PROGRAMME DESIGN DOCUMENT FORM FOR SMALL-SCALE CDM PROGRAMMES OF ACTIVITIES (F-CDM-SSC-PoA-DD) Version 02.0

PROGRAMME OF ACTIVITIES DESIGN DOCUMENT (PoA-DD)

PART I. Programme of activities (PoA)

SECTION A. General description of PoA

A.1. Title of the PoA

Green Commercial Vehicles Projects
Version: 01.2
Date: 20/11/2012

A.2. Purpose and general description of the PoA

The Green Commercial Vehicles Projects is a small-scale CDM Programme of Activities (hereafter referred to as "PoA") developed to reduce greenhouse gas (GHG) emissions from the transport sector in two ways:

(i) Introduction and operation of new less GHG emitting vehicles (e.g. LNG, CNG, LPG, electric or hybrid) for commercial passengers (including public transportation), material and freight transport, operating on routes with comparable conditions.
(ii) Retrofitting of existing vehicle (e.g. switching from high greenhouse gas intensive to low greenhouse gas intensive fossil fuel) for commercial passengers (including public transportation), material and freight transport.

The main objective of this PoA is to reduce a significant amount of GHG emissions which includes commercial passenger vehicles (including public transport), material and freight transport. This PoA aims to increase the number of green vehicles[1] or less GHG emitting vehicles by introducing new or retrofitting existing vehicles which will contribute to increased fuel economy, lower GHG and improved tailpipe emissions. These actions will lead to an increase in environmentally friendly vehicles and thus assist the host country to achieve a more sustainable transportation system. The PoA also intends to promote, encourage and expand more green vehicles to be used in the host country as an alternative to the current conventional vehicles. The development of vehicle energy efficiency and fuel switch technology in the host country is in line with the host country's National Green Technology Policy[2] to increase national capability and capacity for innovation in green technology development for the transport sector.

Only small-scale CDM programme activity (SSC-CPA) will participate in this PoA and each SSC-CPA will consist of single unit vehicle or a group of vehicles depending on the emission reduction of the SSC-CPA that must be less than or equal to 60kt CO_2 equivalent annually. The vehicle's owner will sign an agreement[3] with the CME prior to being included in this PoA, where the CME will provide complete CDM services and technical support in term of management and monitoring of the projects, thus ensuring long-term sustainability of the project activity. The CME is focussing on the road and waterborne transportation categories in the host county to be included in the PoA as the main target group, as these two categories have high potential to develop as GHG reduction projects at the time the PoA-DD is written. Other categories such as aviation, rail and others can be explored in the future whenever the conditions are applicable and these are also covered by this PoA.

[1] Green vehicle is a vehicle which contributes to better fuel economy, lower greenhouse gases and improved tailpipe emissions - defined by Malaysian Green Technology Corporation (GreenTech Malaysia).
[2] http://www.greentechmalaysia.my/GreenLearn/LearnPoliciesAndActs.aspx#first
[3] Emission Reduction Purchase agreement (ERPA)

Malaysia has identified that transport category as the second largest contributor to the greenhouse gas emission in Malaysia for the Year 2000 under energy sector after energy industries category[4]. Road transport is one of the largest consumers of oil and also the highest contributor to overall CO_2 emissions in Malaysia. To control and reduce the greenhouse gas emission in Malaysia, government has encouraged the use of technology to reduce emission for the new or existing vehicles for public transportation, commercial vehicles and also private vehicles. This expanded including the available or new technologies in the market such as hybrid, electric, compressed natural gas (CNG) and others[5].

Malaysian government currently plans to adopt a comprehensive strategy to diversify the fuel basket for the transport sector and adopt fuels like natural gas, electricity and biodiesel on a large scale. This policy will come with adequate infrastructure to encourage the use of these fuels by population. Malaysian government also encourages energy efficient movement and improving fuel quality in order to reduce dependence on petroleum based fuels and the consequent pollution and emissions. In addition to promote alternative and clean fuels as recommended above, Malaysian government can target developing mandatory fuel efficiency norms, stringent emission standards and strict inspection and maintenance regime that will encourage energy efficient and less polluting movement of all transport modes[6].

The proposed PoA is a voluntary action by the CME since the implementation of SSC-CPAs through introduction of new low GHG emitting vehicles and retrofitting of existing vehicles to low GHG emitting vehicles are voluntary actions in the host country. There are no mandated laws or regulations enforcing the introduction of new low GHG emitting vehicles and retrofitting of existing vehicles to low GHG emitting vehicles. The CME also is not obliged by any local legislation nor have any contractual obligation to implement the PoA.

The PoA will support the sustainable development policies of the host country and bring direct benefits towards achieving sustainable development as listed below:

Environmental criteria

- Each SSC-CPA will provide alternatives to the conventional fossil fuel vehicles by using less GHG emitting fuels which are more environmental friendly, energy efficient and high technology.
- Energy efficient vehicles can reduce fossil fuel consumption which contributes to GHG emissions into the atmosphere.
- Each SSC-CPA implemented will minimize the air pollution from vehicle exhaust and reduces pollution impacts resulting in the preservation of the environment.
- All SSC-CPAs will help to reduce smoke, odour and related health hazards which would have been produced by fossil fuel vehicles from current practises.
- The PoA will help to promote and support the host country's sustainable transportation programme and reduce national energy consumption.

Economic criteria

- Host country and other private companies can get more economic benefits in terms of savings of fuel subsidies and savings from lower fuel consumption.
- The PoA will encourage renewable energy, green technology and energy efficiency market for the transport sector by providing an incentive from carbon credit revenues.
- Research and development in renewable energy, green technology and energy efficiency will be boosted through this PoA.
- Enhances host country's competitiveness in green technology.

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[4] Table 2.5 – Key Source Analysis for Greenhouse Gas Emissions for Year 2000, with LULUF. Chapter 2: Greenhouse Gas Inventory. Second Communication to the UNFCCC Report.

[5] 8.10 – Transport. Chapter 8: Addressing Climate change. Second Communication to the UNFCCC Report.

[6] *Energy Efficient Pathways for the Transportation Sector in Malaysia* by Siti Indati Mustapa, Dr Tan Ching Sin and Dr Leong Yow Peng (Institute of Energy Research and Policy (IEPRe), University Tenaga Nasional).

- The PoA will improve the economics related to transport sector by increasing business opportunities for local suppliers, maintenance & repair companies, supplier of equipment and parts, and other services.
- Training will be provided to the local staff to execute and manage the projects, thus increasing the host country's qualified manpower and knowledge.
- More job opportunities will be created to fulfil the needs of manpower in green vehicles industry.
- The PoA will provide an opportunity for technology transfer and this will encourage investors to invest and develop the green vehicles market and manufacturing sector.
- The project will lead to an increase of the Gross Domestic Product (GDP) and will have a positive impact on the host country's annual GDP growth rate.

Social criteria

- Provide knowledge and awareness to the vehicle's owners and users with respect to environment, climate change and green technology. This will lead to commitment of adoption and application of green vehicles.
- Improve the transportation companies' way of doing business in a sustainable manner.
- Improve the quality of life and environmental condition of the community leading to a healthier population.
- The PoA will prepare the platform for local engineers, technicians and operators to acquire the know-how on green technology and increase the competency level of the workers.
- Increase national capability and capacity for innovation in green technology.
- Enhance public education and awareness and encourage its widespread use.
- Expansion of local research institutes and institutions of higher learning to expand research, development and innovation activities on green vehicles towards commercialisation.

