

Top-Down Validation of European Halocarbon Emission Inventories

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Continuous measurements of halocarbons at continental background sites have the potential to be used to estimate regional and global sources. Whereas global emissions of specific substances can be estimated by straightforward accounting for their trends and atmospheric lifetimes, assessing regional sources requires a more sophisticated approach. In Europe emissions of halocarbons are regularly estimated by continuous measurements at Jungfraujoch (high-alpine site, Switzerland) and at Mace Head (coastal site, Ireland). These estimations are derived by combining measurements during pollution events with independent tracers (e.g. CO, Rn-222), concurrent meteorological information, or statistical methods. The derived emissions down to the level of individual countries have the potential to be used as an independent tool for verification of the yearly inventories submitted to the United Nations Framework Convention on Climate Change. Examples of the different methods in use and case studies of the divergence between the inventories and measurement-based estimates will be shown (Figure 1).

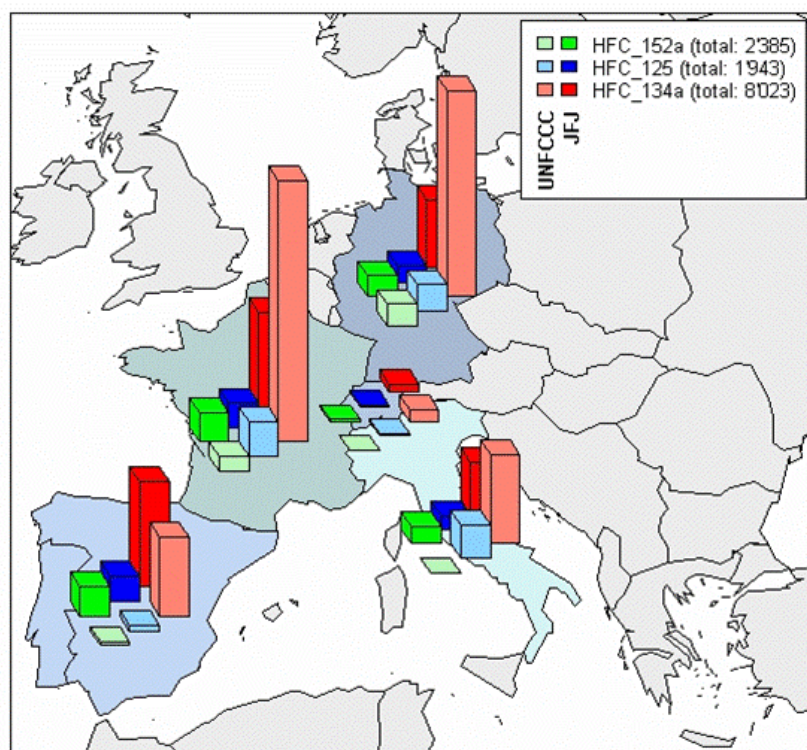


Figure 1. Estimation of emissions of different Hydrofluorocarbons (HFCs) divided into individual European countries, using measurements of HFCs and Rn-222 at Jungfraujoch in combination with a Lagrangian Particle Dispersion Model (FLEXPART).