



Data  
Models  
Inventories

# PARIS

Process Attribution of Regional Emissions

GA 101081430, RIA

## Dissemination and Exploitation Plan

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### Deliverable D1.4

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D1.4 – Dissemination and Exploitation Plan

## 1. Changes with respect to the DoA (Description of the Action)

The deliverable D1.4 belongs to work package WP1 (management). It was initially not included in the Grant Agreement and amended on request of CINEA. A first version of the “Dissemination and Exploitation Plan” (DEP) is due in project month 24, and an updated DEP is due in project month 36.

Since this is the first version of the DEP, it describes the strategy outlined in the Grant Agreement, including the activities which already have taken place.

## 2. Dissemination and uptake

The PARIS deliverable “Dissemination and Exploitation Plan” will be publicly available through the PARIS website (<https://horizoneurope-paris.eu>) and the CORDIS website (<https://cordis.europa.eu>).

## 3. Objective and short summary of results

The PARIS project aims to improve national reporting of greenhouse gas (GHG) and short-lived climate forcer emissions through the integration of top-down and bottom-up methodologies. Table 1 gives an overview of specific needs, expected results and measures to reach out to our target groups.

**Table 1:** Summary of needs, expected results and measures related to communication, dissemination, and exploitation

SPECIFIC NEEDS	EXPECTED RESULTS	D & E & C MEASURES
Robust evaluation of national greenhouse gas and short-lived climate forcer emissions inventories	New top-down and bottom-up national flux estimates for wide range of species for which estimates were previously unavailable. For methane and carbon dioxide, new methods for source sector flux attribution.	<b>Dissemination:</b> Annexes to National Inventory Reports for submission to the UNFCCC for eight focus countries. Scientific publications and open publication of data. Continued participation in scientific assessment reports (WMO, IPCC, etc.). Workshop or conference session hosted jointly with other projects funded under this call and IG3IS, TransCOM, etc. Continued input to IPCC reporting guidelines. <b>Exploitation:</b> Annexes to National Inventory Reports. Long-term engagement of PARIS team in national inventory refinement processes. Knowledge exchange between PARIS team members from countries with wide range of expertise and levels of engagement with inventory process. Open publication of data and analysis tools
Expanded capacity to make measurements and carry out atmospheric and process modelling to support top-down and bottom-up emissions evaluation	New measurements in countries previously sparsely sampled. Application of state-of-the-art modelling tools across PARIS consortium.	<b>Communication:</b> Open access publications, open data (FAIR principles), publication of analyses. Publicly accessible data visualisation tools and explanatory resources. Public-facing summaries of PARIS outcomes (news releases, blogs, etc.). Sharing of resources and public updates through website and social media.
TARGET GROUPS	OUTCOMES	IMPACTS
<b>National inventory compilers</b>	New top-down and bottom-up constraints on national inventories, draft Annexes to National Inventory Reports	Refined national inventory estimates, ultimately resulting in more robust, accurate national GHG emissions estimates. Draft Annexes for direct inclusion in NIRs, if desired. Top-down and bottom-up methods embedded in inventory refinement process.
<b>Parties to the Montreal Protocol and UNFCCC</b>	Data and analyses that will inform future Assessment Reports by WMO, IPCC, etc. on, for example, the efficacy of regional and global climate policies such as the Kigali Amendment to the Montreal Protocol.	Improved decision making through the provision of more robust, accurate regional flux information.
<b>National policymakers</b>	Evaluated national emission estimates	New data with which to evaluate and modify national climate change mitigation policies.
<b>Climate science community</b>	Improved understanding of anthropogenic and natural fluxes	More accurate estimates of current emissions of climate forcers that can underpin improved future projections

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Specific goals include evaluation and refinement of national GHG inventories, developing top-down and bottom-up national flux estimates for previously unmeasured species, and improving source sector flux attribution methods. In PARIS, we will translate these scientific results into draft Annexes to National Inventory Reports (NIRs) for submission to the UNFCCC for eight focus countries. This is accompanied by active contribution to key scientific assessment reports such as those by WMO and IPCC to inform global climate discussions.

The outreach strategy of PARIS aims to inform the target groups, actively disseminate the results achieved by the project and ensure exploitation of its products.

## 4. Evidence of accomplishment

### 4.1 Introduction | Background of the deliverable

PARIS is a science-focused project, and the Dissemination & Exploitation strategy is directed to this.

