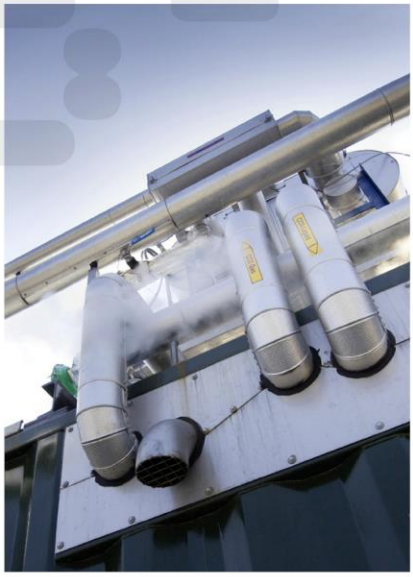
BIOGRACE II

Harmonised Greenhouse Gas Calculations for Electricity, Heating and Cooling from Biomass

Universiteit Utrecht



BioGrace-II Report of the Second Policy Maker Workshop

Brussels, 6 March 2015

Final Version

www.biograce.net

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1 Introduction and objective

The BioGrace-II policy maker workshop held on 6 March 2015 in Brussels was the second BioGrace-II policy maker workshop. It was organised in co-operation with the Utrecht University from the project "Harmonisation of Sustainability Certification Schemes for Solid Biomass" dealing with a topic that overlaps with the one of BioGrace-II. The workshop was thus at the same time the follow-up event of a workshop organised by Utrecht University (November 2014) and of the first policy maker workshop of BioGrace-II (March 2014).

The current workshop focussed on countries that already have implemented sustainability criteria on solid (and gaseous) biomass in the electricity and heat production or that are preparing to do so. These are Belgium, UK, Denmark, and The Netherlands, plus Italy which is preparing to take a decision on whether or not to have criteria. From outside the EU, Norway is also considering to have sustainability rules. Invitations thus exclusively went to policy makers of these six countries. As the introduction of sustainability criteria in these countries is discussed with stakeholders from North America (an important region for sourcing biomass feedstock), sustainability schemes, auditors and energy companies, a number of these stakeholders were invited too. Last but not least also representatives from the European Commission were invited.

In preparation of the workshop, a questionnaire was prepared with questions on greenhouse gas (GHG) accounting, sustainable forest management (SFM) and other sustainability criteria. The purpose was to sort out which topics are most urgent to be discussed in the workshop. The questionnaire was sent to 18 potential participants; 14 responded. The agenda was based on the outcome of the questionnaire.

The workshop attracted 31 participants of which 4 were organisers, 6 representatives of the European Commission (EC) or the Joint Research Centre (JRC), 8 representatives of ministries or state agencies. The remaining 13 participants came from sustainability schemes, verification/certification bodies and companies.

The workshop started at 09:00 and went until 16:30. The agenda was split into three sessions:

1. Update on ongoing policy developments in the four countries & presentation of the outcome of the questionnaire
2. GHG accounting: methodologies and actual verification
3. Debate on sustainability forest management.

The objective of the workshop was to investigate and compare the sustainability frameworks in place and under development in Belgium, Denmark, the Netherlands and the United Kingdom to understand the viewpoint of related stakeholders on the sustainability regulation and use of solid biomass, and to check in how far international voluntary schemes used to certify solid biomass can be used to demonstrate compliance with current and future legislation.

2 Content of the workshop

This chapter contains a summary of the content of the workshop. The agenda of the workshop is provided in the Annex to this report.

2.1 Update on ongoing policy developments in the four countries & presentation of the outcome of the questionnaire

Jan de Leeuw, Ministry of Economic Affairs, The Netherlands

In the Netherlands, government and stakeholders have made an Energy Agreement for Sustainable Growth to meet the country's renewable energy targets for 2020. 14 % of the Dutch energy consumption should come from renewables by then. The current share of renewables is around 4 %. 1,2 % is expected to come from co-firing. This equals to 25 PetaJoule. As part of the agreement only biomass that meets sustainability criteria will be used for co-firing. The sustainability criteria are the result of negotiations between Dutch utilities and NGO's.

The following sustainability criteria will apply for wood designated to co-firing:

- feedstock from sustainable forest management (SFM)
- no or low carbon debt
- greenhouse gas reduction of 70 %.

The SFM-criterion follows the same rules as applied for the Dutch timber procurement. The carbon-debt-criterion focuses on forests with a rotation time of over 40 years. The Netherlands will establish a negative list where the feedstock must not come from. This list will among others contain wood from converted natural land or wood from converted peat land. The methodology to calculate the greenhouse gas reduction must be in line with the publications of the European Commission (EC). The BioGrace-II GHG calculation tool will serve for economic operators to prove compliance.

Questions/discussion:

- *Q: What is the expected extra-demand for wood?*
  Answer: There should be 3 times more technical supply than extra demand caused by UK, DK, NL by 2025. The technical potential from the three main sourcing regions is 50 Mton (20 Mton in SE US, 14 in West Canada, 16 in NW Russia), the demand is 3,2 Mton in NL, total demand in UK, DK, NL will be around 17 Mton.
- *Q: Will you include a criterion for IWUC?*
  Answer: We left that, there is a report on how this discussion went.
  (Note: the report has been added to the mail with the draft report).
- *Q: Will this criteria apply to all biomass used in NL?*
  Answer: No. To co-firing only.
- *Q: Will the criteria come into use directly?*
  Answer: Yes, co-firing that will receive subsidy in or after 2015 will have to cope directly with the new criteria.

Kristine van het Erve Grunnet (Danish Energy Association) Denmark

In Denmark, biomass use in the electricity and heat production is regulated by a voluntary industry agreement established in 2014. The agreement reflects the Danish guidelines for public timber procurement, the European guidelines for SFM, and the British bioenergy legislation. The sustainability rules are based on two pillars: sustainable forestry and CO_2-emissions.

The pillar of sustainable forestry consists of

1. Legality
2. Protection of forest ecosystems
3. Maintenance of the forest's productivity and its ability to contribute to the global carbon circle
4. Healthiness and well- functioning of the forest
5. Protection of biodiversity and areas that are sensitive and/or worthy of conservation
6. Respect of social and labour rights
7. FSC and PEFC are recognized as compliant, SBP can be used.

