LIFE06 ENV/AT/PREP/06

PROGRESS REPORT No. 1

Covering the project activities from 01 February 2007 to 30 June 2007

As of: 30 June 2007

EC4MACS – European Consortium for Modelling of Air Pollution and Climate Strategies

Project location	Austria
Project start date:	01/02/2007
Project end date:	31/01/2012 **Extension date:** N/A
Total Project duration (in months)	60 months **Extension months:** N/A
Total budget	€ 8,839,371
EC contribution:	€ 4,417,186
(%) of total costs	49,97%
(%) of eligible costs	50%

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1 Lists of key-words and abbreviations

Beta	Benefits Table database: Estimates of the marginal external costs of air pollution in Europe
CAPRI	Common Agricultural Policy Regionalised Impact Model
CAFE	Clean Air for Europe Programme of the European Commission
DG-ENV	Directorate General for Environment of the European Commission
EC4MACS	European Consortium for Modelling of Air Pollution and Climate Strategies
EMEP	European Monitoring and Evaluation Programme, Science-based and policy-driven program under the Convention on Long-range Transboundary Air Pollution for international co-operation to solve transboundary air pollution problems.
EUROSTAT	Statistical Office of the European Communities
ExternE	Externalities of Energies. A research project of the European Commission
FASOM	Forest and Agricultural Sector Optimization Model
GAINS	Greenhouse Gas and Air Pollution Interactions and Synergies model
GEM-E3	A general equilibrium model for Europe and the World
MET NO:	Norwegian Meteorological Institute
PRIMES	A modelling system that simulates a market equilibrium solution for energy supply
RAINS	Regional Air Pollution Information and Simulation developed by the International Institute for Applied Systems Analysis (IIASA)
TREMOVE	Transport and emission simulation model developed for the European Commission
UNFCCC	United Nations Framework Convention on Climate Change

2 Executive Summary

2. 1 Project Summary

The EC4MACS (European Consortium for Modelling of Air Pollution and Climate Strategies) project builds and maintains a network of well established modelling tools for a comprehensive integrated assessment of the policy effectiveness of emission control strategies for air pollutants and greenhouse gases. The common assessment framework (GAINS) incorporates the RAINS integrated assessment model for air pollution, the PRIMES energy model, the TREMOVE transport model, the CAPRI agriculture model, the EMEP atmospheric dispersion model, the GAINS-Europe model for greenhouse gas mitigation, models for health and ecosystems impacts, the GEM-E3 macro-economic general equilibrium (GEM-E3) model and the Beta and ExternE benefit assessment approaches. All these models have been successfully applied in earlier policy processes (i.a., the CAFE programme). Their combined analytical capacity will be extended by a newly developed model for carbon sinks, which will then allow an integrated assessment of mitigation and enhanced carbon sinks across sectors and pollutants.

The current databases of these models will be updated to reflect latest perspectives on energy demand and agricultural production in the EU up to 2030 to be consistent with relevant energy, transport, and agricultural policies as well as environmental legislation including commitments under the Kyoto Protocol and subsequent climate obligations. Model descriptions of key processes will be improved to reflect new scientific findings, e.g., on health, ecosystems impacts, biodiversity and atmospheric chemistry.

The technical and economic description of emission sources and abatement technologies for air pollutants and greenhouse gases will be updated and the analysis of non-technical measures will be introduced. Databases will be validated in consultations with stakeholders from Member States and industry.

With these improvements, the project will provide scientific and economic analyses for (i) the revision of the Thematic Strategy on Air Pollution in 2010/2011, and (ii) the European Climate Change Programme on policies for reducing greenhouse gas emissions beyond 2012. It will assess the costs and benefits of policy options to further improve air quality in Europe, taking full account of the synergies and trade-offs with greenhouse gas reductions, and explore country- and sector-specific mitigation potentials for the six Kyoto greenhouse gases and their interactions with air pollution control.

2.2 Objectives of the EC4MACS project

- Provide the necessary scientific and economic analyses for the revision of the Thematic Strategy on Air Pollution and the European Climate Change Programme. Establish and maintain the analytical capacity to assess the policy effectiveness of reducing air pollution and greenhouse gases through bringing together established modelling tools from the relevant fields
- Enhance the analytical capacity of the current model implementations by including relevant new scientific findings in different fields so that the tool will be up-to-date for policy application in 2010/2011.
- Update the model databases with most recent statistical data and projections on energy, transport, agriculture, emissions for all European countries (including the EU Member States) and economic sectors.

- Achieve acceptance of modelling tools and data from stakeholders from Member States, industry and other interest groups
- Make the assessment tool available to the public via the Internet.

2.3 Key Deliverables for the four areas of work

see Annex1

3 Project management

A full-time project coordinator (Hans Benzinger) has been hired by IIASA to conduct the financial and organisational administration of the consortium. He took up work at the project start on 01 February 2007 and focussed on the organisation of the kick-off meeting, which took place on the 06 and 07 March 2007 at IIASA with 27 participants, the development of the Consortium agreement and the financial reporting routines. Permanent contact to the partners has been kept to establish and stabilize the partnership and to clarify technical issues.

IIASA has organized a meeting of the EC4MACS Steering Group at DG-ENV in Brussels (April 26, 2007). The minutes of this meeting are attached ***(see ANNEX 2).***

Since the start of the project the *Inception Report* (Deliverable) of EC4MACS has been delivered to the Commission on April 30, 2007 along with the minutes of the Kick-Off meeting and of the first Steering Committee Meeting.

Apart from this project-neutral amendment regarding the Norwegian Meteorological Institute there is currently no extension, modification or significant change envisioned.

