior to export to meet the official requirement of the importing country or existing official requirements of the exporting country. Official requirements are those performed or authorized by a national plant, animal, environmental, health or stored product authority.

Non-QPS applications are MB treatments other than those stated under the QPS applications, such as soil sterilization, stored commodities and structural uses.

(*Continued on p.23*)

(*Continued from p. 22*)

POD continues to work together with the FPA to ensure the sustainability of the phase-out of non-QPS uses of MB. FPA coordinates with the following agencies within the DA:

Bureau of Plant Industry (BPI) coordinates with the FPA in the implementation of the accreditation system for fumigators and in upholding fumigation standards. It also validates and furnishes additional data/information on certificates issued to accredited Quarantine Treatment Providers.

National Food Authority (NFA) coordinates with FPA through reports on fumigation conducted at NFA warehouses nationwide and mobilize the agency in availing information and attendance to meetings/ training conducted by FPA in like with the phase-out strategy and in the use and application of alternatives and substitutes.

Bureau of Post Harvest Research and Extension (BPHRE) provides information/ technology based on the studies and research conducted on fumigation and pest management in stored grains.

FAQ 16

Why has an "ozone hole" appeared over the Antarctica when ozone depleting gases are released mainly in the Northern Hemisphere?

The Earth's atmosphere is continuously stirred over the globe by wind systems, which is a reason why ozone-depleting gases are present throughout the stratosphere, including Antarctica, regardless of where they are released.

South Pole is part of very large land mass (Antarctica) completely surrounded by ocean. This symmetry affects the meteorological conditions that allow the formation of a very cold region in the stratosphere over the Antarctic during winter. The very low stratospheric temperature in Antarctic leads to the formation of polar stratospheric clouds (PSCs).The chemical reactions in the PSCs promote production of chemically active chlorine and bromine. When sunlight comes in Antarctica in late winter and spring (August-November)of each year, the activation of chlorine and bromine leads to rapid ozone loss.

FAQ 17

Is there Depletion of the Arctic Ozone Layer?

Yes, depletion of the ozone layer over the Arctic region can be observed in some years in the late winter and early spring period (January to March). But the reduction is much smaller than that of the Antarctic ozone hole due to the dissimilar weather patterns of the two polar regions.

Over the South Pole, the sun barely or never sets around winter, creating a confluence of sunlight and cold in the atmosphere. Under these conditions, chlorine from CFCs eats away at ozone molecules. In the Arctic area, however, the sun reappears in the sky in the spring as temperatures start to warm, so the conditions are not as favorable for ozone depletion. But in 2011, the ozone concentration in the late winter Arctic was about 20 percent lower than average.

Source: The National Geographic; http://news.nationalgeographic.com/news/2011/03/110321-ozone-layer-hole-arctic-north-pole-science-environment uv-sunscreen/ (last accessed 2013)

FAQ 18

Do changes in the Sun and volcanic eruptions affect the ozone layer?

Yes, factors such as changes in solar radiation and formation of stratospheric particles after volcanic eruptions affect the ozone layer. But neither factor can explain the average decreases observed in global total ozone over the last decades. If large volcanic eruptions occur in the coming decades, ozone depletion will increase for several years afterwards.

