Task Force on Integrated Assessment Modelling
37th meeting, 22-24 February 2010

Informal report by the Chair

I. INTRODUCTION

1. This report describes the results of the thirty-seventh meeting of the Task Force on Integrated Assessment Modelling, held from 22 to 24 February 2010 in Geneva, Switzerland, in accordance with item 2.3 of the workplan approved by the Executive Body at its twenty-seventh session (ECE/EB.AIR/99/Add.2). It describes progress in setting the baseline scenario for integrated assessment modelling. The presentations made during the meeting and the reports presented are available at: http://gains.iiasa.ac.at/index.php/meetings/pastmeetings.

2. Forty-nine experts from the following Parties to the Convention attended the meeting of the Task Force: Austria, Belarus, Belgium, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Russian Federation, Serbia, Spain, Sweden, Switzerland, the former Yugoslav Republic of Macedonia, and the United Kingdom of Great Britain and Northern Ireland. Also present were representatives from the Working Group on Strategies and Review, the Working Group on Effects, the Expert Group on Techno-Economic Issues, the Centre for Integrated Assessment Modelling of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP/CIAM) and the Coordination Centre for Effects (CCE). The European Environment Agency (EEA), the European Environmental Bureau (EEB), , the Oil Companies' European Organization for Environment, Health and Safety (CONCAWE), and the Union of the Electricity Industry (EURELECTRIC) were represented. A member of the Convention secretariat also attended.

3. Mr. R. Maas (Netherlands) chaired the meeting.

II. OBJECTIVES

4. The Chair noted that the meeting's purposes were: (a) to formulate baseline scenarios for further work on to the revision of the 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol) and (b) to assess further development of GAINS. The Chair outlined the conclusions from the Executive Body meeting of last December and progress by other subsidiary bodies relevant to the work of TFIAM.

III. BASELINE SCENARIO

A. Input data

5. The Head of CIAM presented two data sets that could be used as baseline scenarios in the GAINS model scenarios for countries within and outside the European Union (EU). The basic assumptions for the scenarios are summarized in table 1.

6. The first data set, hereinafter the national baseline, comprised 2009 updates of national energy and activity scenarios from 15 countries, including Norway, Switzerland, Croatia and 12 EU Member States. For the rest of the EU Member States data from the 2009 CAPRI (Common Agricultural Policy Regionalized Impact) model and the energy projection from the 2008 PRIMES

model that reflected the EU climate and energy package. The Task Force noted that no updates were received from most of the non-EU countries. As far as those countries were not covered by PRIMES or CAPRI, data from the 2009 World Energy Outlook of the International Energy Agency (IEA) and the most recent outlook of the Food and Agricultural Organization (FAO) were used.

7. The second data set, hereinafter the PRIMES 2009 baseline, was mainly based on the December 2009 update of the PRIMES energy baseline for the 27 European Union (EU) Member States and selected candidate countries (Croatia, the Former Yugoslav Republic of Macedonia, and Turkey). The projection included the effects of the economic crisis. The data held climate and energy measures currently in place in 2009, but no future commitments. Therefore, these data did not describe the full attainment of the climate and energy package. The key assumptions included the EU Emission Trading Directive, carbon dioxide (CO_2) and passenger car regulation, the economic recovery package, national and EU legislation on emissions from sectors not in the emission trading system, and national renewable energy policies. The latter, however, were not always sufficient to meet the target of a 20 per cent share of total energy use across the EU.

8. For Switzerland and Norway PRIMES 2009 projections were not available. In the PRIMES 2009 baseline scenario the 2009 updates of the national scenarios were used.

9. During the review of the draft national baseline additional comments and material submitted by 10 countries had been implemented. Most countries submitting national scenarios also provided information on control strategies (e.g. national interpretation of flexibilities in the European Commission's proposal for the Industrial Emissions Directive). For other countries the effects of such flexibilities on implementing control measures by 2020 take into account recent information from the European Commission.

10. Emission factors for road traffic were based on the COPERT-IV model in both the national baseline and the PRIMES 2009 baseline. This describes realistic emissions from cars complying with Euro 2 and 3 standards. However, it does not include recent measurements by a Dutch TNO institute suggesting that emissions from Euro V heavy duty vehicles in real life circumstances would be higher than emissions during the test cycle. Both baseline scenarios assumed emission control measures recently agreed by the International Maritime Organization (IMO). The worldwide decrease in the sulphur content of shipping fuels to 0.5 per cent of sulphur was assumed only from 2025.

