

Added-value products for policy use

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on behalf of the MACC-III POL team



MACC-III User Workshop
Rome, 11 May 2015



Policy users in the context of the MACC-III core service:

- involved in decision making on air quality legislation (and climate change)
- use MACC-III products to compile downstream information, which can be used directly by policy decision makers

Policy-relevant products of MACC-III include:

- daily forecasts air of air pollution and pollen concentrations
- the 'green scenarios' toolbox
- source-receptor calculations
- periodic air quality assessment reports
- global and regional emission data, etc.

→ some examples are shown in this presentation!

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 - Reactive Gases
 - Aerosols
 - European Air Quality
 - UV Index
 - Ozone Layer
 - CO2

LATEST Poor air quality over Western Europe



Air Quality and Atmospheric Composition



Climate Forcing



Ozone Layer & UV



Solar Radiation



Emissions and Surface Fluxes

- User Support**
- Documentation
- Validation
- E-learning
- Mailing Lists
- Operational Info

- Services**
- Air Quality & Atmospheric Composition
- Climate Forcing
- Ozone Layer & Ultra-Violet Radiation
- Solar Radiation
- Emissions & Surface Fluxes

- Latest Analyses**
- European Air Quality
- Fire Monitoring
- Reactive Gases
- Aerosols

In Focus: User Workshop



14 April 2015 On 11 May MACC-III is organizing, in collaboration with the Italian user community, its next User Workshop. The meeting will take place in Rome and will consist of presentations from both MACC-III representatives and MACC-III users. More information and registration can be found on [the events page](#).



Potential users of MACC-III are invited to complete the questionnaire at this [link](#)

MACC-III is a Coordination & Support Action (2014-2015) funded by the European Union under the Horizon 2020 Programme. It is coordinated by the European Centre for Medium-Range Weather Forecasts and operated by a 36-member consortium.

<http://www.copernicus-atmosphere.eu/>

MACC Project - Air Quality... x +

www.copernicus-atmosphere.eu/services/aqac/

Monitoring atmospheric composition & climate

macc Monitoring atmospheric composition & climate

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Search Content

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Home > Services > Air Quality & Atmospheric Composition >

Air Quality & Atmospheric Composition

Air quality is defined as the quality of the air that one directly breathes at the surface. It directly affects lives of most European citizens. It forms a significant risk factor for various health conditions and can also aggravate existing health conditions, such as respiratory disease. On a larger scale, atmospheric composition represents the full state of the global atmosphere covering phenomena such as desert dust plumes, long-range transport of atmospheric pollutants and ash plumes from volcanic eruptions, but also variations and long-term changes in the background concentrations of trace components.



MACC-II uses a comprehensive global monitoring and forecasting system that estimates the state of the atmosphere on a daily basis, combining information from models and observations, and it provides a daily 5-day forecast. The global modelling system is also used to provide the boundary conditions for an ensemble of more detailed regional air quality models that are used to zoom in on the European domain and produce 4-day forecasts of air quality.

European Air Quality	Global Atmospheric Composition
Access to Product Catalogue	Access to Product Catalogue
Validation & verification	Validation & verification
Documentation	Documentation

Additional resources

- [Scientific field campaign support](#)
- [European Policy support](#)

User cases

Model (Uryu) aerosol amount and cloud fraction along S194 km of A-Train orbit between 10:35:45 & 10:39:09 07/07/12 UT

Beginning of July 2012, Seattle and Vancouver were covered in a thick haze

ACCESS CATALOGUE

Services

- Air Quality & Atmospheric Composition
- Climate Forcing
- Ozone Layer & Ultra-Violet Radiation
- Solar Radiation
- Emissions & Surface Fluxes

Today's Forecasts

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User Support

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<http://www.copernicus-atmosphere.eu/services/aqac/>



Search Content

Air Quality & Atmospheric Composition

- Verification of Global Services
- Scientific Field Campaign Support
- Verification of Regional Services

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Latest Analyses

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MACC-III for Policy Use

The MACC-III Policy Portal provides an overview of the information available from the MACC-III services that can be of interest for policy users.

Information, products and tools on this webpage are intended to identify the contribution of different sources to exceedances of air quality limit values and to help in the design of policy responses to prevent severe air pollution episodes.