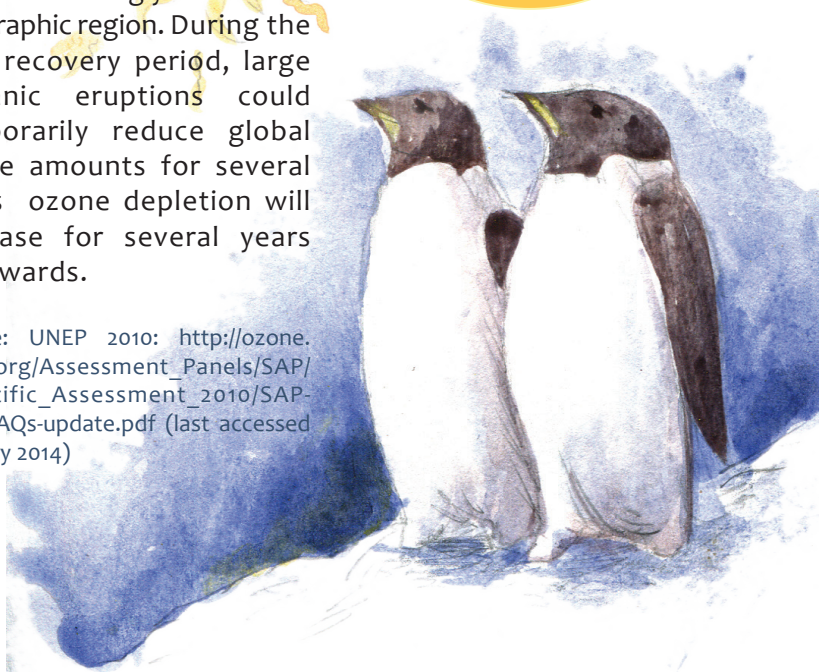
Source: UNEP 2010: http://ozone.unep.org/Assessment_Panels/SAP/Scientific_Assessment_2010/SAP-2010-FAQs-update.pdf (last accessed January 2014)

FAQ 19

When is the ozone layer expected to recover?

Substantial recovery of the ozone layer from the effects of ozone-depleting substances (ODS) is expected near the middle of the 21st century (2060-2070), assuming global compliance with the Montreal Protocol. Recovery will occur as ODS and reactive halogen gases in the stratosphere decrease in the coming decades. In addition to responding to ODS, future ozone amounts will increasingly be influenced by expected changes in climate. The resulting changes in stratospheric ozone will depend strongly on the geographic region. During the long recovery period, large volcanic eruptions could temporarily reduce global ozone amounts for several years ozone depletion will increase for several years afterwards.

Source: UNEP 2010: http://ozone.unep.org/Assessment_Panels/SAP/Scientific_Assessment_2010/SAP-2010-FAQs-update.pdf (last accessed January 2014)



