BIOGRACE II

Harmonised Greenhouse Gas Calculations for Electricity and Heat from Biomass

Report of GHG expert workshop (D2.4)

30 November 2012

Project IEE/11/733 SI2.616371 BioGrace-II

1. Rationale and goals of the workshop

While the draft methodological background document, a first rough draft of the calculation rules and a first draft of the BioGrace II Excel-based GHG calculation tool has been accomplished within the first 5 month of the project, this workshop was to have a feedback on these starting activities and their directions. The BioGrace team supposed to gain reflections on the methodological background document and to know whether the most important calculation rules need improvement (in case parts are difficult to understand) and if experts and stakeholders agree to the content (if not this should be discussed in detail).

While presenting a first version 1 of the tool to the participants the BioGrace team expected statements from experts who are familiar with GHG calculations as well as with solid or gaseous biomass for electricity, heat and cooling concerning:

- the clarity of the structure of the tool, for instance in terms of the way emissions of the biomass (gaseous, liquid or solid) are calculated (in g $CO_{2.eq}$/MJ fuel) or how the electrical, thermal and cooling efficiencies are taken into account leading to a result in g $CO_{2,eq}$ / MJ electricity, heat or cooling;
- the clarity of the tool in terms of the different approaches for bioliquids and for gaseous and solid biomass.

Therefore, the objective of the workshop is twofold:

1. to get feedback from these experts on the methodological background document and the most important (and still draft) calculation rules, and
2. to get feedback on the draft version 1 of the GHG calculation tool.

Since regulation based on an update of the report COM(2010)11 has not yet been finalised by the time the workshop has taken place, it was of special interest by the BioGrace team and the participants to gain latest information on the state of this regulation and the way it might be specified in a number of details, relevant for BioGrace II.

Briefly summed up the workshop's key objectives have been:

- to review the BioGrace II Excel-based GHG calculation tool,
- to discuss key questions concerning GHG data and accounting methodologies,
- to identify key policy recommendations for harmonising solid and gaseous biomass GHG calculations.

2. Technical information about the workshop

The task (2.3) to organise this one–day workshop has been up to IFEU. It has been dated on October 23, 2012 and located in Heidelberg/Germany. During summer a list of more than 70 relevant experts, who are working in the field of GHG calculation for solid and or gaseous biomass have been contacted. Participation has been restricted to invited participants. Invited experts were free to propose further invitees in case the invited expert could not participate.

Finally, 24 experts have participated in the workshop. Two of them have been connected via teleconference. Many invited experts have regretted explicitly not being able to show up due to other appointments. After all the size of the group was adequate and allowed intensive discussion.
A complete participant list can be found in the annex of this report.

The extended agenda can also be found in the annex. The major items of the workshop have been:

I. The state of regulations
- A. Update on the Commission report on biomass sustainability
- B. Default values for solid and gaseous biomass for electricity, heat and cooling

II. The BioGrace II Project
- Project aims, outline and state of results

III. Presentation of draft BioGrace II results
- A. Special methodological aspects - what is new and different from BioGrace I
- B. Structure of the draft excel sheet BioGrace II, general approach

IV. Lessons from first practical implementation of GHG calculations according to RED relevant for solid and gaseous biomass for electricity, heat or cooling
- A. The PELLCert initiative - GHG calculation for wood pellets
- B. Biogas – how to deal with actual multi-input into a biogas plant

V. Special methodological issues
- A. Carbon accounting of forest bioenergy
- B. Avoided methane emissions from fermentation of manure

