Deliverable 7.5: Updated communication, dissemination and exploitation plan

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1. Introduction

The overarching goal of CARGO-ACT is to deliver a clear roadmap for sustainable global cooperation between key organisations for integrating current ground-based networks having different interests and priorities into global entities capable of tackling the global and regional challenges of climate change, extreme weather, air quality and policy effectiveness. This effort to achieve global interoperability is motivated by the compelling need to respond to the user-driven requests and requirements for globally consistent datasets; therefore, the aim of CARGO-ACT is to provide all users, in the scientific community and beyond, with the best possible services for accessing and using data related to the properties of aerosol, clouds and trace gases in the atmosphere.

The CARGO-ACT consortium involves the European research infrastructure on short-lived Aerosol, Cloud and Trace Gases (ACTRIS) and three agencies in the US (U.S. Department of Energy's Atmospheric Radiation Measurement program, ARM; NOAA Global Monitoring Laboratory, GML; NASA Micro-Pulse Lidar Network, MPLNET), and it is a first step towards convergence to a global research infrastructure for aerosol, clouds and trace gases, with actions that will develop, strengthen and maintain the position of ACTRIS within the international landscape. The scope is not limited to the immediate consortium beneficiaries, and CARGO-ACT has the ambition of attracting additional networks to collaborate in these actions promoting convergence. To be effective in promoting the goals of CARGO-ACT, a clear plan for **disseminating**, **exploiting** and **communicating** the project strategy and activities is required.

CARGO-ACT is a three-year project that started in March 2024 and will last until February 2027. Communication within the project is handled by WP7, namely task 7.3, for which the responsible entity is the coordinating institute, FMI. This deliverable (D7.5 Updated communication, dissemination and exploitation plan) provides the updated communication, dissemination and exploitation (CDE) plan, building on the knowledge and lessons learned during the first two years of the project. This update builds upon the initial CDE plan prepared early in the project timeline and described in deliverable "D7.2 Initial communication, dissemination and exploitation plan". The content of the initial plan is still relevant and retained, with the updated plan adding additional elements to ensure that CARGO-ACT activities and results continue to be delivered to target audiences both within and outside of the immediate project consortium in a timely and proactive manner.

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Revision of the communication, dissemination and exploitation plan

Additional elements to the initial CDE plan have been implemented during the first 18 months of the project and revisions made using lessons learnt during the first period. The revisions include updates to:

- Communication tools and visual identity
- External communication, including stakeholder events
- Internal communication, whether within ACTRIS itself, within partner networks, or within the CARGO-ACT consortium
- Exploitation: impacts from project results

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2. Communication tools

Visual identity

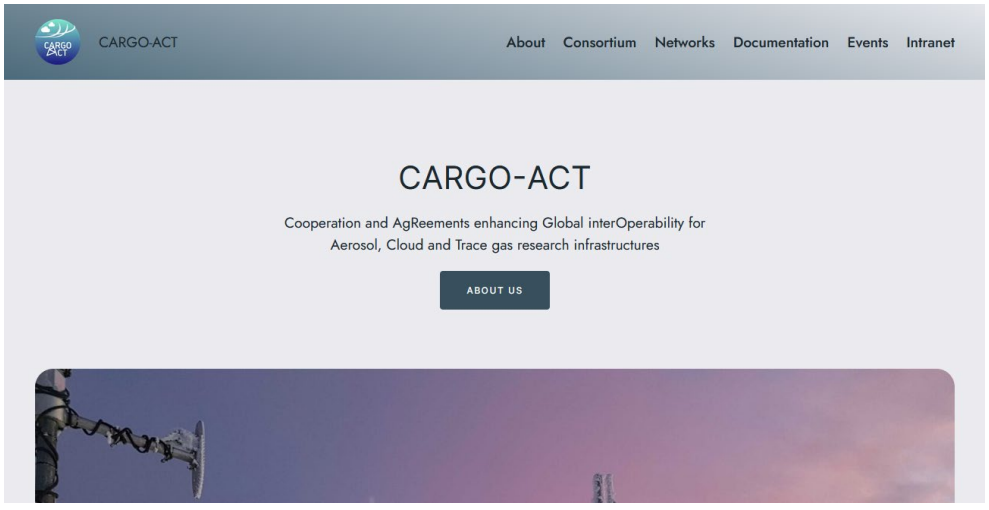
A consistent visual identity has been developed to enable effective communication and dissemination, and cultivate engagement and collaboration among partners. It should be repeated here that the RIs and networks involved in the project already have strong visual identities of their own, with some exceeding 30+ years of use, and that the goal is not to subsume these identities but enhance the collaborative aspect of the project.