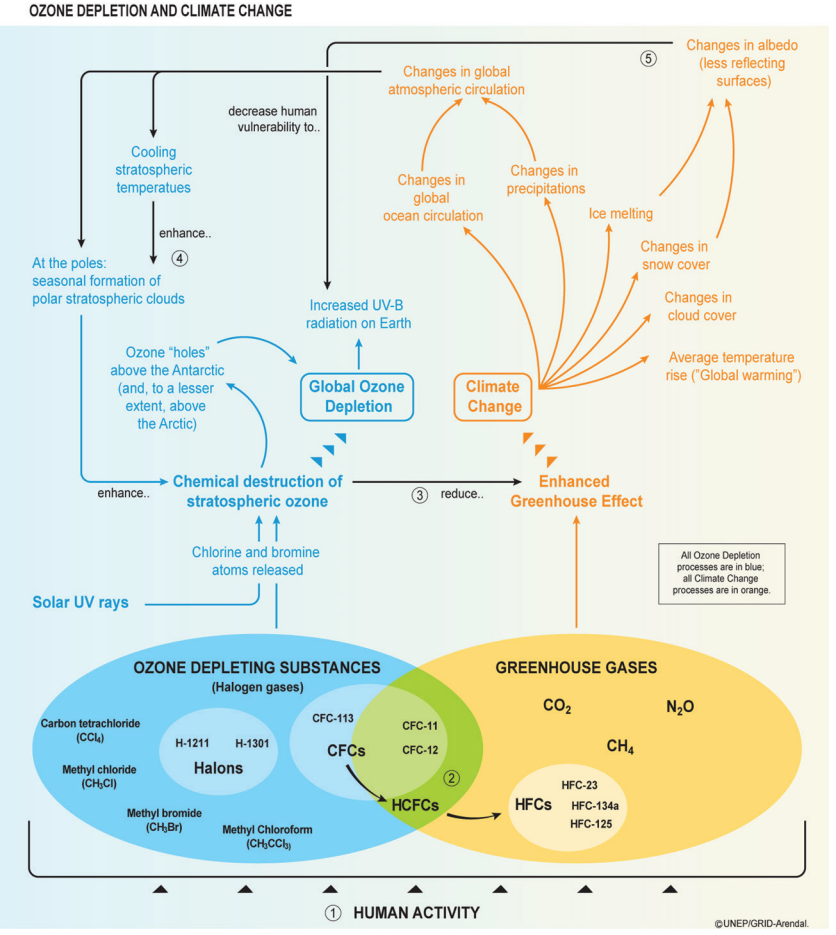
FAQ 20

How is ozone depletion related to global warming?

Research has shown that by phasing out ozone-depleting substances, the world has avoided the equivalent of 135 billion gigatons of carbon dioxide equivalent between the 1990 and 2010, equivalent to about 13% of accumulated emissions of CO_2 from human activities. This effectively delayed climate change by 7 to 12 years (G. Velders et al., PNAS, 2007).

In 2007, during the 20th Anniversary of the Montreal Protocol, Parties to the agreed to accelerate the phase-out of HCFCs – chemicals widely used throughout the world which contribute to both ozone depletion and climate change (Decision XIX/6). The goal of this important step is to repair ozone layer more rapidly and combat climate change as a result of new and emerging science that indicates ozone depletion and climate change are interconnected.

Ozone layer depletion and climate change are two different problems with essentially different effects, but with powerful connections.



Source: UNEP Vital Ozone Graphics (2012)

"Research has shown that by phasing out ozone-depleting substances, the world has avoided the equivalent of 135 billion gigatons of carbon dioxide equivalent between the 1990 and 2010..."

• Complex relationship exists between science of ozone depletion and science of climate change. Then build-up of greenhouse gases (GHGs) causes warming the lower atmosphere and cooling the upper atmosphere, which is likely to exacerbate the destruction of the ozone layer. Similarly changes in the upper atmosphere due to ozone depletion can affect processes in the lower atmosphere and affect the climate.

• Most ODS are also powerful GHGs, so ODS phase-out helps climate change mitigation. CFCs and HCFCs have a much higher global warming potential (GWP) compared with CO_2, which has a GWP of 1:

- o CFCs: 4,000 – 11,000
- o HCFCs: 700 – 2,300

• Most alternatives to ODS are GHGs, giving an opportunity for Parties to leapfrog and select alternatives that are both ozone and climate-friendly. Hydrofluorocarbons (HFCs) that commonly replace about twenty percent of ODS are also powerful greenhouse gases:

- o GWP of HFC-134a: 1440 (motor vehicle, refrigeration and building air conditioning)
- o GWP of HFC-125: 3500
- o GWP of HFC-143a: 4470

Alternatives technologies with zero or low-GWPs that replace the use of high-GWP HFCs include:

