



# UL 2854

## Standard for Sustainability for Renewable Low-Impact Electricity Products

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Standard for Sustainability for Renewable Low-Impact Electricity Products, UL 2854

First Edition, Dated January 25, 2018

***Summary of Topics***

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**JANUARY 25, 2018**

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**First Edition**

**January 25, 2018**

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**CONTENTS**

**INTRODUCTION**

1 General .....6  
 2 Scope .....7  
 3 Units of Measurement .....7  
 4 Undated References .....7  
 5 Glossary .....7

**GENERAL REQUIREMENTS – ALL TECHNOLOGIES**

6 Generation Requirements .....16

**TECHNOLOGY-SPECIFIC GENERATION REQUIREMENTS**

7 General .....17  
 8 Biogas-Fuelled Electricity .....18  
 9 Biomass-Fuelled Electricity .....18  
 10 Geothermal-Powered Electricity .....19  
 11 Water-Powered Electricity .....19  
     11.1 General .....19  
     11.2 Hydro-Powered Electricity .....20  
     11.3 Tidal, Wave, and In-Stream-Powered Electricity .....21  
 12 Wind-Powered Electricity .....21  
     12.1 General .....21  
     12.2 Onshore wind power generators .....21  
     12.3 Offshore wind power generators .....21  
 13 Solar-Powered Electricity .....22

**NON-GENERATION REQUIREMENTS**

14 General .....22  
 15 A Generator, a Broker and a Marketer .....22  
 16 A Generator, a Broker, a Marketer and an End-user .....23  
 17 A Generator, a Marketer and an End-user .....24  
 18 An End-user .....24

**BUNDLED RENEWABLE LOW-IMPACT ELECTRICITY PRODUCT REQUIREMENTS**

19 General .....24  
 20 A Generator, a Broker and a Marketer .....24  
 21 A Generator, a Broker, a Marketer and an End-user .....24  
 22 An End-user .....25

**RENEWABLE ENERGY CERTIFICATE (REC) PRODUCT REQUIREMENTS**

23 General .....25  
 24 A Generator, a Broker and a Marketer .....25  
 25 A Generator, a Broker, a Marketer and an End-user .....26  
 26 An End-user .....26

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**AIR EMISSIONS TESTING FREQUENCY, CONDITIONS AND ACCEPTABLE METHODS**

27 Testing Conditions, Frequency, and Methods .....	26
---	----

**LOAD POINT DETERMINATION**

28 General .....	27
29 Measured Data .....	28
30 Load Point Calculation .....	29

**APPENDIX A**

A1 External References .....	A1
------------------------------	----

**APPENDIX B**

B1 Informative Appendix .....	B1
-------------------------------	----

**APPENDIX C**

C1 Informative Appendix Containing Requirements from PRC-018-1996 .....	C1
C1.1 General Requirements .....	C1
C1.2 Product Specific Requirements .....	C1
C1.3 Verification .....	C2
C1.4 Conditions for EcoLogo Use .....	C2

**APPENDIX D**

D1 Informative Appendix Containing Requirements from PRC-084-2000 .....	D1
D1.1 General Requirements .....	D1
D1.2 Product Specific Requirements .....	D1
D1.3 Verification .....	D3
D1.4 Conditions for EcoLogo Use .....	D3

**APPENDIX E**

E1 Informative Appendix Containing Requirements from CCD-003-2003 .....	E1
E1.1 General Requirements .....	E1
E1.2 Product Specific Requirements .....	E1
E1.3 Verification .....	E5
E1.4 Conditions for EcoLogo Use .....	E6
E1.5 Air Emissions Testing Frequency, Conditions and Methods .....	E7
E1.6 Load Point Determination .....	E8

**APPENDIX F**

F1 Informative Appendix Containing Requirements from CCD-003-2006 .....	F1
---	----



F1.1 General Requirements .....F1  
F1.2 Product Specific Requirements .....F1  
F1.3 Verification .....F5  
F1.4 Conditions for EcoLogo Use .....F6  
F1.5 Air Emissions Testing Frequency, Conditions and Methods .....F7  
F1.6 Load Point Determination .....F8  
F1.7 Addendum: Type IV Electricity Designation .....F9

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## INTRODUCTION

### 1 General

1.1 This Standard is designed to support a continuing effort to improve and/or maintain environmental quality by reducing energy and materials consumption and by minimizing the impacts of pollution generated by the production, use and disposal of goods and services.

1.2 This Standard is based on a review of life cycle information and consideration of the electricity markets, as well as stakeholder input. This standard is intended to assist with the identification of the top environmental performers in the electricity sector, and realizing the value of those environmental benefits in the marketplace. These best performers would demonstrate that, compared to others on the market, they have an overall reduced burden on the environment. Some of this reduced burden can be achieved by:

- a) The displacement of non-renewable fuels by renewable, more sustainable fuel sources;
- b) Lower air emissions that contribute to climate change, smog, acid rain and air-borne particulate pollution;
- c) The reduction of solid wastes arising from both the mining and extraction of non-renewable fuel sources, and the disposal of toxic metal emissions and nuclear wastes; and
- d) The reduction of impacts on aquatic, riparian and terrestrial ecosystems from electricity generating activities.

1.3 This Standard is a republication of Ecologo Certification Criteria Document (CCD) 003, Renewable Low-Impact Electricity Products. The criteria have been reformatted for consistency with the Style Manual for UL Standards.

1.4 Due to long term contractual agreements, such as Power Purchase Agreements, clients will be grandfathered to maintain certification under previous versions of the standard, as long as they maintain continuous certification to the earlier version of the standard. For informational purpose only, the criteria pertaining to each version of the standard have been included as follows:

- a) PRC-018-1996: Appendix C;
- b) PRC-084-2000: Appendix D;
- c) CCD-003-2003: Appendix E; and
- d) CCD-003-2006: Appendix F.

It is to be noted that no new certification will be granted under the versions of the standard listed above and which are provided under the Appendices C to F.

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## 2 Scope

2.1 This Standard covers two renewable low-impact electricity products, which allow the commodification of renewable energy generation, and denote relatively low environmental impacts when compared to traditional fossil based electricity generation activities. These impacts are among other things, low net greenhouse gas emissions, limited depletion of non-renewable resources, reduced emissions of other pollutants and reduced impacts on aquatic, riparian and terrestrial ecosystems and species. These two products are:

- a) Bundled renewable low-impact electricity; and
- b) Renewable Energy Certificates.

## 3 Units of Measurement

3.1 For the purposes of these requirements, values shall be reported in accordance with the requirements of the specific criteria and shall be in metric units. If a manufacturer's choice of units deviates, that change shall be documented and justified as to the reason and relevance for that change.

## 4 Undated References

4.1 Any undated reference to a code or standard appearing in the criteria of these requirements shall be interpreted as referring to the latest edition of that code or standard. The exception shall be in the case where the criterion explicitly states a certain version or date to be used.

## 5 Glossary

5.1 For the purpose of these requirements, the following definitions apply.

5.2 BIOGAS – Gaseous products (primarily methane and carbon dioxide) produced by the anaerobic decomposition of organic wastes. For the purpose of this standard, facilities producing biogas include sewage treatment plants, manure and other farm and food/feed-based anaerobic digestion processing facilities, and excludes landfill gas.

5.3 BIOGAS-FUELED ELECTRICITY – Electricity generated from a system in which biogases are captured for combustion and conversion to electricity.

5.4 BIOGENIC – From recently living plants and animals that have died 80 or less years ago.

5.5 BIOMASS – Vegetative matter or its derivatives including:

- a) Solid biomass removed from fields and forests which are managed by following sound environmental management practices. Solid biomass can either be whole plants, parts of plants, or harvesting and industrial by-product residues arising from the harvesting and processing of agricultural crops or forestry products that would otherwise be land filled or incinerated;
- b) Dedicated energy crops; and
- c) Liquid fuels derived from biomass as defined in items (a) and (b) above, including among other things ethanol, biodiesel, and methanol.

Eligible biomass fuels exclude manufacturing process by-products that have been treated in the manners listed below to prevent toxic emissions:

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- a) Wood coated with paint, plastics or laminated plastic;
- b) Wood treated with preservatives containing halogens, chlorine or halide compounds like chromated copper arsenate or arsenic;
- c) Wood that has been treated with adhesives; and
- d) Wood that is treated with creosote, for example, railroad ties.

If the treated biomass types comprise 1% or less by weight of the total biomass used to generate electricity at a particular facility and the remainder is from eligible sources of biomass, all biomass-derived electricity may be eligible.

5.6 BIOMASS-FUELLED ELECTRICITY – Electricity generated through the combustion of biomass.

5.7 BROKER – An entity that puts a seller of a REC or bundled renewable low-impact electricity product in contact with a buyer of these products. The broker is not an owner of REC or bundled renewable low-impact electricity products at any point in the process.

5.8 BUNDLED RENEWABLE LOW-IMPACT ELECTRICITY – A combined transaction in which RECs and electricity are sold together. Bundled renewable low-impact electricity can come from the initial generating facility or be, with restrictions as defined in this standard, bundled with a grid power mix.

5.9 BYPASSED REACH – That area in the waterway between the initial point where water has been diverted through turbines or other mechanical means for water-powered electricity generation and the tailrace.

5.10 "CAPTIVE" RATE-BASED CUSTOMERS – Utility clients who have no choice but to purchase electricity from their local utility if on-grid.

5.11 CITES – The Convention on International Trade in Endangered Species of Wild Fauna and Flora.

5.12 CONCENTRATING SOLAR THERMAL TECHNOLOGY – A system that concentrates the heat of the sun through collectors, and uses the collected heat to drive a generating system to produce electricity.

5.13 CUMULATIVE EFFECTS ANALYSIS – An analysis performed following the Council on Environmental Quality's recommendations.

5.14 CUMULATIVE EFFECTS ASSESSMENT – A cumulative assessment performed following the Cumulative Effects Assessment Practitioners Guide of the Cumulative Effects Assessment Working Group.

5.15 DEDICATED ENERGY CROPS – Those non-food crops grown specifically for their fuel value, and in the case of this standard, for electricity generation. These sources include: short-rotation woody crops (e.g., poplar trees) and herbaceous energy crops (e.g., switch grass).

5.16 DE-INKING SLUDGE – Solid material filtered out of the wastewater from the process used to remove ink and other undesirable materials from printed wastepaper.

5.17 DIVERSION – The construction of works to divert water into a canal, tunnel, penstock or similar conduit to supply water for electricity generation purposes.

5.18 CHLORINE – The gas in its elemental form (Cl<sub>2</sub>).

5.19 ECOLOGICAL VALUES – In the context of forestry, the ecological attributes that are maintained by following sound environmental practices.

5.20 END-USER – The final purchaser or recipient of a REC or bundled renewable low-impact electricity product. An end-user could be anyone who consumes a bundled renewable low-impact electricity product or promotes themselves in relation to a REC purchase. An end-user could be a residential or commercial customer, a marketer or a generator. Additionally, an end-user could have an on-going contractual agreement for the delivery of a REC or bundled renewable low-impact electricity product, or could be receiving a REC or bundled renewable low-impact electricity product on a one-time use basis.

5.21 ENVIRONMENTAL ATTRIBUTE – The representation of the environmental costs and benefits associated with a fixed amount of electricity generation, usually from a specific generation facility.

5.22 ENVIRONMENTAL BENEFITS – The beneficial environmental attributes of a generation facility. In the context of this standard, the environmental benefits result from the generation of renewable low-impact electricity. These benefits can include among other things the displacement of non-renewable fuels, the reduction of air emissions, the reduction of solid and nuclear wastes, and the reduction of impacts on aquatic, riparian and terrestrial ecosystems.

5.23 EUTROPHICATION – The process by which a body of water becomes enriched in dissolved nutrients (e.g., phosphates) that stimulate the growth of aquatic plant life usually resulting in the depletion of dissolved oxygen, lowering its availability to higher order aquatic species.

5.24 FARM AND FOOD/FEED-BASED BIOGAS SYSTEMS – Biogas-fuelled electricity systems in which biogases are based on the anaerobic digestion of plants including dedicated energy crops and animal residues (including manure) with no remaining food market value.

5.25 FISH HABITAT – Spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes.

5.26 FISH PASSAGE – Both the upstream and downstream migration of fish that can be ensured with the use of natural and/or human-made methods. Human-made methods include among other things fishways, fish ladders, fish locks, fish elevators, powerhouse collection galleries, diversion screens, and by-pass facilities.

5.27 FOSSIL – From coal, petroleum, natural gas or any of their derivatives.

5.28 GENERATION FACILITY – A power station designed and built to produce electricity.

5.29 GENERATOR – An entity that owns and operates a generation facility or multiple generation facilities.

5.30 GEOTHERMAL-POWERED ELECTRICITY – Electricity generated from a system that uses hydrothermal steam or water.

5.31 GREENHOUSE GAS (GHG) – A gas that is considered to contribute to climate change by trapping heat emitted from the earth's surface, and includes, among other compounds, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O) (U.S. EPA).

5.32 GRID – A network of wires and cables that transport electricity from generation facilities to end users situated elsewhere.

5.33 HABITAT COMPENSATION – The replacement of habitat that has been subjected to harmful alteration, disruption or destruction with newly created habitat or improvement of the productive capacity of some other natural habitat.

5.34 HARMFUL ALTERATION, DISRUPTION OR DESTRUCTION – With respect to fish habitat, any change to fish habitat that reduces, or eliminates, its productive capacity in relation to one or more life processes of fish.

5.35 HARVESTING AND INDUSTRIAL BY-PRODUCT RESIDUES – By-products of agricultural and industrial activity limited to the following types of biomass:

- a) Silviculture and logging residues not needed to be retained for ecological values;
- b) Crop and animal residues with no remaining human food market value and not needed for soil nutrient balance and management (e.g., straw, chaff, corn cobs, bean residues, and dried stalks of harvested grain);
- c) 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); and
- d) Untreated construction and demolition wastes that have been demolished in such a manner that they cannot be reused in their previous form.

