

# CAMS Service Evolution



## D7.2 Dissemination and Exploitation Plan

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## 1 Executive Summary

The project's dissemination and exploitation activities present a crucial element in the success of the CAMEO project, as they ensure that results are taken up by the wider community and are sustainable beyond the initial funding period, thus providing value for money.

This deliverable (D7.2) provides the starting point for both dissemination and exploitation in the project.

The dissemination plan identifies instruments and targets. These include activities organised by CAMEO (including workshops, website, news items, etc.) as well as important events attended by CAMEO members (i.e. workshops, conferences, seminars, etc.).

The present deliverable also provides the potential exploitation avenues in terms of outputs as well as respective exploitation activities during and after the end of the project, thus fulfilling the requirements of the DoA.

The dissemination and exploitation plans are to be considered living documents as new avenues might become important to the project over its lifetime. Thus, both will be updated regularly as the need arises.

A mid-term Dissemination and Exploitation Report (Month 18) will provide an update of the dissemination and exploitation activities, whilst a final Dissemination and Exploitation Report with detailed descriptions of dissemination activities, exploitable results and related activities will be produced towards the end of the project (Month 36).

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## **2 Introduction**

### **2.1 Background**

Monitoring the composition of the atmosphere is a key objective of the European Union's flagship Space programme Copernicus, with the Copernicus Atmosphere Monitoring Service (CAMS) providing free and continuous data and information on atmospheric composition.

The CAMS Service Evolution (CAMEO) project will enhance the quality and efficiency of the CAMS service and help CAMS to better respond to policy needs such as air pollution and greenhouse gases monitoring, the fulfilment of sustainable development goals, and sustainable and clean energy.

CAMEO will help prepare CAMS for the uptake of forthcoming satellite data, including Sentinel-4, -5 and 3MI, and advance the aerosol and trace gas data assimilation methods and inversion capacity of the global and regional CAMS production systems.

CAMEO will develop methods to provide uncertainty information about CAMS products, in particular for emissions, policy, solar radiation and deposition products in response to prominent requests from current CAMS users.

CAMEO will contribute to the medium- to long-term evolution of the CAMS production systems and products.

The transfer of developments from CAMEO into subsequent improvements of CAMS operational service elements is a main driver for the project and is the main pathway to impact for CAMEO.

The CAMEO consortium, led by ECMWF, the entity entrusted to operate CAMS, includes several CAMS partners thus allowing CAMEO developments to be carried out directly within the CAMS production systems and facilitating the transition of CAMEO results to future upgrades of the CAMS service. The CAMEO consortium also has partners from outside CAMS to ensure information/ knowledge exchange from the wider scientific community.

This will maximise the impact and outcomes of CAMEO as it can make full use of the existing CAMS infrastructure for data sharing, data delivery and communication, thus supporting policymakers, business and citizens with enhanced atmospheric environmental information.

### **2.2 Scope of this deliverable**

#### **2.2.1 Objectives of this deliverables**

This deliverable 7.2 provides the outline dissemination and exploitation plan.

The Dissemination Plan complements the Media and Communication Plan (D7.3) and identifies instruments and targets for dissemination, including important conferences, journals, and events.

The Exploitation Plan initiates the exploitation work within the CAMEO project by identifying initial exploitation routes and innovation ideas. The deliverable summarises, in a first version, the general project aims. Subsequent versions will include feedback from CAMEO partners on their exploitation intentions as well as ideas for joint exploitation, where possible.

### 2.2.2 Work performed in this deliverable

In this deliverable the work outlined in The Description of Action WP7 T7.4 was performed. The aim being to “outline the dissemination activities as well as identify the potential for exploitation and their routes”.

The initial version of this document will summarise the aims at project commencement. Feedback from the partners pertaining to both dissemination and exploitation will be garnered throughout the project and be presented in subsequent versions of this document

### 2.2.3 Deviations and counter measures

No deviations have been encountered.

