

CAMS Service Evolution



D7.6 Mid-Term 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 mid-term Dissemination and Exploitation Report (Month 18) provides an update of the dissemination and exploitation activities half way through the project, 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).

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.

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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 D7.6 provides the mid-term update on dissemination and exploitation plan.

The Exploitation Plan initiated in the earlier deliverable, D7.2, explains the exploitation work within the CAMEO project by identifying initial exploitation routes and innovation ideas.

The objective of D7.6 is to report on the dissemination activities of the first 18 months and to provide an update, where appropriate, of the dissemination and exploitation plans.

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 provide a mid-term update on the dissemination activities as well as re-check the potential for exploitation and their routes.

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] Deliverable 7.2 Dissemination and Exploitation Plan

[3] CAMEO website <https://www.cameo-project.eu/>

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
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

CAMEO

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 Report on Dissemination Activities

As a project, we have taken an active role in conferences, workshops and seminars explaining the project aims and initial results. International liaison work also continues to be an important aspect to the project.

In this first 18 months, CAMEO has been presented 16 times at conferences and workshops as well as at another 3 occasions at expert meetings and committees.

CAMEO held its first in-person General Assembly at ECMWF premises in Bonn, 14th and 15th May 2024. This was very well attended with over 50 project partners. Laurence Rouil, Director of CAMS, gave the opening talk. Following this, with project updates from linked Horizon Europe (HE) projects, were: Richard Engelen (CORSO project coordinator), Anna Agusti-Panareda (CATRINE Project Coordinator) and Samuel Remy (CAMAERA Project Coordinator).

The project is actively liaising with these fellow Horizon Europe projects, as mentioned above (E.g. CORSO and CATRINE, amongst others) to ensure synergies are identified and developed.

The project is also liaising with the CAMS Copernicus Service and was represented at their annual General Assembly, June 2024.

The CAMEO website has provided regular updates and news items.

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.

As a reminder and 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

3.1.1 Scientific and technical results

- a) Scientific Publications – article in Journal

There are no publications yet.

b) and c) Conference and Organised Workshops Talks

Name	Date	Location	Presenter	Presentation title
7th CAMS General Assembly Copernicus	13-15 June 2023	Valencia. Spain	Antje Inness	CAMEO Talk
7th CAMS General Assembly Copernicus	13-15 June 2023	Valencia. Spain	Vincent Guidard	
7th CAMS General Assembly Copernicus	13-15 June 2023	Valencia. Spain	Marc Guevara	Talk: Uncertainty of emissions and surface fluxes in CAMS products
20th Conference GEIA	21-23 June 2023	Brussels. Belgium	Thierno Doumbia	Poster: Quantification of the uncertainties on surface emissions within the CORSO and CAMEO projects
20th Conference GEIA	21-23 June 2023	Brussels. Belgium	Ronald van der A	Evaluation of satellite-derived NO _x emissions from TROPOMI (poster)
20th Conference GEIA	21-23 June 2023	Brussels. Belgium	Katerina Sindelarova	High-resolution global BVOC emission dataset including isoprene updates in Europe (poster)
The International Cooperative for Aerosol Prediction (ICAP) 13th working group meeting	8-10.11.2023	Darmstadt	Oleg Dubovik	Harmonization of aerosol approaches in remote sensing and transport models
SEEDS General Assembly	5.12.2023	Toulouse,	Katerina Sindelarova	Talk: Perspectives on BVOC emission estimates from CAMS
American Geophysical Union, Fall Meeting	29.1.2024	Virtual	Johannes Flemming	Welcome to CAMAERA from CAMS and CAMEO
CAMAERA Kick off meeting	28/29th February 2024	online	Angela Benedetti	Welcome to CERTAINTY from CAMEO
CERTAINTY kick off meeting	14.-19.04.2024	Vienna, Austria	Lewis Blake	Analytical Propagation of Emission Uncertainties into CAMS Policy Products
EGU 2024	14.-19.04.2024	Vienna, Austria	Gael Descombes	Satellite data assimilation at regional scale using the Chimere model

