

ECMWF Copernicus Procurement

Invitation to Tender



Copernicus Atmosphere Monitoring Service

EQC of emission and surface fluxes products:
prototype EQC activities for global products

Volume II: Specification of Requirements

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Table of Contents

1	Introduction.....	3
2	Contract Summary.....	4
3	Technical Specification	4
3.1	General Requirements	4
3.2	Work Package 1 (WP1) – Development of EQC Framework	8
3.3	Work Package 2 (WP2) – EQC demonstrators	8
3.4	Work Package 0 (WP0) – Management and coordination.....	8
4	General Requirements	12
4.1	Implementation schedule and allocation of resources.....	12
4.2	Deliverables and milestones	12
4.3	Acquisition of necessary data and observations.....	13
4.4	Communication.....	13
4.5	Data and IPR.....	13
4.6	Key performance indicators.....	13
4.7	Travel Costs	14
4.8	Payment Plan	14
5	Tender Format and Content.....	16
5.1	Page Limits	16
5.2	Specific additional instructions for the Tenderer’s response	16
5.2.1	Executive Summary	16
5.2.2	Track Record	16
5.2.3	Quality of Resources to be Deployed	16
5.2.4	Technical Solution Proposed	17

1 Introduction

Some of today's most important environmental concerns relate to the composition of the atmosphere. Ozone distributions in the stratosphere influence the amount of ultraviolet radiation reaching the surface. In the troposphere, aerosols, ozone and other reactive gases such as nitrogen dioxide determine the quality of the air around us, affecting human health and life expectancy, the health of ecosystems and the fabric of the built environment. The variable abundance of the reactive gases changes the oxidation capacity of the atmosphere and controls therewith also the abundance of long-lived greenhouse gases. The composition of the troposphere and the associated deposition fluxes are major components of the biogeochemical cycles of carbon, nitrogen and sulphur and iron, which affect the land- and marine ecosystems. Dust, smoke and volcanic aerosols affect the safe operation of transport systems and the availability of power from solar generation, the formation of clouds and rainfall, and the remote sensing by satellite of land, ocean and atmosphere.

The increasing concentration of the greenhouse gases and the various aerosol-weather feedbacks are prominent drivers of climate change, but quantification of their contributions remains uncertain. In the wake of the agreement signed in Paris at the UNFCCC's 21st Conference of the Parties (COP-21) in December 2015, the need to monitor and to inform about the mitigation efforts for anthropogenic emissions of key greenhouse gases has become more acute and prominent. With its global coverage (or regional in the case of geostationary platforms), Earth Observation has a decisive role to play within such a monitoring system, complementing ground-based observations, "bottom-up" estimates of the emissions (included in official reporting) based on inventory data and biogeochemistry models, and atmospheric transport modelling.

To address these environmental concerns, there is a need for data and processed information. The Copernicus Atmosphere Monitoring Service (CAMS) has been developed to meet these needs, aiming at supporting policymakers, business and citizens with enhanced atmospheric environmental information.

Within its first phase (2015 – 2020, Cop1), the Service consolidated many years of preparatory research and development to deliver a range of operational services. In its second phase (2021 – 2028, Cop2), these services are further consolidated, improved and expanded to address all the existing and emerging societal needs related to the atmospheric environment. The CAMS service portfolio consists of the following service elements:

- a) Daily production of real-time analyses and forecasts of global atmospheric composition;
- b) Reanalyses providing consistent multi-annual global datasets of atmospheric composition with a stable model/assimilation system;
- c) Daily production of real-time European air quality analyses and forecasts with a multi-model ensemble system;
- d) Reanalyses providing consistent annual datasets of European air quality with a frozen model/assimilation system, supporting in particular policy applications;
- e) Products to support policy users, adding value to "raw" data products in order to deliver information products in a form adapted to policy applications and policy-relevant work;
- f) Solar and UV radiation products supporting the planning, monitoring, and efficiency improvements of solar energy production and providing quantitative information on UV irradiance for downstream applications related to health and ecosystems;
- g) Greenhouse gas atmospheric inversions for CO₂, CH₄ and N₂O net surface fluxes, allowing the monitoring of the evolution in space and time of these fluxes;

- h) Climate forcing from aerosols and long-lived (CO₂, CH₄) and shorter-lived (stratospheric and tropospheric ozone) agents;
- i) Anthropogenic and natural emissions, based on inventory data and modelling, for the global and European domains;
- j) Observation-based emission estimates of atmospheric pollutants for the global and European domains;
- k) Observation-based anthropogenic emission estimates of CO₂ and CH₄ for the global domain and emission hotspots.

