



EUROPEAN COMMISSION  
RESEARCH AND INNOVATION DG

Periodic Report

**Project No:** 282910

**Project Acronym:** ECLAIRE

**Project Full Name:** Effects of Climate Change on Air Pollution  
Impacts and Response Strategies for European Ecosystems

## Periodic Report

**Period covered:** from 01/04/2013 to 30/09/2014

**Start date of project:** 01/10/2011

**Project coordinator name:**  
Dr. Mark Sutton

**Version:** 1

**Date of preparation:** 10/07/2014

**Date of submission (SESAM):**

**Project coordinator organisation name:**  
NATURAL ENVIRONMENT RESEARCH  
COUNCIL

This file contains both the information which was electronically submitted to the Participants Portal, and the 'core report' which was added as a separate pdf to the site, in one file, for ease of reading. Please note, that the page numbers have NOT been harmonised.

# Periodic Report

## PROJECT PERIODIC REPORT

<b>Grant Agreement number:</b>	282910
<b>Project acronym:</b>	ECLAIRE
<b>Project title:</b>	Effects of Climate Change on Air Pollution Impacts and Response Strategies for European Ecosystems
<b>Funding Scheme:</b>	FP7-CP-IP
<b>Date of latest version of Annex I against which the assessment will be made:</b>	22/04/2013
<b>Period number:</b>	2nd
<b>Period covered - start date:</b>	01/04/2013
<b>Period covered - end date:</b>	30/09/2014
<b>Name of the scientific representative of the project's coordinator and organisation:</b>	Dr. Mark Sutton NATURAL ENVIRONMENT RESEARCH COUNCIL
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<b>Project website address:</b>	

## Declaration by the scientific representative of the project coordinator (1)

I, Dr. Mark Sutton NATURAL ENVIRONMENT RESEARCH COUNCIL , as scientific representative of the coordinator of the project ECLAIRE and in line with the obligations as stated in Article II.2.3 of the Grant Agreement declare that:

The project has achieved most of its objectives and technical goals for the period with relatively minor deviations.

The attached periodic report represents an accurate description of the work carried out in this project for this reporting period.

The public website is up to date.

To my best knowledge, the financial statements which are being submitted as part of this report are in line with the actual work carried out and are consistent with the report on the resources used for the project (section 6) and if applicable with the certificate on financial statement.

All beneficiaries, in particular non-profit public bodies, secondary and higher education establishments, research organisations and SMEs, have declared to have verified their legal status. Any changes have been reported under section 5 (Project Management) in accordance with Article II.3.f of the Grant Agreement.

<b>Name</b>	Dr. Mark Sutton NATURAL ENVIRONMENT RESEARCH COUNCIL
<b>Date</b>	

This declaration was visaed electronically by Agnieszka BECHER (ECAS user name neljasag) on

# 1. Publishable summary

## Summary description of project context and objectives

Exceedances of threshold levels for ecosystem impacts of ozone (O<sub>3</sub>) result in significant impacts on semi-natural ecosystems, while an estimated ~€7 billion in the year 2000 were lost due to phyto-toxic impacts of O<sub>3</sub> on arable crops. Due to intercontinental transport, future O<sub>3</sub> concentrations will depend crucially on how emissions of nitrogen oxides (NO<sub>x</sub>) and volatile organic compounds (VOCs) evolve in the developing world, outside Europe, but it is likely to have severe implications for the economy and global food security.

At the same time, atmospheric reactive nitrogen compounds (Nr) represent an increasingly important pollution driver of European land ecosystems, especially as emissions of sulphur dioxide (SO<sub>2</sub>) in the EU-27 have decreased by nearly 70% between 1990 and 2007, with much smaller reductions for NO<sub>x</sub> (~30%) and ammonia (NH<sub>3</sub>, ~15%) over the same period. Together, wet and dry deposition of both oxidized and reduced nitrogen are having multiple impacts on terrestrial ecosystems, in some cases increasing productivity and carbon storage.

However, nitrogen deposition is also threatening ecosystem functioning and plant community composition in many areas, representing an annual loss of ~€10-70 billion.

Last but not least, many atmospheric pollutants that affect ecosystems, like ozone, nitrogen and secondary aerosols, are not only important climate forcing agents, but their atmospheric burden strongly responds to climate change in turn. The interactions of climate change, change in nitrogen deposition, increasing atmospheric CO<sub>2</sub> concentration, changing aerosol burdens and changing ozone background and peak levels make projections of pollution impacts on terrestrial ecosystems challenging. This is especially so, since these affect ecosystem physical and biogeochemical responses on different spatial and temporal scales, and individually in either positive or negative ways (e.g., on ecosystem productivity, water use efficiency, carbon storage or biodiversity). What is more, changing biogenic emissions in response to air pollution and/or climate change can affect air pollution and climate change in turn, in a complex system that contains multiple, interacting feedbacks.

To optimise the efficacy of European emission control strategies in the global pollution-climate change context, it is vitally important that we develop a consistent and process-based observational and modelling framework to understand how interactive atmospheric pollutants will impact ecosystems in response to climate and air pollution change.

Focusing especially on the role of ozone and nitrogen, and where relevant their interactions with volatile organic compounds, aerosols and sulphur, the Overall Objectives of ÉCLAIRE are therefore to:

O1: provide robust understanding of air pollution impacts on European land ecosystems including soils under changing climate conditions, and

O2: provide reliable and innovative risk assessment methodologies for these ecosystem impacts of air pollution, including the economic implications, to support EU policy.

ÉCLAIRE is targeting climate-ecosystem-atmosphere interactions and their implications for ecosystem effects at the European scale, combining observations and experiments in the field and laboratory with modelling experiments from plot to European scales, while accounting for changes in global background.

The new scientific understanding and risk-assessment methodologies under climate change which are emerging from ÉCLAIRE will be of central importance to future air pollution policies.

## Description of work performed and main results

#### Emissions and Exchange Processes:

A flux measurement network has been established that has provided the basis to greatly improve the availability of fluxes of soil NO, O<sub>3</sub>, NH<sub>3</sub> and biogenic volatile organic compounds (BVOCs) within European ecosystems. Data collection is now nearly complete, and the results are being analyzed. Progress has also been made with laboratory experiments, especially with respect to NO and BVOC emissions. Development of a process level exchange model is underway to maximise the use of recent measurements and discoveries.

#### Emissions and exchange at local, EU and global scales:

A model developments have been achieved regarding emissions of N compounds and biogenic O<sub>3</sub> precursors in response to climate change and other factors. Emission models aimed at future projections and the role of biogenic emissions for air pollution and climate on European or global level are being tested. Results from model intercomparisons investigating the effects of climate change on ozone have been presented for EU Thematic Strategy work. Current efforts focus high-resolution assessment to better support EU air quality and Natura 2000 policy.

