British Columbia Greenhouse Gas Offset Protocol

FUEL SWITCH

BRITISH COLUMBIA
Ministry of Environment and Climate Change Strategy

Version: 1.1
2019

August 21, 2019

Director

Date

Greenhouse Gas Industrial Reporting and Control Act

SUMMARY OF REVISIONS

VERSION	DATE	DESCRIPTION
1.1	August 2019	Amended to clarify project criteria and the use of emission intensity factors to estimate emissions from electricity usage.
1.0	August 2018	The B.C. Fuel Switch GHG Offset Protocol was published for use.

TABLE OF CONTENTS

1.0 GUIDANCE

This Protocol establishes mandatory requirements to carry out emission reduction projects. Failure to comply with this Protocol or requirements of the Greenhouse Gas Emission Reduction Regulation may result in a project plan not being accepted or offset units not being issued.

The Project Proponent is responsible to ensure the Validation Body selected for a Project using this Protocol is accredited by the Standards Council of Canada to Technical Sector A: GHG Emission Reductions from Fuel Combustion or by the American National Standards Institute Sector for Group 1: GHG Emission Reductions from Fuel Combustion.

For a Project that involves both an increase in energy conservation / efficiency and Fuel switching, the Project Plan may be prepared in accordance with this Protocol, and available Protocol(s) for energy conservation / efficiency.

The Project Proponent is responsible to provide justification where any assumptions or estimates are used in the Project Plan.

The Project Proponent is responsible to ensure the requirements of the Protocol, the Act and Regulations are met, and required forms are complete.

2. DEFINITIONS

In the Protocol, the capitalization of terms where the capitalization is not solely performing a grammatical function indicates a defined term in the Act, Regulation or this section.

"Biomass" means

> non-fossilized plants or parts of plants, animal waste, or any product made of either of these and includes, without limitation, biomass derived fuels, wood and wood products, agricultural residues and wastes, biologically derived organic matter found in municipal and industrial wastes, landfill gas, black liquor, kraft pulp fibres and sludge gas.

"Energy Service Process" means a process or processes carried out that includes the Primary Activity and:

(a) generates electricity or steam,

(b) heats, cools or compresses solid, liquid or gas, or

(c) provides motive force to a mechanical process.

"Fuel" includes electricity and material that is combusted or transformed to generate usable energy or do work.

"Functionally Equivalent" means the same function, quality and quantity of Energy Service Process output.

"Initial Testing Period" means the period of time between when a system is installed and when the system becomes operational.

"Integrated Grid" means an electrical distribution system that is connected to a transmission system operated by BC Hydro or FortisBC.

"Isolated Grid" means an electrical distribution system that is not connected to the Integrated Grid.

"Operation" means a facility or location where the Primary Activity of the Project Scenario occurs or Primary Activity of the Baseline Scenario would occur.

"Primary Activity" means the main activity or set of activities in the Project Scenario that result in the majority of Emissions Reduction from the Functionally Equivalent Baseline Scenario.

"Project Scenario" means the activities that have an effect on greenhouse gas emissions and are considered in estimating Project Emissions.

"Regulation" means the Greenhouse Gas Emission Control Regulation.

"Renewable Energy" means energy from sources that constantly renew themselves or that are regarded as practically inexhaustible. Renewable Energy includes, but is not limited to, energy derived from solar, wind, geothermal, hydroelectric, Biomass, tidal, sea currents and ocean thermal gradient sources.