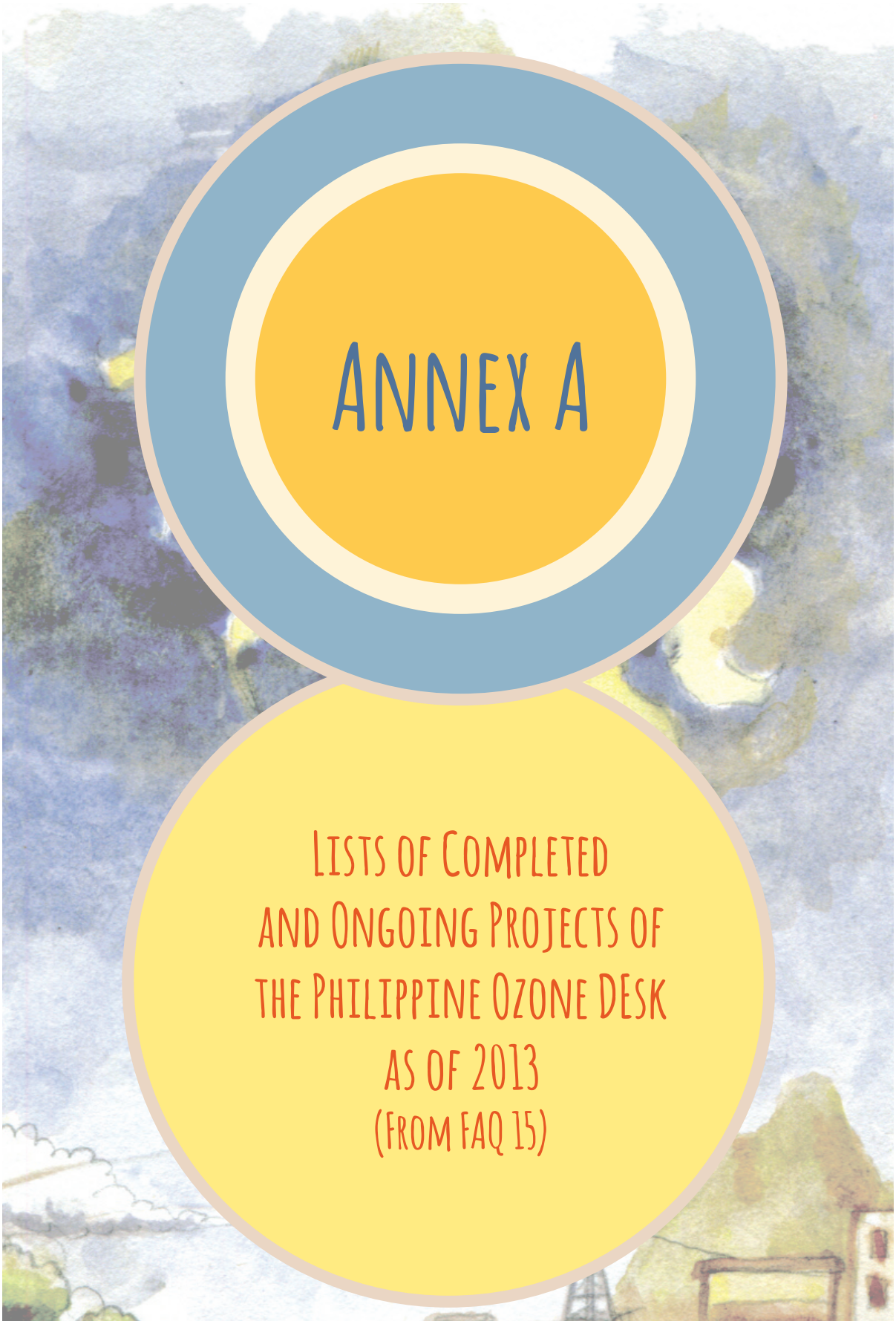
• Alternative methods and processes (also called 'not-in-kind' alternatives). Commercially used examples include fibre insulation materials, dry-powder asthma medication, and architectural designs that avoid theneed for air-conditioners.

• Non-HFC substances with low or zero GWP. Commercially used examples include hydrocarbons (e.g.R-290, R-600a), ammonia (R-717), carbon dioxide (R-744), nitrogen, dimethyl ether, and other substances.

• Low-GWP HFCs. Several low-GWP HFCs (with lifetimesof less than a few months) are being developed and introduced. Examples include HFC-1234yf, HFC-1234zeand HFC-1336mzz.

From UNEP Synthesis Report "HFCs: A Critical Link in Protecting Climate and the Ozone Layer" (2011).