In terms of carbon debt, the industry aims at not using biomass that comes from

1. Regions with an alternative demand for wood in the high-value production
2. Area with fertile soil that has been converted to forestry
3. Deforestation
4. Harvest patterns that negatively affect the quantity or quality of the forest in the medium or long run.

The CO_2 emission pillar prescribe a minimum reduction of 70% by 2015, 72% by 2020 and 75% by 2025. Bioenergy life cycle emissions are counted against fossil fuel comparators stated in the Commission staff working document (SWD/2014/259) "State of play on the sustainability of solid and gaseous biomass used for electricity, heating and cooling in the EU".

The BioGrace-II GHG calculation tool will be recommended for making calculations to comply with the CO_2-criterion.

Utilities with a capacity above 20MW are obliged to annual sustainability documentation. The agreement shall be fully implemented by 2019.

Questions/discussion:

- *Q: Will the biomass use in DK increase with that agreement?*
  Answer: No, a lot of biomass is already being used, so no large changes foreseen. It is to show that it is sustainable.
- *Q: What is the share of plants above 20MW?*
  Answer: 80-90 % of biomass is used in utilities above 20MW.
- *Q: How will the ILUC issue be implemented for solid biomass as it might have opposite impacts e.g. increased demand for solid biomass induces a higher market price and as such more forests to be planted?*
  Answer: ILUC is a key topic for NGOs and they demand it to be included in the Energy Agreement. It is not yet clear how this will be applied. It will probably not be implemented in the same way as is considered for agricultural crops. It might be expressed as a CO_2 criterion for forest management.

Additional remark: ILUC is irrelevant for existing forests, but it could be an issue for crops used for biogas production.

- *Q: Is it already known how the positive/negative list of carbon debt will look like?*
  Answer: Different kinds of wood are examined; e.g. which trees from thinning can be used for energy purposes and which not.

Brian Denvir(E4Tech)UK

Brian Denvir summarized the latest policy developments in the UK in terms of heat and electricity from biomass.

The UK set a cap of 400MW on total new-build electricity-only dedicated biomass capacity. At the time being, 7 projects are being supported or are about to be supported, which sum up to 290 MW. That leaves a remaining free capacity of 110 MW. Mandatory sustainability criteria for heat and electricity from biomass are expected to come into force by the end for 2015. This will be based on an amendment of the Renewable Order, in parallel with an amendment of the Renewable Heat Initiative and the kick-off of Contracts-of-Differences.

In December 2014 the woodfuel guidance was published. The guidance is split into three documents: (1) The *Woodfuel Advice Note* provides a helpful summary of all the requirements for complying with the timber standard; (2) the *Consignments and Mass Balance Approach* document that sets out how suppliers should operate a 'mass balance' system and (3) the *Risk Based Regional Assessment: a Checklist Approach* document that describes how to use a checklist approach to operate a risk based regional assessment of sustainability criteria.

In 2014 the Department of Energy and Climate Change repeated a survey of large biomass stations (>50MW). The survey asked the intended virgin and reclaimed wood use, domestic and imported, over the next five years. The purpose is to help non-energy sectors and investors understand likely impact of biomass electricity development on wood sources. A summary of the survey shall be published.

Finally the Department of Energy and Climate Changed has commissioned a research project on biomass fuel sourcing in February 2015. The aim of project is to assess the likely occurrence of selected biomass sourcing scenarios from North America identified in the Department's recent report "Lifecycle Impacts of Biomass Electricity in 2020". Results are expected in May and June 2015. A policy response is expected for autumn 2015.

Questions/discussion:

- *Q: What does "grandfather support" mean?.*
  Answer: If an energy project goes ahead on the promise of a subsidy, when the policy changes, the subsidy will continue. So no retroactive changes.
- *Q: In what form will companies have to declare where the used biomass comes from?*
  Answer: The declaration will probably be anonymous. The time target for implementing this declaration is 5 to 10 years.
- *Q: Were there economic models used?*
- Answer: No. The model used is rather straightforward; it is not an economical model. It is similar to the BioGrace-approach.

- *Q: Will carbon debt be included in policy?*
  Answer: Same approach as Denmark could be considered but no decision yet, follow developments.

Pierre-Yves CORNÉLIS (CWAPE) Wallonia, Belgium

In Wallonia support to bioenergy utilities is based on their CO_2-emission performance. The CO_2-accounting was established in 2005 when the first large-scale coal plant – with a capacity of 80 MW – switched to full biomass firing. Since then, the methodology has continuously been improved. The applied methodology is for large parts in line with the RED-methodology. The Walloon approach though does not consider savings from improved agricultural management (although it includes emissions from agriculture), carbon capture and storage, carbon capture and replacement; Co-generation is accounted for by way of improved efficiency yield rather than excess electricity. However emissions from the disposal of waste are included in the Walloon approach whereas they are neglected in the RED-methodology.
Recently discussions in Wallonia have focused on sustainable wood. FSC/PEFC fulfil sustainable forestry management (SFM) requirements (eg biodiversity) but do not include GHG data. SBP performs risks analyses and is acceptable as there is insufficient supply of certified wood. SBP is not a SFM scheme but rather a product scheme; it checks its sources are sustainable and has nothing to do with management of the forest itself.

Improvements currently discussed to the existing sustainability methodology include:

- A voluntary cascade of usages
- A negative list of products excluded from electricity support
- Reduced / controlled support for wood fuel in electricity
- Overview of supply plans
- Resource risk analysis.

Questions/discussion:

- *Q: In what form will companies have to declare where the used biomass comes from?*
  Answer: The declaration will probably be anonymous. The time target for implementing this declaration is 5 to 10 years.
- *Q: How would you define roundwood?*
  Answer: Wood that can be manufactured into other products. This depends on thickness, size, health. There is a long list of technical aspects.
- *Q: What is the time line for the revision of the existing sustainability methodology?*
  Answer: We are currently reviewing. There is no deadline.