2.1 Logo

The CARGO-ACT visual identity is primarily defined by the CARGO-ACT logo, which is of SVG (scalable vector graphics) design and therefore suitable for use across a range of sizes. This ensures that the same logo item is attractive both for posters and as a small logo. Being usable and identifiable at small sizes aids in the collaborative aspect, particularly when being included in presentations or other dissemination activities (brochures, posters) which are not being delivered by members of CARGO-ACT or are not part of CARGO-ACT activities directly.

2.2 Website

The CARGO-ACT website (Figure 1, https://www.cargo-act.eu) was launched in May 2024 (M3) and serves the project content (documentation, deliverables, events, notices), details the project consortium, partner networks and goals, and receives regular updates. The website acts as a basis for ensuring that CARGO-ACT information and documentation is publicly available to all.



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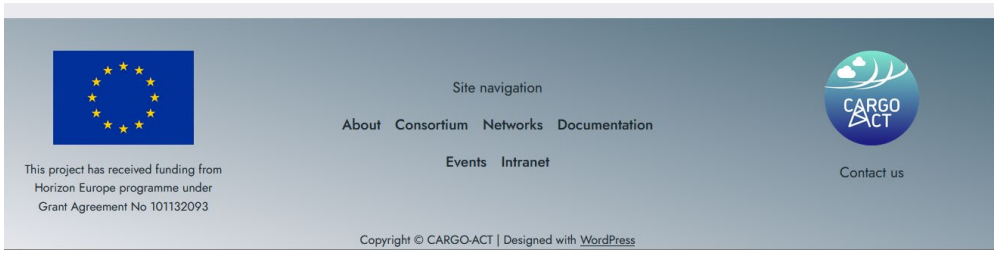

Figure 1: CARGO-ACT website header and footer.

2.3 Presentation and poster templates

The presentation slide templates (in pptx format) are designed to be clean and uncluttered, with a premium on space for content and a white background to aid effectiveness (Figure 2). The template acknowledges European Commission funding by displaying the European logo and project grant agreement number. These templates are used as the basis for all presentations given by members of the CARGO-ACT consortium when presenting material on behalf of CARGO-ACT, at conferences, workshops, stakeholder meetings, internal project meetings, reinforcing the collaboration and engagement of the consortium members.

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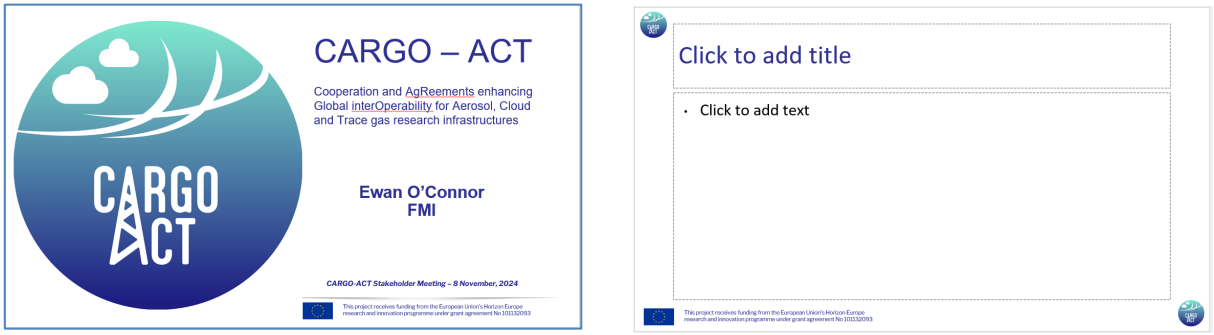

Figure 2: Presentation template (title slide and general content slide)

The poster template uses the same colour scheme as the website with an initial setup in two-column portrait aspect. An optional QR code is also provided which links directly to the project website https://www.cargo-act.eu. Figure 3 shows an example of a poster for the European Aerosol Conference using this format.

Figure 3: CARGO-ACT poster for the EAC 2025 conference in Lecce, Italy.

