

Carbon Atmospheric Tracer Research to Improve Numerics and Evaluation



CATRINE

Carbon Atmospheric Tracer
Research to Improve
Numerics and Evaluation

D9.2 Dissemination, exploitation, media and communication plans

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CATRINE

Carbon Atmospheric Tracer
Research to Improve
Numerics and Evaluation

CATRINE: Carbon Atmospheric Tracer Research to Improve Numerics and Evaluation

Horizon Europe RIA (Research and Innovation Action)

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Executive Summary

The project's dissemination and exploitation activities present a crucial element in the success of the CATRINE 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 (D9.2) provides the starting point for both dissemination and exploitation in the project as well as outlining the project's Media and Communication Plan.

The dissemination plan identifies instruments and targets. These include activities organised by CATRINE (including workshops, website, news items, etc.) as well as important events attended by CATRINE 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 Description of the Action (DoA).

The project's Media and Communication Plan describes the project branding and is the baseline for outreach and communication work for the project. Communication activities will be developed and implemented across the life of the project, to promote it, facilitate interactions and disseminate its milestones and deliverables. It is expected that project partners support the communication activities to ensure the maximum visibility within the various communities. The various annexes of this document will be updated during the lifetime of the project. CATRINE's Plan offers an overview of how and when Communications activities will help and support CATRINE in meeting its objectives and compliments the Dissemination and Exploitation plan included in this deliverable

This document is a living document which will be developed during the lifetime of the project to follow and share the developments of the CATRINE project.

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1 Introduction

To enable the European Union (EU) to move towards a low-carbon economy and implement its commitments under the Paris Agreement, a binding target was set to cut emissions in the EU by at least 40% below 1990 levels by 2030. European Commission (EC) President von der Leyen committed to deepen this target to at least 55% reduction by 2030. This was further consolidated with the release of the Commission's European Green Deal on the 11th of December 2019, setting the targets for the European environment, economy, and society to reach zero net emissions of greenhouse gases in 2050, outlining all needed technological and societal transformations that are aiming at combining prosperity and sustainability.

To support EU countries in achieving the targets, the EU and European Commission (EC) recognise the need to support establishing the new European anthropogenic CO₂ emissions Monitoring and Verification Support capacity (CO₂MVS). To support the Commission and the CO₂ Task Force with designing and ultimately building the CO₂MVS, previous projects have been funded such as: the CO₂ Human Emissions (CHE) project, the CoCO₂ project (<https://coco2-project.eu/>) and recommendations from the VERIFY project (<https://verify.lsce.ipsl.fr/>). However, some of the recommendations from the CHE project were not available at the time of the definition of the CoCO₂ project and could therefore not be fully taken into account. The EC, supported by the CO₂ Task Force, took the various recommendations from the CHE project onboard as input to the Horizon Europe Work Programme and created two Calls. The CATRINE project addresses the requirements from one of those two resultant calls.

The Carbon Atmospheric Tracer Research to Improve Numerical schemes and Evaluation (CATRINE) project aims to evaluate and improve the numerical schemes for tracer transport in the new Copernicus anthropogenic CO₂ emissions Monitoring and Verification Support capacity (CO₂MVS) and more widely in the Copernicus Atmosphere Monitoring Service (CAMS). The research and development activities in CATRINE will focus on the priorities identified by these previous activities. The CATRINE project will contribute to the further development of the new Copernicus element for the monitoring of anthropogenic CO₂ and methane (CH₄) emissions and sinks.

The main objectives of CATRINE are to improve the methods used to represent resolved tracer transport by the winds, with a particular focus on mass conservation, and to identify other systematic errors associated with unresolved processes represented by parametrizations. The project will define protocols for evaluating tracer transport models at both global and local scales. Test beds based on field campaign case studies will be developed, along with suitable metrics for tracer transport evaluation, utilising a range of tracers and observations at both global and local scales. These metrics will be employed in the operational CO₂MVS to evaluate the implementation of new transport model developments, characterise transport accuracy and representativity in data assimilation, and provide a quality control stamp of tracer transport accuracy. Lastly, CATRINE will provide clear recommendations to the CO₂MVS and the Carbon Cycle Community which works with atmospheric inversion models for the evaluation and quality assessment of tracer transport models.

