



EYE-CLIMA
Verifying emissions
of climate forcers

First Update to Communication dissemination, and exploitation plan

DELIVERABLE 5.2

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Summary

Communication, Dissemination and Exploitation of project results are key elements in the implementation of Horizon Europe projects. The present report defines and describes activities specific for the EYE-CLIMA project to maximize the project's visibility and impact. With the overall project aim of developing observation-based verification of greenhouse gas and black carbon inventories, activities described here cover these three elements: (1) the way general project information is provided to target audiences including the public and the press, e.g. via web access or social media (communication); (2) sharing project results and getting them endorsed via scientific exchange, as well as initiating further research by open access data availability, while at the same time elucidating the results and their implications in the form of policy briefs (dissemination); (3) creating a product of value to stakeholders, specifically as an improved methodology for the verification of greenhouse gas (and black carbon) inventories (exploitation). This report extends on the general approach already described in an earlier version submitted at month 6 (D5.1), based on experience of the first project phase, and reflecting refinements by coordinating outreach among Horizon Europe research projects in the same field. It also adds detail to planned exploitation, e.g. including industry among potential end users of data products. A further update is foreseen closer to the end of the project (month 36), including refinements based on the first implementation of project results.



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Abbreviations / Acronyms

ACTRIS	Aerosol, Clouds and Trace Gases Research Infrastructure
AKI	Annual Kigali-Index
AVENGERS	Attributing and Verifying European and National Greenhouse Gas and Aerosol Emissions and Reconciliation with Statistical Bottom-up Estimates – project funded under the Horizon Europe programme
BC	Black carbon (aerosol component)
CH ₄	Methane (greenhouse gas)
CINEA	European Climate, Infrastructure and Environment Executive Agency
CLRTAP	Convention on Long Range Transboundary Air Pollution (“Air Convention”)
CO ₂	Carbon dioxide (greenhouse gas)
CoCO2	Prototype System for a Copernicus CO ₂ Service – project funded under the Horizon 2020 programme
EC	European Commission
EU	European Union
F-gases	Fluorinated compounds (class of greenhouse gases)
GCP	Global Carbon Project
GGGW	Global Greenhouse Gas Watch
GHG	Greenhouse gas
GRA	Global Research Alliance on Agricultural Greenhouse Gas Emissions
ICOS	Integrated Carbon Observation System
IG ³ IS	Integrated Global Greenhouse Gas Information System
IMEO	International Methane Emissions Observatory
IPCC	Intergovernmental Panel on Climate Change
N ₂ O	Nitrous oxide (greenhouse gas)
NGHGI	National greenhouse gas inventory
PARIS	Process Attribution of Regional emISsions – project funded under the Horizon Europe programme
RECCAP	Regional Carbon Cycle Assessment Program
TFTEI	Task Force on Techno-Economic Issues under the Convention
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change



1. Introduction

Scope of the EYE-CLIMA project

The current methodologies for reporting national greenhouse gas (GHG) emissions to the UNFCCC are detailed in the IPCC Guidelines for National Greenhouse Gas Inventories (NGHGs). The guidelines describe three tiers of methods for bottom-up inventories: Tiers 1 and 2 use emission factors applied to activity data, with the difference being that Tier 2 uses more specific emission factors, while Tier 3 involves the use of more complex models. While these methods for reporting emissions are designed to follow the principles of transparency, consistency, comparability, completeness, and accuracy, they still are associated with significant uncertainties (as a rule of thumb, the lower the tier the higher the uncertainty). As in any scientific method, the use of independent data to validate (“verify” in IPCC nomenclature) is needed to ascertain results that otherwise are based mostly on statistical data. Here measurements of atmospheric concentrations are valuable, in particular, as the concentrations determine the radiative forcing, which is the key factor to be monitored and mitigated.

Changes in atmospheric concentrations represent the integrated effect of human emissions, natural fluxes, atmospheric transport, and any atmospheric production and loss. By accounting for atmospheric production and loss, changes in concentrations can be used to constrain human emissions and natural fluxes - this is referred to as the top-down approach. Using a model of atmospheric transport and chemistry, changes in concentrations can be used to infer spatially and temporally resolved fluxes – a method known as atmospheric inversion (Rodgers, 2000). The top-down approach has the advantage that it links emissions to changes in atmospheric concentrations and thus to their radiative forcing and climate impact. There is a growing interest in top-down verification methods and in the 2019 refinement of the IPCC Guidelines, the use of atmospheric observations as a means to verify NGHGs has been highlighted. However, the technical complexity and the hitherto limited spatial and sectoral resolving power of atmospheric constraints makes it challenging for NGHGI compilers to adopt this type of verification and to see its utility.

