

Background Notes

EcoLogo™ Program Standard Review (Round 1)

CCD-003 Electricity-Renewable Low-Impact

(C) BIOMASS-FUELLED ELECTRICITY

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1. Introduction

Biomass-fuelled electricity is currently considered in the EcoLogo™ standard for renewable low-impact electricity. To date, 17 biomass-fuelled generating facilities amounting to a total capacity of 372 MW have already been third-party certified by the EcoLogo™ Program.

Biomass-fuelled electricity products can sometimes offer considerable environmental benefits when by meeting strict requirements for *inter alia* species conservation, soil conservation, water quality and a reduction in noxious air emissions and carbon dioxide emissions.

During a preliminary research period, the EcoLogo™ Program engaged with stakeholders to narrow down the scope of environmental criteria categories needing revision or to be added to the standard to continue to define environmental leadership. As such, the EcoLogo™ Program was able to narrow down its criteria scope. This scope will be presented in this document. Moreover, the EcoLogo™ Program will propose environmental leadership criteria for further stakeholder review as well as outline unresolved questions for further consideration by stakeholders.

2. New Criteria Statements to the Current Active Standard

Following preliminary research and a discussion with stakeholders, the EcoLogo™ Program will address the following environmental impact categories and related stressors by proposing to add new criteria statements to the current active standard. Each proposed criteria statement is followed by a rationale explaining why we are proposing the addition to the standard. Only those topics that were discussed with stakeholders will be presented below.

2.1. Use of Genetically Modified Organisms

[Addition]:

7. To meet the requirements of this standard, biomass-fuelled electricity must be generated in such a manner that:

(d) in the case where the generator of electricity and the producer of biomass residuals share common ownership, genetically modified products cannot be used.

Rationale:

In general, stakeholders mentioned that genetically modified organisms (GMOs) are not used in the forest sector in Canada. However, a stakeholder did mention being “uneasy about the use of GMO short-rotation woody crop species in agro-forestry, such as willow and poplar, unless they are guaranteed sterile so that there is no risk of contamination of natural trees with GMO genes. Willow is a strongly out-breeding species, with a large number of sub-species and wide variation in the wild; GMO gene leakage – as has occurred in agriculture-would be a concern.”

As for agricultural biomass, it was stated that “the leakage of GMO genes into a number of wild populations of crop species (e.g., maize) is now a matter of record.” However, on the other hand, it was stated that “genetically modified feedstocks could require fewer inputs such as water and fertilizer and produce more energy dense plants,” thereby providing some environmental benefits.

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Since it remains controversial whether or not GMOs are safe to ecosystems, the EcoLogo™ Program proposes to use the precautionary principle and disallow the use of GMO biomass until long term evidence of these effects on both the environment and the food chain are available. This rule would not apply where animal and biomass harvesting and processing residues are used as fuels when the generator and the residue source do not share common ownership. However, the EcoLogo™ Program does encourage all biomass-fuelled electricity producers to encourage their biomass fuel providers to not use any GMO products in their operations.

2.2. Following Organic Standard

[Addition]:

7. To meet the requirements of this criteria document, biomass-fuelled electricity must be generated in such a manner that:

(c) if generated from dedicated energy crops:

iii) at least 5% of the energy crops should be grown organically following the Canadian National Organic Production Standard specified in the Organic Products Regulations (SOR/2006-338) in Canada and the United States Department of Agriculture Organic Standard in the U.S.

Rationale:

Following preliminary research and a discussion with stakeholders, it was found that by using organic growing methods in agriculture, fertilizer usage would go down and therefore protect waterways from eutrophication. The Canadian government is targeting a produce market share of 10% organic products by 2010. With these considerations in mind, the EcoLogo™ Program is proposing that to represent environmental leadership, at least 5% of energy crops should be grown organically.

3. Revised Criteria Statement to the Current Active Standard

Following preliminary research and a discussion with stakeholders, the EcoLogo™ Program will address the following environmental impact categories and related stressors by proposing to revise certain criteria statements to the current active standard. Each proposed criteria statement is followed by a rationale explaining why we are proposing the revision to the standard. Only those topics that were discussed with stakeholders will be presented below.