An organigram that reflects the partnership as of 30 June 2007 is attached ***(see Annex 3)***

4 Technical development

4.1 Task 1: Management and reporting to the EU

- Permanent contact to the partners has been kept to establish and stabilize the partnership, to give advice and guidance for project partners as well as to clarify administrational and financial issues in advance.
- A two-day Kick-off meeting has been organized at IIASA where the work plan and the administrative procedures of EC4MACS were discussed among all participants. All materials have been made available to partners on a preliminary homepage (www.iiasa.ac.at/~benzing/).
- A first meeting of the EC4MACS Steering Committee has been held at the premises of the European Commission DG-ENV (minutes are attached). The meeting was attended by representatives from DG-ENV, DG-ENTER and DG-JRC-IES, while representatives from DG-AGRI, DG-TREN, DG-ECFIN and DG-JRC-IPTS sent apologies.
- Following the recommendation of the LIFE Monitoring body for EC4MACS, it has been agreed to draw up a Consortium Agreement in order to regulate responsibilities and financial procedures over and above the LIFE Common Provisions. Thus, the project coordinator has drafted a first version of the Consortium Agreement and consulted with the project partners. A revised version reflecting comments received from the partners has been circulated and should be signed by all partners in the coming weeks.
- Financial and administrative tools for the management of EC4MACS have been developed and made available to the partners.
- In order to ensure that all partners are setting up financial documentation systems that enables IIASA to adequately report to the Commission and make the required financial information available at all times, a first financial reporting test has been conducted covering the first two months of the project. As a result, additional guidance and a set of forms to assist partners have been developed and IIASA's own time recording system has been adjusted to meet LIFE reporting requirements.
- A subcontract to EMRC-Ecometrics Research and Consulting (agreed in application as sole supplier) for the coordination work under task 8 has been prepared. The sub-contract is expected to be issued as soon as a revised and detailed breakdown of costs and tasks has been received and accepted by IIASA.
- Preparations for the transfer of the initial payment to the partners (collection of bank details, VAT status etc.) have been made. Payments will be initiated as soon as the consortium agreement has been signed by all partners.
- The EC4MACS project web site (www.ec4macs.eu) has been created.
- Delivery of reports to Commission at the end of April deadline (Inception Report, Minutes of Kick-Off meeting, Minutes of Steering Committee meeting).

4.2 Task 2: Integrated assessment of air pollution and greenhouse gases

Several bilateral meetings were held among project partners to agree on the interplay between the various models dealing with agriculture/carbon sequestration/soil nitrogen cycles/critical loads for ecosystems. A common understanding was developed on the relevant policy issues and how these could be addressed with the participating EC4MACS models in the most efficient way.

Work has begun to explore the possibility for web-based data interfaces between the EC4MACS models.

As a first priority, the data interface between the PRIMES energy model and the GAINS model is being improved. In response to urgent policy questions, it was decided to focus as a first step on the technical information that is required to assess carbon capture technologies.

The latest population data and projections developed by IIASA have been exchanged with the AEAT team working on the benefit assessment in order to assure consistency between the benefit estimates and the underlying data used in GAINS.

The latest set of critical loads data that has been compiled by the CCE has been implemented in the GAINS model and tested. This data set includes eco-specific critical loads for acidification and eutrophication.

The GAINS emission inventories of the non-CO_2 greenhouse gases for the year 1990 and 2000 have been updated for all 27 Member States to reflect the recent national submissions to the UNFCCC. Furthermore, routines for constructing cost curves for the non-CO_2 gases have been developed, tested and implemented in the GAINS software.

Work has begun to link IIASA's GAINS model with IIASA's FASOM (Forest and Agricultural Sector Optimization Model) model. For the FASOM model, input data on the infrastructure for biophysical modelling were established including detailed topographic data, land-cover, crop extend and agricultural practices, forest biomass, NPP products, weather generators, soil information and other bio-geochemical indicators. Much of these data sets were originally compiled by the INSEA project (www.insea-eu.info). Technical data to assess costs and potentials in the agricultural sector as well as the forestry sector were extended to assess bioenergy and biorefinery production chains based on 1st and 2nd generation bioenergy systems. Most importantly secondary products enter the cost calculation database. The most recent baseline projections have been included in the database.

The technical progress reports for the GAINS and FASOM models are available at the EC4AMCS web site (www.ec4macs.eu/home/gains-news.html and www.ec4macs.eu/home/fasom-news.html)

4.3 Task 3: Ecosystems impact assessment

The Coordination Centre for Effects (CCE) has requested all designated national focal centers on impact assessment to provide *voluntary* data on elements that are required for the EC4MACS tasks, i.e. regarding (a) modeled critical loads, (b) empirical critical loads (for the first time), (c) dynamic modelling, and (d) Natura2000 areas (N2K) and other designated-protection-areas and sensitive ecosystems. Responses have been presented to and reviewed at the seventeenth CCE workshop (Sofia, 23–25 April 2007) and the twenty-third Task Force meeting (Sofia, 26–27 April 2007) of ICP Modelling and Mapping. Results will be published in a CCE progress report, conceived under the work-programmes of EC4MACS and of the Convention on Long-range Transboundary Air Pollution that is published in the autumn of 2007.

CCE has contacted DG-ENV to gain access to the database on Natura2000 areas, so that the site-specific critical loads for acidification and eutrophication can be developed. After several iterations, DG-ENV has promised to provide necessary data in the coming weeks.

The technical progress report for the CCE-IMPACTS model is available at the EC4AMCS web site (www.ec4macs.eu/home/impacts-news.html).

4.4 Task 4: Atmospheric dispersion

MET.NO provided transfer matrices for five meteorological years for acid deposition, PM2.5 and ozone. These matrices have been implemented in the GAINS model to develop policy scenarios that take account of the inter-annual meteorological variability.

Further action on Task 4 requires a clarification of the status of MET.NO as a LIFE partner (see remarks in Section 5).

