

ESR20-030 - Vienna Urban Carbon Laboratory (VUCL)

Abstract

The VUCL will test the latest measurement-based emissions monitoring methods to address a pressing scientific research question with practical and political implications – Can Vienna’s greenhouse gas (GHG) emissions be adequately measured? The need for climate action in cities is critical. Systems that quantify local GHG emissions to evaluate mitigation measures are thus growing in importance and will undergo increasing levels of scrutiny. Measurement-based systems offer enormous potential; however, there is still substantial research required before they can be established within routine monitoring systems which currently rely on emission inventories. The VUCL thus proposes a number of cutting-edge scientific investigations, involving tall-tower eddy covariance measurements of net carbon dioxide (CO₂) and methane (CH₄) fluxes, CO₂ isotope and isoflux measurements, as well as test campaigns with a differential column sensor network to measure upwind-downwind gradients in CO₂ and CH₄ mixing ratios. The VUCL brings together the University of Natural Resources and Life Sciences Vienna (BOKU), the Technical University Munich (TUM), the Environment Agency Austria (EAA) and A1 Telekom Austria AG (A1) and aims to: advance science in the field of measurement-based GHG emissions estimates; showcase the latest measurement-based methods to city administrators; and lay the foundations for an adequate local monitoring system for quantifying total and sector specific emissions reductions.

Scientific disciplines:

Environmental physics (50%) | Atmospheric chemistry (40%) | Sustainable urban development (10%)

Keywords:

Urban greenhouse gas emissions, flux measurements, stable isotopes, total column mixing ratios, carbon dioxide, methane, climate change mitigation, inverse modeling and mass balance approaches

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Status: Ongoing (01.02.2021 - 31.01.2025)

Further links to the persons involved and to the project can be found under

<https://www.wwtf.at/funding/programmes/esr/ESR20-030/>