Thuy Mai-Moulin (Utrecht University) Questionnaire regarding GHG calculations and SFM certification

In preparation of the workshop, potential participants had been contacted and asked to fill in a questionnaire on sustainability issues of solid biomass. The questionnaire was sent to 9 policy makers

and 9 industrial stakeholders in Belgium, Denmark, the Netherlands, UK, Italy, Norway and USA. 14 of these 18 people responded.

Questions dealt with GHG calculations, SFM and other sustainability criteria.

Key messages of the policy makers were:

1. There is an on-going discussions in Belgium (Wallonia), Denmark, the Netherlands, and the UK in terms of certification level and implementation
2. A harmonised GHG emissions calculation is preferred in consultation with Member States which have sustainability certification schemes for solid biomass
3. Inclusion of carbon debt is still under debate
4. Policy makers are aware of benefits of a harmonised scheme to industry and recognize the Initiatives for EU-wide sustainability criteria for solid biomass
5. Policy consultation and information exchange with other EU Member States are important

Key messages of the industry representatives were

1. The level of biomass certification is of concern for bioenergy sector.
2. A harmonised method of GHG emissions calculation and sustainability criteria at EU level is expected.
3. SBP is widely recognised as a harmonised scheme but industry also acknowledges FSC and PEFC initiatives.

2.2 GHG accounting: methodologies and actual verification

Jacopo Giuntoli (JRC) – JRC default GHG emissions calculations for solid and gaseous biomass

Jacopo Giuntoli explained the role of the JRC and how default values are calculated. It is the Institute for Energy and Transport (IET) within the JRC that is in charge of the GHG emissions calculations for bioenergy systems. Important outputs of the IET are the well-to-wheel reports (as part of the JEC consortium), the default values for Directive 2009/28/EC and for the two Commission reports COM(2010) 11 and SWD(2014) 259, several iLUC papers and reports, and the carbon accounting of forest bioenergy (EUR 25354 EN). (See https://ec.europa.eu/jrc/en/publications for a list of publications on the topic).

Starting point of a default value is either a stakeholder request or a Commission initiative. After that the pathway is defined in all of its processes, including the definition of typical import routes to the EU. The data collection for each of the process steps is based on peer reviewed publications, published handbooks, LCA databases, and consultation with stakeholders. The data chosen ought to be representative of average European conditions. The data acquired and converted, are inserted into a LCA calculation tool that applies the methodology set in the SWD document and, via a set of emission factors (available in the JRC report (EUR 26696 EN)), produces the final "typical value". Based on that typical value, a default value is finally determined. In terms of solid biomass, the SWD features 93 typical values differentiated between feedstock, biomass end product (e.g. pellets), process utilities

(e.g. wood chips CHP), and transport means and distances. In terms of gaseous biomass, the SWD features 30 typical values following the variables feedstock, processing alternatives (e.g. open or closed storage of digestate) and end use (electricity generation of biomethane).

The IET is always open to discuss methodological assumptions, and used input values or emission factors. They welcome inputs, suggestions and comments from stakeholders which help to get more reliable data. Jacopo Giuntoli gives some examples on where input from stakeholders has helped in the past to adjust data. He, however, reminds to bear in mind that the prescribed methodology is also a political choice out of various options and that the default values represent a EU-scope. The default value therefore might deviate from specific individual situations. As a consequence the actual calculation offers a large potential for operators to reduce the declared emissions.

Jacopo Giuntoli invited participants and other stakeholders to contact the JRC working group for (technical) questions on current calculations, to suggest new pathways, to provide primary data etc….

Questions/discussion:

- *Q: Will there be a harmonisation of the methodologies for solid/gaseous pathways and for liquid pathways?*
  Answer: Commission works on update of Annex V. Possible but not certain that these changes are implemented by then.
- *Q: When?*
  Answer: no comment on this. Maybe after ilUC process there will be room. At least a year.
- *Q: What was included in the SWD document on carbon debt and has JRC included any carbon debt provisions into the calculations?*
  Answer: No c-debt provisions are included in the JRC calculations and neither explicitly in the SWD. JRC has already published a review of the scientific literature on carbon emissions of forest biomass. See the JRC report.
- *Q: We would need a emissions factor for empty ships going back to US.*
  Answer: The 2014 JRC report contains a detailed description of the assumptions and calculations behind the fuel consumption data used in the calculations.
- *Q: How many resources are available for this topic?*
  Answer: Enough to do a proper job at the level that is required but not enough to expand the scope or number of calculations.
- *Q: Will this work be continued?*
  Answer: The current project on GHG default values runs until end of 2017. It is expected that it will be renewed afterwards.

John Neeft (BioGrace/RVO) - BioGrace & implementation of GHG accounting into national legislation

John Neeft explained the background of the BioGrace-II project and the development of the BioGrace-II calculation tool. BioGrace uses calculations that are made by JRC in the context of the European

Commission work on bioenergy sustainability. The BioGrace-II tool therefore demonstrates how the EC default values on solid and gaseous biomass (and its expected update) are calculated.

John Neeft pointed to some implementation issues of sustainability criteria for solid and gaseous biomass. These are important when implementing criteria into national legislation and at the same time are also harmonisation issues. These are:

1. How to deal with carbon debt and indirect land use change in GHG accounting?
2. Should methodological choices for biofuels/bioliquids and solid/gaseous biomass be the same?
3. Is the use of (disaggregated) default values allowed?
4. How to classify materials as (co-)product or waste/residue?
5. Which GHG calculation tool to use? If several: should these tools give the same result?
6. Which fossil fuel comparators?
7. Do actual calculations need to be verified?

In terms of methodology, John Neeft recalled that there are no EU binding sustainability criteria for solid and gaseous biomass used in heating and electricity. In its 2010 report, the European Commission tabled a report (COM(2010)11) recommending to Member States to use the EU harmonized methodology for accounting the GHG emissions of biomass. This report was complemented/updated by the July 2014 Staff Working Document (SWD(2014)259), which in some aspect applies a slightly different approach compared to the 2010 report. to follow an EU harmonized methodology. In particular, the approach followed in the SWD(2014)259 does not apply the mass balance rules for co-digestion and includes a bonus from improved manure management. This is also a point of attention as at the feedstock level it is sometimes not known whether a biofuel or whether electricity or heat will be produced; several feedstocks can be used for both applications. This complicates making actual GHG calculations, eg an owner of a codigester with manure as one of the feedstocks and with biomethane as a product, might have to make two different GHG calculations (one with and one without the credit for improved manure management), one for each of the two possible future uses of the biomethane (biofuel or heat/electricity).