3. Communication and dissemination

Target groups

The four target group sectors for CARGO-ACT were presented in Table 1 in deliverable "D7.2 Initial communication, dissemination and exploitation plan" and is shown again here (Table 1) to aid the discussion.

Table 1: Stakeholders targeted by CARGO-ACT and grouped into broad categories

Target Group	Includes
Scientific community	• Satellite-related • Earth monitoring • Forecasting, climate, and air quality modelling
Service providers	• EU research infrastructures and US partners • Related measurement networks and RIs
National and International agencies, policy-making	• Global environmental and health policy makers • Environment and Regulatory agencies
Other target groups	• Research organisations • National metrology institutes and standards bodies • Energy sector (solar, wind), instrument manufacturers

The CARGO-ACT consortium comprises a limited number of beneficiaries representing their research infrastructure or measurement network (i.e. not all members of each research infrastructure or measurement network are present in the CARGO-ACT consortium). There are large research communities directly targeted through each network (see internal communication and dissemination). For instance: ACTRIS, a 22-nation consortium, has 130+ research organisations; ARM, managed by 9 federal labs and several university partners, has a partner program ASR (Atmospheric System Research) where numerous (100+) research organisations conduct research using ARM data and services; NFAN, MPLNET and ASCENT also have collaborating institutions operating each observation station.

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The consortium research infrastructures/measurement networks are service providers, not only to their constituent members providing observations and quality control but also to the national and international users of their data and services.

The consortium partner networks engage continuously with their users, whether large stakeholders such as the satellite agencies (including ESA, EUMETSAT, JAXA, NASA), weather and climate modelling centres, national and international environmental monitoring agencies (including WMO), or individual scientists from the wider research community. The national environmental and meteorological institutes may also be contributing to the measurement networks.

ACTRIS is a member of the ENVRI Community (https://envri.eu) bringing together 26 European Research Infrastructures studying multiple aspects of the Earth system (atmosphere, ecosystem, marine, solid earth, multi-domain). An **action for the ACTRIS members** of CARGO-ACT is to promote the results of CARGO-ACT to relevant members of the ENVRI community, which will also be achieved through the participation of ACTRIS in the EU Horizon project ENIVRI-Hub Next.

Since instrument measurements are the core of the observation networks, there is also continual dialogue with the instrument manufacturers. Data quality control and assurance at network and global level necessitates interaction with metrology and standards bodies, particularly for those measurements that contribute to environmental standards monitoring which may entail a legislative framework.

External communication and dissemination

CARGO-ACT activities are disseminated to appropriate stakeholders through workshops (see Table 1) and the project obtains excellent detailed feedback from the stakeholders via these workshops. Regular contact with stakeholders is maintained through the contacts made in these workshops and has resulted in ad-hoc meetings held as side meetings or break-out sessions at other workshops which are not directly attributable as stakeholder workshops (see Table 2). These particular meetings can focus on one particular topic such as satellite calibration and validation and have stakeholders involved as interested parties.

At least one more stakeholder workshop is planned, with a focus on communicating the improvement in global harmonisation through increasing FAIRness.

Table 1: Stakeholder workshops

Workshop location and date	Stakeholders	Topics	Link to agenda
Matera, Italy (8th November 2024)	NDACC, AEROCOM, CAMS, ECMWF, EUMETSAT, US DoE, MPLNET, SHADOZ, ESA; WMO	Stakeholder expectations and requirements	https://www.cargo-act.eu/wp-content/uploads/2024/08/CARGO-ACT-Project-Meeting-and-Stakeholder-Workshop-2024.pdf

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Geneva, Switzerland (2nd April, 2025)	NFAN, ARM, NOAA, WMO, GAW	Framework for access	https://cargo-act.eu/wp-content/uploads/2025/03/CARGO-ACT_Stakeholder_meeting_Apr2025.pdf

Table 2: Ad hoc side meetings

Workshop location and date	Stakeholders	Topics	Main meeting
Frascati, Italy (17th March 2025)	EVDC	Lidar remote sensing and satellite calibration / validation	EarthCARE 2nd in-orbit validation workshop
Online (2nd June 2025)	ASCENT	Relevance of CARGO-ACT activities for ASCENT	ASCENT annual meeting

CARGO-ACT has been directly promoted in presentations at international conferences (Table 3) and is also regularly referred to within other scientific presentations such as those given at the 31st International Laser Radar Conference (ILRC). CARGO-ACT was also introduced at the kick-off meeting for the EC–ESA Aerosol Cloud Cluster which links the two EU-funded projects CleanCloud and CERTAINTY as well as other ESA-funded initiatives such as AIRSENSE.