The main evidence of impact from PARIS is the annual production of draft Annexes to the National Inventory Reports (NIRs) by the PARIS team. The key stakeholders are, alongside researchers from related disciplines, the national inventory teams in the UK, Switzerland, Germany, Netherlands, Ireland, Hungary, Italy and Norway. The Annexes are the overarching results of PARIS and will describe top-down emission rate estimates derived from atmospheric observations and their comparison with the bottom-up estimates. The aim of the Annexes is to highlight and communicate the areas of agreement and disagreement, both spatially and temporally, by gas or by sector, in the context of estimated uncertainties. These Annexes will be used to start an in-depth dialogue with the inventory experts to reconcile these differences.

This Dissemination & Exploitation Plan (DEP) outlines the strategies for outreach and use of data with a focus on the Annexes and the key stakeholders. It also includes the project communication strategy to maximize the project's impact on GHG reporting and assessment practices by fostering cross-sector collaboration and ensuring transparency.

The timing of the Annexes also constrains the timing of parts of the outreach activities, as the top-down results will be presented with a time lag of about half a year (after completion of a yearly measurement dataset) and can provide a 'forward' look for inventory teams, who operate 1-2 years behind real time.

The PARIS outreach strategy will proceed in parallel to the scientific programme. Data and scientific outputs will be presented to the public and stakeholders through e.g. open data tools, news releases, the project website, or social media.

### 4.2 Scope of the deliverable

We present the wider dissemination plan, split by products and datasets, reports, international assessments, conferences and publications.

## 4.3 Content of the deliverable

### 4.3.1 Communication – Inform, promote and communicate activities and results

#### 4.3.1.1 Collaboration with other European projects and initiatives

From the start of the project, PARIS has initiated online and in-person meetings with the PIs and work package leads of the other two projects funded under this call, AVENGERS and EYE-CLIMA, to determine common research goals and consolidate the research plans in areas of overlap. This has led to scientific collaborations and joint outreach activities as described in the 1<sup>st</sup> Periodic Report, which will be continued during the lifetime of the project.

The collaboration has been particularly intensive regarding a common outreach strategy, and as a "consortium of consortia" the projects have linked up with other large initiatives in Europe, particularly the Copernicus Atmospheric Monitoring Service (CAMS) and the International Carbon Observation System (ICOS). This way, the projects streamline their outreach activities across the individual projects and related projects such as CORSO (<https://corso-project.eu>, funded under HORIZON-CL4-2022-SPACE-01-42 "Copernicus Anthropogenic CO<sub>2</sub> Emissions Monitoring & Verification Support (MVS) capacity"). This effective and intensive collaboration has resulted in common presentations, posters, webinars and newsletters.

#### 4.3.1.2 Foster collaboration with international programmes

PARIS is actively engaging with several international programmes. These collaborations include communication, but also dissemination and exploitation activities.

**AGAGE** - Several of the PARIS team members are also members of AGAGE (Advanced Global Atmospheric Gases Experiment), a global F-gas measurement network. The PARIS F-gas measurement network links with AGAGE to extend F-gas observations across Europe. The AGAGE project meets every six months, where updates from PARIS are presented. The PARIS team also works closely with other F-gas monitoring networks such as that operated by NOAA through existing links between AGAGE and NOAA. GUF and UNIURB are part of the EU infrastructure project ACTRIS and GUF is responsible within the EU infrastructure CARIBIC for global airborne measurements of F-gases. The new PARIS F-gas data will be integrated with these international measurement initiatives by the production of "obs-packs" which will be used in the inversions.

**Global Carbon Project** - PARIS team member WU is part of the Global Carbon Project's core team, coordinating the creation and synthesis of fluxes from atmospheric inverse modelling. This includes a substantial international community that produces results for the annual release of the widely used budgets for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O.

**TRANSCOM** - For several years, PARIS team members have been closely involved with TransCOM inverse model intercomparison projects, and have participated in or led, several TransCOM activities. TransCOM represents a particularly valuable network that can be exploited to disseminate the methodological developments made under PARIS. The PARIS team informs about and presents new PARIS datasets and modeling results at TRANSCOM and TRANSCOM related meetings.

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**WMO** - To ensure that the outcomes of PARIS feed into new international guidelines on GHG emissions evaluation, PARIS engages closely with the WMO Integrated Global Greenhouse Gases Information System (IG3IS). Three PARIS members are part of the IG3IS steering committee and represent PARIS outputs in ongoing IG3IS efforts to showcase top-down emissions evaluation and draft best-practice guidelines on national-scale emissions estimation. The initial version of the national guidelines will be published in 2025 (and led by PARIS members).

