

Prototyping an Earth Observation (EO)-enabled kit supporting greenhouse gas reporting – GHG-Kit

Christian Maurer¹, Marcus Hirtl¹, Peter Redl¹, Antje Hoheisel¹, Marielle Mulder¹,
Stefan Schneider¹

¹ GeoSphere Austria

When the Paris Agreement was adopted by the United Nations Framework Convention on Climate Change (UNFCCC) in 2015, all nations agreed to undertake ambitious efforts to combat climate change with the aim to confine the global average temperature increase to below 2°C. One of the regulations in the Paris Agreement requires all nations to report on their national anthropogenic GHG emissions and removals.

Earth observation (EO) data can be a useful tool to deliver independent and comprehensive input data for greenhouse gases emission verification. In particular, the future Copernicus CO₂ Monitoring Mission (CO₂M) will support the measurements of carbon dioxide concentrations. Satellite data with high accuracy and relevant spatio-temporal coverage and resolution can improve an independent quantification of self-reported emissions. Inverse modelling, based on biogenic and anthropogenic a priori fluxes and atmospheric transport modelling, can be used to compute a posteriori emissions.

The envisaged ASAP18 flagship project GHG-KIT (<https://ghg-kit.at/>) aims at developing an overall system, together with the main stakeholder Umweltbundesamt (UBA), that will support the integrated greenhouse gas accounting and monitoring using EO-based information. To tackle the various challenges and aspects within the inventory generating process, we aim for the design and development of a modular system (Tool-KIT-System), with the focus on the integration of Copernicus satellite data (from existing and future missions). First results of data collection efforts, anthropogenic and biogenic a priori inventory preparation based on TNO as well as on the Österreichische Luftschadstoff-Inventur/Bundesländer Luftschadstoff-Inventur (OLI/BLI) data and the Vegetation Photosynthesis and Respiration Model (VPRM) model runs will be presented.