ECMWF Copernicus Procurement

Invitation to Tender

Copernicus Atmosphere Monitoring Service

Development and provision of hot-spot emissions of methane (CH_4) from Copernicus Contributing Missions

Volume II: Specification of Requirements

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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 but often uncertain drivers of climate change. 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 effectiveness of 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 CO_2, CH_4 and N_2O net surface fluxes, allowing the monitoring of the evolution in space and time of these fluxes;

h) Climate forcing from aerosols and long-lived (CO_2, CH_4) 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 CO_2 and CH_4 for the global domain and emission hotspots.

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

2 Contract Summary

This ITT, entitled "Development and provision of hot-spot emissions of CH_4 from Copernicus Contributing Missions", is for providing quantitative estimates of methane emissions from large point sources around the world based on satellite data from the Copernicus Contributing Missions (CCM) programme. The Successful Tenderer shall use the observations of methane abundances in the atmosphere provided by the CCM satellite missions to derive emission estimates for the targeted local emission sources. The CCM programme is still being ramped up for atmospheric composition observations, which means that this ITT is meant to be exploratory to assess the added value of the CCM missions with regards to CAMS. This ITT therefore asks for an agile approach with **optional** activities that will be triggered by ECMWF, once sufficiently mature data from each of the satellites becomes available for use in this contract. The Successful Tenderer shall also support ECMWF with the production of web-based graphics to communicate the information to a range of user stakeholders, including the European Commission, EU member states, and Copernicus contributing countries.

3 Technical Specification

3.1 General Requirements

The concept for an anthropogenic CO_2 and CH_4 emissions Monitoring and Verification Support (CO2MVS) capacity as part of the CAMS portfolio is based on the recommendations from the European Commission's CO_2 Monitoring Task Force[1]. 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 CO_2 Monitoring Task Force can be found on https://www.copernicus.eu/en/news/news/new-co2-green-report-2019-published

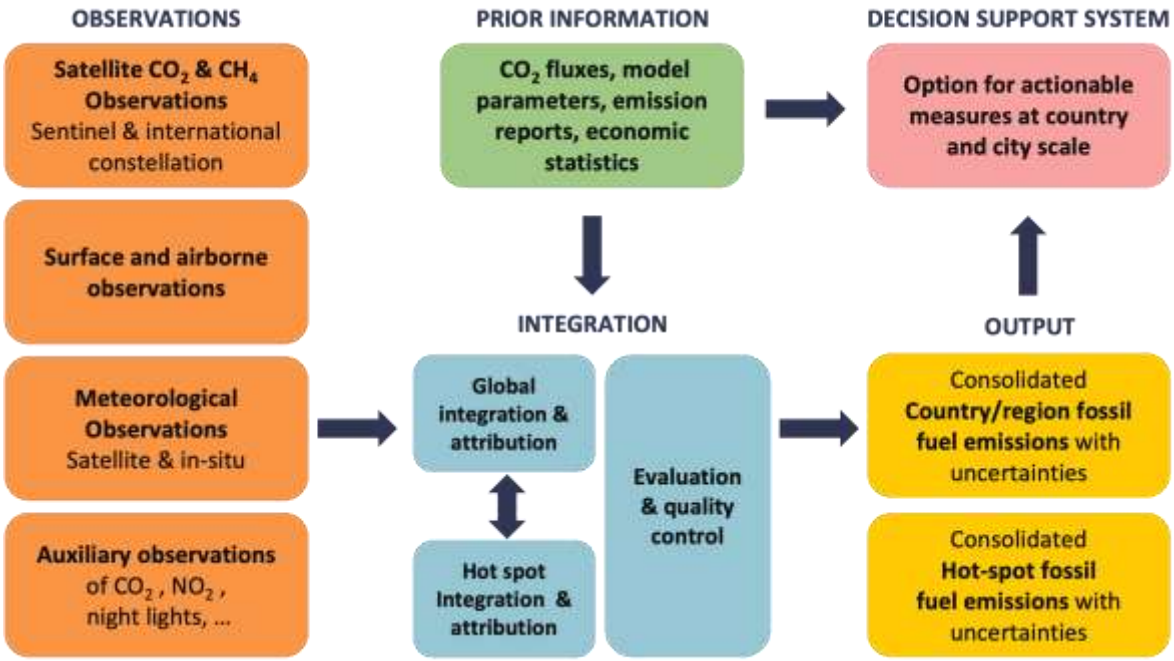

Figure 1 *Main building blocks of the functional architecture of a future CO_2 and CH_4 human emissions monitoring system*

The top four priorities for the new CO_2 and CH_4 service element during phase 2 of CAMS (2021 – 2028) are:

- Transform the various related research activities into a mature pre-operational (and then operational) system that can deliver the required monitoring and verification support capacity.
- Support 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.
- Support 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.
- Contribute 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 CO_2 report from the CO_2 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.