5.36 HEAD POND – Generally the body of water immediately upstream of the intake structure of electricity generation facilities. Head ponds may be natural or human made (lands inundated, and/or water bodies created as a result of the construction of the generation station and/or the associated diversion structure(s)), or a combination thereof. Head ponds may serve one or more purposes including, but not limited to:

- a) Providing the appropriate hydraulic characteristics, such as submergence, for the intake structure;
- b) Increasing the available head of the generation facility; and
- c) Storing water for subsequent discharge through the generation facility.

Head ponds also include changes caused by the diversion of a portion of a river through a canal or penstock.

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5.37 HIGH CONSERVATION VALUE FORESTS – Forests of outstanding and critical importance due to their environmental, socio-economic, cultural, biodiversity and landscape value.

5.38 HUMAN FOOD MARKET VALUE – Food that could be reasonably expected to be environmentally and cost-effectively transported to a place where it could be used for food purposes (e.g., is unspoiled, found in food markets).

5.39 HYDRO-POWERED ELECTRICITY – Electricity generated from a system or technology that uses a mechanical method to capture and convert the potential energy of water into electricity. Hydropower facilities use one-way water flow to generate electricity. There are two categories of hydropower plants, run-of-river and store and release. Not included in the definition of hydropower are pump storage or instream-powered electricity.

5.40 INSTREAM FLOW – The water volume flowing in a waterway.

5.41 INSTREAM-POWERED ELECTRICITY – Electricity generated from currents within a stream or river which has not been dammed or altered by a bypass reach.

5.42 ISLANDED GRID – A small grid system that is not connected to another power pool.

5.43 LOW NET GREENHOUSE GAS EMISSIONS – Those emissions that are either mostly biogenic greenhouse gases and/or life cycle greenhouse gas emissions that are lower than the best fossil fuel systems. Greenhouse gases include: CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O.

5.44 MARKETER – A commercial body that sells their REC or bundled renewable low-impact electricity products to interested buyers (e.g., residential, commercial or institutional buyers or other marketers). Note that a marketer possibly combines electricity from various sources and that sometimes, marketers are also generators.

5.45 MEGAWATT (MW) – A unit of electrical power capacity.

5.46 MEGAWATT-HOUR (MWH) – Megawatt-hour, and a unit of electricity equal to one megawatt of power produced, consumed or flowing for a period of 1 hour.

5.47 NEW RENEWABLE LOW-IMPACT – The age nature of an eligible facility that began operating or that was repowered after the indicated dates in the following table:

Year of Sale	New Date
2010	1997
2011	1997
2012	1998
2013	1999
2014	2000
2015	2001
2016	2002
2017	2003
2018	2004

The New Date will continue to advance by one year each year after 2018. To be considered a new renewable low-impact electricity product, the facility from which the REC or bundled renewable low-impact electricity product was derived must have either been:

- a) Placed in operation (generating electricity) on or after the applicable New Date; or
- b) Repowered on or after the applicable New Date such that 80% of the fair market value of the project derives from new generation equipment installed as part of the repowering.

The definition of "new renewable low impact" electricity is relevant to some renewable energy markets and it is included in this standard primarily for attribution for marketing purposes of Renewable Energy Certificates. The standard applies to all renewable electricity facilities that meet the criteria in this document.

5.48 NULL ELECTRICITY – Electricity distributed on the grid from which RECs have been separated that has no associated environmental, social and premium economic attributes. Once all the RECs have been separated from the renewable low-impact electricity, the electricity becomes "null".

5.49 OFF-GRID – That a generation facility is not connected to any islanded grid or large power pool.

5.50 OPERATIONAL AIR EMISSIONS – The quantity of air-borne emissions of a specified substance or compound that is released as a result of the generation of electricity.

5.51 PARTICULATE MATTER (PM) – Suspended air particulates less than 10 microns in size, often implicated in cardiopulmonary health effects when inhaled. Sources can be dust or construction sites, or in the case of fine particulate matter (less than 2.5 microns), chemical reactions by pollutants emitted from fossil fuel combustion (U.S. EPA). PM concentrations should be measured using the frequency and methods specified in Section 27 of this standard.

5.52 PCDDS and PCDFS – Polychlorinated dibenzo-para-dioxins and polychlorinated dibenzo-furans, and is a family of chlorinated organic compounds formed as trace contaminants or by-products in industrial processes. This includes the undesirable toxic contaminants generated when chlorine is used in the bleaching of wood pulp and when salt-laden wood is combusted.

5.53 PLANNED GENERATION FACILITY – A generation facility not yet producing electricity.

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5.54 PHOTOVOLTAIC (PV) TECHNOLOGY – A cell, module, panel, array and/or array field that directly converts light energy from the sun into electricity.

5.55 REGIONAL POWER POOL – Any power pool of which a smaller region is a part. The role of the power pool may be to coordinate, control, and monitor the operation of an electrical power system. For example, in North America, organizations playing this role include the North American Electric Reliability Corporation (NERC) region, the Independent System Operator (ISO) region, the Electric System Operator (ESO) region, the Regional Transmission Organization (RTO) region or the Balancing Authority Area.

5.56 RENEWABLE – Replenished through natural processes or through sustainable management practices so that a resource is not depleted at current levels of consumption.

5.57 RENEWABLE ENERGY CERTIFICATE (REC) – An authorized electronic or paper representation of the environmental, social and premium economic attributes associated with the generation of 1 MWh of renewable low-impact electricity. It is basic evidence for the generation or purchase of an amount of renewable energy. A REC is allowed to be passed on or sold as a separate product from electricity itself, or as part of a bundled renewable low-impact electricity product. For the purpose of this standard, where legally possible, only indirect GHG emissions from the consumption of purchased electricity are quantitatively included in the REC.

5.58 RENEWABLE PORTFOLIO STANDARD (RPS) – A national or sub-national level policy that requires retailers to buy, or electricity suppliers to provide retail customers a minimum level of electricity generated from eligible renewable energy sources. A synonym of an RPS is a Renewable Electricity Standard (RES). The RPS usually specifies the minimum amount of electricity required (usually as a percentage) and those renewable resources that are eligible for inclusion (e.g., can include solar PV, wind, wave, tidal, low-impact hydro, low-impact biomass). Many such policies also specify, at least for a portion of the requirement, the date after which eligible generators must have begun operation.

5.59 RETIREMENT – The final disposition of a REC or bundled renewable low-impact electricity product in the market. It does not necessarily refer to the retirement of a REC in a particular web-based tracking system for the purpose of trading across tracking systems. Once a REC has been retired, it can longer be exchanged on the market.

5.60 RIPARIAN – The land and habitat found along the banks of streams, rivers and lakes.

5.61 SALT-LADEN WOOD – Timber and forestry residues that contain a high concentration of salt (NaCl), due to either a prolonged exposure to maritime air or to immersion in marine waters (generally for the purpose of transportation).

5.62 SOLAR-POWERED ELECTRICITY – Electricity generated by converting the sun's light energy and/or heat energy into electricity, and includes among other things photovoltaic technologies and concentrating solar thermal technologies.

5.63 SOCIAL IMPACTS – Effects on community values like, for example, heritage, culture, recreation, landscape aesthetics, noise and/or tourism.

5.64 SOUND ENVIRONMENTAL MANAGEMENT PRACTICES – Those practices and goals used to manage forest and/or agricultural products, fish and wildlife harvesting, resource extraction, etc. within a sound environmental management system, as defined in the definitions section of this standard, that have the objectives of maintaining ecological values of the surrounding ecosystem. At a minimum for biomass production, these practices must address the following elements, among others:

- a) Species selection;
- b) Soil structure, temperature and fertility;
- c) Soil composition, compaction and conservation;
- d) Erosion control;
- e) Hauling distance from the harvesting site to the 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.

5.65 SOUND ENVIRONMENTAL MANAGEMENT SYSTEM – A system, including among other things the International Organization for Standardization (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 governmental environmental policies, regulations and guidelines and committing to meeting or surpassing these within an adaptive management framework; 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

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- c) Monitoring and measurement of 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 Forest Stewardship Council (FSC) and the Sustainable Forestry Initiative (SFI) forest management certification systems are potential examples of sound environmental management systems used to manage forest products. The background documentation which led biomass feedstock to receive one of these certifications may need to be investigated to ensure that these adequately meet sound environmental management practices and explicitly address intensive biomass removals.

5.66 SPECIES DESIGNATED AS ENDANGERED OR THREATENED – Any species that is listed as either “endangered” or “threatened” on recognized catalogues of such species. The default international listing shall be that of the International Union for the Conservation of Nature’s (IUCN) Red List. In Canada and the U.S., the federal Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and species listings falling under the Endangered Species Act in the U.S., are acceptable. Relevant national or sub-national listings that supersedes the former, where designations are more stringent, may be used.

5.67 TAILRACE – The point at which water is released back into the waterway below a generation station after being passed through turbines or other mechanical means to produce water-powered electricity generation.

5.68 TEQ – Toxic equivalent, and is determined by multiplying the measured concentration level of a given congener by the appropriate I-TEF. By converting the measured concentration levels to a common basis, the TEQ quantities may be summed to provide a single representative quantity. For the purposes of this standard, TEQs are determined for 2,3,7,8-TCDD and 2,3,7,8-TCDF.

The seven congeners for which 2,3,7,8-TCDD TEQs shall be determined are 2,3,7,8-TCDD; 1,2,3,7,8-P5CDD; 1,2,3,4,7,8-H6CDD; 1,2,3,6,7,8-H6CDD; 1,2,3,7,8,9-H6CDD; 1,2,3,4,6,7,8-H7CDD; and OCDD. The ten congeners for which 2,3,7,8-TCDF TEQs shall be determined are 2,3,7,8-TCDF; 1,2,3,7,8-P5CDF; 2,3,4,7,8-P5CDF; 1,2,3,4,7,8-H6CDF; 1,2,3,6,7,8-H6CDF; 2,3,4,6,7,8-H6CDF; 1,2,3,7,8,9-H6CDF; 1,2,3,4,6,7,8-H7CDF; 1,2,3,4,7,8,9-H7CDF; and OCDF.

5.69 TIDAL-POWERED AND WAVE-POWERED ELECTRICITY – Electricity generated from kinetic energy arising from tidal or wave action.

5.70 UTILITY – Any electricity service provider that has “captive” rate-based customers.

5.71 WATER-POWERED ELECTRICITY – Electricity generated from hydro-powered electricity, instream-powered electricity and tidal and wave-powered electricity.

5.72 WATER QUALITY – Characteristics of water, specifically including amount of dissolved oxygen, pH, total phosphorus, turbidity, transparency and chlorophyll, and any other item that is critical for ecosystem and human health.

5.73 WIND-POWERED ELECTRICITY – Electricity generated from a wind turbine that converts the kinetic energy of the wind into electricity.

5.74 WIND TURBINE – A system that uses air foils or blades attached to a drive shaft in order to capture the kinetic energy of the wind. The wind pushes against the blades/foils and spins a drive shaft. The drive shaft, either directly or indirectly through a series of gears, moves the generator to produce electricity.

## GENERAL REQUIREMENTS – ALL TECHNOLOGIES

### 6 Generation Requirements

6.1 To meet the requirements of this standard, a REC and a bundled renewable low-impact electricity product must initially be derived from renewable low-impact electricity that must:

- a) Meet or exceed all applicable governmental, industrial safety and performance standards;
- b) Be accompanied by evidence that:

- 1) Appropriate consultation with communities and stakeholders has occurred, that issues of concern have been reasonably addressed, that reasonable mitigation of negative social impacts and environmental impacts, where applicable, has been carried out, and that unmitigated or immitigable social and environmental impacts, if they exist, are of limited scale and scope;

*Exception: Evidence is not required for this item if the preexisting facility was built prior to national or sub-national requirements for consultation or previously exempt for another reason, for example size of facility.*

- 2) Prior or conflicting land use, biodiversity losses and scenic, recreational and cultural values have been addressed during project planning and development;

*Exception: Evidence is not required for this item if the preexisting facility was built prior to national or sub-national requirements for consultation or previously exempt for another reason, for example size of facility.*

- 3) A Cumulative Effects Assessment has been performed, or that such an assessment has been considered and if not performed, reasons why are provided;

*Exception: Evidence is not required for this item if the preexisting facility was built prior to national or sub-national requirements for consultation or previously exempt for another reason, for example size of facility.*

- 4) A monitoring plan has been considered to monitor all of the stressors of potential environmental impacts addressed by this standard such that:

- i) There is proof that a monitoring plan is in place that monitors these stressors;  
or

- ii) If no monitoring plan is in place or if the monitoring plan is incomplete, there is proof that such a plan has been considered and if it was not pursued, reasons why are provided;

- 5) An appropriate waste management plan is in place for the proper waste minimization, re-use, sorted recycling and/or safe disposal of all solid waste resulting from the construction, generation and end of life phases of the electricity generation;

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- c) Be generated in a manner that:
- 1) All steps of the process, including the disposal of waste products arising therefrom, will meet the requirements of all applicable governmental acts, by laws and regulations in the jurisdiction where generation takes place;
  - 2) Is reliable and practical (i.e., not in research and development stage but actually generating electricity);
  - 3) An appropriate water management plan is in place for ancillary water uses if water is used during generation activities. This plan must include, where appropriate, water conservation and water quality considerations;
  - 4) It is only attributable to:
    - i) The proportion of fuel heat input that is an eligible renewable low-impact source of power as defined by this standard; and
    - ii) The net value of renewable low-impact electricity produced (i.e., fossil fuels or grid power cannot be used to directly generate renewable low-impact electricity);
  - 5) It will not jeopardize the survival or recovery of any species designated as endangered or threatened; and
- d) Be generated in the same calendar year, the first three months of the following calendar year and the last six months of the previous calendar year in which this REC or bundled renewable low-impact electricity product is sold.