Questions/discussion:

- *Q: In US pictures were shown that pellets were made from round wood. Carbon debt and iLUC are therefore the two points NGOs always point at. If these points are not addressed NGOs in the US will recommend not to use BioGrace-II.*
  Answer: In Europe we stimulate companies to make actual calculations. As even GHG experts do not know how to make carbon debt and iLUC calculations, we cannot demand this from companies. As a result, our conclusion is that it will only be possible to include iLUC and carbon debt into GHG calculations when – at the policy level – decisions have been made AND if GHG experts show that such calculations can be made.
- *Q: Couldn't we share Dutch negative list?*
  Answer: The Dutch negative list is not scientifically water proof. But if NGOs agree to that list, it is good for the time being.
  Answer (2): Policy makers always postpone decision to the moment when scientist will agree on methodology. Scientists will never come up with agreement.
- *Q: How important are coproducts for the result of the GHG calculation? If up-front emissions are low, then this is not an issue, is it?*

Answer: Correct, for wood chips and pellets this is not so important. Still, the choice what is a (co)product and what is residue (not speaking about "waste") has to be made because without this choice you cannot make the calculation. For other materials this is more important, for example bakery yeast.

Brian Denvir (E4Tech) Greenhouse gas accounting for solid & gaseous biomass – the UK approach

The UK has GHG saving and reporting requirements for biomass used in all types of energy applications. These are:

Fuel type	End Use	GHG requirement
Biofuels	Transport	>50% saving over FF baseline from Jan 2017 <42 gCO2e/MJ[fuel]
Solid & Gaseous Biomass	Heat	>60% saving over FF baseline from Oct 2015 <34.8 gCO2e/MJ[heat]
Solid & Gaseous Biomass	Power	>60% saving over FF baseline from 2015 <285 gCO2e/kWh[electricity]
Biomethane	Grid Injection	<34.8 gCO2e/MJ[biomethane]

Three key policy mechanisms support biomass for heat and power:

1. Renewables Obligation (RO)
2. Contracts for Difference (CfD)
3. Renewable Heat Incentive (RHI)

Each of the mechanisms uses the same GHG calculation methodology, which is an adapted version of the RED Annex V.C methodology for biofuels/bioliquids. Specific GHG calculation tools are not prescribed, but for all policy mechanisms operators are recommended to use one of the national carbon calculators:

- **Biofuels & Bioliquids Carbon Calculator** (for reporting under the RTFO and RO)
- **Solid & Gaseous Biomass Carbon Calculator 'B2C2'** (for reporting under the RO and RHI)

B2C2 was built in 2011 and contains a reporting function tailored for the Renewable Obligation. An updated version of the tool with improvements of the functionality and the data quality is expected for April 2015; an alignment with the BioGrace-II calculator is yet not planned.

Outstanding methodological issues are

- Nuance differences between the British and the EC/JRC approach
- Nuance differences between the RED methodology for biofuels/bioliquids and the methodology for solid and gaseous biomass as set out in SWD/2014/259:
  - Conservative factor of 1.2 of 1.4
  - NO_x and CH_4 emissions at combustion
  - Manure credit
  - Digestate as a co-product
  - Marginal electricity factors
  - Methane slip default assumptions

A harmonised GHG approach across the EU has advantages but will be very difficult to be agreed on. Harmonising LHVs and other standard values may prove easier and would be a step in the right direction. A broader methodological question, though, is carbon debt and the counterfactuals, which are difficult to include.

Questions/discussion:

- *Q: The GHG methodology for solid/gaseous biomass to be put in legislation (UK, NL) is spread over COM(2010)11 and SWD(2014)259. There was a condensed paper of the methodology, which was never published. Can this be released?*
  Answer DG ENER: This was not published for the reason to have flexibility for developing a post2020 methodology. I will ask my colleague.
- *Q NGO: Resistance from industry. Why would the industry be against harmonisation?*
  Answer: This is more an issue for biogas, the updated methodology may be punitive for biogas from AD in some cases compared to the current.

Catherine Neve (SGS) - Biomass GHG accounting: Belgian case Methodologies and actual verification

SGS certifies about 100 pellet producers in Europe, Northern America, Russia and the Baltics. In her presentation Catherine Neve compared the two Belgian verification schemes. Wallonia grants green certificates to producers. One green certificate represents 456 kg CO_2-emisisions avoided. Reference value is 456 kg CO_2-emisisions /kWh_e. In Flanders, to the contrary, 1 green certificate represents 1 MWh net electricity produced from biomass. In an energy balance, inputs during the production chain and energy output are set off one another. GHG emissions thus are not considered. In Flanders forestry operations and harvesting are out of scope but they are included in Wallonia. The amount of green certificates determines the amount of financial subsidies for the power plant. Other countries rather use minimum saving criteria for the eligibility of biomass, e.g. UK and the Netherlands). An identical calculation in all countries is probably not possible unless more legislation comes at the European level.

In general, easily measurable and verifiable data are

- Power and fuel use at conversion plant
- Moisture contents
- Input-output
- Actual LHV of pellets

Other activity data are difficult to monitor:

- Energy used for harvesting
- Actual fuel use for transport

A specific remark to the BioGrace-II tool was that in BioGrace, material is measured in MJ instead of tons. This makes the tool difficult to use it because LHV is not necessarily measured at each stage of the production process.

Questions/discussion:

- *Q: How do you verify the definitions of residues?*
  Answer: We ask companies to take photographs. If we don't know we apply the harvesting default value which is a conservative approach..
- *Q: Which tools do you use?*
  Answer: We have two sheets, one based on g CO2/t another one on g CO2/MJ.

2.3 Debate on sustainable forest management

Brian Kittler (Pinchot Institute) -- U.S. Pellet Exports: Perspective on environmental risks and risk mitigation methodologies

Regarding the SFM in the Southeast, the presenter mentioned that this practice is mostly carried out under voluntary practices, incentives and markets. Only 3% of family owned lands have a forest management plan and only 13% receive advice from professionals, making professional SFM management of forests challenging. As forests are regulated at the state level, a high number of states apply forest best management practices to control non-point source of pollution mainly affecting the water quality during harvesting operations. Most BMPs also aim to increase responsible biomass harvesting. Although these programmes are mainly voluntary, there is a high percentage of compliance, about 90%.