The CO2MVS services shall, in the long term and in some well-identified instances and situations, provide additional evidence on the amount of anthropogenic CO_2 and CH_4 emissions reported by national statistical offices and, in particular, help to identify and assess the uncertainties and gaps associated with their emission inventories. More generally, the CO2MVS will provide the European

Union with a comprehensive and consistent picture on the actual level of emissions and their reductions by all countries worldwide. The new service element is targeted for operational status in 2026 in order to provide support to the 2028 Global Stocktake based on observations from the proposed CO_2 Monitoring (CO2M) satellite constellation and other satellite sensors.

3.1.1 The Copernicus Contributing Missions programme

With the evolution of the Copernicus Services' needs, the European Space Agency (ESA) and the European Commission (EC) have agreed to revise the Copernicus Contributing Missions (CCM) activity[2] in the current Multiannual Financial Framework (MFF 2021-2027) as follows:

- The commercial data procurement will be ensured through a Dynamic Purchasing System for CCM, for faster involvement of new operators into the data offer. Three categories of Earth Observation (EO) data suppliers are involved:
    - Category 1: European Earth Observation Emerging Data Suppliers, i.e., European missions under development or in their initial operations phase. The agreements with these European New Space companies aim at verifying the capability to deliver EO data subject to Copernicus high quality standards in terms of data quality and delivery performance through a set of pilot activities.
    - Category 2: European Earth Observation Established Data Suppliers. Commercial contracts with these companies, including a multi-year subscription scheme, to satisfy the majority of the on-demand EO data needs from the Copernicus Users.
    - Category 3: Earth Observation Data Suppliers for miscellaneous data needs. Where complementary EO data is required to fulfil the Copernicus Users' operational needs, additional agreements will be placed with companies offering non-European missions, to complement the Category 2 (and Category 1) data offer.
- A new 24/7 Coordination Service (CCM Rapid Response Desk service) relying on a state-of-the-art infrastructure, interfaces and support functions coordinates the on-demand data provision from CCM Entities (data suppliers) to Copernicus Users.
- The aspects related to CCM data quality will be incorporated into the four existing Sentinel Mission Performance Clusters (MPC), according to the type of CCM data (e.g., CCM CH_4 data will be incorporated into the Sentinel-5p MPC).

As part of the ramp-up activities for the CAMS CO2MVS capacity, ECMWF is exploring the use of observations of atmospheric CH_4 from satellite sensors that are part of the CCM programme. These instruments are or will be able to zoom in on specific locations that are identified by ECMWF. The existing CAMS routine monitoring of methane hotspots[3] based on Sentinel-5p/TROPOMI data will support this identification. The activities subject of this ITT will use the observations of methane abundances in the atmosphere provided by the CCM satellite missions described below to derive emission estimates for the targeted local emission sources.

The CCM programme is still being ramped up for atmospheric composition observations, which means that this ITT is meant to be exploratory to assess the added value of the CCM missions with regards to CAMS. One of the foreseen three missions, GHGSat[4], is already in orbit with multiple satellites as a Category 3 mission, but the other two, GESat[5] (Absolute Sensing) and GEI-SAT[6] (Satlantis), are still in their commissioning phase as Category 1 missions. This ITT therefore asks for a flexible approach with

[2] https://dataspace.copernicus.eu/explore-data/data-collections/copernicus-contributing-missions
[3] https://atmosphere.copernicus.eu/cams-methane-hotspot-explorer
[4] https://www.ghgsat.com/en/
[5] https://absolut-sensing.com/
[6] https://www.satlantis.com/aplications/methane/

optional activities and work packages that will be triggered by ECMWF, once sufficiently mature data from each of the satellites becomes available for use in this contract.

The costing of activities shall be based on a cost per emission estimate for both single source and complex source scenes in combination with the indicated number of observations per year for each satellite mission. More details can be found in Section 4.1.

3.2 Work Package 1 (WP1) – Emission estimation based on GHGSat observations

In this work package, the Successful Tenderer shall provide source rate estimates (including uncertainties) of observed atmospheric methane plumes from hotspots based on GHGSat observations, which are part of CCM Category 3.

