

ACTRIS

Aerosols, Clouds and Trace gases Research Infrastructure

Ground-based stations to understand past, current and predict future evolution of the atmosphere

TYPE: distributed

COORDINATING COUNTRY

FI

MEMBER COUNTRIES

CH
CY
CZ
EL
ES
FI
FR
IT
NL
PL
RO
UK

PARTICIPATING COUNTRIES

BE
BG
DE
DK
EE
HU
IE
NO
SE

TIMELINE

- ESFRI Roadmap entry: 2016
- Preparation phase: 2016-2019
- Construction phase: 2019-2021
- Pre-operation phase: 2021
- Operation phase: 2025

ESTIMATED COSTS

- Capital value: 450 M€
- Preparation: 6 M€/year
- Construction: 190 M€
- Operation: 50 M€/year

HEADQUARTERS

University of Helsinki and Finnish Meteorological Institute
Helsinki
Finland

National Research Council
Rome
Italy

WEB SITE

<http://www.actris.eu>

DESCRIPTION

The Aerosols, Clouds and Trace gases Research Infrastructure (ACTRIS) is a distributed infrastructure dedicated to high-quality observation of aerosols, clouds, trace gases and exploration of their interactions. It will deliver precision data, services and procedures regarding the 4D variability of clouds, short-lived atmospheric species and the physical, optical and chemical properties of aerosols to improve the current capacity to analyse, understand and predict past, current and future evolution of the atmospheric environment. ACTRIS serves a vast community of users working on observations, experiments, models, satellite data, analysis and predicting systems and offers access to advanced technological platforms for exploration of the relevant atmospheric processes in the fields of climate change and air quality.

BACKGROUND

Short-lived atmospheric components – aerosols, clouds, trace gases – have a residence time in the atmosphere from hours to few weeks, which differentiates them from long-lived greenhouse gases. The short lifetimes make their concentrations highly variable in time and space and involve fast processes. They are recognised to be among the most significant anthropogenic pollutants affecting Earth's radiation balance and the largest source of uncertainty in terms of radiative forcing impact. In parallel, short-lived atmospheric compounds have recognized adverse health effects at concentrations typically found across Europe and potentially lead to more than 400.000 premature deaths annually in the EU28. Information on concentrations and distributions of aerosols and trace gases is therefore required to reduce air pollution and related adverse effects on health and ecosystems.

ACTRIS addresses these challenges by operating at National Facilities via a combination of near-surface and remote-sensing systems and include: near-surface measurements of aerosols and short-lived trace gases, vertically resolved measurements of aerosols, vertically resolved measurements of clouds and precipitation, profile and column observations of short-lived trace gases and ancillary measurements of meteorological and radiation quantities. ACTRIS also includes exploratory platforms at the national level. The observation platforms are often components of European or international networks. ACTRIS relies on appropriate Central Facilities – Calibration Centres, Data Centre, Head Office – that ensure compliance with standard operating procedures and/or quality protocols to provide harmonized, reliable, and documented observational data. The data curation and storage services are handled by a dedicated Central Facility, the ACTRIS Data Centre. Central Facilities are fundamental to provide the access to the ACTRIS services, organising the right level of training and education, both within and outside the RI, and delivering tailored services for various users, scientific community, space agencies, COPERNICUS and the private sector.

STEPS FOR IMPLEMENTATION

ACTRIS is a new ESFRI project but it results from long-term collaborative work of the atmospheric science community through a series of INFRA projects that started in 2000. ACTRIS complements the environmental research infrastructure as it contributes data and services with its National Facilities and Central Facilities on atmospheric composition changes. Aims of the full implementation plan is to set up a research infrastructure service system for the complex data-stream that starts at the National Facilities and goes through quality screening and higher level data products made available through the data centre, and finally to the repositories that will secure long-term access by a very large community of users, globally. ACTRIS enters now in the preparation phase. The gradual shift towards the construction phase is foreseen in 2019-2021 planning the commissioning phase in 2021-2022. ACTRIS will be fully operational in 2025.