This Invitation to Tender (ITT) is mainly targeting the CAMS service element described under item g), i), j), and k) above.

2 Contract Summary

This ITT, entitled “EQC of emission and surface fluxes products: prototype EQC activities for global products”, is for the development of an EQC framework that targets the existing and emerging CAMS services related to the monitoring of global emissions and natural fluxes. The successful Tenderer shall identify and assess the various options that could be used for the routine EQC as part of an operational service provision. The EQC framework shall take lessons learned from existing EQC activities within CAMS and take recommendations from the CoCO₂ project and the European Commission’s CO₂ Monitoring Task Force into account. The successful Tenderer shall also evaluate the maturity and fitness-for-purpose of a subset of the proposed EQC methodologies.

3 Technical Specification

3.1 General Requirements

Introduction

CAMS is implementing a significantly expanded service portfolio with the focus on using Earth Observation data to monitor emissions of greenhouse gases and some of the main air pollutants. The concept for this emissions Monitoring and Verification Support (CO₂MVS) capacity as part of the CAMS portfolio is based on the recommendations from the European Commission’s CO₂ Monitoring Task Force¹. As shown in Figure 1, it comprises an integrated system approach capable of inferring emissions from observations (space and in-situ), prior information (such as bottom-up emission estimates from inventories and reporting) and modelling as well as data assimilation capabilities.

¹ The reports from the CO₂ Monitoring Task Force can be found on <https://www.copernicus.eu/en/news/news/new-co2-green-report-2019-published>

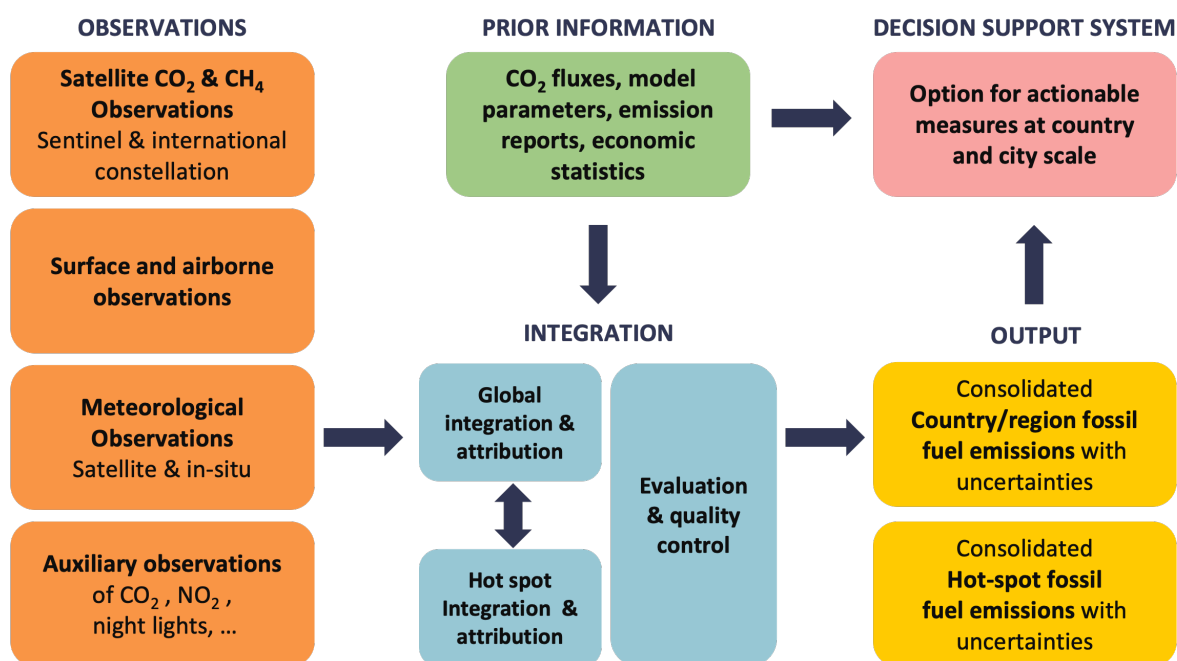


Figure 1 Main building blocks of the functional architecture of a future CO₂ and CH₄ human emissions monitoring system

