The BIPM Gas Metrology Programme focuses on the international equivalence of air quality and greenhouse gas standards.

Outputs from the current programme include:

**Technical Coordination**
- 129 NMI participations in 6 comparisons coordinated by the BIPM in the 2016-2019 programme to date in support of the CCQM strategy
- 14 visiting scientists working on gas metrology projects in BIPM laboratories for a total of 61 person-months
- 11 key comparison final reports published in Metrologia

**Science**
- 5 papers published in peer reviewed journals
- 1 review article on gas metrology published
- New measurements of ozone absorption cross section in the UV
- New reference facility for CO₂ in air standard comparisons
- Calibration strategy for optical isotope ratio instruments developed
- New facility for generation of isotope ratio mixtures of CO₂

**Representation**
- Represented gas metrology at WMO-GAW and the Expert Group on VOCs, IAEA, WMO-IAEA GGMT
- Contributed to guidelines and reports for atmospheric gas measurements of WMO-GAW
- Supported regional activities on capacity building in gas standards and analysis

**Metrology for clean air knowledge transfer to NMIs**
- Training of NMI scientists on advanced FTIR methods and BIPM software for gas standard analysis
- Sponsorship of CBKT visiting scientist training secondments by NPL and PTB

**A new reference for global CO₂ atmospheric measurements**

- BIPM manometric (CO₂-PVT) reference facility for CO₂ in air standard comparisons
- On-demand comparisons available in 2020-2023 programme as BIPM.QM-K2

\[ x_{\text{CO}_2} = \frac{1}{R_v} \frac{P_{\text{CO}_2} T_{\text{air}}}{P_{\text{air}} T_{\text{CO}_2}} \]

**More accurate ozone measurements for cleaner air in our cities**

- CO₂ in air standard comparison coordinated by BIPM (2016)
- NMIs producing more accurate standards for CO₂ monitoring world-wide

**BIPM comparisons of ozone standards (BIPM.QM-K1) and accurate measurements of ozone cross-section**

A new more accurate value of ozone cross section in the UV:

The recommended value is 1.2 % lower than the current value (Hearn-61) implemented in reference instruments for tropospheric ozone measurements. Uncertainty 6 times smaller!