### 2.2.4 Reference Documents

[1] Project 101082125- CAMEO-HORIZON-CL4-2021-SPACE-01 Grant Agreement

### 2.2.5 CAMEO Project Partners:

(Participant number order)

ECMWF	EUROPEAN CENTRE FOR MEDIUM-RANGE WEATHER FORECASTS
Met Norway	METEOROLOGISK INSTITUTT
BSC	BARCELONA SUPERCOMPUTING CENTER-CENTRO NACIONAL DE SUPERCOMPUTACION
KNMI	KONINKLIJK NEDERLANDS METEOROLOGISCH INSTITUUT-KNMI
SMHI	SVERIGES METEOROLOGISKA OCH HYDROLOGISKA INSTITUT
BIRA-IASB	INSTITUT ROYAL D'AERONOMIE SPATIALEDE BELGIQUE
HYGEOS	HYGEOS SARL
FMI	ILMATIETEEN LAITOS
DLR	DEUTSCHES ZENTRUM FUR LUFT - UND RAUMFAHRT EV
ARMINES	ASSOCIATION POUR LA RECHERCHE ET LE DEVELOPPEMENT DES METHODES ET PROCESSUS INDUSTRIELS
CNRS	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS
GRASP-SAS	GENERALIZED RETRIEVAL OF ATMOSPHERE AND SURFACE PROPERTIES EN ABREGE GRASP
CU	UNIVERZITA KARLOVA

CAMEO

CEA	COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES
MF	METEO-FRANCE
TNO	NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK TNO
INERIS	INSTITUT NATIONAL DE L ENVIRONNEMENT INDUSTRIEL ET DES RISQUES - INERIS
IOS-PIB	INSTYTUT OCHRONY SRODOWISKA - PANSTWOWY INSTYTUT BADAWCZY
FZJ	FORSCHUNGSZENTRUM JULICH GMBH
AU	AARHUS UNIVERSITET
ENEA	AGENZIA NAZIONALE PER LE NUOVE TECNOLOGIE, L'ENERGIA E LO SVILUPPO ECONOMICO SOSTENIBILE

## 3 Project Communication & Dissemination

### 3.1 Internal & External Communication Channels

A restricted web-based environment has been set up at ECMWF that includes a document repository and acts as the project's collaborative platform. The CAMEO website acts as the main location to showcase all project information and outputs. The details of this are described in D7.3.

### 3.2 EU funding acknowledgement & Disclaimer

Dissemination of results (including public and confidential deliverables, conference/workshop presentations, journal papers, and any type of information or promotional material) must display the EU emblem (see below "European Commission visual identity"); and include the following text:

"The CAMEO project (grant agreement No101082125) is funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the Commission. Neither the European Union nor the granting authority can be held responsible for them."

When displayed together with another logo, the EU emblem must remain distinct and separate and cannot be modified by adding other visual marks, brands or text. For the purposes of their obligations under Article 17 of the Grant Agreement, the beneficiaries may use the EU emblem without first obtaining approval from the Commission. This does not however give them the right of exclusive use. Moreover, they may not appropriate the EU emblem or any similar trademark or logo, either by registration or by any other means.

In addition, any publication, presentation, poster etc. needs to include the project logo, the EU Emblem and the above statement. These logos and statement are accessible to all partners on the internal pages of CAMEO's Confluence wiki.

The project coordinator, ECMWF, has provided presentation and poster (PowerPoint) templates and Deliverable (Word) templates to the consortium partners that fulfil the above-mentioned requirements.

