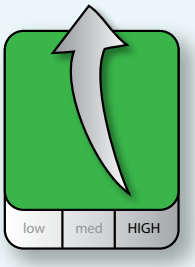
THEME **Atmosphere and Climate**

INDICATOR **Ozone Depleting Substances (ODS)**

DEFINITION	Trend in consumption of ozone depleting substances (ODS)
PURPOSE	Tracks countries progress to phasing out ODS. Ozone depleting substances destroy the earth's ozone which protects the earth from UV radiation
DESIRED OUTCOME	Negative trend in ODS consumption



Status
Good

Trend
Improving

Data confidence
High

Actions by households and individuals were essential to meeting global ozone goals. Participants of the 2 Million Tree Planting Campaign, Samoa. © Roland Setu

CRITICAL CONNECTIONS

Taking action on ozone-depleting substances has benefits for Pacific people, species, ecosystem services, and climate.

Ozone-depleting substances, like many other hazardous wastes, move long distances and have transboundary impacts. Spatially protected areas cannot, alone, protect species and ecosystems from such transboundary pollution impacts.

Refrigeration and air conditioning were major users of CFCs. Under the Montreal Protocol, CFCs were completely phased out, first replaced by HCFCs and then HFCs. The Kigali Amendment is now stimulating a further shift towards low global warming HFCs or alternative coolants, such as hydrocarbons or ammonia. This shift to new coolants has also allowed manufacturers and users to switch to refrigeration and air conditioning systems with more efficient energy use, reducing our reliance on fossil fuels and thereby increasing our energy independence.

The ozone story illustrates the success that can be obtained through committed, coordinated action that links production, consumption, waste management, and environmental management for a cleaner, healthier world for both people and nature.

PRESENT STATUS

Ozone depleting substances (ODS) are considered hazardous wastes due to the impacts of ozone destruction on people, ecosystems, and species. For more about other hazardous wastes, please see Regional Indicator: Hazardous waste.

The Vienna Convention for the Protection of the Ozone Layer was adopted in 1985, followed by the Montreal Protocol on Substances that Deplete the Ozone Layer in 1987. These multilateral environment agreements (MEAs) are the first international environmental treaties to be universally endorsed by 198 nations. Now, 16 September is World Ozone Day, marking these unique agreements that have protected our planet and ourselves.

All Pacific island countries are parties to the Montreal Protocol, with annual reporting and triennial meetings. For more about Pacific reporting to multilateral environment agreements, see Regional Indicator: MEA reporting requirements.

Since 2015, all reporting Pacific island countries (13) with the exception of Nauru have maintained their consumption of controlled ODS below the agreed limits. No data are available for Niue. Clear data records are maintained at the Ozone Secretariat's Data Centre; see: https://ozone.unep.org/countries

The present status of this indicator is *good* with *improving* trends among countries. The availability and clarity of the data provide *high* confidence.

While addressing ozone depletion, a new problem was created: some replacements for ODS, known as hydrofluorocarbons (HFCs), have proven to be powerful greenhouse gases. Some HFCs are more than a thousand times more potent than carbon dioxide in contributing to climate change. To continue protecting the ozone layer while also mitigating greenhouse gas emissions, the parties to the Montreal Protocol agreed in 2016 to amend the Protocol to include control measures to reduce HFCs (the Kigali Amendment). A successful HFC phasedown is expected to avoid up to 0.4 degree Celsius of global temperature rise by 2100, while continuing to protect the ozone layer.

Eleven Pacific island countries have acceded to or ratified the Kigali Amendment (see Table 2.1). To date, only Palau and Vanuatu have established HFC licensing systems. In 2019, Pacific island countries exported 354,611 tonnes of recovered, recycled, or reclaimed HFCs (UN Environment Ozone Secretariat 2020).

WHAT IS THE OZONE LAYER?

The ozone layer is a region of high ozone concentration in the stratosphere, 15 to 35 kilometres above Earth's surface. The ozone layer acts as an invisible shield and protects us from harmful ultraviolet (UV) radiation from the sun. In particular, the ozone layer protects us from the UV radiation, known as UV-B, which causes sunburn. Long-term exposure to high levels of UV-B threatens human health and damages most animals, plants, and microbes, so the ozone layer protects all life on Earth. Protection of the ozone layer even protects our food security. Plants need sunlight to grow, so they cannot avoid exposure to UVB, but too much UVB can also harm plants. By taking action to avoid and safely manage existing ODS, we protect ourselves and the environment on which we depend. Because of the Montreal Protocol and national actions to stop producing, consuming, and releasing ODS, we have avoided a world in which severe ozone holes would have occurred every year over the Arctic and Antarctic. For more, see https://ozone.unep.org/ozone-and-you

PRESSURES AND OPPORTUNITIES

According to the Ozone Secretariat, in the mid-1970s, scientists realised that the ozone layer was threatened by the accumulation of gases containing halogens (chlorine and bromine) in the atmosphere. Manmade chemicals containing halogens were determined to be the main cause of ozone loss. These chemicals are collectively known as ozone-depleting substances (ODS).

