



Project Number 282910

ÉCLAIRE

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

Seventh Framework Programme

Theme: Environment

D16.5 Feedback from the GAINS model on the applicability of the newly acquired critical thresholds

Due date of deliverable: **01/10/2014**

Actual submission date: **10/07/2015**

Start Date of Project: **01/10/2011**

Duration: **48 months**

Organisation name of lead contractor for this deliverable : **RIVM**

Project co-funded by the European Commission within the Seventh Framework Programme		
Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	<input type="checkbox"/>
RE	Restricted to a group specified by the consortium (including the Commission Services)	<input type="checkbox"/>
CO	Confidential, only for members of the consortium (including the Commission Services)	<input type="checkbox"/>

1. Executive Summary

Novel critical load (CL) functions of sulphur (S) and nitrogen (N) with the aim to protect plant species diversity have been derived on a European scale (see Deliverables 16.3 and 16.4), making use of the 'biodiversity model' PROPS, (further) developed under Component 4. These critical load functions have been provided to the operators of the GAINS model at IIASA (see Component 5), incorporated into the GAINS model, and successfully used in the assessment of cost-optimal emission reduction scenarios. This was demonstrated and discussed at a recent common session of Component 5 and 4 (29-30 June 2015), where also future short- and longer-term improvements were agreed upon.

2. Objectives:

To derive critical load (CL) functions of N and S, based on criteria to safeguard plant species diversity that can be used within the GAINS model for integrated assessment on a European scale.

3. Activities:

CL functions to protect plant species diversity (characterised by 4 numbers) have been computed for about 1.3 million 'sites/ecosystems' using the PROPS vegetation model and the European background data base on the needed abiotic parameters (see Slootweg et al., 2014, and Deliverable 16.3 for more details). This information has been converted into an agreed-upon format and transferred to IIASA for incorporation into the GAINS integrated assessment model (see Component 5).

4. Results:

The biodiversity CL data provided by Component 4 have been successfully incorporated into the GAINS model and used in first assessments of cost-optimal emission reduction scenarios – see Figure 1 which shows an illustration of results of such an optimisation, presented in a recent meeting of Components C5 and C4.

