

Base Protocol Plan for Energy Efficiency

DRAFT

March 27, 2009

1. Identification of the Protocol Developer

1.1 Title of the Base Protocol

Greenhouse Gas Quantification Protocol for Energy Efficiency Projects, as adapted from the following Alberta GHG Offsets System protocols: Buildings protocols #1 – commercial (draft); Buildings protocols #1 – residential (draft); Quantification Protocol For Energy Efficiency Projects; Energy Efficiency GHG Quantification Protocol (draft).

1.2 Lead Protocol Developer

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1.3 Initiating Entity

Organization	IPOG Energy Efficiency Working Group. Funding members: <ul style="list-style-type: none">• Carbon Capital Management• Efficiency New Brunswick• FPAC• New Brunswick Power• Pristine Power• Spectra Energy• TransCanada
Name	
Title	
Mailing address	
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Website	

1.4 Rationale for Development of the Base Protocol

This Base Protocol is being developed by the Industry Provincial Offsets Group (IPOG), which is a broad group of stakeholders having an interest in generating and trading greenhouse gas (GHG) offsets. Members have an interest in generating and trading offsets from energy efficiency projects across Canada, and are seeking to adapt the various draft Alberta energy efficiency protocols to meet federal Offset System requirements as part of the “fast track” process.

Many companies are interested in implementing energy efficiency projects – either implementing retrofits in existing facilities or building highly efficient new facilities – and this wide interest, coupled with the diverse array of potential projects, provides the potential for offsets to be brought to the market.

2. Description of the Base Protocol

2.1 Description of the Project Type

This protocol outlines the quantification of direct and indirect reductions of GHG emissions arising from energy-efficiency projects at end-user facilities, including:

- Commercial/institutional/residential buildings,
- Industrial facilities and processes, and,
- Demand-side management (DSM) involving physical equipment change (but *excluding* DSM focused exclusively on education/behavioural change).

For the purposes of this discussion, DSM refers to broad programs intended to improve energy efficiency at multiple sites, typically undertaken by utilities.

The protocol can be applied to new facilities or the retrofit of existing facilities. It is intended to apply to a broad range of energy conservation measures (ECMs) including, but not limited to, those relating to:

- Heating, ventilation and air conditioning (HVAC).
- Heat generation (including industrial steam systems).
- Chilling/cooling systems.
- Lighting
- Water heating
- Building mechanical infrastructure
- Appliances and industrial processes (including heating and cooling requirements and process modification).
- Electric motors.
- General building envelope modifications.

By reducing energy consumption, eligible projects will reduce GHG emissions associated with the conversion of primary energy sources to secondary forms of energy (e.g., electricity, heat, mechanical energy, etc.).

All of these emission sources are included within Canada's National GHG Inventory, within the Energy and Industrial Processes source categories.

2.2 Description of any Project-Specific Technology

No project-specific technologies will be included within the protocol, as the protocol is intended to apply to a wide range of different projects and associated technologies, and since energy efficiency improvements can be realized by a wide range of approaches.

2.3 GHG(s) that will be Reduced

Emission of the following GHGs will be reduced, corresponding to standard combustion-related GHGs:

- Carbon dioxide (CO₂).
- Methane (CH₄).
- Nitrous oxide (N₂O).

2.4 Description of How Real Reductions will be Achieved

Real reductions will be achieved through the implementation of new energy conservation measures (ECMs) in existing facilities beyond those that would have occurred in the absence of the project, or through the construction of new facilities that incorporate energy-efficiency measures above and beyond those required by relevant legislation or normal business practice. In all cases, implemented ECMs will reduce energy consumption at project sites to levels below the baseline case.

Examples of potential ECMs include:

- Replacement of existing equipment with more energy-efficient equipment.
- Construction of new facilities to state-of-the-art specifications that go beyond regulatory requirements.
- Modifying operational practices to reduce energy demand.
- Enhancing insulation or making other modifications to reduced energy losses.
- Making process adjustments to reduce the amount of energy required.
- Selection of more energy-efficient processes, which would not be normal business practice.

In all cases, functional equivalence of the type and level of service provided in the project and baseline cases will be maintained. Depending on the complexity of the ECMs implemented, a testing period may or may not be required prior to full-scale implementation.

A net emission reduction would be achieved by such activities so long as a net reduction in overall energy consumption is achieved, since production of energy, particularly from fossil energy sources, has significant associated GHG emissions (typically combustion-related), including both direct and indirect sources. This quantification protocol has been prepared in accordance with ISO 14064-2.

2.5 Base Protocol Flexibility

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

1. **Simple vs. advanced approaches.** The protocol includes both simple and advanced approaches to GHG emission reduction quantification. The simple approach will have less onerous and less costly requirements for monitoring, but will use more conservative models and assumptions to ensure that emission reductions are conservatively quantified. The advanced approach, using less conservative assumptions and requiring a more robust level of monitoring, may, given the resultant higher level of accuracy, yield greater GHG reduction estimates than the simple approach.
2. **General approaches to parameter estimation / measurement.** The Base Protocol will allow the user to select from four quantification options depending on the specifics of their project:
 - Option A – *Retrofit Isolation: Key Parameter Measurement*; Savings are determined by measurements of the key parameters which affect the energy use of the ECM-affected systems.
 - Option B – *Retrofit Isolation: All Parameter Measurement*; Savings are determined by measuring the energy use of the ECM-affected systems.
 - Option C – *Whole Facility*; Energy use for the entire facility is measured and any savings are calculated accordingly.
 - Option D – *Calibrated Simulation*; Energy use and savings are determined using an accurate and calibrated simulation of the facility.
3. **Baseline type.** Depending on the specifics of the project (namely retrofit vs. new/end-of-life construction), the protocol allows for both historic or performance standard baselines to be selected.