#### Ecological response processes and thresholds:

The main experimental results are now available. A particularly novel discovery is the identification of the link between N supply and ozone pollution. One way of expressing this is that O<sub>3</sub> reduces Nitrogen Use Efficiency (NUE), implying that O<sub>3</sub> pollution exacerbates other N pollution problems. A new pollution mechanism has also been identified, whereby high Particulate Matter (PM) concentrations can exacerbate drought stress in both natural and agricultural ecosystems. Methods to develop novel thresholds have also been refined.

#### Ecological response at regional and European scales:

Development of Global Dynamic Soil and Vegetation models has allow the impact of ozone exposure and nitrogen deposition on productivity to be examined. An empirical forest model has been developed, for rapid assessment of air quality and climate change interactions. Data mining to improve process parameterisation has been undertaken. Preliminary mapping of critical phytotoxic ozone dose thresholds for forests is now completed. Modelling of combined effects of past and expected future changes in various factors, on carbon sequestration in forests has been modelled.

#### Integrated Risk Assessment and Policy Tools:

Spatially explicit global emission scenarios have been developed. Literature reviews on ecosystems valuation have been completed, revealing the importance of clear apportionment of damage share due to air pollution. A range of approaches will be compared in further work, recognizing the challenge of ecosystem valuation. European scale nitrogen-dose-response functions have been developed.

#### Key outcomes

Based on the emerging activities of this reporting period, a clear message is emerging that climate change will worsen the threat of air pollutants on Europe's ecosystems:

- Climate warming is expected to increase the emissions of many trace gases, such as biogenic volatile organic compounds (BVOCs), ammonia (NH<sub>3</sub>) and the soil component of nitrogen oxides (NO<sub>x</sub>) emissions. These effects are expected to increase ground-level concentrations of NH<sub>3</sub>, NO<sub>x</sub> and ozone (O<sub>3</sub>), as well as atmospheric nitrogen deposition.
- Climate warming may increase the vulnerability of ecosystems towards air pollutant exposure or atmospheric deposition. Such effects may occur as a consequence of combined perturbation, as well as through specific interactions, such as between drought, O<sub>3</sub>, N and aerosol exposure.

The emerging message is that the first of these interactions are likely to be very significant. Unless

decisive mitigation actions are taken, it is anticipated that ongoing climate warming will increase agricultural and other biogenic emissions, posing a challenge for national emissions ceilings and air quality objectives related to nitrogen and ozone pollution.

### **Expected final results and potential impacts**

The ÉCLAIRE project will deliver a range of measurements and modelling outputs and predictions. These results will be integrated to answer the following Key Questions:

Q1: What are the expected impacts on ecosystems due to changing ozone and N-deposition under a range of climate change scenarios, taking into consideration the associated changes in atmospheric CO<sub>2</sub>, aerosol and acidification?

Q2: Which of these effects off-set and which aggravate each other, and how do the mitigation and adaptation measures recommended under climate change relate to those currently being recommended to meet air pollution effects targets?

Q3: What are the relative effects of long-range global and continental atmospheric transport vs. regional and local transport on ecosystems in a changing climate?

Q4: What are the appropriate metrics to assess ozone and nitrogen impacts on plants and soils, when considering state-of-the-art understanding of interactions with CO<sub>2</sub> and climate, and the different effects of wet vs. dry deposition on physiological responses?

Q5: What is the relative contribution of climate dependence in biogenic emissions and deposition vs. climate dependence of ecosystem thresholds and responses in determining the overall effect of climate change on air pollution impacts?

Q6: Which mitigation and/or adaptation measures are required to reduce the damage to “acceptable” levels to protect carbon stocks and ecosystem functioning? How do the costs associated with the emission abatement compare with the economic benefits of reduced damage?

Q7: How can effective and cost-efficient policies on emission abatement be devised in the future?

In effect the overall results of the project will be the answers to these questions. As such the impacts of the ÉCLAIRE project are then: a) knowledge generation, b) institutional development strengthening the European Research Area, and, c) the integration of information for the development of future European policies. ÉCLAIRE is specifically targeted to provide information that can directly support the further integration of European policies, such as improving procedures for calculation of robust thresholds, including those that make the link to dose-response relationships.

This will in turn lead to delivery and impact on three of the societal ‘grand challenges’ identified by the European Commission:

- **Climate change:** ÉCLAIRE will provide a first Europe-wide quantification of how climate change is altering the threat of air pollution on ecosystems and soils, and how, in return, pollutant impacts on ecosystems affect terrestrial C stocks, including the potential for feedbacks, providing direct support for the next generation of more integrated air pollution – climate policies.
- **Food Security:** ÉCLAIRE will provide an improved quantification of how air pollutants affect crop yields, especially considering the way in which climate change may alter the extent of crop loss across Europe due to tropospheric O<sub>3</sub>. At the same time, it will show how agricultural NH<sub>3</sub> emissions can expect to alter under climate change, exacerbating this major loss of fertilizer nitrogen.
- **Energy Security:** ÉCLAIRE will provide information on how climate change will alter the net effect of air pollutants on forest carbon sequestration, with implications for wood and bioenergy production. It will integrate, among others, the roles of N fertilization from atmospheric deposition (from NH<sub>3</sub> and NO<sub>x</sub>), the phytotoxic growth inhibition effect of O<sub>3</sub> (from NO<sub>x</sub> and VOCs) and the diffuse radiation stimulatory effect of atmospheric aerosol (from NO<sub>x</sub>, NH<sub>3</sub>, VOCs and SO<sub>2</sub>).

First results have already been used to inform revision of the UNECE Gothenburg Protocol, continually feed into the relevant parts of the UNECE Convention on Long Range Transboundary Air Pollution and have been have been communicated to provide scientific support in preparing the EU Air Quality Package.

**Project public website address:**

[www.eclairerfp7.eu](http://www.eclairerfp7.eu)

## 2. Core of the report

**Project objectives, Work progress and achievements, and project management during the period**

The Project Summary Pdf document contains the core of the report.