Name	Date	Location	Presenter	Presentation title
EGU 2024	14.- 19.04.2024	Vienna, Austria	Vincent Huijnen	Talk: Towards an online parameterization of biogenic VOC emissions in the Integrated Forecasting System
EGU 2024	14.- 19.04.2024	Vienna, Austria	Oleg Dubovik	Poster: Harmonization of the aerosol modeling in CAMS model and remote sensing approaches
EGU 2024	14.- 19.04.2024	Vienna, Austria	Zoi Paschalidi	Talk: Integrating geostationary satellite data for advanced air quality modelling: Evaluating GEMS NRT observations within the ECMWF's IFS system for the HE CAMEO project
CAMS GA 2024	10.- 13.06.2024	Brussels, Belgium	Zoi Paschalidi	Update on Horizon Europe CAMS EvOLution Project - CAMEO

d) Reports to and feedback from Committees and Boards

Name	Date	Location	Presenter	Presentation title
2-nd life REMY Expert Meeting review	07/06/2023	Remy	Renske Timmermans	Talk: Receptor and Source oriented apportionment: goals and activity in the framework of the CAMEO project
CEOS AC-CV Meeting	25.10.2023	Brussels, Belgium	Johannes Flemming	Surface PM2.5 and AOD Data assimilation Status update from the Global CAMS system
Models, In situ, and Remote sensing of Aerosols (MIRA)	22.04.2024	Webinar, on line	Oleg Dubovik	Harmonization of the aerosol modeling in climate model and remote sensing approaches

3.1.2 Products through dissemination of

- a. *Datasets and accompanying material (e.g. descriptions, meta data)*
- b. *Algorithms / Specifications*
- c. *Graphics and animations*

Figure 1 shows the dedicated page on the CAMEO website (www.cameo-project.eu) for CAMEO produced public datasets.

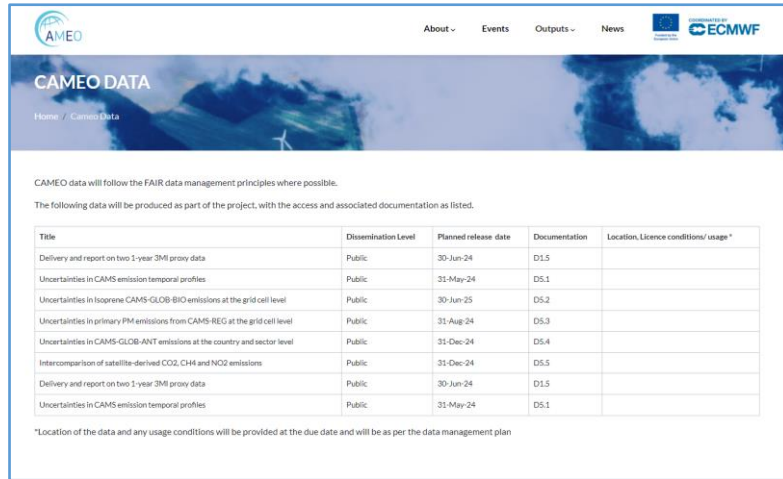


Figure 1: CAMEO Website: Data Page

These datasets will be uploaded when they are available for use/ made public. Algorithms, graphics and animations have not been produced yet.

The CAMEO website <https://www.cameo-project.eu/> has been used for News items and public deliverables to date. (Figures 2 and 3). A page is available and ready to list the scientific papers (Figure 4).