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

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

Potentially Relevant Legal Requirements

- Municipal, provincial/territorial or federal building codes.
- Pending federal industrial GHG emissions regulations (as per the Regulatory Framework for Industrial GHG Emissions, March 2008).
- Alberta:
 - Specified Gas Emitters Regulation under the Climate Change and Emissions Management Act, 2007, including the, 2007.
- British Columbia:
 - Greenhouse Gas Reduction Targets Act, 2007.

- Local Government (Green Communities) Statutes Amendment Act, 2008.
- Amendments to the Utilities Commission Act, 2008.
- Manitoba:
 - Climate Change And Emissions Reduction Act, 2008
- Nova Scotia:
 - Environmental Goals and Sustainable Prosperity Act, 2007.

Potentially Relevant Climate-Change Incentives

- Extensive list to be provided with base protocol

2.7 Building on Existing Protocols or Proprietary Information

This Base Protocol will be developed based on a similar protocol developed for the Alberta Offset System and methodologies for the UNFCCC. This protocol was based on numerous reference sources, including the following Alberta GHG Protocols noted in Annex J of the draft federal Guide for Protocol Developers as being eligible for the fast track process (numbers 10, 11 and 14 in Table J.1 of the Guide for Protocol Developers).

Registered name of protocol	Buildings protocols #1 – commercial
System for which protocol was developed	Alberta Offset System
Date protocol was completed and approved (if applicable)	Draft
Developer of the protocol (name/organization)	BlueSource Canada (formerly Baseline Emissions Management Inc.)

Registered name of protocol	Buildings protocols #1 – residential
System for which protocol was developed	Alberta Offset System
Date protocol was completed and approved (if applicable)	Draft
Developer of the protocol (name/organization)	BlueSource Canada (formerly Baseline Emissions Management Inc.)

Registered name of protocol	Quantification Protocol For Energy Efficiency Projects
System for which protocol was developed	Alberta Offset System
Date protocol was completed and approved (if applicable)	September 2007 (Version 1)
Developer of the protocol (name/organization)	BlueSource Canada (formerly Baseline Emissions Management Inc.)

Reference was also made to the following protocol, available in draft form and developed from the protocols described above.

Registered name of protocol	Energy Efficiency GHG Quantification Protocol
System for which protocol was developed	Alberta Offset System

Date protocol was completed and approved (if applicable)	Draft
Developer of the protocol (name/organization)	Direct Energy / Climate Check

Explanation of how the existing protocol will be adapted

The Base Energy Efficiency Protocol will be derived primarily from the draft (and when available final) Direct Energy Alberta GHG Protocol. Significant work had already been completed by Direct Energy / Climate Check during drafting of this Alberta protocol to adapt the other Alberta protocols noted above that are listed in Annex J of the draft federal Guide for Protocol Developers, as well as to incorporate key elements of the International Performance Measurement and Verification Protocol (IPMVP) ¹ and ASHRAE Guideline 14-2002² into the methodology. IPMVP is an internationally-respected standard for quantifying energy efficiency improvements from a wide variety of projects. ASHRAE Guideline 14-2002 is an internationally-respected guideline for quantifying energy savings for commercial equipment.

Building on this most recent draft Alberta GHG protocol, modifications to create a federal GHG protocol include, but are not necessarily limited to:

- Converting to the required format and ensuring consistency with federal Offset System requirements
- Generalizing the current commercial-building-focused methodology such that it could be applied to project types beyond commercial buildings.
- Developing methodologies appropriate for:
 - An industrial context.
 - DSM projects.
- Enhancing the existing commercial building-focused methodologies, where appropriate.
- Enhancing justification within the protocol to meet ISO 14064-2 requirements, including, for instance:
 - Rationale for exclusion of certain SSRs from monitoring/estimation.
 - Chosen minimum precision for metering.
- Elaborating on the quantification method section, ensuring that quantification procedures are described for all relevant SSRs, including provision of as many default emission factors and other assumptions as practical.
- Enhancing monitoring and data quality management sections, including providing specific requirements for each parameter for quantifying emissions for each relevant SSR.
- Identifying “key” SSRs

¹ Efficiency Valuation Organization, 2007. International Performance Measurement and Verification Protocol - Concepts and Options for Determining Energy and Water Savings - Volume 1. April 2007. Available at www.evo-world.org.

² American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Guideline 14-2002, Measurement of Energy and Demand Savings, ISSN 1046-8940X, available at: www.ashrae.org.

- Preparing a section on the non-GHG air impacts of in-scope project types.
- Describing the technical review process undertaken to date on the Direct Energy protocol and any other sources of protocol methodologies (applies to various sections of the base protocol).
- Preparation of a Summary of Instructions for Project Proponents
- Cross-protocol review with other protocols adapted by IPOG to ensure consistency.

These modifications will be performed in a transparent, documented manner, with IPOG energy efficiency working group members having the opportunity to comment on drafts at various stages during the protocol development process.

Explanation of the nature of the proprietary information and how it might be used in the Base Protocol:

It is not envisaged that any proprietary information will be used.

3. Declaration, Consent and Signature

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

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

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

The undersigned is duly authorized to sign this application.

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

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

By:

Name:

Title:

Signature:

Signed this day of , 2009

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