### 3. Deliverables and milestones tables

Deliverables (excluding the periodic and final reports)										
Del. no.	Deliverable name	Version	WP no.	Lead beneficiary	Nature	Dissemination level	Delivery date from Annex I (proj month)	Actual / Forecast delivery date	Status	Comments
1	First 6 months of continuous flux data of CO <sub>2</sub> , H <sub>2</sub> O, O <sub>3</sub> and meteorological variables at 9 sites	1.0	1	NATURAL ENVIRONMENT RESEARCH COUNCIL	Other	PP	18	30/09/2013	Submitted	
2	Final 9 months of continuous flux data of CO <sub>2</sub> , H <sub>2</sub> O, O <sub>3</sub> and meteorological variables at 9 sites	1.0	1	NATURAL ENVIRONMENT RESEARCH COUNCIL	Other	PP	24	30/09/2013	Submitted	
3	2 x 6 weeks of campaign-based fluxes of VOCs, NH <sub>3</sub> and NO <sub>x</sub> at selected sites	1.0	1	NATURAL ENVIRONMENT RESEARCH COUNCIL	Other	PP	24	30/09/2013	Submitted	
4	NH <sub>3</sub> fluxes over Mediterranean agricultural and semi-natural surfaces	1.0	1	NATURAL ENVIRONMENT RESEARCH COUNCIL	Other	PP	15	31/12/2012	Submitted	
5	Integrated dataset of canopy scale flux and in-canopy gradient measurements at a forest site	1.0	1	NATURAL ENVIRONMENT RESEARCH COUNCIL	Other	PP	16	31/01/2013	Submitted	
6	4 publications on integrated campaign	0.0	1	NATURAL ENVIRONMENT RESEARCH COUNCIL	Report	PU	30	31/12/2014	Not submitted	
1	Initial database of controlled emission measurements on soil and litter	1.0	2	FORSCHUNGS ZENTRUM JUELICH GMBH	Other	PU	24	10/07/2014	Submitted	
2	Data on microbial N turnover and NO (N <sub>2</sub> O) and CO <sub>2</sub> emissions	1.0	2	FORSCHUNGS ZENTRUM JUELICH GMBH	Other	PU	24	30/09/2014	Submitted	
3	Assessment of primary	1.0	2	FORSCHUNGS	Report	PU	22	10/07/2014	Submitted	

	and secondary BVOC exchange rates			ZENTRUM JUELICH GMBH					
4	Definition and improved parameterization of fluxes of BVOC	0.0	2	FORSCHUNGSZENTRUM JUELICH GMBH	Report	PU	42	31/03/2015	Not submitted
5	Manuscript on constitutive emission considered for ozone balance	1.0	2	FORSCHUNGSZENTRUM JUELICH GMBH	Report	PU	13	03/06/2013	Submitted
6	Manuscript on stress induced emissions considered in ozone balance	0.0	2	FORSCHUNGSZENTRUM JUELICH GMBH	Report	PU	45	30/06/2015	Not submitted
1	NH3 emission model for agricultural management	1.0	3	Karlsruher Institut fuer Technologie	Other	PP	30	31/03/2014	Submitted
2	NH3 exchange with soil/vegetation module	0.0	3	Karlsruher Institut fuer Technologie	Other	PP	30	30/04/2015	Not submitted
3	Soil NO emission model	0.0	3	Karlsruher Institut fuer Technologie	Other	PP	30	31/12/2014	Not submitted
4	BVOC modelling framework	1.0	3	Karlsruher Institut fuer Technologie	Other	PP	30	31/03/2014	Submitted
1	Improved pollution- and climate-sensitive exchange parameterisations	0.0	4	INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE	Other	PP	36	31/03/2015	Not submitted
2	Ozone dry deposition parameterisations	1.0	4	INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE	Demonstrator	PP	36	31/03/2015	Submitted
3	A coupled pollutant deposition and carbon based growth model	1.0	4	INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE	Other	PP	36	30/09/2014	Submitted
4	Chemical processing model of NO-NO2-O3-VOCs and NH3-HNO	0.0	4	INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE	Other	PP	36	31/03/2015	Not submitted

5	Current and future estimates of Nr and O3 deposition	0.0	4	INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE	Other	PP	42	31/03/2015	Not submitted	
1	Assessment of current GCMs and CTMS	1.0	5	JRC -JOINT RESEARCH CENTRE- EUROPEAN COMMISSION	Report	PU	18	10/07/2014	Submitted	
2	Report describing the range of future evolutions of global, hemispheric and European ozone	0.0	5	JRC -JOINT RESEARCH CENTRE- EUROPEAN COMMISSION	Report	PU	36	31/01/2015	Not submitted	
3	Report describing the contributions of regions and processes on key environmental variables	0.0	5	JRC -JOINT RESEARCH CENTRE- EUROPEAN COMMISSION	Report	PU	36	31/03/2015	Not submitted	
4	Boundary conditions for regional conditions	1.0	5	JRC -JOINT RESEARCH CENTRE- EUROPEAN COMMISSION	Report	PU	24	30/09/2013	Submitted	
1	Initial dynamic biogenic emissions, based on synthesis of existing work and mainly for testing	1.0	6	Karlsruher Institut fuer Technologie	Other	PP	8	03/06/2013	Submitted	
2	Improved terrestrial (semi)natural and agricultural emissions	1.0	6	Karlsruher Institut fuer Technologie	Other	PP	30	10/07/2014	Submitted	
3	Sectoral emission profiles for selected source sectors and countries	1.0	6	Karlsruher Institut fuer Technologie	Other	PU	30	31/03/2014	Submitted	
1	Maps of current air pollution metrics (APMs) across Europe, from the EMEP model and five other CTMs	1.0	7	METEOROLOGISK INSTITUTT	Report	PU	18	11/09/2013	Submitted	
2	Improved EMEP model with	0.0	7	METEOROLOGISK INSTITUTT	Other	PP	40	31/01/2015	Not submitted	

	ith climate-change and canopy-chemistry capabilities, able to predict the impact			ISK INSTITUTT					
3	Report on effects of in-canopy BVOC and NO emissions on in-canopy O <sub>3</sub> and POD estimates	0.0	7	METEOROLOG ISK INSTITUTT	Report	PU	44	31/05/2015	Not submitted
4	Report on effects of changes in global climate, chemistry, emissions and landcover changes on APMs	0.0	7	METEOROLOG ISK INSTITUTT	Report	PU	48	30/09/2015	Not submitted
5	Source-receptor matrices of APMs for current and future conditions	0.0	7	METEOROLOG ISK INSTITUTT	Other	PP	36	30/06/2015	Not submitted
1	Synthesis report on the different local scale models dealing with atmosphere-biosphere exchange	0.0	8	STICHTING ENERGIEONDERZOEK CENTRUM NEDERLAND	Report	PU	12	31/03/2015	Not submitted
2	Report on local scale interactions between air quality and climate change	0.0	8	STICHTING ENERGIEONDERZOEK CENTRUM NEDERLAND	Report	PU	30	31/03/2015	Not submitted
3	Concentration and deposition maps	1.0	8	STICHTING ENERGIEONDERZOEK CENTRUM NEDERLAND	Report	PU	16	10/07/2014	Submitted
4	Sub-Grid module for inclusion in the EMEP model	0.0	8	STICHTING ENERGIEONDERZOEK CENTRUM NEDERLAND	Other	PP	30	31/01/2015	Not submitted
1	Progress report on availability of data for use in WPs 12 and 13	1.0	9	NATURAL ENVIRONMENT RESEARCH COUNCIL	Report	PU	6	03/06/2013	Submitted
2	First phase database for	1.0	9	NATURAL EN	Other	PP	12	03/06/2013	Submitted

