Base Protocol Plan for Biomass Energy Generation

DRAFT

March 27, 2009

1. Identification of the Protocol Developer

1.1 Title of the Base Protocol

Greenhouse Gas Quantification Protocol for Biomass Energy Projects, adapted from the *Quantification Protocol for Diversion of Biomass to Energy from Biomass Combustion Facilities* developed for the Alberta Offset System.

1.2 Lead Protocol Developer

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1.3 Initiating Entity

Organization	IPOG Biomass Working Group. Funding members: • BlueSource Canada • Forest Products Association of Canada • Icarus Energy • New Brunswick Power • Ontario Power Generation • Spectra Energy • TransCanada • Viterra
Name	
Title	
Mailing address	
Telephone	
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E-mail	
Website	

1.4 Rationale for Development of the Base Protocol

This Base Protocol is being developed by the biomass working group of the Industry Provincial Offsets Group (IPOG), which is a broad group of stakeholders having an interest in generating and trading greenhouse gas (GHG) offsets. Given the working groups collective interest in advancing biomass projects and to take advantage of 'fast-track' provisions within the current version of the federal draft Guide for Protocol Developers, this protocol has been developed by adapting the Alberta biomass energy protocol.

2. Description of the Base Protocol

2.1 Description of the Project Type

This protocol will apply to projects involving the generation of energy (specifically heat and/or electricity) using biomass combustion, where the baseline approach to energy generation would have included the combustion of fossil fuels and/or less use of biomass than in the project case. This would be achieved either from fuel switching using the same equipment, or where necessary installation of new equipment able to combust the project biomass fuel. In the case of a baseline involving the use of biomass energy, increases in project biomass use would only be eligible under this protocol where they are not technically feasible without the replacement or retrofit of an existing boiler.

Eligible projects would fall into one of the following categories:

- Direct combustion of biomass on-site
- Conversion of biomass to an intermediate fuel gas (i.e. gasification) with subsequent combustion of the resulting gas, where:
    - The resulting gas is combusted at the site of gasification, or conveyed by piping to a neighbouring site for combustion (in such cases, the site of gasification and combustion would essentially be considered one large site)
    - The only inputs into the gasification system are[1]:
        - Biomass
        - Fossil fuels (e.g. for start-up)
        - Electricity
        - Ambient air or gases extracted from ambient air (e.g. oxygen) at the project site as long as this extraction process only requires electricity.

[1] These limitations have been placed on the gasification process to avoid the need to consider any additional gasification-specific emission sources with the protocol (e.g. those associated with off-site production and transport of additional process inputs). Should other gasification processes be used, this protocol would need to be modified to ensure that all relevant emission sources are considered.

Eligible biomass types would include both waste products as well as purpose-grown crops, the only requirement being that either:

- the biomass fuel contains no non-biogenic fossil-fuel derived carbon (i.e .no plastics, petroleum-based chemicals, etc.); or
- in the case of biomass co-firing, that the biomass portion of the fuel contains no non-biogenic fossil-fuel derived carbon and can be directly measured and easily distinguished from non-biomass sources.

Solid processed biomass feedstocks, such as wood pellets, that meet the above requirements would be eligible for use in the protocol.

All project and baseline emission sources included in this protocol, such as generation of electricity, heat and other energy sources via combustion of fuels, are included in Canada's National GHG Inventory. Excluded from the scope of the protocol would be:

- Mixed energy sources containing both biomass and non-biomass components (e.g. municipal solid waste).
- Conversion of biomass to liquid or gas fuels, with the exception of the gasification case described above.

2.2 Description of any Project-Specific Technology

Due to the extra complexity of gasification processes, a brief technical overview of gasification will be provided in the base protocol. Otherwise, no project-specific technologies will be included within the protocol, as the protocol is intended to apply to a wide range of different projects and associated technologies. Individual project proponents would be expected to describe their specific technologies and utilize appropriate data when applying the protocol.