During phase 2 of CAMS (2021 – 2028) the implementation of the CO2MVS is focused on:

- Transforming the various related research activities into a mature pre-operational (and then operational) systems that can deliver the required monitoring and verification support capacity.
- Supporting the European Commission and EU member states with the global stocktake in 2028 using Earth Observation data and state-of-the-art modelling capabilities in order to provide accurate and globally consistent estimates of emissions, their uncertainties and their reductions.
- Supporting the European Commission and EU member states with the implementation of the EU Methane Strategy as well as the Global Methane Pledge through a capability for detecting and monitoring global super-emitters.
- Contributing to international coordination frameworks related to the monitoring of greenhouse gas concentrations and fluxes, such as the Global Greenhouse Gas Watch (G3W) of the World Meteorological Organisation (WMO) and the International Methane Emissions Observatory (IMEO) of the United Nations Environment Programme (UNEP).

As recommended in the second CO₂ report from the CO₂ Monitoring Task Force, the future CO2MVS capacity will deliver the following high-level products as defined by user requirements:

1. Detection of emitting hot spots such as megacities or power plants,
2. Monitoring of the hot spot emissions to assess emission reductions of the activities,
3. Assessing emission changes against local reduction targets to monitor impacts of the Nationally Determined Contributions (NDCs),
4. Assessing the national emissions and changes in 5-year time steps to estimate the global stocktake.

While the CO2MVS was initially conceived to support the GHG monitoring and reporting activities with respect to the EU's commitment to the Paris agreement, CAMS is also extending these capacities to the monitoring of air pollutant emissions, such as nitrogen dioxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO₂), NMVOCs, and aerosols. EU air quality regulation defines national emissions reduction objectives (Directive 2016/2284/EU) for 5 air pollutants (SO_x, NO_x, PM_{2.5}, NMVOC and NH₃)

to be met by 2030. Annual emissions are reported by the Member states following a formal regulatory process, and the European Commission is interested in independent evaluation systems based on Earth Observations. The activities will also support the implementation of the E-PRTR² reporting regulation which target industrial emissions and a defined set of point sources. The new service element is targeted for operational status in 2029 aligned with the launch of the CO₂ Monitoring (CO2M) satellite constellation, but various parts are already implemented using existing satellite observations and other relevant data sets.

Content of this ITT

An important element of the new emission monitoring service portfolio, as is the case for all CAMS services, is the routine evaluation and quality control (EQC) of the provided data. EQC involves the assessment of the closeness of the data to the geophysical reality and of the sources of uncertainty of the data, over the geographic, vertical and temporal domains of relevance. Uncertainty estimates can include, but are not restricted to, estimates of the bias and precision of the data, and identification of the temporal and spatial domains over which those estimates are valid. Reference measurements used in the comparisons are supposed to represent the atmospheric “truth”. A key aspect of any comparison performed for EQC purposes is the careful selection of this “truth”. The challenge for the EQC of the CO2MVS portfolio is that there are very few direct observations of the “truth” for emissions and natural fluxes of greenhouse gases and atmospheric pollutants. This means that even the reference data will often be indirect measurements and innovative methods need to be designed to ensure the EQC of the data products is meaningful. Still, those reference data must be well documented, and procedures must exist and be documented to ensure adequate quality assurance in the long term. EQC of CAMS data products can rely on comparisons with accurate and well-documented independent observations from ground-, aircraft-, balloon- and satellite-based systems but can also include evaluation against other modelling or data assimilation systems.

This ITT asks for the development of a EQC framework that targets the existing and emerging CAMS services related to the monitoring of global emissions. The successful Tenderer shall identify and assess the various options that could be used for the routine EQC as part of an operational service provision. The EQC framework shall take lessons learned from existing EQC activities within CAMS³ and take recommendations from the CoCO2 project⁴ and the European Commission’s CO₂ Monitoring Task Force⁵ into account. The successful Tenderer shall also use relevant outcomes of related research project, such as CATRINE⁶, CAMEO⁷, AVENGERS⁸, EYE-CLIMA⁹, and PARIS¹⁰, into account.

The successful Tenderer shall also evaluate the maturity and fitness-for-purpose of a subset of the proposed EQC methodologies.