A.3. CMEs and participants of PoA

Integra Carbon Sdn Bhd (hereinafter referred to as "Integra") is the CME to the PoA, and will be the entity which communicates with the Executive Board. Integra and Landfill Gas Canada Ltd (hereinafter referred to as "LFGC") are the project participants for this PoA. Other participant/s of the activities (if any) to be included under this PoA will be identified within the SSC-CPA design document (hereinafter referred to as "SSC-CPA-DD") of each individual CPA.

A.4. Party(ies)

Name of Party involved (host) indicates a host Party	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Malaysia (host)	Private entity- Integra Carbon Sdn Bhd	No
Netherlands	Private entity- Landfill Gas Canada Ltd	No

A.5. Physical/ Geographical boundary of the PoA

At the commencement of the PoA, the physical boundary will be within the geographical boundaries of Malaysia where all CPAs included in the PoA will be implemented. After registration of the PoA, the boundary may be amended for additional countries in accordance with the procedure provided under EB60 Annex 26. The map of Malaysia is shown below:

Figure 1: Map of Malaysia

A.6. Technologies/measures

The project activity will apply AMS-III.S. "Introduction of low-emission vehicles/ technologies to commercial vehicle fleets" version 3 methodology and subsequent versions under the type III project activities "Scope 7 – Transport".

A SSC-CPA will be a new or retrofitted individual vehicle or a group of vehicles that has/ have lower GHG emissions than the baseline by using energy efficiency approach or fuel switch approach. Currently, fossil fuel with higher GHG emission is used as a baseline and it is a prevailing practise for most of the vehicles. The GHG emission will be reduced when the SSC-CPA is implemented because energy is used more efficiently or low GHG intensive fossil fuel is used instead of high GHG intensive fossil fuel. In the project activity, each SSC-CPA is expected to install a green technology which has better performance in terms of energy efficiency and lower GHG emission than the baseline. The green technologies that are currently available and new technologies in the future can be considered for each SSC-CPA and each technology will comprise measures that reduce the GHG emissions of vehicles by means of one or a combination of methods based on AMS-III.S methodology (version 3 or later).

Each SSC-CPA will have only one technology and one measure applied to the vehicles. Any other technologies or measures that may be developed in coming years are eligible for SSC-CPAs to be included in this PoA, provided they meet the eligibility requirements outlined. The installed project technology at each SSC-CPA project site will not be substituted by other or added with more technologies within the crediting period.

The technology used for each CPA can be either imported from other country or locally developed, as long as the technology is environmentally safe and sound technology and approved by authorities or complied with certification/testing by technology provider.

Each SSC-CPA is expected to reduce not more than 60 kilotonnes of carbon dioxide equivalent annually.

A.7. Public funding of PoA

The PoA has not received and will not be seeking public funding. Each SSC-CPA will provide written affirmation that funding from Annex 1 parties, if any, does not result in a diversion of official development assistance.

SECTION B. Demonstration of additionality and development of eligibility criteria

B.1. Demonstration of additionality for PoA

The additionality of the programme can be demonstrated considering that there are no mandatory regulations and requirements for:

(i) Introduction and operation of new less greenhouse gas (GHG) emitting vehicles (e.g. LNG, CNG, LPG, electric or hybrid) for commercial passengers (including public transportation), material and freight transport.

(ii) Retrofitting of existing vehicle (e.g. switching from high greenhouse gas intensive to low greenhouse gas intensive fossil fuel) for commercial passengers (including public transportation), material and freight transport.

The PoA is thus implementing a voluntary coordinated action not required by legislation that would not be implemented in the absence of the PoA. The proposed PoA is a voluntary coordinated action by the CME to promote the use of low GHG emission vehicles for commercial passengers (including public transportation), material and freight transport in the host country. There are no rules and regulations in the host country that impose the use of low GHG emission vehicles for commercial passengers (including public transportation), material and freight transport.

The following are regulations for registered vehicles under the transport sector in Malaysia but none of them are related to GHG emission. The restrictions in Malaysia's environmental regulations are listed below:

(i) Noise from motor vehicle.[7]

(ii) Smoke from engine diesel.[8]

(iii) Carbon Monoxide and Hydrocarbon/ Nitrogen Oxide emission from petrol engines.[9]

In the absence of the PoA, the vehicles for commercial passengers (including public transportation), material and freight transport in the host country would continue to use fossil fuel as a main source of energy. This is the prevailing practice for transportation sector in Malaysia which is wholly dependent on liquid fossil fuels[10].

Each SSC-CPA[11] must comply with the regulation enforced by the local Department of Environment before inclusion into the PoA and cannot use the CDM project to comply with the regulations imposed (wherever applicable). There is no mandatory law to introduce and operate new less greenhouse gas (GHG) emitting vehicles and retrofit of existing vehicle by switching from high greenhouse gas intensive to low greenhouse gas intensive fossil fuel.

There are a few technologies available in the market that can reduce the GHG emission for vehicles in the host country. Currently, the technology is unfavourable due to the high cost of installation and the technology is still new and does not give consistent result. Availability of reliable and economical technology is required to introduce the low GHG emission vehicles or to retrofit existing vehicles in the host country. This has been acknowledged by Malaysia's policy maker and in 12th Malaysian Plan, the long term target is to implement widespread adoption of green technology for application in five green energy sectors which include the transportation sector[12]. Continuation of preferable current practise that is

[7] Environmental Quality (Motor Vehicle Noise) Regulations 1987

[8] Environmental Quality (Control Of Emission From Diesel Engines) Regulations 1996

[9] Environmental Quality (Control Of Emission From Petrol Engines) Regulations 1996

[10] Journal of Public Transportation, Vol. 11, No. 3, 2008. *Travel Demand Management: Lessons for Malaysia* by Jeyapalan Kasipillai & Pikkay Chan

[11] For retrofitting existing vehicles

[12] *Development of National Green Technology* by Ahmad Zairin Ismail, Malaysian Green Technology Corporation.

by using fossil fuel for vehicles in the host country is already sufficient to comply with the government regulation and requires no additional investment.

B.2. Eligibility criteria for inclusion of a CPA in the PoA

A description of the criteria for enrolling a SSC-CPA is described below; the criteria for demonstrating additionality of a SSC-CPA shall be described in more detail in Part II section B.5.

1. All SSC-CPA are within the geographical boundary including any time-induced boundary set in the PoA, per Part I section A.5 of this PoA
2. Each SSC-CPA included in this PoA will have a unique identification number as a reference. To avoid double counting, each included SSC-CPA with its reference number will be linked with the geographic coordinates of the vehicle's station[13] marked by GPS. Each vehicle in CPA also will have an individual identification number by using registration number assigned to each vehicle.
3. The project must comprise measures that reduce GHG from vehicles by means of the following options:

(a) Energy efficiency

(b) Fuel switch

The technology used is environmentally safe and sound technology and approved by authorities or complied with certification/testing by technology provider.

