Intent to Develop Alberta Offset System Quantification Protocol: Fleet Fuel Switch

Please contact Climate Change Central with any questions or clarification of requirements at contact@climatechangecentral.com.

This Intent to Develop an Alberta Offset System Quantification Protocol document is intended to provide Alberta Environment with an overview of the proposed protocol idea to demonstrate how this protocol will meet the requirements of the Alberta Offset System. The protocol developer is required to present this information to Alberta Environment and **must** receive approval in concept for the protocol before the protocol idea will be considered for development in the Alberta Offset System.
Familiarity with and general knowledge of the Alberta Offset System is required prior to initiating a protocol. Information on the Alberta Offset System is available on the Carbon Offset Solution website (http://carbonoffsetsolutions.climatechangecentral.com) and on the Alberta Environment website (http://environment.alberta.ca/02275.html).

Alberta Environment will review the submitted information in order to assess and provide feedback on the following elements:

- How the proposed protocol meets the eligibility criteria in section 7 of the *Specified Gas Emitters Regulation;*
- Applicability of the proposed protocol against purpose and intent of the Alberta Offset System;
- Baseline adoption levels and credit potential for Alberta;
- Baseline, project condition, and key assumptions for the proposed protocol;
- Key stakeholders and technical experts in the field; and
- Relevant science and technical information

1.0 General Description of Proposed Protocol

Intent:
This protocol will apply to projects involving the switching from conventional fossil fuels in commercial/institutional fleet vehicles to less GHG-intensive fuels. GHG intensity will be determined by examining the entire life-cycle of the fuel displaced and the replacement fuel.
On an energy equivalent basis, replacement fuels must demonstrate a lower GHG intensity in comparison to the displaced fuel. As such, replacement fuels can include other fossil fuels, biofuels, renewable fuels, and/or electricity.

Baseline:
The baseline condition is defined by the emissions associated with the use of fossil fuels in both heavy duty, passenger, and light fleet vehicles prior to switching to fuels with a lower life-cycle GHG emissions intensity (on an energy equivalent basis.)

Fleet vehicles are commonly designed to consume conventional fuels, primarily, gasoline and diesel. The implementation of combustion engines which can accommodate alternative fuels with lower life-cycle GHG emissions intensities can result in significant reductions in emissions.

It is proposed that a **Dynamic Historic Benchmark** approach be applied in the proposed protocol. This will ensure that the volume of conventional fuel displaced by a lower-intensity replacement fuel (on an energy equivalent basis), is used in quantifying the GHG emission reductions for each reporting period.

Project Condition:
The project condition is defined by the emissions associated with the use of fuels with lower lifecycle carbon intensities in comparison to the conventional fuel previously consumed under the baseline condition.

No project-specific technologies are described within this protocol, as the protocol is intended to apply to a wide range of different projects and associated energy generation technologies. Individual project proponents are expected to describe their specific technologies and utilize appropriate data when applying the protocol to the preparation of a GHG project plan.

Applicability:
Emissions of the following fossil fuel combustion-related GHGs will be reduced:

Specified Gas	**Formula**	**100-year GWP**	**Applicable to Project**
Carbon Dioxide	CO_2	1	Y
Methane	CH_4	21	Y
Nitrous Oxide	N_2O	310	Y
Sulphur Hexafluoride	SF_6	23,900	N
Perfluorocarbons*	PFCs	Variable	N
Hydrofluorocarbons*	HFCs	Variable	N

Under most circumstances, emissions of the following additional fossil fuel combustion-related GHGs would also be reduced, though in some cases where the project involves using a less GHG-intensive fossil fuel, emissions of these GHGs may increase, depending on the fuel type, specific combustion conditions, including temperature, and emission controls in place for the project system relative to the baseline.

Regulatory Requirements:
Alberta's Renewable Fuels Standard (RFS) will require an average of two per cent renewable diesel in diesel fuel and five per cent renewable alcohol in gasoline sold in Alberta.
Referencing Environment Canada's emission factors for conventional gasoline and diesel, these factors can be adjusted to reflect the new carbon intensity of "displaced fuels" as a result of mandated blending requirements. This will ensure that baseline emissions accurately reflect the emission reductions associated with regulated volume of blended renewable diesel and ethanol.

For example, conventional gasoline has a generally accepted lifecycle carbon intensity of 2.341 g CO_2e/L. The addition of renewable alcohol, under the provincial RFS mandates the alcohol to be 25% less intensive then gasoline, at an average concentration of 5%. As such, an adjusted emission factor for an E5 blend would be approximately 2.30 g CO_2e/L. If a replacement fuel includes a renewable alcohol or renewable diesel blend, comparing the emission factor for the replacement fuel with an adjusted emission factor for the baseline fuel will ensure emission reductions are incremental.

Additionality:
Real emission reductions will be achieved primarily through the reduction of fossil fuel combustion emissions relative to what would have occurred in the absence of the project by substituting fossil fuels as primary energy sources with less GHG-intensive fossil fuel or renewable energy sources. This may involve the transition to new fleet equipment to capacitate the use of new fuels and/or efforts to establish new sources of energy supply that would not have existed or been used in the baseline case.

