September 2013

Report 'Forest Sustainability and Carbon Balance of EU Importation of North American Forest Biomass for Bioenergy Production'

Frequently Asked Questions (FAQs)

- *What are the objectives of the report?*

The objectives of the report are to better inform stakeholders – like policymakers - about current biomass sourcing practices, to highlight the key role of Sustainable Forest Management (SFM) in forest-based biomass energy production, to outline commercial realities of SFM decision making in the context of healthy forests used for multiple purposes, and to critically examine the carbon dynamics of forests from which biomass fuels are obtained.

- *Why does the report focus on Southeast region (SE US) and British Colombia, Canada (BC)?*

According to the information provided by Member States in their National Renewable Energy Action Plans, bioenergy will contribute to approximately half of the EU renewable energy target of 20% by 2020. Although EU biomass production potential is large, in practice, projections from these same plans and from experts highlight the role of biomass imports from countries outside the EU as critical to meeting these targets. For various reasons, including existing woody biomass supply volumes, supply security, infrastructure, and advantages of working with large volume single suppliers, imports can in some cases deliver woody biomass at a lower cost, especially under large multiple-year biomass supply contracts.

North America (US and Canada) is today and is likely to remain in the future the most important supply region for imported volumes of biomass, mostly wood pellets. The environmental, economic and regulatory conditions in this region make it possible to support abundant and highly productive forest cover while at the same time producing a sustainable flow of wood raw materials. Forest biomass availability in several major timber-producing regions – specifically the US SE and BC – creates favourable conditions for sourcing of biomass from these regions for export to locations overseas, and especially to Europe.

- *What are the main findings of the report regarding Sustainable Forest Management (SFM) rules in SE US and BC, Canada?*

In both the United States and Canada, forestry is practiced under strict regulations and guidelines that help to ensure responsible harvesting and restoration of harvested sites. Forest landowners and forest products companies must comply with multiple laws and

regulations promulgated by various levels of government in conducting harvest operations and silvicultural activities.
Private forestry operations in the US are regulated by a complex set of protective laws, regulations, and non-regulatory policies at the federal, state and local level. While the resulting framework is fairly complicated and can vary widely between jurisdictions, it has been effective in improving the environmental performance of forestry operations, and can be expected to do so in the future.

An independent academic study by a Finnish research company (Naturally Wood 2011) found that British Colombia has some of the most stringent forest practices regulations in the world. BC's Forest and Range Practices Act (FRPA) (BC Ministry of Forests, Range and Natural Resource Operations 2004) is a leading example of forest management regulation that has long been advocated by policy experts. It requires on-the-ground results rather than process, and is built on a foundation of professional skills and accountability. Stringent forest policies and innovative forest practices continue to evolve to meet current needs and reflect the most recent scientific knowledge.

- *What is the state of play of Sustainable Forest Management (SFM) in Europe?*

European forests are managed under a multiproduct approach and are submitted to strict national rules and legislations which ensure that these are sustainably managed. Part of this forest area is also PEFC/ FSC certified. European forests areas, carbon stock, and wood stock have been increasing for the last decades.

- *What types of woody raw materials are used for pellet production in Europe, Southeast region (SE US) and British Colombia, Canada (BC)?*

The raw materials used for pellet productions originate from: 1) sawmills residues (sawdust); 2) harvesting residues (tops, crowns, branches) and 3) thinning and low value roundwood. This is related to the "multiple product approach" on which we insist in the study.

- *What is forest management under a multi-product approach?*

European, US and Canadian forests are managed under a multi-product approach, including timber products, pulpwood, panel products and bioenergy, as well as for public use, conservation and ecosystem services.

- *What are the main conclusions of the report regarding GHG calculations?*

A review of literature and modelling of the carbon implications of biomass importation for EU bioenergy production formed much of the basis for this report. Findings reveal that assumptions and methodological choices employed in modelling forest carbon dynamics play a significant role in determining study outcomes. Methodological choices (baseline, spatial considerations and temporal consideration) and scenario assumptions (biomass origin, fossil fuel and efficiency comparators and counterfactual) are vitally important to realistic and accurate results. Findings point to fundamental flaws in key assumptions and methodology that underlie prominent studies that have found forest-

based bioenergy to be associated with carbon deficits – of which the following three are the most significant:

- *The forestry system the biomass is obtained from*. Studies finding long carbon debt repayment times generally assume that forests are managed and harvested purely for bioenergy. In addition, studies often assume that these forests are slow growing, that they were previously unmanaged, had high original carbon stocks and that they would maintain these stocks over time. This is in sharp contrast with actual wood pellet production today and anticipated production practices for the future: wood pellets are produced to a large extent from residues and low value products of existing forestry activities in forests that are already being managed for other purposes (sawtimber, pulpwood).
- *Low carbon replacement efficiencies.* Several studies assume very low carbon replacement efficiencies and/or unfavourable fuel being replaced.. Most industrial wood pellets have efficient supply chains and are used to directly replace coal achieving very high carbon replacement efficiencies.
- *The assumed counterfactual* (only relevant under the Anticipated Future Baseline approach): many studies assume a 'continued growth' counterfactual. This is not realistic when evaluating biomass from existing production forests which have been managed for timber and pulp for years. A more appropriate counterfactual should recognise the fact that industrial and harvesting residues are disposed every year by pilling and burning (Canada) as well as the need of forest owners (especially private owners) to continue to receive economic benefit from the forest.