3.0 APPLICABILITY

3.1 Criteria

1. The Project must:
   a) Involve a change to an existing stationary or mobile Energy Service Process where the Primary Activity in the Project Scenario is a change from a more greenhouse gas (GHG) emission intense Fuel in the Primary Activity of the Baseline Scenario to a less GHG emission intense Fuel in the Primary Activity of the Project Scenario.
2. Project Reductions must not result from:
   a) Improvements in energy efficiency other than thermal efficiency in the Primary Activity of the Project Scenario,
   b) Reductions in GHGs other than CO_2, CH_4 and N_2O,
   c) A Project that is subject to an agreement under (section 8.01) of the *Greenhouse Gas Reduction (Renewable and Low Carbon Fuel Requirements) Act*, or
   d) A Project that is a component of an agreement under the British Columbia Clean Infrastructure Royalty Credit Program, the Clean Growth Infrastructure Royalty Program, or equivalent.
3. The Primary Activity of the Project Scenario must be an activity that uses:
   a) Combustion-based equipment or energy transformation equipment that does not require additional material or energy inputs beyond:
      i. A primary Fuel energy source,
      ii. An auxiliary Fuel energy source,
      iii. Ambient air or gases extracted from ambient air (e.g. oxygen) at the Operation as long as this extraction process only requires electricity and ambient air,
      iv. The substance that will receive or give up energy during the process, if applicable (e.g. the water that will be heated, turned to steam, or the gas that will be compressed), and
      v. Maintenance-related materials (e.g. lubricating fluids, spare parts).
   b) Non-combustion Renewable Energy technologies that do not require additional material or energy inputs beyond:
      i. A primary Renewable Energy source,
      ii. The substance that will receive or give up energy during the process, if applicable (e.g. the water that will be heated, turned to steam, or the gas that will be compressed), and
      iii. Maintenance-related materials (e.g. lubricating fluids, spare parts) or
      iv. Electricity supplied by an Integrated Grid or Isolated Grid.

3.2 Start Date

The Start Date is asserted by the Project Proponent in accordance with the Regulation (section 14 (3) (n) (i)) and must be a date on or before the completion of the Initial Testing Period. An Initial Testing Period must not exceed three months from the day the Primary Activity of the Project Scenario started performing its intended function.

3.3 Crediting Period

The Crediting Period is up to 10 years in accordance with the Regulation (section 18 (1) (b) (ii) (B)). The Project Proponent must provide justification for the length of the Crediting Period based on the analysis used to establish Baseline and Project Scenarios.

3.4 Project Report Period

The first Project Report Period begins on the Project Start Date. The Project Report Period must be a 12-consecutive-month period (e.g. October 16, 2018 – October 15, 2019) except for the first and last Project Report Periods.

The first Project Report Period may be from six to eighteen months in length to align the Project Report Period with the Project Proponent's business requirements (e.g. October 16, 2018 – December 31, 2019 for alignment with a calendar year). The total length of all Project Report Periods may not exceed the Crediting Period.

3.5 Materiality

For the purpose of this Protocol any errors, omissions or misrepresentations are considered material for the purposes of complying with (sections 15 (3) (c) and 21 (4) (c)) of the Regulation if the individual or aggregate effects result in an overestimation of the Project Reductions of more than 5%.

4.0 PROJECT BOUNDARY

4.1 Description of the Project

The Project Proponent must provide a detailed technical description of the technologies and measures employed, and how a Project Reduction will be achieved. The description must include a list of the equipment in use for the Energy Service Process prior to the implementation of the Project and over the life of the Project. The Project Proponent must provide for each piece of equipment:

- the age, technical life and estimated remaining life of the asset determined in accordance with *Greenhouse Gas Industrial Reporting and Control Act* Bulletin 001 Determining the Remaining Life of an Asset,
- existing and forecasted installed capacities, load factors and efficiencies,
- a diagram of the Energy Service Process equipment, and
- an explanation of how the Project Scenario is Functionally Equivalent to the Baseline Scenario. The explanation must include the types and levels of goods and services provided by the Energy Service Process and any relation to equipment and systems outside the Project boundary.

4.2 Identification of the Project Location

Project Plans must include latitude and longitude for the location where the Primary Activity of the Project Scenario will be carried out and any other information allowing for the unique identification of the Primary Activity of the Project Scenario. Street address and postal code must be provided, if available.

If the Primary Activity involves mobile sources, the Project Plan must describe how the location of each of those sources will be identified and tracked using a location tracking device or how adequate records will be maintained and used to quantify emissions that occurred inside or outside of B.C. The Project Plan must describe how mobile sources that travel to jurisdictions outside of B.C. will track and exclude the component of travel outside of B.C. from quantification of Project Emissions.