The following data sets are already part of the operational CAMS global products portfolio and shall be included in the new EQC framework:

² European Pollutants Release and Transfer Register Regulation (EC/2006/166)

³ <https://atmosphere.copernicus.eu/quality-assurance>

⁴ <https://coco2-project.eu/node/400>

⁵ The CO₂ Monitoring Task Force is currently writing a Report with guidance for the implementation of a EQC framework for the monitoring of greenhouse gas emissions and fluxes. The report is expected to be published in Q3 2026.

⁶ <https://www.catrane-project.eu/>

⁷ <https://www.cameo-project.eu/>

⁸ <https://avengers-project.eu/>

⁹ <https://eyeclima.eu/>

¹⁰ <https://horizoneurope-paris.eu/>

- Global emission inventories¹¹
- European emission inventories
- Global biomass burning emissions based on fire radiative power (GFAS)¹²
- Global inversion-optimised greenhouse gas fluxes and concentrations¹³

Some of these data sets are already undergoing EQC before being published. Information about this can be found through the data set access on the Atmosphere Data Store (ADS). The successful Tenderer shall engage with current service providers to benefit from available expertise, build on these existing EQC methodologies, and ensure they become part of the wider more consistent EQC framework.

In addition, the successful Tenderer shall design EQC activities for the data products that will be implemented in the coming years. Under this ITT, which is focused on global products, these consist of the following:

- Global high-resolution estimates of anthropogenic and natural emissions and sinks of CO₂, CH₄, and NO₂.

ECMWF will provide guidance to the successful Tenderer about these expected datasets including their spatial and temporal resolution, their production schedule, and their role in the CAMS portfolio in terms of addressing user requirements.

The following aspects shall be addressed as part of the design and evaluation of the EQC framework:

- What are reliable science-based methodologies to evaluate current and upcoming products?
- What are the criteria for a good emission product and what are the suitable evaluation methods and indicators to assess these criteria?
- Which independent observations should be used as part of the evaluation framework?
- Which type of observations, including their location, would improve substantially the EQC capabilities?
- Is there scope and added value for the use of products outside the Copernicus landscape to evaluate the CAMS products (e.g., from activities such as the Global Carbon Budget, the OCO-2 Model Intercomparison Project (MIP), or RECCAP)?
- How can evaluation results and uncertainties be communicated to users?
- Are there high-level skill scores that could be used to indicate improved quality of the products over time?
- How can consistency over time of the EQC methodologies be ensured, which is important for an operational service?

To support the acquisition of the in situ observations required for the evaluation of CAMS products, ECMWF has dedicated contracts with several of the existing observations networks. Most relevant for this ITT are the contracts with ICOS¹⁴ and NDACC¹⁵. Within the ICOS contract the focus is on:

- Provision of improved higher frequency radiocarbon analysis and improved estimates for nuclear ¹⁴CO₂ emissions
- Provision of extended global flux data

¹¹ <https://ads.atmosphere.copernicus.eu/datasets/cams-global-emission-inventories?tab=overview>

¹² <https://ads.atmosphere.copernicus.eu/datasets/cams-global-fire-emissions-gfas?tab=overview>

¹³ <https://ads.atmosphere.copernicus.eu/datasets/cams-global-greenhouse-gas-inversion?tab=overview>

¹⁴ <https://www.icos-cp.eu/>

¹⁵ <https://ndacc.larc.nasa.gov/>

- Access to ICOS Fast-Track atmospheric observations

The NDACC contract is focused on the provision of quality-controlled targeted NDACC data more rapidly for the verification and validation activities of the Copernicus Atmosphere Monitoring Service. This includes observations of CH₄ and NO₂.

3.2 Work Package 1 (WP1) – Development of EQC Framework

In this work package, the successful Tenderer shall develop an EQC framework for the CAMS services related to the monitoring of emissions and fluxes. It shall describe in detail the various concepts that can be used to evaluate the CAMS products, the required observational data, and the required alternative flux and emission data sets. Where relevant, the successful Tenderer shall interact with current CAMS service providers to ensure their expertise is included in the development of the EQC framework. The assessment shall include maturity levels of the various EQC methodologies, considerations for operational implementation, and fitness-for-purpose regarding communicating uncertainties to CAMS users.

The Tenderer shall provide in its proposal a clear timeline for the development of the proposed EQC framework within the duration allocated for this contract, including the indicative deliverables listed below.

Indicative list of required deliverables:

- Detailed description of the proposed EQC framework;
- Meetings with ECMWF to discuss the proposed EQC framework;
- Documentation of feedback gathered from relevant CAMS contracts, Horizon Europe projects, and other related activities;
- Final description of the EQC framework.