Observations of atmospheric CH_4 concentrations will be provided through an agreement between ESA and ECMWF to assess the added value of GHGSat observations for the monitoring of CH_4 hotspots as part of CAMS. The work shall focus on more detailed estimates of local CH_4 emissions zooming-in over detected hotspots that are identified with Sentinel-5p (Tip & Cue) or based on known sources. The Use Case shall generate sufficient statistics and experience with different scenes, seasons, and parts of the world. Annually, the Successful Tenderer and ECMWF shall define a plan for the selection of scenes. For the first period this will include observations in the past that were already selected by ECMWF or provided by GHGSat. As part of their CCM contract with ESA, GHGSat will provide data to ECMWF and its relevant contractors with the following characteristics:

> **Product type**: Abundance distribution of atmospheric methane from single satellite observations (ppb or mol/m2), and per-pixel measurement error expressed as a standard deviation.
>
> **Expected data volume (in terms of number of needed scenes)**: This number shall vary as a function of source type and acquisition. GHGSat will support as primary goal single observations over single sources. The expected number of abundance acquisitions is up to 667 over single sources per year. Some of these can be replaced by observations over complex sources, where a complex source acquisition is defined as a location with more than 4 plumes acquired. One complex source acquisition replaces 4 single source acquisitions. The specification of a single source versus a complex source will be made in the data ordering process, where a single source is specified by a longitude and latitude, while a complex source is defined by an Area of Interest.
>
> **Image size**: The image size is on the order of 12 x 12 km2. The final image size is a trade-off between the horizontal resolution and the signal-to-noise of the individual pixel observations.
>
> **Horizontal resolution (GSD)**: the horizontal resolution within the image size will be approximately 30 m.
>
> **Latency from request (order submission or automatic tasking) to image availability on pick-up point**: < 1 day.

The Successful Tenderer shall use the provided satellite data to derive emission estimates. The provision of the required source rate estimates shall be based on a methodology using the latest scientific developments, ideally already documented in the peer-reviewed literature. For full transparency of CAMS services, the emission estimation methodology will need to be publicly documented as part of this contract in support of CAMS users. The Tenderer shall demonstrate their capabilities and performance over a range of point sources, including oil and gas production and transportation facilities, coal mining, and waste facilities.

The Tenderer shall describe the proposed methodology and indicate the feasible timeliness (latency) of the provided data (as close to the acquisition time of the GHGSat observations within the

constraints of providing accurate estimates). The Successful Tenderer shall use the Use Case as part of this Work Package to report on the threshold level above which emissions can be detected at the time scales proposed.

Finally, the Tenderer shall describe in detail how the data will be provided to ECMWF in terms of data format, metadata, and dissemination mechanism. This includes support to ECMWF for the potential visualisation of these data on the CAMS website.

While ESA has already confirmed the availability of GHGSat data for 2025 and 2026, this is not yet the case for 2027. If data will become available for 2027, ECMWF will trigger this optional deliverable four months before the starting date of the period. For the first period, GHGSat observations between 1 April and the start of this contract shall be taken into account as well.

Tenderers shall complete the relevant table in Volume IIIA as part of their bid, which shall include the deliverables and milestones for this work package already indicated in the tables below. Volume IIIA will be used by the Tenderer to describe the complete list of deliverables, milestones and schedules for each work package. All milestones and deliverables shall be numbered as indicated. All document deliverables shall be periodically updated and versioned as described in the tables.

WP1 Deliverables			
#	*Type*	*Title*	*Due*
D1.1.1-Q1	Data/Report	Provision of emission estimates of local methane sources from GHGSat abundance observations between 1 April 2025 and 31 October 2025 – Quarter 1	Report on 15/11/2025; Data within week after observation
D1.1.2-Q1	Data/Report	Provision of emission estimates of local methane sources from GHGSat abundance observations between 1 November 2025 and 31 October 2026 – Quarter 1	Report on 15/02/2026; Data within week after observation
D1.1.2-Q2	Data/Report	Provision of emission estimates of local methane sources from GHGSat abundance observations between 1 November 2025 and 31 October 2026 – Quarter 2	Report on 15/05/2026; Data within week after observation
D1.1.2-Q3	Data/Report	Provision of emission estimates of local methane sources from GHGSat abundance observations between 1 November 2025 and 31 October 2026 – Quarter 3	Report on 15/08/2026; Data within week after observation
D1.1.2-Q4	Data/Report	Provision of emission estimates of local methane sources from GHGSat abundance observations between 1 November 2025 and 31 October 2026 – Quarter 4	Report on 15/11/2026; Data within week after observation
D1.1.3-Q1	Data/Report	Provision of emission estimates of local methane sources from GHGSat abundance observations between 1 November 2026 and 31 October 2027 – Quarter 1	Report on 15/02/2027; Data within week after observation - **Optional deliverable**
D1.1.3-Q2	Data/Report	Provision of emission estimates of local methane sources from GHGSat abundance observations between 1 November 2026 and 31 October 2027 – Quarter 2	Report on 15/05/2027; Data within week after observation -