3.1. Use of Food Crops

[Revised]:

Interpretation

“wood-wastes and agricultural wastes” means a form of clean biomass, and includes inter alia:

- (a) mill residues (e.g. waste by-products associated with the processing of forest materials such as bark, sawdust, solid trim, shavings, veneer clippings, clarifier sludge, pulping liquors),
- (b) logging residues (e.g. residual materials left in the forest following harvesting such as slash, sortyard debris, thinning, stumps, roots),
- (c) crop residues (e.g. materials not needed for soil re-incorporation such as straw, chaff, corn cobs, bean residues, and dried stalks of harvested grain), and
- (d) untreated construction and demolition wastes; and
- (e) no biomass by-products with remaining food value**

[Current]:

Interpretation

“dedicated energy crops” means those **non-food crops** grown specifically for their fuel value, and in the case of this criteria document, for electricity generation. These sources include inter alia short-rotation woody crops (such as poplar trees) and herbaceous energy crops (such as switch grass);

“wood-wastes and agricultural wastes” means a form of clean biomass, and includes inter alia:

- (a) mill residues (e.g. waste by-products associated with the processing of forest materials such as bark, sawdust, solid trim, shavings, veneer clippings, clarifier sludge, pulping liquors),
- (b) logging residues (e.g. residual materials left in the forest following harvesting such as slash, sortyard debris, thinning, stumps, roots),
- (c) crop residues (e.g. materials not needed for soil re-incorporation such as straw, chaff, corn cobs, bean residues, and dried stalks of harvested grain), and
- (d) untreated construction and demolition wastes.

Rationale:

The EcoLogo™ Program wants to ensure that no food can be used for energy production.

3.2. Diminishing Risk of Using Logging Residues

3.2.1. Redefinition of “Wood-Wastes and Agricultural Wastes”

[Revised]:

7. To meet the requirements of this standard, biomass-fuelled electricity must be generated in such a manner that:

- (b) if generated from **harvesting and industrial by-products residues**, and in cases where the generator and the waste source share common ownership:
 - i) use only **harvesting and industrial by-products residues** that have been sourced from operations that have implemented a sound environmental management system and are adhering to sound environmental management practices,
 - iii) not use **harvesting and industrial by-product residues** from species that are listed in the CITES Appendices

Interpretation

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“**clean biomass**” means organic materials as listed below that have, at no stage in their lifecycle, been treated with organic and/or inorganic substances to change, protect or supplement the physical properties of the materials (including inter alia synthetic chemical pest-control products, fungicides, wood preservatives, paints, varnishes or other surfaces coatings, halogenated compounds and/or compounds containing heavy metals). Specific types of clean biomass recognized under this criteria document include:

- (a) **ecologically sustainable amounts of solid biomass removed from fields and forests either as whole plants, parts of plants, or as harvesting residues, and any industrial by-product residues arising from the harvesting and processing of agricultural crops or forestry products that would otherwise be sent to landfills and/or incinerated.**

“**harvesting and industrial by-products residues**” means a form of clean biomass, and includes *inter alia*:

- (a) mill residues (e.g. **residual** by-products associated with the processing of forest materials such as bark, sawdust, solid trim, shavings, veneer clippings, clarifier sludge, pulping liquors),
- (b) logging residues (e.g. residual materials left in the forest following harvesting such as slash, sortyard debris, thinning, stumps, **roots removed for health reasons**),
- (c) crop residues (e.g. materials not needed for soil re-incorporation such as straw, chaff, corn cobs, bean residues, and dried stalks of harvested grain), and
- (d) untreated construction and demolition wastes **that cannot be reused**

[Current]:

7. To meet the requirements of this criteria document, biomass-fuelled electricity must be generated in such a manner that:

- (b) if generated from **wood-wastes and/or agricultural wastes**, and in cases where the generator and the waste source share common ownership:
 - i) use only **wood-wastes and/or agricultural wastes** that have been sourced from operations that have implemented a sound environmental management system and are adhering to sound environmental management practices,
 - ii) ensure the rate of harvest does not exceed levels that can be sustained, and
 - iii) not use **wastes** from species that are listed in the CITES Appendices;

Interpretation

“**clean biomass**” means organic materials as listed below that have, at no stage in their lifecycle, been treated with organic and/or inorganic substances to change, protect or supplement the physical properties of the materials (including inter alia synthetic chemical pest-control products, fungicides, wood preservatives, paints, varnishes or other surfaces coatings, halogenated compounds and/or compounds containing heavy metals). Specific types of clean biomass recognized under this criteria document include:

- (a) **the wood-wastes and agricultural wastes that are solid residues arising from the harvesting and processing of agricultural crops or forestry products that might otherwise be sent to landfill and/or incinerated,**

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“**wood-wastes and agricultural wastes**” means a form of clean biomass, and includes *inter alia*:

- (e) mill residues (e.g. **waste by-products** associated with the processing of forest materials such as bark, sawdust, solid trim, shavings, veneer clippings, clarifier sludge, pulping liquors),
- (f) logging residues (e.g. residual materials left in the forest following harvesting such as slash, sortyard debris, thinning, stumps, **roots**),
- (g) crop residues (e.g. materials not needed for soil re-incorporation such as straw, chaff, corn cobs, bean residues, and dried stalks of harvested grain), and
- (h) untreated construction and demolition **wastes**.

Rationale:

Following preliminary research and a discussion with stakeholders, it was clear that the term “waste” to describe biomass by-products was causing confusion. The intention of the term “waste” in the current active standard is to ensure that only residues which would not affect the sustainability of fields and forests would be used. However, the EcoLogo™ Program agrees with stakeholders that substituting the terms “wood-wastes and agricultural wastes” to “harvesting and industrial by-products residues” provide greater ecological clarity to the standard. Moreover, specifying that only roots removed for the protection against diseases such as wood rot also brings more ecological clarity to the standard. Furthermore, specifying that only untreated construction and demolition wastes that cannot be reused is accepted in the standard further provides clarity to CCD-003.

3.3. Diminishing Risk of Eutrophication

[Revised]:

“**sound environmental management practices**” means those practices and goals used to manage forest and/or agricultural products within a sound environmental management system, as defined in the definitions section of this criteria document, that have the objectives of maintaining environmental values of the surrounding ecosystem. At a minimum, these practices must address *inter alia*:

- (a) species selection;
- (b) soil structure, temperature and fertility;
- (c) soil composition rates, compaction and conservation;
- (d) erosion control;
- (e) hauling distance from the harvesting site to the combustion/generation site;
- (f) silvicultural practices and techniques;
- (g) harvesting practices including techniques, rates and waste minimization;
- (h) crop regeneration;
- (i) road/trail construction and maintenance;
- (j) protection of biodiversity, wildlife and rare, threatened and endangered species;
- (k) water quality and quantity;
- (l) watershed conservation and **eutrophication control**; and
- (m) prior land use.

[Current]:

“**sound environmental management practices**” means those practices and goals used to manage forest and/or agricultural products within a sound environmental management system, as defined in

the definitions section of this criteria document, that have the objectives of maintaining environmental values of the surrounding ecosystem. At a minimum, these practices must address inter alia:

- (a) species selection;
- (b) soil structure, temperature and fertility;
- (c) soil composition rates, compaction and conservation;
- (d) erosion control;
- (e) hauling distance from the harvesting site to the combustion/generation site;
- (f) silvicultural practices and techniques;
- (g) harvesting practices including techniques, rates and waste minimization;
- (h) crop regeneration;
- (i) road/trail construction and maintenance;
- (j) protection of biodiversity, wildlife and rare, threatened and endangered species;
- (k) water quality and quantity;
- (l) watershed conservation; and
- (m) prior land use.