1.1 Scope of this deliverable

1.1.1 Objectives of this deliverables

This deliverable 9.2 provides the outline of the CATRINE dissemination and exploitation plan as well as the Media and Communication plan.

As these plans complement each other and are brought together as separate chapters in this deliverable. The Media and Communication Plan identifies instruments and targets for dissemination, including important conferences, journals, and events and complements the Dissemination plan by identifying instruments and targets for dissemination, including important conferences, journals, and events.

The Exploitation Plan initiates the exploitation work within the CATRINE 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 CATRINE partners on their exploitation intentions as well as ideas for joint exploitation, where possible.

1.1.2 Work performed in this deliverable

In this deliverable the work outlined in The Description of Action WP9 Task 9.4 is 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 gathered throughout the project and be presented in subsequent versions of this document.

1.1.3 Deviations and countermeasures

No deviations have been encountered.

1.1.4 Reference Documents

[1] Project CATRINE Grant Agreement, Description of the Action (DoA)

2 Project Communication & Dissemination

2.1 Media and Communication Strategy

2.1.1 Communication Background

CATRINE is a Copernicus Evolution project aimed at the atmospheric tracer transport research areas identified by the EU's CO₂ Task Force, the CO₂ Human Emissions (CHE) project, and the Copernicus CO₂ service (CoCO₂) projects.

CATRINE is a research project made up of a consortium of 8 organisations with ECMWF as lead coordinator for the project. It will run for 36 months until the end of December 2026.

CATRINE's outcomes will further support the development of a European capacity for monitoring anthropogenic CO₂ emissions. Therefore, it should be treated as high profile, with interest and prestige riding on it for all involved.

The project results will directly contribute to the development of the CO₂MVS in the Copernicus programme and more generally to the Copernicus Atmosphere Monitoring Service (CAMS), while drawing on the strong links with activities related to

- ICOS Cities ("PAUL - Pilot Application in Urban Landscapes - Towards integrated city observatories for greenhouse gases"),
- the ERC-SyG "urbisphere – coupling dynamic cities and climate" projects focusing on the role of cities in CO₂ emissions and transport,
- the CHE, CORSO and CoCO₂ CO₂MVS precursor projects,
- the international carbon cycle research community via the TransCom programme and
- the WMO Global Greenhouse Gas Watch (G3W).

The key objectives of CATRINE express the ambitious efforts of the project:

1. Deliver improved methods to simulate resolved transport of tracers by the winds, focusing on the reduction of systematic modelling errors. Emphasis will be given on mass conservation, as this has been identified as a priority research topic in the recommendations given by the CHE project, being a requisite for accurate flux estimation in the CO₂MVS.
2. Assessment of the impact of improving tracer transport on the quality of the estimated CO₂ and CH₄ fluxes in the CO₂MVS.
3. Provide protocols for the evaluation of tracer transport models at global and local scales.
4. Develop test beds linked to field campaign case studies and to long-term observations collected at supersites. The case studies will be selected from dedicated field campaigns at various ecosystems covering different types of emissions and natural fluxes. The purpose of these test beds is to attribute transport errors to specific transport processes. These test beds will be designed for global and local transport models.
5. Test developments in parametrizations of unresolved transport processes (turbulent mixing and convection).
6. Develop accurate metrics for tracer transport evaluation using a range of tracers and a wide range of observations at global and local scales. The metrics will be used in the operational CO₂MVS to assess the implementation of new transport model developments, to characterise the transport accuracy and representativity in data assimilation with potential blacklisting of observations and to provide a quality control stamp of tracer transport accuracy.

7. Provide clear recommendations to the CO2MVS and the Carbon Cycle Community working with atmospheric inversion models regarding the evaluation and quality assessment of tracer transport models.

2.1.2 Communication Objectives

All stakeholders aim to be kept informed of the development and achievements of the project, understanding how they will benefit from it and how they can support it.

a. Strategic Communication Objectives

These will clearly communicate:

- The relevance of the project
- Its challenging and compelling nature

b. Operational Communication Objectives

to bring together the relevant European (and international) expertise in a consolidated and collaborative manner to support an operational CO₂ emission monitoring capacity.