			Optional deliverable
D1.1.3-Q3	Data/Report	Provision of emission estimates of local methane sources from GHGSat abundance observations between 1 November 2026 and 31 October 2027 – Quarter 3	Report on 15/08/2027; Data within week after observation - **Optional deliverable**
D1.1.3-Q4	Data/Report	Provision of emission estimates of local methane sources from GHGSat abundance observations between 1 November 2026 and 31 October 2027 – Quarter 4	Report on 15/11/2027; Data within week after observation - **Optional deliverable**
D1.Y.Z-yyyyQx[7]	…	…	…

WP1 Milestones			
#	*Title*	*Means of verification*	*Due*
M1.1.1	Meeting with ECMWF to define the selection of GHGSat hotspots until 31 October 2025	Presentation and Minutes of Meeting	15/09/2025
M1.1.2	Meeting with ECMWF to define the selection of GHGSat hotspots between 1 November 2025 and 31 October 2026	Presentation and Minutes of Meeting	31/10/2025
M1.1.3	Meeting with ECMWF to define the selection of GHGSat hotspots between 1 November 2026 and 31 October 2027	Presentation and Minutes of Meeting	31/10/2026 - **Optional milestone**
M1.1.4	ECMWF's decision concerning the activation of the WP1 optional deliverables and milestone	Note	30/06/2026
M1.2.1	Meeting with ECMWF to agree on implementation of web-based graphics on CAMS website	Presentation and Minutes of Meeting	30/09/2025
M1.Y.Z	…	…	…

3.3 Work Package 2 (WP2) – Emission estimation based on GEISAT observations

In this work package, the Successful Tenderer shall provide source rate estimates (including uncertainties) of observed atmospheric methane plumes from hotspots based on GEISAT observations provided by SATLANTIS[8]. GEISAT is currently a Category 1 Mission.

[7] Deliverables (and Milestones) shall be numbered as per the following format DX.Y.Z (MX.Y.Z), where X is the WP number, Y is the task number and Z is the Deliverable (Milestone) number in this task. Deliverables delivered annually should be numbered DX.Y.Z-yyyy, where yyyy is the year the Deliverable refers to (e.g. DX.Y.Z-2016, DX.Y.Z-2017). Deliverables delivered quarterly should be numbered DX.Y.Z-yyyyQx, where yyyyQx is the quarter of the year the Deliverable refers to (e.g. DX.Y.Z-2016Q1, DX.Y.Z-2016Q2). The same numbering format shall be applied for Milestones. Continuous deliverables at higher frequency can be labelled in the same way as quarterly deliverables.

[8] https://www.satlantis.com/about-us/

Observations of atmospheric CH_4 concentrations will be provided through an agreement between ESA and ECMWF to assess the added value of GEISAT observations for the monitoring of CH_4 hotspots as part of CAMS. The work shall focus on more detailed estimates of local CH_4 emissions zooming-in over detected hotspots that are identified with Sentinel-5p (Tip & Cue) or based on known sources. The Use Case shall generate sufficient statistics and experience with different scenes, seasons, and parts of the world. Annually, the Successful Tenderer and ECMWF shall define a plan for the selection of scenes. For the first period this might include observations in the past that were already selected by ECMWF or provided by GEISAT. As part of their CCM contract with ESA, SATLANTIS will provide data to ECMWF and its relevant contractors with the following characteristics:

> **Product type**: Abundance distribution of atmospheric methane from single satellite observations (ppb or mol/m2), and per-pixel measurement error expressed as a standard deviation.
>
> **Expected data volume (in terms of number of needed scenes)**: This number shall vary as function of source type and acquisition. GEISAT will support as primary goal single observations over single sources. The minimum expected number of abundance acquisitions is still under negotiation but will be on the order of 100 per year.
>
> **Image size**: The image size is on the order of 8 x 13 km2. The final image size is a trade-off between the horizontal resolution and the signal-to-noise of the individual pixel observations.
>
> **Horizontal resolution (GSD)**: the horizontal resolution within the image size will be in the range of 13 m.
>
> **Latency from request (order submission or automatic tasking) to image availability on pick-up point**: TBC by SATLANTIS.

The Successful Tenderer shall use the provided satellite data to derive emission estimates. The provision of the required source rate estimates shall be based on a methodology using the latest scientific developments, ideally already documented in the peer-reviewed literature. For full transparency of CAMS, the emission estimation methodology will need to be publicly documented as part of this contract in support of CAMS users. The Tenderer shall demonstrate their capabilities and performance over a range of point sources, including oil and gas production and transportation facilities, coal mining, and waste facilities.

The Tenderer shall describe the proposed methodology and indicate the feasible timeliness (latency) of the provided data (as close to the acquisition time of the GEISAT observations within the constraints of providing accurate estimates). The Successful Tenderer shall use the Use Case as part of this Work Package to report on the threshold level above which emissions can be detected at the time scales proposed.

