

12th Ozone Research Managers Meeting

24 – 26 April 2024, Geneva

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Full report (Parts I and II): <https://ozone.unep.org/meetings/12th-meeting-ozone-research-managers/post-session-documents>



ORM Reports and **WMO-UNEP Scientific Assessments** are required under the **Vienna Convention** and **Montreal Protocol (SAP, EAP, and TEAP)**.

They have complementary but different purposes:

- **Scientific Assessments** inform the Parties about most recent research results, e.g. on success of control measures under the Montreal Protocol.
- **SAs** neither make policy recommendations nor are they research planning documents. However, they provide input for both.
- **ORM Reports** address research and monitoring needs in light of information provided by the Assessments
- **ORM Reports** make recommendations regarding international actions on research, monitoring, international coordination and networking.

- Vienna Convention “Trust Fund for Research and Systematic Observations”
- State of the ozone layer and expected recovery
- Ozone layer & climate change, emerging issues (e.g. climate intervention)
- Ground-based ozone & UV monitoring

- Controlled substances monitoring
- Space-based monitoring
- National & regional reports on ozone research and monitoring
- Framing recommendations for the ORM report

- Discussion and adoption of recommendations

5 areas:

- Research Needs
- Systematic observations
- Gaps in atmospheric monitoring of controlled substances, options to enhance such monitoring
- Data archiving and stewardship
- Capacity building

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- Continue observing and modelling ozone variations and trends
- Improve understanding, e.g. lower stratospheric ozone, connections to climate change
- Improve understanding of emissions of ozone-depleting substances, HFCs, HFOs, feedstocks, VSLS (very short-lived halogenated substances), and other relevant gases (sources, importance, top-down vs. bottom up, ...)
- Requires expanded monitoring, modelling, ... of these gases
- Improve understanding of ozone – climate coupling, global circulation changes
- Improve understanding of effects from extreme wildfires, volcanic eruptions, supersonic aviation, space activities, and climate intervention (all affecting aerosol in the stratosphere in various ways, and thus the ozone layer)

- Monitoring of trace gases, stratospheric aerosol, surface UV needs to continue, not shrink
- Maintain proven systems, but accelerate implementation of new & cost-effective instruments (e.g. Brewer replacements)
- Close gaps in data poor areas (often Article 5 countries)
- Improve monitoring of vertical profiles / fluxes of ODS, VSLS, N₂O, CH₄, H₂O
- Continue satellite observations, close imminent LIMB gap / bridge with enhanced ground-based observations (end of MLS will make us blind for relevant trace gases and detailed processes like polar ozone depletion)
- Improve monitoring of parameters relevant for connections between ozone, large-scale circulation, climate change.

Ground-based and ozone-sonde monitoring is essential for calibrating satellite data used for trend analyses

ORM12 gaps in monitoring controlled substances

- 2020 white paper “Closing the gaps in top-down regional emissions quantification: needs and action plan”
- MOP33, 2021, decision XXXIII/4, MOP35, 2023, decision XXXV/14: costs? locations and options? Better defined by workshop in February 2024.
- Recognize pilot project in Bangladesh, EU funded with in-kind contribution from UK
- Further assess number and locations for possible stations, especially in under-sampled regions
- Range of costs to expand monitoring is wide, depends very much on local conditions and depth / scope of monitoring (e.g., flask or in-situ)
- Leverage existing monitoring stations and programs (for other trace-gases)
- **Recommend that parties to the Vienna Convention and the Montreal Protocol discuss funding regimes to sustain measurement activities**
- Utilize Vienna Convention “Trust Fund for Research and Systematic Observations” as a funding mechanism?
- Importance of quality assessed and reviewed data with open access

- Recognize importance of data centers
- Encourage data providers to submit to established databases
- Continue improvements in data archiving, inter-operability, findability, accessibility (e.g. DOIs, FAIR, GCOS principles)
- Use synergies, e.g. central processing
- Recognize importance of data curation, including historical data
- Provide necessary resources (IT, personnel)