4.5 Task 5: Energy scenarios

Work at NTUA (E3MLab) collected new data for the energy system of each of the EU27 member-states for the time period up to 2005. The new energy data have the form of detailed energy balance sheets per country and per time period as available in disaggregated format from Eurostat. The data have been compiled and checked so as to be transformed to the input format of the model PRIMES. Similar work took place for other sets of data, including cogeneration statistics (EUROSTAT CHP survey), energy prices and taxes and sectoral economic activity. The PRIMES data were adjusted and corrected retrospectively (back to 1990) because of retrospective changes carried out by the statistical offices.

Furthermore, new data with more than 25000 records for power plants in all European countries have been collected and introduced into the PRIMES model. Information has been collected about current energy policies and measures in the Member States and at community level in the domains of energy efficiency, biofuels, renewable, taxation-subsidies, market opening, interconnection, energy security of supply, domestic energy resources, environment as well as regarding the EU ETS. Information the investment plans of electricity and gas companies have been collected.

Technological and economic projections about the future evolution (learning) of new energy technologies have been updated based on the results of the EU Technology Platforms. Resource and renewable potential information disaggregated per source and member – state have been also updated and included, for the first time, data on possibilities of CO2 geological storage.

All the above data fed the input database of PRIMES which has been calibrated to reproduce years 2000 and 2005 exactly matching the statistics.

The progress of work took place according to schedule. The finalized outcome is the database and the calibrated model code.

The technical progress report for the PRIMES model is available at the EC4AMCS web site (www.ec4macs.eu/home/primes-news.html).

4.6 Task 6: Transport scenarios

The existing TREMOVE transport baseline has been reviewed. Input data have been crosschecked with national statistical data. Output data have been checked for consistency and compared with other sources of information (e.g., the TRENDS model and with national statistical data). A detailed map of the model has been designed and all output files have been organized in order to simplify the reporting procedure. Since the output file is a MS Access file, SQL queries have been created to allow data classification and aggregation in levels suitable for consistency checks.

Since TREMOVE does currently not have an user interface, operating the model is complicated and unsuitable for inexperienced users. A first design for an interactive model interface has been completed. In these first steps an easy way to run the model and extract output data has been done as well as the implementation of simple scenario design dealing with emission factors and fixed costs changes.

A number of scenarios have been designed to implement transport policies in the model. These scenarios have been organized in a detailed file structure and reported to allow the reuse of them when needed. Also a combination of all scenarios is also possible by modifying files related to the scenarios.

The technical progress report for the TREMOVE model is available at the EC4AMCS web site (www.ec4macs.eu/home/tremove-news.html).

4.7 Task 7: Agricultural scenarios

The databases of the CAPRI model are currently updated. This includes downloads of revised data from EUROSTAT and a number of other databases, checking for changes in definitions and correspondence of codes, checking of large changes between old and new raw data and consolidated data, and revising the program code as necessary.

During the kick off meeting it has been decided to incorporate biofuel production into the CAPRI projections and scenario analysis. Work has started by exploring available databases and methodological modelling solutions. A final decision on the preferred methodology is foreseen for the coming months.

The technical progress report for the CAPRI model is available at the EC4AMCS web site (www.ec4macs.eu/home/capri-news.html).

4.8 Task 8: Benefit assessment

The team has continued to develop the links between benefits assessment and the GAINS model. A report considering the linkages between the benefits assessment and other components of EC4MACS is being developed. This considers which of the models/tasks can provide input to the benefits assessment (GAINS, EMEP, ecosystem analysis, CAPRI), and which may utilise its outputs (possibly PRIMES and TREMOVE).

Extensive work on the development of methods for the cost-benefit analysis linked to other models was performed in earlier studies for the European Commission (under the ExternE series and then the CAFE). Opportunities for further development and refinement of the methodology have been identified and will be considered in detail in the next phase of the project. These include:

- New work on crop damage from air pollution;
- Conclusions of a workshop of health experts convened by WHO to consider whether there are grounds for revising the health impact functions that they defined under the CAFE process;
- Potential linkage with the CAPRI and other agricultural models to extend to quantification of impacts on crops and to improve valuation of crop damage;
- New valuation work;
- Improved description of ecological damage from air pollution, bringing in the results from Task 3 on ecosystems impact assessment.

For dissemination, three opportunities have so far been used by the participants of Task 8 to informally disseminate EC4MACS from the perspective of Task 8:

- European Commission DG Environment workshop on the valuation of air pollution damage to ecosystems on June 5th 2007.
- NEC-PI meetings (expert group on revision of the National Emission Ceilings Directive, involving representatives of all EU Member States, Norway, Switzerland, etc.
- Saltsjobäden 3 workshop held in Gothenburg 12-14 March 2007.

The technical progress report for the BENEFIT assessment model is available at the EC4AMCS web site (www.ec4macs.eu/home/benefits-news.html).

4.9 Task 9: Macro-economic impacts

No activities on the macro-economic impact model were foreseen for the period February to June 2007.

4.10 Task 10: Dissemination

The LIFE logo is used for any material that may become public. Partners have also been informed and encouraged to use the logo on all documents and to provide the lead partner with a copy for project documentation.

A web site on the EC4MACS project with an own URL **(www.ec4macs.eu)** has been set up on the IIASA server at the end of July 2007. Inter alia, the site provides a flow chart of all EC4MACS models, descriptions of their methodologies and how they interact with each other, the technical progress reports, information on all partner institutions, and presentation material that can be used for own presentations. The LIFE logo is displayed on the main page and on each sub-page.