## TECHNOLOGY-SPECIFIC GENERATION REQUIREMENTS

### 7 General

7.1 To meet the requirements of this standard, a REC and a bundled renewable low-impact electricity product shall also initially be derived from renewable low-impact electricity that meet the technology-specific generation requirements and associated definitions in this standard.

## 8 Biogas-Fuelled Electricity

8.1 The total of load points assessed for operational air emissions of carbon monoxide (CO), particulate matter (PM), nitrogen oxides (NO<sub>x</sub>, measured as NO<sub>2</sub>) and sulphur oxides (SO<sub>x</sub>, measured as SO<sub>2</sub>), as determined in Section 30, Load Point Calculation, shall not exceed 6.

8.2 For farm and food/feed-based biogas systems:

- a) Best practices applicable to local conditions for nutrient management of agricultural materials must be followed; and
- b) The project's nutrient management plan must show how by-product P and N will be beneficially used, and not allowed to contribute to eutrophication where this could become an adverse effect.

## 9 Biomass-Fuelled Electricity

9.1 The total of load points assessed for operational air emissions of carbon monoxide (CO), particulate matter (PM), nitrogen oxides (NO<sub>x</sub>, measured as NO<sub>2</sub>) and sulphur oxides (SO<sub>x</sub>, measured as SO<sub>2</sub>), as determined in Section 30, Load Point Calculation, shall not exceed 6.

9.2 Biomass from species that are listed in the CITES Appendices shall not be used.

9.3 Electricity generated in recovery or power boilers from biomass fuel containing salt-laden wood, de-inking sludge or spent pulping liquors – the facility must not emit, in the exhaust gases, polychlorinated dioxins and/or furans in excess of the limits for new or rebuilt pulp and paper boilers burning salt-laden wood as specified in the laws and regulations of the jurisdiction in which the facility operates.

9.4 Electricity generated from solid biomass, harvesting and industrial by-product residues, or dedicated energy crops:

- a) These feedstocks must have been sourced from operations that have implemented a sound environmental management system and are adhering to sound environmental management practices;
- b) Full disclosure of certified content must be provided where forest management certification documentation is submitted to prove compliance that a sound environmental system has been implemented and that sound environmental practices are being followed;
- c) Forests must not be converted to plantations or non-forests except in very limited areas, when the forest is not a High Conservation Value Forest, and when the change leads to long-term conservation benefits;
- d) Rates of harvest that do not exceed levels that can be sustained must be ensured;
- e) No land must have been deforested and peatland drained for the purpose of growing non-woody crops; and
- f) Genetically modified biomass sources must not be used.

## 10 Geothermal-Powered Electricity

*[Note – See Appendix B for additional information]*

10.1 When a facility does not re-inject all spent geothermal fluids underground, best practices applicable to effluent management and discharge quality shall be followed.

10.2 When a facility re-injects spent geothermal fluids underground, it shall not contaminate the surrounding surface water and groundwater outside of the well waters.

10.3 All discharges to surface water shall meet drinking water quality guideline levels.

10.4 Engineered solutions shall be incorporated to avoid the leakage of acidic fluids to groundwater during the acid treatment of wells.

10.5 Mercury and hydrogen sulfide air emissions shall be controlled following best practices and shall not exceed applicable health standard levels.

10.6 Hazardous solid waste shall be properly stored on-site and contained before final treatment and disposal at an appropriate hazardous waste facility.

10.7 Recoverable solids such as sulfur cake shall be recycled to the extent feasible.

10.8 Drill cutting and fluids shall be stored in tanks or sump lines with an impervious membrane, and shall be re-used where feasible or disposed at appropriate hazardous waste sites.

10.9 The facility shall not be sited in a way that creates unacceptable health risks due to air or water emissions to nearby communities.

## 11 Water-Powered Electricity

### 11.1 General

11.1.1 The generation facility shall operate in compliance with all regulatory licenses and requirements, and/or other authorizations pertaining to fisheries without regard to waivers or variances that may be granted or authorized.

11.1.2 The generation facility shall not operate under any authorization with terms and conditions allowing the harmful alteration, disruption or destruction of fish habitat unless:

- a) Such harmful alteration, disruption or destruction is not affecting the limiting factor controlling productive capacity, and;
- b) Habitat compensation is implemented such that loss of the affected habitat is replaced by the creation of similar habitat, supporting the same stock, at or near the development site within the same ecological unit such that the created habitat replaces lost productive capacity, within an approved safety factor.<sup>i</sup>

<sup>i</sup>For facilities located in Canada, these conditional authorizations include those issued under Section 35(2) of the Fisheries Act, by the Minister of Fisheries and Oceans or under regulations made by Governor in Council under the Fisheries Act.

## 11.2 Hydro-Powered Electricity

11.2.1 Hydro-powered electricity generation facilities shall, within practical limits and subject to regulatory direction and approval, ensure that plant operations are coordinated with any other water-control facilities that influence water levels and/or flows operating on the same waterway, in order to mitigate impacts and protect indigenous species and the habitat upon which they depend.

11.2.2 Hydro-powered electricity generation facilities shall, as a maximum, cause as much water to flow out of the head pond as is received in any 48-hour period.

*Exception: In cases where this particular criterion cannot be met, compliance with this standard can still be achieved if the applicant submits evidence that indicates those hydrological and ecological components key to sustainability of the surrounding watershed are maintained. As a minimum, this evidence must include environmental impact assessments and documentation from a formal public consultation process. In cases where neither of the above conditions is met, the applicant can opt to apply to a multi-stakeholder and public Electricity Review Process to demonstrate equal or lower adverse environmental impacts.*

11.2.3 Hydro-powered electricity generation facilities shall operate such that reduced water flows in the bypassed reach and reaches downstream of diversion dams and/or dykes are not detrimental to indigenous aquatic and riparian species.

11.2.4 Hydro-powered electricity generation facilities shall operate such that instream flows downstream of the tailrace are adequate to support downstream indigenous aquatic and riparian species at pre-project ranges.

11.2.5 Hydro-powered electricity generation facilities shall operate such that water quality in a head pond, a bypassed reach, reaches downstream of the tailrace and reaches downstream of any diversion dams and/or dykes remains comparable to pre-project quality in unaltered bodies of water or waterways within the local watershed.

11.2.6 Hydro-powered electricity generation facilities shall operate such that any changes in water temperature caused by the facility in the head pond or in reaches downstream of the tailrace or downstream of any diversion dams and/or dykes are not detrimental to indigenous aquatic species.

11.2.7 Hydro-powered electricity generation facilities shall provide fish passage when necessary for the purpose of maintaining pre-existing migration patterns for fish communities both upstream and downstream where a human-made structure is placed across a waterway where no natural barriers exist.

11.2.8 Hydro-powered electricity generation facilities shall provide any measures (including among other things trash racks, oversized intake structures designed to slow intake velocities, underwater strobe and sound, fish screens) necessary to minimize fish mortality that would occur through impingement and entrainment.

11.2.9 Hydro-powered electricity generation facilities shall operate in compliance with all regulatory licenses, regulatory requirements and/or other authorizations regarding water levels and flows, without regard to waivers or variances that may be granted or authorized.



### **11.3 Tidal, Wave, and In-Stream-Powered Electricity**

11.3.1 Paragraph 11.1.2 items (a) and (b) shall be applied to marine mammal habitat.

11.3.2 Generation activities shall not cause significant adverse effects on the fundamental hydrodynamic processes of a tidal or wave regime (energy flow, erosion, sediment transportation, and deposition) or on biological processes.

## **12 Wind-Powered Electricity**

### **12.1 General**

12.1.1 Impacts from the generating facility and its structures on indigenous or migratory avian and bat species shall be minimized and mitigated.

12.1.2 The generation facility and its structures shall not be located in an area that is protected for avian and bat species designated as endangered or threatened.

12.1.3 Wind power generators are required to conduct migratory studies to evaluate the location of their facility in relation to migratory avian and bat species. When it is determined that the facility is in a migratory flyway and poses a reasonable risk to these animals, the facility owner must evaluate the various methods to protect such migratory species.

### **12.2 Onshore wind power generators**

12.2.1 Construction activities or routine wind turbine operations shall 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.

12.2.2 Excavated soil replaced, and uprooted vegetation replanted, after construction or scrapping, when this can be done without interfering with the operation and servicing of the wind generation facility.

### **12.3 Offshore wind power generators**

12.3.1 Negative impacts to indigenous and migratory marine mammal, fish, and shellfish species shall be minimized and mitigated.

12.3.2 The generation facility and its structures shall not be located in an area that is protected for marine mammal, fish and shellfish designated as endangered or threatened.

### 13 Solar-Powered Electricity

13.1 To meet the requirements of this standard, solar-powered electricity shall be generated in such a manner that adequate arrangements (i.e., financial reserves) have been made for the proper disposal and/or recycling of all solid waste resulting from the manufacturing of solar cells and of the generation of electricity, including the disposal of batteries and machinery or equipment used in the generation process itself, that contains measurable levels of cadmium.

### NON-GENERATION REQUIREMENTS

#### 14 General

14.1 To meet the requirements of this standard, a REC and a bundled renewable low-impact electricity product shall be managed in accordance with Sections 15 – 18 as applicable.

#### 15 A Generator, a Broker and a Marketer

15.1 A generator, a broker and a marketer shall:

- a) Not base such a product on planned generation facilities;
- b) Not sell, market or otherwise transfer such a product if it has already been retired;
- c) Sell, broker or otherwise transfer this product in blocks of at least 0.1 REC, 0.1 MWh per month or 0.1 MWh on a one-time use basis (this represents approximately 17% of the electricity used by an average household). One-time uses include amongst other things for trade shows, conferences, receptions and other events;
- d) Not contribute to the double counting of such a product. For instance, a generator, a broker and a marketer shall:
  - 1) Represent such a product in a way that it must not be double counted;
  - 2) Not sell such a single product to multiple buyers; and
  - 3) Not retire such a single product to meet multiple regulatory (e.g., renewable portfolio standards) or voluntary program requirements (e.g., institutional or company procurement policies, residential customer renewable low-impact electricity purchasing programs, and in certain instances, voluntary GHG trading programs). Such a single product must only be retired to fulfill one regulatory or voluntary program requirement.
- e) Provide product disclosure information along with such a product which:
  - 1) At minimum, is provided yearly to a product recipient end-user or marketer through contracts, pre-purchase contracts included;
  - 2) Can be presented as a label, official certificate, information pamphlet and/or website information. A copy of all product disclosure and/or explanatory wording in its final format for release or publication must be provided to the certifying organization upon request; and
  - 3) Includes the following minimum information:

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- i) A description of what a REC or bundled renewable low-impact electricity product is;
- ii) The date(s) of initial operation or repowering of the electricity facilities from which the product was derived. The age profile of the product can be represented by a range (e.g., "This product is from renewable low-impact electricity facilities that first came into operation between 1900-2007");
- iii) The percentage of new renewable low-impact electricity product content (e.g., "This product contains 50% new low-impact renewable electricity.");
- iv) The net quantity (in MWhs) of renewable low-impact electricity from which the product was initially derived;
- v) The physical location from where the product was derived and initially produced (i.e., the province or state, and country of the renewable low-impact electricity facility);
- vi) The detailed resource(s) used to generate the product such as whether it is derived from: biomass, biogas, hydro, tidal, wave, wind, geothermal or solar power, and the percentages of each resource used in the initial renewable low-impact generation (e.g., "this product was derived from 50% wind and 50% solar power.") In such cases where resources are prone to fluctuations, a range representing the worst and best case scenarios anticipated must be provided (e.g., "If the wind blows as anticipated, this product will contain 25% wind and 75% biomass. If the wind does not blow, this product will contain 100% biomass"); and
- vii) The standard version under which the product maintains certification (e.g., standard designation, edition number, date).

## 16 A Generator, a Broker, a Marketer and an End-user

### 16.1 A generator, a broker, a marketer and an end-user shall:

- a) Include in this product all of the environmental benefits, including greenhouse gas emissions benefits, attributable to the initial renewable low-impact electricity at the point of generation to the full extent possible based on current legal requirements. For instance, where legally possible, only indirect GHG emissions from the consumption of purchased electricity are quantitatively included in the REC;
- b) Base such a product amount on the actual associated amount of net renewable low-impact electricity from which this product was initially derived and not on the generation facility's capacity, and;
- c) Not make claims about the renewable, low-impact, and social, premium economic and environmental attributes related to the initial renewable low-impact electricity generation of such a single product if all RECs have been separated from such product because, in such a case, this product no longer contains renewable low-impact electricity attributes and is considered null electricity.

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## 17 A Generator, a Marketer and an End-user

17.1 A generator, a marketer and an end-user shall not retire such a single product or have it retired on its behalf more than once.

## 18 An End-user

18.1 An end-user shall:

- a) Not market, sell or otherwise transfer such a single product, and;
- b) Be the only user permitted to make claims about bundled renewable low-impact electricity usage or REC purchases for self-promotion purposes. This includes in any printed, electronic or broadcast materials.

## BUNDLED RENEWABLE LOW-IMPACT ELECTRICITY PRODUCT REQUIREMENTS

### 19 General

19.1 Along with all the General Requirements outlined above, to meet the requirements of this standard, a bundled renewable low-impact electricity product shall comply with Sections 20 – 22 as applicable.

### 20 A Generator, a Broker and a Marketer

20.1 A generator, a broker and a marketer shall only sell or otherwise transfer such a product while representing it as “renewable low-impact electricity” or “green electricity” when the initial renewable low-impact electricity from which its associated REC product was derived was part of the same or neighboring regional power pool as where the end-user is consuming the bundled renewable low-impact electricity product. The associated grid power to which a REC is bundled must also come from the same or neighboring power pool.

