

SATELLITE-BASED CO₂ MONITORING

Prototyping a satellite enabled tool-kit system for GHG verification in Austria

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The need for GHG reporting

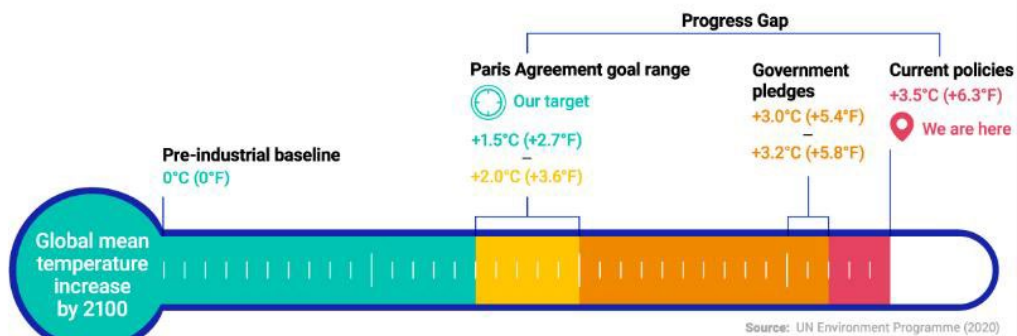
PARIS CLIMATE AGREEMENT

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1. Limit the avg. global temperature increase to $<2^{\circ}\text{C}$ + achieve net zero emissions by mid-century
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2. Enhance resilience and adaptation to climate impacts certain to occur
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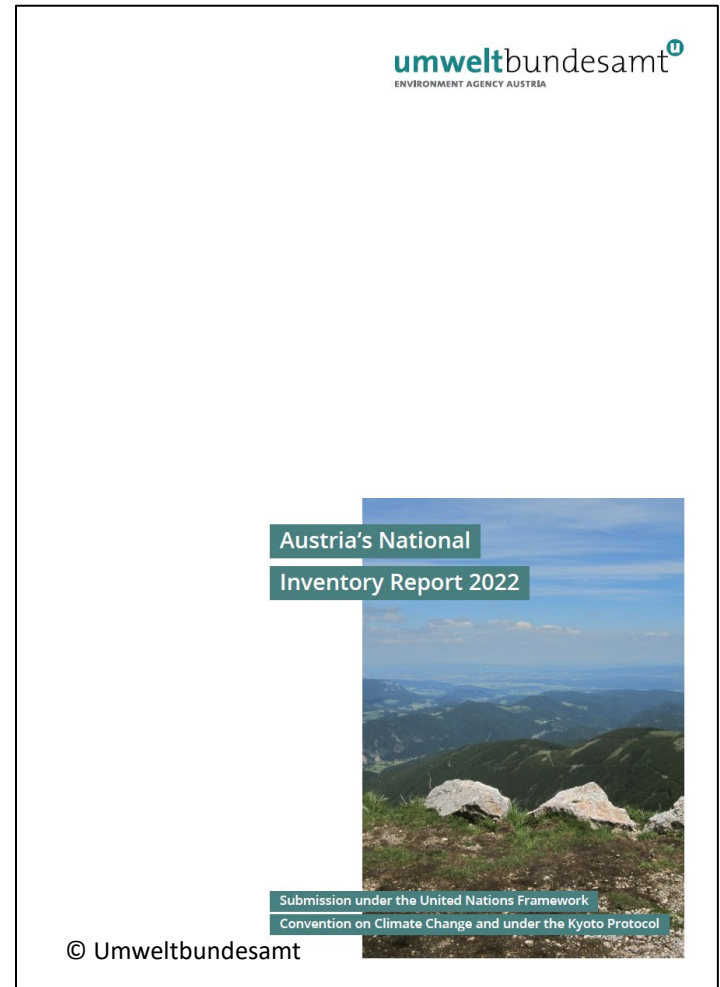
3. Align financial flows in the world with these objectives