Finally, the Tenderer shall describe in detail how the data will be provided to ECMWF in terms of data format, metadata, and dissemination mechanism. This includes support to ECMWF for the visualisation of these data on the CAMS website.

ESA has not yet confirmed the availability of GEISAT data for 2025, 2026, or 2027, as evaluation of the data from the first satellite is still on-going. If data will become available for any of these years, ECMWF will trigger the optional deliverables and milestones during the negotiation phase for this contract or four months before the starting date of the concerned period.

Tenderers shall complete the relevant table in Volume IIIA as part of their bid, which shall include the deliverables and milestones for this work package already indicated in the tables below. Volume IIIA will be used by the Tenderer to describe the complete list of deliverables, milestones and schedules for each work package. All milestones and deliverables shall be numbered as indicated. All document deliverables shall be periodically updated and versioned as described in the tables.

WP2 Deliverables			
#	*Type*	*Title*	*Due*
D2.1.1-Q1	Data/Report	Provision of emission estimates of local methane sources from GEISAT abundance observations between 1 September 2025 and 31 December 2025 – Quarter 1	Report on 15/01/2026; Data within week after observation - **Optional deliverable**
D2.1.2-Q1	Data/Report	Provision of emission estimates of local methane sources from GEISAT abundance observations between 1 January 2026 and 31 December 2026 – Quarter 1	Report on 15/04/2026; Data within week after observation - **Optional deliverable**
D2.1.2-Q2	Data/Report	Provision of emission estimates of local methane sources from GEISAT abundance observations between 1 January 2026 and 31 December 2026 – Quarter 2	Report on 15/07/2026; Data within week after observation - **Optional deliverable**
D2.1.2-Q3	Data/Report	Provision of emission estimates of local methane sources from GEISAT abundance observations between 1 January 2026 and 31 December 2026 – Quarter 3	Report on 15/10/2026; Data within week after observation - **Optional deliverable**
D2.1.2-Q4	Data/Report	Provision of emission estimates of local methane sources from GEISAT abundance observations between 1 January 2026 and 31 December 2026 – Quarter 4	Report on 15/01/2027; Data within week after observation - **Optional deliverable**
D2.1.3-Q1	Data/Report	Provision of emission estimates of local methane sources from GEISAT abundance observations between 1 January 2027 and 31 December 2027 – Quarter 1	Report on 15/04/2027; Data within week after observation - **Optional deliverable**
D2.1.3-Q2	Data/Report	Provision of emission estimates of local methane sources from GEISAT abundance observations between 1 January 2027 and 31 December 2027 – Quarter 2	Report on 15/07/2027; Data within week after observation - **Optional deliverable**
D2.1.3-Q3	Data/Report	Provision of emission estimates of local methane sources from GEISAT abundance observations between 1 January 2027 and 31 December 2027 – Quarter 3	Report on 15/10/2027; Data within week after observation - **Optional deliverable**
D2.1.3-Q4	Data/Report	Provision of emission estimates of local methane sources from GEISAT abundance observations between 1 January 2027 and 31 December 2027 – Quarter 4	Report on 15/01/2028; Data within week after observation - **Optional deliverable**

D2.Y.Z-yyyyQx	…	…	…

WP2 Milestones			
#	*Title*	*Means of verification*	*Due*
M2.1.1	Meeting with ECMWF to define the selection of GEISAT hotspots until 31 December 2025	Presentation and Minutes of Meeting	15/09/2025 - **Optional milestone**
M2.1.2	Meeting with ECMWF to define the selection of GEISAT hotspots between 1 January 2026 and 31 December 2026	Presentation and Minutes of Meeting	15/12/2025 - **Optional milestone**
M2.1.3	Meeting with ECMWF to define the selection of GEISAT hotspots between 1 January 2027 and 31 December 2027	Presentation and Minutes of Meeting	15/12/2026 - **Optional milestone**
M2.1.4	ECMWF's decision concerning the activation of the WP2 optional deliverables and milestone for 2025	Note	At contract signature
M2.1.5	ECMWF's decision concerning the activation of the WP2 optional deliverables and milestone for 2026	Note	31/10/2025
M2.1.6	ECMWF's decision concerning the activation of the WP2 optional deliverables and milestone for 2027	Note	31/10/2026
M2.Y.Z	…	…	…

3.4 Work Package 3 (WP3) – Emission estimation based on GESat observations

In this work package, the Successful Tenderer shall provide source rate estimates (including uncertainties) of observed atmospheric methane plumes from hotspots based on GESat observations provided by Absolute Sensing[9]. GESat is currently a Category 1 mission.