5.0 ESTABLISHMENT OF BASELINE SCENARIO

The Baseline Scenario is determined using a project specific assessment of Baseline Scenario candidates.

5.1 Project Specific Approach

The Project Proponent must select the Baseline Scenario after:

1. listing Baseline Scenario candidates,
2. identifying obstacles for each candidate, and
3. conducting a comparative assessment of obstacles for each candidate.

The Project Plan must list and describe all reasonable Baseline Scenario candidates which include existing and alternative types of activities, technologies and Fuels.

One of the Baseline Scenario candidates must be the continuation of historic practices.

The Project Plan must identify potential obstacles associated with implementing each of the listed Baseline Scenario candidates. Obstacles to be identified, if they exist, must include, but are not limited to:

- access to credit or capital, and other factors related to capital cost,
- operating costs,
- availability and/or cost of technological expertise,
- availability of infrastructure related to types of Fuel available at the site, transmission and distribution equipment, and any necessary structures,
- institutional resistance,
- challenges in procurement of, or costs of obtaining, a reliable supply of alternative Fuel types,
- social acceptance, and
- legal requirements.

The Project Proponent must estimate the relative magnitude and risk of each obstacle for each Baseline Scenario candidate identified. The magnitude and risk of an obstacle must be quantified and monetized as much as practicable. When characterizing an obstacle qualitatively the magnitude and risk must include a detailed explanation and justification.

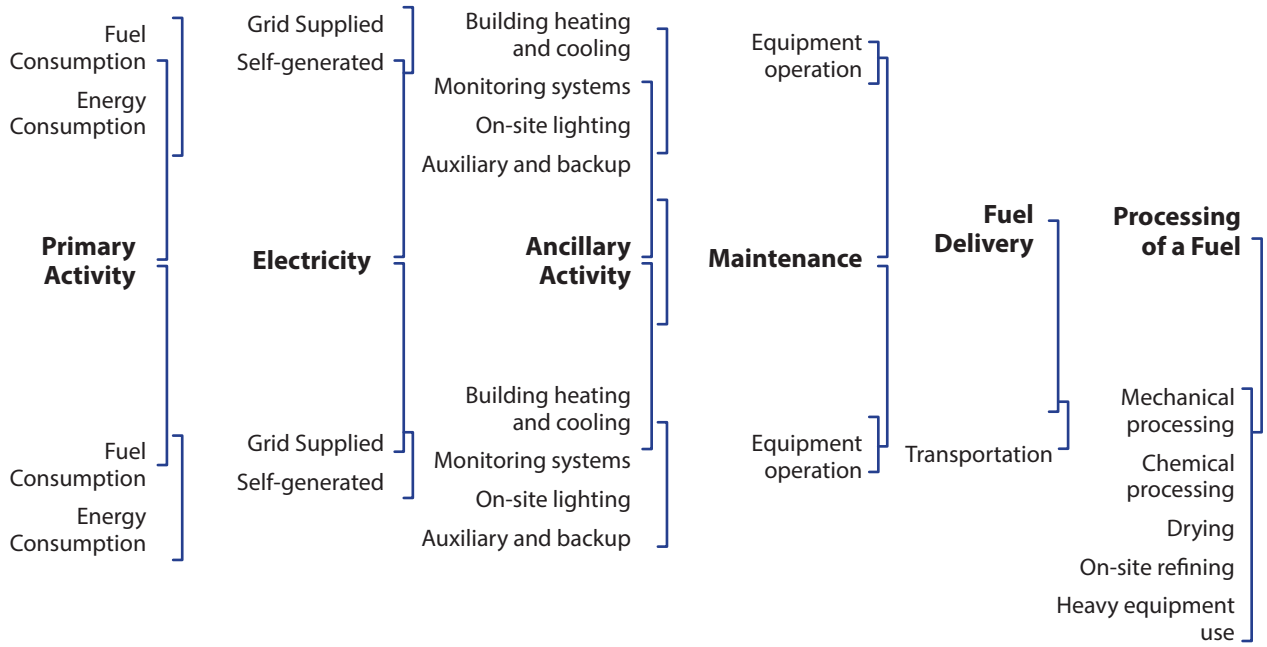
The Project Proponent must substantiate their assessment and explain why the selected Baseline Scenario candidate is the reasonable choice for the Baseline Scenario.