VI. Conclusions and Outlook
- A. Recapitulating
- B. What do the experts expect from the BioGrace II project

3. Overall summary of the workshop results

Since the proposals and reports from the Commission on sustainability of solid and gaseous biomass for electricity, heat and cooling are still pending, a number of questions and issues could not be tackled and solved in a final way. Thus some of the workshop's objectives could not be met in a way it has been expected at the beginning of the BioGrace II project.
Nevertheless, many important questions have been discussed in a very constructive way, considerably helpful for the progress of the project.
First of all it was essentially important to catch up with the state of mind of the Commission and to have the opportunity to reflect this within a competent expert panel. It was important to learn that the Commission is convinced that the voluntary sustainability requirements from COM(2010)11 for solid and gaseous biomass are not sufficient.
JRC took the opportunity to explain the calculation of the default values for solid and gaseous biomass for electricity, heat and cooling in a detailed and comprehensible way.
The BioGrace II team gave a description of relevant methodical issues which will need watertight rules once the BioGrace II spreadsheet shall be a recognised ready-to-use tool. Experts widely agreed that these issues (e.g. LHV and water content) will need clarity in practice.
Furthermore the BioGrace II team informed the participants on the state and structure of the spreadsheet. The approach has been considered as comprehensive and applicable, however, a number of improvements have been recommended.
There was input from experiences of the private sectors and from certification practice in the wood and biogas sectors. A presentation from AEBIOM showed the state of involvement of the pellet sector in GHG claims and the strong need for harmonised tools. Another presentation displayed methodical issues the biogas sector is confronted with.
JRC again explained the state of its study on carbon accounting. The Commission like many experts considers this issue as a crucial one. However, there are still very controversial opinions on that aspect as the discussion on the workshop showed.
Overall many questions remained open, at least partially. However, this was to be expected in view of the current premature status of a number of discussions.

4. Overview over the workshop along the agenda

I. The state of regulations - Input from the Commission and JRC

A. Update on the Commission report on biomass sustainability
B. Default values for solid and gaseous biomass for electricity, heat and cooling

Giulio Volpi from DG ENER informed (via teleconference) about the latest the developments and proposals by the Commission. He explained that the Commission does not see that the recommended sustainability criteria from 2010 were taken over by the Member States. This has leaded the Commission to conclude that there is need for a regulation at Community level. He explained that DG

ENER is still working on their proposal. The result, which is the new report from the Commission on sustainability is expected early 2013.
From the presentation by Jacopo Giuntoli, we learned how JRC makes their calculations using the E3database from LBST. This was very instructive and showed the complexity of the calculation in transparent way. He gave detailed explanation on one of the calculation example. The presentation that was distributed among the participants includes two more examples. JRC announced that by the end of this year there will be a report with all detailed numbers that were used for these calculations.

II. The BioGrace II Project

John Neeft (Coordinator of BioGrace II) introduced the project aims, outline and state of results. He made clear which role BioGrace II shall play on the level of policy implementation. He explained that some of the current discussions are not yet applicable at the level of a tool like BioGrace (e.g. forest carbon stock changes, indirect land use change). BioGrace will not include such topics in tools before policy makers have decided (based on scientific input) to include these issues into legislation and to amend the GHG calculation methodology.
The major work of the project will be to build the tool in line with the (soon) given default values, to involve stakeholders and to foster European harmonisation.

III. Presentation of draft BioGrace II results

A. Special methodological aspects - what is new and different from BioGrace I
B. Structure of the draft excel sheet BioGrace II, general approach

Per Wollin (STEM) explained the differences between the 1st and now completed BioGrace project and the ongoing BioGrace II project which consists apart from type of biomass and state of regulation mostly on the inclusion of the final electric and thermal efficiency. He gave an overview on aspects to be discussed within an issue paper for methodological advices. He highlighted two aspects: (1) LHV and water content, (2) methodology on CHP and heat efficiency.

- LHV and water content: divergent opinions about the question whether or how to consider water content for the LHV. The BioGrace team will summarise the comments made, and send this as input to JRC/LBST and the Commission. It will be up to them to decide whether to stick to the guidance by the Communication 2010/C160/02 or to change it.
- Methodology on heat efficiency: exergy as a physical dimension has been considered as a complex way to allocate heat and power for general practice. On the other hand, the given minimum temperature of 150°C appears to be a great simplification. Thus this setting is an arbitrary one from the scientific point of view but from a political viewpoint it will allocate more emissions to low temperature heat (e.g. hot water) to discharge CHP-electricity more than it would happen if exergy allocation was applied in a strict way.

Susanne Köppen (IFEU) introduced the BioGrace II GHG calculation tool and touched upon some of the details. She demonstrated how the CHP allocation is implemented and how users can apply roll-down functions to select between transport options.
As soon as the tool will be more advanced, BioGrace will organise feedback sessions and workshops on this. This will be announced on the BioGrace website.