SFM certifications are not widespread in the US: only 21% of all forests are certified by a number of recognised SFM initiatives such as SFI, FSC, and ATFS. SFI focused largely on water quality whilst FSC has greater focus on biodiversity conservation (they have restrictive standards with respects to old and natural forests). Although these schemes exist, the percentage of certified forests in the US Southeast region is still low (17%) and if taking into account both certified and non-certified lands, there are four categories by which wood pellets enter the export market: path 1 covers 100% certified material through ATFS/SFI and FSC schemes, path 2 is the mixing of certified and non-certified biomass through existing systems (FSC and SFI), path 3 includes uncertified wood from sources verified to comply with existing BMP and BHG programmes and path 4 is for unverified compliance with voluntary state BMP and BHG programmes. The representative stated that with the US situation of a large amount of uncertified biomass, the risk based approach of FSC, SFI, etc. might be a solution for biomass supply for energy towards the EU. One challenge to overcome is the cost burden of certification assessment. As an indication, costs can vary between 0.09-0.33 US$/acre, depending strongly on the size of the forest. The presenter added some information regarding the differences between the two systems FSC and FSI: whilst SFI focuses largely on water quality, FSC requires extensive biodiversity protection; they have different limit of clear-cut size; difference in treatment and mixing of non-certified context (controlled wood vs. fibre sourcing), etc. FSC has a controlled wood policy specifying how to control risk related to where the material is coming from which is acknowledged by a number of stakeholders.

The presenter finalised his presentation by giving his final thoughts that the cultural context of the Southeast is important for dealing with multiple small forest areas, as it is a market-driven system and socially and politically conservative. European buyers might have influence on the US forest

certification. The pulp and paper industry in the southeast historically play a significant role in the US economy, they also aim to develop more certified land.

Questions/discussion:

- One participant asked the presenter's opinion on the impact of European pellet market expansion to the (de)forestation in the US Southeast. The presenter stated that deforestation in the southeast US is a function of land rents, economics of associated alternative land uses, population growth, local land use regulatory frameworks, and related factors. Urban and suburban development are the driving force of deforestation in the South. Demand for wood fiber has contributed to steady and increasing forest inventories in the southeast US and for increased investment in forest growth (principally plantations). The effects of increasing demand for pulpwood for pellets and other uses (OSB, composite wood products, paper, packaging) are complex but one expected result based on observations of past periods of increasing pulpwood demand is for replanting in anticipation of future market returns.
- The second question: BMPs are very important when certification does not exist, so what are the main principles of these programmes? The third question was on the 90% compliance with BMP programmes - why this rate is that high? The representative responded to these two questions that Best Management Practices (BMPs) are guidelines provided to forest managers and logging contractors designed to encourage implementation of practices that protect water quality during silvicultural activities, principally logging, fertilization, application of chemicals, management of roads, stream side management zones, etc. Under the US Federal Clean Water Act states are required to develop BMP programs for forestry activities. A 2008 review of BMP program monitoring across the 13 southern states found the rate of BMP implementation to range from 68–99% (a mean of 87%) in timber harvests (See: Implementation of Forestry Best Management Practices A Southern Region Report. Southern Group of State Foresters, 2008.). This review found that individual BMPs are implemented unevenly across the region, with some states reporting considerably higher performance. Monitoring, reporting, and enforcement of BMP implementation vary from state to state. Few BMP programs in the south contain recommended practices for protecting resources other than water and soil.
- A final remark was made on the fact that the scenario's developed by Bob Abt show that the entire forest carbon stored in both pellet and no-pellet scenarios is more or less the same as more carbon is extracted for pellet production but also more natural stand are converted into plantations which are more productive and sequester more carbon. Ultimately this leads the same result, i.e. there is no carbon debt. If FSC criteria are applied (where there are no conversions from natural to planted forests are allowed) that would effectively prevent us a no C-debt scenario. The presenter responded that that there could be potential tradeoffs between sustainability criteria intending to limit forest type conversion (i.e. naturally regenerated to plantation management) and future forest carbon stocks at a regional level and that this important issue warrants more study given the implications for the carbon life cycle for forest bioenergy.

Peter Feilberg (NEPCon) - Benefits and risks of a risk-based approach: based on case studies in Eastern Europe

Peter Feilberg first introduced his organisation's activities on legal and sustainable management practices. He then started with risk assessment issue by evaluating the general corruption level (higher corruption level leads to higher risk) versus value of product (higher value of production leads to lower value of risk). Combining these two indicators allows ranking the resulting risk to low, medium and high risk. He highlighted that this approach could be applied to assess risk of sustainable solid biomass in the whole supply chain. He gave an example of requirements from Russia, and FSC standards were given to illustrate that approach. There are 279 requirements that each forest operation need to comply with. Data of 41 certificate holders of about 1,000 ha of forest were investigated in term of risk assessment and there were about 940 non-conformances regarding rule compliance of legal and sustainable forest management: 90 requirements has no single problem, 47 requirements has one non-conformance, and in general more than half of the requirements do not follow rules. From such an analysis, discussion on how big risk is acceptable can be organised. In the example provided in the presentation, if the user is willing to accept zero or one violation, 50% of the forest area would comply.