6.0 CATEGORIZATION AND DESCRIPTION OF SELECTED PROJECT AND BASELINE SOURCES, SINKS AND RESERVOIRS

The Project Plan must include sources listed in Figure 1 and Table 1. There are no Reservoirs or Sinks associated with this Protocol. Sources, Sinks and Reservoirs (SSRs) include GHGs: CO_2, CH_4 and N_2O.

Figure 1 – Selected sources, Sinks and Reservoirs (SSR)

Baseline sources, Sinks and Reservoirs in scope



Project sources, Sinks and Reservoirs in scope

Table 1: Selected SSRs

SSR	Description
Primary Activity Source B1 Source P1	GHG emissions of the Energy Service Process resulting from energy consumption and utilization. Combustion of Fuel on-site is a controlled source. Consumption of electricity generated off-site is a related source.
Electricity Source B2 Source P2	GHG emissions resulting from the generation of electricity that is required in a non-electrical Energy Service Process and electricity consumed for the purposes of SSRs B3/P3, B4/P4, P5 and P6. This does not include electricity consumed for B1/P1.
Ancillary Activity Source B3 Source P3	GHG emissions resulting from those activities that support the function of the Primary Activity including: - running auxiliary emission controls, - monitoring systems, - heating and/or cooling systems, - running of auxiliary equipment, and / or - burning of Fuels to warm up equipment. This does not include the Primary Activity of the Baseline Scenario and Project Scenario. This SSR may be excluded where the Baseline Scenario GHG emissions will be greater than the Project Scenario GHG Emissions.
Maintenance Source B4 Source P4	GHG emissions resulting during scheduled and non-scheduled maintenance of the Energy Service Process and its equipment including transportation to and from the Energy Service Process. This SSR may be excluded where the Baseline Scenario GHG emissions will be greater than the Project Scenario GHG Emissions.
Fuel Delivery Source P5	GHG emissions in B.C. resulting from the transportation of the Fuel used by the Primary Activity in the Project Scenario.
Fuel Processing Source P6	GHG emissions resulting from the processing of non-electricity Fuel that is used by the Primary Activity after it is delivered to the Operation. This includes emissions associated with: - treating Fuels with mechanical and chemical processes, - refining or processing of non-electricity Fuels on-site, - using heavy equipment, thermal drying equipment and conveyors, - gasification of the Fuel, and / or - creating a syngas for on-site combustion. This includes emissions associated with combustion of non-electricity Fuels during such processes. Where the Operation does not include controlled processing of Fuel, this SSR may be excluded from quantification.

7.0 PROJECT JUSTIFICATION

The Project Proponent must identify in the Project Plan the obstacles to the Project in the same manner as required for Baseline Scenario candidates in section 5.

The Project Proponent must assert and justify in the Project Plan that there are financial, technological or other obstacles to carrying out the Project that are overcome or partially overcome by having the Project Reductions recognized as Offset Units. The justification in the Project Plan must include:

- financial analysis including the impact of carbon finance on investment hurdle rates and decision-making,
- how the economic business case and values used in the financial analysis compare to those commonly used by the Project Proponent and industry-specific standards, and
- the anticipated rate of adoption of the Primary Activity over the Crediting Period.

8.0 QUANTIFICATION OF EMISSIONS REDUCTION AND REMOVALS ENHANCEMENT

The Project Proponent must quantify Baseline Emissions, Project Emissions and Project Reductions.

Each SSR in Table 1 is calculated using specified quantification methods.