GHG EMISSION ACCOUNTING

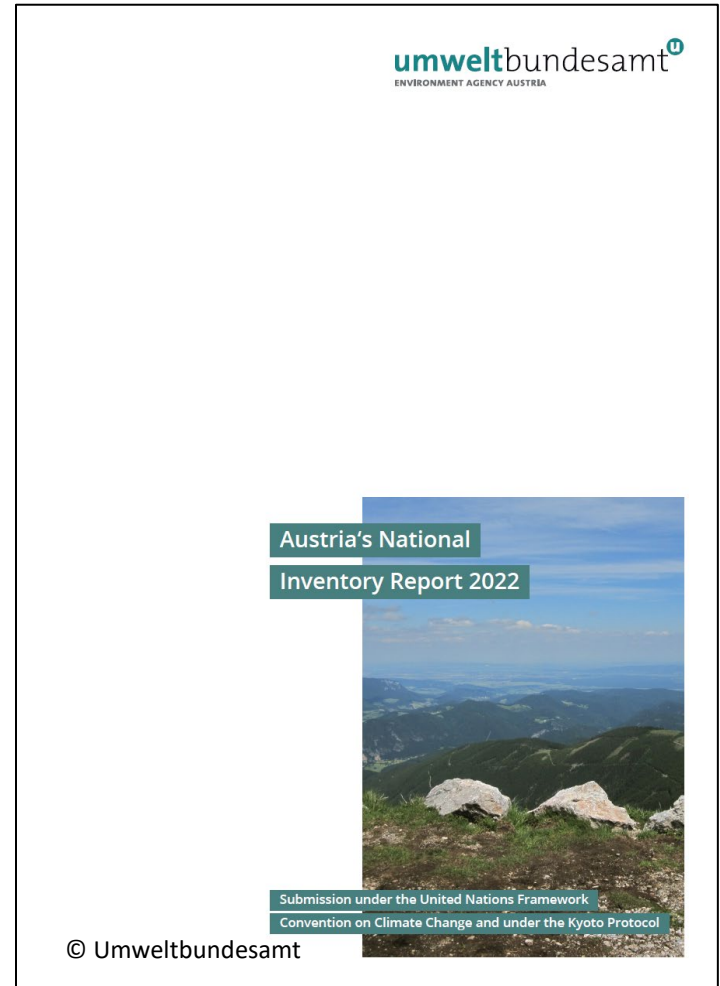
GHG reporting: Austria

- Austria obliged to estimate and report GHG emissions estimates annually under United Nations (UNFCCC-Paris Agreement) and EU climate legislation (EU 525/2013; EU 2018/1999)
- According to the Austrian Environmental Control Act (*Umweltkontrollgesetz*), the Environment Agency Austria (Umweltbundesamt) is tasked with inter alia compiling and reporting national emissions inventories
- At Environment Agency Austria (EEA) we have a dedicated Inspection Body for Emissions Inventories (IBE) that is ISO/IEC 17020 accredited:
 - Functioning Quality Management System (QMS)
 - Technical competence, integrity and independence of the inventory experts



GHG reporting: Austria

- IBE QMS secures that the estimation of national GHG emissions fulfils – and even goes beyond – international reporting requirements for national emissions inventories
- Inventory approach: Emissions are estimated with models based on socio-economic and environmental activity
 - Example for simplest model: $Emi_{GHG} = AD \times EF_{GHG}$
 - Complex models (e.g. if country specific) quite common
- Inventory methods adhere to international reporting requirements and follow the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, as well as the 2019 Refinements
- Inventory adheres to the TACCC quality principles of Transparency, Accuracy, Completeness, Comparability and Consistency
- Austrian GHG inventory submission is reviewed up to 2 times a year by international experts on behalf of the European Commission and the UNFCCC (reporting requirements, quality principles)



GHG reporting: Austria

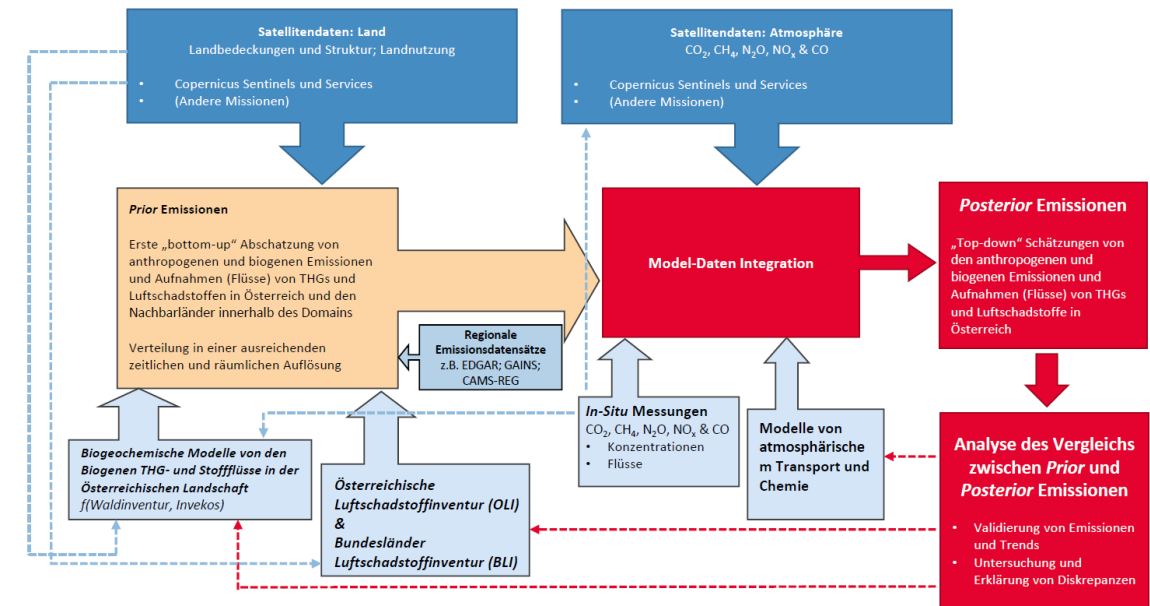
- High quality of the Austrian GHG Inventory has been achieved by QMS processes that maintain standards and ensure continuous improvements
- One current focus is the potential utilisation of Earth Observation (EO) data for improving methods (activity data/emissions factors) and for verifying inventory emission estimates.
- Participation in GHG-Kit:
 - Environment Agency Austria, together with the Austrian Research Promotion Agency (FFG) of the Federal Ministry for Climate Action, developed the ASAP 18 call for this flagship project
 - Environment Agency Austria will be an active partner and stakeholder in GHG-Kit