EYE-CLIMA addresses the need for independent verification of NGHGs by developing top-down methods based on atmospheric inversion (using both satellite remote sensing and ground-based observations) to a level of readiness where they can be used to determine emissions at national and sub-national scales and be incorporated into NGHGs. In addition, EYE-CLIMA works closely together with NGHGI compilers, in particular, through pilot projects, to determine what data products they need for verification and to develop a system of verification and reconciliation of NGHGs that they can use.

EYE-CLIMA will support European and national policies through its top-down emissions estimation methodology and verification of NGHGs. In particular, the European Union (EU) has pledged to reduce its GHG emissions with a set of policy initiatives known as the Green Deal, which aim to reduce GHG emissions to net zero in 2050, with the interim target of reducing GHG emissions by 2030 by at least 55% compared to 1990 levels. The European Commission (EC) has outlined strategies to reduce GHG emissions across all sectors: energy, transport, agriculture, waste and industry. In addition to emissions reduction, the strategy includes carbon sequestration by the land biosphere, with the aim to at least maintain but preferably enhance this sink through improved land management practices (EU Forest Regulation). The EU has also signed up to the Methane Pledge, an international initiative to reduce methane (CH₄) emissions and aims to reduce emissions by at least 30% by 2030 with respect to 2020 levels, in particular, by reducing emissions associated with fossil fuel use and agriculture. To support the implementation of these policies and monitor their efficacy, accurate estimates of the emissions are needed in each of these source categories and at national scale for all EU countries. Without this, it cannot be known if policies are working and precious time and EU taxpayer money could be wasted and ultimately the EU’s goal of mitigating climate change could be put at risk.



The need for a communication – dissemination – exploitation strategy

While EYE-CLIMA aims to develop top-class science results, such results will not benefit society unless they are being shared with others who pick-up and use the methods and/or carry the ideas and methods forward. As in the metaphor of “standing on the shoulders of giants”, any scientific discovery is both based on previous information shared and on further activities that make sure these results are being used. Without making use of the results, these may get lost and the effort on the project will be misspent. Facilitating the use of project results can be done passively in a wait-and-see fashion or can be pursued actively via a strategy. In line with EC’s objectives under Horizon Europe, EYE-CLIMA will take an active approach that strategically develops its activities in communicating, disseminating and exploiting project outcomes. The strategic considerations of the respective approaches to share the project outcomes with the world, the project outreach, are the topic of this report.

Definitions of terms

In developing these outreach activities, EYE-CLIMA strives to keep closely aligned to the definitions developed by the EC for Horizon Europe. This is relevant specifically as to distinguish the activities and strategies directed to address communication, dissemination and exploitation.

Communication refers to activities to inform others about the project and its results where “others” can refer to the stakeholders or the general public, who have varying levels of interest and understanding of the research and its implications.

Dissemination is the sharing of results and knowledge to others who may be able to take advantage of them, without conditions attached. Dissemination may involve an element of reciprocity, i.e. project participants engaged in sharing may at the same time benefit from information attained elsewhere. Joint development with stakeholders may start here.

Exploitation covers the implementation and uptake of the knowledge and results obtained from the project for making concrete use. This may include the development of a product (e.g. software, methodology). Involving stakeholders in that development will most likely lead to greater uptake and utility of a product.

EYE-CLIMA stakeholders and strategic involvement

EYE-CLIMA project partners identified a number of stakeholders and stakeholder groups that would be specifically relevant to involve. Table 1 provides an overview of these stakeholders and provides the strategic reasons why they are considered relevant for the project. While overlaps exist, the table also indicates in which category of outreach the strongest interaction with project activities is expected, as to properly match stakeholders and activities.



Table 1: EYE-CLIMA stakeholders

Stakeholder	Expected outcome	Forms of outreach
Scientifically interested public	Promoting EU research activities, informing about research related to climate and the Green Transition	Communication
Press (traditional media)	Raising awareness among stakeholders, especially the general public	Communication
Scientists	Providing critical feedback to approaches and results, uptake of project methods and results	Dissemination, Exploitation
Junior scientists	Training towards independently performing research in this or related projects (such as PARIS, AVENGERS), uptake of project results	Communication, Dissemination, Exploitation
Policy makers	Using project results as instruments to develop, to harmonize and to monitor climate policy, guiding the development of such instruments	Communication, Dissemination, Exploitation
Inventory agencies	Applying inverse modelling methods and results for GHG inventory verification	Communication, Dissemination, Exploitation
International agencies and institutions	Employing EYE-CLIMA's methodologies and results in international guidelines and agreements	Communication, Dissemination, Exploitation

Timing of initiatives

EYE-CLIMA outreach activities (communication, dissemination and exploitation) consider progress to be achieved within the project, but also take account of long-term global developments of climate policy. Consolidating these two elements will require fine-tuning throughout the duration of the project. Hence, also this report constitutes an update of an earlier plan (submitted as D5.1 at month 6). Later in the project, it will be replaced by the final version of the outreach report, due in month 36.