A number of presentations at international scientific meetings have introduced the EC4MACS project. These include:

- The meeting of the UN/ECE Task Force on Integrated Assessment Modelling (Prague, May 2-4, 2007)
- The meeting of the Bureau of the EMEP Steering Body (Vienna, March 26-28, 2007)
- The seventeenth CCE workshop (Sofia, April 23–25, 2007)

- The twenty-third Task Force meeting of ICP Modelling and Mapping of the Convention on Long-range Transboundary Air Pollution (Sofia, April 26–27, 2007)
- Workshop on the Valuation of Air Pollution Ecosystem Damage (Brussels, 21 June 2007).
- NEC-PI meetings (expert group on revision of the National Emission Ceilings Directive, involving representatives of all EU Member States, Norway, Switzerland, etc.
- Saltsjobäden 3 workshop (Gothenburg 12-14 March 2007).

Apart from the inception report (deliverable for 30 April 2007) no separate reports have been produced in the first five months.

5 Problems encountered

The Norwegian Meteorological Institute (MET.NO) is facing problems to establish the financial flows that provide the necessary co-funding for a Norwegian (non-LIFE country) partner. As a consequence, MET.NO has decided to withdraw as a formal partner from the EC4MACS project. However, MET.NO remains committed to deliver the foreseen contributions to the EC4MACS consortium, although formally not under the LIFE project agreement and as a consequence, without EU funding. The Bureau of the EMEP Steering Body under the Convention on Long-range Transboundary Air Pollution, which oversees the work plan of the EMEP Meteorological Synthesizing Centre-West (MSC-W) hosted by the Norwegian Meteorological Institute, has agreed to provide the originally foreseen contributions of MET.NO to the EC4MACS project under the EMEP work plan and with resources of the European Monitoring and Evaluation Programme (EMEP) of the Convention. Once the full implications of this decision are known, the Commission will be informed in a separate note.

There is some delay in establishing the consortium agreement (scheduled for end of April) due to the need to obtain agreement from all partners. Some partners are from or affiliated with large entities where legal experts are to be involved who are not or little familiar with the project. The time to explain and to get constructive feedback and re-draft has been underestimated. The consortium agreement is now planned to be signed within August.

A further deferral has occurred in sub-contracting task 8 (Benefit assessment) due to necessary revisions and additions to the subcontractor's offer. This is also expected to be completed within August 2007.

There is also some minor delay to establish an individual partner budget and to produce the necessary evidence. Therefore, the table of chapter 9 (Project Costs Incurred) does not include all costs for Feb-Jun 07. Some evidence of that period is currently outstanding and will be included in the next reporting period.

No major technical or organisational delays over and above the delays in contracting have been identified.

6 Dissemination

Dissemination of EC4MACS information is an individual task within EC4MACS (Task 10). See details on dissemination activities in Section 4.10

7 Achieved and envisioned progress up to 31 December 2007 (next 6 months)

7.1 Achievements in the period 01 February 2007 to 30 June 2007

The progress of the project is largely according to schedule. There is however, a slight delay in completing the contractual arrangements. The time needed by the partners to consider the draft agreements has been somewhat underestimated. Delays were caused by partners who have to involve their own legal departments for their analysis, which took more time than originally planned. As a knock-on effect, the transfer of the initial payment to the partners has also been delayed accordingly. The transfer will occur immediately after the closure of the consortium agreement. It is necessary to stress that the implementation of the project has not been affected by these delays.

7.2 Envisioned progress up to 31 December 2007 (next 6 months)

Progress is according to schedule, i.e., the work elements and deliverables listed in the work plan are confirmed and are expected to be completed in time.

With regard to project management, tasks for the next six months include:

- Completion of partner budgets
- Collection of confirming documents from partners regarding VAT-status
- Collection of outstanding cost evidence
- Completion of Consortium Agreement
- Transfer of the initial payment to the partners
- Completion of Sub-contracting
- Payment to sub-contractor
- Preparing for and receiving visit from Monitoring Team (Thomas Mayer/Particip) on 17/08/2007
- Development of a project logo for publicity reasons
- Preparation for project meeting in spring 2008
- Continuous updates and improvements of the project homepage
- Co-ordination of partners

Attached GANTT chart gives a full overview of the completed and envisioned tasks *(see ANNEX 4).*

8 Financial issues

PROJECT COSTS INCURRED:

	Cost category	Total cost according to the Commision's decision*	Costs incurred from the start date to 30/06/2007	%**
1.	Personnel	6,757,318	267,943	3.97
2.	Travel	214,114	7,356	3.44
3.	Outside assistance	1,275,000	0	0
4.	Durables: total non-depreciated cost		2,705	54.1
	- Infrastructure sub-tot.		N/A	-
	- Equipment sub-tot.	5,000	2,705 (total eligible / not depreciated)	54.1
	- Prototypes sub-tot.		N/A	-
5.	Consumables		N/A	-
6.	Other costs	5,000	0	0
7.	Overheads	577,939	19,460	3.37
	SUM TOTAL	**8,834,371**	**297,464**	**3.34**

*) If the Commission has officially approved a budget modification indicate the breakdown of the revised budget
**) Calculate the percentages by budget lines: How many % of the budgeted personnel costs are incurred by 30/06/2007

This report is for the first 5 months of the project's duration. Expenses that have not been fully evidenced are not included in the financial table above. The expenses not included will be evidenced in due course and will be indicated in the next progress report (due 31 January 2008).

IIASA has spend a good part of its Equipment budget on a one piece of equipment (server "Sun workstation" for running the Oracle databases and web-server), which is depreciable within 3 years.

From the current perspective the 30% threshold will not be reached before the mid-term report and it appears to be unlikely that the interim claim (after 30% of total costs are spent) will occur before July 2009).

Other costs (audit) will also not be applicable until the mid-term report is completed.

There is currently no budget modification expected.