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The potential value of EO data

- Validation of inventory calculations of emissions and trends
- Identification of potential errors in the inventory models
- Methodological improvements in the inventory approach (e.g. related to the LULUCF sector)



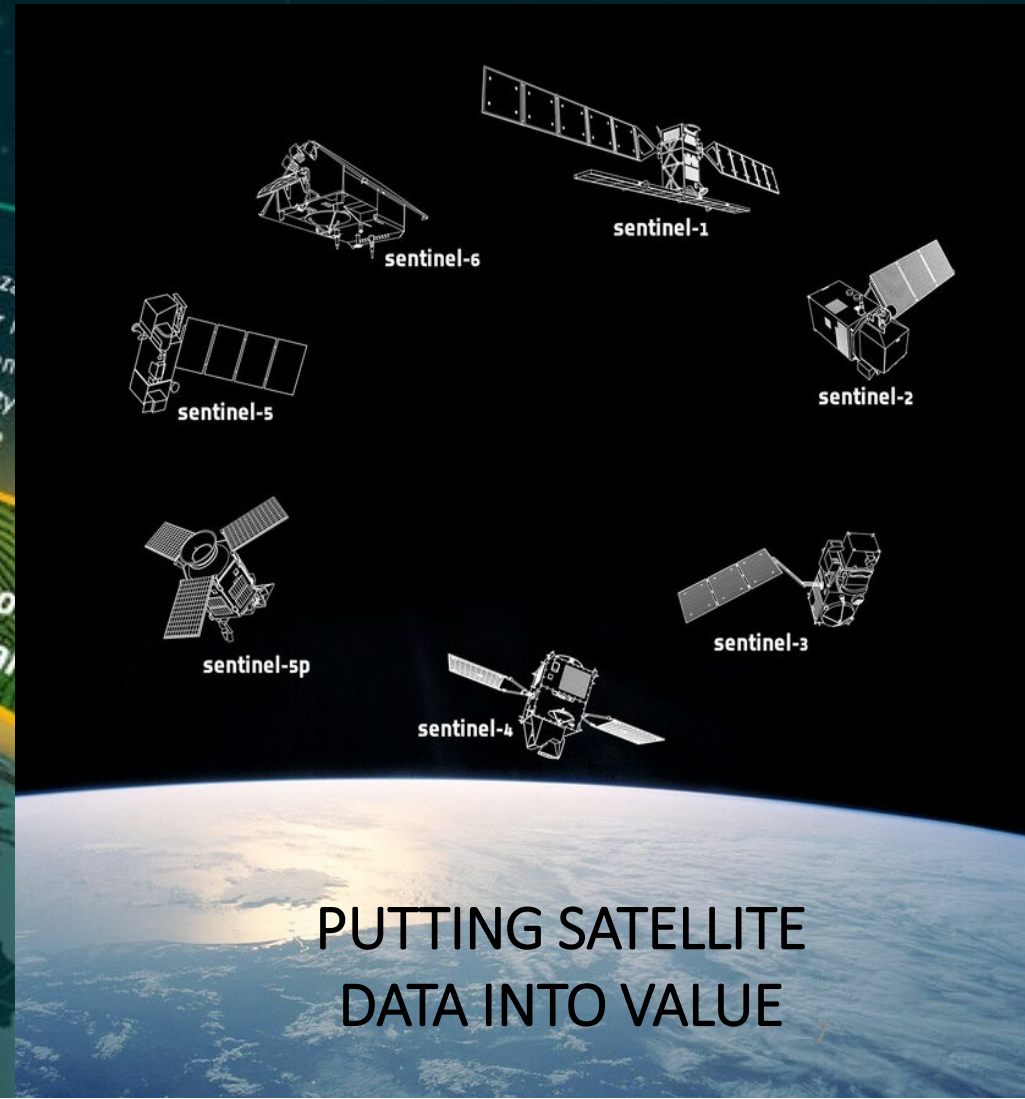
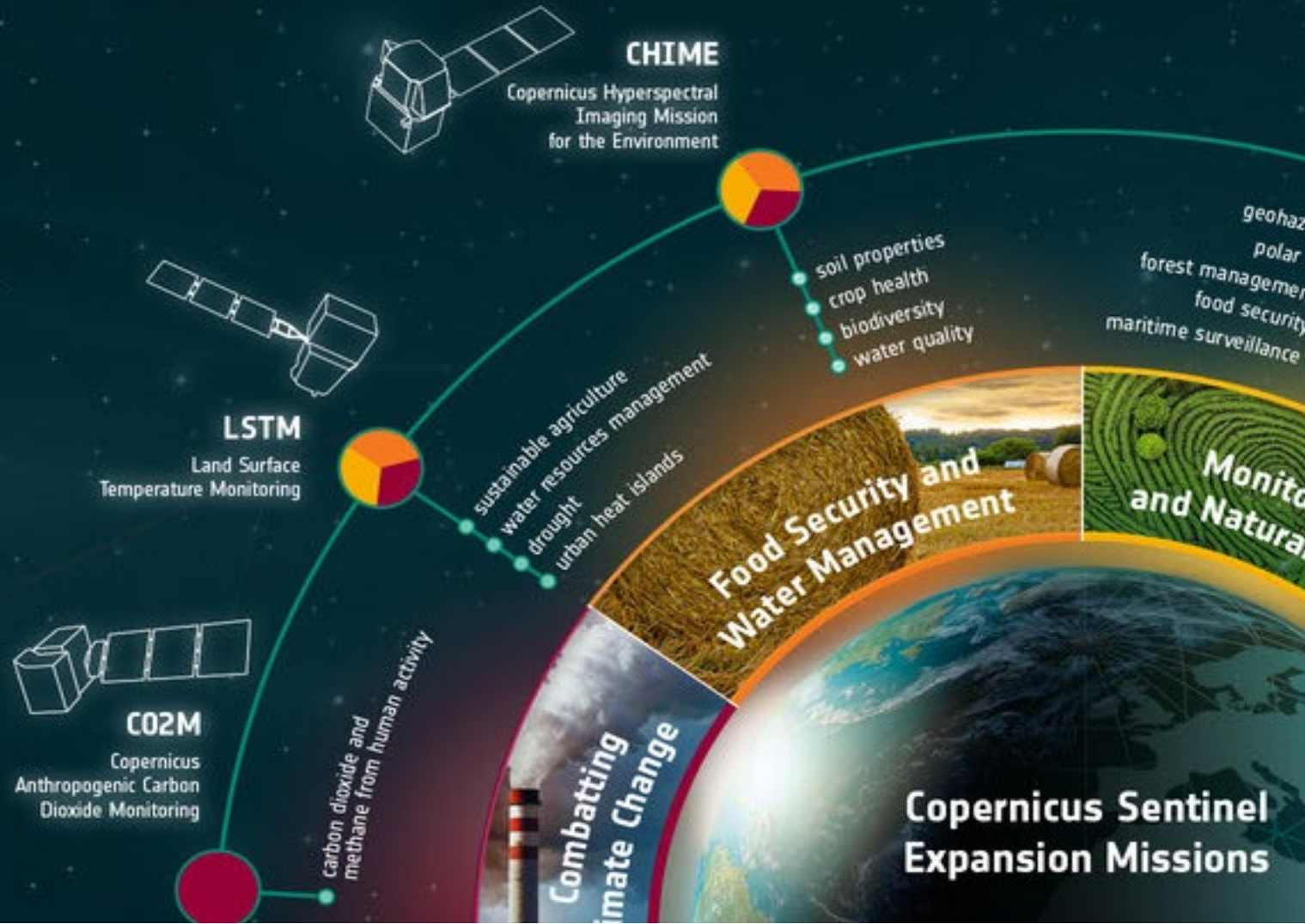
European satellite capacities for the GHG sector