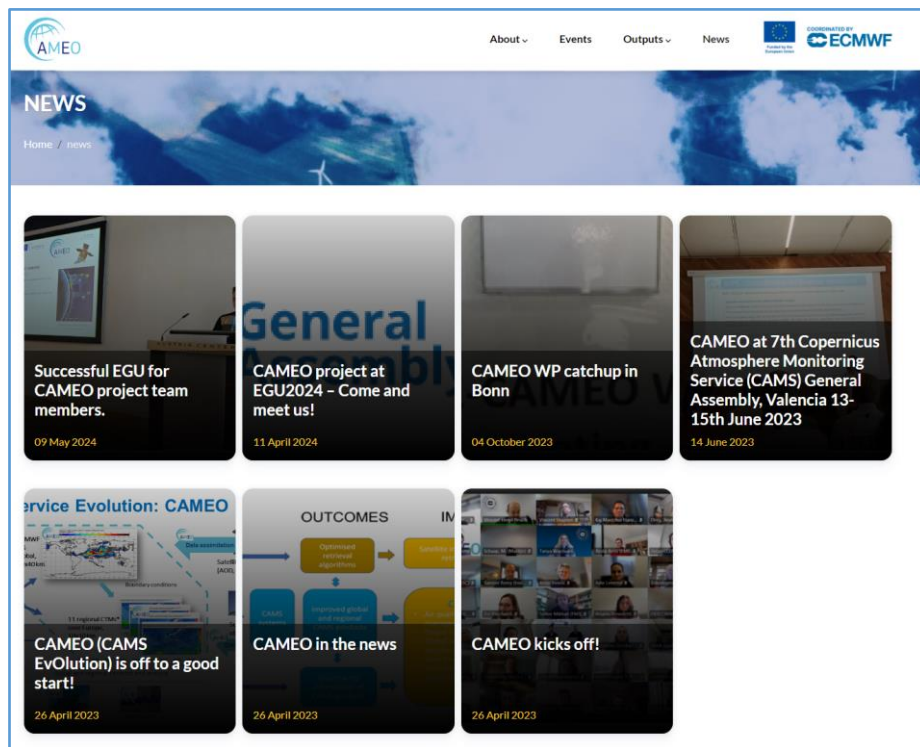


Figure 2: CAMEO Website: News Page

DELIVERABLES
Home / Deliverables

WP1 - Global aerosol assimilation in CAMS

Del No	Title	Type	Dissemination Level	Due Month	Download
D1.1	Report on construction of AVRAS prototype	REPORT	Public	May-2024	Download
D1.2	Report on operational AVRAS experiment	REPORT	Public	Nov-2025	
D1.3	Report on the selection of suitable sensors and channels	REPORT	Public	Jun-2024	
D1.4	Report on aligning aerosol parameter retrievals	REPORT	Public	Dec-2023	Download
D1.5	Delivery and report on two 1-year 3MI proxy data	DATA	Public	Jul-2024	
D1.6	Delivery and report on Observation-Operator-Post-Processor (OOPP)	REPORT	Public	Jul-2024	
D1.7	Report on improved retrievals for IFS-AER and evaluation of global CAMS products	REPORT	Public	Nov-2025	

WP2 - Enhancement of satellite data assimilation and inversion techniques in IFS global model

Del No	Title	Type	Dissemination Level	Due Month	Download
D2.1	Report on data assimilation results	REPORT	Public	Dec-2024	
D2.2	Report on super-observations	REPORT	Public	Sep-2024	
D2.3	Report on assimilation of HCHO data	REPORT	Public	Sep-2024	
D2.4	Report on NMVOC emission inversion	REPORT	Public	Nov-2025	
D2.5	Report on weak-constraint 4DVar, concept	REPORT	Public	May-2024	Download
D2.6	Report on weak-constraint 4DVar, application	REPORT	Public	Dec-2025	

Figure 3: CAMEO Website: Deliverables Page

CAMEO PUBLICATIONS
Home / CAMEO Publications

Date Published	Details

Figure 4: CAMEO Website: Publications Page (no publications yet).

CAMEO uses the confluence pages for communication and dissemination within the project. Social media, (Linkedin and X (formerly known as “Twitter”)) are not used directly by CAMEO but instead we rely on the established communications channels of CAMS and ECMWF. CAMEO was one of the projects highlighted by HaDEA attending EGU 2024 (Figure 5) and at CAMS General Assembly, June 2024.