Rationale:

It was proposed that in addition to using organic agricultural methods, other alternatives such as riparian buffer zones between farmed fields and waterways, in conjunction with proper clean up and disposal of animal residues could be implemented to reduce the risk of eutrophication from agricultural biomass derivatives. Therefore, the EcoLogo™ Program thought it was necessary to highlight eutrophication control methods in its sound environmental practices to address this issue more directly.

3.4. Environmental Management Systems for Biomass Forest and Agricultural Products

3.4.1. Forest Management and Protection

[Revised]

“sound environmental management system” means a system, including inter alia the ISO 14000 series of standards, used to manage forest and/or agricultural products that incorporates sound environmental management practices. At a minimum, system elements must include:

- (a) planning elements such as: identifying forest and/or agricultural resources; identifying environmental aspects; assessing environmental impacts; identifying environmental legislative and regulatory requirements; and defining and committing to environmental policies, objectives and targets;
- (b) operational elements such as: defining roles and assigning responsibilities; providing adequate staff training; communicating environmental aspects and policies both internally and externally; implementing an environmental management program based on identified environmental aspects and impacts; documenting all policies, goals and procedures; periodically reviewing and, where necessary, revising the system; performing public consultation and/or outreach; and establishing an environmental emergency preparedness and response plan; and
- (c) monitoring and measurement elements such as: monitoring and measuring key aspects of the system; evaluating and mitigating negative environmental impacts; correcting non-conformance with the management system; performing internal reviews; and having third party audits performed;

The Canadian Standards Association, the Forest Stewardship Council and the Sustainable Forestry Initiative forest management certification systems are also specifically recognized as sound environmental management systems used to manage forest products.

[Current]:

“sound environmental management system” means a system, including inter alia the ISO 14000 series of standards, used to manage forest and/or agricultural products that incorporates sound environmental management practices. At a minimum, system elements must include:

- (a) planning elements such as: identifying forest and/or agricultural resources; identifying environmental aspects; assessing environmental impacts; identifying environmental legislative and regulatory requirements; and defining and committing to environmental policies, objectives and targets;
- (b) operational elements such as: defining roles and assigning responsibilities; providing adequate staff training; communicating environmental aspects and policies both internally and externally; implementing an environmental management program based on identified environmental aspects and impacts; documenting all policies, goals and procedures; periodically reviewing and, where necessary, revising the system; performing public consultation and/or outreach; and establishing an environmental emergency preparedness and response plan; and
- (c) monitoring and measurement elements such as: monitoring and measuring key aspects of the system; evaluating and mitigating negative environmental impacts; correcting non-conformance with the management system; performing internal reviews; and having third party audits performed;

Rationale:

At present, the Canadian Standards Association (CSA, 2003), the Forest Stewardship Council (FSC, 2004) and the Sustainable Forestry Initiative (SFI, 2005-2009) forest management certification standards contain provisions addressing forest management issues. In fact, according to the Forest Products Association of Canada, all these standards contain requirements to:

- Conserve biological diversity
- Maintain wildlife habitat and species diversity
- Protect/maintain special sites
- Maintain soil and water resources
- Ensure harvest levels are sustainable
- Protect forestlands from deforestation and conversion
- No wood from illegal or unauthorized sources
- Aboriginal rights and/or involvement
- Require public disclosure

The EcoLogo™ Program therefore proposes to directly include these sustainable forest management certification systems within CCD-003.

3.4.2. Adaptive Management

[Revised]:

“sound environmental management system” means a system, including inter alia the ISO 14000 series of standards, used to manage forest and/or agricultural products that incorporates sound environmental management practices. At a minimum, system elements must include:

(a) planning elements such as: identifying forest and/or agricultural resources; identifying environmental aspects; assessing environmental impacts; identifying **governmental environmental policies, regulations and guidelines and committing to meeting or surpassing these within an adaptive management context**; and defining and committing to environmental policies, objectives and targets;

[Current]:

“sound environmental management system” means a system, including inter alia the ISO 14000 series of standards, used to manage forest and/or agricultural products that incorporates sound environmental management practices. At a minimum, system elements must include:

(a) planning elements such as: identifying forest and/or agricultural resources; identifying environmental aspects; assessing environmental impacts; **identifying environmental legislative and regulatory requirements**; and defining and committing to environmental policies, objectives and targets;

Rationale:

During a conversation with stakeholders, it was mentioned that “adaptive forest management (AFM) – learning by doing – is an essential component to ensuring environmental sustainability. It is essential that outcomes are monitored, and are combined with new scientific knowledge and operational experience to feed back into revisions of policies, regulations and guidelines.” The EcoLogo™ Program agrees that adaptive management is an important component of environmental management and has therefore included this for emphasis in CCD-003.

3.4.3. Polychlorinated Dioxins and Furans Emissions

[Revised]:

The EcoLogo™ Program proposes to remove the standard pertaining to dioxins and furans within CCD-003.

[Current]:

7. To meet the requirements of this criteria document, biomass-fuelled electricity must be generated in such a manner that:

(c) **if generated from clean biomass fuel sources containing salt-laden wood, de-inking sludge or spent pulping liquors from mills using elemental chlorine bleaching, the facility must not emit polychlorinated dioxins and/or furans in excess of one of the following, whichever may be lower:**

- i) 100 pg I-TEQ/m³; or
- ii) the limits for new pulp and paper boilers burning salt-laden wood as specified in the Canada Wide Standards for Dioxins and Furans (Canadian Council of Ministers of the Environment);

Rationale:

Based on preliminary research, it appears as though the risks posed by dioxins and furans are currently being reassessed by both the U.S. and Canadian governments. Due to the fact that both governments are working to control these emissions, the EcoLogo™ Program will not further address this issue within CCD-003.

4. Considerations Withdrawn from Review

Following preliminary research and a discussion with stakeholders, the EcoLogo™ Program has withdrawn the following environmental considerations from this review. Below, we provide a rationale explaining why we have decided not to address these considerations further during this review. Only those topics that were discussed with stakeholders will be presented there.

4.1. Greenhouse Gas Emissions

Rationale:

See *General Considerations Background Notes* presented elsewhere for the review of CCD-003.

4.2. Resource Conservation

Rationale:

Despite being a generally sound principle, stakeholders did not agree with the blanket use of the waste management hierarchy proposed in the Certification Discussion Document because certain cases might defy this rule as the best environmental approach. For instance, it was stated that modern waste conversion technologies can offer significant environmental benefits from a life cycle analysis perspective compared to recycling.

4.3. Efficiency

Although some biomass-fuelled electricity power systems are more efficient at transforming biomass into electricity, the EcoLogo™ Program has decided not to mandate greater efficiency as part of CCD-003. This is due to the fact that it has not been possible to create a method to compare different efficiencies across different power technologies. In other words, a percentage efficiency in one power technology such as wind, cannot be equated to an efficiency for biomass combustion. Therefore, the EcoLogo™ Program has decided not to address efficiency at this time in CCD-003.

4.4. Methanol Toxicity

The EcoLogo™ Program does not have sufficient information on the risk of methanol toxicity at this time to further address this issue during this review.

5. Unresolved Issues

Following preliminary research and a discussion with stakeholders, the EcoLogo™ Program has not been capable of resolving certain issues. Indeed, no clear direction could be found indicating how EcoLogo™ should address these issues, although, in certain cases, several proposals were brought forward. The goal of the EcoLogo™ Program is to determine whether these issues can be resolved and what criteria statement could be included in the standard.

5.1. Criteria Air Contaminant Emissions (CO, NO_x, SO_x and PM)

Rationale:

See *General Considerations Background Notes* presented elsewhere for the review of CCD-003.

6. References

Canadian Standards Association. (2003). *Z809-02 Sustainable Forest Management: Requirements and Guidance*. Retrieved May 12, 2009, from http://www.csainternational.org/product_areas/forest_products_marking/program_documents/CAN_CSA_Z809-02O_English.pdf

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