3.3 Work Package 2 (WP2) – EQC demonstrators

In this work package, the successful Tenderer shall provide demonstrators of the EQC Framework developed in WP1 to illustrate the fitness-for-purpose, maturity, and (pre-)operational implementation. The demonstrators shall include at least each of the current existing CAMS services related to emission and flux monitoring and provide EQC statistics for a representative time period of the data sets.

The successful Tenderer shall also provide detailed recommendations for the operational implementation of the proposed EQC framework.

The Tenderer shall provide in its proposal a clear timeline for the development of the EQC demonstrators within the duration allocated for this contract, including the indicative deliverables listed below.

Indicative list of required deliverables:

- Demonstrators of the proposed EQC framework;
- Recommendations for the implementation of the EQC framework.

3.4 Work Package 0 (WP0) – Management and coordination

This work package includes overall responsibility for day-to-day service management and coordination. The following contract management aspects shall be considered and as needed briefly described in the proposal:

- **Contractual obligations** as described in the ITT Volume V Clause 2.3 and Annex 5 on reporting and planning.
- **Meetings** (classified as tasks and listed in a separate table as part of the proposal):
 - ECMWF and the Successful Tenderer will organise a Kick-Off Meeting online.
 - ECMWF will host monthly teleconference meetings to discuss CAMS service provision, service evolution and other topics. The Prime Investigator appointed by the Successful Tenderer will represent the Successful Tenderer in such meetings.
 - ECMWF and the Successful Tenderer will organise six-monthly Progress Review Meetings (linked to Payment Milestones, unless agreed otherwise) online unless otherwise agreed.
 - ECMWF will organise annual CAMS General Assemblies. The Successful Tenderer is required to attend physically these meetings with maximum 2 team members covering the various topics that are part of this ITT.
 - Tenderers can propose additional project internal meetings (annual face-to-face meeting and monthly teleconferences) as part of their response. Most such meetings should be held by remote participation.
- **Quality assurance and control:** the quality of reports and deliverables shall be equivalent to the standard of peer-reviewed publications. The final quality check of the deliverables should be made by the prime contractor (contents, use of ECMWF reporting templates for deliverables and reports (Microsoft Word), format, deliverable numbering and naming, typing mistakes, etc.); all reports in this project shall be in English. Unless otherwise specified the specific contract Deliverables shall be made available to ECMWF in electronic format.
- **Communication management** (incl. external and internal communication). Any external communication activity must be agreed with the ECMWF Copernicus Communication team in advance. This includes, but not exhaustively, communication planning, branding and visual style, media outreach, website and social media activity, externally facing text and graphical content and events. Agreed activity would also need to be evaluated and reported on once complete so that success measures and KPIs could be provided to the European Commission (cf. ITT Volume V Clause 2.4.6 of the Framework Agreement).
- **Resources planning** and tracking using the appropriate tools.
- **Risk Management:** The proposal shall include a risk register that describes identified risks for each work package, along with a mitigation strategy for each of the identified risks. This mitigation strategy shall be composed by both preventive and corrective measures. The risk register shall be updated regularly by the Successful Tenderer, and any update (related to new risks, likelihood or impact) shall be reported during the progress review meetings, as well as part of the quarterly and annual implementation reports.
- **Sub-contractor management**, including conflict resolution, e.g., the prime contractor is responsible for settling disagreements, although advice/approval from ECMWF may be sought on the subject. A list of sub-contractors describing their contribution and key personnel shall be provided, as well as back-up names for all key positions in the contract. The Tenderer shall describe how the Framework Agreement, in particular ITT Volume V Clause 2.9, has been flowed down to all their sub-contractors.

- **Management of personal data** and how this meets the requirements of Clause 2.8 and Annex 6 of the Framework Agreement (cf. ITT Volume V).
- **List of minimum deliverables and milestones** required as part of WPO, covering the contractual and financial reporting obligations towards ECMWF in line with the Clauses/Terms and Conditions of the Framework Agreement (cf. ITT Volume V Clause 2.3 and Annex 5):