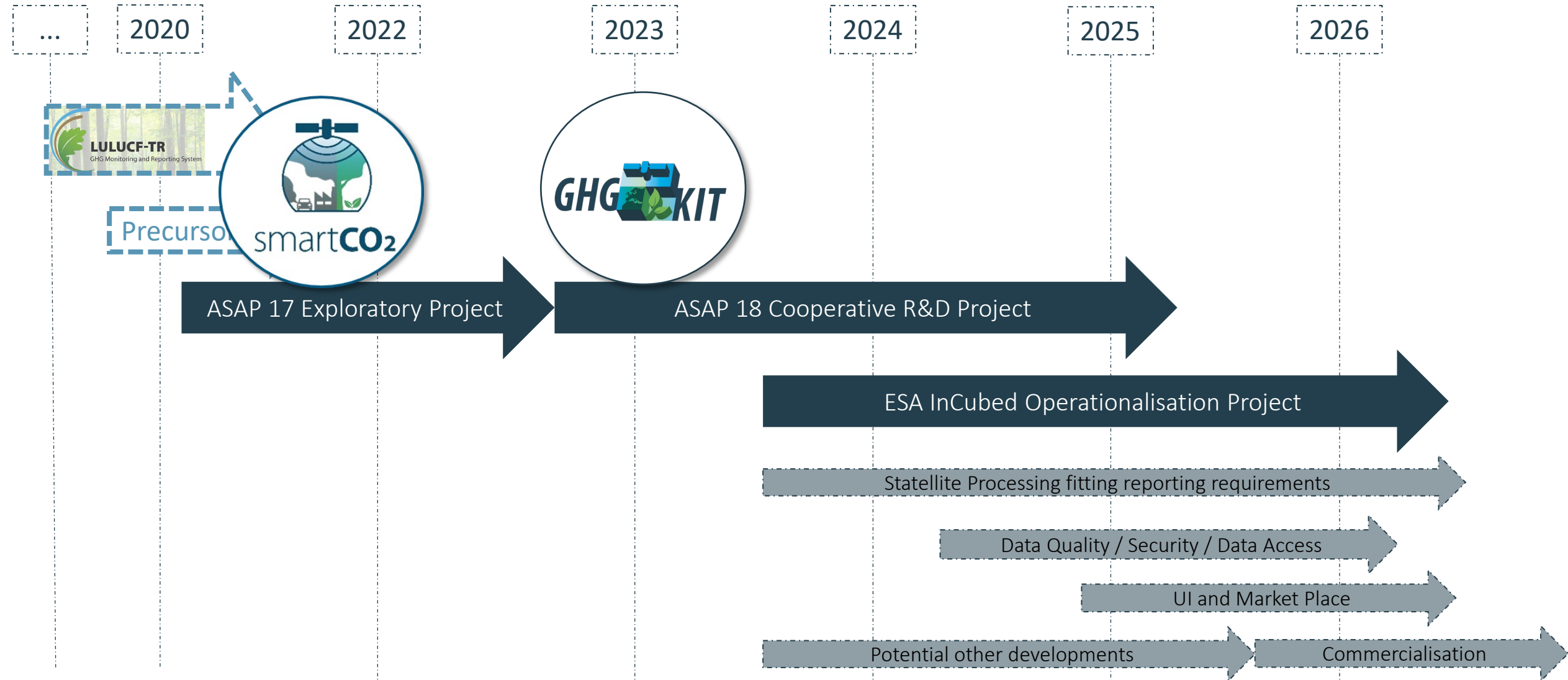
PROGRAMME OF THE
EUROPEAN UNION



co-funded with



Towards an EO enabled reporting

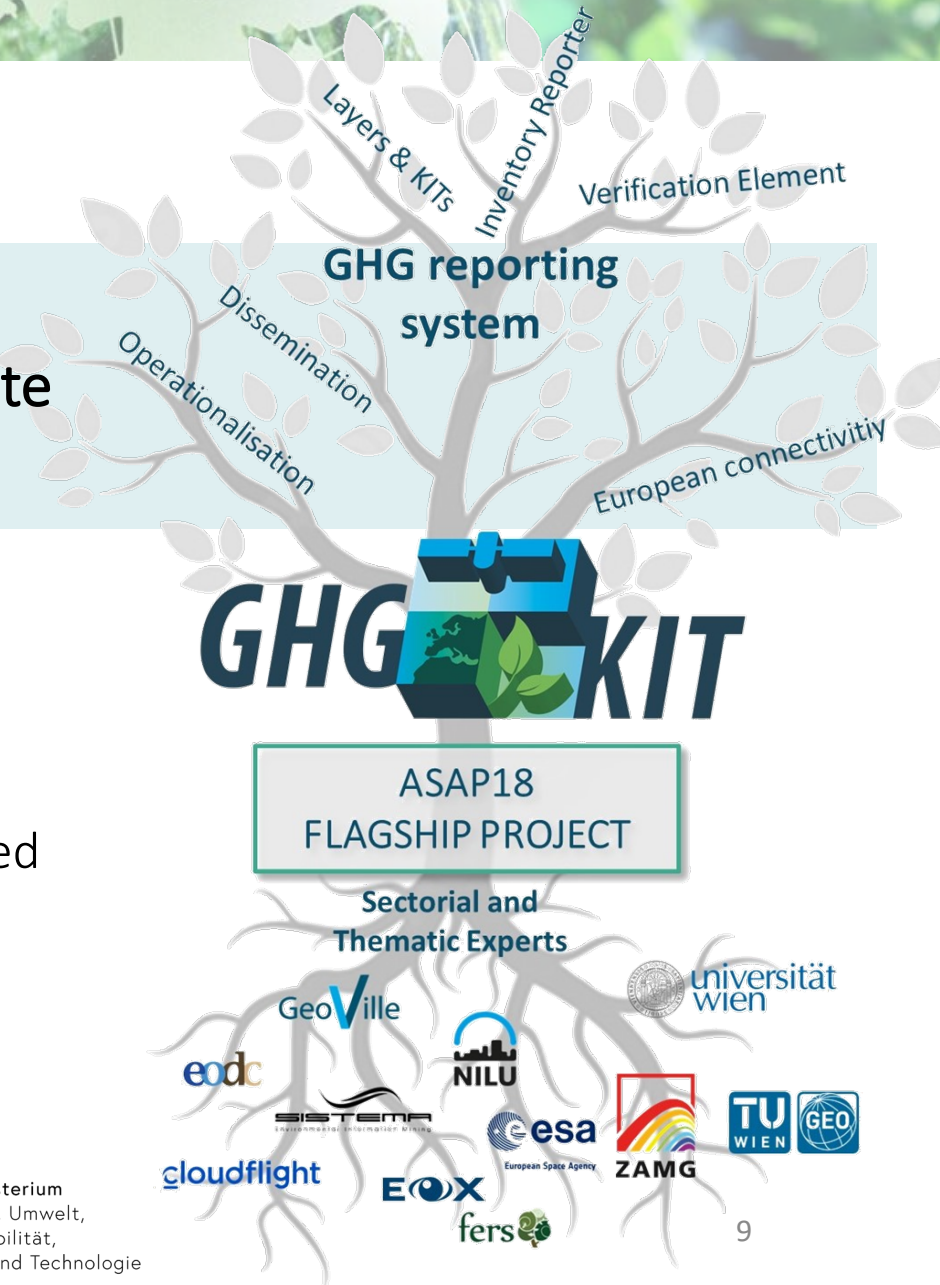


Towards an EO enabled reporting

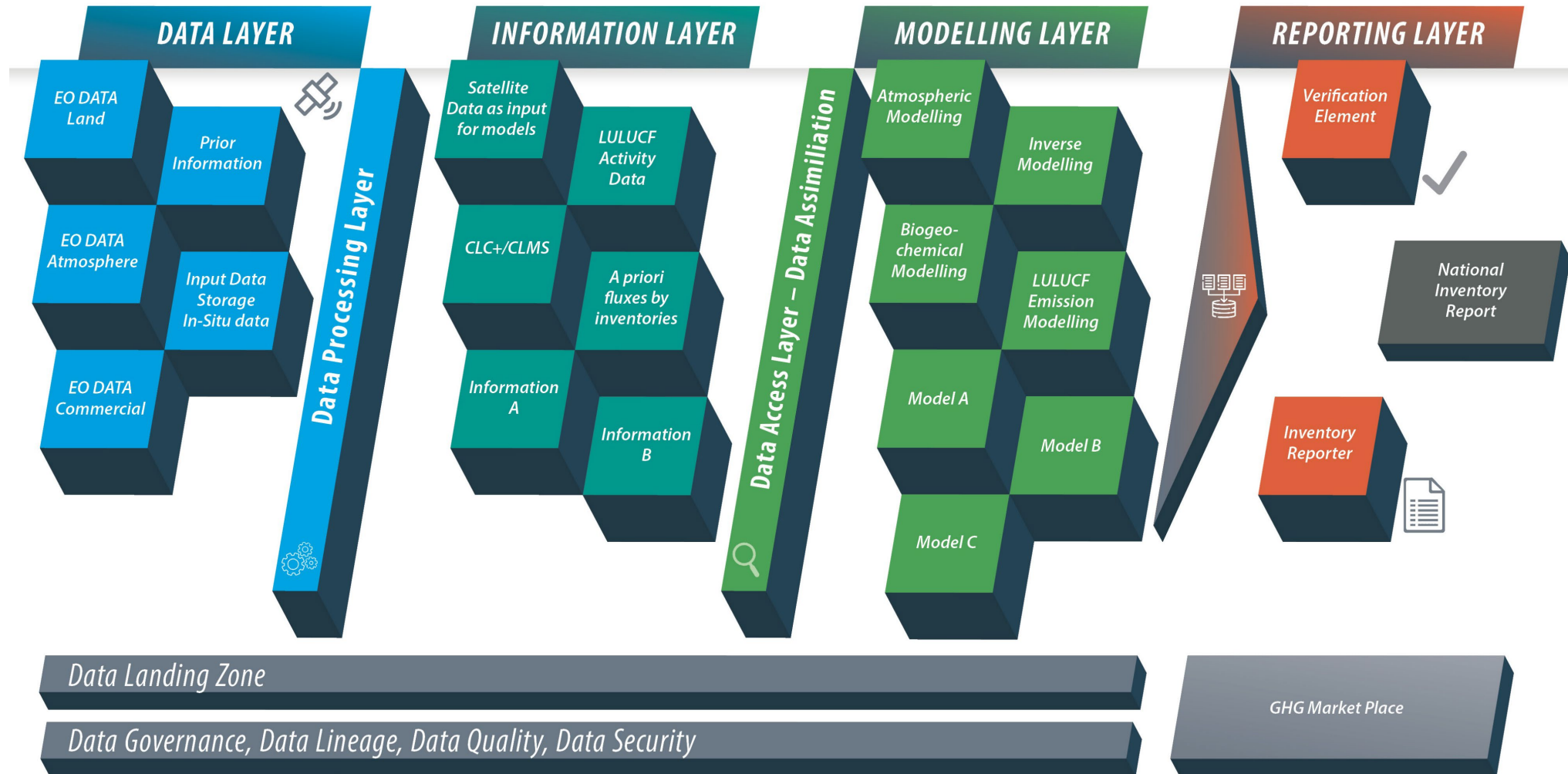
KEEP IT TRACEABLE.

Development of a prototype support system for integrated Greenhouse gas accounting and monitoring based on satellite information products

- Development and demonstration of two prototypes
 - System for deriving **LULUCF activity data** time series for Austria from EO data
 - **Inverse modelling system** for **verification** of the currently reported emissions (top-down approach)
- Team: 3 research institutions, 4 industry partner, 4 advisory board members, stakeholder & users from sector