The most important ODS were chlorofluorocarbons (CFCs), which at one time were widely used in air conditioners, refrigerators, and aerosol cans. Other chemicals, such as hydrochlorofluorocarbons (HCFCs), halons, and methyl bromide, also deplete the ozone layer.

Other gases containing nitrogen and hydrogen are also in the stratosphere and participate in reaction cycles that destroy ozone converting it back into oxygen. These reactions decrease the amount of ozone in the stratosphere. When undisturbed, the balance between the natural processes of ozone production and destruction maintains a consistent ozone concentration in the stratosphere.

Older materials and equipment, particularly refrigeration and cooling units, can still contain ODS, HCFCs, or CFCs. Only Fiji and Tuvalu are on the list of parties not wishing to receive products & equipment relying on Annex A & B Substances (Dec.X/9). In 2020, Vanuatu joined the list of parties which formally do not want to receive products and equipment containing or relying on hydrochlorofluorocarbons (HCFCs) *(Decision XXVII/8)*.

No treatment facilities for the neutralisation and safe disposal of ODS exist in the Pacific island countries. For disposal, ODS and HFCs would need to be collected, safely stored, and transported internationally to a treatment centre. The permitting and cost of this process has been a significant barrier, despite its small value (USD thousands or less) in the context of international efforts.

The process of ODS management illustrates the resources and time needed for even agreed-upon change. In case of the Montreal Protocol, where reporting is driving decision-making and action and under which significant progress has been made since 1987, several countries, including Cook Islands, Kiribati, Nauru, Niue, and Tonga, were parties to the Montreal Amendment to the Protocol but only recently established import and export licensing systems for ozone-depleting substances and therefore achieved compliance with Article 4B of the Protocol, with financial assistance approved for all of them through the Multilateral Fund.

Continued effort to identify and avoid the import and consumption of ODS will help us keep our global ozone layer intact.

REGIONAL RESPONSE RECOMMENDATIONS

The regionally adopted *Cleaner Pacific 2025: Pacific Regional Waste and Pollution Management Strategy 2016–2025* and its 2020 mid-term review (SPREP, forthcoming) set out national and regional recommendations, including for countries to:

- Separate ODS and other hazardous wastes from the general waste stream and recyclable materials;
- Develop regular, consistent monitoring and reporting at regional and national levels for hazardous waste management activities, waste generation, and the receiving environment;
- Develop and update national and regional inventories of hazardous substances and hazardous waste;
- Implement national measures to restrict and regulate importation, handling, storage, and sales of ODS-containing equipment and hazardous substances;
- Construct national secure storage facilities for chemicals and hazardous waste management, with environmentally sound operation;
- Support regional and national training and capacity development for management of priority hazardous wastes, such as ODS, including compliance monitoring, enforcement, and prosecution; and
- Partner for informed and effective hazardous waste management, including partnerships with customs officials and local industry.

INDICATOR IN ACTION SDGs 12.4, 12.5, 12.7 as well as 3.9, 11.6, 14.1 • Montreal Protocol • SAMOA Pathway • Pacific Regional Environment Objectives 3.1, 3.4 • Pacific Islands Framework for Nature Conservation Objectives 3, 5

FOR MORE INFORMATION

In addition to national focal points, the Secretariat of the Pacific Regional Environment Programme is coordinating regional efforts for hazardous waste management and hosts a Hazardous Waste Management Advisor. Contact sprep@sprep.org for assistance with hazardous waste management.

SPREP (forthcoming) Mid-term review report: Cleaner Pacific 2025 Pacific Regional Waste and Pollution Management Strategy 2016–2025. Bradley M (author). Apia, Samoa: Secretariat of the Pacific Regional Environment Programme.

SPREP (2016) *Cleaner Pacific 2025: Pacific Regional Waste and Pollution Management Strategy 2016–2025*. Apia, Samoa: Secretariat of the Pacific Regional Environment Programme.

SPREP PROE

The Secretariat of the Pacific Regional Environment Programme (SPREP) supports 14 countries and 7 territories in the Pacific to better manage the environment. SPREP member countries and members of the Pacific Roundtable on Nature Conservation (PIRT) have contributed valuable input to the production of this indicator. www.sprep.org

National and regional environment datasets supporting the analysis above can be accessed through the Pacific Environment Portal. pacific-data.sprep.org

For protected areas information, please see the Pacific Islands Protected Area Portal. pipap.sprep.org