WPO Deliverables			
#	Nature	Title	Due
D0.Y.Z-yyyyQx	Report	Quarterly Implementation Report YYYYQQ <i>YYYYQQ being here the previous quarter (e.g. 2025Q3)</i>	Quarterly on 15/04, 15/07 and 15/10 <i>(only at the above dates since QIR for Q4 will be part of the AIR Part 1)</i>
D0.Y.Z-yyyy	Report / Other	Annual Implementation Report Part 1 for year YYYY <i>including both:</i> • the Quarterly Implementation Report YYYYQ4 and • the requested preliminary financial information for year YYYY <i>YYYY being here the year n-1</i>	Annually on 15/01
D0.Y.Z-yyyy	Report	Annual Implementation Report Part 2 for year YYYY <i>YYYY being here the year n-1</i>	Annually on 28/02
D0.Y.Z	Report	Final Implementation Report	By the end of the Framework Agreement
D0.Y.Z-yyyy	Report	Annual Implementation Plan for year YYYY <i>YYYY being here the year n+1</i>	Annually on 30/09
D0.Y.Z-yyyy	Other	Copy of Prime Contractor's general financial statements and audit report for year YYYY <i>YYYY being here the year n-1</i>	Annually, not later than on 15/12 ⁽¹⁾ (no associated cost)
D0.Y.Z	Presentation/MoM	Kick-Off Meeting	Not later than 30 days after the start of contract
D0.Y.Z	Presentation/MoM	Progress Review Meeting No. xx / Payment Milestone SC1-PMx <i>xx being here the iteration number of the PRM</i>	~ Every 6 months ⁽²⁾
D0.Y.Z	Report	Mission reports (brief) from the travel listed in the Cost and Prices tab in the "Pricing tables"	By end of November 2028 or once per calendar year, depending on the mission schedule

WPO Milestones			
#	Title	Means of verification	Due

M0.Y.Z	CAMS Service Level Board meetings	Attendance	Monthly
M0.Y.Z	CAMS General Assembly YYYY <i>YYYY being here the concerned year</i>	Attendance	Annually, not later than on 15/12 ⁽³⁾

These due dates are indicated to frame the corresponding deliverables and milestones schedule only, consequently the following shall be considered by the Tenderer:

- ⁽¹⁾ the general financial statements shall be sent by the Successful Tenderer as soon as available,
- ⁽²⁾ the schedule of the PRMs shall be aligned with the different Payment Milestones,
- ⁽³⁾ depending on the year, the CAMS GA may take place at a different period of the year.

ECMWF will provide the templates for reports and plans at the beginning of the contract. Reporting documents should be short and factual, following the guidance which will be provided by ECMWF during negotiations with the Successful Tenderer.

⇒ Contract management and coordination is expected to amount to approx. 7% of the planned use of the resources.

4 General Requirements

4.1 Implementation schedule and allocation of resources

ECMWF intends to award a single Framework Agreement, which shall be implemented via a single Service Contract expected to commence on 1 January 2027 and finish on 31 December 2028.

4.2 Deliverables and milestones

The Tenderer shall provide the list of deliverables and milestones (cf. ITT Volume IIIA “Pricing and deliverables”, Excel spreadsheet “Deliverables List”) for each WP. All deliverables and milestones must be consistent with the activities and objectives described in section 3 of this ITT Volume II:

- A deliverable is a substantial, tangible or intangible good or service produced as a result of a project (see also the deliverable definition in this ITT Volume V Clause 1.2 and Clause 3.2). In other words, a deliverable is a verifiable outcome produced in response to the specific objectives of the contract and is subject to approval by both ECMWF’s TO and CMO before being considered as contractually approved. All document deliverables shall be periodically updated and versioned as described in section 2.
- Milestones should be designed as markers of demonstrable progress in service development and/or quality of service delivery during the contract implementation (see also the milestone definition in this ITT Volume V Clause 1.2). They should not duplicate deliverables.

The following shall apply to the deliverables and milestones:

- The deliverables and milestones should be consistent with and meet the technical requirements specified in section 2 of this ITT Volume II;
- All contract deliverables shall be produced in English;
- The quality of reports shall be equivalent to the standard of peer-reviewed publications and practice;
- Unless otherwise specified in the contract, or requested by ECMWF during the contract implementation the final version of each deliverable shall be made available to ECMWF without any comments and tracked changes in electronic format (Microsoft Word/Microsoft Excel/HTML or compatible, PDF in case of signed version, while all other formats – if any – must be agreed during the contract negotiation) via the Copernicus Deliverables Repository portal – OpenText Core (OTC).