## 4 The Dissemination Plans

As per the DoA, CAMEO dissemination activities are designed around providing/disseminating information to the scientific communities and relevant stakeholders in three areas:

1. Scientific and technical results through
  - a. Scientific Publications
  - b. Conference Talks
  - c. Organised Workshops, providing updates on the project results
  - d. Reports to and feedback from Committees and Boards
2. Products through dissemination of
  - a. Datasets and accompanying material (e.g. descriptions, meta data)
  - b. Algorithms / Specifications
  - c. Graphics and animations
3. Progress information through provision of
  - a. News items
  - b. Public Deliverables
  - c. Dissemination Materials (brochures, posters, flyers)
  - d. Website and social media

The following table provides information on the CAMEO Dissemination (and Communication) Targets.

**Table 1: Dissemination Targets**

<b>Target audience</b>	<b>Communication/ Dissemination Means</b>	<b>Responsibility</b>
European Commission, EU Member States (incl. policy makers)	Dissemination: – Workshops and resulting reports Communication: – Project news – Tailored updates on the results – CAMEO website	ECMWF with support from all partners
Scientific community	Dissemination: – Peer-reviewed scientific papers – CAMEO data portal – Workshops – Conferences Communication – News items	All partners
Satellite agencies, technology providers	Dissemination – CAMEO data website page Communication – Targeted publication material – Link with relevant H2020, Horizon Europe, and other initiatives – Representation at relevant conferences and fairs – News items	All partners
General public	Communication – General Information Material – CAMEO website – Project news/ News items – Dissemination Material – Press releases	ECMWF with support from all partners and in close collaboration with the European Commission (HaDEA and DG-DEFIS).

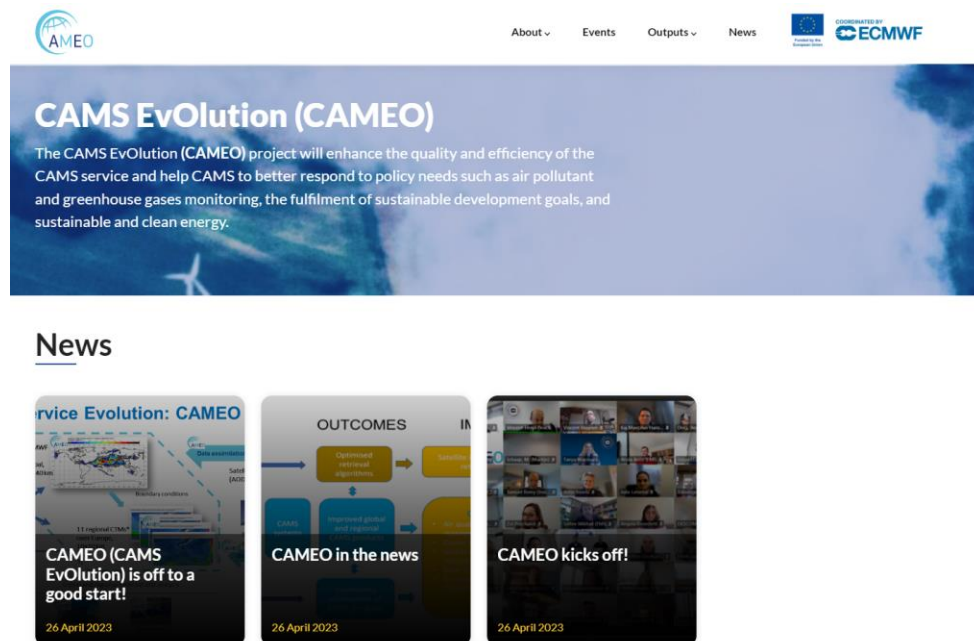


## 4.1 Dissemination Instruments

This subsection provides an overview of the instruments used for dissemination.

### 4.1.1 CAMEO Website

The CAMEO website ([www.CAMEO-project.eu](http://www.CAMEO-project.eu)) serves as the main dissemination instrument for the project. It contains various sections both for the general public as well as specifically targeted towards stakeholders including the scientific community.



