Project Number 282910

ÉCLAIRE

Effects of Climate Change on Air Pollution Impacts and Response Strategies for European Ecosystems

Seventh Framework Programme

Theme: Environment

D20.1: Report from Stakeholder Workshop

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Start Date of Project: **01/10/2011** Duration: **48 months**

Organisation name of lead contractor for this deliverable :
IIASA

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Dissemination Level		
PU	Public	☒
PP	Restricted to other programme participants (including the Commission Services)	☐
RE	Restricted to a group specified by the consortium (including the Commission Services)	☐
CO	Confidential, only for members of the consortium (including the Commission Services)	☐

1. Executive Summary

In striving to maintain links to environmental policy, the ÉCLAIRE concepts regarding impact modelling and economic assessment were presented to the NIAM group, who were requested to comment and provide further recommendations. These suggestions are compiled in the present report, together with the presentation slides used to inform of the project. Appropriate to the very initial project phase, results shown indicate responses on a rather general level as detailed results are not available.

Concerns of the NIAM group focus on an adequate way of presenting advice to policy makers. Several of the suggestions provided focus on the non-linearity of ecosystems covered and on the resulting difficulties to appropriately assess a dose-response relationship. The concept of elaborating “marginal impacts” has been proposed. Moreover, consideration of co-benefits for realistically interpreting the outcomes of a cost-benefit analysis is recommended.

This first stakeholder interaction provided a fruitful exchange for all partners involved. Thus an extension of information sharing is foreseen and additional, more focused suggestions from NIAM may be expected once the first ÉCLAIRE results are being produced.

2. Objectives:

Objectives according to the ÉCLAIRE Description of Work (DoW):
"Interact with policy makers (IIASA (Winiwarter), NERC (EDI)). A workshop will be organized to establish the needs of environmental policy with respect to air pollution effects of climate change. Scientists working close to decision makers (stakeholders) will be invited, e.g., along the Network for Integrated Assessment Modelling (NIAM: http://www.niam.scarp.se)."

3. Activities:

Activities leading to this report consisted of:

- Addressing a group of stakeholders ("NIAM", the Network for Integrated Assessment Modelling) as a forum to discuss the concepts of policy-relevant reporting of ÉCLAIRE results
- Presenting ÉCLAIRE concepts to the forum
- Collecting and compiling feedback

NIAM is a network of scientists working in close interaction to environmental decision makers who both understand the needs of policy and the complexity of scientific modelling. Most NIAM members are closely familiar with the GAINS model and the GAINS system and thus are able to provide immediate feedback on the concepts developed within ÉCLAIRE. Thus they represent the ideal community to review the outlined implementation plans.

Meetings of NIAM are organized on an irregular schedule in response to the needs of their individual workplans. ÉCLAIRE was able to take advantage of a scheduled meeting, and the discussion of the ÉCLAIRE concept was added into the meeting agenda (see annex II). The presentation slides used to provide the ÉCLAIRE concept have been added to this report as Annex I. As ÉCLAIRE is in its first year only, no significant results are available at this time for discussion of the stakeholder group. Thus some of their recommendations may smoothly fit into concepts to be developed within the project anyway. In such a case recommendations may be seen as a confirmation of concepts and approaches.

4. Results:

During the presentation and in the discussion following thereafter a number of points were mentioned and are noted here for further consideration within the ÉCLAIRE community. NIAM participants were invited to comment also subsequent to the meeting, and have been requested to follow up on the further progress of the project. A participation of ÉCLAIRE also at the next NIAM meeting (not yet scheduled) has been tentatively agreed upon.

Specifically, recommendations of NIAM participants covered the following key topics to be forwarded to the ÉCLAIRE community:

a. Consider sub-grid effects when developing source-receptor matrices.