He continued providing information on risk assessment based on a number of certification initiatives including EU Timber Regulation, SBP, FSC Control Wood (CW) and the full FSC regarding sustainability requirements which cover legality, unacceptable sources and additional sustainability criteria. About legality, the basic requirements of the EUTR are reflected into SBP, FSC CW and the full FSC. Unacceptable sources are not included in the EUTR but covered in the other three systems. There are additional sustainability criteria in the full FSC system than in the SBP standard, but SBP has a GHG emission standard, which is not covered in other systems. Although the full FSC system includes assessment of forest management at the unit level and verifies compliance on site, the advantage of EUTR, FSC CW and SBP is to use a risk based/ due diligence approaches to analyse risk of non-conformance and if there is a risk/ its magnitude, then they will provide risk mitigation actions. Full FSC also includes elements of controlled-wood/ national risk assessment. It is a complicated and expensive process, but it is being improved and applied in about 40 countries in the world. When a risk based approached can be applied, the quality of the result depends on clear evaluation criteria, thresholds of low risk/specified risk, capacity of stakeholders assessing risk, data availability and detailed level of risk. The presenter mentioned that that a risk assessment conducted by certificate holders themselves turned out to be of low quality. After that, he introduced the high conservation value forest (HCVF) and how they are mapped and sufficiently protected by also giving an example from Lithuania where both FSC CW and SBP risk assessments have been used. The results showed that HCVF areas are mapped in detail, but that they are currently not sufficiently protected, and that 47% of the HCVF Category 3 (Woodland Key Habitats) in private forest is currently not protected adequately by existing legislation, whereas 92% in state owned forests are still intact.. GIS mapping is used to assess legal and sustainable management practices and helps to take action to prevent illegal activities or improve legal and sustainable forests.

Questions/discussion:

- The first question was about how to carry out the risk assessment using the level of corruption and product value: The presenter answered that his organisation follows the

international transparent tool of corruption and product indexes which can be easily found through the corruption perception index from Transparency International (https://www.transparency.org/cpi2014) and the World Bank Governance Indictors – especially the “Rule of law” and the “Control of Corruption” - http://info.worldbank.org/governance/wgi/index.aspx#home..

- The second question also concerned the value of biomass: the question was which value exactly was meant, e.g. the value in the forest or the value of pellets including subsidy. The presenter mentioned that this depends on the specific situation to determine the risk level and what biomass is sourced.
- One participant stated that in the example of the presenter, the value meant is for the forest owner. but the value of biomass for the end user might be different, therefore the risk perception should be different at different stages in the value chains.
- The third question was as different certification systems all use the mass balance system, whether the different products (e.g. saw logs and wood for energy) are certified separately on-site, and how the mass balance system was then applied. The speaker answered that usually all products coming from one stand of land are certified at the same time, thus avoiding any problems with double-counting.
- The subsequent question was about how to proceed with a risk assessment in case there is not enough information/ poor data? The presenter explained that there are a number of solutions: first of all, the type and reliability of the sources of information needs to be assessed, -typically consulting with a range of different experts/ related stakeholders of different areas on the (non-) compliance level is needed. After establishment of a draft risk assessment, this needs then to be sent out to a broader group of stakeholders to obtain feedback. In all cases, also workshops are organised with both experts and stakeholders to reach (more or less) consensus with various parties on the appropriate risk level.
- One policy maker added that it is very difficult to make a clear standard, as it is difficult to determine a clear threshold for various criteria. He thought that from a regulatory point of view, this made using a risk-based approach difficult. The speaker answered that in the majority of cases, it was very clear if something was high risk or a low risk, and that the difficult border-line cases were typically only occurring in few cases. One industry representative added that depending on the country, some risk categories (e.g. the risk of child labour in the US) can most likely be excluded up-front. In other countries, such as Russia, concentrated efforts and actual verification for most if not all criteria are needed to help anticipate risk.
- There was one question about why PEFC was also a recognised certification scheme but was not mentioned by the speaker in the risk assessment? The response was PEFC could be included but his organisation works mainly with the aforementioned schemes.
- The last question was about why the quality of self-risk assessment seems to be low? The speaker explained that this is different from country to country, but especially for the border-line criteria, forest owners are less critical then independent third parties. When looking at the result of risk assessments done by the companies themselves compared to an independent assessment, there were major differences in the assessment. Based on

this, FSC concluded that company self-assessment does not work; it does not ensure a sufficiently robust system of risk assessment.

Peter K. Kristensen (DONG Energy) – Risk based approach to ensure sustainable biomass

<Peter K. Kristensen kindly agreed to present after a cancellation from Nigel Burdett (Drax)>

Peter K. Kristensen started his presentation by introducing his energy company activities and its target is to reduce coal (about 80%) and to use more biomass (triple increase) in CHP plants from sustainable forests with the aim to deliver green and renewable energy. He also mentioned the types of biomass (good and bad) regarding sustainable forest management. The speaker mentioned the US situation with existing certification schemes which do not have the uptake in the regions where the company expects the problem of unsustainable forest management to be solved and his company's ambition is to use a risk based approach with the support of modern technologies such as real time low cost satellite imaging, social media, internet coverage, etc. in identifying legal and sustainable biomass. The representative however also pointed out that risk based approaches of a number of recognised schemes lack uptake in key wood baskets and small forest owner uptake due to cost and administrative burdens. He highlighted the SBP initiative which represents 70% of the global pellet market for industry grade wood pellets, and therefore also has a huge influence on pellet production. Its approach is to increase the uptake of sustainable forest to receive the industry supports and SBP certification mechanism is to ensure controlling and documenting that suppliers complies with regulatory sustainability criteria; independent 3rd party auditor certifies suppliers through annual surveillance audits and there are re-certification every 5 years as well as documentation of CO2 emissions and traceability throughout the value chain. The SBP is currently working on national risk assessment in a number of countries as SBP members acknowledge that it will bring different levels of credibility to the system. The SBP assurance framework was introduced by the presenter including insurance of feedstock sustainability and supply-chain traceability as well as accurate GHG data savings.

The speaker also provided one example of how a Danish production forest has been changed by forest re-planning/ new way of forest managing and planting a mix of traditional oak trees with fast growing species, having the same functions in the forest to ultimately add more forest benefit, higher general forest yield and create a better economy. He finalised his presentation concluding that sustainable yields of wood for energy can be double with better forest planning and management.

Questions part:

- The first question was about the Danish forest management: is it already taking place or just planned? The response was that it is already happening in Denmark, especially for new forests (about 45%).
- The second question was whether the SBP initiative was only applying for wood pellets or also for wood chips. The presenter confirmed that the SBP mechanism is developed for both wood chips and wood pellets so that the wood market coverage is bigger. SBP does not intend to compete with FSC and PEFC but expects to help utilities to overcome challenges in certification, for example the GHG accounting issue.

