

# Model integration for sustainable bioenergy supply

22 – 25 October 2012

## **Workshop description, aims and outcomes**

Bioenergy is considered an important option in making future global energy supply more sustainable. However, many questions are being raised with respect to the sustainability of bioenergy and the bio-based economy. For example, what is the net contribution bio-based options can make to mitigate greenhouse gas emissions, accounting for impacts of land use change and agricultural intensification? How can large-scale biomass production and supply be organized over time so that unsustainable price impacts on food markets or undesired land use change can be avoided? Comprehensive answers to these and other questions are not yet available, while the current methodologies and modeling frameworks have insufficient capabilities to answer them. Thus, an improved modeling toolbox is needed that 1) closely integrates economic models, energy models, and biophysical land use models and 2) is fed by detailed technical information. A much improved and more integrated modeling framework is vital for showing how a bio-based economy can be done right and for defining necessary preconditions. Such assessments can then deliver more concrete input for developing proper policy strategies.

In this workshop we brought together leading researchers from the different modeling approaches (i.e. economic modeling, biophysical modeling, land use modeling, energy modeling and bottom-up analysis) in order to discuss the current status and limitations, and future possibilities of model integration for better assessing biomass supplies and impacts. The workshop created many opportunities for researchers from the different disciplines to interact and discuss. At the end of the workshop, we had learned a lot from the different modeling approaches. We were also able to define the key uncertainties and suggest specific ways forward in model integration. We are now in the process of writing an article for an international, peer-reviewed journal in order to disseminate our findings to the broader scientific community.

## **Workshop organisation/format**

The workshop was organized in different sessions: On the first day, plenary sessions took place in which the different modeling teams presented the current status of their models. In the following days, breakout groups were organized in which the two main topics were discussed: i) gaps in existing approaches (interdisciplinary groups), and ii) ways forward in improving modeling activities (one session with disciplinary groups and one session with interdisciplinary groups). After each round of breakout groups we had plenary meetings in which the results from the breakout groups were reported and discussed with all workshop participants. A final session (including both plenary and breakout group discussions) was dedicated to setting up the structure, and writing first sections, of a journal article to be submitted early 2013. Extended coffee and lunch breaks were useful for additional discussions and for giving participants time to get to know each other.

The Lorentz Center@Snellius workshop provided us with a stimulating environment, especially the different work areas, the many white- and blackboards (which were in constant use), and the comfortable common room all facilitated fruitful discussions between individual participants, in breakout groups and in the plenary group. The location and setup strongly contributed to the success of the workshop.

We enjoyed four intense days of productive and valuable discussions. We are grateful to have had the opportunity to use the inspiring facilities for our discussions and for working out our ideas for model integration. We would like to suggest to the organizers to be less strict on the time requirements for workshops - many of our workshop's participants were not able to attend four days, while on the last day the remaining participants were also tired from the intense discussions of the first three days.

We would like to thank the Lorentz Center for the opportunity for hosting and co-funding our workshop. We are especially grateful to Gerda Fillipo for her support in preparing and hosting the workshop.

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