CAMEO will prepare CAMS for the uptake of upcoming satellite data, advance the data assimilation (DA) and inversion capacity of the global and regional CAMS production systems beyond the state-of-the-art and develop methods to provide novel uncertainty estimates for CAMS products in direct response to some of the main outstanding expressed user requirements. CAMEO will contribute to

The CAMEO website provides access to information on the progress of the project. All deliverables that are published in the form of reports will be hosted on the website. A news slot on the website will draw attention to highlights such as new data deliveries and reports, eye-catching developments, and so forth, when they become available.

Important information of general interest will be published on the CAMEO website, including the project status on milestones and deliverables. Further details are provided in the CAMEO deliverable D7.3 Media and Communication Plan.

Reports will be openly available from the public pages of the central CAMEO website. To increase its visibility, the CAMEO website will be linked on the websites of ECMWF, CAMS, C3S, Horizon Europe CORSO project and other partners.

#### 4.1.2 CAMEO Journals, Conferences and Workshops

Strong engagement with the academic sector and national meteorological agencies will promote the work performed in CAMEO and at the same time follow the scientific developments taking place outside the consortium. This exchange of information and knowledge will be realised through attendance of scientific conferences, organisation of sessions devoted to CAMEO and related topics at relevant scientific conferences (e.g., EGU, Transcom, IG3IS, IWGGMS), and by the general process of CAMEO scientists attending and presenting seminars and engaging in discussion at universities and research institutes. Conferences and Workshops of interest for CAMEO include, but are not limited to:

- European Geoscience Union General Assembly
- American Geophysical Union Fall Meetings
- WMO/WCRP/ WWRP reanalysis conference
- ECMWF Machine learning workshop
- GCOS
- CEOS
- GEIA (Global Emission Initiative) <https://www.geiacenter.org/>
- IGAC (International Global Atmospheric Chemistry) <https://igacproject.org/>

Publication in open-access scientific journals will play a major role as this allows a rigorous peer-review to take place, ensuring that CAMEO results are relevant to the community. Relevant Journals include:

- Geoscientific Model Development (GMD) - <https://www.geoscientific-model-development.net/>
- Atmospheric Chemistry and Physics (ACP) - <https://www.atmospheric-chemistry-and-physics.net/>
- Atmospheric Measurement Techniques (AMT) - <https://www.atmospheric-measurement-techniques.net>
- Earth System Science Data (ESSD) - [https://www.earth-system-science-data.net/about/aims\\_and\\_scope.html](https://www.earth-system-science-data.net/about/aims_and_scope.html)

It is envisaged that over the course of the project, and for up to one year after project closure, a minimum of 9 peer-reviewed, co-authored (journal) publications will be produced covering the topics of the scientific-technical work packages of the CAMEO project (WPs 1 to 6). In addition, regular conference and workshop publications and attendance with talks on topics from CAMEO will complement these publications.

#### 4.1.3 Scientific Committees

The representation of ECMWF and project partners in international committees will be used as a channel for disseminating CAMEO results and output in the weather and climate prediction communities, in particular to support of the CAMS capacity.

Scientific results from CAMEO will be conveyed to international programmes and bodies such as the Global Climate Observing System (GCOS), Committee on Earth Observation Satellites (CEOS), the World Climate Research Programme (WCRP), WMO-IG3IS, GEIA and IGAC. Finally, progress and results will be directly shared with the European Commission.

#### **4.1.4 Other Instruments**

Other instruments used by the CAMEO project to disseminate its results include:

- Web / wiki pages
- Dissemination of information through relevant social media,
- Linked communication with the CAMS communication sites
- Overview of project results in partners' newsletter.

Other instruments also include ad-hoc and planned interactions and liaison with relevant international research activities, such as Horizon Europe projects, as well as the relevant Copernicus Services, CAMS and C3S with their annual General Assemblies.