4. The start date of each SSC-CPA will be based on vehicle purchasing documentary evidence.
5. Each SSC-CPA must adhere to the applicability, baseline and monitoring methodology of AMS-III.S. "Introduction of low-emission vehicles/ technologies to commercial vehicle fleets" version 3 methodology or future update. Multiple methodologies are not applicable to the SSC-CPA & PoA.
6. Each SSC-CPA must demonstrate the project's additionality by applying the "Guidelines on the demonstration of additionality of small scale project activities" Version 09.0, formerly known as Attachment A of Appendix B (EB 68, Annex 27) or future updates. If the SSC-CPA aims to achieve emission reductions at a scale of not more than 20 ktCO_2e per year, the "Guidelines for demonstrating additionality of microscale project activities" version 3 or future update can be used. If this is the case, the SSC-CPA must fulfil both conditions (i) and (ii) below:
   (i) Each of the independent subsystems /measures in the project activity achieves an estimated annual emission reduction equal to or less than 600 tCO_2e per year; and
   (ii) End users of the subsystems or measures are communities or SMEs.
7. The PoA-specific requirements stipulated by the CME:
   (a) Local stakeholder meeting was conducted at the PoA level.
   (b) Environmental impact assessment is not required for the implementation of energy efficient technologies per the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987.
   (c) The CME has approved the participation of the SSC-CPA into the PoA, with the signing of an Emission Reduction Purchase Agreement (ERPA) and an Inclusion Form.
8. Each SSC-CPA will provide written affirmation that funding from Annex 1 parties, if any, does not result in a diversion of official development assistance.
9. The target group is commercial and/or public transport vehicles. The distribution mechanism is either by direct installation or contractual installation.
10. Each SSC-CPA is anticipated to be verified individually.
11. Every SSC-CPA in aggregate meets the small scale or microscale threshold criteria and remains within those thresholds throughout the crediting period of the SSC-CPA.
12. Each SSC-CPA shall satisfy the latest version of de-bundling rules for PoA, adhering to the "Guidelines on assessment of de-bundling for SSC Project activities" version 03 or future updates.

[13] Any stop with similar function as station, e.g. depot, port, etc.; start point of the route taken also can be used.

B.3. Application of methodologies

The approved SSC baseline and monitoring methodology applied to a SSC-CPA included in this PoA is AMS-III.S. "Introduction of low-emission vehicles/technologies to commercial vehicle fleets" version 3 and future updates.

All technologies that reduce vehicle's greenhouse gas emissions are applicable under this PoA. The technology can be either technology for new vehicle or retrofitting technology.

Types of technologies covered by the PoA but not limited to:

- Compressed natural gas (CNG) vehicles
- Electric vehicles
- Liquid petroleum gas (LPG) vehicles
- Hybrid vehicles with electrical and internal combustion motive systems
- Liquefied natural gas (CNG) vehicles

Types of vehicles covered by the PoA but not limited to:

- Commercial passenger
- Public transportation
- Material and freight transport

Each CPA must comprise measures that reduce GHG from vehicles by means of the following options:

(a) Energy efficiency

(b) Fuel switch

Every CPA in this PoA will be verified individually.

SECTION C. Management system

(i) A record keeping system for each SSC-CPA under the PoA

The CME will ensure that each SSC-CPA maintains standard records, archives the monitoring data in a secure database and keep the records for the entire crediting period and two years after. Data (paper & electronic) will be transmitted semi-annually to the CME who is responsible for the record keeping relating to production of the Monitoring Reports. CME will conduct data audits and ensure compliance with the monitoring plan at least twice a year for each SSC-CPA.

(ii) A system/ procedure to avoid double accounting (e.g. to avoid the case of including a new SSC-CPA that has been already registered either as a CDM project activity or as a CPA of another PoA).

Prior to registering a new SSC-CPA under the proposed PoA, the CME will check the CPA and PoA databases in the UNFCCC website to ensure that a similar SSC-CPA has not been submitted for validation or has been registered already. The Designated National Authority of the host country will also be consulted prior to the inclusion of the SSC-CPA to confirm that the participating transport facility has not been registered either as a CDM project activity or as a CPA of another PoA. The individual SSC-CPA also has to issue an authorization letter to the CME as declaration informing that they are aware of and have agreed that their activity is being subscribed to this proposed PoA and they are not registered either as a CDM project activity or as a CPA of another PoA.

Each SSC-CPA included in this PoA will have a unique identification number as a reference. To avoid double counting, each included SSC-CPA with its reference number will be linked with the geographic coordinates of the vehicle's station marked by GPS. Each vehicle in CPA also will have an individual identification number by using registration number assigned to each vehicle.

(iii) The SSC-CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity.

The CME will follow the "Guidelines on assessment of de-bundling for SSC Project activities" version 3 or future updates to ensure that the proposed SSC-CPA is not a de-bundled component of another CPA or CDM project activity.

(iv) The provisions to ensure that those operating the SSC-CPA are aware of and have agreed that their activity is being subscribed to the PoA.

The individual SSC-CPA will issue an authorization letter to the CME informing that they are aware of and have agreed that their project is being subscribed to this PoA and the project is not registered either as a CDM project activity or as a CPA of another PoA.

SECTION D. Duration of PoA

D.1. Start date of PoA

Start date of the PoA will be the date on which the PoA is listed for web-hosting.
06/06/2012

D.2. Length of the PoA

The length of the PoA is 28 years.

SECTION E. Environmental impacts

E.1. Level at which environmental analysis is undertaken

The Environmental Analysis will be carried out at the CPA level, due to the nature of the individual SSC-CPA which is unique and site specific. Each SSC-CPA may have a different technology and a different measure approach to reduce the GHG emissions based on the site specific condition and requirement. The impacts are confined to each SSC-CPA and all SSC-CPAs will follow all regulations under the host country's law which will guarantee the environmental integrity of each SSC-CPA.

E.2. Analysis of the environmental impacts

The analysis of environmental impacts, including transboundary impacts, will be conducted at CPA level.

Generally, the PoA will not have any adverse environmental impacts, including transboundary impacts. In addition, the activity does not fall under those that require an Environmental Impact Assessment (EIA) by the host country, Malaysia.

Rather than causing negative impacts to the environment, the CPA will provide the following environmental benefits:

- Reduce SOx, NOx, CO2 and particulate matter emissions
- Reduce risk of pollution due to the fossil fuel
- Reduce fossil fuel consumption
- Significantly reduce odor and smoke from exhaust

SECTION F. Local stakeholder comments

F.1. Solicitation of comments from local stakeholders

A national level stakeholder consultation was done at the PoA level in order to reach a wider group of stakeholders. The targeted groups are government departments, local authorities, technology provider, consultants, associations, transportation related companies, academic institutions, NGOs, local leaders, investors, reporters, and the public. The main objective of the stakeholder meeting was to present the PoA

together with first SSC-CPA and to encourage discussion and comments from the host community. This PoA also helps to educate the stakeholders on the programme as to achieve long-term real and measurable emission reductions and encourage them to be a part of the PoA.

A national stakeholder's consultation was held to brief about the proposed programme and CDM project and to invite their comments regarding the PoA as well for the first SSC-CPA. The CME of this PoA and the project participants of the first SSC-CPA had issued a public announcement and invitation by newspaper advertisement and formal invitation letters[14].

The following steps were taken to engage the local stakeholders:

1. The local stakeholder meeting was advertised in the four major newspapers (New Straits Times, Berita Harian, Borneo Post and Utusan Borneo) under national listing on 30th January 2012.
2. Invitation was extended to government departments, local authorities, technology provider, consultants, associations, transportation related companies, academic institutions, NGOs, local leaders, investors and reporters.
3. The local stakeholder meeting was held in the Hotel Grand Dorsett Labuan's ballroom on 15th February 2012.
4. All participants were invited to comment and raised queries regarding the proposed project activity.

The meeting presented per the following:

(a) Opening speech by Datuk Yussof Mahal, Labuan Corporation Chairman and Member of Parliament for Labuan
(b) Presentation on CDM, PoA and CPA by CME representative
(c) Wartsila duel fuel engine technology presentation by Mr. Francis Tang from Wartsila Ship Design Singapore.
(d) Question and answer session.

There were 38 stakeholders attending the meeting and the participants were required to register their attendance. A copy of the register will be made available to the DOE for review.