### 21 A Generator, a Broker, a Marketer and an End-user

21.1 A generator, a broker, a marketer and an end-user shall not:

- a) Contribute to the double counting of such a product. For instance, a generator, a broker, a marketer and an end-user must not both consume such a single product and sell or otherwise transfer this same product; nor
- b) Derive this product from an off-grid renewable low-impact electricity generating facility or from an islanded grid.

## 22 An End-user

### 22.1 An end-user:

- a) Shall only consume a single bundled renewable low-impact electricity product one time. Once used, such a product is considered retired and it must no longer be consumed by anyone, sold, passed on, or donated to any entity;
- b) Shall retire a REC product associated to the bundled renewable low-impact electricity or have it retired of its behalf once this end-user has consumed this bundled renewable low-impact electricity product. Once retired, this REC must no longer be part of any other bundled renewable low-impact electricity product, and must not be transferred to another entity; and
- c) Shall only make claims about:
  - i) Consuming bundled renewable low-impact electricity commensurate to the bundled renewable low-impact electricity purchased and consumed by such an end-user; and
  - ii) The use of a bundled renewable-low impact electricity product one time only when a recipient of this product. Once claimed as used, such a product is considered retired and it must no longer be used by anyone, sold, passed on, or otherwise transferred to any entity.

## RENEWABLE ENERGY CERTIFICATE (REC) PRODUCT REQUIREMENTS

### 23 General

23.1 Along with all the General Requirements outlined above, a REC product shall also be managed in a way that complies with Sections 24 – 26, as applicable.

### 24 A Generator, a Broker and a Marketer

24.1 A generator, a broker, and a marketer shall not:

- a) Contribute to the double counting of such a product. For instance, a generator, a broker, a marketer and an end-user must not both consume such a single product and sell or otherwise transfer this same product; nor:
  - i) When a marketer is making claims about their ownership of this product while marketing them to potential buyers in any printed, electronic or broadcast material (e.g., "We have RECs for sale"); and
  - ii) When a broker is making claims about this product in any printed, electronic or broadcast material for the purpose of passing on its ownership of this product from a buyer to a seller (e.g., "We can put you in contact with a REC seller who has X amount of RECs for sale"); and
- b) Attach such a product to the grid mix outside of a particular or neighboring power pool and sell or otherwise transfer it as "renewable low-impact electricity." These products can only be represented as RECs.

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## 25 A Generator, a Broker, a Marketer and an End-user

25.1 A generator, a broker, a marketer and an end-user can derive this product from an off-grid renewable low-impact electricity generating facility or from an islanded grid.

## 26 An End-user

26.1 An end-user shall only claim the purchase of a REC product that cannot be bundled commensurate to this purchase for self-promotion purposes when an owner of this product. An example of such a claim includes: "Our company X has supported renewable low-impact electricity generation by purchasing of Y {issuing agency's} RECs this month (or other precise time period)." Once such a claim has been made, such a product is considered retired and it can no longer be transferred to any entity.

## AIR EMISSIONS TESTING FREQUENCY, CONDITIONS AND ACCEPTABLE METHODS

### 27 Testing Conditions, Frequency, and Methods

27.1 Tables 27.1 and 27.2 shall be used to determine testing conditions and testing methods.

**Table 27.1  
Testing Conditions**

Compound/Pollutant	Testing Conditions
Carbon monoxide (CO), Nitrogen oxides (NO <sub>x</sub> ), Particulate matter (PM), Sulphur oxides (SO <sub>x</sub> )	Conditions: Testing must be performed at operational load. Emissions for load point values must be determined from the concentration measurements (ppm (v/v) converted to mg/m <sup>3</sup> at 25°C) and flow rate (dry basis at 101.3 kPa and 25°C ) in the duct or stack.

**Table 27.2  
Testing Methods**

Compound / Pollutant	Testing Methods
Carbon monoxide (CO)	<ul style="list-style-type: none"> <li>i. Reference Method for the Monitoring of Gaseous Emissions from Fossil Fuel-fired Boilers, Reference Method EPS 1/RM/15, September 1990; or</li> <li>ii. Continuous Emissions Monitoring (CEMS) Code (REF. 107), Alberta Environment; or</li> <li>iii. Method 10, Determination of Carbon Monoxide Emissions from Stationary Sources, in the Alberta Stack Sampling Code (REF. 89), Alberta Environment</li> <li>iv. EPA Method 10 – Determination of carbon monoxide emissions from stationary sources; or</li> <li>v. EPA Method 10B – CO from Stationary Sources, Determination of carbon monoxide emissions from stationary sources; or</li> <li>vi. State of California Air Resources Board (CARB) Reference Method 10 for the Determination of Carbon Monoxide Emissions from Stationary Sources.</li> </ul>

Table 27.2 Continued

Compound / Pollutant	Testing Methods
Nitrogen oxides (NO <sub>x</sub> ) measured as NO <sub>2</sub>	<ul style="list-style-type: none"> <li>i. Method 7E, Determination of Nitrogen Oxide Emissions from Stationary Sources, in the Alberta Stack Sampling Code (REF. 89), Alberta Environment; or</li> <li>ii. Continuous Emissions Monitoring (CEMS) Code (REF. 107), Alberta Environment; or</li> <li>iii. EPA Method 7 – Nitrogen Oxide (NO<sub>x</sub>), Determination of nitrogen oxide emissions from stationary sources; or</li> <li>iv. EPA Method 7A – NO<sub>x</sub>, Determination of nitrogen oxide emissions from stationary sources (Ion Chromatographic Method); or</li> <li>v. EPA Method 7B, Determination of nitrogen oxide emissions from stationary sources (Ultraviolet spectrophotometric method); or</li> <li>vi. EPA Method 7C, Determination of nitrogen oxide emissions from stationary sources (alkaline permanganate/colorimetric method); or</li> <li>vii. EPA Method 7D, Determination of nitrogen oxide emissions from stationary sources (alkaline-permanganate/ion chromatographic method); or</li> <li>viii. EPA Method 7E, Determination of nitrogen oxides emissions from stationary sources (instrumental analyzer procedure).</li> </ul>
Particulate matter (PM)	<ul style="list-style-type: none"> <li>i. Reference Method for Source Testing: Measurement of Releases of Particulate from Stationary Sources, Reference Method EPS 1/RM/8; or</li> <li>ii. Method 5, Determination of Particulate Emissions from Stationary Sources, in the Alberta Stack Sampling Code (REF. 89), Alberta Environment; or</li> <li>iii. EPA Method 5, Determination of particulate matter emissions from stationary sources</li> </ul>
Sulphur oxides (SO <sub>x</sub> ) measured as SO <sub>2</sub>	<ul style="list-style-type: none"> <li>i. Continuous Emissions Monitoring (CEMS) Code (REF. 107), Alberta Environment; or</li> <li>ii. Method 6C, Determination of Sulphur Dioxide Emissions from Stationary Sources, in the Alberta Stack Sampling Code (REF. 89), Alberta Environment; or</li> <li>iii. EPA Method 6, Determination of sulfur dioxide emissions from stationary sources; or</li> <li>iv. EPA Method 6C, Determination of sulfur dioxide emissions from stationary sources (instrumental analyzer procedure); or</li> <li>v. EPA Approved alternative method Alt-001, SO<sub>2</sub> interference in methods 7 and 7A.</li> </ul>
Velocity and Volumetric Flow Rate	<ul style="list-style-type: none"> <li>i. Method B – Determination of Velocity and Volumetric Flow Rate of Flue Gases, from Reference Method for Source Testing: Measurement of Release of Particulate from Stationary Sources (EPS 1/RM/8); or</li> <li>ii. Method 2, Determination of stack gas velocity and volumetric flow rate (types pitot tube); or</li> <li>iii. Method 1, Sample and velocity traverses for stationary sources.</li> </ul>

## LOAD POINT DETERMINATION

### 28 General

28.1 The process used to determine the load points for operational air emissions in this standard is based on a matrix of four environmental air emission parameters, each with a range of values based on actual industry performance. Each level of performance is assigned a specific load point value, and points are then totaled over all parameters. Products with different environmental profiles will thus be able to qualify under this standard. The allowable number of points has been set such that, while tradeoffs between parameters is possible, very poor performance in any one parameter will disqualify a generation facility as a supplier of electricity meeting the requirements of this standard.

28.2 The four parameters used to evaluate electricity generation under this standard are carbon monoxide (CO), particulate matter (PM), nitrogen oxides (NO<sub>x</sub>) and sulphur oxides (SO<sub>x</sub>). Load point calculations will be based on measured air emissions quantities of these compounds released as a result of only those operations directly used to generate electricity. The air emission measurements must represent annual emissions normalized to a per MWh basis, and include more than one datum point.

28.3 Measured emissions data and the quantity of annual electricity generated must be documented as shown in Section 29, Measured Data, and load points must then be determined by using Section 30, Load Point Calculation. The load point for each compound must be taken from the top of each column corresponding to the emissions range for that compound's kilogram per MWh value.

## 29 Measured Data

### 29.1 Using Table 29.1:

- a) Enter the Annual Quantity of Electricity Generated (in MWh) by the generation facility. This quantity must be measured net of all parasitic loads from the generation facility, and net of transformer and line losses up to the point of connection to the utility grid or the user's system (if directly connected).
- b) Enter the Annual Measured Quantity of CO, PM, NO<sub>x</sub> (measured as NO<sub>2</sub>) and SO<sub>x</sub> (measured as SO<sub>2</sub>) emitted (in kilograms), noting that appropriate test methods and the prescribed frequency and conditions of testing are provided in Section 27, Testing Conditions, Frequency, and Methods 1 for each compound.
- c) Determine the Annual Measured Quantity per MWh of CO, PM, NO<sub>x</sub> (measured as NO<sub>2</sub>) and SO<sub>x</sub> (measured as SO<sub>2</sub>) emitted (in kilograms per MWh). These values will be used in the Load Point Calculations, Section 30.

**Table 29.1**  
**Measured data**

Annual Electricity Generation (in MWh)	Compound	Annual Measured Quantity (in kg)	Annual Measured Quantity per MWh (in kg/MWh)



### 30 Load Point Calculation

30.1 Assign the load point value to each compound by taking the value at the top of each column corresponding to the emissions range for that compound's kilogram per megawatt-hour value determined in Section 29.

30.2 Determine the Total Load Points by summing the four individual load point values. See Table 30.1.

**Table 30.1**  
**Load Points**

Compound	Load Points					Assigned Load Points
	0	1	2	3	4	
CO	≤ 2.15 kg/MWh	2.151 – 3.22 kg/MWh	3.221 – 4.30 kg/MWh	4.301 – 5.37 kg/MWh	> 5.371 kg/MWh	
PM	≤ 0.23 kg/MWh	0.24 – 0.39 kg/MWh	0.40 – 0.52 kg/MWh	0.53 – 0.65 kg/MWh	> 0.66 kg/MWh	
NO <sub>x</sub> (as NO <sub>2</sub> )	≤ 0.77 kg/MWh	0.78 – 1.2 kg/MWh	1.3 – 1.5 kg/MWh	1.6 – 1.9 kg/MWh	> 2.0 kg/MWh	
SO <sub>x</sub> (as SO <sub>2</sub> )	≤ 0.6 kg/MWh	0.7 – 0.9 kg/MWh	1.0 – 1.2 kg/MWh	1.3 – 1.5 kg/MWh	> 1.6 kg/MWh	
<b>TOTAL LOAD POINTS</b>						

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## APPENDIX A

### A1 External References

#### Alberta Environment and Sustainable Resource Development

*Alberta Stack Sampling Code (REF. 89) –*  
<http://www.environment.alberta.ca/01588.html>

*Continuous Emissions Monitoring (CEMS) Code (REF. 107) –*  
<http://environment.alberta.ca/01003.html>

#### Committee on the Status of Endangered Wildlife in Canada (COSEWIC)

*Committee on the Status of Endangered Wildlife in Canada –*  
<http://www.cosewic.gc.ca/>

#### Environment Canada

*Reference Method for Source Testing: Measurement of Releases of Particulate from Stationary Sources, EPS 1/RM/8 –*  
<http://ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=CBA5BD1D-1>

#### Forest Stewardship Council (FSC)

*Forest Stewardship Council –*  
<https://ic.fsc.org/>

#### International Finance Corporation

*Environmental, Health and Safety Guideline for Geothermal Power Generation –*  
<http://www.ifc.org/wps/wcm/connect/329e1c80488557dabe1cfe6a6515bb18/Final%2B-%2BGeothermal%2BPower%2BGeneration.pdf?MOD=AJPERES&id=1323161975166>

#### International Organisation for Standardisation

*ISO 14000 Series –*  
<http://www.iso.org/iso/iso14000>

#### International Union for the Conservation of Nature

*Red List of Threatened Species –*  
<https://www.iucn.org/resources/conservation-tools/iucn-red-list-threatened-species>

#### State of California Air Resources Board (CARB)

*Method 10 - Determination of Carbon Monoxide Emissions from Stationary Sources –*  
[http://yosemite.epa.gov/R9/R9Testmethod.nsf/0/ECE75212F2C55E76882570CE00613513/\\$file/Meth10\\_clean.pdf](http://yosemite.epa.gov/R9/R9Testmethod.nsf/0/ECE75212F2C55E76882570CE00613513/$file/Meth10_clean.pdf)

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**Sustainable Forestry Initiative (SFI)**

*Sustainable Forestry Initiative* –  
<http://www.sfiprogram.org/>

**U.S. Environmental Protection Agency (EPA)**

*Approved alternative method Alt-001, SO<sub>2</sub> interference in methods 7 and 7A* –  
<http://www.epa.gov/ttn/emc/approalt/alt-001.pdf>