2. Communication

Purpose and users

In its communication strategy, EYE-CLIMA aims to inform the general public as well as stakeholders on (i) the way EU research funds are being made use of, (ii) the success (and limits of success) of climate policies, scientifically underpinned and hence with a claim of objectivity, and (iii) opportunities to increase the trust and the confidence in GHG (and black carbon) emission information as well as in the measures taken to mitigate such emissions. Informing the general public also involves targeting specific interest groups and organizations that may act as multipliers, who are able to pass the message on to a considerable fraction of the public through their own activities.

Among such groups, EYE-CLIMA aims to specifically address and collaborate with journalists of traditional news media (press, radio, TV, but also more modern channels, e.g. podcasts).

Furthermore, the following public interest groups have been identified, which in part derive from civil society movements to tackle climate change: Fridays for Future; Scientists for Future; the European Environmental Bureau; but they in part also extend into the relevant institutional networks, such as the European Climate, Infrastructure and Environment Executive Agency (CINEA).

Communication channels will also be useful to raise awareness of EYE-CLIMA topics among those stakeholders who are expected to collaborate more closely with the project, e.g. scientists, inventory agencies and policy makers.

Tools

Sharing general information on EYE-CLIMA first of all takes advantage of the project website, accessible at <https://eyeclima.eu>. The top page (homepage) is displayed in Appendix 1. The website not only provides a general description of EYE-CLIMA's activities, but it also acts as the repository for publicly accessible reports, including project deliverables. Furthermore, it employs a contact form to encourage more specific requests. Further plans include to host online interactive graphics so that users can explore the emissions of CO₂, CH₄, N₂O, F-gases and BC, e.g. compare observation-based emission trends with nationally reported emissions (based on NGHGs) as well as pledged reductions.

In its interaction with social media, EYE-CLIMA builds from the experience in other projects that establishing an own user profile not only is very time-consuming, it also requires significant investments in terms of attractive messages to become established. Hence, EYE-CLIMA decided to take advantage of existing user profiles of partners (NILU, CICERO, IIASA) and individual scientists (such as Glen Peters who operates a widely visible X (formerly Twitter) profile) that already are well established and therefore have a much broader reach than any new individual profile would have. The project's visibility will be assured by consistently using the #EYECLIMA handle in all appearances in media such as X or LinkedIn.

Accompanying certain types of scientific publications (those that are considered particularly relevant), EYE-CLIMA will, in collaboration with the respective press offices of the participating institutions, develop press releases aiming to guide journalists to engage with project results. EYE-CLIMA scientists will take advantage of past engagements with journalists interested in climate policy topics and use such contacts to disseminate information on its results but will also distribute them through, e.g. Alpha Galileo (a science news service). Press releases will also be sent to news platforms covering environmental and science stories, such as Carbon Brief (<https://www.carbonbrief.org>), Inside Climate News (<https://insideclimatenews.org>) and Horizon Magazine (<https://ec.europa.eu/research-and-innovation/en/horizon-magazine>) as well as relevant national news platforms.



At the end of each project year, EYE-CLIMA will release an “EYE-CLIMA Outlook”, summarizing key findings and project outcomes in the preceding project year relevant to users to widen the awareness of the project and its outcomes.

In order to improve the project identity and “brand recognition”, standardized templates have been developed to harmonize the project outputs of Deliverables, Milestones, presentation slides and posters. These templates include the EYE-CLIMA logo and the appropriate funding acknowledgment and disclaimer. Details are available as Appendix 2 to this report, which itself is based on the deliverables template.

Beyond the concept of data sharing outside of the project, detailed procedures have been developed also to coordinate efforts within the project. This information has been made available as an internal document (Deliverable D6.1), while the handling of data in EYE-CLIMA is outlined and discussed in the Data Management Plan (Deliverable D6.2, updated as Deliverable D6.3).



3. Dissemination

Purpose and users

EYE-CLIMA will actively engage in sharing its results to a wide range of stakeholders. Here, the intention is to enable project results to be taken-up by others who can make good use of them. EYE-CLIMA hence will actively engage in open science practices as are also promoted by the EC.