IV. Lessons from first practical implementation of GHG calculations according to the RED relevant for solid and gaseous biomass for electricity, heat or cooling

A. the PELLCert initiative - GHG calculation for wood pellets
B. Biogas – how to deal with actual multi-input into a biogas plant

Cristina Calderón from AEBIOM presented the Pellcert initiative – how ENplus certifies the quality of pellets for residual use, and intends to expand this to industrial use and also intends to include sustainability criteria incl. GHG calculations. ENplus is using a GHG calculation tool developed by BE2020 to get some experience. In the future they will use the BioGrace-II tool.

Horst Fehrenbach (IFEU) presented a way how to deal with actual biogas plants with multiple inputs. This issue has been brought up by the operators and certifiers of biogas plants who cannot solve the following conflict: the Commission does not allow averaging the results of biomass conversion from different raw materials. However, there is no rule on how to disaggregate biogas from mixed inputs and allocate this to those inputs. The presented proposal provides an approach to handle this in a practical, scientifically sound way. During the discussion not all aspects could be clarified sufficiently. There will be an exchange of opinions after the workshop between IFEU and LBSt. If there will be clarity, BioGrace will adopt the proposal for the tool.

V. Special methodological issues

A. Carbon accounting of forest bioenergy
B. Avoided methane emissions from fermentation of manure

Alessandro Agostini (JRC) presented major findings of a report from JRC on carbon accounting of forest bioenergy. This report is a literature review on recent scientific assessments about this issue. The report is not yet published, thus the presentation just gave an overview on the included conceptions. It concluded that the assumption of biogenic carbon neutrality is not valid for some of the forest potential bioenergy under short-term time horizons; he concluded further the necessity to integrate all the carbon pools in the bioenergy GHG emission assessment and their evolution in the time horizon of the analysis. The presentation finished by stating that for many aspects within the scope of carbon accounting agreed methods are not yet available.
The discussion during the workshop mirrored the discrepancy of opinions about carbon accounting – particularly when the issue is reduced to the negative term carbon debt. The discussion didn't result in clear conclusions.

Alessandro Agostini (JRC) presented JRC's reflections on avoided methane emissions for biogas GHG calculations. JRC hasn't yet made a decision whether such credits shall be included into the calculation of the corresponding biogas pathways. Results from GHG calculations without credits for avoided methane emissions are totally different as compared to system expansion approaches (in classical LCA) were they are included.

Some of the participants express doubts as a clear advantage of manure digestion is not taken into account. On the other hand it was argued that the current outcomes lead to the right incentives to have closed digestate storage and off-gas combustion when upgrading the biogas. The final decision on how this is to be done will be taken by the Commission.

VI. Conclusions and Outlook

A. Recapitulating

B. What do the experts expect from the BioGrace II project

John Neeft (Coordinator of BioGrace II) summarised the workshop. The overall echo was that this meeting was to the point, handled the relevant issues and happened perfectly on time. Particularly woody biomass is estimated to gain increasing relevance.
A harmonised tool is highly appreciated however a number of crucial specific points are not yet clear. The discussion on these points will have to continue.

BIOGRACE II

Harmonised Greenhouse Gas Calculations for Electricity and Heat from Biomass

ANNEX

Experts' workshop on GHG emission accounting for biomass and biogas

23 October 2012 – Heidelberg, Germany

The workshop will focus on methodological issues when harmonising GHG calculations for electricity, heat and cooling from solid or gaseous biomass.
The workshop's key objectives include:

- to review the BioGrace II Excel-based GHG calculation tool,
- to discuss key questions concerning GHG data and accounting methodologies,
- to identify key policy recommendations for harmonising solid and gaseous biomass GHG calculations.

We are inviting only relevant experts in the field of GHG calculation for solid and or gaseous biomass in order to have a through technical discussion.

Background on BioGrace II

The project BioGrace has completed the work on harmonising calculations of biofuel greenhouse gas (GHG) emissions and thus supports the implementation of the EU Renewable Energy Directive (2009/28/EC) and the EU Fuel Quality Directive (2009/30/EC) into national laws. The project has also applied for recognition of the BioGrace calculation tools as 'voluntary scheme' by the EU Commission.