Table 3: Conference presentations

Conference	Conference location and date	Conference Link	Title
EAC	Lecce, Italy (31 August–5 September, 2025)	https://eac2025.iasaerosol.it/	CARGO-ACT: towards a global interoperability for aerosol, cloud and trace gas research infrastructures
ISARRA	Larnaca, Cyprus (29-31 October, 2025)	https://emme-care.cyi.ac.cy/10th-international-society-for-atmospheric-research-using-remotely-piloted-aircraft-isarra-conference-larnaca-cyprus-29-31-october-2025/	CARGO-ACT: towards a global interoperability for aerosol, cloud and trace gas research infrastructures
EGU	Vienna, Austria (3-8 May, 2026)	https://www.egu26.eu/	Strengthening EU-US Cooperation towards a Sustainable Global Atmospheric Research Infrastructure: Key achievements from CARGO-ACT

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Internal communication and dissemination within ACTRIS

ACTRIS is a relatively large RI and efficient internal communication is therefore achieved through multiple routes as shown in Table 4.

Table 4: Communicating within ACTRIS

Route	Method	No of participants	Regularity
ACTRIS week	CARGO-ACT community session	180 in person, 200 online	1 per year
Data Centre	Regular online meetings	10	6+ per year
Central Facilities	Regular online meetings	100	5+ per year per Central Facility
Central Facilities	Workshops and training	40+ per workshop	1+ per year per Central Facility
Training materials	Available online		

ACTRIS week is a yearly event bringing the entire ACTRIS community together in person and online (typically 150-200 attendees in person and a similar number online). The purpose of ACTRIS week is to keep the ACTRIS community informed about recent progress, projects, challenges and stimulate discussion and interaction. A CARGO-ACT community session was held during ACTRIS week 2025 (https://actris.eu/news-events/events/actris-week-2025) open to the entire ACTRIS audience participating at the ACTRIS Week, with US CARGO-ACT colleagues also attending and answering questions online. The wide range of participants at the ACTRIS Week from Research Directors to Early Career Scientists is of particular relevance to CARGO-ACT dissemination, ensuring that all understand the importance of harmonisation, not just at the ACTRIS level but also at the global level, and why this is vital for the relevance of the ACTRIS data that is produced by the attendees to global stakeholders.

The ACTRIS Data Centre is distributed among 6 units, 5 with complementary expertise, and one with integrating activities. ACTRIS also has 6 Central Facilities which provide operational support for measurement stations, including calibration, quality control and monitoring services. Each Central Facility has particular expertise and is linked to an appropriate Date Centre Unit. Central Facilities (and some Data Centre Units) consist of multiple facilities (and organisation) themselves. Since the Data Centre and the Central Facilities are integral to the smooth operation of ACTRIS, presenting regular updates on CARGO-ACT activities in their routine online meetings provides direct dissemination to those who may be required to take action and update procedures, or data FAIRness, based on CARGO-ACT recommendations. The additional fora that the Central Facilities hold regularly, including Central Facility workshops and training sessions, ensure that dissemination of pertinent information reaches the entirety of ACTRIS.

Milestone "MS9 Training materials for calibration and operation procedures and estimation of measurement uncertainties" details the training materials and in-person/online provided by the ACTRIS

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Central Facilities relevant for CARGO-ACT (and by the partner networks in the US). The training materials include instrument handbooks, describing instrument operation and methods for quality control/quality assurance procedures, and documentation of tools for processing, calibration and data submission.

Using multiple routes to inform the ACTRIS community aims to reinforce the messages from CARGO-ACT activities, but care must be taken to ensure that the messages from different routes are consistent with each other and that links to the reference documentation on the CARGO-ACT website are always provided. The reference documentation must be clear, direct and concise.

Internal communication and dissemination in partner networks

Similar dissemination activities to those described in section 3.2 are being performed within the US research communities associated with each partner network, including

- GML 5-year review,
- AERONET Science and Application Exchange,
- DOE AMSG strategic planning workshop;

and as in section 3.3, there are regular research workshops and training sessions held for each instrument, together with comprehensive handbooks available online, as described in Milestone "MS9 Training materials for calibration and operation procedures and estimation of measurement uncertainties".