European Air Quality and Pollution Episodes

MACC-III produces annual assessment reports with validated information on the state and evolution of background concentrations of air pollutants in Europe. The reports are based on best available information from the MACC-III model ensemble combined with observations through data assimilation techniques. They include a number of regulatory indicators for policy use and detailed information on the origin of specific pollution episodes.

- [2012 Air Quality Assessment Report](#)
- [2011 Air Quality Assessment Report](#)
- [Validation report](#) for the 2011 Air Quality Assessment Report
- [2010 Air Quality Assessment Report](#)
- [Validation report](#) for the 2010 Air Quality Assessment Report
- [2009 Air Quality Assessment Report](#)
- [2008 Air Quality Assessment Report](#)
- [2007 Air Quality Assessment Report](#)

European Air Quality Forecasts

MACC-II produces regional air quality forecasts every day, accompanied with quarterly verification reports. In addition, model performance is monitored on a daily basis for the past 7 days and for the past 3 months.

User Support

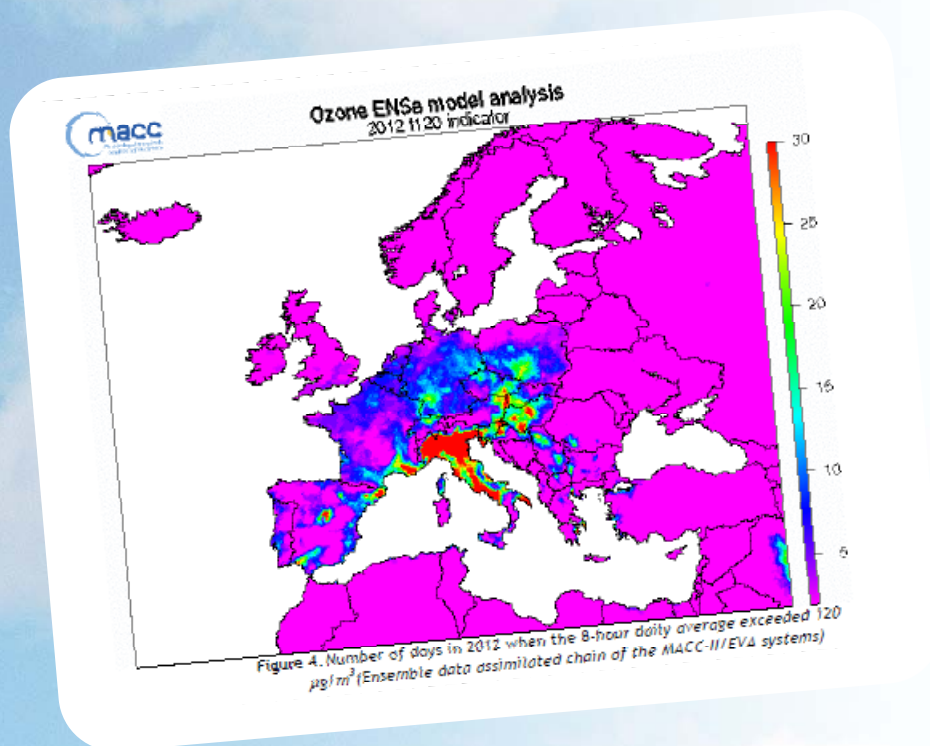
- Documentation
- Validation
- E-learning
- Mailing Lists
- Operational Info

Services

- Air Quality & Atmospheric Composition
- Climate Forcing
- Ozone Layer & Ultra-Violet Radiation
- Solar Radiation
- Emissions & Surface Fluxes



Air Quality Assessment reports



- MACC-III regional ensemble
- Status of air pollution
- Re-analyses of episodes
- Model evaluation
- Provided annually

MACC-II Report n°D113.4

Assessment Report: Air quality in Europe in 2012

Date: 07/2014

Authors: Laurence ROUÏL (INERIS), and the
MACC/EVA teams



Grant agreement n°283576

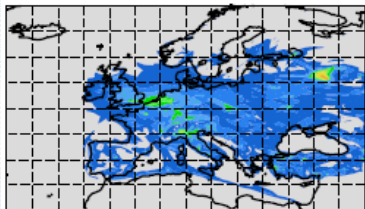
Daily Air Quality Forecasts

- 7 state-of-the-art European Air Quality models
- Five gaseous species, PM₁₀ and PM_{2.5}, pollen