During the meeting, presentations were made by the CME to outline the proposed project activity in a non-technical manner including environmental, social and technological considerations, climate change and understanding CDM. A question and answer session was held after the presentation to give the participants an opportunity to raise their comments and opinions about the proposed CDM project.

F.2. Summary of comments received

Comments	Replies
Programme of Activities	
What kind of project will qualify as a CDM project? By: Mr. Alden Wong (Imatech Sdn Bhd)	Any project that results in greenhouse gas emission reductions will qualify as a CDM project. The project must fulfil all of the requirements of the CDM. CDM project not just limited to transport sector only. In Malaysia a lot of CDM projects coming from palm oil industry, for example biogas project, biomass project and composting project. For transport sector, currently there are 12 projects registered and mostly are from bus rapid transit projects. For PoA, this will be the second project from transport

[14] Invitation letters sent out by hand, mail and fax.

	sector. The first one is vehicles scrapping and recycling program from Egypt.
Who is the Annex 1 Country? Where can we find the reference? By: Alden Wong (Imatech Sdn Bhd)	They are developed countries that have signed the Kyoto Protocol and have agreed to commit to reducing GHG emissions from 2008 to 2012. The full list can be found on the UNFCCC website.
Does Malaysia have the obligatory to reduce the emission after 2012? By: Datuk Haji Yusuf B Haji Mahal (Labuan Corporation)	Malaysia does not have any obligation to reduce the emission after 2012. All the CDM projects implemented in Malaysia are voluntary because this is one of the requirements from CDM. Malaysia is adopting a voluntary national reduction indicator of up to 40% in terms of GDP emission intensity by 2020 compared with 2005 levels as announced in Copenhagen by our prime minister.
Can we claim carbon credits for our individual car? By: Mr. Asmawi (Labuan Parliament Office)	Each GHG emission reduction must be based on certain methodologies approved by UNFCCC. For this PoA, only a commercial passenger, public transportation and also material and freight transport can be a project activity under this PoA. This PoA is using AMS-III.S methodology Version 3 which is for introduction of low-emission vehicles and technologies to commercial vehicle fleets.
What is the role of Labuan Corporation in this PoA? By: Captain Chanan (shipping consultant)	Government is developing Labuan to become a sustainable oil and gas hub to boost Labuan's economic potential. This is one of the way to promote Labuan and we have receive a lot of feedback and support from Labuan Corporation, transport companies and government agencies to do the National Stakeholder Meeting here in Labuan. Labuan Corporation itself is not involved in this project activity. The government is also planning to build a LNG bunker facilities in Labuan.
What is the role of the Annex 1 Country and DNA Malaysia? By: Datuk Sulaiman Ibrahim (Labuan Corporation)	The Annex 1 Country can be carbon credit purchaser, the equity provider or the technology provider for the CDM project. It is a Malaysian Government regulation that any CDM project in Malaysia will have to involve an Annex 1 Country participation. DNA Malaysia which is under Environment Ministry of Natural Resources will ensure that the CDM project or PoA will comply with Malaysia's National CDM criteria.
Are the LNG vessels built already? By: Datuk Haji Yusuf B Haji Mahal (Labuan Corporation)	No, not yet. Wartsila and Dayang Teras Shipyard are still finalizing on the final design to meet the local requirements. There are 12 LNG powered offshore supply vessels and all of them in Europe. This will be the first LNG powered offshore supply vessel in Asia.
How much is the cost of the Wartsila's LNG offshore supply vessel? By: Datuk Haji Yusuf B Haji Mahal (Labuan Corporation)	We have yet to finalize the final costing on the vessels for this project. As mentioned, we are now finalizing on the details design based on local oil and gas industries requirements and standard. We expect the price to be 30%-50% higher compared to conventional diesel offshore supply vessel.

Can CNG be used instead of the LNG for the vessel? By: Mr. Ahmad Azmir bin Rushdi (Bomba)	Technically feasible but if the vessel is using CNG instead of LNG, the fuel storage tank will be bigger. Wartsila has a proven LNG duel fuel engine for vessel and we want to apply the same technology here to serve the maritime sector. Malaysia is the second largest LNG exporter and we want this opportunity to change the prevailing practice of the oil and gas maritime services in Malaysia.
Have you received any financial assistance from the government? By: Datuk Sulaiman Ibrahim (Labuan Corporation)	For this PoA and the first SSC-CPA, all the investment is coming from private companies. The project has not received and will not be seeking any public funding or government financial assistance. It will be 100% private investment.
Any PoA projects registered in Malaysia? By: Pg. Dato Mashor (Bruneey Finers)	The Malaysia Biogas Projects PoA has been registered last year. There are several PoA that are still in validation process.
How long does it take to register a PoA? By: Pg. Dato Mashor (Bruneey Finers)	PoA registration depends on the validation processes by third party auditor and the Executive Board at UNFCCC. Normally it will take around 1 year to get it registered. But inclusion of SSC-CPA will be much shorter, around 4 to 6 months.

F.3. Report on consideration of comments received

All questions related to the PoA have been answered during the national stakeholder's consultation. The stakeholders did not raise any concerns or objections to the PoA, or request for any changes to the implementation of the project. As such, no further actions were taken for the comments received.

SECTION G. Approval and authorization

Name of Authorizing Party	Project Participants that have been authorized	Contact info
Malaysia (host)	Private entity- Integra Carbon Sdn Bhd	Name: Mr. Azhar Anas Email: azhar@integra-group.com.my Phone: +6-012-209-8084
Netherlands	Private entity- Landfill Gas Canada Ltd	Name: Eng. Gerald Peter Hamaliuk Email: projectnet@cogeco.ca Phone: +1-905-334-6177

PART II. Generic component project activity (CPA)

SECTION A. General description of a generic CPA

A.1. Purpose and general description of generic CPAs

The CDM Programme Activity (hereinafter referred to as "SSC-CPA") for the [XXX] Project ([CPA reference number]) involves [technology/ measure proposed]. The SSC-CPA will be developed by [XXX]. The coordinating and managing entity (CME) will manage all the CDM regulatory works under the Green Commercial Vehicles Programme of Activities (PoA). This SSC-CPA is a Small Scale project activity (SSC-CPA) and does not exceed 60,000 tCO_2e in the Type III SSC methodology.

Under this section, the project proponent will be required to elaborate on the following:

1. The objectives of the CPA.
2. Type of vehicle and the technologies/ measures to be implemented.
3. CPA contribution to reduce the GHG emissions
4. Expected benefit from the implementation of the project activity.
5. Identification of all the parties involved in this CPA.
6. Authorization for this CPA to be subscribed into the PoA.
7. A brief description of project baseline.

SECTION B. Application of a baseline and monitoring methodology

B.1. Reference of the approved baseline and monitoring methodology(ies) selected

The approved SSC baseline and monitoring methodology applied to a SSC-CPA included in this PoA is AMS-III.S. "Introduction of low-emission vehicles/technologies to commercial vehicle fleets" Version 3 or future updates.

There are 2 Tools that can be used as a reference with the AMS-III.S Methodology Version 3.

1. Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion Version 2 or future updates.
   - It can be used in cases where CO_2 emissions from fossil fuel combustion are calculated based on the quantity of fuel combusted and its properties.
2. Tool to calculate baseline, project and/or leakage emissions from electricity consumption Version 1 or future updates.
   -This tool provides procedures to estimate the baseline, project and/or leakage emissions associated with the consumption of electricity.