- *Why should (EU) policy makers take the report into account?*

The main findings of this report should be taken into account the conclusions by Policy makers when discussing biomass developments and sustainability:

- the report shows that today's dominant bioenergy systems using wood pellets from Canada and the SE US achieve significant GHG savings, and make a meaningful contribution to climate change mitigation. This is also the case for European pellets
- carbon debt and foregone sequestration (when one might exist) in realistic bioenergy scenarios are very small compared to the carbon savings that are achieved over time.
- further, there is a critical difference between a small and temporary 'carbon debt' when one might exist, and the permanent fossil carbon emissions savings achieved by use of bioenergy rather than fossil fuels

- *What's the biomass potential in the Southeast region (US SE) and British Colombia, Canada (BC) and Europe?*

According to projections (US Department of Energy 2011), available forest biomass from the US as a whole in 2030 could range from 83 to 102 million dry tonnes annually

depending upon price (assuming prices ranging from $40 to $60 /dry ton), with the vast majority of this projected volume in the SE region.

In British Columbia, Canada, where most forest land is owned by the government, large volumes of mill residue that until very recently were burnt as waste are available for use, as are vast volumes of logging residues that are commonly disposed of by piling and burning annually each fall. Bioenergy production offers an immediate opportunity to stem this wasteful practice and reduce emissions to the atmosphere.

As far as Europe is concerned several recent studies have assessed biomass availability for energy use and came to the conclusion that there is high potential for further developments.

- *What is the rationale behind the forest biomass carbon neutrality principle?*

The principle of carbon neutrality is generally understood as the biogenic carbon cycle based on photosynthesis. When wood is burnt, carbon which has been removed from the atmosphere and stored by the tree is released back into the atmosphere. This is in contrast to combustion of fossil fuels (coal, oil, and natural gas), wherein carbon is released that has been stored in the earth for millions of years, and which cannot be replenished on anything short of a geologic time scale.

Under a sustainably managed forest regime, regeneration operations (re-planting or natural regeneration) occur soon after harvesting such that net growth across the forested landscape remains equal to or greater than total removals. Given these conditions, a quantity of carbon equal to or greater than the volume of carbon released into the atmosphere (when harvested wood is combusted), is removed from the atmosphere again through the growth of new trees. Moreover, the energy generated through wood combustion displaces fossil fuels, preventing the net release of fossil carbon that would have occurred had not bioenergy been produced.

- *What does this study show - when applying methodological assumptions based on market realities and scenario choices based on today's real life bioenergy systems?*

Bioenergy using biomass from existing sustainably managed forests (ie where the yearly harvested volume is lower than the annual stock increase) realizes absolute GHG savings from year 1 because a) forest carbon stocks are maintained or even increase over time, and b) fossil fuel burning is simultaneously avoided.

It is also possible to look at the relative GHG emission savings compared to an anticipated future baseline scenario without bioenergy (Anticipated Future Baseline (AFB) Approach). Modelling exercises using this methodology show that bioenergy from existing sustainably managed forests can initially lead to a small increase in emissions compared to an anticipated future baseline without harvesting for bioenergy due to a decline in the amount of carbon stored in forest litter. After this initial phase bioenergy leads to large relative GHG emission savings compared to the baseline scenario. In SE US, the time to carbon parity is short (3 years) when forest residues are used.

- As the study shows, it is possible to demonstrate a worst case unrealistic scenario wherein long time periods to carbon parity are required. Calculations using the AFB approach show that in a scenario in which a 30 year rotation forest in the SE US were harvested entirely for bioenergy, it would take approximately 22 years before the carbon parity point were reached, but only if a completely inappropriate "no harvest" counterfactual were applied. This scenario is unrealistic since management of forests strictly for bioenergy is not expected to play a role in actual pellet production for the foreseeable future. While today's biomass for pellets originate from forests that are already being managed for other purposes (sawtimber, pulpwood), some parties have expressed concerns that the increase in biomass demand for bioenergy could lead to new forest areas being taken into active management and that this could lead to significant increases in GHG emissions for substantial periods of time. However, this is unlikely to materialize as managing and harvesting new forest areas in the USA or Canada for bioenergy alone is simply uneconomic. If new forest areas were to be taken into production in the US or Canada, such an expansion would be driven by the demand for higher value products such as sawn timber and pulp. Such forests would be managed for multiple products, not only and not even primarily for bioenergy. This would lead to very large GHG emission savings due to the combined effects of bioenergy, and increased production of durable timber products that form durable carbon stocks and replace GHG intensive alternatives such as concrete or steel.