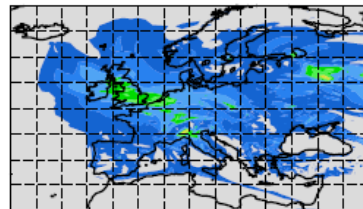
Monitoring atmospheric composition & climate

METEO
RANCI

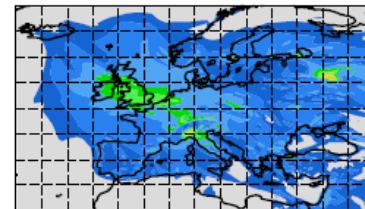
CHIMERE



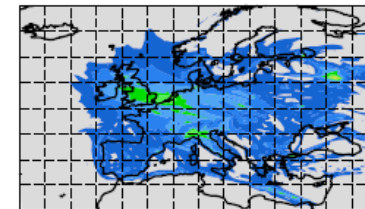
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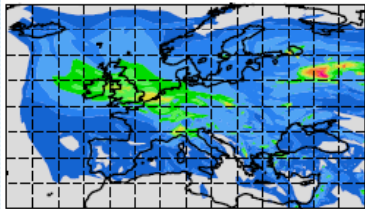
SILAM



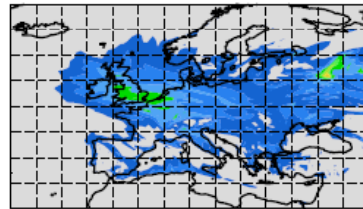
LOTOS-EUROS



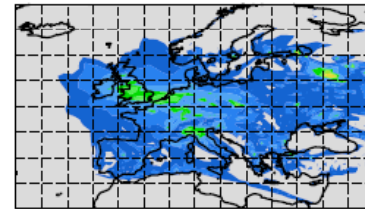
MOCAGE



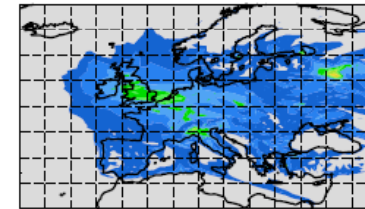
EURAD-IM



MATCH



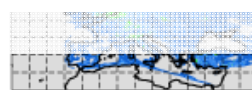
ENSEMBLE MEDIAN (N=7)



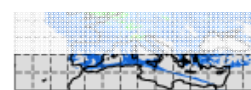
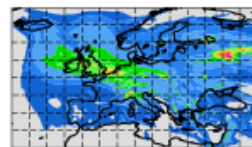
LOTOS-EUROS
SILAM

Parameter

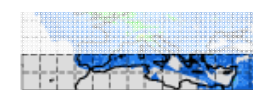
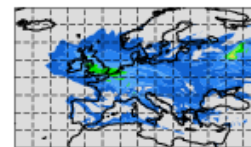
Ozone
Nitrogen Dioxide
Sulfur Dioxide
Carbon monoxide
PM 10 aerosol
PM 2.5 aerosol
Birch Pollen in development



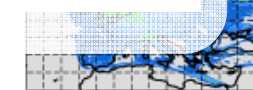
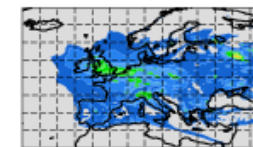
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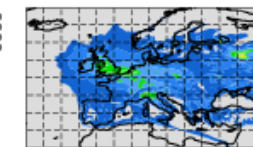
EURAD-IM



MATCH



ENSEMBLE MEDIAN (N=7)



'Green scenarios' Toolbox

Control scenarios

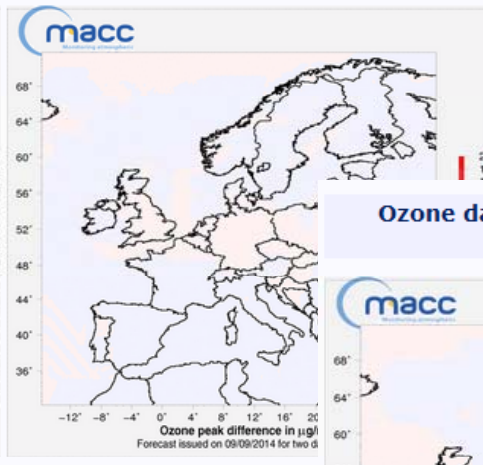
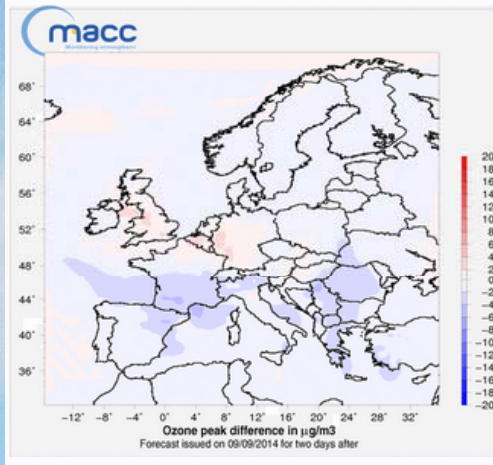
Forecasts