The CME will follow the standard and guidelines as listed below:

(i) Annex 3 of EB 65 - "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for Programme of activities" version 01.0
(ii) Annex 38 of EB 55 – "Procedure for registration of a programme of activities as a single CDM project activity and issuance of certified emission reductions for a programme of activities" version 04.1
(iii) Annex 64 EB66 – "Clean development mechanism project cycle procedure" version 02.0

B.2. Application of methodology(ies)

Requirement for applicability of the methodology	**Compliance of CPA with the given requirement**	**Reference**
1. This methodology is for project activities that are: (i) Introducing low-greenhouse gas emitting vehicles for commercial passenger (including public transportation), material and freight transport, operating on routes with comparable conditions. (ii) Retrofitting of existing vehicles (e.g. switching from high greenhouse gas intensive to low greenhouse gas intensive fossil fuel) is also included in the methodology.	Each SSC-CPA to be implemented under this PoA will apply either option (i) or option (ii) of the listed options in the AMS–III.S. version 3 The mitigation activity involved will be in energy efficiency and fuel switch categories.	AMS–III.S. version 3 Paragraph 1

2. Types of low-emission vehicles to be introduced include but not limited to: • Compressed natural gas (CNG) vehicles; • Electric vehicles; • Liquid petroleum gas (LPG) vehicles; • Hybrid vehicles with electrical and internal combustion motive systems.	The CME will ensure that each SSC-CPA under this PoA will consist of vehicles that have a lower GHG emissions compare to the baseline. Other low-emission vehicles can also can be included in this PoA and not limited to the four types of vehicles as mentioned in AMS–III.S. version 3.	AMS–III.S. version 3 Paragraph 2
3. Types of vehicles covered by the methodology include but not limited to: • Buses, jeepneys, commuter vans and tricycles for public transport; • Trucks for freight transport, waste collection or other services with regular routes.	Other type of vehicles can also be included in this PoA and not limited to the vehicles from road transport as mentioned in the AMS–III.S. version 3. Low greenhouse gas emitting marine vessels and retrofitting of water borne vehicles to switch from high to low greenhouse gas intensive fossil fuel (e.g. diesel to natural gas) used solely for domestic water borne transport are applicable as well.	AMS–III.S. version 3 Paragraph 3
4. Project participants must demonstrate that: • The project activity is unlikely to change the level of service [15] provided on comparable routes before the project activity;[16] • The project activity does not include measures to bring about a modal switch (e.g. shift from bus transport to underground train system) in transport.	The CME will ensure that each SSC-CPA under this PoA complies with the methodological requirement.	AMS–III.S. version 3 Paragraph 4
5. Project participants shall identify the following parameters: • The routes along which the vehicles operate; • The level of service on each route, for example the average/total number of passengers or tonnage transported and the average distance the passengers or freight was transported on that route on an annual basis.	The CME will ensure that each SSC-CPA under this PoA complies with the methodological requirement.	AMS–III.S. version 3 Paragraph 5

[15] The level of service here refers to the overall level of service of the project activity and differences between the type of baseline and project vehicles are allowable.

[16] That is by showing that the frequency of operations is not decreased by the project activity, the characteristics of the travel route - distance, start and end points and the route itself and/or that the capacity introduced by the project activity is sufficient to service the level of passenger/freight transport previously provided.

6. Measures are limited to those that result in emission reductions of less than or equal to 60 kt CO_2 equivalent annually for Type III project activities.	The CME will ensure that each SSC-CPA under this PoA complies with the methodological requirement. SSC-CPA will consist of one vehicle or a group of vehicles depending on the emission reduction of the SSC-CPA that must be less than or equal to 60kt CO_2 equivalent annually for Type III project activities.	AMS–III.S. version 3 Paragraph 6

B.3. Sources and GHGs

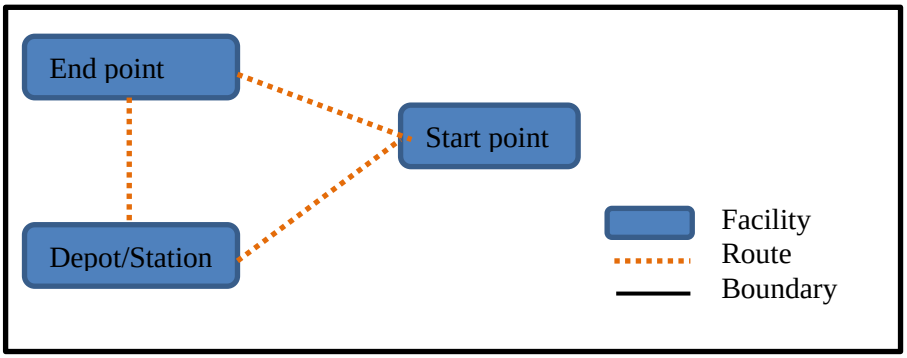
The project boundary includes the following:

- Fleet to which low emission vehicles are introduced;
- The geographical area covering the physical routes along which these vehicles operate;
- Auxiliary facilities such as fuelling stations, workshops and service stations that are visited by the vehicles in the fleet.

Summary of Gases and Sources included in project boundary:

Emission	Source	Gas	Included	Justification
Baseline Scenario	Fossil fuel based energy	CO_2	Yes	Main emission source
		CH_4	No	Excluded for simplification and conservativeness
		N_2O	No	Excluded for simplification and conservativeness
Project Scenario	Fossil fuel based energy	CO_2	Yes	Main emission source
		CH_4	No	Excluded for simplification and conservativeness
		N_2O	No	Excluded for simplification and conservativeness

Figure 2: Flow diagram for generic CPA



B.4. Description of baseline scenario

The PoA and consequently each SSC-CPA applies the simplified baseline methodology for selected small-scale CDM project activities AMS-III.S. "Introduction of low-emission vehicles/ technologies to commercial vehicle fleets" version 3 or future updates.

A baseline shall be established on a project-specific basis for each SSC-CPA. The baseline scenario will be investigated and identified during the feasibility study in the planning stage or before any project

activity decision is confirmed. This will be done at the CPA level. The identified baseline must be in accordance with the procedures provided in the approved small scale baseline and monitoring methodology of AMS-III.S. Version 3. The option taken must be consistent with mandatory applicable laws and regulations. The Small-Scale CDM Programme Activity Design Document (F-CDM-SSC-CPA-DD) will describe in detail the identified baseline for each SSC-CPA.

The baseline vehicles that would have provided the same transportation service level should be identified following the related and relevant requirements for Type II and III Greenfield projects in the "General guidelines to SSC CDM methodologies".

B.5. Demonstration of eligibility for a generic CPA

No.	PoA Eligibility Criteria for Enrolling CPA	Justification in relation to the generic SSC-CPA
1	The geographical boundary of the SSC-CPA must be within Malaysia.	
2	Each SSC-CPA included in this PoA will have a unique identification number as a reference. To avoid double counting, each included SSC-CPA with its reference number will be linked with the geographic coordinates of the vehicle's station marked by GPS. Each vehicle in CPA also will have an individual identification number by using registration number assigned to each vehicle.	
3	The project must comprise measures that reduce GHG from vehicles by means of the following options: (a) Energy efficiency (b) Fuel switch The technology is environmentally safe and sound technology and approved by authorities or complied with certification/testing by technology provider.	
4	The start date of each SSC-CPA will be based on vehicle purchasing documentary evidence.	
5	Each SSC-CPA must be adhered to the applicability, baseline and monitoring methodology of AMS III.S. "Introduction of low-emission vehicles/technologies to commercial vehicle fleets" Version 3 methodology or future update. Multiple methodologies are not applicable to the SSC-CPA & PoA.	
6	Each SSC-CPA must demonstrate the project's additionality by applying the "Guidelines on the demonstration of additionality of small scale project activities" Version 09.0, formerly known as Attachment A of Appendix B (EB 68, Annex 27) or future updates. If the SSC-CPA aims to achieve emission reductions at a scale of no more than 20 ktCO2e per year, the "Guidelines for demonstrating additionality of microscale project activities" Version 3 or future update can be used. The SSC-CPA must fullfil both conditions (i) and (ii) below: (i) Each of the independent subsystems/measures in the project activity achieves an estimated annual emission reduction equal to or less than 600	