WMO is particularly interested in sharing a stakeholder workshop on top-down approaches with PARIS, EYE-CLIMA and AVENGERS, and preparations have started.

Exchange of information with the IGACs AMIGO-team will be established through existing contacts with AMIGO's PI's.

##### *4.3.1.3 Open data tools*

Data of Paris are publicly and freely accessible via the ICOS Carbon Portal. The data sets are communicated on the PARIS website (<https://horizoneurope-paris.eu/data/>), which also links directly to the data sets (see also chapter 4.3.2.2).

##### *4.3.1.4 Newsletters, articles and press releases*

PARIS produces a [joint newsletter](#), in collaboration with EYE-CLIMA, AVENGERS and CAMS (Copernicus Atmospheric Monitoring Centre). The newsletter is planned preferably bi-annual, including contributions of PARIS, EYE-CLIMA and AVENGERS. The frequency and timing of publication will be aligned with scientific output to ensure the newsletters as a valuable and useful dissemination activity. The next edition of the newsletter will be released in Spring 2025 to line up with advertising (joint) conference activities at the EGU 2025.

Alongside to the newsletter, PARIS will communicate public articles or press releases published by consortium members on the project website, as well as scientific articles.

##### *4.3.1.5 Website, webinars and social media*

At the outset of PARIS, a project website was created providing detailed information about PARIS and link to its products such as reports and data sets. Within the lifetime of the project the website will be used to present publicly accessible summaries of recent PARIS developments, advertise meetings, and host resources for stakeholders.

PARIS participates in the webinars coordinated by AVENGERS. The webinars organised via CMCC are recorded and available on the CMCC Youtube channel: <https://www.youtube.com/@CMCCvideo>.

Social media play a minor role as PARIS focusses its visibility on a scientific audience and related events such as scientific conferences, and personal interactions with inventory compiler teams. Project partners are encouraged to promote their activities on social media but the consortium is not fostering an overarching approach for PARIS as project. The PARIS account on X is not maintained anymore. This is in line with the policy of Utrecht University, affiliation of the coordinator.

## 4.3.2 Dissemination – make knowledge and results publicly available

### 4.3.2.1 Dissemination to national inventory teams through draft Annexes to the NIRs

Draft Annexes to National Inventory Reports will be compiled in a harmonised fashion across the eight focus countries of PARIS, coordinated by WP2 and publicly available as deliverable reports on the project website. To facilitate uptake, PARIS aims to follow UNFCCC naming conventions. The production of these draft Annexes will be streamlined in time with the annual cycle of reporting to the UNFCCC. This means that such meetings will take place in the last quarter of each year. The producers of the draft Annexes within PARIS will hold annual meetings in the autumn with the inventory teams from each individual focus country, together with a representative from the PARIS consortium from the same country, acting as contact point. This is done to establish long-lasting in-country collaborations and a possibility for feedback and further interaction within each country.

### 4.3.2.2 Products and Datasets

PARIS will produce a variety of new measurements and other products and datasets. These include expanded measurements of fluorinated gases (F-gases) across Europe, extending coverage to Germany, the Netherlands, southern Italy, southern Norway, and Hungary. Additionally, there will be enhanced continuous methane isotopologue measurements at various European sites to verify sectoral emission inventories, as well as new atmospheric N<sub>2</sub>O measurements from Hegyhátsál, Hungary. The initiative will also expand ICOS capacity for atmospheric potential oxygen (APO) monitoring through coordinated new and continuous instruments in the UK and Benelux, along with new organic matter (OM) and black carbon (BC) measurements from Dublin, Ireland. In addition to the measurements, a large amount of model data will be generated.

These data will be disseminated via the ICOS Carbon Portal or the EBAS portal for aerosols (for ACTRIS). Annexes to National Inventory Reports (NIRs) will be incorporated into a country's NIR submission if requested or archived through the ICOS Carbon Portal and the PARIS website.

### 4.3.2.3 Reports

In addition to producing new datasets, model results, and emissions estimates and inventory report annexes, PARIS will generate several deliverable and milestone reports synthesizing insights gained throughout its duration. One key output will be annual inventory engagement feedback reports, coordinated by WP2, which will document the outcomes of meetings with inventory compilers, highlight focus areas for inventory teams, and share lessons learned from the previous year. These reports will be integrated into a user requirement document (URD) at the end of the second iteration of the interaction cycle with inventory compilers. It will summarize the main lessons from PARIS regarding the co-production of annexes to National Inventory Reports (NIRs) with inventory teams and monitoring services. This URD will be submitted to the WMO IG3IS project for potential inclusion in the development of WMO guidelines for national-scale top-down emissions estimation.