- Continue the success of calibration and intercomparison campaigns, trainings & workshops (e.g., Dobson, Brewer)
- **Expansion of funding of the Vienna Convention Trust Fund** would help: (i) maintaining the quality of the global ozone-observing system (e.g., calibration and intercomparison of Brewer and Dobson instruments), and (ii) provide training opportunities.
- Harness other funding sources
- Encourage **developing countries to expand their scientific capacity**, identifying points of contact and stakeholders is key to foster local and international cooperation
- Encourage true partnership in science among researchers in developing and developed countries

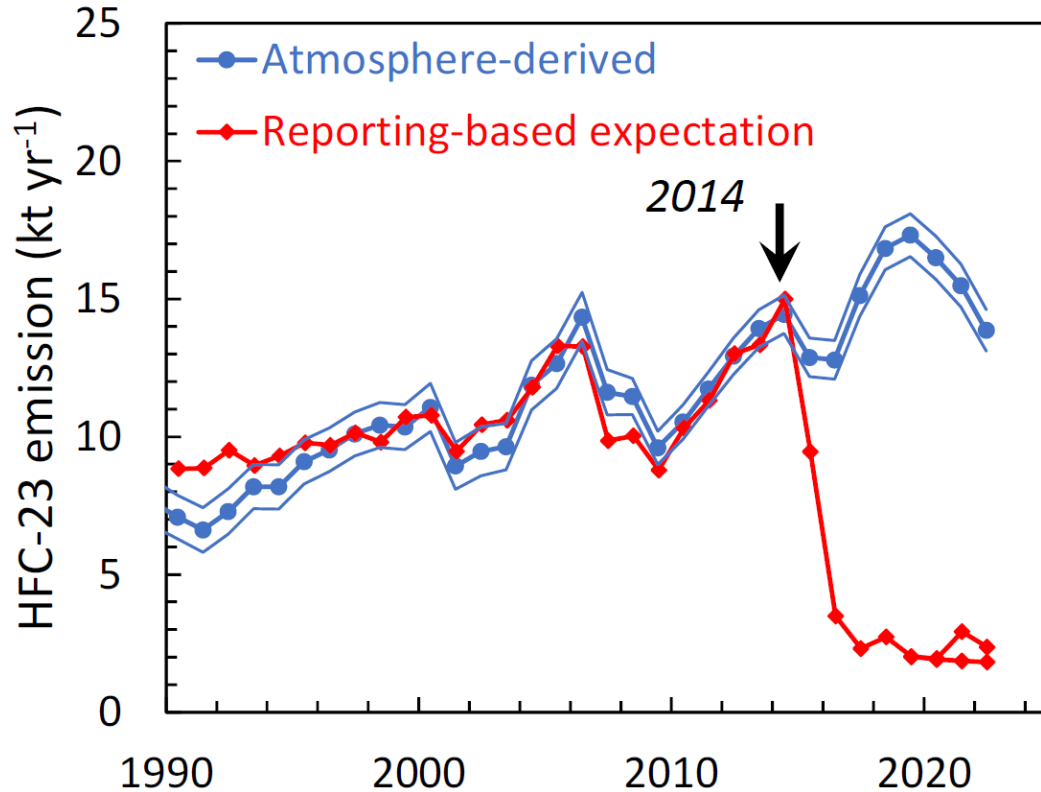
- Improve understanding and accuracy of future projections of global ozone
- Maintain and enhance observation capabilities for climate and ozone layer variables
- **Fill gaps in atmospheric monitoring of controlled substances**
- **Enhance the Vienna Convention “Trust Fund for Activities on Research and Systematic Observations” to better support the above goals**
- Dedicate to building capacity everywhere to meet the above goals

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Need to monitor emissions



- ➔ fill gaps in atmospheric monitoring of controlled substances
- ➔ enhance the Vienna Convention “Trust Fund for Activities on Research and Systematic Observations” to better support the above goals.



Thanks to all participants, but especially to
UNEP ozone secretariat & WMO