11. The Task Force noted that the national scenarios were based on national activity statistics, while emissions of the PRIMES 2009 scenario were based on data from Eurostat. The latter were in some cases different from the national statistics (e.g. the sectoral accounting of co-generation of heat and power, non-commercial wood burning in households, the use of black liquor from the pulp and paper industry, and the use of energy by-products from the chemical or metal industry).

12. The Task Force noted that the national baseline contained for most countries a pre-economic crisis scenario having a higher growth in activity levels. Subsequently emissions for these countries in 2020 would be higher than in the PRIMES 2009 baseline. However, a few countries had submitted post-crisis projections, which result in lower emissions. Overall differences in calculated environmental impacts were limited , although for some countries differences in emissions between the national and PRIMES 2009 projections were significant,.

Table 1. Current status and sources for basic energy and activity assumptions for the two proposed baseline scenarios.

	National baseline	**PRIMES-2009 baseline**
27 EU Member States	National (energy and agricultural) projections updated in 2009 (12 EU Member States) 2008 PRIMES energy projections with EU climate and energy package, 2009 CAPRI agricultural projections (15 EU Member States)	2009 PRIMES energy projections 2009 CAPRI agricultural projections
Croatia	National data updated in 2009	2009 PRIMES; 2009 CAPRI
Norway and Switzerland	National data updated in 2009	National data updated in 2009
The Former Yugoslav Republic of Macedonia	2008 PRIMES baseline; 2009 CAPRI	2009 PRIMES; 2009 CAPRI
Turkey	2008 PRIMES baseline; FAO outlook 2003	2009 PRIMES; FAO outlook 2003
Other non-EU countries	IEA 2009 World Energy Outlook; 2009 CAPRI (if available), otherwise FAO 2003	IEA 2009 World Energy Outlook; 2009 CAPRI (if available), otherwise FAO 2003

13. The Task Force noted that the development of a baseline scenario was not a goal in itself, nor the subject of negotiation. It was only a means to facilitate negotiations on environmental targets and new emission ceilings and to assess the costs of additional policies.

14. The Task Force noted that for most non-EU countries assumptions on the implementation of current legislation were more important for air pollutant emissions than economic assumptions. Both baselines contained conservative estimates on the implementation of current legislation.

15. The Task Force noted that for Euro IV/V heavy duty vehicles real emissions could be higher than the current scenario assumptions. The latter were based on emission factors during the test cycle.

16. Several experts expressed concerns about the unavailability and lack of transparency of PRIMES data and problems in providing feedback on preliminary PRIMES results. However, it was noted that a stakeholder consultation process was organized between the PRIMES modelling team and national energy experts. In order to avoid confusion, all comments should be fed into this process through the national representative in the energy-economist group of the European Commission. Some experts noticed that assumptions about coal and nuclear power capacity had been partially adapted by the PRIMES modelling team, but that there was insufficient information to make a thorough check for inconsistencies, e.g. on the modelled projections of road transport activities. Feedback mechanisms for non-EU countries and for non-governmental organisations still needed to be clarified.

17. The Task Force decided that detailed data on the national baselines would be made available via the CIAM website on 1 March 2010. Comments should be made before 26 March. Detailed data on the PRIMES 2009 scenario would be made available after the official release by the European Commission.

B. Proposal for the baseline scenario

18. The Task Force concluded that both baseline scenarios had advantages and disadvantages. Further efforts to improve the baseline would notreduce basic uncertainties in future economic developments and climate and energy policies.

19. The PRIMES 2009 baseline, with the input data as of December 2009, had the advantage of being internationally consistent and considering the most recent economic development for all countries. It provided an internationally coherent perspective comprising current legislation on climate and energy measures, although some national experts might have different assumptions on future national energy and climate policies.

20. The national baselines varied widely in assumptions about economic growth and the implementation of climate policy measures. For some countries the economic crisis was included, but for most countries not. Some countries had included significant domestic implementation of climate and energy measures, others had assumed lower carbon prices. The use of the national baseline would introduce an unequal starting point for assessing the cost-effectiveness of further emission reduction measures. Therefore, it might result in a distorted distribution of additional mitigation efforts. The PRIMES 2009 baseline would offer a more equal starting point for further measures.

21. Most experts agreed to use the PRIMES 2009 baseline as the basis for defining targets to achieve desired environmental goals. In view of the uncertainties about future developments, the Task Force recommended that more than one baseline be used for exploring strategies to achieve environmental targets. The use of the national baseline scenario with higher growth assumptions would currently offer the best available proxy for an alternative scenario. It could be used to assess the sensitivity and attainability of emissions ceilings.