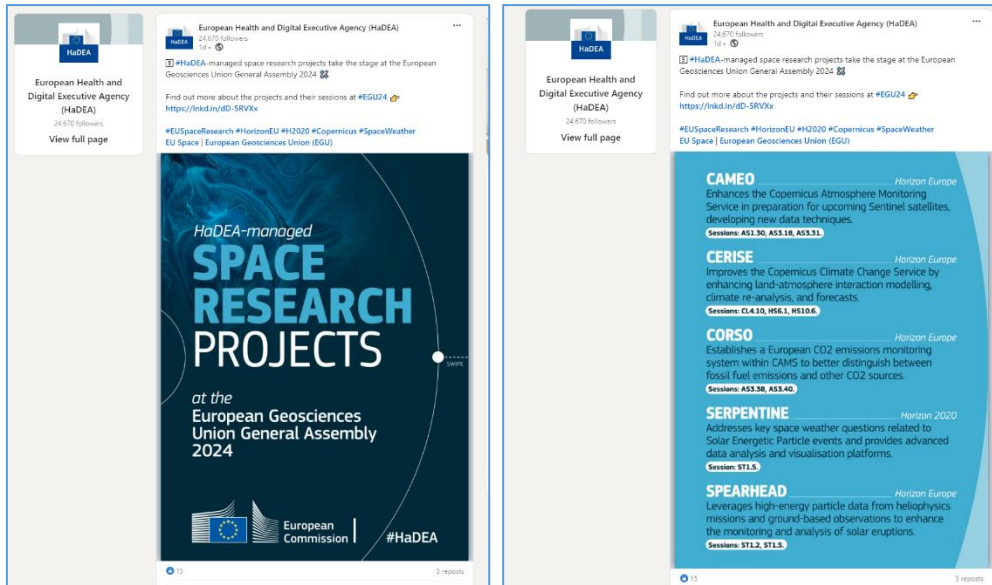


Figure 5: HaDEA announcement on LinkedIn, mentioning the CAMEO project

ECMWF and Copernicus social media accounts are being used to like/ follow project updates.

CAMEO was also one of the projects presented at the CAMS General Assembly June 2024.

<p>14:00 – 15:45</p> <p>15:45 – 16:00</p>	<p>CAMS supporting R&D projects</p> <p>Moderator: Lukas Lanneau (HaDEA)</p> <ul style="list-style-type: none"> • Introduction from HaDEA – Lukas Lanneau (HaDEA) • CoCO2 – Luca Cantarello (ECMWF) • CATRINE – Adrien Martinez (LSCE) • CORSO – Auke Visser (ECMWF) • CAMEO – Zoi Paschalidi (ECMWF) • SEEDS – Paul Hamer (NILU) • CAMAERA – Rose-Cloé Meyer (Hygeos) <p>Conclusions</p> <p>Conclusions by Maria Berdahl (DG DEFIS), Laurence Rouil and Richard Engelen (ECMWF)</p>	<p>8th Copernicus Atmosphere Monitoring Service General Assembly</p> <p>Brussels Plenary 12-13 June 2024</p>
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Figure 6: CAMS General assembly Agenda extract; CAMEO project

CAMEO

The CAMEO Website went live May 2023. Google analytics has been used to collect and monitor traffic and users over the last 13 months.