While RED and the BioGrace tools focus on biofuels and other bioliquids, the Commission is now working on a report on the sustainability of solid and gaseous biomass for electricity, heat and cooling. Through its Intelligent Energy Europe programme (IEE), the Commission financially supports the extension of the BioGrace tool to cover biomass and biogas. The key steps of the BioGrace-II project are to:

1. Build an Excel-based tool for GHG calculations for electricity and heat from biomass and biogas;
2. Persuade policy makers from at least 6 Member States to choose for harmonisation and use the same tool or approach;
3. Involve companies who will give feedback and ensure that the GHG calculation tool meets their needs.

The outcome of the methodological discussion will be communicated to the European Commission.

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Supported by
Intelligent Energy Europe
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BIOGRACE II

Harmonised Greenhouse Gas Calculations for Electricity and Heat from Biomass

Agenda

Greenhouse gas experts' workshop
23 October 2012 – Heidelberg, Germany

Time: 09:00 – 16:00

Location: ARTHOTEL, Grabengasse 7, 69117 Heidelberg

	09:00	Start of morning session
1.	09.00	Opening, introduction of participants
2.	09.15	<u>The state of regulations</u> **A.** *(Giulio Volpi, DG ENER)* **B.** Default values for solid and gaseous biomass for electricity, heat and cooling. *(Jacopo Giuntoli, JRC Petten)* **C.** Questions and answers
3.	10:10	<u>The BioGrace II Project</u> **A.** Project aims, outline and state of results *(John Neeft, Coordinator of BioGrace)* **B.** Questions and answers
	10:30	Coffee/tea break
4.	10:45	<u>Presentation of draft BioGrace II results</u> **A.** Special methodological aspects - what is new and different from BioGrace I *(Anders Dahlberg, Per Wollin , STEM, BioGrace Team)* **B.** Structure of the draft excel sheet BioGrace II, general approach *(Susanne Köppen, IFEU, BioGrace Team)* **C.** Discussion What are the crucial and still unspecified aspects within the annex V rules? What do the GHG experts think on this?
	12:30	**Lunch**

Agenda continued

	13:30	Start of afternoon session
5.	13.30	Lessons from first practical implementation of GHG calculations according to RED relevant for solid and gaseous biomass for electricity, heat or cooling **A.** the PELLCert initiative - GHG calculation for wood pellets *(Cristina Calderón, AEBIOM, BioGrace team)* **B.** Biogas – how to deal with actual multi-input into a biogas plant *(Horst Fehrenbach, IFEU, BioGrace team)* **C.** Discussion
6.	14.15	Special methodological issues **A.** Carbon accounting of forest bioenergy *(Alessandro Agostini, JRC Petten)* **B.** Avoided methane emissions from fermentation of manure *(Alessandro Agostini, JRC Petten)* **C.** Discussion
	15.00	Coffee/tea break
7.	15.15	Conclusions and Outlook **A.** Recapitulating *(John Neeft, Coordinator of BioGrace)* **B.** What do the experts expect from the BioGrace II project?
	16.00	Closure of meeting

Location: ARTHOTEL, Grabengasse 7, 69117 Heidelberg
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Directions to Heidelberg and to the hotel: http://www.arthotel.de/index.php?id=1&L=1

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Experts' workshop on GHG emission accounting for biomass and biogas

23 October 2012 – Heidelberg, Germany

List of participants.

Name	Institution
Giulio Volpi	DG ENER
Alessandro Agostini	EU JRC
Jacopo Giuntoli	EU JRC
Sven-Olov Ericson	Swedish Ministry of Enterprise
Hans Langeveld	Biomassresearch
Mairi Black	Drax power
Luc Pelkmans	Vito
Chrystelle Verhoest	Laborelec
Werner Weindorf	LBSt
Sergio Ugarte	SQ Consult
Victoria Junquera	EPFL
Mireille Faist	EMPA
Kathleen Meisel	DBFZ
Mikael Ekhagen	Vattenfall
Carla De Carolis	ICTI
John Neeft	ANL
Timo Gerlagh	ANL
Grégoire Thonier	Bio IS
Cristina Calderon	AEBIOM
Anders Dahlberg	STEM
Per Wollin	STEM
Nikolaus Ludwiczek	Bioenergy 2020+
Susanne Köppen	IFEU
Horst Fehrenbach	IFEU
Anna Hennecke	IFEU