Emission scenario impacts

Pollutant Day

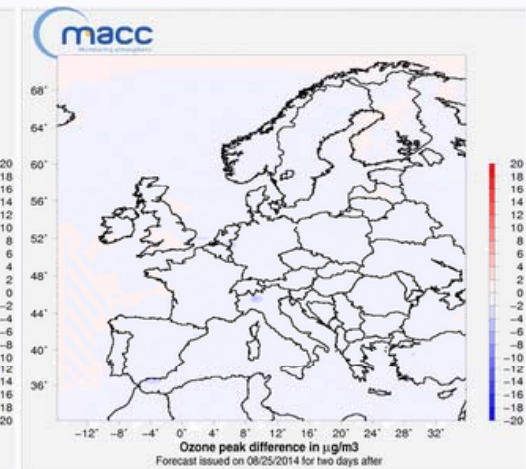
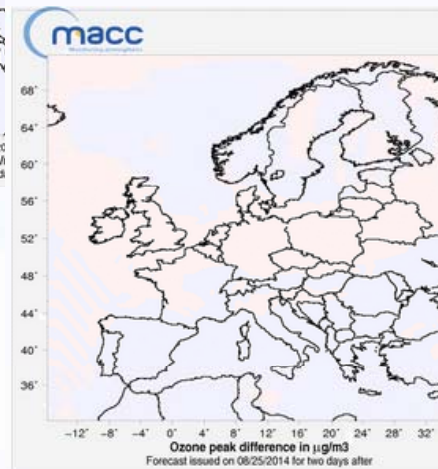
Ozone daily peak difference
(stra-ref)

Ozone daily peak difference
(sres-ref)



Ozone daily peak difference
(sagr-ref)

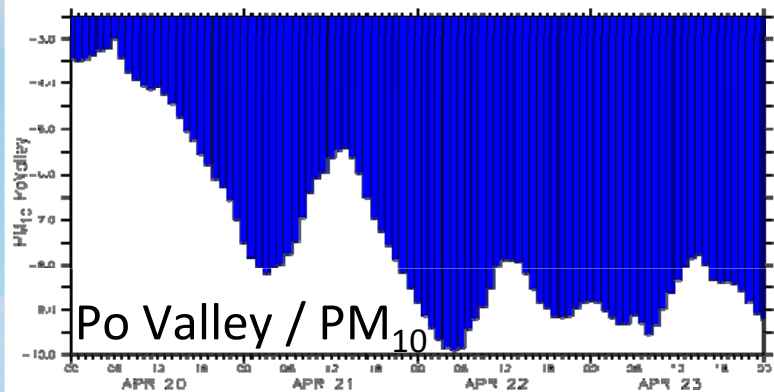
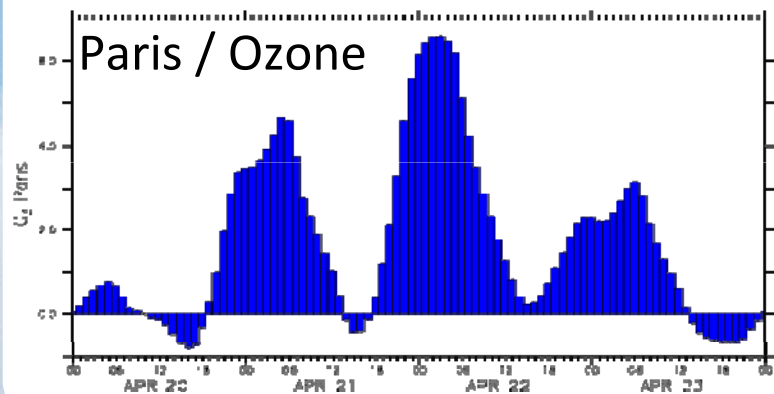
Ozone daily peak difference
(sind-ref)