2.1.3 Audiences

In defining the target audience, it is important to produce impact outside CATRINE and tailor the information provided accordingly. Defining the target audience is important to produce the impact outside CATRINE and tailor the information provided accordingly. The target audiences identified for CATRINE include the European Commission (also outside DG-DEFIS), EU Member States, the CO2 Task Force, industry, satellite agencies and technology providers, science community outside the consortium, climate community, amongst others. This is an initial listing of possible interest stakeholders who could benefit from the outputs of CATRINE.

Table 1: Initial CORSO Audience Mapping

	STAKEHOLDER	CHANNELS	INFORMATION	COMMUNICATION
1	European Commission, CO2 Task Force, ICOS, Member States, ESA, EUMETSAT	Attendance of relevant meetings Reports CATRINE website	Scientific/technical General progress	Presentations Project news Tailored updates on website, posts on websites
2	Scientific community	Conferences and fairs Peer-reviewed journals CATRINE website CORSO and Copernicus ECMWF X (formally known as Twitter) HaDEA Twitter	Scientific/technical General progress	Peer-reviewed papers News items Website publication material (including deliverables and datasets)

	STAKEHOLDER	CHANNELS	INFORMATION	COMMUNICATION
3	Satellite agencies, technology providers	CATRINE data portal Targeted publication material Link with relevant H2020, Horizon Europe, and other initiatives Representation at relevant conferences and fairs	Scientific/technical General progress	Presentations Project news Tailored updates on website Peer-reviewed papers News items
4	General Public (to be defined and segmented) Universities and interest groups	CATRINE website CORSO, CoCO2 and Copernicus ECMWF Twitter HaDEA Twitter	Scientific/technical General progress	Project news items Targeted publication material (where possible)

2.1.4 Implementation

Communicating effectively and efficiently is an important factor in realising the impact of the CATRINE project. It will help the project to reach the right audience with the right message. This is supported by keeping to these Guiding principles:

- We will exploit CATRINE bespoke digital resources (e.g., website) alongside existing assets to achieve maximum impact at minimum cost.
- We will channel the engagement, interest and enthusiasm of our stakeholders to amplify the impact of our communications.
- We will take full advantage of established activities and events (e.g., scientific conferences, workshops) to share our message.
- We will retain a sharp focus upon the core CATRINE objectives.

CATRINE communication activities will address the interaction with current stakeholders and promote the project to potential new stakeholders and the general public.

The CATRINE website will be the main repository for the project documentation and related news. Project description, news items, listing of main events, description of results and products will all be published through the CATRINE website. The website will be maintained by ECMWF with input from the consortium partners.

Working closely with partners, CATRINE will utilise the ECMWF communications department as well as its Copernicus Department to ensure a high visibility of the project in the sector and among the wider audience, promoting the added value of this European collaboration.

We will communicate and promote **scientific and technical results** through:

- a. Scientific Publications
- b. Conference Talks
- c. Attend Workshops, providing updates on the project results

d. Reports to and feedback from relevant Committees and Boards

Both the **scientific and technical** achievements and findings within the CATRINE project will be advertised and disseminated through the project website, which will contain all reports and technical documentation, publications in the scientific literature, publications in conference proceedings and links to the relevant data portals. However, an important additional pathway is through the uptake of results by CAMS as part of the ramp-up of the CO2MVS. CATRINE's specific aim is to support this ramping-up and the project's results will therefore be used either directly in the CO2MVS prototype or through the ITT process

CATRINE will also align its communication activities with the general communication around the future Copernicus CO2 service element, as things develop. This involves the European Commission, ECMWF, ESA and EUMETSAT. Key results from CATRINE can in particular be disseminated through ECMWF Copernicus communication efforts, resulting in very substantial additional reach in press, media and social media.

The products of CATRINE will comprise reports, datasets and improved methods. All these elements have their own important role. Reports are mostly targeted at informing the Commission and its Task Force 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.

Reports will be openly available from the public pages of the central CATRINE website. To increase its visibility, the CATRINE website will be linked on the websites of ECMWF, CAMS, C3S, and other partners. The CATRINE website will provide 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. Important information of general interest will be published on the CATRINE website, including the project status on milestones and deliverables.

The **wider scientific community and policy makers** will be able to use the CATRINE website to follow the progress of the project. All public 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 and eye-catching developments. Our news activity will seek to drive traffic to the website, as well as sharing our news more widely to relevant, targeted audiences.