Information is also being disseminated to their research communities, e.g. through news posts such as ARM | ARM's New European Partner on their respective websites.

Internal communication and dissemination in CARGO-ACT

CARGO-ACT is a small consortium (9 beneficiaries and 6 associated partners) and partners interact regularly during online meetings for each WP in addition to the yearly CARGO-ACT community meeting.

Practical activities include capacity building activities in training and summer schools enabling the development of strategies for creating a harmonised aerosol in situ calibration centre (see impact section) and an online joint workshop (MS6) of lidar experts from US and EU (ACTRIS Centre for Aerosol Remote Sensing - CARS) to discuss development of a US version of CARS (documented in Deliverable D2.6:

http://public.lidar.fmi.fi/processing/CARGO-ACT/documents/CARGO-ACT_WP2_D2.6_Implementation_plan_for_harmonised_lidar_calibration_services_in_Europe_and_in_the_US.pdf).

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4. Exploitation and monitoring impact

CARGO-ACT activities have provided concrete impact. This includes significant contribution to the current revision of the WMO-GAW report 227 Aerosol Measurement Procedures, Guidelines, and Recommendations (https://www.wmo-gaw-sag-aerosol.org/files/FINAL_GAW_227.pdf). The updated document, when finalised, will be the reference for the global aerosol in-situ community, not just ACTRIS.

BNL aerosol scientists travelled to TROPOS, Germany, early in the CARGO-ACT project (M3), and to participate in the workshop for Milestone "MS7: Training at the current calibration centres for dissemination of the harmonised procedures" in M10. About 12 months later, the Aerosol Observing System at the ARM SGP site in Oklahoma was audited by the WCCAP (*World Calibration Centre for Aerosol Physics*) hosted by TROPOS, Germany and received an excellent review: "ARM | SGP Aerosol Observing System Gets Excellent Review From Global Body".

CARGO-ACT activities have also resulted in BNL establishing a regional aerosol in-situ calibration centre similar to WCCAP (*World Calibration Centre for Aerosol Physics*) hosted by TROPOS, Germany. The new calibration centre, to be known as CAMS, will satisfy the local needs of the US aerosol measurement networks and construction is already underway with equipment and reference instruments in the procurement stage (see Deliverable D2.5:

http://public.lidar.fmi.fi/processing/CARGO-ACT/documents/CARGO-ACT_WP2_D2.5_Strategy_plan_for_the_harmonisation_of_a_regional_aerosol_in-situ_calibration_centre_in_the_US.pdf).

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Glossary

AEROCOM	Aerosol model intercomparison initiative	https://aerocom.met.no
ACTRIS	Research Infrastructure for Aerosol, Clouds And Trace Gases	https://www.actris.eu
ARM	Atmospheric Radiation Measurement	https://arm.gov
ASCENT	Atmospheric Science and Chemistry Measurement Network	https://ascent.research.gatech.edu
CAMS	Copernicus Atmosphere Monitoring Service	https://atmosphere.copernicus.eu
EC	European Commission	https://commission.europa.eu
ECMWF	European Centre for Medium-Range Weather Forecasts	https://www.ecmwf.int
ESA	European Space Agency	https://www.esa.int
EUMETSAT	European Organisation for the Exploitation Of Meteorological Satellites	https://www.eumetsat.int
EVDC	ESA Validation Data Centre	https://evdc.esa.int
GAW	Global Atmospheric Watch Program	https://wmo.int/activities/global-atmosphere-watch-programme-gaw
US DoE	US Department of Energy	https://www.energy.gov
MPLNET	NASA Micro-Pulse Lidar Network	https://mplnet.gsfc.nasa.gov
NDACC	Network for the Detection of Atmospheric Climate Change	https://ndacc.larc.nasa.gov
NFAN	NOAA Federated Aerosol Network	https://gml.noaa.gov/aero/net
NOAA	National Oceanic and Atmospheric Administration	https://www.noaa.gov
SHADOZ	Southern Hemisphere Additional Ozonesondes	https://tropo.gsfc.nasa.gov/shadoz
WMO	World Meteorological Organization	https://wmo.int

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