Equation references to:

- 'f' refers to a 'grid type',
- 'h' refers to a 'Fuel type',
- 'i' refer to a 'SSR' type in of the SSR column of Table 1,
- 'j' refer to a 'GHG' type in Section 6, and
- 'm' refer to a Project Report Period.

References to WCI refer to the most current version of the *Western Climate Initiative Final Essential Requirements of Mandatory Reporting - amended for Canadian Harmonization* as published on the Ministry of Environment and Climate Change Strategy's website. For each SSR, only specific calculation methods within WCI are permitted. In using WCI, references to quantification of annual GHG emissions are to be adapted to reflect the time period of the given Project Report Period '*m*.'

If more than one option exists, the Project Proponent must select the most accurate quantification method unless the alternative method in the Protocol provides a result that is materially the same and the selection is justified.

CO_2 emissions from Biomass combustion must be quantified, but are not included in the total GHG emissions for a given SSR. Associated CH_4 and N_20 emissions are quantified and included in the total GHG emissions for a given SSR.

If Fuel sales records are used as evidence of activity level, the Project Proponent must demonstrate that there has been no diversion of the purchased Fuels.

To convert individual GHG totals into total GHG emissions in units of tonnes of CO_2 equivalent (tCO_2e) Equation 1 is used.

Equation 1: Conversion to TCO_2e

$$T_{i,m} = \sum_j (T_{i,j,m} \times GWP_j)$$

Where,

$T_{i,m}$ = Total GHG emissions in tCO_2e for SSR *i* for Project Report Period *m* (tonnes of CO_2e).

$T_{i,j,m}$ = Total GHG emissions of GHG *j* for SSR *i* for Project Report Period *m* (e.g. tonnes of CO_2, tonnes of CH_4, tonnes of N_2O).

GWP_j = 100-year global warming potential for GHG *j* relative to CO_2.

Global warming potentials (GWP) for GHG *j* must use the latest values set out in Column 4 of the Schedule to the Carbon Neutral Government Regulation.

8.1 Baseline Emissions and Removals

8.1.1 B1 Fuel Consumption for Energy Service Process

This emission source is the Fuel consumption for the Energy Service Process in the Baseline Scenario. The measure of Functionally Equivalent is the Energy Service Process output of the Project for Project Report Period *m*. The quantity of Fuel is the amount required by the Energy Service Process in the Baseline Scenario to produce the Functionally Equivalent Energy Service Process output of the Project for Project Report Period *m*.

Quantification of CO_2 emissions must use WCI.23 (b), (c) or (e), and, if applicable, WCI.23 (f). Quantification of CH_4 and N_2O emissions must use WCI.24.

Where applicable, use Equation 1 to convert to tCO_2e.

Quantification of electricity Fuel emissions must use equation B2.

8.1.2 B2 Grid Electricity

This emission source includes the GHG emissions resulting from the generation of electricity that is required in a non-electrical Energy Service Process Operation.

This emission source also includes all electricity consumed as a result of the activities in SSRs B3 and B4.

Equation B2 and B2.1 must be used to calculate GHG emissions associated with the electricity supplied by an Integrated Grid or Isolated Grid.

Equation B2: Grid Electricity

$$T_{B2,m} = \sum_{j} EF_{B2,f,m} \times AL_{B2,f,m}$$

Where,

$T_{B2,m}$ = Total GHG emissions in tCO_2e due to consumption of electricity supplied by all electricity grids for Project Report Period *m* (tCO_2e).

$EF_{B2,f,m}$ = Emission factor for electricity supplied by grid type *f* for Project Report Period *m* (e.g. tCO_2e / MWh).

$AL_{B2,f,m}$ = Total electricity consumed from grid type *f* for Project Report Period *m* (e.g. MWh).

Emission Factor ($EF_{B2,f,m}$)

Integrated Grid ($EF_{B2,ing,m}$)

For electricity supplied by an Integrated Grid, the Project Proponent must use the appropriate emission intensity factor for the Project Report Period *m* published on the B.C. Ministry of Environment and Climate Change Strategy's website published in accordance with Schedule E of the Greenhouse Gas Emission Reporting Regulation. If a published emission factor is not available, the Project Proponent may use the most recent emission intensity factor as published by BC Hydro.