9 Annexes

A1 List of Key Deliverables for the four areas of work
A2 Minutes of Steering Committee meeting (26/04/2007)
A3 Organigram (Partnership Structure)
A4 GANTT chart

Annex 1: Key Deliverables for the four areas of work

	Methodology	Data	Dissemination	Policy application
2007	Continuous Improvements 31.07 1st progress report		31.07 EC4MACS website	First Steering Committee Meeting
2008	31.01: 2nd progress report 30.4: Interim documentation on methodology 31.07: 3rd progress report 31.07: Full report on methodology	Data collection 31.07: Preliminary results of critical loads for Natura 2000 area, on dynamic modeling of N-impacts and assessment of biodiversity 31.10: Documentation of EU-FASOM/GAINS linkage	31.10. Consultation on methodology over Internet	First quarter: 2nd Steering Committee meeting
2009	31.01: 4th progress report 31.07: 5th progress report 31.07: Mid-term report 31.7. Revised modeling methodology documentation	31.1.: Documentation of interim data	30.4. Internet access 31.10. Methodology workshop	First quarter: 3rd Steering Committee meeting 30.4. Interim assessment report (baseline development and policy range 31.07: Full report on interim baselines and scope for policy measures
2010	31.01: 6th progress report 30.4. Report on Uncertainty 31.07: 7th progress report 31.07: Report on uncertainties (task 2) 31.10: Full report on uncertainties 31.10: Report on final methodology of ecosystems impact assessment		Bilateral consultations on data 31.7. Workshop on baseline	First quarter: 4th Steering Committee meeting

2011	31.01: 8th progress report 31.01: Full report on methodological description 31.01: Final estimates, results and indicators (task 3) 31.01: Report on final modelling methodology 31.07: 9th progress report 30.09: Full report on modeling technology 31.10: Full report on policy scenarios and their macroeconomic impacts	30.4.:Documentation of data for final assessment		First quarter: 5th Steering Committee meeting 31.7.: Final report on baseline projections and scenario 31.10.: Final policy scenarios
2012	31.01: 10th progress report 31.01: Analytical report on costs and policies	30.04: Final report		

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LIFE III – EC4MACS

EC4MACS – European Consortium for Modelling of Air Pollution and Climate Strategies

INCEPTION REPORT

30 April 2007

Introduction

This inception report of the EC4MACS (European Consortium for Modelling of Air Pollution and Climate Strategies) project under the EU LIFE programme summarizes the objectives of the project and outlines the workplan as it has been discussed and agreed upon at the inception meeting of the project partners and the Steering Group meeting.

. Project summary

Objectives of EC4MACS

The EC4MACS (European Consortium for Modelling of Air Pollution and Climate Strategies) project will build and maintain a network of well established modelling tools for a comprehensive integrated assessment of the policy effectiveness of emission control strategies for air pollutants and greenhouse gases. The common assessment framework (GAINS) will incorporate the RAINS integrated assessment model for air pollution, the PRIMES energy model, the TREMOVE transport model, the CAPRI agriculture model, the EMEP atmospheric dispersion model, the GAINS-Europe model for greenhouse gas mitigation, models for health and ecosystems impacts, the GEM-E3 macro-economic general equilibrium (GEM-E3) model and the Beta and Externe benefit assessment approaches. All these models have been successfully applied in earlier policy processes (i.a., the CAFE programme). Their combined analytical capacity will be extended by a newly developed model for carbon sinks, which will then allow an integrated assessment of mitigation and enhanced carbon sinks across sectors and pollutants.

The current databases of these models will be updated to reflect latest perspectives on energy demand and agricultural production in the EU up to 2030 to be consistent with relevant energy, transport, and agricultural policies as well as environmental legislation including commitments under the Kyoto Protocol and subsequent climate obligations. Model descriptions of key processes will be improved to reflect new scientific findings, e.g., on health, ecosystems impacts, biodiversity and atmospheric chemistry.

The technical and economic description of emission sources and abatement technologies for air pollutants and greenhouse gases will be updated and the analysis of non-technical measures will be introduced. Databases will be validated in consultations with stakeholders from Member States and industry.

With these improvements, the project will provide scientific and economic analyses for (i) the revision of the Thematic Strategy on Air Pollution in 2010/2011, and (ii) the European Climate Change Programme on policies for reducing greenhouse gas emissions beyond 2012. It will assess the costs and benefits of policy options to further improve air quality in Europe, taking full account of the synergies and trade-offs with greenhouse gas reductions, and explore country- and sector-specific mitigation potentials for the six Kyoto greenhouse gases and their interactions with air pollution control.

With this network of established models, the policy analysis will rest on a scientifically solid knowledge base and validated input data for all Member States and economic sectors in the EU. Stakeholder consultations will facilitate the general acceptance of the tool and thus increase the legitimacy of the policy analyses. All reports and the main analytical tool will be made available to the public on the Internet.

Table 1: Objectives of the EC4MACS project

- Provide the necessary scientific and economic analyses for the revision of the Thematic Strategy on Air Pollution and the European Climate Change Programme. Establish and maintain the analytical capacity to assess the policy effectiveness of reducing air pollution and greenhouse gases through bringing together established modelling tools from the relevant fields
- Enhance the analytical capacity of the current model implementations by including relevant new scientific findings in different fields so that the tool will be up-to-date for policy application in 2010/2011.
- Update the model databases with most recent statistical data and projections on energy, transport, agriculture, emissions for all European countries (including the EU Member States) and economic sectors.
- Achieve acceptance of modelling tools and data from stakeholders from Member States, industry and other interest groups
- Make the assessment tool available to the public via the Internet.