Scientific evidence as well as legislation (Habitats Directive, Birds Directive etc.) call for site-specific protection rather than considering the effects on pre-determined grids (as EMEP 50x50 km² grids) only. Potential sub-grid effects, i.e. responses that may be different on a specific site than on a full grid cell, thus should at least be investigated – recognizing that of course a full coverage of details is not feasible.

b. Dynamic modelling on the effects of exposure on the recovery properties is of interest

Typical dose-effect estimates presume that an increment in dose will also produce an increment in effects. This is the classic approach taken in effect modelling. Only this assumes merely static conditions. In reality ecosystems will behave dynamically, such that the recovery may take the form of a hysteresis (i.e., taking a different course than just pollution unloading) or otherwise the effect of previous ecosystem pollution may affect the recovery potential. Covering all these effects would also require dynamic models to be developed. Only these could gather information needed on the accumulation of noxious substances that may become visible only at a later stage ("chemical time-bombs").

c. Marginal impacts are more relevant than the total impacts

Adequately considering an ecosystem's response may not be possible from adding up all impacts. It is rather important to understand a marginal (incremental) impact based on the incremental change in pollution. Any effect modelling may be performed more relevantly on such incremental effects compared to a standard situation, as any of the measures will be applied incrementally rather than as a bulk total. Thus considering marginal effects also will reflect a real situation more closely.

d. Assessing re-migration of species needs also to understand the behaviour of invasive species

Ecosystem impacts often are connected with retreating of species due to adverse conditions. Wit improving circumstances, re-migration may however be impeded by seemingly independent effects. Invasive species may have taken the place of the migrated ones, and may then not backtrack when the underlying conditions (soil acidification or eutriphication etc.) have been resolved. It is realistic to assume ecosystems to change into a different, clearly affected equilibrium which can not be returned to its original state.

e. The OPERA project provides information on valuing ecosystems services

Valuation of ecosystems services is of interest more generally. The ÉCLAIRE community may wish to consider also the respective activities linked to the OPERA project (Operational Procedure for Emission Reduction Assessment; http://www.operatool.eu), e.g. by Nick Hanley – University of Stirling.

f. Also consider health improvement benefits when evaluating the "negative costs" associated with ecosystems protection

Cost-benefit analysis of ecosystems protection may underestimate the positive effects of pollution abatement. When comparing abatement costs to the achievements, also co-benefits need to be addressed. If ecosystem alone is available at "negative costs", i.e., the value of protection is larger than the cost of abatement, the overall achievements will become even larger when also health benefits are considered which basically are available for the identical measures.

5. Milestones achieved:

The milestone described in this document is MS 89 – Stakeholder workshop (in collaboration with NIAM, the National Integrated Assessment Modelling group)

6. Deviations and reasons:

Both workshop and report are delayed by three months. The NIAM group does not have a regular schedule but meets on an ad-hoc basis. Thus an opportunity to address NIAM had to be identified first, as closely as possible matching ÉCLAIRE's timeline. This NIAM/APPRAISAL meeting was recognized as the best suited occasion.

7. Publications:

No publications have been developed from this activity.

8. Meetings:

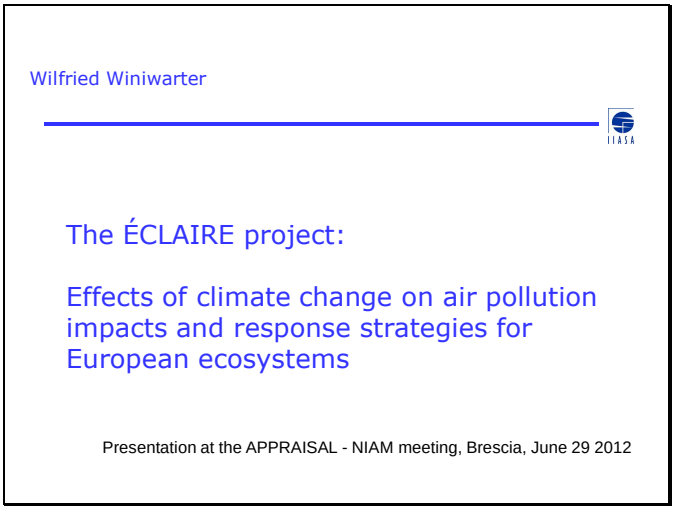
Participation at the NIAM/APPRAISAL workshop in Brescia, Italy (June 29, 2012)