Isolated Grid ($EF_{B2,isg,m}$)

For electricity supplied by an Isolated Grid, the Project Proponent must calculate the appropriate emission factor using Equation B2.1 for each technology / method of Energy Service Process.

Equation B2.1: Emission Factor Isolated Grid

$$EF_{B2,isg,m} = \frac{T_{B2,isg,m}}{TEG_m}$$

Where,

$EF_{B2,isg,m}$ = Emission factor for Isolated Grid for GHG *j* Project Report Period *m* (e.g. tonne CO_2e / MWh).

$T_{B2,isg,m}$ = GHG emissions associated with the electricity supplied by an isolated grid, generated using a non-electricity Fuel in Project Report Period *m*. Quantification of CO_2 emissions must use WCI.23 (b), (c) or (e), and, if applicable, WCI.23 (f). Quantification of CH_4 and N_2O emissions must use WCI.24. Where applicable, use Equation 1 to convert to tCO_2e.

TEG_m = Total electricity generated and supplied in Project Report Period *m* (e.g. MWh).

Activity Level ($AL_{B2,f,m}$)

Electricity Fuel consumption must be calculated based on data from the Operation for Project Report Period *m*.

8.1.3 B3 Ancillary Activity (Functioning of the Operation)

This emission source is non-electricity Fuel consumption as a result of those activities that support the function of the Energy Service Process.

Quantification of CO_2 emissions must use WCI.23 (b), (c) or (e), and, if applicable, WCI.23 (f). Quantification of m CH_4 and N_2O emissions must use WCI.24. Where applicable, use Equation 1 to convert to tCO_2e.

8.1.4 B4 Maintenance

This emission source is non-electricity Fuel consumption for maintenance of the Energy Service Process.

Quantification of CO_2 emissions must use WCI.23 (b), (c) or (e), and, if applicable, WCI.23 (f). Quantification of CH_4 and N_2O emissions must use WCI.24. Where applicable, use Equation 1 to convert to tCO_2e.

8.2 Project Emissions and Removals

For calculations in this section, Fuel information must be based on data for the Operation for Project Report Period *m*.

8.2.1 P1 Fuel Consumption for Energy Service Process

This emission source is the Fuel consumption for the Energy Service Process in the Project Scenario.

Quantification of CO_2 emissions must use WCI.23 (b), (c) or (e), and, if applicable, WCI.23 (f). Quantification of CH_4 and N_2O emissions must use WCI.24.

Where applicable, use Equation 1 to convert to tCO_2e.

Quantification of electricity Fuel emissions must use equation P2.

8.2.2 P2 Grid Electricity

This emission source includes the GHG emissions resulting from the generation of electricity that is required in a non-electrical Energy Service Process Operation.

This emission source also includes all electricity consumed as a result of the activities in SSRs P3, P4 and P5. Electricity consumed for non-electricity Fuel processing is not included here (see P6).

Equation P2 and P2.1 must be used to calculate GHG emissions associated with the electricity supplied by an Integrated Grid or Isolated Grid.

Equation P2: Grid Electricity

$$T_{P2,m} = \sum_{j} EF_{P2,f,m} \times AL_{P2,f,m}$$

Where,

$T_{P2,m}$ = Total GHG emissions in tCO_2e due to consumption of electricity supplied by all electricity grids for Project Report Period *m* (tCO_2e).

$EF_{P2,f,m}$ = Emission factor for electricity supplied by grid type *f* for Project Report Period *m* (e.g. tCO_2e / MWh).

$AL_{P2,f,m}$ = Total electricity consumed from grid type *f* for Project Report Period *m* (e.g. MWh).