Observations of atmospheric CH_4 concentrations will be provided through an agreement between ESA and ECMWF to assess the added value of GESat observations for the monitoring of CH_4 hotspots as part of CAMS. The work shall focus on more detailed estimates of local CH_4 emissions zooming-in over detected hotspots that are identified with Sentinel-5p (Tip & Cue) or based on known sources. The Use Case shall generate sufficient statistics and experience with different scenes, seasons, and parts of the world. Annually, the Successful Tenderer and ECMWF shall define a plan for the selection of scenes. For the first period this will include observations in the past that were already selected by ECMWF or provided by GESat. As part of their CCM contract with ESA, Absolute Sensing will provide data to ECMWF and its relevant contractors with the following characteristics:

Product type: Abundance distribution of atmospheric methane from single satellite observations (ppb or mol/m2), and per-pixel measurement error expressed as a standard deviation.

Expected data volume (in terms of number of needed scenes): This number shall vary as function of source type and acquisition. GESat will support as primary goal single observations

[9] https://absolut-sensing.com/

over single sources. The minimum expected number of abundance acquisitions is still under negotiation but will be on the order of 100 per year.

Image size: The image size is on the order of 10 x 10 km2. The final image size is a trade-off between the horizontal resolution and the signal-to-noise of the individual pixel observations.

Horizontal resolution (GSD): the horizontal resolution within the image size will be approximately 50 m.

Latency from request (order submission or automatic tasking) to image availability on pick-up point: TBC by Absolute Sensing.

The Successful Tenderer shall use the provided satellite data to derive emission estimates. The provision of the required source rate estimates shall be based on a methodology using the latest scientific developments, ideally already documented in the peer-reviewed literature. For full transparency of CAMS services, the emission estimation methodology will need to be publicly documented as part of this contract in support of CAMS users. The Tenderer shall demonstrate their capabilities and performance over a range of point sources, including oil and gas production and transportation facilities, coal mining, and waste facilities.

The Tenderer shall describe the proposed methodology and indicate the feasible timeliness (latency) of the provided data (as close to the acquisition time of the GESat observations within the constraints of providing accurate estimates). The Successful Tenderer shall use the Use Case as part of this Work Package to report on the threshold level above which emissions can be detected at the time scales proposed.

Finally, the Tenderer shall describe in detail how the data will be provided to ECMWF in terms of data format, metadata, and dissemination mechanism. This includes support to ECMWF for the visualisation of these data on the CAMS website.

ESA has not yet confirmed the availability of GESat data for 2025, 2026, or 2027, as evaluation of the data from the first satellite is still on-going. If data will become available for any of these years, ECMWF will trigger the optional deliverables and milestones during the negotiation phase for this contract or four months before the starting date of the period.

Tenderers shall complete the relevant table in Volume IIIA as part of their bid, which shall include the deliverables and milestones for this work package already indicated in the tables below. Volume IIIA will be used by the Tenderer to describe the complete list of deliverables, milestones and schedules for each work package. All milestones and deliverables shall be numbered as indicated. All document deliverables shall be periodically updated and versioned as described in the tables.

WP3 Deliverables			
#	*Type*	*Title*	*Due*
D3.1.1-Q1	Data/Report	Provision of emission estimates of local methane sources from GESat abundance observations between 1 September 2025 and 31 December 2025 – Quarter 1	Report on 15/01/2026; Data within week after observation - **Optional deliverable**
D3.1.2-Q1	Data/Report	Provision of emission estimates of local methane sources from GESat abundance observations between 1 January 2026 and 31 December 2026 – Quarter 1	Report on 15/04/2026; Data within week after observation - **Optional deliverable**

D3.1.2-Q2	Data/Report	Provision of emission estimates of local methane sources from GESat abundance observations between 1 January 2026 and 31 December 2026 – Quarter 2	Report on 15/07/2026; Data within week after observation - **Optional deliverable**
D3.1.2-Q3	Data/Report	Provision of emission estimates of local methane sources from GESat abundance observations between 1 January 2026 and 31 December 2026 – Quarter 3	Report on 15/10/2026; Data within week after observation - **Optional deliverable**
D3.1.2-Q4	Data/Report	Provision of emission estimates of local methane sources from GESat abundance observations between 1 January 2026 and 31 December 2026 – Quarter 4	Report on 15/01/2027; Data within week after observation - **Optional deliverable**
D3.1.3-Q1	Data/Report	Provision of emission estimates of local methane sources from GESat abundance observations between 1 January 2027 and 31 December 2027 – Quarter 1	Report on 15/04/2027; Data within week after observation - **Optional deliverable**
D3.1.3-Q2	Data/Report	Provision of emission estimates of local methane sources from GESat abundance observations between 1 January 2027 and 31 December 2027 – Quarter 2	Report on 15/07/2027; Data within week after observation - **Optional deliverable**
D3.1.3-Q3	Data/Report	Provision of emission estimates of local methane sources from GESat abundance observations between 1 January 2027 and 31 December 2027 – Quarter 3	Report on 15/10/2027; Data within week after observation - **Optional deliverable**
D3.1.3-Q4	Data/Report	Provision of emission estimates of local methane sources from GESat abundance observations between 1 January 2027 and 31 December 2027 – Quarter 4	Report on 15/01/2028; Data within week after observation - **Optional deliverable**
D3.Y.Z-yyyyQx	…	…	…