All reports will be published on the project website.

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##### *4.3.2.4 Scientific assessments and synthesis efforts*

The outcomes of PARIS are important to future IPCC Assessment Reports, and refinements to IPCC emissions reporting guidelines. PARIS team members have served as lead authors of World Meteorological Organisation (WMO) Scientific Assessments of Ozone Depletion and other reports commissioned by the major panels of the Montreal Protocol. Results on European F-gas emissions will fill key knowledge gaps relevant to European HFCs and will be important for the 2024 and 2028 Assessments.

The PARIS consortium has carefully chosen its Scientific Advisory Board (SAB) to advise on how to increase the impact of the results with respect to assessments and synthesis efforts. The Scientific Advisory Board consists of members from NOAA, EEA, EDF, and GNS Science, and is invited to the Annual Consortium Meeting to provide PARIS with feedback.

##### *4.3.2.5 Symposia, conferences and workshops*

PARIS results are and will be presented at numerous (inter)national conferences (EGU, AGU, NCGG, etc.), related project events, and national inventory steering committee workshops. In addition, in collaboration with the other projects funded under this call, PARIS will organise a dedicated splinter meeting at one of the international conferences.

##### *4.3.2.6 Scientific publications*

PARIS will publish all outputs in open-access journals with a CC-BY license, following EC guidelines. This will ensure that PARIS developments can be used by other researchers, the public and the private sector.

### **4.3.3 Exploitation – make concrete use of results for dedicated purposes**

##### *4.3.3.1 Long-term legacy of collaboration with inventory compilers*

Establishing intensive interaction and collaboration between national inventory teams and in-country scientists, is fundamental to the long-term exploitation of PARIS goals beyond the life of the project. The UK and Switzerland have demonstrated how these long-term collaborations can be built, and the design of the PARIS work programme follows from the experience of these countries. Through WP2 and the provision of draft annexes to national inventory reports, PARIS aims to embed the key outcomes of PARIS in the annual inventory process, resulting in a long-term legacy. In collaboration with the inventory teams, PARIS will establish a process of interaction to allow a comparison between the results of various groups and a consistent interpretation.

##### *4.3.3.2 Knowledge transfer*

The PARIS core team and wider network of partners originate from countries with a wide range of expertise in top-down and bottom-up emissions evaluation, atmospheric measurements and modelling, and levels of engagement with national inventory teams. PARIS is designed to ensure that best practices can be shared between team members and outside collaborators, so that the most successful elements of the PARIS work programme can be continued by team members beyond the lifetime of the project, through future national or international projects, and ideally as part of the national inventory reporting



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process (see 4.3.3.1). PARIS will provide Jupyter Notebook (accessed through GitHub), using harmonized data formats, which can allow external users to build on the progress made in PARIS. PARIS team members are part of several European and international projects (e.g., CAMS, AGAGE, ACTRIS, CARIBIC), which will benefit from the new knowledge generated in the project.

##### *4.3.3.3 Exploitation by wider scientific community through open data sharing*

To ensure that the wider scientific community can fully exploit the unique datasets generated in PARIS, the consortium will ensure that all data generated will be fully open access and well documented. Furthermore, the PARIS team members have a track record for publishing open data analysis tools (e.g., the ICOS Carbon Portal, the OpenGHG project, AGAGE global data analysis methods). The consortium will continue this tradition within PARIS to ensure that external researchers have access not only to data, but also to the novel analysis methodology generated in the project. Such open-source publishing of analyses is now considered best practice for several prominent journals and will enhance the accessibility and reproducibility of our planned suite of scientific publications.

#### 4.4 Conclusion and possible impact

The PARIS consortium has outlined a clear communication, dissemination and exploitation strategy, which will be implemented during the lifetime of the project to ensure impact beyond. The strategy is tailored to the identified target audience, and outreach activities will benefit from the experience of the consortium and its embedding in the scientific community.

#### 4.5 References

Products and activities are available on the project website (<https://horizoneurope-paris.eu>), the ICOS Carbon Portal, and the channels mentioned in this deliverable report.

## 5. History of the document

Version	Author(s)	Date	Comments
1	S. Walter	3 October 2024	First set-up, collection of questions to be discussed within the PARIS MT group
		29 November	Final draft sent for feedback
		December	Feedback rounds
		21 January 2025	Finalise and submit