- The attendant continued to ask the presenter how to use a risk based approach for wood chips (as for wood pellets this is already clear): in Denmark there are forest management companies who provide wood chips to utilities and who are certified and work to have the forest management certificate, therefore this is not anymore a concern for utilities

2.4 General moderated discussion

2.4.1 Reflection on presentations:

Simon Armstrong, SBP representative:

The representative explained that the level of risk of non-compliance with various SFM systems varied strongly between different parts of the world: most forests in Sweden would probably comply to a very large degree; forest in the US SE would typically have 1-3 main criteria with problems of compliance, probably with regard to biodiversity, whereas Russia was rather difficult, if not impossible to apply risk-based approach. SBP is a system which aims to be able to assess the risk of biomass for all these regions. The discussion then centred on the possibilities to apply SBP e.g. also to forests in the EU to procure wood chips –the general opinion was that this should not result in major problems. The representative then pointed out that the fundamental starting point is that we all want that sustainably produced biomass is used for bioenergy, but that that there are actually four main issues discussed simultaneously: first of all, it's about the definition of sustainability, i.e. in the SBP framework there are 38 indicators, and there can be far more discussion on this; The 2nd (which is probably central for today's workshop) is verification: how to have credible products, if risk based approach is applied. As risk-based approaches are generally perceived of risks as less credible than full certification, proper stakeholder involvement on the reporting of the supply based evaluation is crucial. Nationally-endorsed risk assessments are also crucial. Another important lesson drawn from other systems is that maintaining very tight control who is auditing and how audits are done is also crucial for credibility. Third, there are the issues of carbon debt and cascading – there are important; yet we do not yet know how to include them in SBP. Beyond that, the fourth key point is about improvements and driving changes in the whole value chain, driving change on the ground. Finally: what is the output we are looking for here today? It is probably the combination of a sound set of criteria, and a working chain of custody that can be verified.

Kees Boon, PEFC Netherlands

The representative first introduced the definition of sustainability according to PEFC: managing forest has to be sustainable and credible on the forest owner level. In the chain of custody, PEFC has risk based approach for maximum 30% of total forest products. However, he points out that if we would not have a pulp & timber industry for hundreds of years, would such an industry ever have developed when facing the same criteria as bioenergy is now?

He mentioned that NGOs, science, industry, government differ in their opinions of what types of mechanism to use to harmonise conclusions of what we all prefer. Despite differences in opinion, it would be useful if there is a role for existing certification schemes to have harmonisation to ensure that the production of solid biomass for bioenergy production is sustainable, regardless the end use.

One attendant added that there are differences between bioenergy use and other uses: bioenergy receives subsidy, and only subsidized biomass needs to meet the criteria..
There is one component missing in the subsidy requirement of the existing forest certification schemes: a GHG accounting tool. PEFC tries to build a voluntary model which allows transferring GHG emissions along the value chain.

John Hontelez, FSC International

FSC is also a scheme designed for sustainable forest management. It is concerned about climate change, how it affects forests, and is keen on ensuring that SFM helps to mitigate climate change and reduce GHG emissions. FSC is concerned about unsustainable increase of demand for forest products in the coming years, while at the same time wanting to encourage more use of timber where this has clear environmental and social advantages, such as in construction, and for innovative bio-based product. It is therefore concerned about an unlimited increase of demand for bio-energy based on forest products, for which some scenarios (WWF/IIASA) expect this can overtake the volume of all other uses together... Such increase of demand will in the end put excessive pressure on sustainable forest management. Therefore FSC found it incomprehensible that some governments that have sustainable procurements nowadays ask for certification as real requirements, when they promote solid biomass for bioenergy even subsiding it, they accept a lower degree of certainty. The representative feared that SBP in particular might, at the end not promote more certification of solid biomass but become an alternative tool which is less reliable as a mechanism to support sustainable forest management.
The representative added that FSC and even PEFC use controlled wood as a concept, it would be wrong to include controlled wood in subsidy schemes assuming sustainable forest management, as controlled wood itself does not stand for SFM. He concluded that FSC is concerned that we are now focussing on the expected demand for four European countries only, and then conclude there is enough surplus in the 3 regions mentioned, but that can rapidly change if demand for other purposes takes up and other countries in the world also become more interested in pellets. This concern is particularly focussed at the situation in SE US, where the European interest seems to concentrate on..
He added his concern that in the four EU countries concerned, demand seems to be more or less fixed, at a very high level, irrespective of whether there is sufficient certified, and therewith sustainable, biomass available. That is a dangerous approach and he pleaded for an alternative approach where demand follows supply. Demand can also increase supply where companies are prepared to invest in promotion of forest certification, including group certification, following the example of paper companies in different parts of the world.

2.4.2 General debate:

Comments and interests about the FSC and PEFC schemes:

- One EC representative mentioned that PEFC is working on GHG tracking emissions model in its Chain of Custody standard and she would like to know if FSC is willing to do that: the response is no. An FSC representative explained that FSC works on this at the forest level, but not in the chain-of-custody.

- Another attendant commented on the certification systems PEFC and FSC that have different degrees of success and high shares of certified forests. According to him, both schemes have good organisational structures and can handle group certification systems; however those systems are not applicable in Eastern Europe where land and forest sizes are small and there are no forest associations to help or facilitate certification with the same degree in other regions and countries. He recommends that these schemes need to be more flexible to access to this potential market of biomass.