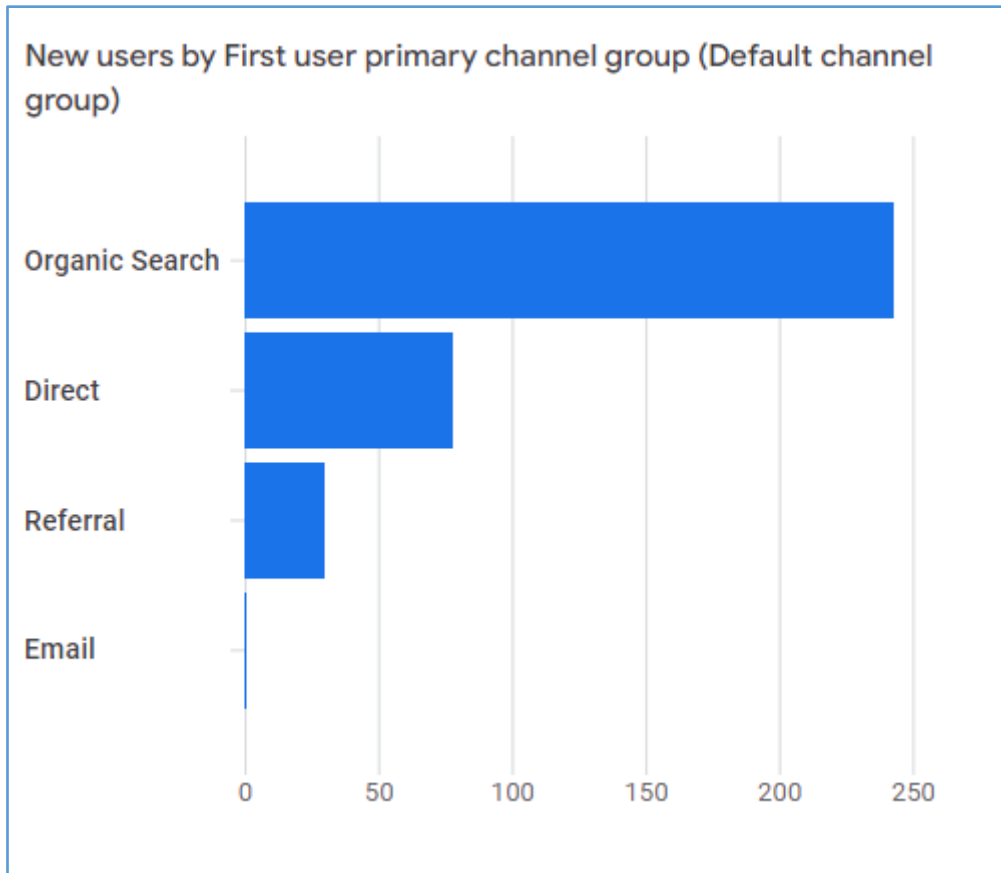


Figure 7: CAMEO Website: Website acquisition,

The majority of users are accessing the website via Organic Search, followed behind by Direct (Figure 7). Proving that the website is easily findable.

The statistics show over 350 users with 1400 plus views (Figure 8). Although this is a strong start, we expect these results to increase as we progress through the project and upload the deliverables and datasets when they become available.