The key partners and stakeholders for dissemination will be scientists and policy makers. Information flow in both cases will be bidirectional, such that EYE-CLIMA will benefit from early contacts and from feedback from either of these groups. Co-development of products (in terms of full understanding of the needs of users as well as clear communication on potentials and limitations of the tools provided) will be a true asset of such collaboration.

Even within these stakeholder groups, dissemination will be specifically targeted towards the respective interest and expertise of partners. Specifically, among scientists, the following groups are distinguished, recognizing that there are multiple overlaps:

Atmospheric inverse modellers: close collaboration has already been established among relevant project consortia under the Horizon Europe programme (with projects CoCO₂, AVENGERS and PARIS). This collaboration will enable cross-checking of results, as well as sharing and a refining of the methodologies. Outside this collaboration, improved methodologies and practice will help improve the quality and reliability of inverse modelling estimates.

Climate scientists: close interaction with the Global Carbon Project (GCP) will allow EYE-CLIMA data products to play a central role in the development of global and regionalized assessments of the GCP. The GCP publishes annual or biannual updates of global emissions of CO₂, CH₄ and N₂O, now also looking into regionalized as part of the Regional Carbon Cycle Assessment Program, RECCAP, and is exploring further climate variables, such as Black Carbon. Moreover, the GRA (Global Research Alliance on Agricultural Greenhouse Gas Emissions) will greatly benefit in devising emission reduction measures when emission information has been validated. In addition, the increased confidence in emission data clearly will improve the assessment quality of climate reports, such as those produced by the IPCC. EYE-CLIMA remains keenly interested to share results with the science community contributing to IPCC reports.

Atmospheric scientists: EYE-CLIMA focusses on the inversion of GHG and BC concentration measurements, but it also uses facilities built-up by the atmospheric research community such as the Integrated Carbon Observation System (ICOS), and the Aerosol, Clouds and Trace Gases Research Infrastructure (ACTRIS). Interaction with the ICOS and ACTRIS communities will help EYE-CLIMA understand the data quality and how best to use the data. At the same time EYE-CLIMA can provide modelling products to help them better interpret their data.

Young scientists: education and training is not only a key purpose for many of the project partners (especially partners that are universities), but also an essential activity to develop the expertise needed to work on the topics relevant to EYE-CLIMA in the future, whether as scientists, in policy or in inventory agencies. Feedback received from young scientists will help to optimize guidance on atmospheric inversion to be delivered to inventory compilers. These activities will go beyond the EYE-CLIMA scientists, for instance via specific training of and collaboration with young scientists working in the AVENGERS and PARIS projects.

Similarly, also among policy makers, there are groups that may be singled-out individually:

Climate policy experts: in order to implement legislation, policy makers need to understand the technical feasibility and the potentials and limitations of inventory verification. The effect of emission reduction



measures and the remaining “distance to target” need to be adequately understood, like also EYE-CLIMA needs to get a grip on policy needs (such as validating not only total emissions for a specific gas, but if possible also allow breakdown into economic sectors). Policy experts to be informed include those working on the EU level, but likewise national policy makers and experts contributing to the EU WG1.

Experts representing international conventions, specifically the UNFCCC and the CLRTAP. Adding independent verification to inventories as an extra tool is of obvious interest to negotiators under the Climate convention, but due to their relevance in European policy making also the experts contributing to the Air Convention are to be involved (e.g. including the Task Force on reactive Nitrogen’s current activities to quantify interaction between agricultural methane and ammonia emissions).

Occasionally, separation between expert groups on policy and science is challenging. This is the case for the Climate and Clean Air Coalition operating under UNEP, or the Arctic Monitoring and Assessment Programme. Both institutions, in their mission, will support further aspects of monitoring and validating the emissions of GHGs.

Instruments and specific activities for information sharing

In order to satisfy the information needs of the diverse user groups, a considerable number of specific activities have been planned. These activities cover both science-to-science exchange and science-to-policy interaction.

Conferences: EYE-CLIMA scientists will attend a range of highly relevant scientific conferences and share initial results for interaction with fellow scientists. Participation in scientific meetings is essential to be up-to-date with the latest developments outside of EYE-CLIMA, but also to receive scientific feedback about research within EYE-CLIMA and to inform other scientists and policy makers about the project results. Table 2 covers the main targeted dissemination events in alphabetical order.