The project team

The project establishes a consortium of modelling teams that have in the past successfully applied their disciplinary models for policy support in Europe. The scientific coordination of the consortium is conducted by Dr. Markus Amann from the International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria. A full-time administrative assistant (Hans Benzinger) has been hired by IIASA to conduct the financial and organisational administration of the consortium. The consortium includes the Coordination Centre on Effects (CCE) at the Netherlands Environmental Assessment Agency' (MNP), Bilthoven, Netherlands; the E3M Lab of the National Technical University, Athens, Greece; the Laboratory of Applied Thermodynamics of the Aristotle University of Thessaloniki, Greece; the Institute for Agricultural Policy, Market Research and Economic Sociology of the University of Bonn, Germany; EUROCARE (Bonn, Germany); AEA-Technology (UK); Metroeconomica (UK). Two subcontracts are foreseen to complement the expertise of the consortium in the fields of atmospheric modelling and economic benefit assessment.

Table 2: Project partners and main contact persons of EC4MACS

	Project partner	***Main contact person (attending the EC4MACS kick-off meeting***
IIASA	International Institute for Applied Systems Analysis	Dr Markus Amann Hans Benzinger
MNP	Netherlands Environmental Assessment Agency CCE Coordination Centre for Effects	Dr Jean Paul Hettelingh
AEA	AEA Energy & Environment	Gwyn Jones
metroeconomica	MetroEconomica Ltd	Prof Anil Markandya
A.U.Th	Laboratory of Applied Thermodynamics Aristotle University of Thessaloniki	Dr Leonidas Ntziachristos
NTAU .	National Technical University of Athens School of Electrical and Computer Engineering	Dr Nikolaos Kouvaritakis
EuroCare	Eurocare GmbH Bonn University (ILR)	Dr Peter Witzke
EMRC	Ecometrics Research and Consulting	Dr Michael Holland (sub-contract)
JRC - IES	ISPRA Joint Research Centr Institute for Environment and Sustainability	Dr Frank Raes Dr Adrian Leip

The EC4MACS framework of models

EC4MACS will build and maintain a network of well-established modelling tools for a comprehensive integrated assessment of the policy effectiveness of emission control strategies for air pollutants and greenhouse gases. The common assessment framework (GAINS) will link the RAINS integrated assessment model for air pollution, the PRIMES energy model, the TREMOVE transport model, the CAPRI agriculture model, the EMEP atmospheric dispersion model, the GAINS-Europe model for greenhouse gas mitigation, models for health and ecosystems impacts, the GEM-E3 macro-economic general equilibrium model and the Beta and ExternE benefit assessment approaches. All these models have been successfully applied in earlier policy processes (i.a., the CAFE programme). Their combined analytical capacity will be extended by a newly developed model for carbon sink, which will then allow an integrated assessment of mitigation and enhanced carbon sinks across sectors and pollutants.

After the approval of the EC4MACS proposal, DG-ENV of the European Commission has established an administrative arrangement with DG-JRC to align the activities on the development of the TM5 atmospheric chemistry model (maintained by JRC-IES in Ispra) and the POLES energy model (maintained by JRC-IPTS in Sevilla) with the EC4MACS work plan.

Table 3: Models of the EC4MACS framework and the associated modelling teams

GAINS-Europe/Asia (IIASA)
PRIMES energy model for EU (NTUA)
CAPRI agricultural model for EU (UniBonn, EuroCare)
EMEP atmospheric chemistry and transport model (met.no)
CCE ecosystems impact assessment (MNP)
GEM-E3 general equilibrium macro-economic impacts (NTUA)
TREMOVE transport model (LAUTh)
Benefit assessment (MH, AEAT, MetroEconomica)
TM5 Hemispheric chemical transport model
POLES global energy model

The flow of information between the models, as well as the sectoral and spatial dimensions covered by the individual models is depicted in Figure 1. With the EC4MACS model suite, analysis addresses the cost-effectiveness of mitigation strategies in the EU across the different economic sectors. The analysis considers global and hemispheric boundary conditions on economic (e.g., energy prices, carbon prices, etc) and atmospheric determinants (concentrations of various pollutants in the atmosphere), a range of drivers in different policy areas in Europe (e.g., energy, agriculture, transport), and explores macro-economic, human welfare and environmental impacts of mitigation strategies.

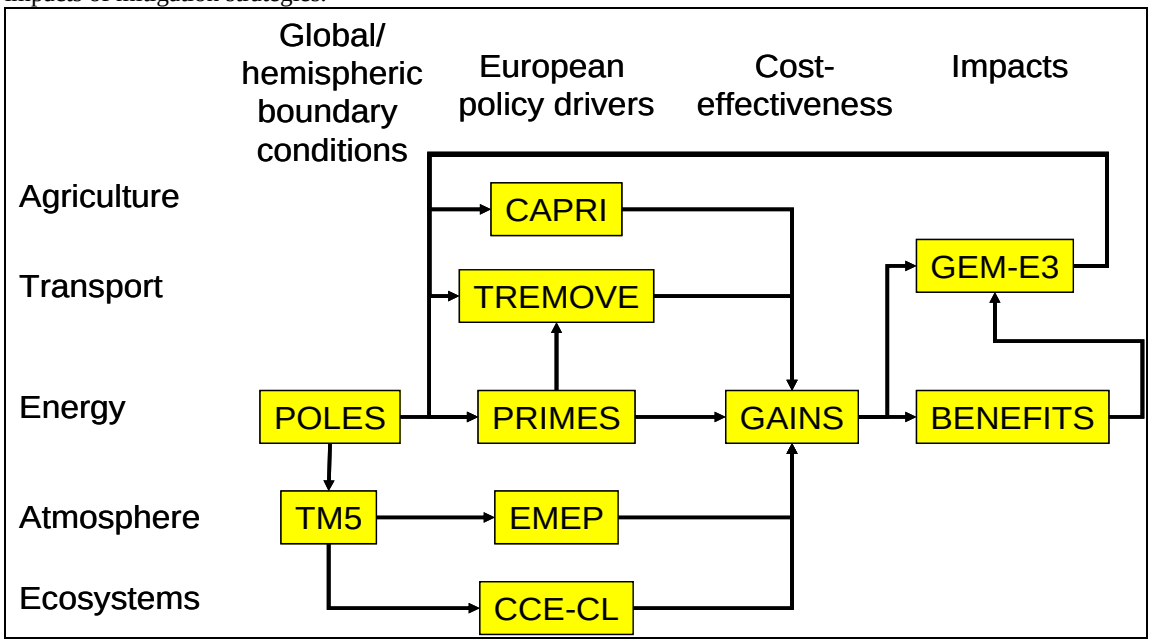


Figure 1: Schematic flowchart of the information flow in the EC4MACS modelling framework

Steering Committee

A Steering Committee has been established to oversee and guide the activities of the EC4MACS project.