22. The Task Force recommended further assessing if and how uncertainties could be reflected through flexibility mechanisms. It also recommended to aim not only on 2020 time but to make full use of 2030 data provided by PRIMES 2009 and the World Energy Outlook.

IV. EX-POST EFFECTS ASSESSMENT

23. The Task Force took note of the progress by the Working Group on Effects to assess environmental impacts for multiple endpoints, such as biodiversity indicators, food security, carbon sequestration and impacts on ecosystem services for human welfare. For further ex-post analysis the two baseline scenarios will be made available to the Working Group on Effects as soon as they become available from CIAM.

24. The head of the Coordination Centre on Effects presented end-points that could additionally be used in integrated assessment modelling, which include exceedance of critical loads in the EU Natura 2000 habitat protection areas; changes in species diversity; target loads for the recovery of ecosystems derived from dynamic models and the likelihood of ecosystem risks derived from both calculated and empirical critical loads.

25. The Head of Programme Coordination Centre for the ICP Vegetation presented indicators for ozone damage to crops, forest growth and vegetation based on the flux approach. According to the flux approach significant ozone damage is more widespread in Europe than estimated with the

current concentration-based approach using the AOT40 indicator (accumulated over a threshold of ozone concentration of 40 parts per billion), and not limited to Southern Europe. She recommended using exceedances of the Phytotoxic Ozone Dose (POD) of 4 mmol m^{-2} for birch and beech as the indicator in integrated assessment models.

V. ANALYSIS OF TECHNICAL ANNEXES

26. The expert from Italy presented a proposal on how to analyze with the GAINS model the emission limit values suggested in the draft annexes prepared by the Expert Group on Techno-economic Issues. The discussion highlighted the difficulties of such an analysis due to the different nature and structure of the data contained in the tables of the Expert Group on Techno-economic Issues (short-term emission limit values at the installation level) and the data input to GAINS (annual emission factors per sector). The methodology proposed will be tested on Italian scenarios to check the efficacy of the results achieved.

VI. LINKS BETWEEN AIR POLLUTION AND CLIMATE CHANGE

27. The Task Force welcomed initiatives to further develop the GAINS modelling framework for the purpose of estimating co-benefits of strategies to reduce ozone and particulate matter for radiative forcing and black carbon deposition in the Arctic. It noted that the following metrics could be used in the inclusion of near-term radiative forcing into a multi-pollutant/multi-effect framework: (a) instantaneous radiative forcing at the regional and global scales; and (b) black carbon deposition to the Arctic. They would not interfere with the objectives of the United Nations Framework Convention on Climate Change (UNFCCC) on long-term stabilization, calculated with the global warming potential (GWP) for 100 years. The metrics could be used to prioritize reductions of precursor emissions of $PM_{2.5}$ and ground-level ozone.

28. The Task Force encouraged its experts to collaborate closely with colleagues that will participate in the new ad-hoc expert group on black carbon of the Convention, as well as in the preparation of the assessment of the United Nations Environment Programme on black carbon and ozone and of the fifth assessment of the Intergovernmental Panel on Climate Change (IPCC).

29. The Task Force requested CIAM to develop emission estimates for black and organic carbon consistent with the database on fine particulate matter ($PM_{2.5}$) and to present these estimates to national experts for review. The Task Force also encouraged Parties to report and validate data on PM emissions and the organic and black carbon fractions in 2010.

30. The Task Force noted that the further speciation of $PM_{2.5}$ in the GAINS model would also offer possibilities to test the robustness of strategies to reduce health risks for alternative assumptions on the toxicity of different species of $PM_{2.5}$.

VII. PROGRESS IN RELATED AREAS

31. The Task Force took note with appreciation of the presentations given by experts from Belarus, Germany, Italy, the Netherlands, Switzerland, EURELECTRIC, CONCAWE and the United States' Clean Air Task Force (CATF).

32. The Task Force acknowledged the benefits of a joint approach of air pollution and climate change; the possible biases due to narrow problem framing; the need to increase the robustness of

policy strategies by analysing the sensitivity and attainability of abatement strategies for several future scenario; and scenarios with a long time horizon.

VIII. FURTHER WORK

1. The thirty-eight meeting of the Task Force will be held from 17-19 May 2010 in the Radisson Hotel in Dublin, Ireland, starting at 14:00. The meeting will focus on options for target setting. A workshop on sensitivity analysis and robustness of results will tentatively be held in October/November 2010 in Laxenburg, Austria.