WP3 Milestones			
#	*Title*	*Means of verification*	*Due*
M3.1.1	Meeting with ECMWF to define the selection of GESat hotspots until 31 December 2025	Presentation and Minutes of Meeting	15/09/2025 - **Optional milestone**
M3.1.2	Meeting with ECMWF to define the selection of GESat hotspots between 1 January 2026 and 31 December 2026	Presentation and Minutes of Meeting	15/12/2025 - **Optional milestone**

M3.1.3	Meeting with ECMWF to define the selection of GESat hotspots between 1 January 2027 and 31 December 2027	Presentation and Minutes of Meeting	15/12/2026 - **Optional milestone**
M3.1.4	ECMWF's decision concerning the activation of the WP3 optional deliverables and milestone for 2025	Note	At contract signature
M3.1.5	ECMWF's decision concerning the activation of the WP3 optional deliverables and milestone for 2026	Note	31/10/2025
M3.1.6	ECMWF's decision concerning the activation of the WP3 optional deliverables and milestone for 2027	Note	31/10/2026
M3.Y.Z	…	…	…

3.5 Work Package 4 (WP4) – User engagement and documentation of service

The objective of this work package is to provide support to users of the delivered products and services.

ECMWF has established a centralised Copernicus Service Desk to provide multi-tiered technical support to all users of CAMS data, products, tools and services. The Service Desk handles user queries through a ticketing system and distributes these queries to specialists when needed. Dedicated staff at ECMWF provide basic support in the form of self-help facilities (FAQs, Knowledge Base, online Forum, tutorials etc.) as well as individualised support on technical queries related to the Atmosphere Data Store (ADS), data formats, data access etc. In addition, ECMWF staff provide specialised scientific support to address questions related to its industrial contributions to CAMS, e.g., in the areas of global forecasting of atmospheric composition.

All CAMS contractors are expected to contribute to the delivery of multi-tiered technical support for the data and/or services they provide. Such specialised user support shall take the form of direct response to individual user queries via the Service Desk facility, as well as contributions to FAQs, Knowledge Base, and user guides. Contractors may also be requested by the CAMS Service Desk to contribute to support questions in the online Forum.

Tenderers shall include in their proposal the level of user support service on Service Desk tickets as a specific Key Performance Indicator (KPI) with a target value of 80% of the assigned specialised user queries being resolved within 15 days after being informed by the CAMS Service Desk.

The Successful Tenderer shall contribute to the relevant documentation. Documentation of CAMS is an integral part of the service provision and is directly linked to the Atmosphere Data Store. The technical and scientific specification of each service shall be documented in the CAMS Knowledge Base as linked from the Atmosphere Data Store. The Successful Tenderer shall therefore support the updates of the Knowledge Base based on the latest developments.

The Successful Tenderer shall accommodate for eventual needs in providing technical and scientific expertise in support of CAMS communication and training activities. The Tenderer shall specify in the bid the experts intended to be allocated to provide this support.

Requests to support activities may be raised on for example:

- Contribute with content specific input to training, education and capacity building material: development and/or review of learning resources in the domain of the contract, participation in train-the-trainer events and Massive Open Online Courses (MOOCs);
- Contribute with content specific input to user-oriented communication material such as slides, story maps and user testimonials;

- Contribute and attend User Uptake workshops and stakeholder meetings. Presentations in your mother tongue may be asked to be provided;
- Input to the User Requirements Database (URDB) with user requirements (cf. template as provided during the negotiation process) as well sharing needs and aspirations as raised by potential new user communities;

If applicable, a small budget may be proposed to cover such resources. Details on the expected activities and the budget shall be refined during the negotiation/contract preparation phase.

Tenderers shall complete the relevant table in Volume IIIA as part of their bid, which shall include the deliverables and milestones for this work package already indicated in the tables below. Volume IIIA will be used by the Tenderer to describe the complete list of deliverables, milestones and schedules for each work package. All milestones and deliverables shall be numbered as indicated. All document deliverables shall be periodically updated and versioned as described in the tables.