2.3 GHG(s) that will be Reduced

Emission of the following GHGs will be reduced

- Carbon dioxide (CO_2).
- Methane (CH_4) (where anaerobic degradation in the base case is avoided).

Project biomass systems may or may not result in methane (CH_4) and nitrous oxide (N_2O) emission reductions from combustion sources, depending on the specific project and baseline fuels used.

2.4 Description of How Real Reductions will be Achieved

Real reductions will be achieved primarily through the reduction of fossil fuel combustion emissions relative to what would have occurred in the absence of the project by substituting fossil fuel primary energy sources with biomass. This will involve the installation of new project equipment and/or efforts to establish new sources of biomass supply that would not have existed or been used in the baseline case.

Since CO2 emissions resulting from biomass combustion are not considered to be a net source of GHG emissions (due to the cyclical nature of the carbon cycle), significant emission reductions could result. Real emission reductions could also be achieved where the biomass used is a waste material that would have otherwise undergone anaerobic decay in the baseline case with associated methane emissions. In this case, methane emissions to the atmosphere would be avoided due to project activities.

Biomass energy projects could be implemented in various locations and contexts, including in stand-alone electricity and/or heat generators and a wide range of commercial / industrial facilities wherever electricity, heat, or other combustion-derived energy is required. Depending on the complexity of the project, a testing period may or may not be required prior to full-scale implementation.

Achievement and appropriate quantification of real emission reductions will be ensured through development of the quantification protocol in accordance with ISO 14064-2 and federal offset system protocol development requirements, including assessment of all relevant lifecycle emission sources (e.g. fossil fuel and biomass production, as appropriate).

2.5 Base Protocol Flexibility

The Base Protocol is intended to have applicability to a wide range of biomass projects. To facilitate this, the following flexibility mechanisms will be included.

1. **Project-specific emission factors.** Where justified and appropriately documented, project-specific emission factors (e.g. biomass combustion emission factors) may be used instead of default factors noted in the protocol. In this case, a project proponent must demonstrate that the emission factors have been developed according to industry standard practice.

2. **Project-specific monitoring approaches.** To account for the wide variety of potential project applications, project-specific monitoring / metering approaches may be used if justified and if they conform to the general requirements stipulated in the protocol. Such project-specific approaches may also include the aggregation of multiple emission sources together where project metering treats those emission sources as one larger combined entity (e.g. multiple combustion sources consuming fuel that is tracked by a single meter).

3. **Exclusion of SSRs.** If justified based on project-specific details and in conformance with criteria specified in the Guide for Protocol Developers and the protocol, the project proponent may exclude some additional SSRs from quantification beyond those excluded by default in the protocol.

4. **Selection of specific projection-based baseline**. Where an historic baseline is not appropriate (e.g. for a new facility without historic activities), the option is provided to either select a conservative default baseline system indicated in the protocol, or to perform a barriers-test analysis to identify the most likely baseline system in the absence of the project.

2.6 Federal and Provincial/Territorial Legal Requirements and Climate-Change Incentives

Legal requirements and climate change incentives will vary according to the type of facility (e.g., residential, commercial or industrial) as well as with the province/territory and municipality within which the facility is located. They include, but are not limited to, the items listed below.

Potentially Relevant Legal Requirements

- With respect to biomass combustion, no relevant legal requirements have been identified
- With respect to avoided emissions from waste disposal (i.e. anaerobic degradation in a landfill), Ontario, BC, Quebec and Nova Scotia all have regulations in place with respect to landfill gas collection.

Potentially Relevant Climate-Change Incentives

- ecoENERGY Incentive for Renewable Power[2]
- Manitoba Hydro Bioenergy Optimisation Program[3]
- Ontario Renewable Power RFPs / Standard Offer Program[4]
- BC Hydro Bioenergy call for power[5]

2.7 Building on Existing Protocols or Proprietary Information

This Base Protocol will be developed based on a similar protocol developed for the Alberta Offset System.