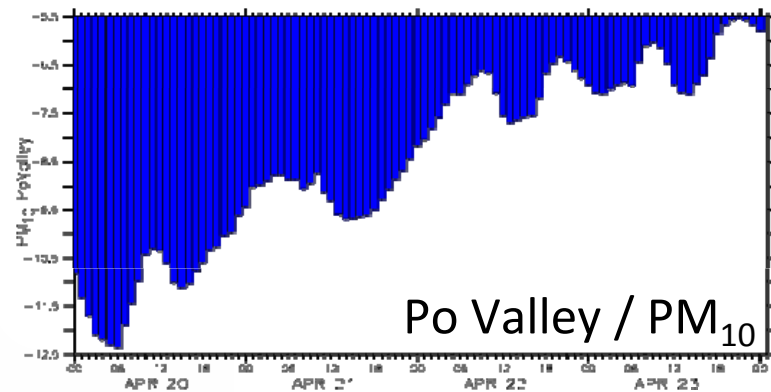
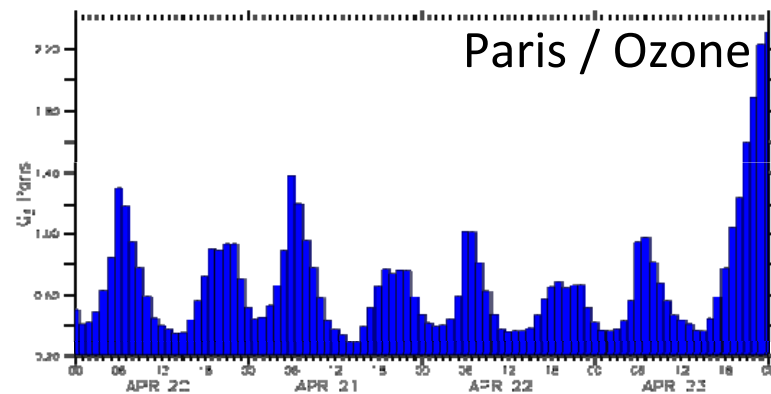
http://www.copernicus-atmosphere.eu/services/aqac/policy_interface/green_scenarios/

Source-receptor calculations

- External emission reductions



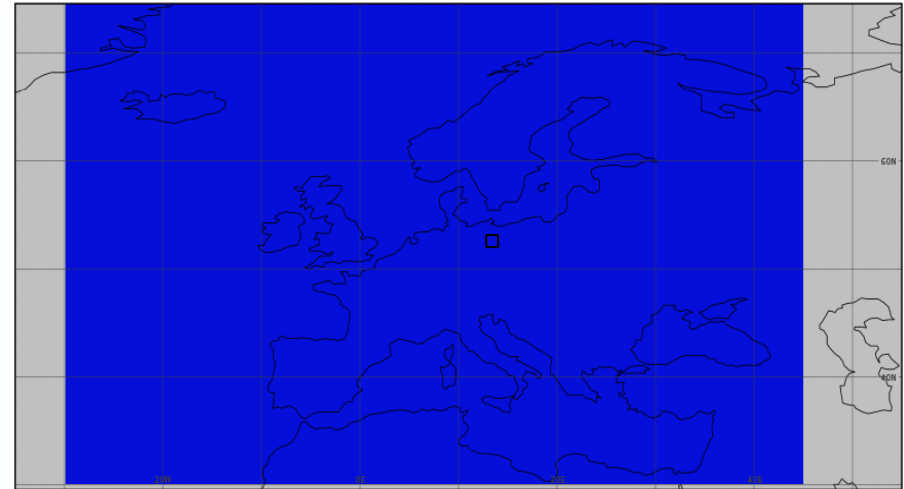
- Local emission reductions



Examples of animations: Berlin, 22-25 June 2014

PM10 Surface (ug/m3)

