



The Impact of Recent East Asian Emissions of CFC-11 on Ozone Recovery

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The Montreal Protocol was agreed as a response to the unambiguous detection of ozone depletion driven by halogen compounds, and is regarded as the most successful environmental treaty to date. However, recent observations indicate that compliance with the Protocol may not be complete, with studies identifying a new source of CFC-11 in East Asia. This new source of CFC-11 will have an impact on the timing of ozone recovery, depending on the duration and magnitude of the emissions.

Using the UM-UKCA model, we explore the immediate and future impact of recent East Asian emissions of CFC-11. A baseline scenario is performed following the WMO₂₀₁₄ recommendations for lower boundary CFC mixing ratios. From this, separate integrations are initialised in 2012 and run to 2100 following different scenarios for CFC-11 (and CFC-12) emissions. We make a range of assumptions about the magnitude and duration of the additional production, their direct emissions into the atmosphere and the effect on the banks. Using these scenarios we examine potential future changes to stratospheric chlorine loading, ozone mixing ratios and the resulting radiative impacts, which could result if rapid action is not taken to curb these recent emissions.