Table 4: Members of the EC4MACS Steering Committee

DG-ENV	Gerardus Klaassen
DG-ENV	Matti Vainio

DG-ENT	Thorsten Brunzema
	Domenico Rossetti-Di-Valdalbero
DG-ENT	Mark Hayden
DG-TREN	Manfred Decker
DG-AGRI	Caroline Raes
JRC-IPTS	Peter Russ
JRC-IES	Frank Raes
	Dinah Peeters

The Steering Committee met on April 26, 2007 at Brussels to get acquainted with the planned activities of EC4MACS and give advice on policy-relevant directions of the work. The minutes of the Steering Committee meeting are attached in the Annex to this report.

. Activities to date

After the formal start of the EC4MACS project on February 1, 2007, IIASA has hired Hans Benzinger as project administrator with the responsibility for administrative and financial matters.
A kick-off meeting with all representatives from all project partners has been organized at IIASA on March 6-7, 2007. The first day of the meeting was devoted to the discussion of the scientific work plan, with special emphasis on the activities to be conducted during the first year, while contractual arrangements and administrative issues have been discussed at the second day. Minutes of the meeting are attached to the Annex of this report.
A meeting of the EC4MACS Steering Group has been held at the premises of the European Commission DG-ENV in Brussels on April 26, 2007. The Steering Group involves members from DG-ENV, DG-ENT, DG-TREN, DG-AGRI, DG-JRC-Ispra, DG-JRC-Sevilla, DG-RES. Minutes of the meeting are attached to the Annex of this report.

Following the discussions at the kick-off meeting, a consortium agreement has been drafted and distributed to all project partners. Partners are currently considering the draft and are making proposals for changes and additions. A final draft ready for signature is expected to be completed within May 2007.
In addition, a sub-contract for EMRC is in preparation according to the application in order to ensure necessary capacity for the completion of task 8 (Benefit Assessment).
Partners are also preparing for their first financial reporting towards the lead partner. To facilitate this, partners have been provided with forms (budget plan / timesheets etc), tools, advice and guidance.

. Workplan

The discussions at the kick-off meeting reviewed the main tasks of the EC4MACS project (Table 5), their implications for the work of each partner, and the overall work plan of the project over the five years period.

Table 5: Main tasks of the EC4MACS project

- Update models and, where necessary, incorporate new scientific insights
- Scientific peer review of all models
- Improve the model interfaces
- Validate input data with stakeholders
- Produce interim assessment in 2009

- Produce final assessment in 2011
- Project administration, financial reporting

In line with the project proposal, priority areas of work have been defined for each of the years.

Table 6: Priority areas for the annual work plans of EC4MACS

2007	Methodological improvements
2008	Data collection
	Feedbacks on methodological improvements
2009	Interim assessment
	Methodology workshop
2010	Uncertainty assessment
	Bilateral consultations on input data
2011	Final assessment

Since the work plan of the EC4MACS project can be divided into (i) methodology development, (ii) data preparation, (iii) dissemination and (iv) policy application, deadlines for deliverables in these four areas can be established as depicted in Table 7.

Table 7: Key Deadlines for deliverables for the four areas of work

	Methodology	**Data**	**Dissemination**	**Policy application**
2007	Continuous Improvements 31.07 1st progress report		31.07 EC4MACS website	First Steering Committee Meeting
2008	31.01: 2nd progress report 30.4: Interim documentation on methodology 31.07: 3rd progress report 31.07: Full report on methodology	Data collection 31.07: Preliminary results of critical loads for Natura 2000 area, on dynamic modeling of N-impacts and assessment of biodiversity 31.10: Documentation of EU-FASOM/GAINS linkage	31.10. Consultation on methodology over Internet	First quarter: 2nd Steering Committee meeting
2009	31.01: 4th progress report 31.07: 5th progress report 31.07: Mid-term report 31.7. Revised modeling methodology documentation	31.1.: Documentation of interim data	30.4. Internet access 31.10. Methodology workshop	First quarter: 3rd Steering Committee meeting 30.4. Interim assessment report (baseline development and policy range 31.07: Full report on interim baselines and scope for policy measures

2010	31.01: 6th progress report 30.4. Report on Uncertainty 31.07: 7th progress report **2010** 31.07: Report on uncertainties (task 2) 31.10: Full report on uncertainties 31.10: Report on final methodology of ecosystems impact assessment		Bilateral consultations on data 31.7. Workshop on baseline	First quarter: 4th Steering Committee meeting
2011	31.01: 8th progress report 31.01: Full report on methodological description 31.01: Final estimates, results and indicators (task 3) 31.01: Report on final modelling methodology 31.07: 9th progress report 30.09: Full report on modeling technology 31.10: Full report on policy scenarios and their macroeconomic impacts	30.4.:Documentation of data for final assessment		First quarter: 5th Steering Committee meeting 31.7.: Final report on baseline projections and scenario 31.10.: Final policy scenarios
2012	31.01: 10th progress report 31.01: Analytical report on costs and policies	30.04: Final report		

In further discussions, the work plan for the first year has been derived from the overall EC4MACS work plan, with foci on methodological improvements, the development of hard-wired model interfaces, collection of grand new ideas for additional analyses, and the testing of financial reporting routines (Table 8).