WP4 Deliverables			
#	*Type*	*Title*	*Due*
D4.y.z-YYYY	Other	Contribution to CAMS Knowledge Base to document products and services as provided within the scope of this contract	Annually
D4.Y.Z	Report	Summary of support to CAMS user support, communication and training activities.	Due 1 month before contract end date
…			

3.6 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 WP0, 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):

WP0 Deliverables			
#	*Nature*	*Title*	*Due*
D0.Y.Z-yyyyQx	Report	Quarterly Implementation Report YYYYQQ *YYYYQQ being here the previous quarter (e.g. 2025Q3)*	Quarterly on 15/04, 15/07 and 15/10 *(only at the above dates since QIR for Q4 will be part of the AIR Part 1)*
D0.Y.Z-yyyy	Report / Other	Annual Implementation Report Part 1 for year YYYY *including both:* • *the Quarterly Implementation Report YYYYQ4 and* • *the requested preliminary financial information for year YYYY*	Annually on 15/01

		YYYY being here the year n-1	
D0.Y.Z-yyyy	Report	Annual Implementation Report Part 2 for year YYYY *YYYY being here the year n-1*	Annually on 28/02
D0.Y.Z	Report	Final Implementation Report	Not later than 60 days after the end of contract and once all other activities duly performed
D0.Y.Z-yyyy	Report	Annual Implementation Plan for year YYYY *YYYY being here the year n+1*	Annually on 30/09
D0.Y.Z-yyyy	Other	Copy of Prime Contractor's general financial statements and audit report for year YYYY *YYYY being here the year n-1*	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 *xx being here the iteration number of the PRM*	~ Every 6 months[(2)]

WP0 Milestones			
#	*Title*	*Means of verification*	*Due*
M0.Y.Z	Updated KPIs (list, targets, etc.) after review with ECMWF	Report	One year after start of contract
M0.Y.Z	CAMS Service Level Board meetings	Attendance	Monthly
M0.Y.Z	CAMS General Assembly YYYY *YYYY being here the concerned year*	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 in September 2025 and finish in December 2028.

The Tenderer shall provide a detailed implementation plan of proposed activities for the full period of the contract following the requested timeline in the Deliverable and Milestone tables above, including in what regards the optional activities and work packages that can be triggered by ECMWF when mature satellite data is available from each of the three CCM satellite missions.

For budgeting purposes, the Tenderer should plan for 2028 primarily as a year for carrying out optional activities, as well as WP0 management and coordination tasks.

For the costing of each Deliverable, the Tenderer shall use **a cost per emission estimate for both single source and complex source scenes in combination with the indicated number of observations per year for each satellite mission**.

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 CAMS website

The CAMS website was initially developed in August 2015, with an additional major re-development and re-launch completed in September 2018 following an extensive usability research and testing phase in 2017. New templates were applied to the website in line with the European Commission's requirements for a common Copernicus look and feel in 2020. Further user experience (UX) testing has taken place to refine the navigation and user experience in Q3 and Q4 2021. The current website can be found via the following link: http://atmosphere.copernicus.eu.

The website is built using Drupal 8 with the colours, typeface, logos and domain, all specified by the European Commission DG DEFIS which must be adhered to.

The website contains static content covering news, events and tendering opportunities, resources for press such as brochures and staff photos, as well as multi-media files such as video. It also provides sign-up functionality for the CAMS newsletter, which is issued quarterly.

In addition, CAMS website provides access to its Atmosphere Data Store at https://ads.atmosphere.copernicus.eu.

4.4 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. Main access point for the Category 2 & 3 CCM missions is ESA's Rapid Response Desk (RRD)[10]. Data acquisition from Category 1 missions shall be arranged directly with the data provider with support from ECMWF.

4.5 Communication

[10] https://www.rapidresponse.copernicus.eu/

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 Copernicus State of the Climate report, 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.

4.6 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.

4.7 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	Delivery of data within agreed timeliness	90%	quarterly	
KPI_2	Level of user support service on Service Desk tickets	80% of the assigned specialised user queries being resolved within 15 days after being informed by the CAMS Service Desk.	annually	
KPI_3	Deliverables submitted on time for review during last quarter	100% of deliverables submitted on time	quarterly	Due dates are the deadlines (inclusive) for the deliverables to be submitted on time for review by ECMWF
…	…	…	…	…

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.

The list of KPIs shall be reviewed with ECMWF in the second year of the contract and updated if necessary.

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
Executive Summary	2
Track Record	2 (for general) and 2 (per entity)
Quality of Resources to be Deployed	2 (excluding Table 1 in Volume IIIB and CVs with a maximum length of 2 pages each)
Technical Solution Proposed	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)
Management and Implementation	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)
Pricing Table	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, including any short ramp-up or mobilization phase, shall be given. The Tenderer shall describe the proposed method for producing the emission estimates outlining in some detail the proposed methodology. The Tenderer shall indicate the timeliness and how their accuracy will be competitive within existing international collaboration frameworks.