

Copernicus CO2M Mission Advisory Group

General Terms of Reference

The objective of the Copernicus Carbon Dioxide Monitoring (CO2M) Mission Advisory Group is to advise ESA and EUMETSAT on the development and commissioning of the space and ground segment components of the Copernicus CO2M Mission. User Requirements identified under the responsibility of the European Commission (EC) have been consolidated in the CO2M Mission Requirements Document (MRD), which has been used throughout the Phase B2/C activities to guide design consolidation activities. During Phases D and E1, ESA and EUMETSAT will closely collaborate, to ensure that there will be a seamless flow of information between the space and ground segments, and the other components of the CO2M System, i.e. the targeted operational service(s) that will be managed by EC with ECMWF as service provider. Phase E1 will end after the successful completion of the In-Orbit Commissioning Review (IOCR) of each of the three satellites. Being a progressive constellation deployment, each satellite will enter in an early Phase E2, that is under EUMETSAT's responsibility, where the routine preparation of each CO2M satellite will be done. Each early Phase E2 ends after the successful completion of a System Operational Readiness Review (SORR) and nominal Phase E2 operations will start for that satellite.

In this context, the Copernicus CO2M MAG for Phase D/E1 is tasked with providing advice to ESA and EUMETSAT as follows:

1. Support, guidance and advice on:
 - trade-off considerations between the core and add-on options in the implementation of the space and ground components,
 - instrument calibration methods (on-ground/in-orbit, as necessary),
 - Evaluating Level 1 & 2 products and product quality requirements, and specifying requirements for new Level-2 products based on the consolidated design of the mission,
 - Approaches to derive uncertainty estimates at L1b, L1c and L2, and verification of the uncertainties,
 - evolution of the L1 and L2 retrieval algorithms,
 - requirements, methods and accuracy of geophysical validation,
 - study, services, and campaign requirements, including for end-to-end product calibration/validation,
 - preparation for Phase E1 calibration, validation and verification activities and coordination of international validation contributions,
 - end-to-end performance simulations for the complete CO2M System, i.e. space and ground components,
 - promoting the mission using presentations and publications.
2. Members may be asked, within reasonable effort, to help generating documentation or presentation material addressing specific topics.
3. Members will be expected to meet on an ad-hoc basis up to four times a year, as needed.
4. Membership of the group is not supported by consultancy contracts, though the ESA and EUMETSAT will cover necessary travel and subsistence*. Exceptions may occur when specific tasks require particular effort or when members are involved in scientific study or service contracts**.

5. For satellites in their early Phase E2 and up to SORR, EUMETSAT seeks advice on the
 - a. system level commissioning activities,, where the level-2 user products are provided, successively by the first and second satellites that will be validated based on the level-1 user products, generated by the EUMETSAT Ground Segment,
 - b. products validation optimisation for the complete CO2M constellation. With the 3rd satellite, the CO2M constellation will be fully deployed. The corresponding system commissioning and user products' validation will build on the processing knowledge, obtained from the first (2) satellites, with the objective to reduce the CO2M system commissioning duration.
6. Membership of the Group will end after the successful completion of the IOCR of the CO2M-C (FM3) satellite, which is currently forecasted at the end of 2029.
7. Group membership and Terms of Reference will then be reviewed to assess the scope and potential need for extension of the MAG activities.
8. Any member of this Group shall be obliged to declare any potential conflict of interest in relation to this activity.
9. A member of the Group cannot be a member of, advisor to, or consultant to, any industrial consortium awarded the Phase B2/C/D/E1/E2 industrial study or service contract run by the respective Agency for this mission.
10. A member of the Group shall be independent from ESA and EUMETSAT Advisory Boards for Earth Observation Programmes, which comprise Member State Delegates (e.g. Programme Board for Earth Observation, and the Data Operations, Scientific and Technical Advisory Group). Members shall not be Delegates or engaged in an advisory capacity to Member State Delegations.
11. All Members of the Group shall sign a Non-Disclosure Understanding (NDU) to safeguard proprietary information and intellectual property.
12. All Communications, Press Releases, Publications or publicly distributed material concerning the candidate Mission shall be discussed and the content agreed with ESA and/or EUMETSAT prior to release.

*** Subsistence Allowance & Responsibilities of the Agencies**

The subsistence allowance (Group II per diem), as paid by the two Agencies shall be deemed to cover all out-of-pocket expenditure, during the relevant period, with the exception of travel expenses. These allowances shall be deemed to cover expenditure such as meals and hotels. ESA and EUMETSAT assume no responsibility, or obligation, refund expenses such as personal insurance, medical expenses, and travel documents (except visa). In the absence of submission of the relevant invoice concerning the hotel (or other official or commercial accommodation), the daily subsistence allowance shall be reduced by 50%. The Agencies shall only reimburse travel expenses and subsistence to a bank account held in the name of the attendee of a meeting and not to the bank account of his/her institute or company. Travel expenditure and subsistence shall not be paid to those people who have a non-exchange of funds (NEF) agreement with the Agencies.

*** In the case of instances where a study or service contract and MAG meetings take place on consecutive days, the ESA or EUMETSAT study or service contract reimbursement rules shall take precedence. Subsistence, if due, will be paid for the days of the MAG meeting only.*