The Evolution of Chemicals for the Foam and Refrigeration and Air-conditioning Industries



Annex A

Lists of Completed and Ongoing Projects of the Philippine Ozone Desk as of 2013 (From FAQ 15)

List of Completed Projects as of July 2013

Name of Project	Implementing Agency	ODP Phased Out (ODP T)	Completion Date	Cost (US$)
Aerosol				
Preparation of investment project in the aerosol sector	UNIDO		Dec 1999	25,000
Foam				
Phase-out of the use of CFC in the manufacture of rigid PUF for thermoware at Nikkon Industrial Corporation	UNDP	15	Mar 1995	268,477
Phase out of CFC in the manufacture of polyurethane insulated building elements at Metal Forming Co.	UNDP	50	Jun 1995	288,302
Phase-out of the use of CFCs in the manufacture of PU foam for insulation and structural purposes at Himalaya Mfg. Corp	UNDP	17	May 1997	96,121
Conversion to CFC-free technology in the manufacture of rigid polyurethane foam at PU Rigid Insulation Contractor	UNDP	24.2	Jun 1999	175,069
Conversion to CFC-free technology in the manufacture of rigid polyurethane foam at MBA Urethane Products Contractor	UNDP	14.5	Jun 1999	91,557
Umbrella project: conversion to CFC-free technology in small CFC consuming enterprises using CFC in the manufacture of rigid polyurethane foam (Ashlar Industrial Corporation, Alen International, Zegal)	UNDP	5.1	Dec 1999	25,945
Phase-out of CFC-11 by conversion to HCFC-141b in the manufacture or rigid polyurethane foam (sprayfoam) at Prescon FIN Construction and Development	UNDP	31.7	Oct 2002	162,680
Elimination of CFC-use at small manufacturers of flexible foam	UNDP	35	Mar 1995	482,846
Phase out of CFC in the manufacture of flexible polyurethane foam at Foamcraft Incorporated	UNDP	90	Jul 1995	165,906
Residual phase-out of CFCs in the manufacture of flexible polyurethane (slabstock) at Mandaue Foam Industries Inc.	UNDP	80	Dec 1996	207,668
Conversion to CFC-free technology in the manufacture of polyurethane foam at Soutech	UNDP	20	Dec 1999	324,951
Phase-out of the residual use of CFC in the manufacture of extruded polystyrene foam sheet in 3 companies: concept Packaging Co., Amtes Co., and Q.C. Styropackaging Co.	UNDP	24	Mar 1995	274,422
Elimination of the residual use of CFC in the manufacture of extruded polystyrene foam sheet at Styrotech Co.	UNDP	25	Jun 1995	57,703
Residual phase-out of CFCs in the manufacture of PUF foam at RGC Foam Group (Polyfoam/Uratex)	UNDP	70	May 1997	646,376
Preparation of a project in the flexible foam subsector	UNDP		Apr 2001	11,909
Preparation for HCFC phase-out investment activities (foam sector)	UNIDO		Nov 2010	$64,249
Fumigant				
Demonstration, training and policy development on alternatives to methyl bromide for banana soil fumigation	UNDP		Dec 2000	16,466
Technical assistance for a national methyl bromide phase-out strategy	IBRD	9	Dec 2008	330,000
Project preparation for a methyl bromide alternative demonstration project	UNDP		Aug 1999	29,642
Preparation of a methyl bromide phase-out plan	IBRD		Sep 2004	50,000
Enhancing the capability of local agricultural organizations and non-governmental organizations in methyl bromide communication	UNEP		Mar 2001	16,120

List of Completed Projects as of July 2013 (Continued)