All mature data products of CATRINE will be made publicly available to maximize the uptake by the scientific community. It is envisaged to make use of several parallel data portals to ensure full visibility of the datasets. Links to the data or the portals will be included on the website, when the data becomes available. Data products and information on data access and data portals will also be included in the Data Management Plan.

Engaging stakeholders and their networks, we will seek to encourage them to develop and disseminate their own materials, while ensuring they remain consistent with our key messaging and meet project objectives.

2.1.4.1 Messaging

The main strategic objective is to clearly communicate the critical importance of the project, the urgency surrounding the undertaking, and its challenging and compelling nature. Communications will therefore convey the importance of CATRINE and the excitement and

pride felt by those involved in the project, in a way that is appropriate to all stakeholders from seasoned policy makers and senior scientists to more general audiences and the media.

The operational level objective of CATRINE is equally clear: *to strengthen the development of the new CO2MVS capacity together with the relevant European expertise in a consolidated and collaborative manner to improve the Copernicus CO2 emissions Monitoring and Verification Support*. This objective includes strengthening interaction and encourage the innovation needed to reconcile the scientific challenges implicit in building that capacity.

2.1.4.2 Measurement

Measuring progress against defined objectives will be key to providing assurance on the delivery of success, enabling corrective action where required.

We will undertake both a quantitative and qualitative approach to measuring stakeholder awareness and perception of the CATRINE project and review updates of the relevant data on a six-monthly basis through google analytics metrics from our website traffic.

Already, in D9.1 Risk and Quality Management Plan identified targets relevant for communication and dissemination, as per the following table:

Table 2: WP9 metrics

Minimum Target Value | Typical Target Value | Optimum Target Value

Metric Definition	Unit of Measure	M10 (WP9)	M18 (WP9)	M28 (WP10)	M36 (WP10)
Visibility of the Public Project Website	Average number of Website Access per month by this period	20/30/40	40/50/60	60/70/80	80/90/100
Scientific and technical presentations	Number of presentations (in scientific events, conferences, trade fairs, congresses, symposiums)	0/1/2	2/4/6	2/4/6	2/4/6
Scientific publications	Number of peer-reviewed publications	0/0/1	1/2/4	2/3/4	4/6/8
Generic Communications from the project	Total number of written and electronic papers / articles / publications	1/2/3	3/4/5	4/5/6	5/6/8

2.2 Internal & External Communication Channels

A partner protected web-based environment has been set up at ECMWF that includes a document repository and acts as the project’s collaborative platform. We maintain an access list for the internal pages of CATRINE’s Confluence wiki which is our collaborative platform. The CATRINE website acts as the main location to showcase all project information and outputs. The details of this are described in section 3.1.1.

2.3 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 CATRINE project (grant agreement 101135000) 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 CATRINE’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.

2.4 Visual Identity of CATRINE

CATRINE builds on a strong, recognisable visual identity, in line with contemporary standards and easily insertable in partners’ communication material. Previous projects CHE, CoCO2 and CORSO have contributed to developing the visual logo for this project CATRINE. As there is a strong tie to the CAMS community the colour palette chosen for CATRINE is linked to those efforts as the outputs of CATRINE are directly relevant to them.

2.5 Logo type

The chosen CATRINE logotype is composed of a pictogram, the project’s acronym, and a short tagline, “Carbon Atmospheric Tracer Research to Improve Numerics and Evaluation”. The tagline gives the full project name and is short enough to be integrated in the logo and bring immediate understanding of the addressed topic.



Figure 1 : the colour schemes of the CATRINE logo

The logo should appear unaltered (scale, colour, and appearance) and in a prominent position (first page of documents, all slides in presentations, etc.) in every document or material produced internally or externally. The same applies for deliverables produced during the project. The various forms and file formats of the logo as well as the visual identity guidelines are available on the project's internal Confluence Wiki.

All partners in both their internal and external communication should adhere to these guidelines to maintain a consistent identity and build awareness.

3 The Dissemination Plans

As per the DoA, CATRINE’s 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. Participation at Workshops, webinars 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, metadata)
 - b. Algorithms / Specifications
 - c. Graphics and animations
3. Progress information through provision of
 - a. News articles to relevant sources
 - b. Public Deliverables
 - c. Dissemination Materials (posters, flyers)
 - d. Website and social media

Table 3 provides information on the CATRINE Dissemination (and Communication) Targets. These targets also link to the CERISE Media and Communication plan, in following chapter.

