MACC – Monitoring Atmospheric Composition and Climate

• A proposed pilot GMES Atmospheric Service, 2009-2011

• Successor to GEMS FP6 project and ESA-funded GMES Service Element project PROMOTE

• Submitted last week to European Commission in response to a call for proposals for FP7 funding

• Responds also to conclusions of a Workshop on the GMES Atmospheric Service held in December 2006

• May be shaped further following the report of the Implementation Group for the Atmospheric Service
The MACC Partnership

• The partnership comprises 45 national institutes from 18 European States, plus ECMWF and JRC

• Partners include 11 Met Services from Member and Cooperating States of ECMWF

• Partners come from 17 Member and Cooperating States

• Supporting organizations comprise several other national institutes, EUMETSAT and WMO

• ECMWF is project coordinator and leads components on:
  – global data assimilation, production and services
  – data acquisition
The MACC product set

• Daily global analyses of greenhouse gases, reactive gases and aerosols
• Estimates of global climate forcing, emissions and sinks
• Global forecasts of reactive gases and aerosols
• Regional multi-model forecasts and assessments of air quality
• Specific services for stratospheric ozone, solar and UV radiation, warning of dust-borne meningitis, …
• Estimates of long-range pollutant transport, source attribution, and data in support of international studies
The MACC Project Architecture

Observations → Global

Global → Regional

Regional → Outreach, services for health and policy, fire analysis, upgraded estimates of emissions, ...

Products
The MACC Global Data Assimilation, Production and Service Component

- **Other MACC global components**
  - Greenhouse gas modelling
  - Reactive gas modelling
  - Aerosol modelling

- **Global data assimilation**
  - Greenhouse gas assimilation
  - Reactive gas assimilation
  - Aerosol assimilation

- **Integrated analysis and forecasting system**

- **Satellite and in-situ observations; estimates of fire and other emissions**

- **ECMWF meteorological operations and climate reanalysis**

- **GEMS pre-production analysis and forecasting system**

- **Global production**
  - Real time
  - Delayed mode

- **Reanalysis**

- **Global services**
  - Product generation
  - Monitoring and validation

- **Product display, supply and general web services**

- **End users**

- **Other MACC components**

- **Downstream services**
Feedback from MACC to NWP

• Provision of initial aerosol distributions and aerosol parametrizations for NWP models
  – for new forecast products
  – for effects on radiation and clouds
  – to be explored by ECMWF and the Met Office in MACC

• Provision of improved ozone analyses and simplified ozone parametrization scheme

• Provision of better trace-gas information for radiative-transfer calculations in assimilation of radiance data

• Provision of new diagnostics of NWP model performance
  – for mass conservation, large-scale transport, convective and turbulent vertical mixing, …
Timescale and budget

• Outcome of assessment of proposal – 4Q 2007
• Report of Implementation Group – 2Q 2008
• Contract negotiation – 3Q 2008
• Project start – 1 January 2009

• ~ 5M € per year for project as a whole
• ~ 30% allocated to ECMWF