Table 8: Key elements of the work plan for the first year

- Development of improved model linkages
  - PRIMES-GAINS
  - CAPRI-GAINS
  - CAPRI-BENEFITS
  - TREMOVE-GAINS
  - IMPACTS (Natura2000)-BENEFITS
  - GAINS-BENEFITS
  - GAINS-GEM-E3
  - Assessment of carbon sink potentials
- Testing of interfaces for extreme projections
- Estimating potentials for biomass production
  - Consistency in input data across models

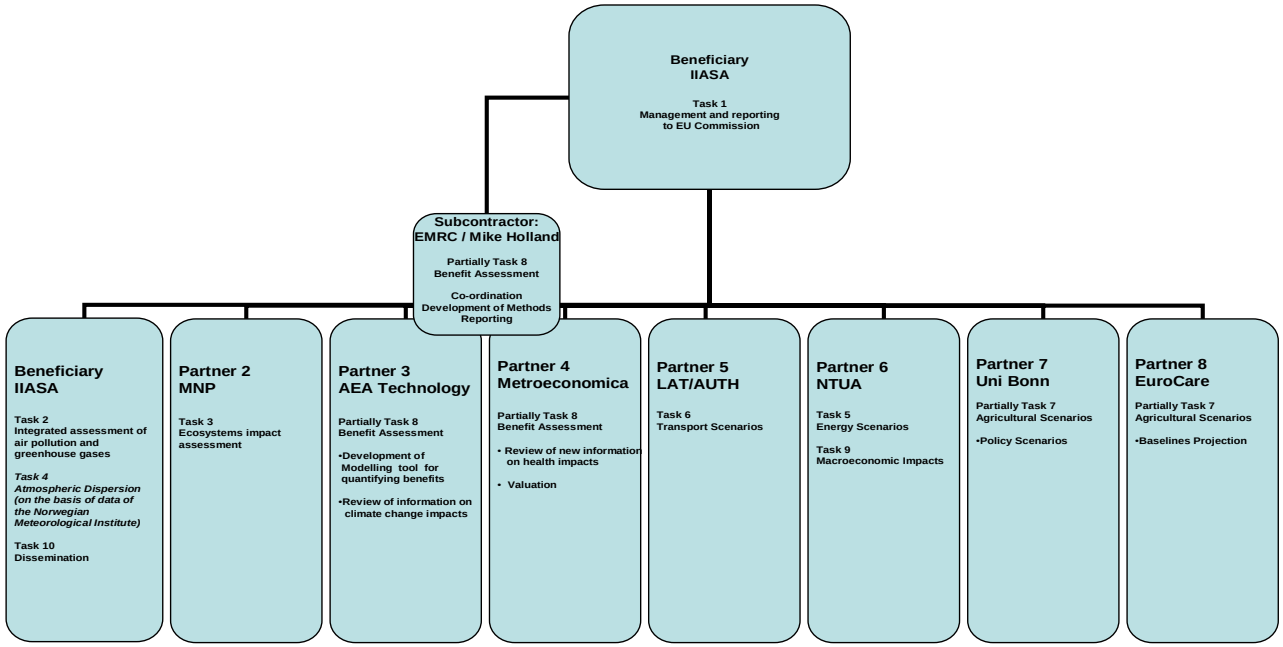
- Development of a harmonized approach to address policy-relevant implications from the C/N cycle
- Modelling the response of the agricultural sector to GHG constraints/prices
- Site-specific impact assessment (NATURA2000, etc.)
- Development and validation of the financial reporting routines

With a view on the work plan of the second year, data collection, experience from the extreme projections, linking the C/N cycle with other models, the link to the global scale and a plan for achieving acceptance by stakeholders have been identified as priority areas.

Annex:

1. Minutes of Kick-Off meeting (06/03/2007)
2. Minutes of Steering Committee meeting (26/04/2007)

ANNEX 3:
Partnership Structure EC4MACS as of 30/06/2007



3.

ANNEX 4: GANTT-chart

Indicate the overall project development and the planned activities by using the following chart/table or a similar presentation

Tasks/ Activities		2007				2008				2009				2010				2011				2012			
		1T	2T	3T	1T	1T	1T	1T	4T	1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T
Overall project schedule	**Proposed**		X (Incep report)	X (PR1)		X (PR2)		X (PR3)		X (PR4)		X (PR5 / Mid-term rep)		X (PR6)		X (PR7)		X (PR8)		X PR9		X PR10	X (Final report Laym en)(		
	Actual																								
Task 1: Management and Reporting to EU	**Proposed**																								
	Actual																								
Task 2: Integrated Assess. of AP and GHG	**Proposed**																								
	Actual																								
Task 3: Ecosystems Impact Assessment	**Proposed**																								
	Actual																								
Task 4: Atmospheric Dispersion	**Proposed**																								
	Actual																								

Start: 01/02/07

Interim date: 31/07/09

30/04/12

31/01/12

31/01/12

31/01/12

Clarification needed regarding MET.NO as a LIFE partner

Project start date: 01 February 2007
Project end date: 31 January 2012
Interim date: 31 July 2009

Tasks/ Activities		2007				2008				2009				2010				2011				2012			
		1T	2T	3T	1T	1T	1T	1T	4T	1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T
Task 5: Energy Scenarios	Proposed																						31/01/12		
	Actual																								
Task 6: Transport Scenarios	Proposed																						31/01/12		
	Actual																								
Task 7: Agricultural Scenarios	Proposed																						31/01/12		
	Actual																								
Task 8: Benefit Assessment	Proposed																						31/01/12		
	Actual																								
Task 9: Macroeconomic Impacts	Proposed																						31/01/12		
	Actual																								
Task 10: Dissemination	Proposed																						31/01/12		
	Actual																								