Table 3: Dissemination Targets

Target audience	Communication/ Dissemination Means	Responsibility
European Commission, CO2 Task Force, EU Member States (incl. policy makers)	Dissemination: <ul style="list-style-type: none"> ○ Workshops and resulting reports ○ Policy briefs Communication: <ul style="list-style-type: none"> ○ Project news ○ Tailored updates on the results ○ CATRINE website 	ECMWF with support from all partners
Scientific community	Dissemination: <ul style="list-style-type: none"> ○ Peer-reviewed scientific papers ○ CATRINE data portal Workshops <ul style="list-style-type: none"> ○ Conferences ○ Communication ○ News articles (web based) 	All partners
Satellite agencies, technology providers	Dissemination <ul style="list-style-type: none"> ○ CATRINE data portal Communication <ul style="list-style-type: none"> ○ Targeted publication material ○ Link with relevant H2020, Horizon Europe, and other initiatives ○ Representation at relevant conferences and fairs ○ Newsletters 	All partners
General public	Communication <ul style="list-style-type: none"> ○ General Information Material ○ CATRINE website ○ Project news/ News articles ○ Dissemination Material 	ECMWF with support from all partners and in close collaboration with the European Commission (HaDEA and DG-DEFIS).

3.1 Dissemination Instruments

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

3.1.1 CATRINE Website

The CATRINE website (www.catrine-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.