	use in initial modelling and identification of data gaps			VIRONMENT RESEARCH COUNCIL						
3	Completed database and results of meta-analysis handed to WP12 and WP13	1.0	9	NATURAL ENVIRONMENT RESEARCH COUNCIL	Other	PP	24	30/09/2013	Submitted	
1	Ecosystem and plant characteristic data for model application	1.0	10	DANMARKS TEKNISKE UNIVERSITET	Other	PP	12	11/09/2013	Submitted	
2	One year ecosystem response data on plant responses to experimental changes	1.0	10	DANMARKS TEKNISKE UNIVERSITET	Other	PP	18	11/09/2013	Submitted	
3	Response data on ecosystem carbon balance responses to experimental changes	1.0	10	DANMARKS TEKNISKE UNIVERSITET	Other	PP	24	30/11/2014	Submitted	
1	Parameterization of the impact of reduced and oxidised wet and dry N deposition on GHG & NOx fluxes	1.0	11	CONSIGLIO NAZIONALE DELLE RICERCHE	Other	PP	18	11/09/2013	Submitted	
2	Predictive modelling of GHG fluxes	1.0	11	CONSIGLIO NAZIONALE DELLE RICERCHE	Report	PU	24	30/09/2013	Submitted	
3	Quantification and parameterization of foliar O3 deposition	1.0	11	CONSIGLIO NAZIONALE DELLE RICERCHE	Other	PP	24	10/07/2014	Submitted	
4	Measurement and parameterization of the fraction of O3 that is taken by leaves due to detoxification	0.0	11	CONSIGLIO NAZIONALE DELLE RICERCHE	Other	PP	34	28/02/2015	Not submitted	
5	Quantification of minimum epidermal conductance under different loads of particles	1.0	11	CONSIGLIO NAZIONALE DELLE RICERCHE	Other	PP	20	10/07/2014	Submitted	
6	Parameterization of water use efficiency for model	1.0	11	CONSIGLIO NAZIONALE	Other	PP	30	10/07/2014	Submitted	

	use			DELLE RICE RCHE						
1	Summary report describing key response parameters derived from empirical studies	1.0	12	UNIVERSITY OF YORK	Report	PU	12	03/06/2013	Submitted	
2	Documentation of the DO3SE_C model	1.0	12	UNIVERSITY OF YORK	Other	PP	24	10/07/2014	Submitted	
3	Delivery of novel thresholds for key dose-response relationships	0.0	12	UNIVERSITY OF YORK	Other	PP	30	31/12/2014	Not submitted	
4	Final Report describing new dose-response relationships and novel thresholds	0.0	12	UNIVERSITY OF YORK	Report	PU	40	31/01/2015	Not submitted	
1	Finalised list of models for use in C3, and list of data requirements for each model	1.0	13	NATURAL ENVIRONMENT RESEARCH COUNCIL	Report	PU	6	03/06/2013	Submitted	
2	New version of DO3SE model	1.0	13	NATURAL ENVIRONMENT RESEARCH COUNCIL	Other	PP	18	03/06/2013	Submitted	
3	Report on performance of site-based and regional-scale models	0.0	13	NATURAL ENVIRONMENT RESEARCH COUNCIL	Report	PU	24	31/03/2015	Not submitted	
4	Assessment of the effects of combined air pollution and climate change scenarios on ecosystems	0.0	13	NATURAL ENVIRONMENT RESEARCH COUNCIL	Report	PU	36	30/06/2015	Not submitted	
1	Synthesis of applicable data on impacts of ozone on photosynthesis	1.0	14	JRC -JOINT RESEARCH CENTRE- EUROPEAN COMMISSION	Other	PP	6	13/09/2013	Submitted	
2	Updated versions of DGVMs and DSVMs	1.0	14	JRC -JOINT RESEARCH CENTRE- EUROPEAN COMMISSION	Other	PP	18	03/06/2013	Submitted	

3	Validated and evaluated version of models (DGVMs and DSVMs) using databases on plant productivity	1.0	14	JRC -JOINT RESEARCH CENTRE- EUROPEAN COMMISSION	Other	PP	24	31/12/2014	Submitted	
4	Model runs (DGVMs and DSVMs) using the ÉCLAIRE scenarios of future emissions and climate change	1.0	14	JRC -JOINT RESEARCH CENTRE- EUROPEAN COMMISSION	Other	PP	30	31/10/2014	Submitted	
5	Dataset of model runs to assess the impact of combined air pollution, climate change scenarios	1.0	14	JRC -JOINT RESEARCH CENTRE- EUROPEAN COMMISSION	Other	PP	36	30/09/2014	Submitted	
6	Report on the comparison of regional-scale models	0.0	14	JRC -JOINT RESEARCH CENTRE- EUROPEAN COMMISSION	Report	PU	40	31/01/2015	Not submitted	
7	Report on ensemble application of DGVMs and DSVMs	0.0	14	JRC -JOINT RESEARCH CENTRE- EUROPEAN COMMISSION	Report	PU	42	31/03/2015	Not submitted	
8	Report on the impacts of historic and future changes (period 1900-2100) in climate, air quality	0.0	14	JRC -JOINT RESEARCH CENTRE- EUROPEAN COMMISSION	Report	PU	44	31/05/2015	Not submitted	
1	The model EU MOVE	1.0	15	STICHTING DIENST LANDBOUWKUNDIG ONDERZOEK	Other	PP	24	10/07/2014	Submitted	
2	Collated dataset of European soil 14C data	1.0	15	STICHTING DIENST LANDBOUWKUNDIG ONDERZOEK	Other	PP	24	10/07/2014	Submitted	
3	The VSD+-EUMOVE and MA DOC-EUMOVE models linked to European databases	1.0	15	STICHTING DIENST LANDBOUWKUNDIG ONDERZOEK	Other	PP	30	10/07/2014	Submitted	

4	Assessments of the effects of combined air pollution and climate change scenarios on plant species	0.0	15	STICHTING DIENST LANDBOUWKUNDIG ONDERZOEK	Other	PP	42	31/03/2015	Not submitted	
1	Indicators for geo-chemical and biological endpoints	1.0	16	RIJKSINSTITUUT VOOR VOLKSGEZONDHEIDEN MILIEU*NATIONALE INSTITUUT FOR PUBLIC HEALTH AND THE ENVIRONMENT EN	Other	PP	12	03/06/2013	Submitted	
2	Map of critical ozone uptake thresholds at European scale	1.0	16	RIJKSINSTITUUT VOOR VOLKSGEZONDHEIDEN MILIEU*NATIONALE INSTITUUT FOR PUBLIC HEALTH AND THE ENVIRONMENT EN	Report	PU	24	10/07/2014	Submitted	
3	Map of critical N loads based on an inverse VSD+-EUMOVE approach at European scale	1.0	16	RIJKSINSTITUUT VOOR VOLKSGEZONDHEIDEN MILIEU*NATIONALE INSTITUUT FOR PUBLIC HEALTH AND THE ENVIRONMENT EN	Report	PU	34	31/10/2014	Submitted	
4	Map of critical N load and critical ozone uptake exceedances based on a comparison with EMEP model	0.0	16	RIJKSINSTITUUT VOOR VOLKSGEZONDHEIDEN MILIEU*NATIONALE INSTITUUT FOR PUB	Report	PU	40	31/01/2015	Not submitted	

