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# 1. Introduction

Wind-powered electricity is currently considered in the EcoLogo™ standard for renewable low-impact electricity (CCD-003). Forty nine wind-powered generating facilities amounting to a total capacity of 815 MW have already been third-party certified by the EcoLogo™ Program.

Wind-powered electricity products can sometimes offer considerable environmental benefits and meet strict requirements for species and soil conservation amongst others.

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. Impacts on Fish, Shellfish and Marine Mammals of Offshore Wind-Powered Electricity

[Addition]:

**12. To meet the requirements of this standard, wind-powered electricity must be generated in such a manner that:**

(c) if generated onshore:

i) construction activities or routine turbine operations do not cause excessive soil erosion such as silting of nearby drainage, streams, ponds, or lakes that would be harmful to aquatic or riparian species, and/or increase erosion from steep slopes, plateau edges, or access roadways; and

ii) excavated soil is replaced, and uprooted vegetation replanted, after construction or scrapping, where this can be done without interfering with the operation and servicing of the wind facility.

(d) if generated offshore:

i) the generating facility and its structures are not detrimental to indigenous or migratory marine mammal, fish and shellfish species;

ii) the generating facility and its structures are not located in an area that is

protected for marine mammal, fish and shellfish designated as endangered or threatened;

**Rationale:**

According to the Centre for Environment, Fisheries and Aquaculture Science (CEFAS; 2004), the construction, development and use of an offshore wind farm can potentially affect fish and shellfish resources, including spawning, overwintering, nursery and feeding grounds, and migratory pathways. Also, certain potential disturbances that might negatively affect marine mammals include:

- *Noise*
- *Vibration*
- *Physical intrusion*
- *Visual intrusion*
- *Interruption of known used routes*
- *Disturbance due to maintenance access during operation*
- *Potential barrier effect*

The current active standard does not differentiate between offshore and onshore wind-powered electricity. However, the EcoLogo™ Program thought that it should to address the potential environmental impacts mentioned here. This is why we are proposing the above additions to the standard.

## **2.2. Recyclability of Materials**

**[Addition]:**

- 12. To meet the requirements of this standard, wind-powered electricity must be generated in such a manner that:**
- (e) adequate arrangements (i.e., financial reserves) have been made for the proper disposal and/or recycling of all solid waste resulting from the generation of electricity.**

**Rationale:**

Nalukowe, Liu, Damien, & Lukawski (2006) recommend that materials be recycled at the end of the life of a wind turbine to greatly reduce the negative environmental impacts associated to wind power generation. For instance, they state that “the recycling of steel and iron from the wind turbine has positive impact on climate change, since it substitutes production of 334 tons of iron with a reduction in energy consumption.” They also show that 90% of the copper in wind turbines could be recycled. Their wind turbine model, however, is composed of glass fiber and plastics that are incinerated and concrete that is fully land-filled. Schleisner (2000) also shows that aluminum in wind turbines can be recycled while PVC and rubber are burned at waste power plants. He also states that “if the materials from the turbine should be used for construction of a new turbine, 80% of the materials could be reused”, and that “94% of the materials used for construction of a wind turbine may be recycled.” However, according to the Science Daily (2007), because the wind-turbine industry is relatively young, there is only a limited amount of practical experience on the removal and recycling of wind turbines, and it is likely to take more than 20 years before a substantial amount of practical experience regarding the dismantling, separation, recycling, disposal, etc., of wind-power systems is gained.

For this reason, the EcoLogo™ Program does not think that it could strictly mandate recycling of wind turbines at this time. Still, we greatly encourage the recycling of these to proliferate. Demanding that EcoLogo™ certified wind-powered electricity generators keep investment reserves for this purpose is a way to ensure this.

### 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. Protection of Bird and Bat Species

**[Revised]:**

12. To meet the requirements of this criteria document, wind-powered electricity must be generated in such a manner that:

- (a) the generating facility and its structures are not detrimental to indigenous or migratory avian **and bat** species;
- (b) the generating facility and its structures are not located in an area that is protected for avian **and bat** species designated as endangered or threatened;

**[Current]:**

12. To meet the requirements of this criteria document, wind-powered electricity must be generated in such a manner that:

- (a) the generating facility and its structures are not detrimental to indigenous or migratory avian species;
- (b) the generating facility and its structures are not located in an area that is protected for avian species designated as endangered or threatened;

**Rationale:**

According to Science Daily (2008), bat fatalities from wind are larger than for birds. Bats can be crucial for the control of insects, especially crop pests. Therefore, the EcoLogo™ Program has decided to consider bat protection within its standard.