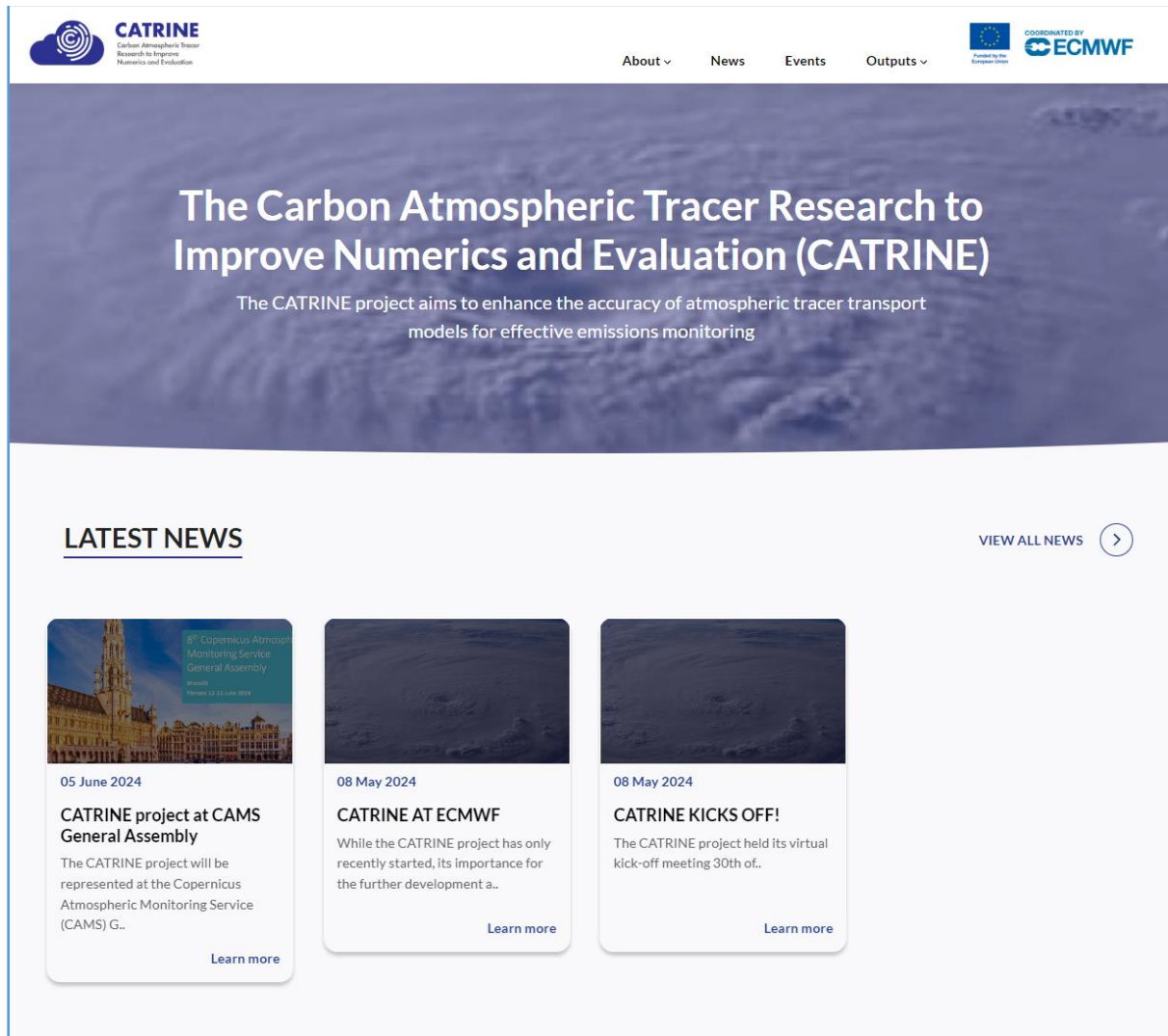


Figure 2 Screenshot of the home page of CATRINE website

The CATRINE 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 similar, when they become available.

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

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

3.1.2 CATRINE Journals, Conferences and Workshops

Strong engagement with the academic sector and national meteorological agencies will promote the work performed in CATRINE 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 CATRINE and related topics at relevant scientific conferences and workshops (e.g., EGU, TransCom, IG3IS, G3W), and by the general process of CATRINE scientists attending and presenting seminars and engaging in discussion at universities and research institutes. Conferences and Workshops of interest for CATRINE include:

- European Geoscience Union General Assembly
- International Workshop on Greenhouse Gas Measurements from Space (IWGGMS)
- CAMS, CORSO and CAMEO General Assemblies
- American Geophysical Union Fall Meetings
- ICOS Science Conference
- WMO/G3W workshops
- UN Climate Change Conference
- TransCom workshops
- ESA Conferences
- CNES Conferences

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

- Atmospheric Chemistry and Physics (ACP) <https://www.atmospheric-chemistry-and-physics.net/>
- Geoscientific Model Development (GMD) <https://www.geoscientific-model-development.net/index.html>
- Earth System Science Data (ESSD) <https://www.earth-system-science-data.net/>
- Biogeosciences (BG) <https://www.biogeosciences.net/>
- Earth System Dynamics (ESD) <https://www.earth-system-dynamics.net/>
- Journal of Advances in Modeling Earth Systems (JAMES) <https://agupubs.onlinelibrary.wiley.com/journal/19422466>

It is envisaged that over the course of the project, and for up to one year after project closure, a minimum of 6 peer-reviewed, co-authored (journal) publications will be produced covering the topics of the scientific-technical work packages of the CATRINE project (WPs 1 to 8). In addition, regular conference and workshop attendance with talks on topics from CATRINE will complement these publications.

3.1.1 Scientific Committees

The representation of ECMWF and project partners in international committees and the TransCom model intercomparison exercise led by CATRINE will be used as a channel for

disseminating CATRINE results and output in the weather and climate prediction communities, in particular to support of the CAMS CO2MVS capacity. Scientific results from CATRINE will be conveyed to pertinent international programmes and bodies eg the WMO GGGW programme. Finally, progress and results will be directly shared with the European Commission and its CO2 Task Force that supports the Commission with planning the development of a future CO2 emission monitoring system. The CO2 Task Force and the TransCom Community will act as informal External Advisory Board for CATRINE. This will directly and indirectly ensure that the advice resulting from the CATRINE project will inform policy makers in Europe and beyond. The close interaction with the Task Force will also ensure that any guidance coming from it can be taken into account during the CATRINE project.

3.1.2 Other Instruments

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

- Web / wiki pages
- Dissemination of information through relevant social media of existing entities like C3S/CAMS and project partners.
- 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 the Horizon Europe project CORSO, CAMEO and CAMAERA, as well as the Copernicus Services relevant, CAMS and C3S with their annual General Assemblies.

The products of CATRINE will comprise reports, graphical displays, datasets and improved methods, algorithms and code. All these elements have their own important role. Reports are mostly targeted at informing the Commission and its Task Force 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 CATRINE project has finished.