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5	Feedback from the GAINS model on the applicability of the newly acquired critical thresholds	0.0	16	RIJKSINSTITUUT VOOR VOLKSGEZONDHEIDEN MILIEU*NATIONAL INSTITUTE FOR PUBLIC HEALTH AND THE ENVIRONMENT	Report	PU	36	31/12/2014	Not submitted	
1	Database of soil and vegetation data for the regional and landscape domains	1.0	17	UNIVERSIDAD POLITECNICA DE MADRID	Other	PP	12	10/07/2014	Submitted	
2	Database of ammonia concentration and nitrogen deposition data for the regional and landscape domain	1.0	17	UNIVERSIDAD POLITECNICA DE MADRID	Other	PP	18	10/07/2014	Submitted	
3	Assessments of uncertainty of critical thresholds for N and their exceedances at the European scale	0.0	17	UNIVERSIDAD POLITECNICA DE MADRID	Report	PU	44	31/05/2015	Not submitted	
1	Report on existing applications of the ESA in Europe	1.0	18	HOLLAND MI CHAEL	Report	PU	12	30/09/2012	Submitted	
2	Description of data for quantifying ecosystem effects and for valuation	1.0	18	HOLLAND MI CHAEL	Other	PP	24	31/08/2014	Submitted	
3	Elaboration of the modelling approach, to include illustrative applications	0.0	18	HOLLAND MI CHAEL	Report	PU	30	31/12/2014	Not submitted	
4	Scenario analysis to include policy recommendations and advice to other interest groups	0.0	18	HOLLAND MI CHAEL	Other	PP	38	30/11/2014	Not submitted	

1	Progress report on the implementation of effect indicators and critical thresholds in GAINS system	1.0	19	RIJKSINSTITUUT VOOR VOLKSGEZONDHEIDEN MILIEU*NATIONAL INSTITUUT FOR PUBLIC HEALTH AND THE ENVIRONMENT	Report	PU	12	03/06/2013	Submitted	
2	Report on the modelling system for the impacts assessment under ÉCLAIRE	1.0	19	RIJKSINSTITUUT VOOR VOLKSGEZONDHEIDEN MILIEU*NATIONAL INSTITUUT FOR PUBLIC HEALTH AND THE ENVIRONMENT	Report	PU	24	10/07/2014	Submitted	
3	Report on magnitude, location and robustness of assessments of diverse effects of GAINS scenarios	1.0	19	RIJKSINSTITUUT VOOR VOLKSGEZONDHEIDEN MILIEU*NATIONAL INSTITUUT FOR PUBLIC HEALTH AND THE ENVIRONMENT	Report	PU	36	30/09/2014	Submitted	
4	Final report on the development, implementation and scenario application of methods	0.0	19	RIJKSINSTITUUT VOOR VOLKSGEZONDHEIDEN MILIEU*NATIONAL INSTITUUT FOR PUBLIC HEALTH AND THE ENVIRONMENT	Report	PU	44	31/05/2015	Not submitted	
1	Report from stakeholder	1.0	20	INTERNATIO	Report	PU	9	03/06/2013	Submitted	

	workshop			NALES INST ITUT FUER ANGEWANDTE SYSTEMANA LYSE						
2	Detailed description of model integration to establish 2050 scenarios	1.0	20	INTERNATIO NALES INST ITUT FUER ANGEWANDTE SYSTEMANA LYSE	Report	PU	14	11/09/2013	Submitted	
3	Detailed description of modelling system beyond 2050	1.0	20	INTERNATIO NALES INST ITUT FUER ANGEWANDTE SYSTEMANA LYSE	Report	PU	19	10/07/2014	Submitted	
4	Description of the consequences of management change	1.0	20	STICHTING DIENST LAN DBOUWKUNDI G ONDERZOEK	Report	PU	22	31/08/2014	Submitted	
5	Preliminary report on cost optimization for 2050 scenarios	1.0	20	STICHTING DIENST LAN DBOUWKUNDI G ONDERZOEK	Report	PU	28	31/08/2014	Submitted	
6	Assessment of sensitivities and uncertainties of the scenarios	1.0	20	STICHTING DIENST LAN DBOUWKUNDI G ONDERZOEK	Report	PU	34	31/07/2014	Submitted	
7	Final cost optimization scenarios for 2050 and beyond	0.0	20	INTERNATIO NALES INST ITUT FUER ANGEWANDTE SYSTEMANA LYSE	Report	PU	44	31/05/2015	Not submitted	
8	Policy recommendations and advice to other interest groups	0.0	20	INTERNATIO NALES INST ITUT FUER ANGEWANDTE SYSTEMANA LYSE	Report	PU	48	30/09/2015	Not submitted	
1	Initial scenario guidelines	1.0	21	INTERNATIO	Demonstrator	PP	6	03/06/2013	Submitted	

	an updatable, internal web page			NALES INSTITUT FUER ANGEWANDTE SYSTEMANALYSE					
2	ÉCLAIRE scenario reference	0.0	21	INTERNATIONALES INSTITUT FUER ANGEWANDTE SYSTEMANALYSE	Other	PP	42	31/03/2015	Not submitted
3	Agreement on common measurement protocols for components C1 and C3	1.0	21	EIDGENOESSISCHES DEPARTEMENT FÜR WIRTSCHAFT, BILDUNG UND FORSCHUNG	Demonstrator	PP	8	03/06/2013	Submitted
4	Agreement on common modelling and uncertainty assessment protocols across components C1-5	1.0	21	EIDGENOESSISCHES DEPARTEMENT FÜR WIRTSCHAFT, BILDUNG UND FORSCHUNG	Other	PP	9	03/06/2013	Submitted
5	First report on uncertainty in model output due to structural elements	1.0	21	THE UNIVERSITY OF EDINBURGH	Other	PP	36	30/09/2014	Submitted
6	Final report on uncertainty in model output due to structural elements	0.0	21	THE UNIVERSITY OF EDINBURGH	Other	PP	48	30/09/2015	Not submitted
7	ÉCLAIRE Data Management Plan & Data Policy Documents	1.0	21	NATURAL ENVIRONMENT RESEARCH COUNCIL	Other	PP	6	03/06/2013	Submitted
8	ÉCLAIRE Data Portal	1.0	21	NATURAL ENVIRONMENT RESEARCH COUNCIL	Other	PP	6	03/06/2013	Submitted
9	Database training sessions for users – online tutorials	1.0	21	NATURAL ENVIRONMENT RESEARCH COUNCIL	Other	PP	8	03/06/2013	Submitted