Emission Factor ($EF_{P2,f,m}$)

Integrated Grid ($EF_{P2,ing,m}$)

For electricity supplied by an Integrated Grid, the Project Proponent must use the appropriate emission intensity factor for the Project Report Period *m* published on the B.C. Ministry of Environment and Climate Change Strategy's website published in accordance with Schedule E of the Greenhouse Gas Emission Reporting Regulation. If a published emission factor is not available, the Project Proponent may use the most recent emission intensity factor as published by BC Hydro.

Isolated Grid ($EF_{P2,isg,m}$)

For electricity supplied by an Isolated Grid, the Project Proponent must calculate the appropriate emission factor using Equation P2.1a for each technology / method of Energy Service Process.

Equation P2.1: Emission Factor Isolated Grid

$$EF_{P2,isg,m} = \frac{T_{P2,isg,m}}{TEG_m}$$

Where,

$EF_{P2,isg,m}$ = Emission factor for Isolated Grid for GHG *j* Project Report Period *m* (e.g. tonne CO_2e / MWh).

$T_{P2,isg,m}$ = GHG emissions associated with the electricity supplied by an isolated grid, generated using a non-electricity Fuel in Project Report Period *m*. Quantification of CO_2 emissions must use WCI.23 (b), (c) or (e), and, if applicable, WCI.23 (f). Quantification of CH_4 and N_2O emissions must use WCI.24. Where applicable, use Equation 1 to convert to tCO_2e.

TEG_m = Total electricity generated in Project Report Period *m* (e.g. MWh).

Activity Level ($AL_{P2,f,m}$)

Non-electricity Fuel consumption must be measured.

8.2.3 P3 Ancillary Activity (Functioning of the Operation)

This emission source is non-electricity Fuel consumption as a result of those activities that support the function of the Energy Service Process.

Quantification of CO_2 emissions must use WCI.23 (b) or (c) or (e), and, if applicable, WCI.23 (f). Quantification of CH_4 and N_2O emissions must use WCI.24. Where applicable, use Equation 1 to convert to tCO_2e.

8.2.4 P4 Maintenance

This emission source is non-electricity Fuel consumption for maintenance of the Energy Services Process.

Quantification of CO_2 emissions must use WCI.23 (b), (c) or (e), and, if applicable, WCI.23 (f). Quantification of CH_4 and N_2O emissions must use WCI.24. Where applicable, use Equation 1 to convert to tCO_2e.

8.2.5 P5 Fuel Delivery

This emission source is the result of non-electricity Fuel consumption caused by the transportation of the Fuel used by the Primary Activity.

Equation P5 must be used to calculate non-electricity Fuel delivery emissions.

Equation P5: Fuel Delivery

$$T_{P5,j,m} = \sum_{h} EF_{P5,j,h} \times AL_{P5,h,m}$$

Where,

$T_{P5,j,m}$ = Total Fuel delivery emissions of each GHG *j* for Project Report Period *m* (tonnes of GHG *j*).

$EF_{P5,j,h}$ = Non-electricity Fuel transportation emission factor for GHG *j* for non-electricity Fuel type *h* (e.g. tonnes of CO_2 / litre of diesel).

$AL_{P5,h,m}$ = Quantity of transport non-electricity Fuel combusted for non-electricity Fuel type *h* for Project Report Period *m* (e.g. litres of diesel).

Use Equation 1 to convert to tCO_2e.

Emission Factor ($EF_{P5,j,h}$)

Quantification must use a mobile combustion emission factor for each GHG *j* from Table A6-12 of Canada's most recent National Inventory Report: Greenhouse Gas Sources and Sinks in Canada.

If it is demonstrated to be a more accurate quantification method, then GHG emissions for CO_2 may be determined using WCI.23 and GHG emissions for CH_4 and N_2O emissions may use a default emission factor referenced in WCI.24.

Activity Level ($AL_{P5,h,m}$)

Transportation non-electricity Fuel consumption for transport vehicles must be measured. Records must only correspond to Project Scenario distance travelled.

8.2.6 P6 Processing of a Fuel

This emission source is the result of the preparation and handling of non-electricity Fuel after it is delivered to the Project.