	tCO2e per year; and (ii) End users of the subsystems or measures are communities or SMEs.	
7	The PoA-specific requirements stipulated by the CME: (i) Local stakeholder meeting shall be conducted at the PoA level. (ii) Environmental impact assessment is not required for the implementation of energy efficient technologies per the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987. (iii) The CME has approved the participation of the SSC-CPA into the PoA, with the signing of Emission Reduction Purchase Agreement (ERPA).	
8	Each SSC-CPA will provide written affirmation that funding from Annex 1 parties, if any, does not result in a diversion of official development assistance.	
9	The target group is commercial and/or public transport vehicles. The distribution mechanism is either by direct installation or contractual installation.	
10	Each SSC-CPA is anticipated to be verified individually.	
11	Every SSC-CPA in aggregate meets the small scale or microscale threshold criteria and remains within those thresholds throughout the crediting period of the SSC-CPA.	
12	Each SSC-CPA shall satisfy the latest version of de-bundling rules for PoA, adhering to the "Guidelines on assessment of de-bundling for SSC Project activities" version 03 or future updates.	

Each SSC-CPA included in this PoA is a small scale project activity. The project's additionality will be demonstrated by applying the "Guidelines on the demonstration of additionality of small scale project activities" Version 09.0, formerly known as Attachment A of Appendix B (EB 68, Annex 27). The additionality will be assessed and demonstrated at the CPA level.

Every SSC-CPA will provide an explanation showing that the project activity would not have occurred otherwise due to at least one of the following barriers below and it is voluntarily coordinated and would not be implemented in the absence of CDM. The project participants of each SSC-CPA shall provide an explanation to show the project activity would not have occurred anyway due to at least one of the following barriers:

1. Investment barrier
   A financially more viable alternative to the project activity would have led to higher emissions. Best practice examples include but are not limited to, the application of investment comparison analysis using a relevant financial indicator, application of a benchmark analysis or a simple cost analysis. It is recommended to use national or global accounting practices and standards for such an analysis.

   Either simple cost analysis, investment comparison analysis or benchmark analysis will be carried out for each SSC-CPA to demonstrate that the project is less financially attractive than the baseline. Currently, there are no direct subsidies or promotional support for the implementation of

low GHG emission vehicles for commercial passenger (including public transportation), material and freight transport in the host country. Each SSC-CPA is expected to have high costs required to install the technology or make the required modification. There is possible potential revenue from switching from high greenhouse gas intensive to low greenhouse gas intensive fossil fuel[17], if applicable is rather very small. Hence, the SSC-CPAs are expected to face investment barrier compared to the usual current practice has been proven to meet the objectives and requirements.

2. Access-to-finance barrier
   The project activity could not access appropriate capital without consideration of the CDM revenue. Best practice examples include but are not limited to, the demonstration of limited access to capital in the absence of the CDM, such as a statement from the financing bank that the revenue from the CDM are critical in the approval of the loan.

3. Technological barrier
   A less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and would have led to higher emissions. Best practice examples include but are not limited to, the demonstration of non-availability of human capacity to operate and maintain the technology, lack of infrastructure to utilize the technology, unavailability of the technology and high level of technology risk.

   The proposed project activity may require special expertise or skilled workers with respect to design of the vehicles or support facilities, operation, maintenance, operation control of the new proposed technology. The monitoring part as well is very crucial as all monitoring equipment needs to be maintained and calibrated on a regular basis. The system requires constant and on-going precise management of a variety of elements to maintain its optimum performance. External supports are needed to establish the facilities so a low GHG emission vehicles can be introduced and operate smoothly.

4. Barrier due to prevailing practice
   Prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions. Best practice examples include but are not limited to, the demonstration that project is among the first of its kind in terms of technology, geography, sector, type of investment and investor, market etc.

   The current existing vehicles which use fossil fuel have been able to serve the purpose and meet the current regulations in Malaysia. This has become a prevailing practice for transportation sector in Malaysia.

5. Other barriers
   Such as institutional barriers or limited information, managerial resources, organizational capacity, or capacity to absorb new technologies.

The investment barrier, technology barrier and barrier due to prevailing practice are the three major barriers faced by transportation in the host country in implementing the project activities and based on these barriers, it is sufficient to demonstrate the additionality of a typical SSC-CPA. Each SSC-CPA's additionality will be assessed individually.

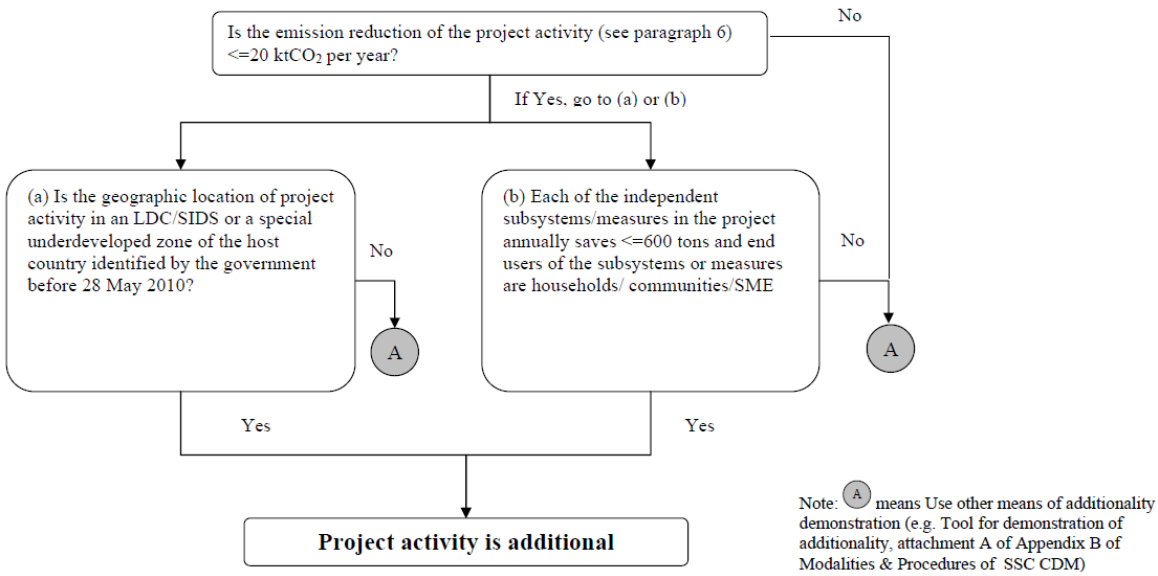
If the SSC-CPA aims to achieve emission reductions at a scale of no more than 20 $ktCO_2e$ per year, the "Guidelines for demonstrating additionality of microscale project activities" version 3 or future update can be used. The SSC-CPA must fulfil both conditions (i) and (ii) below satisfied:

[17] Depending on the fossil fuel price at the time investment decision is decided.

(i) Each of the independent subsystems/measures in the project activity achieves an estimated annual emission reduction equal to or less than 600 tCO_2e per year; and

(ii) End users of the subsystems or measures are communities or SMEs.