				OUNCIL						
10	Database documentation and guides for users	1.0	21	NATURAL ENVIRONMENT RESEARCH COUNCIL	Report	PU	8	03/06/2013	Submitted	
11	First database report on intermediate content, including QA/QC report	1.0	21	NATURAL ENVIRONMENT RESEARCH COUNCIL	Report	PU	12	12/09/2013	Submitted	
12	Second database report on intermediate content, including QA/QC report	1.0	21	NATURAL ENVIRONMENT RESEARCH COUNCIL	Report	PU	24	30/09/2013	Submitted	
13	Third database report on intermediate content, including QA/QC report	1.0	21	NATURAL ENVIRONMENT RESEARCH COUNCIL	Report	PU	36	30/09/2014	Submitted	
14	Final database report on intermediate content, including QA/QC report	0.0	21	NATURAL ENVIRONMENT RESEARCH COUNCIL	Report	PU	48	30/09/2015	Not submitted	
1	Annual progress report year 1	1.0	22	NATURAL ENVIRONMENT RESEARCH COUNCIL	Report	PU	13	03/06/2013	Submitted	
2	Annual progress report year 2	1.0	22	NATURAL ENVIRONMENT RESEARCH COUNCIL	Report	PU	25	31/10/2013	Submitted	
3	Annual progress report year 3	0.0	22	NATURAL ENVIRONMENT RESEARCH COUNCIL	Report	PU	37	31/10/2014	Not submitted	
4	Annual progress report year 4	0.0	22	NATURAL ENVIRONMENT RESEARCH COUNCIL	Report	PU	48	30/09/2015	Not submitted	
5	First periodic Gender Action Report	1.0	22	NATURAL ENVIRONMENT RESEARCH COUNCIL	Report	PU	19	10/07/2014	Submitted	

6	Second periodic Gender Action Report	1.0	22	NATURAL ENVIRONMENT RESEARCH COUNCIL	Report	PU	37	31/10/2014	Submitted	
7	Final periodic Gender Action Report	0.0	22	NATURAL ENVIRONMENT RESEARCH COUNCIL	Report	PU	48	30/09/2015	Not submitted	
1	ÉCLAIRE Training plan	1.0	23	UNIVERSIDAD POLITECNICA DE MADRID	Other	PP	6	03/06/2013	Submitted	
2	First periodic report on training activities	1.0	23	UNIVERSIDAD POLITECNICA DE MADRID	Report	PU	19	10/07/2014	Submitted	
3	Second periodic report on training	1.0	23	UNIVERSIDAD POLITECNICA DE MADRID	Report	PU	37	31/10/2014	Submitted	
4	Final periodic report on training	0.0	23	UNIVERSIDAD POLITECNICA DE MADRID	Report	PU	48	30/09/2015	Not submitted	
5	Concept for an ÉCLAIRE Summer School in year 2	1.0	23	UNIVERSIDAD POLITECNICA DE MADRID	Other	PP	12	03/06/2013	Submitted	
6	Report on ÉCLAIRE Summer School	1.0	23	UNIVERSIDAD POLITECNICA DE MADRID	Report	PU	22	10/07/2014	Submitted	
1	A project web portal for internal and external project communication	1.0	24	NATURAL ENVIRONMENT RESEARCH COUNCIL	Other	PP	1	03/06/2013	Submitted	
2	First dissemination & communication plan	1.0	24	NATURAL ENVIRONMENT RESEARCH COUNCIL	Other	PP	18	12/06/2013	Submitted	
3	Second dissemination & communication plan	1.0	24	NATURAL ENVIRONMENT RESEARCH COUNCIL	Other	PP	36	30/09/2014	Submitted	
4	Final dissemination & communication plan	0.0	24	NATURAL ENVIRONMENT	Other	PP	48	30/09/2015	Not submitted	

				RESEARCH COUNCIL					
5	First report to the General Assembly on networking activities	1.0	24	NATURAL ENVIRONMENT RESEARCH COUNCIL	Report	PU	18	03/06/2013	Submitted
6	Second report to the General Assembly on networking activities	1.0	24	NATURAL ENVIRONMENT RESEARCH COUNCIL	Report	PU	36	30/09/2014	Submitted
7	Final report to the General Assembly on networking activities	0.0	24	NATURAL ENVIRONMENT RESEARCH COUNCIL	Report	PU	48	30/09/2015	Not submitted

## Milestones

Milestone no.	Milestone name	Work package no	Lead beneficiary	Delivery date from Annex I	Achieved Yes/No	Actual / Forecast achievement date	Comments
11	Workshop for summarizing state of the art of the different models	3	KIT	31/03/2012	Yes	31/03/2013	
14	Measurement network established for monthly Nr concentrations at the ÉCLAIRE effect study sites. Start of monitoring for years 2 and 3	4	INRA	30/09/2012	No	30/09/2012	cancelled
15	Literature review	4	FMI	30/09/2012	Yes	30/03/2014	Workshop reports available. To be completed in coordination with the data mining activity of WP9
16	New ÉCLAIRE experimental datasets (used to develop dose-response functions in collaboration with WPs 1.3 & 3.4)	4	SEI-Y, UoY	31/03/2013	Yes	31/12/2013	
25	WP meeting and decis	6	KIT	31/05/2012	Yes	31/05/2012	

	ion on emission-model experimental protocol, including spatial and temporal profiles (in coordination with the other C2 WPs)						
33	Inventory of relevant local scale models	8	ECN	31/07/2012	Yes	31/07/2012	
34	Report on local scale models inventory	8	ECN	30/09/2012	No	01/03/2015	
35	Update of NitroScape to reflect ÉCLAIRE needs	8	ECN	31/01/2013	No	31/12/2014	
36	Concentration/Deposition maps (e.g. NH3 on 5 km x 5 km, 1 km x 1 km, up to 50 m x 50 m resolution) available for further use in ÉCLAIRE (e.g. WP4.4)	8	ECN	31/01/2013	Yes	28/02/2014	
42	Component-kick off meeting – discussion of experimental approaches and responses	10	DTU	30/11/2011	Yes	30/11/2011	
43	Protocol for experimental approaches and interactions	10	DTU	31/12/2011	Yes	31/12/2011	
44	Protocol for response measurements	10	DTU	31/03/2012	Yes	31/03/2012	
47	Completion of experimental set-up	11	CNR	31/03/2012	Yes	31/03/2012	
48	Completion of data collection on NEE, GHG, soil pore water C and N and M3.3.3 species change	11	CNR	30/09/2012	Yes	30/03/2014	
49	Completion of measurements of ozone uptake, water exchange, chemical analysis and gas exchange	11	CNR	31/03/2013	No	28/02/2015	