9. List of Documents/Annexes:

- Presentation slides
- Workshop agenda

Annex I: Presentation slides

Slide 1



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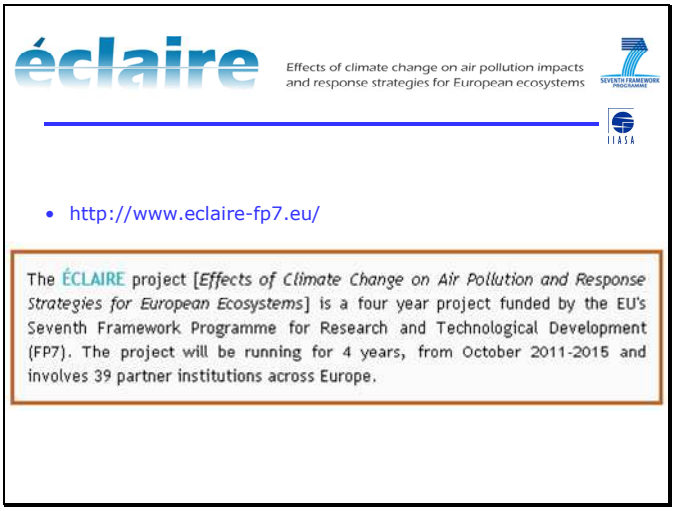

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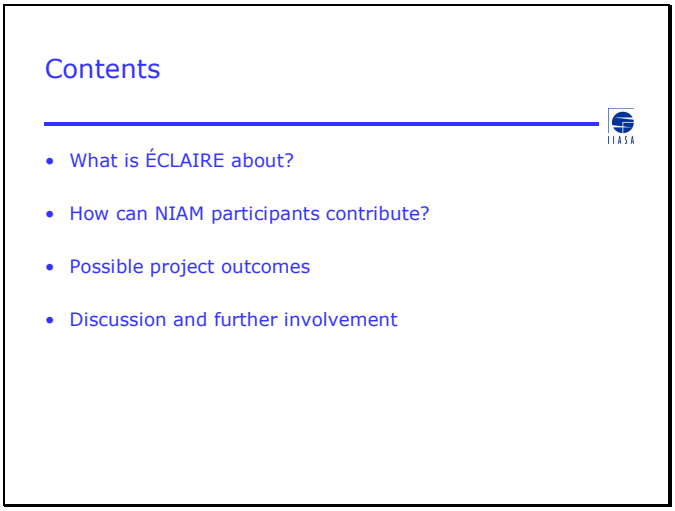


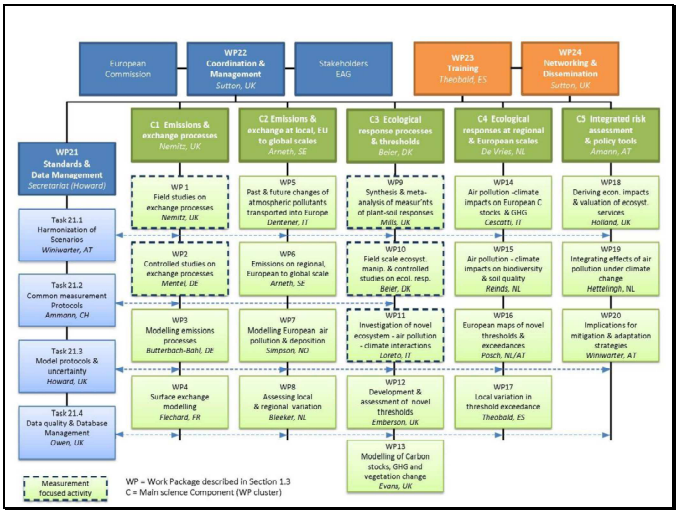
Slide 4

Background / FP7 call for proposals

- ENV.2011.1.1.2-1 The impact of atmospheric pollution on European land ecosystems and soil in a changing climate
- Trace gas exchange between biosphere and atmosphere (new impact indicators)
- Pollution impact: ozone, acidification, eutrophication

- Other relevant projects in this area:
  - ENV-2010.1.1.2-1 Atmospheric chemistry and climate change interactions (PEGASOS)
  - ENV.2011.1.1.2-2 Climate forcing of non UNFCCC gases, aerosols and black carbon (ECLIPSE)

Slide 5



Slide 6

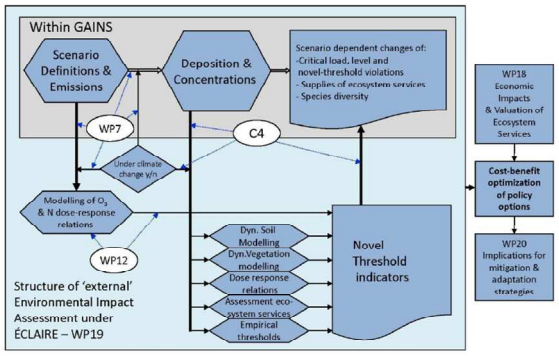
Key components

- *Emissions and Exchange Processes*
- *Emissions & exchange at local, European to global scales*
- *Ecological response processes and thresholds*
- *Ecological responses at regional and European scales*
- *Integrated risk assessment and policy tools*

  - Key question: Will the recommended measures to reduce adverse impacts on ecosystems remain the same under conditions of climate change?

