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Urban greenhouse gas emissions assessment: observations and modelling in a pilot study for the Oslo area.

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Norway has set the target of cutting greenhouse gas (GHG) emissions by at least 40% compared to 1990 levels by 2030. This goal will require the implementation of policy measures aiming at strong reductions of GHGs emissions, especially in the urban environment. The implementation of urban policy measures is still a challenging task and it requires control and verification for success. The URGE project aims at assessing the GHGs emission flux methodologies including comprehensive uncertainty estimates based on inverse transport modelling techniques and optimized use of measurements, in order to establish a coherent and consistent GHG urban emission inventory. This is being be carried out in a case study in Oslo (Norway), where CO_2 is be the priority compound. The overall outcome of the project is expected to provide support in the development of strategies to effectively reduce GHG emissions in the urban environment. The main activities are establishing the baseline urban CO_2 emission inventory for Oslo; determining the optimal measurement locations based on transport modelling; designing and carrying out a pilot measurement campaign of the CO_2-rich air downwind of the city plume combining state-of-the-art instruments and low cost sensors; assessing the feasibility of determining the background concentration surrounding the city (with e.g. satellite measurements); and providing optimised estimates of the emissions and their uncertainties via inverse modelling (source-receptor relationship based optimisation). We are interested the inter-operability and exchange of information with similar activities in other urban areas. We will present the overall project and the preliminary results, discuss the data exchange formats, the algorithms and data structures that could be used for inter-comparisons and the suitability to apply the techniques to other atmospheric compounds.