53	Identification of empirical data required for model application to derive dose-response relationships and novel thresholds	12	SEI-Y, UoY	31/03/2012	Yes	11/09/2013	
54	Identification of key response variables for ozone and N pollution	12	SEI-Y, UoY	30/09/2012	Yes	30/09/2012	
64	VSD+ and MADOC model developed for regional application using gridded European data	15	ALTERRA	30/09/2012	Yes	30/09/2012	
67	Indicators for geo-chemical and biological endpoints are identified to enable the mapping of critical thresholds	16	RIVM	30/09/2012	Yes	30/09/2012	
68	Inverse updated model approaches are available relating quantifiable indicators of well specified natural endpoints to the dose of N deposition and concentration	16	RIVM	31/03/2013	Yes	31/03/2013	
71	Assessment of existing soil and vegetation data resources and their availability	17	UPM	31/03/2012	Yes	31/03/2012	
72	All requests for external soil and vegetation data submitted (if necessary)	17	UPM	30/06/2012	Yes	30/06/2012	
73	Regional and landscape scale soil and vegetation databases complete	17	UPM	30/09/2012	Yes	30/11/2013	
74	Database of atmospheric concentrations and deposition (from WP2.4) for the present period (e.g. 2010) at the regional and landscape scales complete	17	UPM	31/01/2013	Yes	31/10/2013	

78	Agreed prioritisation of ecosystems and ecosystem services (Component 5 status workshop)	18	EMRC	30/09/2012	Yes	30/09/2013	Report to be published in due course
86	Effect indicators and critical thresholds	19	RIVM	30/09/2012	Yes	30/09/2012	
87	First presentation to - and review by ICPC M&M	19	RIVM	31/01/2013	Yes	31/01/2013	
94	Stakeholder workshop (in collaboration with N IAM, the National Integrated assessment modelling group)	20	IIASA	30/04/2012	Yes	30/04/2012	
95	Component 5 status workshop	20	IIASA	30/09/2012	Yes	30/09/2012	
99	Information exchange between internal users and scenario team established	21	IIASA	30/09/2012	Yes	30/09/2012	
100	Common measurement protocols for C1 and C3 agreed and distributed	21	ART	31/05/2012	Yes	31/05/2012	
101	Modelling and uncertainty assessment protocols written and distributed	21	UEDIN	30/06/2012	Yes	30/06/2012	
118	ÉCLAIRE Training plan adopted	23	UPM	30/04/2012	Yes	30/04/2012	
119	Concept for an ÉCLAIRE Summer School in year 2 adopted for implementation	23	UPM	31/10/2012	Yes	31/10/2012	
1	First 6 months data from flux network in database	1	NERC	31/03/2013	Yes	30/09/2013	
5	Data from integrated forest campaign in database	1	NERC	31/01/2013	Yes	30/11/2014	
23	Evaluation of AR5 and	5	JRC	31/03/2013	Yes	30/10/2013	

	other simulations with climate and chemistry global models regarding current						
29	Initial ensemble runs for current conditions	7	MET.NO	31/03/2013	Yes	31/03/2013	
39	Compilation of data from published papers and list of knowledge gaps	9	NERC	30/09/2012	Yes	31/07/2013	
40	Completion of data compilation	9	NERC	31/03/2013	Yes	31/05/2013	
56	Identification of priorities for model development, final list of models for inclusion, and data requirements for parameterisation and testing	13	NERC	31/03/2012	Yes	31/03/2012	
57	Collation of preliminary data from experimental sites for initial model application	13	NERC	30/09/2012	Yes	11/09/2013	
58	Initial application and testing of integrated models to simulate biogeochemical and vegetation changes at C3 experimental sites	13	NERC	31/03/2013	Yes	30/10/2014	
61	Upgraded version of DGVMs and DSVMs operational	14	JRC	31/03/2013	Yes	31/03/2013	
124	Dissemination and Communication plan published	24	NERC	30/09/2012	Yes	11/06/2013	
104	DP and DMP first drafts written and agreed by DMC	21	NERC	31/03/2012	Yes	31/03/2012	
105	ÉCLAIRE data portal online with user registration	21	NERC	31/03/2012	Yes	31/03/2012	

106	Database software ready to accept data for all components, documentation and guides complete and posted on the portal	21	NERC	30/09/2012	Yes	30/09/2012	
110	Project office established and operational	22	NERC	31/10/2011	Yes	31/10/2011	
111	1st periodic project meeting held	22	NERC	31/03/2013	Yes	31/03/2013	
114	Gender Action Group established	22	NERC	31/12/2011	Yes	31/12/2011	
121	ÉCLAIRE web portal launched	24	NERC	31/10/2011	Yes	31/10/2011	
122	Established links with relevant research projects	24	NERC	31/12/2011	Yes	31/12/2011	
123	Established links with relevant policy bodies	24	NERC	31/12/2011	Yes	31/12/2011	
2	Final 9 months data from flux network in database	1	NERC	31/03/2013	Yes	01/11/2014	
3	Data from 1st synchronised campaign in database	1	NERC	31/05/2013	Yes	01/11/2014	
4	Data from 2nd synchronised campaign in database	1	NERC	30/09/2013	Yes	01/11/2014	
7	Improved description of drying-re-wetting effects on soil NO emissions for different soil types, management and climate zones handed available for inclusion in models	2	KIT	30/09/2013	Yes	30/09/2014	
8	BVOC exchange rates under simulated combined climate change and pollution available to modellers	2	CNR	30/09/2014	Yes	01/11/2014	

9	O3 balance data for Mediterranean and Boreal forest species for input in models	2	Juelich	28/02/2014	Yes	01/11/2014	
12	Summary report (on site applications of improved NH3/NO and VOC models, including uncertainty assessment and comparison with original approaches)	3	INRA	30/09/2013	No	30/04/2015	
17	Improved representation of the influence of environmental drivers (meteorological, phenological, CO2, Nr) on stomatal conductance and the partitioning between stomatal and non-stomatal deposition of O3 and their incorporation in the EMEP model	4	SEI, UoY	30/09/2013	Yes	30/11/2014	
18	Incorporation of results from flux monitoring data generated within ÉCLAIRE into process modelling framework	4	INRA	30/09/2013	No	31/03/2015	
19	Calibration of model parameterisation completed	4	INRA	31/03/2014	No	31/03/2015	
24	Future simulations with improved biogenic and soil emissions	5	JRC	30/09/2013	Yes	01/11/2014	
26	First improved emission estimates, based on model development	6	KIT	30/09/2013	Yes	01/11/2014	
27	Improved emission estimates, documented to other groups in ÉCLAIRE, evaluation against ÉCLAIRE results	6	KIT	31/03/2014	Yes	30/09/2014	