The Successful Tenderer shall make the output of their work available on a server accessible by ECMWF using standard protocols such as FTP or HTTPS. **The Successful Tenderer will have to agree with ECMWF on the data formats to be used.** ECMWF will only accept data in formats that follow internationally recognised standards. Such standards must be open (i.e. non-proprietary), managed by a recognised international standardisation body (e.g. ISO, WMO, OGC, etc.), or any de-facto standard. Open-source software should also exist that can read and write files of these standards. Serialisation formats (e.g. NetCDF) should be supported by standard schemas and conventions.

The following shall apply in ITT Volume IIIA “Pricing and deliverables” (cf. Excel spreadsheet “Deliverables List”):

- Deliverables and milestones shall respectively follow the referencing system used in section 2 of this ITT Volume II. Additional deliverables and milestones, if any, shall follow the same referencing system.

- Each deliverable shall have an associated resource allocation and price (cf. column I “Nb of PM allocated” and column J “Estimated price”), while the only resource type to be considered is “payroll” (the total of these allocated resources and prices shall therefore amount to the total price associated with payroll in Volume IIIA spreadsheet “Costs and Prices”).
- Milestones shall not attract the budget under Volume IIIA in the Excel spreadsheet “Deliverables list”.

The Tenderer shall provide a due date for each proposed deliverable and milestone (in accordance with those indicated in section 3 for each WP). The Tenderer shall ensure that the proposed due dates of deliverables and milestones are realistic and achievable.

⇒ Please note that any dependency on input data, whose origin must be specified, shall be detailed by the Tenderer, and also accounted for in the risk register (cf. ITT Volume IIIB Section 5.6).

4.3 Acquisition of necessary data and observations

The Successful Tenderer is responsible for acquiring all the needed observational data sets but shall closely interact with ECMWF for the exchange of relevant data sets related to this ITT. ECMWF has agreements in place with relevant in situ and satellite data providers.

4.4 Communication

The Successful Tenderer shall support ECMWF in its communication activities with regards to CAMS where they are related to the activities described in this ITT. Examples are contributions to the CAMS web site news items and CAMS brochures and flyers.

All communication activity must be agreed with the ECMWF Copernicus Communication team in advance. This includes, but not exhaustively, communication planning, branding and visual style, media outreach, website and social media activity, externally facing written and graphic content and events. Agreed activity would also need to be evaluated and reported on, once complete, so that success measures and KPIs can be provided to the European Commission.

4.5 Data and IPR

It is a condition of EU funding for CAMS that ownership of any datasets developed with CAMS funding passes from the suppliers to the European Union via ECMWF. Ownership will pass from the date of creation of the datasets. Suppliers will be granted a non-exclusive licence to use the datasets which they have provided to CAMS for any purpose.

All software and products used by the successful Tenderer to produce the CAMS datasets will remain the property of the successful Tenderer, except for those components which are acquired or created specifically for CAMS purposes, with CAMS funding, and which are separable and useable in isolation from the rest of the Successful Tenderer’s production system. The identity and ownership of such exceptional components will be passed to the European Union via ECMWF annually. The Successful Tenderer will be granted a non-exclusive licence to use them for any purpose.

4.6 Key performance indicators

The Successful Tenderer shall report to ECMWF on a set of Key Performance Indicators (KPIs) suitable for monitoring various aspect of service performance.

The table below provide the minimum set of KPIs to be used by the Tenderer in its Tender.

Therefore, the Tenderer may propose additional KPIs suitable for the activities subject of this ITT but shall limit them to the sole KPIs whose reporting and analysis may help to optimize the performance of the contract in case of deviation per comparison with the performance targets.

KPI#	KPI Title	Performance Target and Unit of Measure	Frequency of Delivery	Explanations/ Comments
KPI_1	Number of relevant Horizon and ESA projects that were consulted		Annually	
KPI_2	Number of related CAMS contracts that were consulted		Annually	
KPI_3				
...				

All KPIs shall be labelled and numbered as indicated in the table above. All KPIs shall be periodically updated as described in the tables. Tenderers shall provide preliminary versions of the completed tables as part of their bid.

4.7 Travel Costs

The travel costs shall be presented in accordance with the following provisions:

Travel costs should, in principle, be based on the [European Commission's calculator](#) [Table 3: Unit cost per distance band for air or combined air/rail travel, Commission Decision C(2024)5405], and consider a daily subsistence allowance not to exceed €300.

Travel costs must reflect **estimated actual costs and must not include any profit margin**.