Flow chart 1: Additionality test for project activities <= 20 $ktCO_2/y$



B.6. Estimation of emission reductions of a generic CPA

B.6.1. Explanation of methodological choices

Calculation of Baseline Emissions:

The first step to determine the baseline emissions is to calculate a baseline emission factor per passenger or per tonne of goods per kilometre for the baseline vehicle (BEF_i). The baseline emission factor is determined by dividing the emissions from the total annual distance travelled by each baseline vehicle before the project begins (D_i) by the total annual passengers or volume of goods transported by each baseline vehicle (P_i) times the annual average distance of transportation per person or tonne before the project begins.

$$BEF_i = \frac{\sum_j \sum_I D_i * \eta_{BLV\,i} * NCV_j * EF_{CO2,j}}{P_i * dp_i} \quad \textbf{(1)}$$

Where:

BEF_i	Baseline emission factor per passenger or ton of goods per kilometre for the baseline vehicle *i* (tCO_2/passenger km or tCO_2/ton km)
P_i	Total annual passengers or tons of goods transported by each baseline vehicle *i* (passengers or tons)
dp_i	The annual average distance of transportation per person or tonne of freight by each baseline vehicle *i* (km)
D_i	Total annual distance travelled by each baseline vehicle *i* (km)
$\eta_{BLV\,i}$	Fuel efficiency of baseline vehicle *i* (qty of fuel/km, see paragraph 12)
NCV_j	Net calorific value of fuel *j* (MJ/Unit qty of fuel)
$EF_{CO2,j}$	CO_2 emission factor of fuel used by baseline vehicle (tCO_2/MJ energy content of fuel, country specific data or IPCC default value)

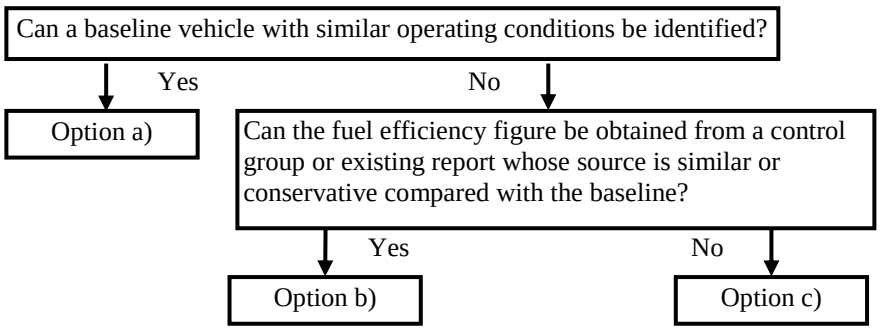
The total baseline emissions are calculated on an annual basis using the monitored data as below.

$$BE_y = \sum P_{i,y,k} * BEF_i * dp_{i,y} \quad \textbf{(2)}$$

Where:

$P_{i,y,k}$	Total annual passengers or tons of goods transported by each project vehicle *i* in year *y* on route *k* taking into account provisions of paragraph 20
BE_y	Total baseline emissions in year *y* (tCO_2/yr)
$dp_{i,y}$	Annual average distance of transportation per passenger or tonne of goods by project vehicle *i* in year *y* (km) taking into account the provisions of paragraph 20

The baseline vehicle fuel efficiency (□BLV) is determined as follows (in order of preference):



(a) When a specific baseline vehicle can be identified, i.e. a vehicle used along the same route and therefore with similar operating conditions and this vehicle will not be replaced over the life of the project, the following applies: η_{BLV} is determined from average operational data of the vehicle under baseline operating conditions, using at least one year of operational data, if that data is available. Otherwise data on fuel efficiency can be obtained from manufacturer's specification, if it can be demonstrated that the value is conservative given the operating conditions of the baseline vehicles.

Such cases may include the situations where the project activity is the introduction of new vehicles, and the baseline vehicle is also new and of the same capacity;

(b) If no specific baseline vehicle can be identified or appropriate operational data is not available, then fuel efficiency should be obtained through a statistically significant control group or existing statistics. Such group or the source of data must have similar or conservative characteristics with respect to vehicle age (equal or newer), traffic conditions (equal or better), and air conditioning. The choice of such control group will be, in descending order:

- Fleet of the same company operating simultaneously with the project activity;
- Fleet of company with similar operations operating simultaneously with the project activity;
- Host country statistics;
- IPCC or other international data

Under this option fuel efficiency is monitored throughout the project crediting period thus gradual efficiency improvements of the fleet or gradual deterioration of driving conditions would automatically be incorporated into the project efficiency levels;

(c) Other cases. Where neither option (a) or (b) is not feasible then baseline fuel efficiency is determined by using the fuel efficiency of top 20% of the fleet before project activity, as determined according to travel distance of each vehicle for the previous three years or according to manufacturers' specifications of the comparable new baseline vehicles. If no data exists for the time period, a shorter period can be chosen, with a minimum period of one year.

Note that under all options (a) till (c), if the identified baseline vehicle does not have air conditioning then the data used should also be from vehicles without air conditioning.

Calculation of Project Emissions:

Project emissions are determined by monitoring the consumption of fuel or energy consumed by the vehicles introduced, according to the following formula:

$$PE_y = \sum_j \sum_i FC_{i,j,y} * NCV_j * EF_{CO2,j,y} \quad \textbf{(3)}$$

Where:

PE_y	Total project emissions in year *y* (tCO_2/yr)
$FC_{i,j,y}$	Consumption of fuel *j* by vehicle *i* in year *y* (quantity of fuel)
NCV_j	Net calorific value of fuel *j* (as obtained by country specific data or IPCC default value)
$EF_{CO2,j,y}$	CO_2 emission factor of fuel used by vehicle (tCO_2/energy content of fuel, country specific data or IPCC default value)

In the case where electric vehicles consuming grid electricity are introduced project activity emissions are calculated as follows:

$$PE_y = \sum_i EC_{i,y} * EF_{elec} \quad \textbf{(4)}$$

Where:

PE_y	Total project emissions in year *y* (tCO_2/yr)
$EC_{i,y}$	Consumption of electricity by vehicle *i* in year *y*
EF_{elec}	CO_2 emission factor of electricity, as determined as per the methods of AMS-I.D Version 17 or future update

In project activities where the project vehicles have air conditioning whereas the baseline vehicles do not, then leakage of HFC shall be taken into account. If data is available this should be calculated for the specific AC units and operating conditions of the vehicles in questions. Otherwise a default value of 400 kg of CO_2e/year should be used for each vehicle.

Leakage:

In case the SSC-CPA involves fossil fuel switching measures leakage resulting from fuel extraction, processing, liquefaction, transportation, re-gasification and distribution of fossil fuels outside of the project boundary shall be considered. The guidance provided in the leakage section of ACM0009 shall be followed in this regard.

In case the SSC-CPA involves the replacement of equipment, and the leakage effect of the use of the replaced equipment in another activity is neglected, because the replaced equipment is scrapped, an independent monitoring of scrapping of replaced equipment needs to be implemented. The monitoring should include a check if the number of SSC-CPA equipment distributed by the project and the number of scrapped equipment correspond with each other. For this purpose scrapped equipment should be stored until such correspondence has been checked. The scrapping of replaced equipment should be documented and independently verified.

Calculation of Leakage

Leakage may result from fuel extraction, processing, liquefaction, transportation, re-gasification and distribution of fossil fuels outside of the project boundary. This includes mainly fugitive CH_4 emissions

and CO_2 emissions from associated fuel combustion and flaring. In this methodology, the following leakage emission sources shall be considered:[18]

- Fugitive CH_4 emissions associated with fuel extraction, processing, liquefaction, transportation, re-gasification and distribution of natural gas used in the project plant and fossil fuels used in the grid in the absence of the project activity;
- In the case LNG is used in the project plant: CO_2 emissions from fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression into a natural gas transmission or distribution system.