28	Implementation and initial testing of coupled model system: EMEP with C1 (preliminary) DO3SE and canopy-chemistry models, combined with WP2.1 boundary conditions and WP2.2 emissions and landcover changes at European level.	7	met_no	30/09/2013	No	31/03/2015	
30	Incorporation of sub-grid methodology from WP2.4 into EMEP model	7	met_no	31/03/2014	No	31/01/2015	
31	Future scenario data-sets read	7	met_no	31/03/2014	Yes	31/03/2014	
116	Second periodic Gender Action Reports	1	NERC	31/10/2014	Yes	30/11/2014	
41	Completion of meta-analysis and handing over of data for use in WP3.4 and 3.5.	9	NERC	30/09/2013	Yes	30/04/2014	
45	Data- model interaction and initial model application workshop	10	DTU	31/05/2013	Yes	31/05/2013	
46	Data-model interaction and final model application	10	DTU	31/03/2014	No	31/01/2015	
50	Submission of data to database for modelling purposes (WP3.5)	11	CNR	30/09/2013	Yes	31/07/2014	
51	Completion of analysis of water use efficiency, water deficit, analysis of gas fluxes and soil pore water chemistry and assessment of release of induced volatiles that signal hypersensitive responses (NO) and structural foliar damage (	11	CNR	30/09/2013	Yes	31/07/2014	

	LOX, methanol) under pollution (O3, aerosol)						
52	Assignment of thresholds of O3 damage and BVOC-mediated O3 detoxification capacity, to be delivered for modelling refinement (WP3.5)	11	CNR	30/06/2014	No	30/04/2015	
55	Application of DOSE_C to develop dose-response relationships	12	SEI, UoY	30/09/2013	No	31/03/2015	
59	Update of experimental datasets, completed testing of site-based and regional-scale models at experimental sites, and provision of outputs to C4	13	NERC	30/09/2013	No	31/03/2015	
62	ÉCLAIRE modelling platform linking DGVMs, DSVMs, climate and air pollution fields operational	14	JRC	30/09/2013	Yes	31/07/2014	
65	FORSPACE-VSD+ and JULES-MADOC models coupled for prediction of air pollution and climate impacts on soil quality	15	ALTERRA	30/09/2013	Yes	30/11/2013	
66	Parameterisation and linking of VSD+ with PROPS at a European scale, to support final large-scale scenario assessments of plant species and soil quality impacts (D4.2.4)	15	ALTERRA	31/05/2014	Yes	30/09/2014	
69	An updated dataset of European soil and vegetation data is available for use in European scale model application.	16	RIVM	30/09/2013	Yes	30/11/2013	

79	Agreed modelling framework in place	18	EMRC	30/09/2013	Yes	30/06/2014	
80	First complete set of scenario results (part of a joint Component 5 workshop)	18	EMRC	31/03/2014	Yes	31/12/2014	
82	First presentation of progress to the Working Group on Effect under the UNECE Convention on Long-range Transboundary Air Pollution including its International Co-operative Programmes on Forests, Water, Integrated Monitoring and Vegetation	19	RIVM	30/06/2012	Yes	30/06/2012	
83	Second presentation of progress to the Working Group on Effect under the UNECE Convention on LRTAP	19	RIVM	30/06/2013	Yes	30/09/2013	
84	Third presentation of progress to the Working Group on Effect under the UNECE Convention on LRTAP	19	RIVM	30/06/2014	Yes	30/09/2014	
88	Second presentation to - and review by ICPC M &M	19	RIVM	31/01/2014	Yes	30/06/2014	
90	Modeling framework in place, agreed within Component 5 and between other components (see Fig. 1.5)	19	RIVM	30/09/2013	Yes	31/10/2013	
91	Discussion of preliminary set of scenario specific adverse effects (Component 5 workshop)	19	RIVM	30/04/2014	Yes	30/04/2014	
96	Setup of modelling system complete (workshop)	20	IIASA	30/04/2013	Yes	30/06/2013	

97	First complete set of scenario results	20	IIASA	31/03/2014	Yes	30/09/2014	
107	Data uploaded and QA checked for months 1-18	21	NERC	30/09/2013	Yes	30/11/2014	
115	First periodic Gender Action Report	22	NERC	30/04/2013	Yes	30/04/2013	
120	ÉCLAIRE Summer School held and evaluated	23	UPM	30/09/2013	Yes	31/01/2014	
32	“Final” model-system ready. Commencement of source-receptor calculations	7	met.no	30/09/2014	No	30/04/2015	
37	Description of local scale interactions between air quality and climate change, based on e.g. NitroScape / EMEP4UK	8	ECN	31/03/2014	No	31/03/2015	
60	Completion of scenario assessments of ecosystem responses to air pollution and climate change at experimental sites, based on final collected datasets	1	NERC	30/09/2014	No	30/06/2015	
63	Database with ensemble runs of DGVM on common climate and air pollution scenarios released, improved understanding of where models provide robust projections and where largest uncertainties lie	14	JRC	30/09/2014	Yes	30/09/2014	
76	Critical threshold and exceedance modelling complete for regional and landscape scales	17	UPM	30/09/2014	No	28/02/2015	
92	First complete set of scenario results (2050 and b	19	RIVM	30/09/2014	Yes	30/09/2014	

	eyond, cost-optimized emission abatement following the metrics as recommended by ÉCLAIRE) - Component 5 workshop						
102	First report on uncertainty in model output due to structural elements	21	UEDIN	30/09/2014	No	30/11/2014	
112	2nd periodic project meeting held	22	NERC	30/09/2014	Yes	30/09/2014	
75	Soil/vegetation model testing complete at the regional and landscape scales	17	UPM	31/01/2014	No	31/01/2014	cancelled
20	Preliminary estimates of Nr and O3 fluxes at the effects study sites inferred from monitored concentrations	4	INRA	31/03/2014	No	31/03/2014	cancelled
21	Comparison of inferential model estimates with EMEP model results	4	INRA	30/06/2014	No	30/06/2014	cancelled

#### **4. Explanation of the use of the resources**

The **explanation on the use of resources** was removed from the scientific periodic reports in SESAM. These details now have to be entered in the cost statement forms in FORCE instead.

<b>Attachments</b>	ECLAIRE second periodic report 02-12-14.pdf
<b>Grant Agreement number:</b>	282910
<b>Project acronym:</b>	ECLAIRE
<b>Project title:</b>	Effects of Climate Change on Air Pollution Impacts and Response Strategies for European Ecosystems
<b>Funding Scheme:</b>	FP7-CP-IP
<b>Project starting date:</b>	01/10/2011
<b>Project end date:</b>	30/09/2015
<b>Name of the scientific representative of the project's coordinator and organisation:</b>	Dr. Mark Sutton NATURAL ENVIRONMENT RESEARCH COUNCIL
<b>Period covered - start date:</b>	01/04/2013
<b>Period covered - end date:</b>	30/09/2014
<b>Name</b>	
<b>Date</b>	

This declaration was visaed electronically by Agnieszka BECHER (ECAS user name neljasag) on