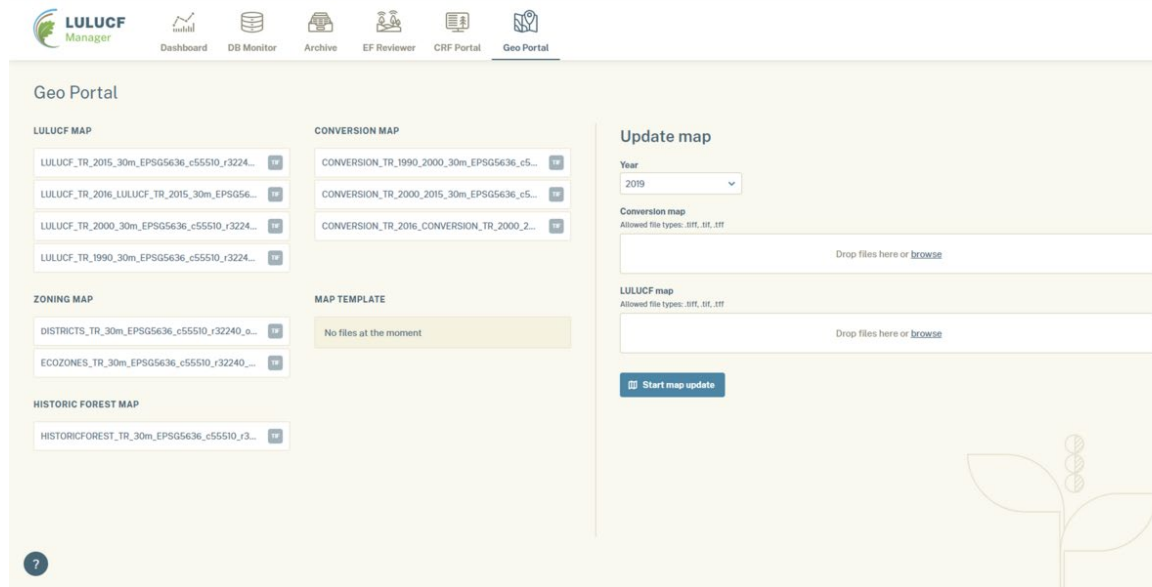
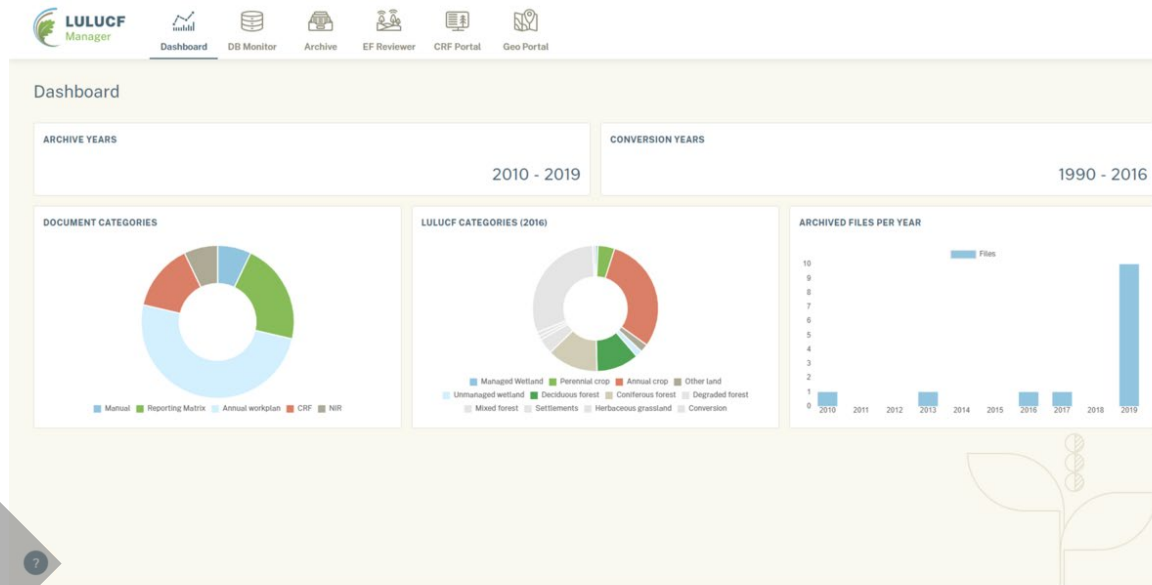
Answering the needs for exploiting EO data



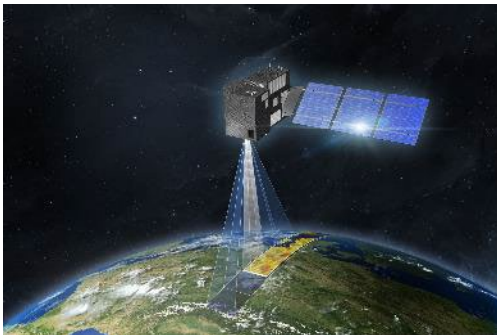
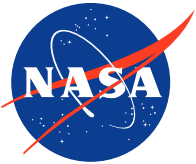
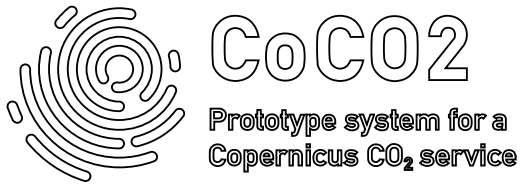
Answering the needs for exploiting EO data



Copernicus
supports LULUCF
reporting
obligations



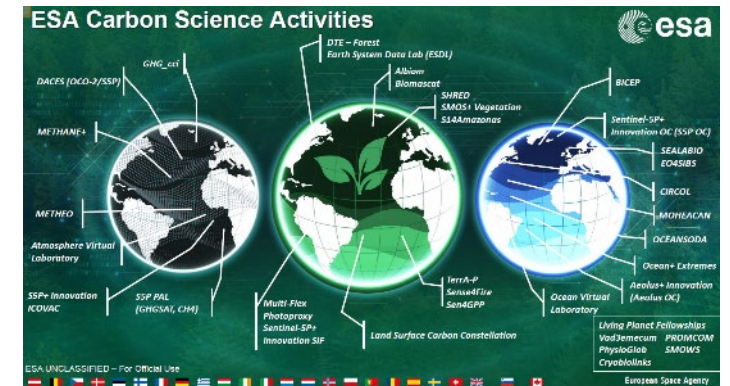
Answering the needs for EO data



CO2M



OCEAN CARBON FROM SPACE



THANK YOU FOR YOUR ATTENTION

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