Discussion about sustainable sourcing and certified biomass

- One participant commented that not all biomass sources imported to European countries such as the UK and the Netherlands are certified and sustainable, therefore, if governments provide subsidies and incentives for solid biomass burnt for bioenergy production, then additional proofs of sustainable biomass need to be identified. Another attendant however had a different viewpoint that not all small forest holders are able to get their forest products to be certified, even if they follow the sustainable methods of forest planning and management. Therefore, having too strict mechanism might exclude smallholder resource.
- The FSC representative added that the FSC system is demand driven. There are many forests which can be certified due to requests from their clients, and some pulp and paper companies assist smallholders in getting together for group certification, with trainings etc, and give smallholders a price premium to compensate for g certification cost. Such approaches can be stimulated by governments staying firm on requiring certified biomass.
- Another participant supported group certification as an instrument for smallholders as the costs are not too high and they will get the premium. Ultimately, this will lead to a stable and sustainable market and is better for the society as a whole.
- The moderator added that under the proposed Dutch legislation, for every tonne of pellets the utilities use for co-firing, there will be an amount put in a fund to ultimately be used to SFM certify the catchment areas of a number of wood pellet mills for example in the US and Canada and therefore incentivise the additional certification (perhaps to 100%). This policy is fundamentally different from the UK one with a 30% risk based share. The moderator also asked the Belgian and Danish policy makers if they planned to drive the development of sustainable forest chains further.
- The response from a Danish policy maker was that in Denmark there were discussions between industry and NGOs about how to comply with the voluntary agreement and the discussion outcome was that the risk based approach is acceptable but they have not discussed further how to deal with this approach.
- One industry representative shared his concerns about risk based approach in process: is this around certification of wood pellets which are not sustainable or is this about driving changes?
- PEFC representative added that moving ahead into the future, forest management certification is also about giving foresters very concrete requirements for forest management, and asked how SBP system could actually drive changes in forest management in different regions? The SBP representative responded that a general management plan of forest is in fact not a useful output but requiring particular processes of management plan to be clear/ detailed is much more effective.

- US situation: US representative stated that in the US, only about 16 % of all forests are certified, and then mentioned that he expected it to be changed/ improved by having fluidity, sustainability criteria and indicators for forest management, particularly in the Southeast. In his opinion, it is encouraging to take the good models of certification which are well working, test them out and see how they can improve the situation in the country. He also expected the US government to have mechanism to foster sustainable forest management and incentive policies.
- Another participant said that some certification models are designed for the European countries for example, therefore cannot work in the US market. Similar situation happened with the group certification systems as fundamental requirements are different from country to country.

To finalise the discussion, two key questions were raised by Dr. Martin Junginger:

1. ***(Particularly for policy makers): What would be the next & feasible steps to harmonise the certification systems?***
   - One participant suggested that related stakeholders should organise meetings more frequently to discuss and exchange ideas of legislation development and certification systems to identify what are differences and what similarities are from country to another, what need to harmonise then come up with agreed solutions.
   - The Canadian representative added that suppliers of solid biomass also have concerns about exporting their products to different markets where exist different certification schemes. Therefore they are also interested in a harmonised system.
   - Another attendant mentioned that we should have the same understanding and agreement on different definitions of sustainability criteria, certification and threshold values in order to acknowledge a harmonised scheme
   - One EC representative questioned if we need to have a harmonised scheme as according to her, there are already exist a number of EC legislations regarding sustainability, international initiatives, emission trading, etc. which can be used. She mentioned that the EC is trying to assess the situation happening in the MSs regarding criteria and certification of solid biomass.
   - Harmonisation might happen at two levels, one attendant added. First level is harmonisation of EU MS legislations, and second level regards to the set of sustainability criteria for solid biomass and timber.
   - One attendant stated that opinions & perspectives of forest owners or related actors should be recognised as they do have useful information to help form related scheme and policies
   - One participant mentioned that stakeholders should agree on the sustainable requirements and sustainability standards, and then develop specific legislation applicable for their own country.
   - One Danish representative also added that agreed definitions of sustainable forest management; agreed compliance are also important

- There was another opinion that we should engage the EC representatives into stakeholders discussion to be able to come to conclusion of agreed sustainability criteria and sustainable forest management

2. *What are the main obstacles to reach harmonised EU system?*

- One participant said that there are different opinions among stakeholders about sustainability criteria and time frame for certification implementation and how for example, opinions of industry are acknowledged by NGOs is still in question in some countries
- Another attendant added that he does not see central guidance for an EU certification system and a set of sustainability criteria at EU level; therefore he considered this also an obstacle
- One representative mentioned about the complexities, for example different calculations of GHG emissions, therefore harmonised calculation for examples is needed, harmonised default and typical values for GHG calculations are also necessary; subsidies to different material for energy productions need to be further verified and assessed properly
- Another participant added that there is lack of scientific agreement on topics such as carbon debt, iLUC, biomass cascading, and it will be very difficult to include a policy measures that address these in an agreement on a harmonised scheme.
- Communication among related stakeholders might be also a challenge to overcome to achieve a common understanding and agreement.

Annex – Workshop agenda

International policy maker workshop

"Implementation of Sustainability Assurance Frameworks: Ongoing Developments and Pending Issues"

organised on **Friday, 6 March 2015, 9h00 – 16h30,** Elisabeth Room,
Leopold Hotel Brussels EU, Rue du Luxembourg 35, B-1050 Brussels, Belgium

Programme

Moderation: Martin Junginger (Copernicus Institute, Utrecht University)

9:00 Session 1: Update on ongoing policy developments in the four countries & presentation of the outcome of the questionnaire

Policy developments in Belgium, Denmark, The Netherlands and UK
Presented by country representatives
Questionnaire review regarding GHG calculations and SFM certification
Thuy Mai-Moulin (Copernicus institute, Utrecht University)

10:30 Coffee break

10:45 Session 2: GHG accounting: methodologies and actual verification

How to demonstrate compliance with GHG criteria?
Can harmonisation of GHG calculations be achieved?

Jacopo Giuntoli (JRC) -	JRC default GHG emissions calculations for solid and gaseous biomass
John Neeft (BioGrace) -	BioGrace & Implementation of GHG accounting into national legislation
Brian Denvir (E4tech) -	Greenhouse Gas Accounting for Solid & Gaseous Biomass - the UK Approach
Catherine Neve (SGS) -	Biomass GHG accounting, Belgian case: Methodology and actual verification

12:30 Lunch break

13:15 Session 3: Debate on sustainable forest management
What are the benefits and risks of a risk-based approach?
Is stand-level certification needed?

Brian Kittler (Pinchot Institute) -	U.S. Pellet Exports: Perspectives on environmental risks and risk mitigation methodologies
Peter Feilberg (NEPCon) -	Benefits and risks of a risk-based approach – based on case studies in Eastern Europe
Nigel Burdett (Drax) -	Sustainable Forest Management - Current practices and future developments

15:15 Coffee break

15:30 Session 4: General moderated discussion

16:30 End of Workshop