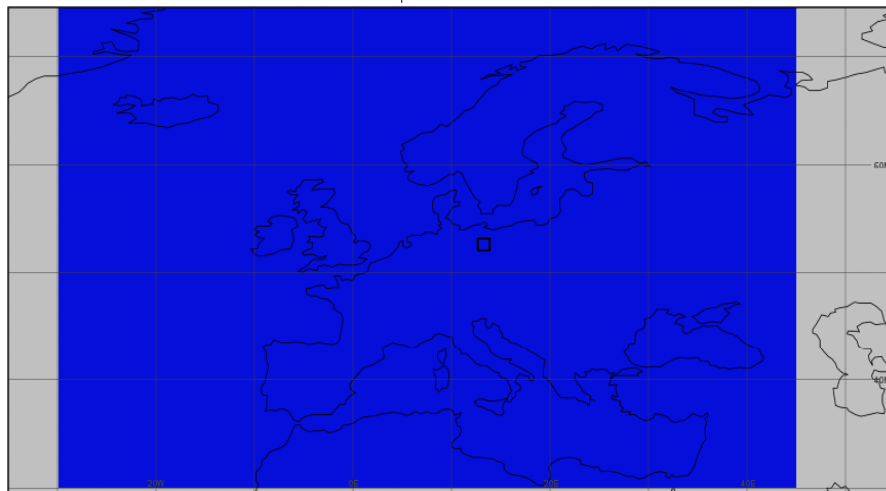
Time at end of period: 2014-06-22 00:00:00



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Meteorological
Institute

PM10 Surface (ug/m3)

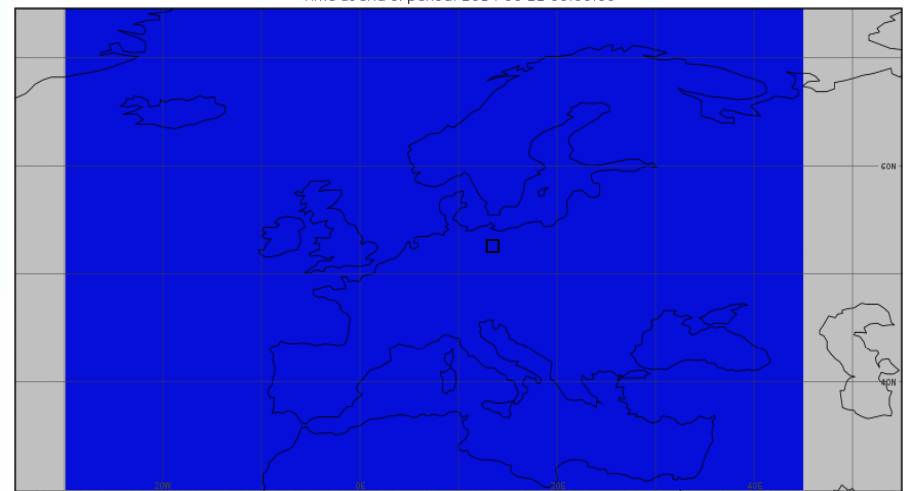
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Meteorological
Institute

PM10 Surface (ug/m3)

Time at end of period: 2014-06-22 00:00:00



Norwegian
Meteorological
Institute

Use cases

- European air quality policy users need accurate and timely information on air pollution and its causes (including advice on mitigation options), in support of:
 - air quality legislation
 - compliance monitoring
 - reporting / alerting
- The successful use of MACC-III model output (global and regional) as boundary conditions has been demonstrated for regional and local air quality modelling and source attribution studies, as well as air quality mapping.
→ see, e.g., later presentation by Leonor Tarrason

MACC workshops dedicated to policy users

MACC-II: Brussels, November 2013

MACC-III: Vienna, March 2015

The policy user workshops have been organized to:

- present policy-relevant products of MACC
- demonstrate their usefulness presentations of use cases
- assist users in the application of MACC products
- obtain feedback from users / learn more about their needs

The policy support activities will be procured in CAMS, but the close interaction with policy users of Copernicus-Atmosphere products is likely to continue

http://www.copernicus-atmosphere.eu/services/aqac/policy_interface/first_pol_workshop/
http://www.copernicus-atmosphere.eu/services/aqac/policy_interface/second_pol_workshop/

Policy user requests from previous workshops (selected)

- Make more data available
 - more information on specific regions
 - ✓ need for local information
 - ✓ need to bridge the gap through downstream service providers
 - more meta data on how the results are produced
 - more choices of green scenarios
 - detailed reanalyses of past air pollution episodes
- Faster delivery
 - periodic assessment reports
- Ease of access
 - searching relevant products
 - signing protocols
 - downloading multiple files, etc.
- Continued user support
 - workshops, training