Achievement and appropriate quantification of real emission reductions will be ensured through development of the quantification protocol and subsequent GHG project plans in accordance with ISO14064-24, Alberta's Climate Change & Emissions Management Act, and other relevant requirements and good practice guidance.

See note above on Regulatory Requirements on how to address the incrementality of going above and

beyond emission reductions achieved through regulated renewable fuel blending requirements.

Barrier Category	Description:
Capital Cost:	A higher capital cost in either the baseline or the project may present a barrier depending on access to credit or capital.
Operating Cost:	Operating costs associated with new technologies may present a barrier for certain types of fuels.
Technical Expertise:	The project or baseline may require technical expertise that is not readily available and hence barriers could be present either through cost of training, timing of expertise availability, etc.
Infrastructure:	Lack of infrastructure may present a barrier in terms of type of fuel available at the site, fleet storage facilities, etc.
Institutional/Political:	Resistance to the project or baseline at an institutional or political level may present a barrier.
Fuel Procurement:	Challenges in procuring or cost of obtaining a reliable supply of certain types of fuel may present a barrier.
Social/Cultural:	Social acceptance of particular technologies or energy generation solutions may be a barrier

Barriers:

Good practice guidance for performing a barriers test can be found in Chapter 8 of the WBCSD/WRI Greenhouse Gas Protocol for Project Accounting[1]. A preliminary barriers assessment is as follows:

[1] WRI GHG Protocol, A Corporate Accounting and Reporting Standard, Chapter 8 http://www.google.ca/url?sa=t&source=web&cd=4&ved=0CCQQFjAD&url=http%3A%2F%2Fwww.ghgprotocol.org%2Ffiles%2Fghgp%2Fpublic%2Fghg-protocol-revised.pdf&ei=iDC_TbDiHeTeiAKdovwm&usg=AFQjCNGDi1F8y3x7Zm4i0Vop4FW_268K_Q

Permanence:
These reductions are not reversible.

Leakage:
The application of this protocol will not result in or threaten leakage of GHG emissions.

Conservativeness:
This protocol could addresses conservativeness in a number of ways:

- The use of nationally accepted emission factors for all relevant fleet fuels;
- The adjustment of emission factors to account for renewable fuel blending requirements in Alberta;
- Quantification will be conducted on an energy equivalent basis to ensure functional equivalence between the baseline and project conditions;

Aggregation:
Aggregation of projects is not likely to occur.

Verification:
Baseline Condition – historic fuel procurement records and vehicle tangible capital asset statements will facilitate the verification of the baseline condition. Tangible capital asset statements provide a description of the vehicles which make up a corporate fleet. Based on the vehicle types listed, historic fuel procurements records will demonstrate what types of fuels were purchased to operate the fleet prior to a change in fuel or

technology.

Project Condition – fuel procurement records related to the project period will confirm what type of replacement fuel has been purchased. The type of fuel must be clearly identifiable and best practice guidance can be referenced to determine the emissions factors for replacement fuels.

Ownership:
Unlike previous transportation fuel related protocol (ie. Alberta's Biofuel Production and Use Protocol), the proposed protocol would entitle the end user of the alternative fleet fuel to claim emission reductions associated with its use.

If biofuels/renewable fuels/renewable electricity are used, the project proponent must be able to demonstrate that the ownership of the environmental benefit associated with these fuels was also transferred to the end user along with the fuel.

Related Protocols and/or Methodologies:
The Alberta Quantification Protocol for Biofuels Production and Usage can be referenced in order to establish the methodology by which a project proponent can determine the relevant emission factors associated with the replacement fuel.

Alberta's Renewable Fuel Standard and the GREET[2] model developed by the California Air Resource Board can be referenced in developing a listing of default fuel emission factors which can be incorporated into the proposed protocol.

The Clean Development Mechanism has a number of protocols related to industrial fuel switching which may be referenced in determining SSRs to be included or excluded from quantification in the proposed protocol. Examples include CDM AM0036[3] "Fuel switch from fossil fuels to biomass residues in boilers for heat generation."

Other Benefits:

- Improved energy security as fuel types used in commercial fleets are diversified
- Development of alternative fuel industry
- Investment into new engine technologies which can capacitate alternative fuels such as compressed natural gas
- Development of expertise in maintenance of alternative fuel engines and associated technologies
- Opportunity to reinvest carbon capital into growing the project incrementally

Adverse Effects:
Although lower in comparison, the displacement of one fossil fuel with another, less intensive fuel will still lead to emissions of GHGs.
Also other operational adverse effects could include the impact of weather and climate on the types of fuels which can be implemented (ie. The effects of cold weather on the viscosity of biofuels).

References:
[2] California Air Resources Board and California Energy Commission, GREET Model for Quantifying GHG Emissions from Alternative Fuels, 2009 http://www.arb.ca.gov/fuels/lcfs/ca_greet1.8b_dec09.xls
[3] AM0036: Fuel switch from fossil fuels to biomass residues in heat generation equipment Version 3.0, http://cdm.unfccc.int/methodologies/DB/7P3CG1OWTTS3XX0N9XKCENFI050SH6

2.0 Proposed Timing for Submission into the Offset System Review Process

It is anticipated that the proposed protocol will be submitted for stakeholder review by September 9, 2011.