Quantification of CO_2 emissions must use WCI.23 (b), (c) or (e), and, if applicable, WCI.23 (f). Quantification of CH_4 and N_2O emissions must use WCI.24. Where applicable, use Equation 1 to convert to tCO_2e.

8.3 Leakage

The GHG sources commonly expected to be material to projects using this Protocol are identified in Figure 1. The Project Plan must confirm that there are no other GHG sources that are material to the Project.

If the Project has an emission source that is potentially material and not included in Figure 1, the Project Proponent must conduct a Leakage assessment as set out in the Regulation (section 14 (3) (k)). Use Equation 1 to convert to tCO_2e.

8.4 Project Reductions

In this section, quantification results from sub-sections 8.1 to 8.3 are inputs for quantifying the Project Reduction for a project report period *m*.

Note that CO_2 emissions from Biomass combustion are excluded from quantification in this section.

Equation PR1: Total Baseline Emissions

(Baseline Emissions) = $T_{B1,m} + T_{B2,m} + T_{B3,m} + T_{B4,m}$

Where,

$T_{B1,m}$ = GHG emissions from baseline Fuel consumption for Energy Service Process SSR B1 (tonnes of CO_2e).

$T_{B2,m}$ = GHG emissions from baseline Grid Electricity (non-primary activity) SSR B2 (tonnes of CO_2e).

$T_{B3,m}$ = GHG emissions from baseline Ancillary Activity SSR B3 (tonnes of CO_2e).

$T_{B4,m}$ = GHG emissions from baseline Maintenance SSR B4 (tonnes of CO_2e).

Equation PR2: Total Project Emissions

(Project Emissions) = $T_{P1,m} + T_{P2,m} + T_{P3,m} + T_{P4,m} + T_{P5,m} + T_{P6,m}$

Where,

$T_{P1,m}$ = GHG emissions from project Fuel consumption for Energy Service Process SSR P1 (tonnes of CO_2e).

$T_{P2,m}$ = GHG emissions from project Grid Electricity (non-primary activity) SSR P2 (tonnes of CO_2e).

$T_{P3,m}$ = GHG emissions from project Ancillary Activity SSR P3 (tonnes of CO_2e).

$T_{P4,m}$ = GHG emissions from project Maintenance SSR P4 (tonnes of CO_2e).

$T_{P5,m}$ = GHG emissions from project Fuel Delivery SSR P5 (tonnes of CO_2e).

$T_{P6,m}$ = GHG emissions from project Fuel Processing SSR P6 (tonnes of CO_2e).

Total Project Reductions from a Project are then calculated using Equation PR3:

Equation PR3: Project Reduction

Project Reduction = Baseline Emissions – Project Emissions – Leakage Emissions

Total Project Reduction is reported as a positive value and a net emissions increase is reported as a negative value.

9.0 PROJECT REDUCTIONS ESTIMATES

In accordance with (section 14 (3) (l)) of the Regulation, the Project Plan must include an estimate of the expected Project Reduction to be achieved during the Crediting Period. In the Project Plan, the Project Proponent must include the estimated Project Reduction for each Project Report Period. The Project Proponent must explain anticipated variability of the Project Reduction across Project Report Periods.

10.0 DATA COLLECTION

In the Project Plan, the Project Proponent must detail how data will be collected and managed in accordance with ISO 14064-2:2006, sections 5.9 and 5.10 over the Crediting Period and record retention period established in (section 27) of the Regulation. The data collection and monitoring approach must be validated and followed throughout the Crediting Period. Measurement must be in accordance with WCI.25 Sampling, Analysis and Measurement Requirements.

For electricity Fuel, electricity emission factors must be updated for each Project Report Period. Total electricity consumed must be measured continuously using an electricity meter approved by Measurement Canada.

For tracking the location of a mobile GHG emission source, the Project Proponent must use:

- a continuous location tracking device while the mobile source is operational, and/or,
- a location tracking record management system for evidence of temporal location, with sufficient frequency to provide a reasonable level of assurance that the location of the mobile source over the Project Report Period can be determined.