Name of Project	Implementing Agency	ODP Phased Out (ODP T)	Completion Date	Cost (US$)
Halon				
Umbrella project for the conversion of production of portable halon fire extinguishers of members companies of Fire Protectors Federation Inc.	UNDP	77	May 1997	105,173
Other				
Conversion of tobacco fluffing process to carbon dioxide at Fortune Tobacco corporation	IBRD	350	Mar 1995	4,452,360
Refrigeration				
Application of a reduced CFC blowing agent and non-CFC application preparation at Concepcion Industries	IBRD	78.3	May 1997	1,078,130
Application of a reduced CFC blowing agent and non-CFC application preparation at Sanyo Philippines	IBRD	23.9	Mar 1997	622,939
Application of a reduced CFC blowing agent and non-CFC application preparation at Transunion (formerly called Federal Electric Company)	IBRD	26.4	May 1997	565,781
Application of a reduced CFC blowing agent and non-CFC application preparation at Philippines Appliance Corporation (Philacor)	IBRD	240	May 1997	1,902,350
Elimination of CFCs 11 and 12 in the manufacture of domestic refrigerators at Matsushita Electric Philippines Corporation (Mepco)	UNDP	47	May 1997	107,731
Phase out of CFC in the manufacture of commercial refrigerators and ice boxes at Unimagna Philippines, Inc.	UNDP	29.5	Jul 1995	961,376
Umbrella project for conversion from CFC-11 foam blowing agent into HCFC-141b, and CFC-12 and R-502 refrigerants into HFC- FIN 134a and HFC-404a at Gomeco, Chee Puck and Well Built	UNDP	28	Apr 1998	117,706
Elimination of CFC-11 and CFC-12 in the manufacture of commercial refrigeration equipment at Azkcon Refrigeration Industries, Inc.	Germany	18.9	Dec 1999	294,905
National CFC recovery and recycling scheme	UNIDO	60	Jun 1999	557,451
MACs servicing demonstration project	USA	11	Nov 1996	285,500
Training programme in the refrigeration sector	UNDP		Jun 1992	62,293
Training programme for customs officials and other key stakeholders	UNEP		Jan 2004	166,662
Preparation of a recovery and recycling project in the refrigeration sector	UNIDO		Jan 1996	15,543
Project preparation in the refrigeration sector	UNDP		Dec 1997	30,736
Preparation of a government strategy to reduce and eliminate the use of CFC refrigerants for servicing and installations on-site	Sweden		Dec 2001	141,400
Preparation for HCFC phase-out investment activities (refrigeration and air-conditioning sectors except residential air conditioning)	UNDP		Nov 2010	65,000
Preparation for HCFC phase-out investment activities (domestic air-conditioning sector)	IBRD		Nov 2010	65,000

List of Completed Projects as of July 2013 (Continued)

Name of Project	Implementing Agency	ODP Phased Out (ODP T)	Completion Date	Cost (US$)
Solvent				
Conversion to aqueous cleaning at Electronic Assemblies, Inc.	IBRD	4.2	Sep 1993	675,859
Conversion to high-purity water cleaning at Integrated Microelectronic, Inc.	IBRD	14.6	Sep 1993	357,002
Conversion to semi-aqueous cleaning solvents at Ionics Circuits, Inc.	IBRD		Sep 1993	
Conversion to semi-aqueous and aqueous cleaning solvents at Ionics Circuits, Inc.	IBRD	85.7	Sep 1993	790,000
Conversion to low-emission processing and organic solvents at Pacific Semiconductors, Inc.	IBRD		Sep 1993	
Elimination of the use of CFC-113, 1,1,1 trichloroethane (TCA), CFC-11 and CFC-12 at multiple corporations that manufacture FIN special formulations for various industrial markets	UNDP	53.6	Nov 1997	461,133
Elimination of CFC-113, 1,1,1 trichloroethane and CFC-12 at multiple corporations that manufacture special formulations for industrial markets (Ariad Industrial Co., Cloisonne, Redisol, Rodler)	UNDP	18.4	Feb 2000	241,286
Project preparation to prepare the second and final phase for phase out of ODS by solvent blenders	UNDP		Dec 1998	2,880
Phase-out Plan				
National CFC phase out plan: manufacturing sector (first tranche)	IBRD	89.3	Dec 2003	2,858,473
National CFC phase-out plan (manufacturing sector): 2004 annual programme	IBRD	150	Dec 2004	1,853,923
National CFC phase-out plan: 2005 annual programme	IBRD	301	Dec 2005	2,160,071
National CFC phase-out plan: 2006 annual programme	IBRD	149	Dec 2006	1,189,583
National CFC phase-out plan: 2007 annual programme	IBRD	907	Mar 2008	319,621
National CFC phase-out plan: 2008 annual programme	IBRD	421	Mar 2009	
National CFC phase out plan: servicing sector (first tranche)	Sweden		Dec 2003	152,400
National CFC phase-out plan servicing sector: 2004 annual programme	Sweden		Dec 2004	52,088
National CFC phase-out plan servicing sector: 2005 annual programme	Sweden		Dec 2007	40,000
Preparation of a HCFC phase-out management plan	IBRD		Dec 2009	195,000
Preparation of a national CFC phase out plan	IBRD		Dec 2002	70,000