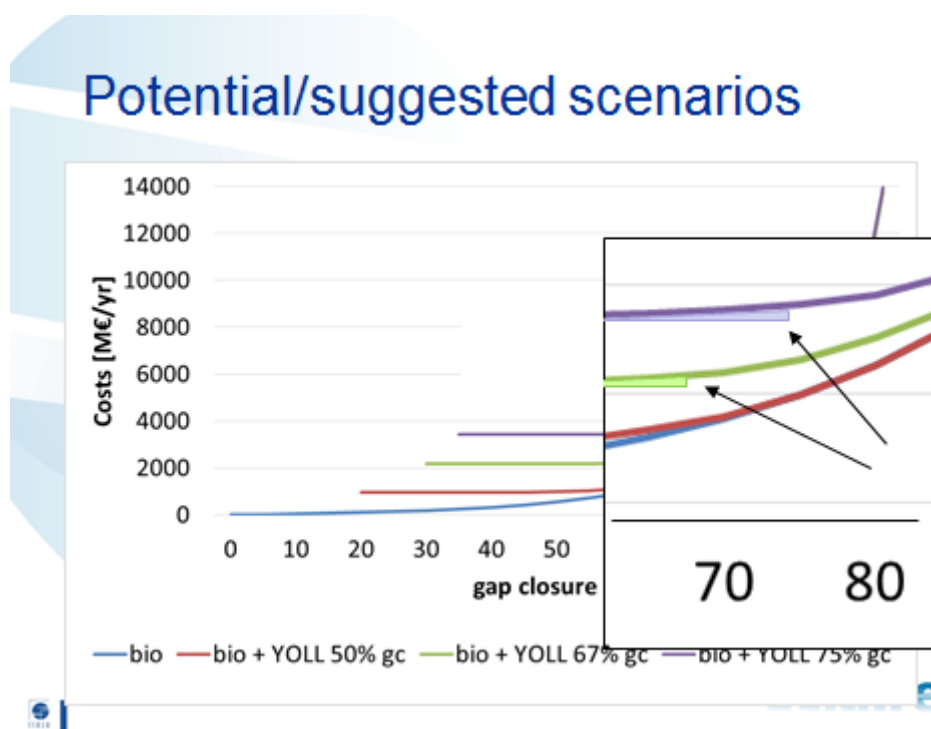


Figure 1: European (marginal) costs to achieve given percentage emission reductions between the 'Current Legislation' scenario and Maximum Feasible Reductions (MFR) using biodiversity CLs ('bio') in combination with human health related targets ('YOLL') – **Output from the GAINS model**

Notwithstanding further desirable improvements, it was concluded in a joint meeting of Component 5 and 4 (29-30 June 2015) that the biodiversity CL information provided by Component 4 can be used in integrated assessments with the GAINS model (see also Figure 2).

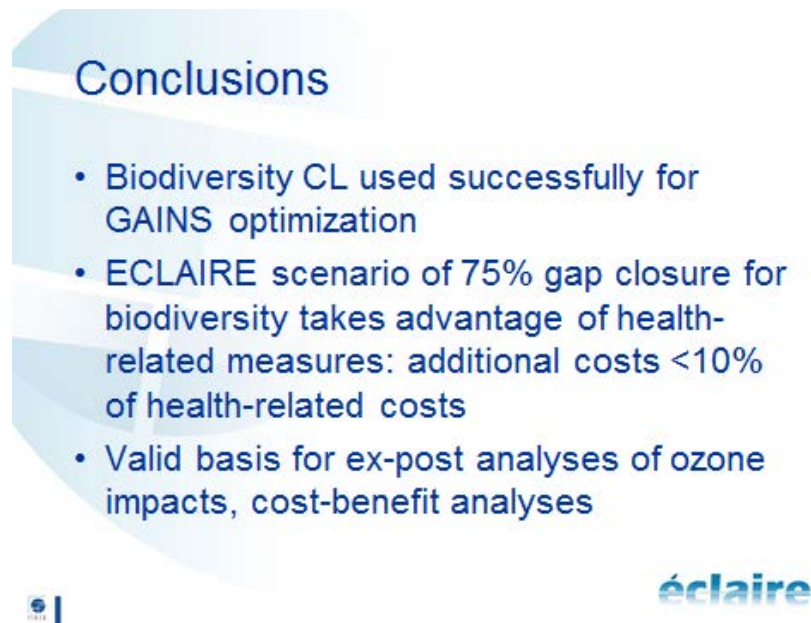


Figure 2: Conclusions (copy of PowerPoint slide) reached during a joint meeting (29-30 June 2015) by the operators of the GAINS model (Component 5) when (also) using the biodiversity CL information provided by Component 4.

5. Milestones achieved:

The deliverable is not related to any particular milestone within Component 4 (see also Component 5).

6. Deviations and reasons:

The deliverable was delayed by several months. The main reason for the delay was difficulties in linking the PROPS vegetation model to a suitable habitats map covering Europe. The advantage of the delay was that the data/approach could be discussed at the dedicated C5-C4 meeting held at IIASA (Laxenburg, 29-30.06.2015).

7. Publications:

Slootweg J, Posch M, Hettelingh J-P, Mathijssen L (eds), 2014. Modelling and mapping of atmospherically-induced plant diversity impacts in Europe: CCE Status Report 2014. RIVM Report 2014-0075, Coordination Centre for Effects, Bilthoven, Netherlands, 160 pp; www.wge-cce.org

8. Meetings:

- Numerous meetings between WP16 and WP15 (at Alterra, Wageningen) to improve the PROPS model and link it to the European database;
- C5-C4 technical meeting at IIASA (Laxenburg, 29-30 June 2015).

9. List of Documents/Annexes:

None.