*Greenhouse Gases Overview* –  
<https://www.epa.gov/ghgemissions/overview-greenhouse-gases>

*Method 1, Sample and velocity traverses for stationary sources* –  
[http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&TPL=/ecfrbrowse/Title40/40cfr60\\_main\\_02.tpl](http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&TPL=/ecfrbrowse/Title40/40cfr60_main_02.tpl)

*Method 2, Determination of stack gas velocity and volumetric flow rate (types pitot tube)* –  
[http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&TPL=/ecfrbrowse/Title40/40cfr60\\_main\\_02.tpl](http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&TPL=/ecfrbrowse/Title40/40cfr60_main_02.tpl)

*Method 5, Determination of particulate matter emissions from stationary sources* –  
<http://www.epa.gov/ttn/emc/methods/method5.html>

*Method 6, Determination of sulfur dioxide emissions from stationary sources* –  
<http://www.epa.gov/ttnemc01/promgate/m-06.pdf>

*Method 6C, Determination of sulfur dioxide emissions from stationary sources (instrumental analyzer procedure)* –  
<http://www.epa.gov/ttnemc01/promgate/method6C.pdf>

*Method 7, Determination of nitrogen oxide emissions from stationary sources* –  
<http://www.epa.gov/ttnemc01/promgate/m-07.pdf>

*Method 7A, Determination of nitrogen oxide emissions from stationary sources* –  
<http://www.epa.gov/ttnemc01/promgate/m-07a.pdf>

*Method 7B, Determination of nitrogen oxide emissions from stationary sources (Ultraviolet spectrophotometric method)* –  
<http://www.epa.gov/ttnemc01/promgate/m-07b.pdf>

*Method 7C, Determination of nitrogen oxide emissions from stationary sources (alkaline permanganate/colorimetric method)* –  
<http://www.epa.gov/ttnemc01/promgate/m-07c.pdf>

*Method 7D, Determination of nitrogen oxide emissions from stationary sources(alkaline-permanganate/ion chromatographic method)* –  
<http://www.epa.gov/ttnemc01/promgate/m-07d.pdf>

*Method 7E, Determination of nitrogen oxides emissions from stationary sources (instrumental analyzer procedure)* –  
<http://www.epa.gov/ttnemc01/promgate/method7E.pdf>

*Method 10, Determination of carbon monoxide emissions from stationary sources* –  
<http://www.epa.gov/ttnemc01/promgate/method10r06.pdf>

*Method 10B, CO from Stationary Sources, Determination of carbon monoxide emissions from stationary sources –*

<http://www.epa.gov/ttnemc01/promgate/m-10b.pdf>

*Particulate Matter (PM) Pollution –*

<https://www.epa.gov/pm-pollution/particulate-matter-pm-basics#PM>

### **U.S. Fish and Wildlife Service**

*Endangered Species Act –*

<http://www.fws.gov/ENDANGERED/laws-policies/index.html>

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## APPENDIX B

### B1 Informative Appendix

The information contained in this appendix is intended to assist in the interpretation and application of the normative requirements in the body of the requirements. The structure of this appendix is similar to that of the body of the standard. For instance, paragraph AD1.1 in this appendix would correspond to paragraph 1.1 in the body.

#### AD10 Geothermal-Powered Electricity

This Section is based on the International Finance Corporation's sections 1.1, 1.3 and 2.1 of the Environmental, Health and Safety Guideline for Geothermal Power Generation.

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## APPENDIX C

### C1 Informative Appendix Containing Requirements from PRC-018-1996

#### C1.1 General Requirements

C1.1.1 To be authorized to carry the Ecologo<sup>M</sup>, alternative source electricity generation must:

- a) Meet or exceed all applicable governmental and industrial safety and performance standards; and
- b) Be manufactured and transported in such a manner that all steps of the process, including the disposal of waste products arising therefrom, will meet the requirements of all applicable governmental acts, by laws and regulations including for facilities located in Canada, the *Fisheries Act* and the *Canadian Environmental Protection Act (CEPA)*.

#### C1.2 Product Specific Requirements

C1.2.1 To be authorized to carry the Ecologo, alternative source electricity generation must:

- a) Be generated by one of the following alternative source technologies:
  - i) Renewable energy recovery technologies (e.g. methane from sewage or landfills),
  - ii) Solar technologies (e.g. photovoltaics, solar water and air heating, specific building designs),
  - iii) Water technologies (e.g. generation of 20 MW or less, run-of-the-river facilities including advanced micro-hydro facilities),
  - iv) Wind technologies (e.g. turbines such as individual or small to medium wind farms), and
  - v) Other technologies which use media such as hydrogen, compressed air or fuel cells to control, store and/or converting renewable energy sources;
- b) Be reviewed by the ECP on a generating facility by generating facility basis prior to certification, including the submission of the following information:
  - i) The proposed generating facility,
  - ii) The proposed partners, if contracted by the generator,
  - iii) The generating technology to be used,
  - iv) The generating capacity in MW, and
  - v) Any environmental assessment studies or other equivalent reports which ensure the project will not disrupt an environmentally sensitive area.

C1.2.2 To be authorized to carry the Ecologo, facility owner/operator must:

- a) Vet all promotional, advertising, public relations and marketing copy, which use or refer to the Ecologo, through the ECP prior to use with a 48 hour vetting period guaranteed to the utility; and
- b) Not use the Ecologo and associated statements in promotional, advertising, public relations and marketing efforts to convey the message that:
  - i) The entirety of the owner's/operator's facilities are licensed by the ECP, and
  - ii) Electricity generation sources other than those officially licensed by the ECP are Ecologo certified; and
- c) Only use the Ecologo for that electricity or percentage of electricity purchased by a consumer(s) unless it can be proven to be generated by a licensed facility; proof shall constitute generation records and sales records.

### C1.3 Verification

C1.3.1 To verify a claim that a product meets the criteria listed in this document, the ECP will require access, as is its normal practice, to relevant quality control and production records and the right of access to production facilities on an announced basis.

C1.3.2 Compliance with requirement C1.1.1(b) shall be attested to by a signed statement of the Chief Executive Officer or the equivalent officer of the licensee. The ECP shall be advised in writing immediately by the licensee of any noncompliance, which may occur during the term of the license. On the occurrence of any noncompliance, the license may be suspended or terminated as stipulated in the license agreement.

### C1.4 Conditions for EcoLogo Use

C1.4.1 The EcoLogo may appear on wholesale or retail packaging, or on the product itself, provided that the product meets the requirements in this document.

C1.4.2 All licensees and authorized users must comply with the ECP's *Guide to Proper Use of the EcoLogo<sup>M</sup>* regarding the format and usage of the EcoLogo.

C1.4.3 Any accompanying advertising must conform with the relevant requirements stipulated in this guideline, the license agreement and the ECP's *Guide to Proper Use of the EcoLogo<sup>M</sup>*.

## APPENDIX D

### D1 Informative Appendix Containing Requirements from PRC-084-2000

#### D1.1 General Requirements

D1.1.1 To be authorized to carry the Ecologo<sup>M</sup>, the *renewable low-impact electricity* must:

- a) Meet or exceed all applicable governmental and industrial safety and performance standards; and
- b) Be manufactured and transported in such a manner that all steps of the process, including the disposal of waste products arising therefrom, will meet the requirements of all applicable governmental acts, by laws and regulations including, for facilities located in Canada, the *Fisheries Act* and the *Canadian Environmental Protection Act (CEPA)*.

#### D1.2 Product Specific Requirements

D1.2.1 To be authorized to carry the EcoLogo, the *renewable low-impact electricity* must:

- a) Be accompanied by evidence that appropriate consultation with communities and stakeholders has occurred, issues of concern have been reasonably addressed, and, where applicable, reasonable mitigation of negative impacts has been addressed;
- b) Be accompanied by evidence that prior to conflicting land use, biodiversity losses and scenic, recreational and cultural values have been addressed during project planning and development;
- c) Be generated in a manner that is reliable, non-temporary and practical (e.g. not in research and development stages, not for pilot-scale demonstration purposes only);
- d) In order to allow for conditions such as start-up, fuel stabilization and uneven fuel supply, be generated in a manner such that supplementary non-renewable fuels are used in no more than 2.00% of fuel heat input;
- e) Be generated in a manner such that no adverse impacts are created for any species recognized as endangered or threatened.

D1.2.2 To be authorized to carry the EcoLogo, the *renewable low-impact electricity* must be generated in such a manner that the generating facility:

- a) Operates in compliance with all regulatory licenses pertaining to fisheries including, for facilities located in Canada, the *Fisheries Act*;
- b) Operates in compliance with all regulatory licenses regarding water levels and flows;
- c) Within practical limits and subject to regulatory direction and approval, ensures that plant operations are coordinated with any other water-power facilities operating on the same waterway in order to mitigate impacts and protect indigenous species and habitat;
- d) As a maximum, causes as much water to flow out of the head pond as is received in any 48-hour period;

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- e) Operates such that reduced water flows in the bypassed reach and reaches downstream of diversion dams and/or dykes are not detrimental to indigenous aquatic and riparian species;
- f) Operates such that instream flows downstream of the tailrace are adequate to support downstream indigenous aquatic and riparian species at pre-project ranges;
- g) Operates such that water quality in a head pond, a bypassed reach, reaches downstream of the tailrace and reaches downstream of any diversion dams and/or dykes is comparable to that in similar free-flowing or unaltered bodies of water or waterways in the area;
- h) Operates such that any changes in water temperature caused by the facility in the head pond or in reaches downstream of the tailrace or downstream of any diversion dams and/or dykes are not detrimental to indigenous aquatic species;
- i) Where a human-made structure is placed across a waterway where no natural barriers exist, provides fish passage when necessary to ensure pre-existing migration patterns for maintaining fish communities both upstream and downstream; and
- j) Provides any measures (including *inter alia* trash racks, oversized intake structures designed to slow intake velocities, underwater strobe and sound, fish screens) necessary to minimize fish mortality that would occur through impingement and entrainment.

D1.2.3 To be authorized to carry the EcoLogo, the *water-powered alternative-use electricity* must be generated in a manner such that all applicable certification criteria and definitions in this document are met. The environmental impacts from the existing operation and the alternative-use process will be reviewed and allocated on a case-by-case basis. If the potential impacts from the existing operation are not fully considered or addressed within this document, but meet the intent of the document, proponents may consider application under the Panel Review Process.

D1.2.4 In order to sell ECP-certified electricity, marketers of *renewable low-impact electricity* must be appropriately licensed as a secondary licensee with the ECP. Furthermore, the licensed marketer must ensure that:

- a) As of August 01, 2000, a minimum of 20% of the ECP-certified electricity comes from Type II Facilities, while the remaining percentage comes from Type I Facilities; and
- b) As of August 01, 2002, a minimum of 50% of the ECP-certified electricity comes from Type II Facilities, while the remaining percentage comes from Type I Facilities.

### D1.3 Verification

D1.3.1 Ownership of all environmental benefits arising in association with the generation of ECP-certified electricity (including, *inter alia*, emission reductions, renewable energy credits, and environmentally-related tradable tags) will be transferred first to marketers and then to the final users of the ECP-certified electricity. This certification will be retained in any sale and/or transfer of the electricity only if the ownership of all environmental benefits is transferred to the marketer and final user. ECP-certification of the electricity will not be retained if this ownership is transferred to a party other than the marketer or final user, or is retained by the generator.

D1.3.2 ECP certification status is only available to electricity from ECP-complying generation facilities that are in operation, not electricity from planned generation facilities. Through a verification and auditing process, reconciliation measures will be implemented to ensure that sales levels of ECP-certified electricity do not exceed production/supply levels, and that ownership of all environmental benefits has been transferred appropriately.

D1.3.3 To verify a claim that a product meets the criteria in the document, the Environmental Choice Program will require access, as is its normal practice, to relevant quality control and production records and the right of access to production facilities on an unannounced basis.

D1.3.4 Compliance with sections D1.1.1(b), D1.2.2(a) and D1.2.2(b) shall be attested to by a signed statement of the Chief Executive Officer or the equivalent officer of the licensee. Compliance with sections D1.2.2(a) and D1.2.2(b) shall also be confirmed by an authorized representative of each applicable government body that has issued a license and/or operating permit for the facility. The ECP shall be advised in writing immediately by the licensee of any noncompliance which may occur during the term of the license. On the occurrence of any noncompliance, the license may be suspended or terminated as stipulated in the license agreement. In the event of a dispute related to the suspension or termination of the license, the license agreement provides for arbitration.

### D1.4 Conditions for EcoLogo Use

D1.4.1 The EcoLogo may appear in association with a product, provided that the product meets the requirements in this document.

D1.4.2 Only those components of a multi-sourced power product that fully satisfy all pertinent ECP certification and licensing criteria are allowed to be identified as “ECP-certified” and to carry the EcoLogo.

D1.4.3 A criteria statement must appear with the EcoLogo whenever the EcoLogo is used in association with the electricity. While the exact wording used in the criteria statement is left to the discretion of the licensee, the statement itself should provide clarification as to why the product was certified. The statement must not represent the product nor the reason it received certification, and must contain at least the following information:

- a) For generators, identification of the amount of ECP-certified electricity generated and/or marketed in quantitative units (e.g. kWh or MWh);
- b) For marketers, identification of the amounts of ECP-certified electricity received from generators and/or supplied to users as either percentages of larger multi-sourced power products or in quantitative units (e.g. kWh or MWh); and
- c) For users, identification of the amounts of ECP-certified electricity purchased/used as percentages of larger multi-sourced power products.

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D1.4.4 All licensees must comply with the Environmental Choice Program's *Guide to Proper Use of the EcoLogo<sup>M</sup>* regarding the format and usage of the EcoLogo.