List of Completed Projects as of July 2013 (Continued)

Name of Project	Implementing Agency	ODP Phased Out (ODP T)	Completion Date	Cost (US$)
Several				
Survey of ODS usage, data base generation and technical assistance for ODS phase-out for small-scale enterprises	UNDP		Nov 1994	100,000
Country programme preparation	IBRD		Jun 1992	37,367
Country programme preparation	UNDP		Oct 1993	79,640
Institutional strengthening for Ozone Desk Operations	IBRD		Mar 1996	209,000
Renewal of institutional strengthening	IBRD		Aug 2001	139,333
Renewal of institutional strengthening project (Phase III)	IBRD	15	Apr 2004	181,133
Extension of institutional strengthening project	IBRD		Apr 2005	90,566
Extension of the institutional strengthening project (phase IV, second year)	IBRD		Apr 2006	90,567
Extension of institutional strengthening project (phase V)	IBRD		Apr 2008	181,133
Extension of institutional strengthening project (phase VI)	IBRD		Mar 2010	181,133
Extension of institutional strengthening project (phase VII)	IBRD		Dec 2011	94,020
Technical assistance for the financial institution	IBRD		Mar 1994	100,000
Information exchange programme	IBRD		Nov 1993	
Information exchange programme	UNEP		Dec 1995	198,512
Preparation of investment projects (1991)	IBRD		Jun 1992	50,315
Controlled substances engineering project	IBRD		Dec 1993	393,675
Preparation of investment projects (1992)	IBRD		Feb 1993	42,740
Preparation of investment projects (1993)	IBRD		Mar 1994	65,329
Project preparation assistance	UNDP		Jul 1994	50,000
User-sector project identification and preparation (1993)	IBRD		Nov 1994	
Supervision of project implementation (1994)	IBRD		Mar 1995	42,349
Preparation of investment projects (1994)	IBRD		Mar 1995	
Project preparation assistance	UNDP		Dec 1995	50,000
Preparation/supervision of investment projects (1995)	IBRD		Mar 1996	99,937
Project preparation assistance	UNDP		Nov 1996	45,000

Source: MLFS Database

List of Ongoing Projects

Name of Project	Implementing Agency	ODS to be Phased Out (ODP T)	Approval Date	Allocation (US$)
Foam				
Sector plan to phase out HCFC-141b in the foam sector	UNIDO	40	Dec 2010	1,770,650
Sector plan to phase out HCFC-141b in the foam sector	Japan		Dec 2010	317,350
National CFC phase-out plan: Final implementation plan	UNEP		Jul 2013	1,835,205
HCFC phase-out management plan (stage I, first tranche)	UNEP		Dec 2012	207,000
Preparation for pilot demonstration project on ODS waste management and disposal	IBRD		Apr 2009	50,000
Extension of institutional strengthening project (phase VIII: 1/2012-12/2013)	UNEP		Jul 2011	181,133
Extension of institutional strengthening project (phase VII)	UNEP		Nov 2011	64,471
Extension of institutional strengthening project (phase IX: 1/2014-12/2015)	UNEP		Jul 2013	181,133

Source: MLFS Database

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