If the proposed travel costs deviate from these reference values, the deviation shall be clearly indicated and duly justified.

The Tenderers are requested to provide a summary table as shown below as part of their bid.

Type of cost	Route/Destination	Estimated number of missions	Estimated unit price [€]
Travel/Subsistence			
Travel/Subsistence			

Travel Costs summary

ECMWF will reserve the right to re-claim any declared unspent or unaccounted budget for “Travel”, as it will be described in the Annex 2 Pricing Tables of the Framework Agreement.

4.8 Payment Plan

The Tenderer can propose a draft Payment Plan in ITT Volume IIIA “Pricing and deliverables” (cf. Excel spreadsheet “Payment Plan preparation”):

- The Payment Milestones should relate to the deliverables and milestones delivered during the corresponding Payment Milestone period (e.g. the payment covering the period January-June

would only relate to the deliverables and milestones whose due dates are part of the same period).

- Given the total duration of the contract, it is recommended to abide by a circa 6-month frequency between each Payment Milestone and associated payment. Any other plan can be submitted by the Tenderer but shall be duly substantiated.
- In case of request for a payment at contract signature, please note that this should be duly substantiated by the Tenderer (e.g. in terms of necessary investment that would be necessary prior to or during first weeks/months of implementation for ensuring the initial set up of the project). It is necessary to relate this payment to activities subject to other Payment Milestones.
- The frequency of Progress Review Meetings might be adapted to synchronise with the anticipated date of completion of each Payment Milestone (i.e. with one PRM ca. 15 days before each PM anticipated date of completion).

5 Tender Format and Content

General guidelines for the tender are described in Volume IIIB. Specific requirements to prepare the proposal for this particular tender are described in the next sub-sections.

5.1 Page Limits

As a guideline, it is expected that individual sections of the Tenderer's response do not exceed the page limits listed below. These are advisory limits and should be followed wherever possible, to avoid excessive or wordy responses.

Section	Page Limit
<i>Executive Summary</i>	2
<i>Track Record</i>	2 (for general) and 2 (per entity)
<i>Quality of Resources to be Deployed</i>	2 (excluding Table 1 in Volume IIIB and CVs with a maximum length of 2 pages each)
<i>Technical Solution Proposed</i>	2 + 3 per Work package (Table 2 in Volume IIIB, the section on references, publications, patents and any pre-existing IPR is excluded from the page limit and has no page limit)
<i>Management and Implementation</i>	6 (excluding Table 3, Table 5, Table 6 and Table 7 in Volume IIIB) + 2 per each Work Package description (Table 4 in Volume IIIB)
<i>Pricing Table</i>	No limitation

Table 1: Page limits

5.2 Specific additional instructions for the Tenderer's response

The following is a guide to the minimum content expected to be included in each section of Volume IIIB (technical proposal), additional to the content described in the general guidelines of the said Volume IIIB. This is not an exhaustive description, and additional information may be necessary depending on the Tenderer's response.

5.2.1 Executive Summary

The Tenderer shall provide an executive summary of the proposal, describing the objectives, team and service level.

5.2.2 Track Record

The Tenderer shall demonstrate for itself and for any proposed sub-contractor that they have experience with relevant projects in the public or private sector at national or international level. ECMWF may ask for evidence of performance in the form of certificates issued or countersigned by the competent authority.

5.2.3 Quality of Resources to be Deployed

The Tenderer shall propose a team that meets at least the following requirements:

- A senior team member (Prime Investigator) with more than 5 years of experience in managing activities related to this ITT;
- At least one additional senior team members with more than 5 years of experience on performing activities related to the various aspects of this ITT.

- The Successful Tenderer shall appoint a Service Manager, which will be its primary contact for contractual delivery and performance aspects.

These team members shall be involved in the activities of this ITT at a minimum level of 10% of their total working time.

5.2.4 Technical Solution Proposed

The Tenderer is expected to provide a short background to the proposed technical solution to demonstrate understanding of the solution proposed. This should include background of the Tenderer's understanding of the Copernicus Atmosphere Monitoring Service, the global earth observing system, and the current state of monitoring greenhouse gas emissions.

An exhaustive and detailed description of the proposed technical solution for all work packages described above shall be given. The Tenderer shall describe the proposed approach for producing the EQC Framework for CAMS global emission and flux data sets including the selection of prototype examples. The Tenderer shall also describe in detail their background and expertise related to EQC activities and the use of observations in the domain.