All mature data products of CATRINE will be made publicly available to maximize the uptake by the scientific community. These include the results from the various modelling studies (depending on maturity). It is envisaged to make use of several parallel data portals to ensure full visibility of the datasets.

4 Exploitation Plan

Exploitation has various meanings, however 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 CATRINE GA (Article 16), 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.

4.1 Exploitation Targets

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

“CATRINE will use existing modelling and inversion infrastructure (after further improvement where needed) to investigate and develop the specific aspects of the CO2MVS that need to be addressed as part of this Call. The important outputs of CATRINE are therefore new data sets, reports and peer-reviewed articles describing new algorithms and methodologies, and specific developments in the global and local models and data assimilation systems. Although various developments within CATRINE 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 Copernicus CO2 and CH4 emission monitoring service element, which is normally done through competitive Invitations To Tender (ITT). 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 will be exploitation targets. Science communities include those related to CO2 and CH4 monitoring, atmospheric monitoring, as well as the wider weather and climate modelling communities. This is especially relevant for any parallel or future studies related to the development of the future CO2 emission monitoring system as initiated by the European Commission and/or the European Space Agency. There may in addition be some exploitation of CATRINE products in the other activities undertaken by partners in the consortium operating CATRINE.”

4.1 Exploitation Activities and Routes

In attempting to gather an overview of the exploitation intentions of the partners, and to identify potential exploitation actions, a questionnaire will be circulated to each partner.

The following questions will be included:

Exploitable Results

Which deliverables from CATRINE do you intend to exploit?

CATRINE

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 CATRINE to test whether outputs are exploitable?

Products resulting from Exploitation

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

Exploitation Activities during the CATRINE project

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

Exploitation Activities after the CATRINE project

What exploitation activities do you plan to perform post- CATRINE 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 CATRINE 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 6 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 CATRINE, and to actively consider potential routes and related exploitation activities.

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.

Based on the responses to the questionnaire, the following table summarises the findings (Table 4).

Table 4: Summary of Exploitation Findings

Exploitable Products	<ul style="list-style-type: none">• New benchmarking datasets based on computationally expensive schemes that will help evaluate and tune further numerical models• High-resolution multi-model multi-tracer simulations, which will extend into a new international TransCom tracer transport model inter-comparison exercise at local and global scales.• New metrics to assess tracer transport model errors• Test beds with detailed diagnostics and evaluation metrics, supported by field campaign observations and operational observing networks.• Reports with recommendations for the implementation of
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	the Copernicus CO2MVS
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. Several of these datasets are innovative and should create significant interest. • Project reports with recommendations will support uptake/implementation activities in CAMS, C3S, and potentially other frameworks, already during the project.
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. Several of these datasets are innovative and should create significant interest. • Project reports with recommendations will support uptake/implementation activities in CAMS, C3S, and potentially other frameworks.
Consortium-wide/Joint Exploitation	<ul style="list-style-type: none"> • While outputs will be shared publicly as much as possible through documentation and peer-reviewed literature, the project will also support its consortium members to be better prepared for any upcoming CO2MVS implementation ITTs.

The activities during the project will now 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 an Association) after the end of the project are unlikely, due to the nature of this research project CATRINE. Nevertheless, a number of items (especially the use in the CO2MVS prototype) have been identified and will be further investigated as to the possibilities for direct joint exploitation, e.g. through joint responses to other funding opportunities.

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.

5 Conclusion

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

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

Initial exploitation ideas have been collated in this document, complemented by the identification of exploitation activities. Work Package leaders can now use this information to steer the activities towards innovation 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.

The CATRINE Media and Communication plan has also been initiated in this deliverable. Whilst this provides a good starting point for the engagement activities of the CATRINE project, it nevertheless needs careful reflection and updating when appropriate to ensure that new developments (technical as well as strategy) within the CATRINE project are well reflected by the communication plan.

Document History

Version	Author(s)	Date	Changes
0.1	Tanya Warnaars (ECMWF)	May 2024	Initial version for internal review
1.0	Tanya Warnaars, Rhona Phipps, Anna Agusti-Panareda, Michail Diamantakis	May/ June 2024	First Issued version

Internal Review History

Internal Reviewers	Date	Comments
Stefan Versik (KIT), Andreas Christen, (UFR)	June 2024	Made a few corrections and some comments.

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