Journal publications: EYE-CLIMA will publish in renowned peer-reviewed journals with open access in the domains of atmospheric research, climate research, climate policy, and biogeosciences. Where a study warrants publication in a top journal, such as Nature or Science, for particularly high impact, an agreement from the lead author’s institute(s) to pay for open access (which is not an eligible cost to be charged to the project) will be needed before submission. If this cannot be agreed upon, then publication in an alternative but still high impact journal will be sought. The main journals where publications are foreseen are the European Geophysical Union (EGU) journals, such as Atmospheric Chemistry and Physics, Atmospheric Measurement Techniques, Earth System Science Data, Biogeosciences, and Geoscientific Model Developments, as well as other internationally renowned open-source journals such as Environmental Research Letters, and Scientific Reports. EYE-CLIMA takes advantage of the Zenodo repository (<https://zenodo.org/communities/eye-clima/>) for storage and central accessibility of Open Access publications and data (see also Updated EYE-CLIMA Data Management Plan, D6.3). Publications will be stored together with full bibliographic information and with their original Digital Object Identifier (DOI).



Table 2: Conferences targeted by EYE-CLIMA scientists (in bold those that have been used for EYE-CLIMA presentations already)

Event	Description
AGU Fall Meeting	Annual meeting typically held in San Francisco
EGU General Assembly	Annual meeting held in Vienna
ICOS Science Conference	Biennial meeting held at varying locations in Europe
International Carbon Dioxide Conference (ICDC)	Every four years; upcoming in July 2024, Manaus, Brazil
International Conference on Negative CO ₂ Emissions	Every two years with the next one in Oxford, June 2024
Non-CO₂ Greenhouse Gas (NCGG) Symposium	June 2023 in Amsterdam, the next one likely in 2026
International Global Atmospheric Chemistry Conference (IGAC)	Held every two years in different locations globally, the next one in Kuala Lumpur, September 2024
International workshop on greenhouse gas measurements from space (IWGGMS)	May 2024 in Boulder, likely to be repeated later during the project.
Scientific events at UNFCCC Conference of the Parties (COP)	Annually in different locations, the next one in Baku 2024

Data products: The flux datasets (including the uncertainties) from bottom-up modelling (WP2) and inverse modelling (WP3) will be made publicly available through an open access repository where the data will be stored under their own DOI to be easily referenced. They will be findable through the repository's data search tools (see also Updated EYE-CLIMA Data Management Plan, D6.3). For storing data products, EYE-CLIMA uses the Zenodo repository, an own "community" has been established as part of the EU Open Research Repository (<https://zenodo.org/communities/eye-clima/>).

Summer School: For young scientists, including those in the project, EYE-CLIMA will teach at the ICOS summer school and provide comprehensive information about top-down emission estimation and observation-based verification of NGHGs. The ICOS summer school, organized in Hyytilää, Finland, every two years (including 2023), will see enhanced contributions from EYE-CLIMA in summer 2025.

Policy reports: For policy makers, both at national and EU level, EYE-CLIMA will prepare two policy reports, specifically on the progress towards emission reduction targets ("Progress on Targets" reports), which will be communicated to the European Environmental Agency, DG CLIMA, and national climate policy institutions. The first policy report will be timed after concluding the Global Stocktake and will be available mid-2024. It will present the best observation-based estimates of EU emissions since 2005 (for CO₂ land-biosphere fluxes, CH₄, and N₂O) and compare the trends to pledged reductions. EYE-CLIMA will take advantage of the JPI Climate platform and the events organized with policy makers from individual EU countries (EQUINOX process and Climate Neutrality Forum) to discuss the findings of this report.

A final policy report will be prepared at the end of the project in 2026 and will provide an update to the first report and will be based on the latest project results. For F-gases, this report will also include the



newly developed Annual Kigali-Index (AKI) to check European compliance with the Kigali Amendment and the EU F-gas regulation using the F-gas emission estimates from WP3 and WP4. This report will be presented at a side-event of one of the UNFCCC Conference of Parties. To widen awareness of the project's main results, articles based on the reports will be submitted to European Commission (EC) platforms, such as Cordis (<https://cordis.europa.eu/en>), the Open Research Europe platform (<https://open-research-europe.ec.europa.eu/>) for scientific papers or the Horizon Results platform (<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform>) for showcasing research results.



4. Exploitation

Purpose and users

The core idea of exploitation is to make concrete use of the project results. For EYE-CLIMA, the results that lend themselves for direct exploitation consist of the data products (principally emissions estimates) and methodology (namely the development of an observation-based methodology for the verification of NGHGs). The target stakeholders, who would benefit most from these products, are the compilers of NGHGs, namely the inventory agencies, as well as other European, national and subnational government bodies (such environment and climate agencies). In addition, there are other relevant stakeholder groups for specific products, which are detailed below (Table 3).