D1.4.5 Any accompanying advertising must conform with the relevant requirements stipulated in this document, the license agreement and the Environmental Choice Program's *Guide to Proper Use of the EcoLogo<sup>M</sup>*.

## APPENDIX E

### E1 Informative Appendix Containing Requirements from CCD-003-2003

#### E1.1 General Requirements

E1.1.1 To meet the requirements of this Criteria document, the **electricity – renewable low-impact** must:

- a) Meet or exceed all applicable governmental, industrial safety and performance standards; and
- b) Be generated in such a manner that all steps of the process, including the disposal of waste products arising therefrom, will meet the requirements of all applicable governmental acts, by laws and regulations including, for facilities located in Canada, the Fisheries Act and the Canadian Environmental Protection Act, 1999, (CEPA, 1999).

#### E1.2 Product Specific Requirements

E1.2.1 To meet the requirements of this Criteria document, the **electricity – renewable low-impact** must:

- a) Be accompanied by evidence that appropriate consultation with communities and stakeholders has occurred, issues of concern have been reasonably addressed, and, where applicable, reasonable mitigation of negative impacts has been addressed;
- b) Be accompanied by evidence that prior or conflicting land use, biodiversity losses and scenic, recreational and cultural values have been addressed during project planning and development;
- c) Be accompanied by evidence that the project will not result in irreparable/unmitigable degradation or loss of the site's heritage, cultural, recreational and/or touristic values;
- d) Be generated in a manner that is reliable and practical (e.g. not in research and development stages, actually generating electricity);
- e) Be generated by only that proportion of fuel heat input attributed to eligible renewable sources in order to be designated as ECP-certified;
- f) Be generated in a manner such that no adverse impacts are created for any species designated as endangered or threatened; and
- g) Meet the criteria and associated definitions in this criteria document that are applicable to the generation technology employed.

E1.2.2 To meet the requirements of this criteria document, **alternative-use electricity** must be generated in such a manner that all applicable certification criteria and definitions in this criteria document are met. The environmental impacts from the existing operation and the alternative-use process will be reviewed and allocated on a case-by-case basis.

E1.2.3 To meet the requirements of this Criteria document, **biogas-fuelled electricity** must be generated in such a manner that the total of load points assessed for operational air emissions of carbon monoxide (CO), particulate matter (PM), nitrogen oxides (NO<sub>x</sub> measured as NO<sub>2</sub>) and sulphur oxides (SO<sub>x</sub> measured as SO<sub>2</sub>), as determined in E1.6, does not exceed 6. In cases where the biogas is used as a partial substitute in a generation facility that is designed to primarily utilize non-renewable fuels, load point calculations will be based only on those operational air emission values that can be allocated to the combustion of the biogas.

E1.2.4 To meet the requirements of this criteria document, **biomass-fuelled electricity** must be generated in such a manner that:

- a) The total of load points assessed for operational air emissions of carbon monoxide (CO), particulate matter (PM), nitrogen oxides (NO<sub>x</sub> measured as NO<sub>2</sub>) and sulphur oxides (SO<sub>x</sub> measured as SO<sub>2</sub>), as determined in E1.6, does not exceed 6;

In cases where the clean biomass is used as a partial substitute in a generation facility that is designed to primarily utilize non-renewable fuels, load point calculations will be based only on those operational air emission values that can be allocated to the combustion of the clean biomass.

- 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;

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/m<sup>3</sup>; 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); and

- d) If generated from dedicated energy crops:

i) Use only dedicated energy crops that have been sourced from operations that have implemented a sound environmental management system and are adhering to sound environmental management practices, and

ii) Ensure the rate of harvest does not exceed levels that can be sustained.



E1.2.5 To meet the requirements of this criteria document, **solar-powered electricity** must be generated in such a manner that adequate arrangements (i.e., financial reserves) have been made for the proper disposal or recycling of all solid waste resulting from the generation of electricity, including the disposal of equipment or machinery used in the generation process itself, that contains measurable levels of cadmium.

E1.2.6 To meet the requirements of this criteria document, **water-powered electricity** must be generated in such a manner that the generating facility:

- a) Operates in compliance with all regulatory licenses, regulatory requirements and/or other authorizations pertaining to fisheries (including, for facilities located in Canada, the *Fisheries Act*), without regard to waivers or variances that may be granted or authorized;
- b) Operates in compliance with all regulatory licenses, regulatory requirements and/or other authorizations regarding water levels and flows, without regard to waivers or variances that may be granted or authorized;
- c) Does not operate under any authorization with terms and conditions allowing the harmful alteration, disruption or destruction of fish habitat unless:
  - i) Such harmful alteration, disruption or destruction is not affecting the limiting factor controlling productive capacity,
  - ii) Loss of the affected habitat is compensated by the creation of similar habitat, supporting the same stock, at or near the development site within the same ecological unit such that the created habitat replaces lost productive capacity, within an approved safety factor.

For facilities located in Canada, these conditional authorizations include those issued under Section 35(2) of the *Fisheries Act*, by the Minister of Fisheries and Oceans or under regulations made by Governor in Council under the *Fisheries Act*.

- d) Within practical limits and subject to regulatory direction and approval, ensures that plant operations are coordinated with any other water-control facilities that influence water levels and/or flows operating on the same waterway, in order to mitigate impacts and protect indigenous species and the habitat upon which they depend;
- e) As a maximum, causes as much water to flow out of the head pond as is received in any 48-hour period;

In cases where this particular criterion cannot be met, the ECP will none-the-less consider certification if the applicant submits evidence that indicates those hydrological and ecological components key to sustainability of the surrounding watershed are maintained. As a minimum, this evidence must include environmental impact assessments and documentation from a formal public consultation process.

In cases where neither of the above conditions is met, the applicant can opt to apply to a multi-stakeholder and public Electricity Review Process to demonstrate equal or lower adverse environmental impacts.

- f) Operates such that reduced water flows in the bypassed reach and reaches downstream of diversion dams and/or dykes are not detrimental to indigenous aquatic and riparian species;

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- g) Operates such that instream flows downstream of the tailrace are adequate to support downstream indigenous aquatic and riparian species at pre-project ranges;
- h) Operates such that water quality in a head pond, a bypassed reach, reaches downstream of the tailrace and reaches downstream of any diversion dams and/or dykes remains comparable to pre-project quality in unaltered bodies of water or waterways within the local watershed;
- i) Operates such that any changes in water temperature caused by the facility in the head pond or in reaches downstream of the tailrace or downstream of any diversion dams and/or dykes are not detrimental to indigenous aquatic species;
- j) Where a human-made structure is placed across a waterway where no natural barriers exist, provides fish passage when necessary for the purpose of maintaining pre-existing migration patterns for fish communities both upstream and downstream; and
- k) Provides any measures (including *inter alia* trash racks, oversized intake structures designed to slow intake velocities, underwater strobe and sound, fish screens) necessary to minimize fish mortality that would occur through impingement and entrainment.

E1.2.7 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;
- c) 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
- d) 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.

### E1.3 Verification

E1.3.1 To meet the requirements of this criteria document, marketers of electricity must be able to demonstrate to the satisfaction of the Environmental Choice Program that the portion of their multisourced power product conforming to this criteria document incorporates a minimum of 50% Type II Electricity and/or Type III Electricity and a maximum of 50% Type I Electricity.

E1.3.2 ECP-certified electricity must be generated by facilities that are also certified and, therefore, meet the general and technology specific requirements of this criteria document. When this certified electricity is sold, the seller must make available upon demand the sources of generation and/or the Type or blend of Types of electricity being sold.

E1.3.3 The renewable low-impact electricity must have attached all of the relevant environmental benefits associated with its generation to the full extent possible based on current regulatory and legal requirements. In other words, the renewable low-impact electricity must include all of the environmental benefits associated with the offsetting of the same quantity of null electricity from the grid.

E1.3.4 Prior to being passed on, transferred or sold to the final end-use party, the environmental benefits or the electricity that generated them must not have been used to meet either regulatory or non-regulatory requirement / mandate, including *inter alia*:

- a) Cap-and-trade programs;
- b) Emissions control programs;
- c) Renewable portfolio standards;
- d) Air emission regulatory limits for the generating facility;
- e) Fulfilling procurement policies; or
- f) Calculating another company's or institution's portfolio mix.

E1.3.5 For an electricity product to meet the requirements of this criteria document, the rights to these benefits must either be:

- a) Passed on, transferred or sold to the customer as part of the electricity product in any transaction; or
- b) Retired by the marketer or seller of the certified electricity such that the environmental benefits may no longer be transferred to, sold to or donated on behalf of any other customer.

E1.3.6 These environmental benefits cannot be passed on, sold to or retired/donated on behalf of more than one customer.

E1.3.7 The decision to use (as part of the electricity consumption) or retire the benefits can only be made or agreed to by the customer.

E1.3.8 The customer can use or retire the environmental benefits one time only. Once the customer has consumed the electricity itself, the environmental benefits are automatically considered retired. Once used or retired, the benefits may no longer be used, sold, donated or claimed in any other way.

E1.3.9 Electricity products complying with this criteria document must originate from generation facilities operating in compliance with this criteria document, and cannot comprise electricity from planned generation facilities. Through a verification and auditing process, reconciliation measures will be implemented to ensure that sales levels of complying electricity product do not exceed production/supply levels.

E1.3.10 To verify a claim that a product meets the criteria listed in this document, the Environmental Choice Program and its agents will require access, as is its normal practice, to relevant quality control and production records and the right of access to production facilities on an unannounced basis. It is up to the applicant to provide sufficient information to allow verification of the claim that the facility is in conformity with the criteria documents. In particular, all documentation produced in the context of the environmental assessment of a facility for which certification is sought shall be made available to the ECP.

E1.3.11 Compliance with sections E1.1.1(b), E1.2.6(a) and E1.2.6(b) shall be attested to by a signed statement of the Chief Executive Officer or the equivalent officer of the licensee. Compliance with sections E1.2.6(a) and E1.2.6(b) shall also be confirmed by additional evidence including *inter alia* correspondence from the authorized representative of each applicable government body that has issued a license and/or operating permit for the facility. The Environmental Choice Program shall be advised in writing immediately by the licensee of any noncompliance, which may occur during the term of the license. On the occurrence of any noncompliance, the license may be suspended or terminated as stipulated in the license agreement. In the event of a dispute related to the suspension or termination of the license, the license agreement provides for arbitration.

#### **E1.4 Conditions for EcoLogo Use**

E1.4.1 Where compliance with this criteria document is established under the Environmental Choice Program, the EcoLogo may appear in association with a product, subject to the following conditions:

- a) Only those components of a multi-sourced power product that fully satisfy all pertinent ECP certification and licensing criteria are allowed to be identified as “ECP-certified” and to carry the EcoLogo; and
- b) A criteria statement must appear with the EcoLogo whenever the EcoLogo is used in association with the electricity during sales and related transactions. The criteria statement must also appear with the EcoLogo in other promotional activities and materials.

While the exact wording used in the criteria statement is left to the discretion of the licensee, the statement itself should provide clarification as to why the product was certified. The statement must not misrepresent the product nor the reason it received certification, and must contain at least the following information:

- i) For generators, identification of the amount of ECP-certified electricity generated and/or marketed in quantitative units (e.g. kWh or MWh);
- ii) For marketers, identification of the amounts of ECP-certified electricity received from generators and/or supplied to users as either percentages of larger multi-sourced power products or in quantitative units (e.g. kWh or MWh); and

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iii) For users, identification of the amounts of ECP-certified electricity purchased/used as either percentages of larger multi-sourced power products or in quantitative units (e.g. kWh or MWh).

E1.4.2 All licensees must comply with the Environmental Choice Program’s *Guide to Proper Use of the EcoLogo<sup>M</sup>* regarding the format and usage of the EcoLogo.

E1.4.3 Any accompanying advertising must conform with the relevant requirements stipulated in this Criteria document, the license agreement and the Environmental Choice Program’s *Guide to Proper Use of the EcoLogo<sup>M</sup>*.

