



## CONSULTATION ON EC4MACS MODELLING METHODOLOGY

Please fill in one questionnaire for each model, and provide your comments in the respective boxes.

Please return the questionnaire to the EC4MACS coordinator Hans Benzinger ([benzing@iiasa.ac.at](mailto:benzing@iiasa.ac.at)) before June 15, 2009.

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Model	<b>PRIMES</b>
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## 1 Assessment of model design

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**To what extent does the structure of each model provide a scientifically credible representation of the reality?**

*The PRIMES model is a complex state of the art development from which much can be learned. The report gives a nice general overview, mentioning many factors, **but lacks sufficient depth to evaluate the model thoroughly**. The structure in terms of sectors seems logical with respect to energy demand and supply: however there **are significant gaps**- for example there is no mention of nuclear energy.*

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**What are the limitations of the model structure and the implied system boundaries and to what extent may these restrict the validity of the conclusions and policy**

*There are major omissions (e.g. nuclear energy referred to above); it is unclear how renewables are treated, and how each country's capacity is estimated. But my major concern is the equilibrium (myopic) approach with successive 5 year time steps. Major commitments, for example new build coal fired stations with a life time of several decades and designed to be fitted with CCS, are much longer term; and not the result of instantaneous adaptations every 5 years. I do not think PRIMES takes into account many aspects of restructuring realistically.*

*There are many factors outside the energy system modelled which have been added on – for example environmental aspects, but there is no real description to say how this is done and hence how valid the results are for policy.*

*Other factors such as individual behaviour and response are mentioned, but there are conflicting statements about the extent to which this is represented.*

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## 2 Representation of reality in the modules

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**To what extent does the structure of each model provide a scientifically credible representation of reality?**

*The comments above address the structure of the model. But however good the structure, no model is better than the data fed into it. This is where there is a big deficiency in the model description. For example we are told that it uses data from EUROSTAT, but with some subsequent adaption. This gives me no confidence whatever! **What is needed is much greater transparency**, more along the lines of the GAINS model, where the assumptions for each country are available on the web for each model run that is used to inform policy development. These data are not to be found in the reports cited either. It is difficult to have confidence that a “black box” approach represents reality.*

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### **3 Treatment of uncertainties**

Have the most policy-relevant uncertainties (related to variability of the system inexactness of input data and lack of knowledge) been adequately addressed?

*No information is given on any work that has been done to test for example, the sensitivity of the results to assumptions about carbon price, or fuel price; or the constraints e.g. on GHG emissions. There is mention of calibrating to initial conditions in 2000, but how well does the model reproduce what has happened over the next decade? At a national level energy modelling includes quite a lot of sensitivity analysis, including high/low economic growth etc.*

Is there an alternative formulation conceivable that could provide better policy-relevant insights into uncertainties?

*See suggestions above re sensitivity runs; but also suggest more effort into trying to think through what the implications are for individual countries. If for example some kind of scenario version of the model could be made available to countries to investigate how different assumptions/factors affect their energy projections, as has been done for the RAINS/GAINS models, then it would be possible to gain insight into the model conclusions.*

Do available model results represent uncertainties accurately? Are there other ways conceivable for attaining more robust conclusions?

*See above*

Is there a risk that the model gives policy advice that systematically underestimates or overestimates the need for policy measures to protect the environment? What are the major reasons for a bias, if any?

*Not enough information and transparency about the model to answer this question.*



## **4 Communication with stakeholders, policy-makers and public**

How do the modelling teams verify the quality of input data that are used in model? Is the quality of the input data obtained from national sources and from other models sufficiently guaranteed? In what way do teams give feedback to providers of input to maximise the robustness of model results?

*The PRIMES team has a contact expert in each country. However this is very restricted in scope, and there is no clear evidence of bilateral consultations or any adaptations that have been made to the modelling as a result. As indicated above the data used for each country, together with other assumptions needs to be made freely available for inspection- ideally on a web site.*

*NB The appendix to the report needs a proper explanation. It is inadequate to describe and explain what data is used. What, for example, are “degree days” and how are they used? Where does the data for each country come from (EUROSTAT??) and what detailed verification has been done bilaterally with each country?*

In what way are users and stakeholders involved in the modelling process, and is this sufficient to ensure transparency and acceptability of the results for policy advice?

*In my experience there has been very little involvement of users and stakeholders, with limited information in reports.*

Are the presentations of the results clear? If not, can the communication and dissemination of the results be improved?

*The presentations, as in the report for this review, tend to be generally descriptive and lacking depth; it is difficult to gain real insight into the results except as numbers generated from a black box. Some workshops arranged to give some more in depth information, ideally illustrated with runs produced for the EC climate and energy package, could help to show how the results respond to assumptions and data used. Also see suggestion of a website along the lines of the IIASA one for RAINS/GAINS.*

Is the model structure transparent? (e.g., are the assumptions clearly exposed and motivated, and is their influence on the model-results explained?)

*No- see above.*



## **5 Other comments**

*Overall I have difficulty in filling in this questionnaire because insufficient information has been provided by the PRIMES team. Nor is it clear to me how the PRIMES team have linked with e.g. TREMOVE or CAPRI, and how consistent they are with other models within EC4MACS; including the GAINS model.*

Thank you for providing this feedback to the EC4MACS team!

Please return this questionnaire to the EC4MACS coordinator Hans Benzinger ([benzing@iiasa.ac.at](mailto:benzing@iiasa.ac.at)) before June 15, 2009.

You will receive information on the EC4MACS review workshop that is planned for October 2009.