With respect to NGHGI agencies, the aim is enabling them to implement observation-based verification as a routine tool in their annual process of creating NGHGs. Selected representatives of such agencies are partners in the project, specifically the NGHGI compilers of France (CITEPA), Germany (TI), or they are close collaborators, such as Statistics Finland. Nevertheless, EYE-CLIMA aims to involve other stakeholders who might be interested in inventory verification and collaborating with inventory agencies internationally. This concerns WMO and its Integrated Global Greenhouse Gas Information System (IG³IS) as well as its new initiative, Global Greenhouse Gas Watch (GGW), but likewise the International Methane Emissions Observatory (IMEO) operated by UNEP clearly is a stakeholder in the area of inventory verification.

Further stakeholders that have been identified as possible users of EYE-CLIMA's principal data products (flux estimates and flux uncertainties, as well as hotspot emissions based on satellite observations and atmospheric inversions) include heavily emitting industry and certain international and non-governmental organisations interested in identifying large emission sources (see Table 3 for details). There is already an example of how hotspot emission information can be used by industry, specifically a hotspot of SF₆ emissions was detected independently by the PARIS and EYE-CLIMA projects, which was due to a chemical plant. This led to a consultation of PARIS with the plant operators and action to find the leak and fix it.



Table 3: EYE-CLIMA products and their usage, user groups and means to encourage exploitation.

Product	Usage	Potential users	Means to encourage exploitation
Monthly gridded flux estimates (and uncertainties) based on observations (via atmospheric inversions)	Verification and improvement of national emission inventories	CITEPA, TI, Statistics Finland, other national inventory agencies European, national and sub-national environment administrations	AVEYPA stakeholder council AVEYPA joint newsletter EYE-CLIMA Outlook Summary (D5.4 – D5.7)
	Comparisons with other (e.g. inventory agencies own) emission estimates	WMO (IG ³ IS, G ³ W) Scientists	Guidelines for atmospheric inversions (D5.10) for dissemination via IG ³ IS Relevant scientific publications EYE-CLIMA website and Zenodo repository
National emission estimates and uncertainties for European countries (EU27+3)	Verification of national emission inventories	CITEPA, TI, Statistics Finland, other national inventory agencies European, national and sub-national environment administrations	AVEYPA stakeholder council AVEYPA joint newsletter EYE-CLIMA Outlook Summary (D5.4 – D5.7) EYE-CLIMA online interactive graphics
	Tracking progress on emission reductions	Governmental and non-governmental environment agencies	AVEYPA joint newsletter Progress on targets report (D5.8, D5.9) EYE-CLIMA online interactive graphics



Hotspot emission data (via satellite remote sensing, and high-resolution atmospheric inversions)	Identification of large emission sources as targets for emissions reduction, and for emission inventory verification.	National inventory agencies; national and sub-national environment administrations	AVEYPA joint newsletter AVEYPA webinars
		Industrial associations and operators of installations (such as power plants, chemical plants; oil & gas facilities; coal mining)	Personal contacts to TFTEI, Fertilizers Europe, European Bureau for Research on Industrial Transformation and Emissions AVEYPA joint newsletter
		Non-governmental organisations (NGOs) and international organisations (e.g. IMEO, CCAC) interested in emissions data	AVEYPA joint newsletter Personal contacts to international organisations (e.g. IMEO, CCAC)
Methodology for observation-based emission estimation and comparison with inventory estimates (Good Practice Guidelines on using atmospheric observations to support national inventories (D5.10) and related code)	Verification and improvement of national emission inventories	CITEPA, TI, Statistics Finland, other national inventory agencies	Training workshop in year 4 AVEYPA webinars AVEYPA joint newsletter AVEYPA stakeholder council Informing IG ³ IS stakeholders



While no previous commitments have been made, the expertise of selected EYE-CLIMA partners to support any of these stakeholders individually may lead to future projects of further relevance.

Implementation

As noted above, the target groups for EYE-CLIMA’s exploitation activities are principally NGHGI compilers. EYE-CLIMA has teamed up with other projects working in the same or similar direction (AVENGERS, PARIS, CoCO2, CORSO, CAMS) to coordinate outreach to stakeholders (as these projects all target the same stakeholder group) and to establish a stakeholder council. Communication with the stakeholders will be coordinated by Richard Engelen on behalf of all projects. Richard Engelen suited to this role as he is also the coordinator of the CO2MVS being implemented by ECMWF. A joint newsletter has been established to disseminate results from all projects in a coordinated fashion and will be sent approximately twice a year. Coordination with the other projects adds complexity to the process but is considered inevitable if consortia wish to keep agencies engaged and collaborative. With the recent adoption of the G³W initiative by the WMO congress, there will be ample opportunity to team up with interested national institutions.