Registered name of protocol	Quantification Protocol for Diversion of Biomass to Energy from Biomass Combustion Facilities
System for which protocol was developed	Alberta Offset System
Date protocol was completed and approved (if applicable)	Approved – September 2007
Developer of the protocol (name/organization)	BlueSource Canada (formerly Baseline Emissions Management Inc.)

Explanation of how the existing protocol has been adapted

No major changes to the scope of the Alberta biomass protocol have been undertaken; instead, effort focused on enhancing / clarifying various sections of the protocol to ensure that scope and methodologies are clearly presented, and that all sections conform to federal protocol development requirements. Specifically, adaptation of the existing Alberta Biomass Protocol was accomplished by completing the following tasks:

<u>Adding sections that do not exist in the Alberta protocol document</u>

[2] http://www.ecoaction.gc.ca/ecoenergy-ecoenergie/index-eng.cfm
[3] http://www.hydro.mb.ca/your_business/bioenergy_optimization/index.shtml
[4] http://www.powerauthority.on.ca/sop/
[5] http://www.bchydro.com/planning_regulatory/acquiring_power/bioenergy_call_for_power.html

The federal Base Protocol template includes sections not present in the Alberta protocol template. The main sections have been identified below.

- List of Federal, Provincial/Territorial Legal Requirements & Climate Change Incentives that could affect applicability of the protocol (handled during base protocol plan preparation).
- Description of the protocol development approach undertaken
- Identification of "key" emission sources, sinks and reservoirs with respect to the risk of compromising overall accuracy of emission reduction results due to data uncertainties
- Discussion of other (non-GHG) air pollutant impacts
- Preparing a summary of instructions for project proponents

Adjustments and Enhancements to Existing Sections in the Alberta Protocol

In order to conform to federal / ISO 14064-2 requirements, some enhancements to existing sections of the Alberta Protocol will be necessary, including:

- Adjustment of applicability / eligibility criteria to match federal requirements
- Refinement / clarification of applicability and flexibility options to ensure that it is clear that the protocol can be applied to the project types listed in Section **Error! Reference source not found.** and contains the flexibility options described in Section **Error! Reference source not found.**.
- Review / confirmation of identified SSRs for both project and baseline conditions
- Expanded explanations and justification of criteria, procedures, and decisions to meet ISO 14064-2 / federal requirements in the following sections:
    - Project SSR identification
    - Baseline identification and selection
    - Baseline SSR identification
    - Selection of relevant SSRs for estimation/monitoring
    - Quantification and monitoring methodologies
    - Data quality

Explanation of the technical review the existing protocol has been through

The existing Alberta biomass protocol went through the full Alberta protocol approval process, which included a limited technical review, broader stakeholder review, and final review and approval by the Province of Alberta.

Explanation of the nature of any proprietary information

No proprietary information has been included in the Base Protocol.

3. Declaration, Consent and Signature

The undersigned acknowledges that the undersigned has read, understood and that the undersigned agrees to abide by all the terms, conditions, instructions, and notices set out in the Guide for Protocol Development.

The undersigned acknowledges that the review of, and comments regarding, this base protocol plan or portions thereof does not ensure that the base protocol plan or portions thereof will be used in an Offset System Quantification Protocol by Canada's Offset System for Greenhouse Gases.

The undersigned is legally authorized to use any and all proprietary (or protected) information found in and submitted with the base protocol plan.

The undersigned is duly authorized to sign this application.

The undersigned declares that the base protocol plan submitted for Canada's Offset System for Greenhouse Gases and the information provided on, with or pursuant to this application is true, accurate and complete.

The undersigned consents to the public disclosure, in any manner including, without limitation, posting on Offset System website, of all the information in the base protocol plan and the information submitted with the base protocol plan.

By:

Name:

Title:

Signature:

Signed this day of , 2009

NOTE: the declaration, consent and signature form will need to be completed by all parties listed as Lead Protocol Developer and Initiating Entities in Section 1.