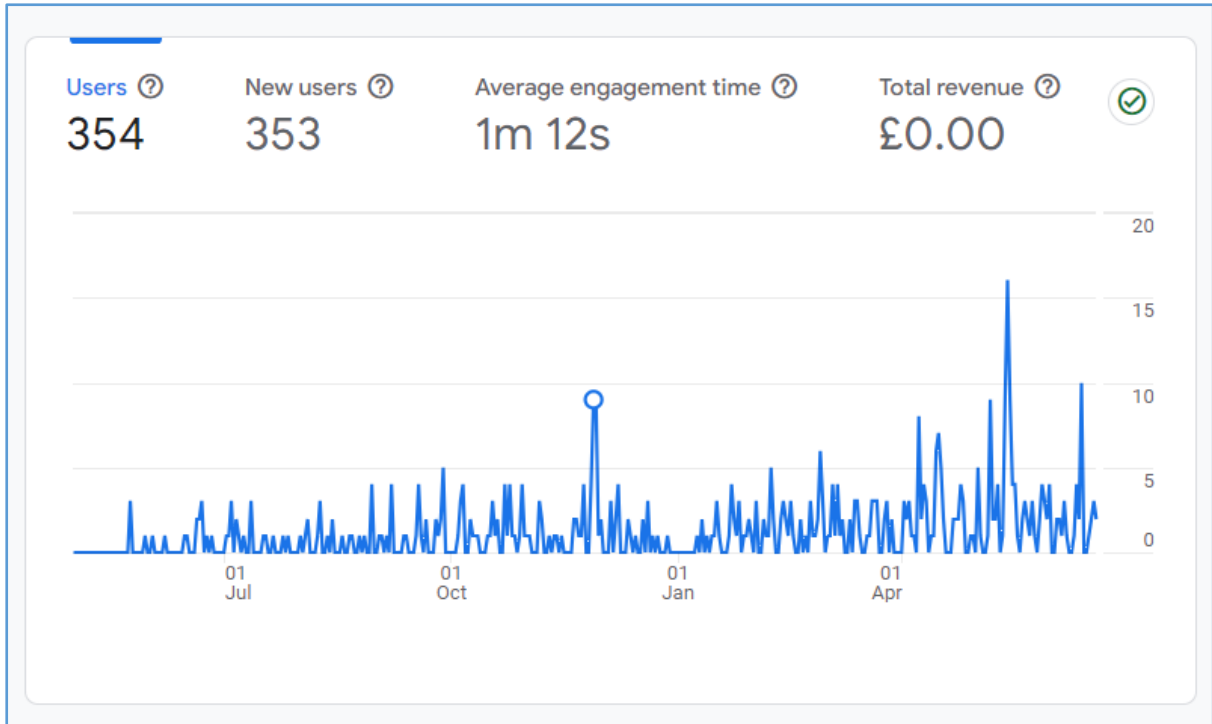


Figure 8: CAMEO Website: Number of users

	Page title and screen class ▾	+	↓ Views	Users
			1,401 100% of total	354 100% of total
1	Home CAMEO		565	309
2	Events CAMEO		105	56
3	Team CAMEO		93	67
4	Consortium CAMEO		73	54
5	About CAMEO		60	35
6	Deliverables CAMEO		58	43
7	Objectives CAMEO		57	42
8	Structure CAMEO		43	34
9	news CAMEO		41	31
10	Cameo Data CAMEO		37	32

Figure 9: CAMEO Website: Number of views and top pages accessed

The most viewed are the home page and the events page (Figure 10).

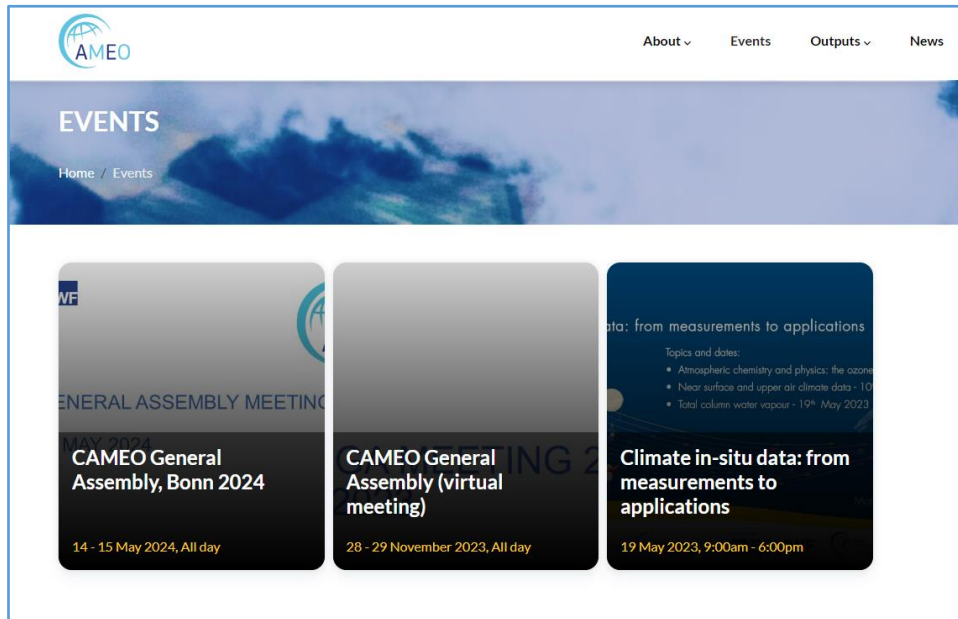


Figure10 : CAMEO Website: Events Page

Figure 11 shows the users per country. Overall there is good access from around the world, but the data shows that most are within the European continent.



Figure 11: CAMEO Website: Users per country.

4 Exploitation Plan

The earlier deliverable, D7.2, already outlined potential exploitation avenues, as per Table 2 below. The exploitation survey to partners, run as part of Deliverable D7.6, shows that the products and activities described remain relevant at this juncture.

Table 1: Summary of Exploitation Findings

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

(Any datasets and databases produced will follow the Data Management plan).

5 Conclusion

This deliverable has provided a mid-term update of the dissemination and exploitation activities to the Dissemination and Exploitation Report.

For the dissemination we have achieved our aims to disseminate via a set of identified instruments namely a website, news items, numerous scientific conference and workshop involvements and scientific papers. This task will continue for the remaining 18 months.

Exploitation updates were solicited from all partners and represents the current state of exploitation activities.

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.

Document History

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1.0	Rhona Phipps	04/007/2024	Issued Version

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Henk Eskes (KNMI), Augustin Colette (INERIS).	July 2024	Minor comments

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