Slide 7

Impact assessment in ÉCLAIRE



Slide 8

General rules for indicators

- CBA works on costs and damages, is in principle able to also balance out tradeoffs
  (but note the considerable uncertainty involved in such "net functions" or differences)
- GAINS can operate on target functions ("endpoints"). It will optimize the path to achieve the target, or at least provide cost information for a given achieved distance to target
- Any benefits need to be integrated in the endpoints
- GAINS can operate on largely independent entities and perform optimization in either direction
  (e.g. air pollution and climate change):
  - Optimize in terms of air pollution and measure climate related benefit
  - Optimize in terms of greenhouse gas emissions and measure pollution-related benefit

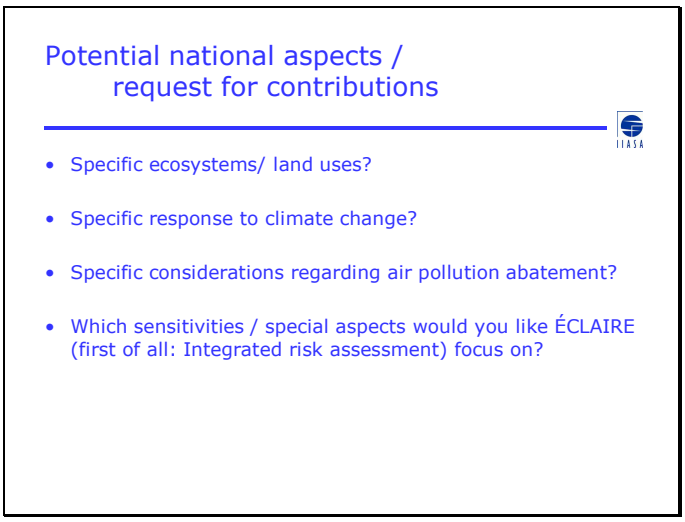
Slide 9

Choice of indicators

- We need to be able to create source-receptor matrices by way of operating the EMEP model
- Indicators need to be derived from a CTM output
- E.g. species' concentrations, "over threshold" (if collected during model output), fluxes (if collected during model output)
- Also combined N / O_3 (& CO_2) indicators to reflect interactions are conceivable (if collected during model output)

- CBA is somewhat more flexible but only if damage costs can be established for specific situations

Slide 10



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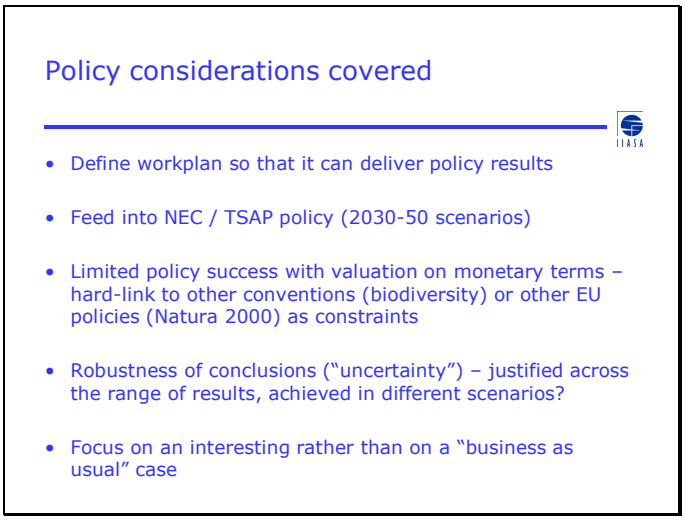