The products of CAMEO will comprise reports, graphical displays, datasets and improved methods, algorithms and code. All these elements have their own important role. Reports are targeted at informing CAMS on assessments, innovation progress and future directions. Graphical displays, where applicable, are targeted at all users as supportive information for the various model runs, method comparisons, and input datasets. The datasets will also target a wide user community to support them with parallel or alternative studies. Finally, improved methods, algorithms and code are meant to form the basis for follow-on development after the CAMEO project has finished.

Reports will be openly available from the public pages of the central CAMEO website. To increase its visibility, the CAMEO website will be linked to the websites of ECMWF, CAMS and other partners.

The data outputs will be made available, subject to the data management plan.

## 5 Exploitation Plan

Exploitation has various intentions, though in the context of Horizon Europe projects these activities are geared towards increasing the impact of their project results, notably:

- They must share publicly research results with the scientific community, commercial players, civil society and policymakers ('dissemination').
- They must use their best efforts to exploit their results directly or to have them exploited indirectly by another entity – notably the use of results in further research and innovation activities other than those covered by the action concerned, ('exploitation')

Dissemination and exploitation are a requirement of the CAMEO GA (Article 17), and provide a route for the use of results that ultimately:

- Lead to new legislation or recommendations
- For the benefit of innovation, the economy and the society
- Help to tackle a problem and respond to an existing demand

Both dissemination and exploitation activities need to adhere to Fair and reasonable conditions.

### 5.1 Exploitation Targets

The CAMEO Description of Action states the following with respect to exploitation:

"The important outputs of CAMEO are the various detailed designs and prototype components. Although various developments within CAMEO will be based on pre-existing technology and will be realised through developing integrated technology, these developments will be shared publicly through proper documentation, either through public project documents or through articles in the peer-reviewed literature. Sharing this information publicly will support the implementation of the future C3S elements, which is normally done through competitive Invitations To Tender. In addition, some data sets will be created, and these will be provided on data servers without any restrictions, as described above. Therefore, the wider science community as well as the policy makers will be target audiences. Science communities include those related to Earth system monitoring and seasonal prediction, as well as the wider weather and climate modelling communities. Policy makers include those on regional, national as well as European level. There may in addition be some exploitation of CAMEO products in the other activities undertaken by partners in the consortium operating CAMEO, in particular at the national level."

### 5.2 Exploitation Activities and Routes

To gather an overview of the exploitation intentions of the partners, and to identify potential exploitation actions, a questionnaire will be used to share with partners to collect their response for continual improvements to Table 2.

The questions outlined below will be used for the upcoming deliverables D7.6 and D7.7 that are due at the mid-term and the end of the project.

The information included in Table 2 in this first version of the Dissemination and Exploitation plan is provided from the coordinator and reflects the original aims in the proposal.

## CAMEO

The following questions will be included as a guide for partners:

### **Exploitable Results**

- Which deliverables from CAMEO do you intend to exploit?
- Which specific output(s) from the deliverable(s) do you intend to exploit?
- Is this output owned by you/another Partner/joint?
- At what TRL (Technology Readiness Level) do you expect this output to be at the end of the project (if applicable)?
- What assessments/ evaluations do you plan within CAMEO to test whether outputs are exploitable?

### **Products/ Outputs resulting from Exploitation**

- What final product/ output do you have in mind as the result of the exploitation?
- What are the key functions of this product/ output?
- What is the Unique Selling Point (USP) for this product/ output?
- What proportion of this product/ output will have been funded by CAMEO?
- Who are the customers for this product/ output?
- What similar systems are already in the marketplace offered by other suppliers?

### **Exploitation Activities during the CAMEO project**

- What exploitation activities do you plan to perform in CAMEO and when?

### **Exploitation Activities after the CAMEO project**

- What exploitation activities do you plan to perform post- CAMEO and when?

### **Consortium-wide Exploitation**

- What would be a consortium-wide results and product to be exploited?
- How might the Consortium work at a collective level to exploit the CAMEO proposition?
- Would your organisation take a part in this, and in what role?
- Which additional stakeholders be needed to operate the model?