In a co-development approach, the members of the stakeholder council will be invited to accompany the scientific output of the collaborating consortia operating under the joint acronym “AVEYPA” (for AVENGERS – EYE-CLIMA – PARIS). A series of webinars has been planned that will allow for interaction between the consortia and the stakeholders. Starting with October 2024, national inventory teams (and other interested persons) will have the opportunity to interact with AVEYPA scientists twice a year on specific topics related to different methods of top-down assessment of national inventories (see Table 4). AVEYPA will itself coordinate via a splinter meeting at the upcoming EGU (Vienna, April 2025), with results further disseminated via Townhall meetings at EGU (meetings planned for 2025 and 2026).

Table 4: AVEYPA consortium of projects – series of webinars

Topic	Platform	Proposed date
UK/CH set up collaboration with inventory teams - introduction	CMCC	Oct 1, 2024
Land surface modelling of greenhouse gas fluxes	TBD	Spring 2025
Satellite remote sensing of CO ₂ and CH ₄ and their emissions	TBD	Autumn 2025
Satellite remote sensing of land biosphere and mapping biosphere and biosphere change	TBD	Spring 2026
Atmospheric inverse modelling and using the results to support NGHGIs	TBD	Autumn 2026

EYE-CLIMA will prepare detailed guidelines on how to use observation-based emission estimates for verification specifically for NGHGI compilers. The stakeholder council will be invited to review the guidelines and data products, to be completed during the final phase of the project (year 4).

Existing contacts to industrial associations will be taken advantage of, via interest groups that are familiar with issues of atmospheric emissions. Specifically, partners like Fertilizer Europe (encompassing nitric acid producers, an N₂O point source) and the TFTEI, the Task Force on Techno-Economic Issues under the Convention on Long Range Transboundary Air Pollution, as well as the European Bureau for Research on Industrial Transformation and Emissions, responsible to provide reference to the best



available technologies (BREF documents), will be targeted for broad dissemination on relevant industries in Europe.

For scientists involved in GHG accounting, and NGHGI compilers interested in establishing their own observation-based flux estimates, EYE-CLIMA will prepare good practice guidelines for atmospheric inversions, including all aspects from how to set-up an atmospheric inversion framework, minimize systematic uncertainties and to evaluate the results. This will be the first attempt to prepare such guidelines and is desperately needed as atmospheric observation-based flux estimates become more heavily used for verifying and supporting NGHGIs. These guidelines will be a stand-alone document, but they will complement the guidelines prepared on using observation-based estimates for verification. These guidelines will now be written and published in collaboration with the AVENGERS project, who have a very similar deliverable in their project. The guidelines for atmospheric inversions will be published through IG³IS and presented at international meetings. Through IG³IS these guidelines will be promoted among the international community, i.e., outside of Europe. The system of preparing CH₄ emission inventories, based on ECMWF's IFS data assimilation system using TROPOMI will be built into the Copernicus CO₂MVS service.

In the last year of the project, EYE-CLIMA will organise a training workshop (in collaboration with the other Horizon Europe projects funded in the same call, PARIS and AVENGERS) with European NGHGI compilers to inform them about the data products and provide guidance on how to use them. This workshop may be extended to other stakeholder interested in inventory verification.

5. Time planning for dissemination and exploitation activities

Dissemination and exploitation activities follow the overall project time schedule. With data preparation and collection scheduled for earlier project phases, dissemination and exploitation move to the later project phases. Several EYE-CLIMA datasets will be available as “preliminary” version deliverables around month 24, i.e. December 2024. These results will be sufficiently mature for dissemination, i.e. discussion of results with stakeholders and with scientists (including young scientists). Hence also scientific publication activities (conferences and, subsequently, publication in peer-reviewed open access journals) are expected to strongly increase in the first and second half of 2025, respectively. Appropriately, also contribution to the ICOS summer school and hence dissemination to junior scientists is scheduled for that period. This will also allow to further develop stakeholder contacts (e.g., via two proposed AVEYPA webinars and newsletters). Contact to industry representatives (as outlined above) also will be made based on these first results during spring of 2025.

Final data products are scheduled as deliverables around month 36, December 2025. Hence, project products will be able for project-external work during 2026. Exploitation activities hence will focus on the year 2026. This includes the proposed AVEYPA Townhall meetings at EGU in spring 2025 and 2026, but more importantly completion of the guidelines on observation-based verification of NGHGI (October 2026), the associated training workshop in fall 2026, and their further international promotion via IG³IS. We expect that, based on previous interaction with stakeholders, inventory agencies, environmental policy makers at different levels, and industry representatives will have had the chance to learn about and use the tools developed in EYE-CLIMA before the end of the project.