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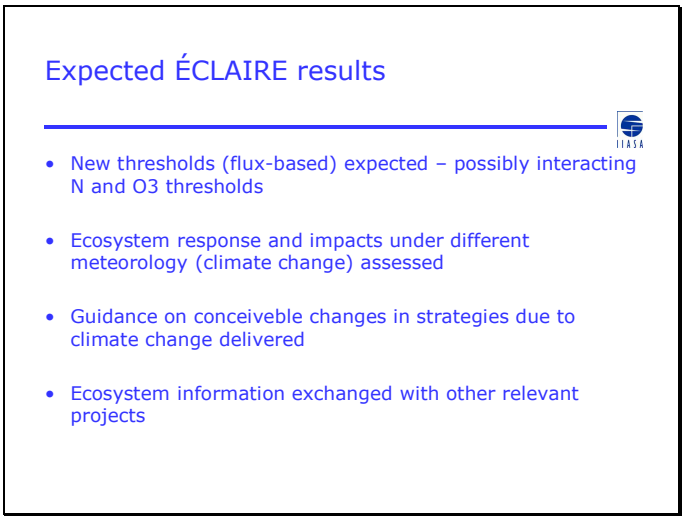

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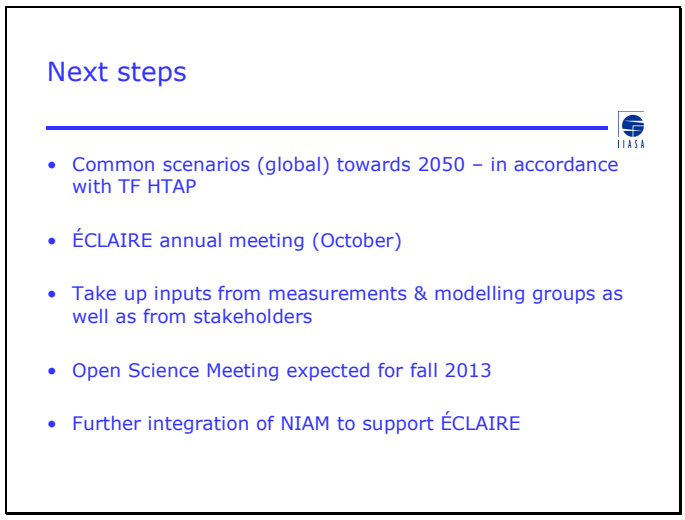
Next steps
IIASA
• Common scenarios (global) towards 2050 – in accordance with TF HTAP
• ÉCLAIRE annual meeting (October)
• Take up inputs from measurements & modelling groups as well as from stakeholders
• Open Science Meeting expected for fall 2013
• Further integration of NIAM to support ÉCLAIRE

Annex II: Agenda

APPRAISAL-NIAM Joint Meeting

June 29th 2012

Palazzo Calini ai Fiumi
School of Law – University of Brescia
Via Battaglie, 58
25122 Brescia

On 28th June at 6pm there will be a guided tour starting at the meeting venue (Palazzo Calini al Fiume – see map), followed by dinner at 8pm at Trattoria Caprese (Piazza della Loggia, 11)

June 29th, 2012

9:00 **APPRAISAL Project**
Luisa Volta: Presenting the APPRAISAL project to NIAM members as stakeholders and potential for participation

Ana Miranda: Report of the APPRAISAL KO meeting

10:00 *coffee break*

10:30 **NIAM presentations:**

Stefan Astrom**:** Linking national emission inventories and projections with integrated assessment modelling, Swedish experiences.

Enrico Pisoni: Sensitivity analysis to precursor emissions of multi-objective air quality control policies

Andrew Kelly: Transport policy evaluation- insights and results from the assessment and modelling of two measures in an Irish context.

Helen ApSimon: Air quality implications of a decentralised energy scenario for London

Zbigniew Nahorski: short overview of IAM activities in Poland

Preliminary thoughts on future NIAM activities to promote discussion over lunch.

12:30 *lunch*

14:00 NIAM presentations with a focus on ecosystem protection

Wilfried Winiwarter: **The ÉCLAIRE project**: effects of climate change on air pollution impacts and response strategies for European ecosystems. Presentation and discussion on how NIAM members can contribute.

Tim Oxley: Application of a “protectability index” to Natura 2000 sites in analysis of the benefits of emission abatement scenarios.

15.30 Discussion on future collaboration and activities in NIAM

16:00 *End of the APPRAISAL-NIAM Joint Meeting*