Naturally, at this early stage in the project (month 5 of 36) not all questions can be answered by all partners. Therefore, the questionnaire also serves the purpose of reminding partners of the importance of exploitation in a project such as CAMEO, and to actively consider potential routes and related exploitation activities.

Based on the above responses to the questionnaire, the following table summarises the findings (Table 2).

**Table 2: Summary of Exploitation Findings**

<b>Exploitable Results/ Products or Outputs</b>	<ul style="list-style-type: none"> <li>• Regional CAMS production systems ready for O3 and NO2 satellite retrievals from novel instruments (S4, IRS)</li> <li>• Global CAMS production systems ready to assimilate aerosol, O3 and NO2 satellite retrievals from new instruments (S4, 3MI, IASI-NG, S5)</li> <li>• Improved aerosol satellite retrievals specifically for use in CAMS</li> <li>• Better regional CAMS air quality products with direct benefit for users and European air quality reporting</li> <li>• Better knowledge of uncertainty of CAMS emissions, solar energy, deposition and policy products and the communication of the uncertainty to users.</li> <li>• Better CAMS products thanks to improved emissions and information about emission uncertainties</li> <li>• Delivery and report on two 1-year 3MI proxy data</li> <li>• Uncertainties in CAMS emission temporal profiles</li> <li>• Uncertainties in Isoprene CAMS-GLOB-BIO emissions at the grid cell level</li> <li>• Uncertainties in primary PM emissions from CAMS-REG at the grid cell level</li> <li>• Uncertainties in CAMS-GLOB-ANT emissions at the country and sector level</li> <li>• Intercomparison of satellite-derived CO2, CH4 and NO2 emissions</li> </ul>
<b>Exploitation Activities during the Project</b>	<ul style="list-style-type: none"> <li>• Any dataset that has been identified as public will be made available to external scientists.</li> <li>• Project reports with recommendations will support uptake/implementation activities in CAMS and potentially other frameworks, already during the project.</li> <li>• CAMEO will also be presented at the CAMS GA in June 2023. (CAMEO updates will be included at all CAMS GA's).</li> <li>• Presentations at external conferences eg EGU and AGU, once project results are available</li> </ul>
<b>Exploitation Activities after the end of the Project</b>	<ul style="list-style-type: none"> <li>• Any dataset that has been identified as public will be made available to external scientists.</li> <li>• Project reports with recommendations will support uptake/implementation activities in CAMS and potentially other frameworks.</li> </ul>
<b>Consortium-wide/Joint Exploitation</b>	<ul style="list-style-type: none"> <li>• Outputs will be shared publicly as much as possible through documentation and peer-reviewed literature.</li> <li>• Presentations at external conferences eg EGU and AGU, once project results are available</li> </ul>

(Any datasets and databases produced will follow the data management plan).

The activities during the project will be taken up by the relevant work packages to ensure that exploitation is pursued and maximised. However, it should be noted that a complete consortium-wide exploitation of results (e.g., through structures such as a Joint Venture or Association) after the end of the project are unlikely, due to the nature of this research project CAMEO.

The Exploitation Plan will be revisited regularly and is thus to be understood as a living document, as developments during the course of the project may open up new avenues for exploitation.

## **6 Conclusion**

In this deliverable, the CAMEO dissemination and exploitation has been defined.

For dissemination a set of instruments have been identified, namely a website, news items and numerous scientific conference and workshop involvements.

Initial exploitation ideas from all partners have been collected in this document, complemented by the identification of exploitation activities. Project Office and Work Package leader can now use this information to steer the activities towards innovation realisation within the various work packages and the project as a whole.

A mid-term Dissemination and Exploitation Report will provide an update of the dissemination and exploitation activities, whilst a final Dissemination and Exploitation Report with detailed descriptions of dissemination activities, exploitable results and related activities will be produced towards the end of the project. These will ensure that the results are sustainable and realised into innovations.

## Document History

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