6. Implications to project execution

While communication, dissemination and exploitation efforts are necessarily centered in EYE-CLIMA's outreach work package, the whole consortium will contribute to make EYE-CLIMA's outreach – and hence the project itself – a success. That also means that each scientific work package will provide specific support, commensurate with the tasks of the work package. Considering outreach an essential element of the project work will have clear impacts on the way the project is executed.

There are many aspects of outreach that will be responded in equal manner by each of the work packages. All EYE-CLIMA partners will contribute to the task descriptions on the web site, and they will also provide texts on their key results to the annual EYE-CLIMA Outlook. Also, each partner will engage in scientific discourse via participation in relevant conferences and publishing in adequate peer-reviewed journals. In case of high-level results, they also will (together with their respective press office, work on preparing and sharing press releases. Also, training of junior scientists will be a joint effort of the whole EYE-CLIMA consortium.

In addition, individual work packages and specific tasks will also explore their respective role in outreach. WP1, Observation Based Data, will strive to share their information on point source methane emissions with national inventory compilers. They also will explore options of carbon sequestration with policy makers regarding available data on biomass and biomass change, extending beyond the core investigation area of EYE-CLIMA (EU plus Norway, Switzerland, United Kingdom), potentially contributing to a policy report.

For WP2, Bottom-Up Modelling, the key results of land- and vegetation based high-resolution fluxes as well as the specific inventory on anthropogenic sources will provide input to a science-to-policy event as well as a policy report.

WP3, Inverse Modelling, will develop guidance documents and best practice approaches to be shared with NGHGs, to guide them developing their own atmospheric inversion framework. WP3 will be instrumental to run the training workshop on inventory verification for NGHGs and other interested stakeholders.

Work in WP4 will not only reconcile bottom-up and top-down inventories, in doing so contributing partners will assess, in part by source sector, national contributions to GHG emission fluxes and thus will be able to compare with national inventories. These will be central results for the “progress-to-targets” reports assessing whether or not countries are on target with their pledges to achieve the Paris agreement. Also, the AKI to check European compliance on F-gas regulations will be contributed to the policy reports and policy makers.

While coordination of outreach is being organized via WP5, clearly inputs into these efforts are shared and well-defined beforehand.



Appendix 1: Project web site (homepage)

Web address: <https://eyeclima.eu/>

EYE-CLIMA
Verifying emissions of climate forcers

HOME ABOUT NEWS PRODUCTS RESEARCH TEAM CONSORTIUM

Improving emission estimates of climate forcers

EYE-CLIMA

EYE-CLIMA is a Research and Innovation project funded by the European Commission under the Horizon Europe programme

EYE-CLIMA aims to improve estimates of emissions and removals of the most important greenhouse gases (CO₂, CH₄, N₂O and six F-gases), as well as black carbon, to support European and international policy to reduce emissions

Emissions
Explore our greenhouse gas emission estimates for the EU and European countries

Reports
Search and read our reports on emissions and reductions

Research
Read about research and innovations in the EYE-CLIMA project

EYE-CLIMA PROJECT

EYE-CLIMA brings together the expertise from 17 different partners in 8 European countries. The partners include universities, national research institutes, research infrastructures (ICOS), operational centres (ECMWF) and national inventory agencies. The project is coordinated by NILU (Norwegian Institute for Air Research)

[read more](#)



OUR PARTNERS



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Contact

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Appendix 2: Project identity

Project logo:



Poster template:

Title of Poster
 Sub-title of Poster (if any)
 Authors Names
 Affiliations.

SUMMARY
 This is a summary text outlining the motivation and most pertinent results of the study.

METHODOLOGY
 This is where you can outline your methodology.

Figure 1: Add figure description here

This is where you can outline your methodology.

DATA ANALYSIS
 This is where you can outline your analyses or results.

Figure 2: Add figure description here

This is where you can outline your analyses or results.

Figure 3: Add figure description here

RESULTS
 This is where you can outline your analyses or results.

Figure 4: Add figure description here

This is where you can outline your analyses or results.

Field1	Field2		

Table 1: Add table description here

CONCLUSIONS
 This is where you can put your conclusions perhaps using bullet points:

- This is conclusion 1
- This is conclusion 2
- This is conclusion 3

Figure 5: Add figure description here

REFERENCES

1. A. Author, Journal, Year
2. B. Author, Journal, Year
3. C. Author, Journal, Year

ACKNOWLEDGEMENTS
 This is where you can give acknowledgements or state where data are available.

eyeclima.eu

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Presentation template:

1 Presentation title
Author(s) and affiliation(s)
EYE-CLIMA

2 Sub-section title
EYE-CLIMA

3 Heading
▪ Main point
▪ Sub-point
▪ Specific point
EYE-CLIMA

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BRUSSELS, 30 06 2024

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