**E1.5 Air Emissions Testing Frequency, Conditions and Methods**

Compound/Pollutant	Testing Conditions and Frequency
Carbon monoxide (CO), Nitrogen oxides (NO <sub>x</sub> ), Particulate matter (PM), Sulphur oxides (SO <sub>x</sub> )	<p>Frequency: As determined in the verification protocol negotiated between the Environmental Choice Program and the generator specifically for each facility.</p> <p>Conditions: Testing must be performed at operational load. Emissions for load point values must be determined from the concentration measurements (ppm (v/v) converted to mg/m<sup>3</sup> at 25°C) and flow rate (dry basis at 101.3 kPa and 25°C ) in the duct stack.</p>

Compound / Pollutant	Testing Methods
Carbon monoxide (CO)	<ul style="list-style-type: none"> <li>(i) <i>Reference Method for the Monitoring of Gaseous Emissions from Fossil Fuel-fired Boilers</i>, Reference Method EPS 1/RM/15, September 1990; or</li> <li>(ii) Continuous Emissions Monitoring (CEMS) Code (REF. 107), Alberta Environment; or</li> <li>(iii) <i>Reference Method for Source Testing: Measurement of Releases of Carbon Monoxide from Stationary Sources</i> (EPS 1/RM/4, 1990) in conjunction with <i>Reference Method for Source Testing: Measurement of Release of Particulate from Stationary Sources</i> (EPS 1/RM/8, 1993), both from Environment Canada; or</li> <li>(iv) Method 10, Determination of Carbon Monoxide Emissions from Stationary Sources, in the Alberta Stack Sampling Code (REF. 89), Alberta Environment.</li> </ul>
Nitrogen oxides (NO <sub>x</sub> ) measured as NO <sub>2</sub>	<ul style="list-style-type: none"> <li>(i) <i>Reference Method for the Monitoring of Gaseous Emissions from Fossil Fuel-fired Boilers</i>, Reference Method EPS 1/RM/15, September 1990; or</li> <li>(ii) Method 7E, Determination of Nitrogen Oxide Emissions from Stationary Sources, in the Alberta Stack Sampling Code (REF. 89), Alberta Environment; or</li> <li>(iii) Continuous Emissions Monitoring (CEMS) Code (REF. 107), Alberta Environment.</li> </ul>
Particulate matter (PM)	<ul style="list-style-type: none"> <li>(i) <i>Reference Method for Source Testing: Measurement of Releases of Particulate from Stationary Sources</i>, Reference Method EPS 1/RM/8, December 1993; or</li> <li>(ii) Method 5, <i>Determination of Particulate Emissions from Stationary Sources</i>, in the Alberta Stack Sampling Code (REF. 89), Alberta Environment.</li> </ul>
Sulphur oxides (SO <sub>x</sub> ) measured as SO <sub>2</sub>	<ul style="list-style-type: none"> <li>(i) <i>Reference Method for the Monitoring of Gaseous Emissions from Fossil Fuel-fired Boilers</i>, Reference Method EPS 1/RM/15, September 1990; or</li> <li>(ii) Continuous Emissions Monitoring (CEMS) Code (REF. 107), Alberta Environment; or</li> <li>(iii) <i>Reference Method for Source Testing: Measurement of Releases of Sulphur Dioxide from Stationary Sources</i>, Report EPS 1-AP-74-3, September 1975; or</li> <li>(iv) Method 6C, <i>Determination of Sulphur Dioxide Emissions from Stationary Sources</i>, in the Alberta Stack Sampling Code (REF. 89), Alberta Environment</li> </ul>
Velocity and Volumetric Flow Rate	Method B – Determination of Velocity and Volumetric Flow Rate of Flue Gases, from <i>Reference Method for Source Testing: Measurement of Release of Particulate from Stationary Sources</i> (EPS 1/RM/8, 1993)

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## E1.6 Load Point Determination

E1.6.1 The process used to determine the load points for operational air emissions in this criteria document is based on a matrix of four environmental air emission parameters, each with a range of values based on actual industry performance. Each level of performance is assigned a specific load point value, and points are then totalled over all parameters. Products with different environmental profiles will thus be able to qualify under this Criteria document. The allowable number of points has been set so that, while tradeoffs between parameters is possible, very poor performance in any one parameter will disqualify a generating facility as a supplier of electricity meeting the requirements of this Criteria document.

E1.6.2 The four parameters used to evaluate electricity generation under this Criteria document for ECP-certification are carbon monoxide (CO), particulate matter (PM), nitrogen oxides (NO<sub>x</sub>) and sulphur oxides (SO<sub>x</sub>). Load point calculations will be based on measured air emissions quantities of these compounds that are from measured emissions released as a result of only those operations directly used to generate electricity. The air emission measurements must represent annual emissions normalized to a per MWh basis, and include more than one datum point.

E1.6.3 Measured emissions data and the quantity of annual electricity generated should be documented in *Part 1: Measured Data*, and load points should then be determined by using *Part 2: Load Point Calculation*. The load point for each compound should be taken from the top of each column corresponding to the emissions range for that compound's kilogram per MWh value.

### PART 1: MEASURED DATA

- 1) Into the table, enter the Annual Quantity of Electricity Generated (in MWh) by the facility. This quantity should be measured net of all parasitic loads from the facility, and net of transformer and line losses up to the point of connection to the utility grid or the user's system (if directly connected).
- 2) Into the table, enter the Annual Measured Quantity of CO, PM, NO<sub>x</sub> (measured as NO<sub>2</sub>) and SO<sub>x</sub> (measured as SO<sub>2</sub>) emitted (in kilograms), noting that appropriate test methods and the prescribed frequency and conditions of testing are provided in E1.5 for each compound.
- 3) Determine the Annual Measured Quantity per MWh of CO, PM, NO<sub>x</sub> (measured as NO<sub>2</sub>) and SO<sub>x</sub> (measured as SO<sub>2</sub>) emitted (in kilograms per MWh). These values will be used in the Load Point Calculations in Part 2.

Annual Electricity Generation (in MWh)	Compound	Annual Measured Quantity (in kg)	Annual Measured Quantity per MWh (in kg/MWh)
	CO PM NO <sub>x</sub> (as NO <sub>2</sub> ) SO <sub>x</sub> (as SO <sub>2</sub> )		

## PART 2: LOAD POINT CALCULATION

1) Assign the load point value to each compound by taking the value at the top of each column corresponding to the emissions range for that compound's kilogram per megawatt-hour value determined in Part 1.

2) Determine the Total Load Points by summing the four individual load point values.

Compound	Load Points					Assigned Load Points
	0	1	2	3	8	
CO	< 2.15 kg/MWh	2.151 – 3.22 kg/MWh	3.221 – 4.30 kg/MWh	4.301 – 5.37 kg/MWh	> 5.371 kg/MWh	
PM	<0.228 kg/MWh	0.2281 – 0.387 kg/MWh	0.3871 – 0.516 kg/MWh	0.5161 – 0.645 kg/MWh	> 0.6451 kg/MWh	
NO <sub>x</sub> (as NO <sub>2</sub> )	< 0.77 kg/MWh	0.771 – 1.15 kg/MWh	1.151 – 1.52 kg/MWh	1.521 – 1.90 kg/MWh	> 1.901 kg/MWh	
SO <sub>x</sub> (as SO <sub>2</sub> )	< 0.141 kg/MWh	0.1411 – 0.212 kg/MWh	0.2121 – 0.282 kg/MWh	0.2821 – 0.352 kg/MWh	> 0.3521 kg/MWh	
<b>TOTAL LOAD POINTS</b>						

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## APPENDIX F

### F1 Informative Appendix Containing Requirements from CCD-003-2006

#### F1.1 General Requirements

F1.1.1 To meet the requirements of this Criteria document, the **electricity – renewable low-impact** must:

- a) Meet or exceed all applicable governmental, industrial safety and performance standards; and
- b) Be generated in such a manner that all steps of the process, including the disposal of waste products arising therefrom, will meet the requirements of all applicable governmental acts, by laws and regulations including, for facilities located in Canada, the Fisheries Act and the Canadian Environmental Protection Act, 1999, (CEPA, 1999).

#### F1.2 Product Specific Requirements

F1.2.1 To meet the requirements of this Criteria document, the **electricity – renewable low-impact** must:

- a) Be accompanied by evidence that appropriate consultation with communities and stakeholders has occurred, issues of concern have been reasonably addressed, and, where applicable, reasonable mitigation of negative impacts has been addressed;
- b) Be accompanied by evidence that prior or conflicting land use, biodiversity losses and scenic, recreational and cultural values have been addressed during project planning and development;
- c) Be accompanied by evidence that the project will not result in irreparable/unmitigable degradation or loss of the site's heritage, cultural, recreational and/or touristic values;
- d) Be generated in a manner that is reliable and practical (e.g. not in research and development stages, actually generating electricity);
- e) Be generated by only that proportion of fuel heat input attributed to eligible renewable sources in order to be designated as ECP-certified;
- f) Be generated in a manner such that no adverse impacts are created for any species designated as endangered or threatened; and
- g) Meet the criteria and associated definitions in this criteria document that are applicable to the generation technology employed.

F1.2.2 To meet the requirements of this criteria document, **alternative-use electricity** must be generated in such a manner that all applicable certification criteria and definitions in this criteria document are met. The environmental impacts from the existing operation and the alternative-use process will be reviewed and allocated on a case-by-case basis.

F1.2.3 To meet the requirements of this Criteria document, **biogas-fuelled electricity** must be generated in such a manner that the total of load points assessed for operational air emissions of carbon monoxide (CO), particulate matter (PM), nitrogen oxides (NO<sub>x</sub> measured as NO<sub>2</sub>) and sulphur oxides (SO<sub>x</sub> measured as SO<sub>2</sub>), as determined in F1.6, does not exceed 6. In cases where the biogas is used as a partial substitute in a generation facility that is designed to primarily utilize non-renewable fuels, load point calculations will be based only on those operational air emission values that can be allocated to the combustion of the biogas.

F1.2.4 To meet the requirements of this criteria document, **biomass-fuelled electricity** must be generated in such a manner that:

- a) The total of load points assessed for operational air emissions of carbon monoxide (CO), particulate matter (PM), nitrogen oxides (NO<sub>x</sub> measured as NO<sub>2</sub>) and sulphur oxides (SO<sub>x</sub> measured as SO<sub>2</sub>), as determined in F1.6, does not exceed 6;

In cases where the clean biomass is used as a partial substitute in a generation facility that is designed to primarily utilize non-renewable fuels, load point calculations will be based only on those operational air emission values that can be allocated to the combustion of the clean biomass.

- 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;

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/m<sup>3</sup>; 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); and

- d) If generated from dedicated energy crops:

i) Use only dedicated energy crops that have been sourced from operations that have implemented a sound environmental management system and are adhering to sound environmental management practices, and

ii) Ensure the rate of harvest does not exceed levels that can be sustained.

F1.2.5 To meet the requirements of this criteria document, **solar-powered electricity** must be generated in such a manner that adequate arrangements (i.e., financial reserves) have been made for the proper disposal or recycling of all solid waste resulting from the generation of electricity, including the disposal of equipment or machinery used in the generation process itself, that contains measurable levels of cadmium.

F1.2.6 To meet the requirements of this criteria document, **water-powered electricity** must be generated in such a manner that the generating facility:

- a) Operates in compliance with all regulatory licenses, regulatory requirements and/or other authorizations pertaining to fisheries (including, for facilities located in Canada, the *Fisheries Act*), without regard to waivers or variances that may be granted or authorized;
- b) Operates in compliance with all regulatory licenses, regulatory requirements and/or other authorizations regarding water levels and flows, without regard to waivers or variances that may be granted or authorized;
- c) Does not operate under any authorization with terms and conditions allowing the harmful alteration, disruption or destruction of fish habitat unless:
  - i) Such harmful alteration, disruption or destruction is not affecting the limiting factor controlling productive capacity,
  - ii) Loss of the affected habitat is compensated by the creation of similar habitat, supporting the same stock, at or near the development site within the same ecological unit such that the created habitat replaces lost productive capacity, within an approved safety factor.

For facilities located in Canada, these conditional authorizations include those issued under Section 35(2) of the *Fisheries Act*, by the Minister of Fisheries and Oceans or under regulations made by Governor in Council under the *Fisheries Act*.

- d) Within practical limits and subject to regulatory direction and approval, ensures that plant operations are coordinated with any other water-control facilities that influence water levels and/or flows operating on the same waterway, in order to mitigate impacts and protect indigenous species and the habitat upon which they depend;
- e) As a maximum, causes as much water to flow out of the head pond as is received in any 48-hour period;

In cases where this particular criterion cannot be met, the ECP will none-the-less consider certification if the applicant submits evidence that indicates those hydrological and ecological components key to sustainability of the surrounding watershed are maintained. As a minimum, this evidence must include environmental impact assessments and documentation from a formal public consultation process.

In cases where neither of the above conditions is met, the applicant can opt to apply to a multi-stakeholder and public Electricity Review Process to demonstrate equal or lower adverse environmental impacts.

- f) Operates such that reduced water flows in the bypassed reach and reaches downstream of diversion dams and/or dykes are not detrimental to indigenous aquatic and riparian species;

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- g) Operates such that instream flows downstream of the tailrace are adequate to support downstream indigenous aquatic and riparian species at pre-project ranges;
- h) Operates such that water quality in a head pond, a bypassed reach, reaches downstream of the tailrace and reaches downstream of any diversion dams and/or dykes remains comparable to pre-project quality in unaltered bodies of water or waterways within the local watershed;
- i) Operates such that any changes in water temperature caused by the facility in the head pond or in reaches downstream of the tailrace or downstream of any diversion dams and/or dykes are not detrimental to indigenous aquatic species;
- j) Where a human-made structure is placed across a waterway where no natural barriers exist, provides fish passage when necessary for the purpose of maintaining pre-existing migration patterns for fish communities both upstream and downstream; and
- k) Provides any measures (including *inter alia* trash racks, oversized intake structures designed to slow intake velocities, underwater strobe and sound, fish screens) necessary to minimize fish mortality that would occur through impingement and entrainment.

F1.2.7 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;
- c) 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
- d) 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.

### F1.3 Verification

F1.3.1 To meet the requirements of this criteria document, marketers of electricity must be able to demonstrate to the satisfaction of the Environmental Choice Program that the portion of their multi-sourced power product conforming to this criteria document incorporates a minimum of 50% Type II Electricity and/or Type III Electricity and a maximum of 50% Type I Electricity.

F1.3.2 ECP-certified electricity must be generated by facilities that are also certified and, therefore, meet the general and technology specific requirements of this criteria document. When this certified electricity is sold, the seller must make available upon demand the sources of generation and/or the Type or blend of Types of electricity being sold.

F1.3.3 The renewable low-impact electricity must have attached all of the relevant environmental benefits associated with its generation to the full extent possible based on current regulatory and legal requirements. In other words, the renewable low-impact electricity must include all of the environmental benefits associated with the offsetting of the same quantity of null electricity from the grid.

F1.3.4 Prior to being passed on, transferred or sold to the final end-use party, the environmental benefits or the electricity that generated them must not have been used to meet either regulatory or non-regulatory requirement / mandate, including *inter alia*:

- a) Cap-and-trade programs;
- b) Emissions control programs;
- c) Renewable portfolio standards;
- d) Air emission regulatory limits for the generating facility;
- e) Fulfilling procurement policies; or
- f) Calculating another company's or institution's portfolio mix.