## 4. Unchanged Criteria Statements in the Current Active Standard

Following preliminary research and a discussion with stakeholders, the EcoLogo™ Program proposes to keep certain criteria statements intact. Only those criteria statements that were discussed with stakeholder will be presented below. A rationale explaining why we are proposing to keep the statements unchanged is provided for those.

### 4.1. Greenhouse Gas Emissions

#### Rationale:

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

## 5. Considerations Withdrawn from Review

Following preliminary research consultations, 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 below.

### 5.1. Criteria Air Emissions (CO, NO<sub>x</sub>, SO<sub>x</sub> and PM)

#### Rationale:

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

### 5.2. Water Use

#### Rationale:

According to the U.S. Department of Energy (2008a), “wind energy does not require the level of water resources consumed by many other kinds of power generation.” Therefore, the EcoLogo™ Program will assume that wind power production inherently includes water use benefits, and does not see the need to add a criteria statement pertaining to this issue in CCD-003.

### 5.3. Land Use

#### Rationale:

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

### 5.4. Impacts related to Sea Cables for Offshore Wind-Powered Electricity

#### Rationale:

Although the EcoLogo™ Program recognizes that offshore wind-powered electricity might be more demanding in terms of cabling, this might not always be the case compared to onshore wind-powered electricity. Also, the tradeoffs related to potentially more cables could be “offset” by the saving of land

spaces for alternative uses deemed more important, and/or to preserve aesthetically sensitive landscapes. Therefore, the EcoLogo™ Program does not think it necessary to further consider this issue during this review of CCD-003.

## **5.5. Habitat Impacts and Incompatible Land Uses**

### **Rationale:**

The EcoLogo™ Program thinks that sections 4a), 4b), 4c), 10 b), 10c) and 10d) of the current active standard already adequately address habitat impacts and incompatible land uses. Therefore, the EcoLogo™ Program does not think it necessary to further consider this issue during this review of CCD-003.

## **5.6. Adopting a Framework for Wildlife Risk Assessment**

### **Rationale:**

The EcoLogo™ Program thinks that the Environmental Impact Assessment used as proof to assess pre-project impacts to wildlife currently used by the program is sufficient at this time. Although we would be interested in considering the new Federal Advisory Committee Act (FACA) framework proposed by a stakeholder, this framework is still being finalized and will not be ready until 2010. Therefore, it would be premature for the EcoLogo™ Program to follow this framework during this review. We may choose to reconsider this issue in a following review once the FACA wind power siting guidelines (U.S. Department of Energy, 2008b) have been established.

## **5.7. Noise**

### **Rationale:**

According to Schleisner (2000), the noise generated by wind-powered electricity generating facilities can be problematic. This is a much larger problem for land-based wind farms. However, according to Boyle (2004), the noise level of wind turbines at 350m is of 55dB(A). To put this in perspective, the noise level of a car going 64 km/h is of 55 dB(A) and the one for a quiet bedroom is of 20 dB(A). Although The EcoLogo™ Program recognizes noise as a potential problem related to wind-powered electricity, we think that noise issues, if relevant, would be adequately addressed by the current 4 a), 4b) an 4c) sections of the active standard.

## **5.8. Carcinogens (Arsenic, Benzene, Cadmium, Other Unspecified Metals)**

### **Rationale:**

According to Nalukowe, Liu, Damien, & Lukawski (2006), this category falls under the four most significant category of impacts for wind power when the whole life cycle of the product is considered. They state that, for this energy type, "electricity from coal contributes most to the carcinogenic effect, followed by steel production and copper production. Furthermore, the reduction of carcinogens in recycling steel and iron is larger than the production of reinforcing steel." The EcoLogo™ Program thinks that it has adequately indirectly addressed the issue of carcinogens by addressing energy use and the recyclability of materials. Therefore, we do not think it necessary to further consider this issue separately during this review of CCD-003.

## 6. 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. Only those topics that were discussed with stakeholders will be presented below.

### 6.1. Energy Use

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

## 7. References

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