F1.3.5 For an electricity product to meet the requirements of this criteria document, the rights to these benefits must either be:

- a) Passed on, transferred or sold to the customer as part of the electricity product in any transaction; or
- b) Retired by the marketer or seller of the certified electricity such that the environmental benefits may no longer be transferred to, sold to or donated on behalf of any other customer.

F1.3.6 These environmental benefits cannot be passed on, sold to or retired/donated on behalf of more than one customer.

F1.3.7 The decision to use (as part of the electricity consumption) or retire the benefits can only be made or agreed to by the customer.

F1.3.8 The customer can use or retire the environmental benefits one time only. Once the customer has consumed the electricity itself, the environmental benefits are automatically considered retired. Once used or retired, the benefits may no longer be used, sold, donated or claimed in any other way.

F1.3.9 Electricity products complying with this criteria document must originate from generation facilities operating in compliance with this criteria document, and cannot comprise electricity from planned generation facilities. Through a verification and auditing process, reconciliation measures will be implemented to ensure that sales levels of complying electricity product do not exceed production/ supply levels.

F1.3.10 To verify a claim that a product meets the criteria listed in this document, the Environmental Choice Program and its agents will require access, as is its normal practice, to relevant quality control and production records and the right of access to production facilities on an unannounced basis. It is up to the applicant to provide sufficient information to allow verification of the claim that the facility is in conformity with the criteria documents. In particular, all documentation produced in the context of the environmental assessment of a facility for which certification is sought shall be made available to the ECP.

F1.3.11 Compliance with sections F1.1.1(b), F1.2.6(a) and F1.2.6(b) shall be attested to by a signed statement of the Chief Executive Officer or the equivalent officer of the licensee. Compliance with sections F1.2.6(a) and F1.2.6(b) shall also be confirmed by additional evidence including *inter alia* correspondence from the authorized representative of each applicable government body that has issued a license and/or operating permit for the facility. The Environmental Choice Program shall be advised in writing immediately by the licensee of any noncompliance, which may occur during the term of the license. On the occurrence of any noncompliance, the license may be suspended or terminated as stipulated in the license agreement. In the event of a dispute related to the suspension or termination of the license, the license agreement provides for arbitration.

#### **F1.4 Conditions for EcoLogo Use**

F1.4.1 Where compliance with this criteria document is established under the Environmental Choice Program, the EcoLogo may appear in association with a product, subject to the following conditions:

- a) Only those components of a multi-sourced power product that fully satisfy all pertinent ECP certification and licensing criteria are allowed to be identified as “ECP-certified” and to carry the EcoLogo; and
- b) A criteria statement must appear with the EcoLogo whenever the EcoLogo is used in association with the electricity during sales and related transactions. The criteria statement must also appear with the EcoLogo in other promotional activities and materials.

While the exact wording used in the criteria statement is left to the discretion of the licensee, the statement itself should provide clarification as to why the product was certified. The statement must not misrepresent the product nor the reason it received certification, and must contain at least the following information:

- i) For generators, identification of the amount of ECP-certified electricity generated and/or marketed in quantitative units (e.g. kWh or MWh);
- ii) For marketers, identification of the amounts of ECP-certified electricity received from generators and/or supplied to users as either percentages of larger multi-sourced power products or in quantitative units (e.g. kWh or MWh); and

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iii) For users, identification of the amounts of ECP-certified electricity purchased/used as either percentages of larger multi-sourced power products or in quantitative units (e.g. kWh or MWh).

F1.4.2 All licensees must comply with the Environmental Choice Program’s *Guide to Proper Use of the EcoLogo<sup>M</sup>* regarding the format and usage of the EcoLogo.

F1.4.3 Any accompanying advertising must conform with the relevant requirements stipulated in this Criteria document, the license agreement and the Environmental Choice Program’s *Guide to Proper Use of the EcoLogo<sup>M</sup>*.

**F1.5 Air Emissions Testing Frequency, Conditions and Methods**

Compound/Pollutant	Testing Conditions and Frequency
Carbon monoxide (CO), Nitrogen oxides (NO <sub>x</sub> ), Particulate matter (PM), Sulphur oxides (SO <sub>x</sub> )	<p>Frequency: As determined in the verification protocol negotiated between the Environmental Choice Program and the generator specifically for each facility.</p> <p>Conditions: Testing must be performed at operational load. Emissions for load point values must be determined from the concentration measurements (ppm (v/v) converted to mg/m<sup>3</sup> at 25°C) and flow rate (dry basis at 101.3 kPa and 25°C ) in the duct stack.</p>

Compound / Pollutant	Testing Methods
Carbon monoxide (CO)	<ul style="list-style-type: none"> <li>(i) <i>Reference Method for the Monitoring of Gaseous Emissions from Fossil Fuel-fired Boilers</i>, Reference Method EPS 1/RM/15, September 1990; or</li> <li>(ii) Continuous Emissions Monitoring (CEMS) Code (REF. 107), Alberta Environment; or</li> <li>(iii) <i>Reference Method for Source Testing: Measurement of Releases of Carbon Monoxide from Stationary Sources</i> (EPS 1/RM/4, 1990) in conjunction with <i>Reference Method for Source Testing: Measurement of Release of Particulate from Stationary Sources</i> (EPS 1/RM/8, 1993), both from Environment Canada; or</li> <li>(iv) Method 10, Determination of Carbon Monoxide Emissions from Stationary Sources, in the Alberta Stack Sampling Code (REF. 89), Alberta Environment.</li> </ul>
Nitrogen oxides (NO <sub>x</sub> ) measured as NO <sub>2</sub>	<ul style="list-style-type: none"> <li>(i) <i>Reference Method for the Monitoring of Gaseous Emissions from Fossil Fuel-fired Boilers</i>, Reference Method EPS 1/RM/15, September 1990; or</li> <li>(ii) Method 7E, Determination of Nitrogen Oxide Emissions from Stationary Sources, in the Alberta Stack Sampling Code (REF. 89), Alberta Environment; or</li> <li>(iii) Continuous Emissions Monitoring (CEMS) Code (REF. 107), Alberta Environment.</li> </ul>
Particulate matter (PM)	<ul style="list-style-type: none"> <li>(i) <i>Reference Method for Source Testing: Measurement of Releases of Particulate from Stationary Sources</i>, Reference Method EPS 1/RM/8, December 1993; or</li> <li>(ii) Method 5, <i>Determination of Particulate Emissions from Stationary Sources</i>, in the Alberta Stack Sampling Code (REF. 89), Alberta Environment.</li> </ul>
Sulphur oxides (SO <sub>x</sub> ) measured as SO <sub>2</sub>	<ul style="list-style-type: none"> <li>(i) <i>Reference Method for the Monitoring of Gaseous Emissions from Fossil Fuel-fired Boilers</i>, Reference Method EPS 1/RM/15, September 1990; or</li> <li>(ii) Continuous Emissions Monitoring (CEMS) Code (REF. 107), Alberta Environment; or</li> <li>(iii) <i>Reference Method for Source Testing: Measurement of Releases of Sulphur Dioxide from Stationary Sources</i>, Report EPS 1-AP-74-3, September 1975; or</li> <li>(iv) Method 6C, <i>Determination of Sulphur Dioxide Emissions from Stationary Sources</i>, in the Alberta Stack Sampling Code (REF. 89), Alberta Environment</li> </ul>
Velocity and Volumetric Flow Rate	Method B – Determination of Velocity and Volumetric Flow Rate of Flue Gases, from <i>Reference Method for Source Testing: Measurement of Release of Particulate from Stationary Sources</i> (EPS 1/RM/8, 1993)

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## F1.6 Load Point Determination

F1.6.1 The process used to determine the load points for operational air emissions in this criteria document is based on a matrix of four environmental air emission parameters, each with a range of values based on actual industry performance. Each level of performance is assigned a specific load point value, and points are then totalled over all parameters. Products with different environmental profiles will thus be able to qualify under this Criteria document. The allowable number of points has been set so that, while tradeoffs between parameters is possible, very poor performance in any one parameter will disqualify a generating facility as a supplier of electricity meeting the requirements of this Criteria document.

F1.6.2 The four parameters used to evaluate electricity generation under this Criteria document for ECP-certification are carbon monoxide (CO), particulate matter (PM), nitrogen oxides (NO<sub>x</sub>) and sulphur oxides (SO<sub>x</sub>). Load point calculations will be based on measured air emissions quantities of these compounds that are from measured emissions released as a result of only those operations directly used to generate electricity. The air emission measurements must represent annual emissions normalized to a per MWh basis, and include more than one datum point.

F1.6.3 Measured emissions data and the quantity of annual electricity generated should be documented in *Part 1: Measured Data*, and load points should then be determined by using *Part 2: Load Point Calculation*. The load point for each compound should be taken from the top of each column corresponding to the emissions range for that compound's kilogram per MWh value.

### PART 1: MEASURED DATA

- 1) Into the table, enter the Annual Quantity of Electricity Generated (in MWh) by the facility. This quantity should be measured net of all parasitic loads from the facility, and net of transformer and line losses up to the point of connection to the utility grid or the user's system (if directly connected).
- 2) Into the table, enter the Annual Measured Quantity of CO, PM, NO<sub>x</sub> (measured as NO<sub>2</sub>) and SO<sub>x</sub> (measured as SO<sub>2</sub>) emitted (in kilograms), noting that appropriate test methods and the prescribed frequency and conditions of testing are provided in F1.5 for each compound.
- 3) Determine the Annual Measured Quantity per MWh of CO, PM, NO<sub>x</sub> (measured as NO<sub>2</sub>) and SO<sub>x</sub> (measured as SO<sub>2</sub>) emitted (in kilograms per MWh). These values will be used in the Load Point Calculations in Part 2.



Annual Electricity Generation (in MWh)	Compound	Annual Measured Quantity (in kg)	Annual Measured Quantity per MWh (in kg/MWh)
	CO		
	PM		
	NO <sub>x</sub> (as NO <sub>2</sub> )		
	SO <sub>x</sub> (as SO <sub>2</sub> )		

## PART 2: LOAD POINT CALCULATION

- 1) Assign the load point value to each compound by taking the value at the top of each column corresponding to the emissions range for that compound's kilogram per megawatt-hour value determined in Part 1.
- 2) Determine the Total Load Points by summing the four individual load point values.

Compound	Load Points					Assigned Load Points
	0	1	2	3	8	
CO	< 2.15 kg/MWh	2.151 – 3.22 kg/MWh	3.221 – 4.30 kg/MWh	4.301 – 5.37 kg/MWh	> 5.371 kg/MWh	
PM	<0.228 kg/MWh	0.2281 – 0.387 kg/MWh	0.3871 – 0.516 kg/MWh	0.5161 – 0.645 kg/MWh	> 0.6451 kg/MWh	
NO <sub>x</sub> (as NO <sub>2</sub> )	< 0.77 kg/MWh	0.771 – 1.15 kg/MWh	1.151 – 1.52 kg/MWh	1.521 – 1.90 kg/MWh	> 1.901 kg/MWh	
SO <sub>x</sub> (as SO <sub>2</sub> )	< 0.141 kg/MWh	0.1411 – 0.212 kg/MWh	0.2121 – 0.282 kg/MWh	0.2821 – 0.352 kg/MWh	> 0.3521 kg/MWh	
<b>TOTAL LOAD POINTS</b>						

### F1.7 Addendum: Type IV Electricity Designation

- 1) The designation of "Type IV electricity" is to be used as an addendum to this Environmental Choice<sup>M</sup> Program criteria document (CCD-003). This designation exists solely for the purpose of facilitating certain Government of Canada needs with respect to green power purchases.
- 2) To that end:
  - a) The Type IV designation has no legitimate application beyond those situations in which the Government of Canada is purchasing green power and specifically requesting this designation.
  - b) Licensees marketing and/or generating electricity meeting the Type IV designation may make reference to this designation only in response to Government of Canada calls for tender for green power, or in communications about a successful sale to the Government of Canada.
  - c) Initial application for certification under CCD-003 with the Type IV designation must be received at the Environmental Choice<sup>M</sup> Program on or before March 31, 2007.

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d) All Type IV designations will expire at the end of any ongoing contract, amended or otherwise, entered into with the Government of Canada. For those licensees with Type IV designation that are not in such an ongoing contract, the designation will expire on March 31, 2008. At that time, the electricity will revert back to Type I, Type II or Type III designations as defined earlier in this criteria document.

e) Electricity bearing "Type IV" designation cannot simultaneously bear any other Type designation. For the purposes of compliance with Article 11 of CCD-003, electricity designated as "Type III" can be wholly or partially substituted by electricity designated as "Type IV".

3) Article 1 of CCD-003, "Interpretation", is amended to include the following definition.

**"Type IV Electricity"** means ECP-certified electricity from a generation facility that first began generating electricity on or after April 1, 2001.

It does not include any restart or recommissioning of a facility, except in those cases where the pre-existing facility ceased production prior to January 1, 1990, and remained out of production until at least April 1, 2001.

Incremental increases in electricity generated as a result of either facility upgrades or expansions occurring on or after April 1, 2001 (where the facility first began generating electricity prior to April 1, 2001) are also eligible for Type IV designation. In such cases, a representative average per annum amount of electricity generated prior to the upgrades and/or expansions will provide the baseline on which to calculate the quantity of Type IV electricity generation.

For Type IV electricity, "facility upgrades and expansions" include *inter alia* any repowering, replacement, refurbishment, upgrading, efficiency improvements, new turbines or arrays, addition of new equipment or components, or other alterations of any pre-existing generation facility. This is applicable even to those preexisting facilities that have been completely decommissioned, dismantled, removed, otherwise rendered unusable or fallen into disuse through lack of repair or maintenance.

For greater clarity, "facility upgrades and expansions" include any facility that supplants or replaces a pre-existing facility by accessing the same renewable resource in the same geographic area (for example, the same airshed, water basin, geothermal basin, landfill energy resource, or other biomass source).



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