Thus, leakage emissions are calculated as follows:

$$LE_y = LE_{CH4,y} + LE_{LNG,CO2,y} \quad \textbf{(5)}$$

Where:

LE_y	=	Leakage emissions during the year *y* in tCO_2e
$LE_{CH4,y}$	=	Leakage emissions due to fugitive upstream CH_4 emissions in the year *y* in tCO_2e
$LE_{LNG,CO2,y}$	=	Leakage emissions due to fossil fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression of LNG into a natural gas transmission or distribution system during the year *y* in tCO_2e

Note that to the extent that upstream emissions occur in Annex I countries that have ratified the Kyoto Protocol, from 1 January 2008 onwards, these emissions should be excluded, if technically possible, in the leakage calculations.

Fugitive methane emissions

For the purpose of determining fugitive methane emissions associated with the production – and in case of natural gas, the transportation and distribution of the fuels – project participants should multiply the quantity of natural gas consumed in all element processes *i* with a methane emission factor for these upstream emissions ($EF_{NG,upstream,CH4}$), and subtract for all fuel types *k* which would be used in the absence of the project activity the fuel quantities multiplied with respective methane emission factors ($EF_{k,upstream,CH4}$), as follows:

$$LE_{CH4,y} = \left[FF_{project,y} \cdot NCV_{NG,y} \cdot EF_{NG,upstream,CH4} - \sum_k FF_{baseline,k,y} \cdot NCV_k \cdot EF_{k,upstream,CH4} \right] \cdot GWP_{CH4} \quad \textbf{(6)}$$

with

$$FF_{project,y} = \sum_i FF_{project,i,y} \quad \textbf{(7)}$$

and

$$FF_{baseline,k,y} = \sum_i FF_{baseline,i,k,y} \quad \textbf{(8)}$$

Where:

$LE_{CH4,y}$	=	Leakage emissions due to upstream fugitive CH_4 emissions in the year *y* in t CO_2e

[18] The Meth Panel is undertaking further work on the estimation of leakage emission sources in case of fuel switch project activities. This approach may be revised based on outcome of this work.

$FF_{project,y}$	=	Quantity of natural gas combusted in all element processes during the year *y* in m³
$FF_{project,i,y}$	=	Quantity of natural gas combusted in the element process *i* during the year *y* in m³
$NCV_{NG,y}$	=	Average net calorific value of the natural gas combusted during the year *y* in GJ/m³
$EF_{NG,upstream,CH4}$	=	Emission factor for upstream fugitive methane emissions from production, transportation and distribution of natural gas in t CH_4 per GJ fuel supplied to final consumers
$FF_{baseline,k,y}$	=	Quantity of fuel type *k* (a coal or petroleum fuel type) that would be combusted in the absence of the project activity in all element processes during the year *y* in a volume or mass unit
$FF_{baseline,i,k,y}$	=	Quantity of fuel type *k* (a coal or petroleum fuel type) that would be combusted in the absence of the project activity in the element process *i* during the year *y* in a volume or mass unit
NCV_k	=	Average net calorific value of the fuel type *k* (a coal or petroleum fuel type) that would be combusted in the absence of the project activity during the year *y* in GJ per volume or mass unit
$EF_{k,upstream,CH4}$	=	Emission factor for upstream fugitive methane emissions from production of the fuel type *k* (a coal or petroleum fuel type) in t CH_4 per GJ fuel produced
GWP_{CH4}	=	Global warming potential of methane valid for the relevant commitment period

Where reliable and accurate national data on fugitive CH_4 emissions associated with the production, and in case of natural gas, the transportation and distribution of the fuels is available, project participants should use this data to determine average emission factors by dividing the total quantity of CH_4 emissions by the quantity of fuel produced or supplied respectively.[19] Where such data is not available, project participants may use the default values provided in Table 3 below. In this case, the natural gas emission factor for the location of the project should be used, except in cases where it can be shown that the relevant system element (gas production and/or processing/transmission/distribution) is predominantly of recent vintage and built and operated to international standards, in which case the US/Canada values may be used.

Note that the emission factor for fugitive upstream emissions for natural gas ($EF_{NG,upstream,CH4}$) should include fugitive emissions from production, processing, transport and distribution of natural gas, as indicated in the Table 3 below. Note further that in case of coal the emission factor is provided based on a mass unit and needs to be converted in an energy unit, taking into account the net calorific value of the coal.

[19] GHG inventory data reported to the UNFCCC as part of national communications can be used where country-specific approaches (and not IPCC Tier 1 default values) have been used to estimate emissions.

Table 1: Default emission factors for fugitive CH_4 upstream emissions[20]

Activity	Unit	Default emission factor	Reference for the underlying emission factor range in Volume 3 of the *1996 Revised IPCC Guidelines*
Coal			
Underground mining	t CH4 / kt coal	13.4	Equations 1 and 4, p. 1.105 and 1.110
Surface mining	t CH4 / kt coal	0.8	Equations 2 and 4, p.1.108 and 1.110
Oil			
Production	t CH4 / PJ	2.5	Tables 1-60 to 1-64, p. 1.129 - 1.131
Transport, refining and storage	t CH4 / PJ	1.6	Tables 1-60 to 1-64, p. 1.129 - 1.131
Total	t CH4 / PJ	4.1	
Natural gas			
USA and Canada			
Production	t CH4 / PJ	72	Table 1-60, p. 1.129
Processing, transport and distribution	t CH4 / PJ	88	Table 1-60, p. 1.129
Total	t CH4 / PJ	160	
Eastern Europe and former USSR			
Production	t CH4 / PJ	393	Table 1-61, p. 1.129
Processing, transport and distribution	t CH4 / PJ	528	Table 1-61, p. 1.129
Total	t CH4 / PJ	921	
Western Europe			
Production	t CH4 / PJ	21	Table 1-62, p. 1.130
Processing, transport and distribution	t CH4 / PJ	85	Table 1-62, p. 1.130
Total	t CH4 / PJ	105	
Other oil exporting countries / Rest of world			
Production	t CH4 / PJ	68	Table 1-63 and 1-64, p. 1.130 and 1.131
Processing, transport and distribution	t CH4 / PJ	228	Table 1-63 and 1-64, p. 1.130 and 1.131
Total	t CH4 / PJ	296	

Note: The emission factors in this table have been derived from IPCC default Tier 1 emission factors provided in Volume 3 of the 1996 Revised IPCC Guidelines, by calculating the average of the provided default emission factor range.

CO_2 emissions from LNG

Where applicable, CO_2 emissions from fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression of LNG into a natural gas transmission or distribution system ($LE_{LNG,CO2,y}$) should be estimated by multiplying the quantity of natural gas combusted in the project with an appropriate emission factor, as follows:

$$LE_{LNG,CO2,y} = FF_{project,y} \cdot EF_{CO2,upstreamLNG} \quad \textbf{(9)}$$

Where:

$LE_{LNG,CO2,y}$	=	Leakage emissions due to fossil fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression of LNG into a natural gas transmission or distribution system during the year *y* in tCO_2e
$FF_{project,y}$	=	Quantity of natural gas combusted in all element processes during the year *y* in m^3
$EF_{CO2,upstreamLNG}$	=	Emission factor for upstream CO_2 emissions due to fossil fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression of LNG into a natural gas transmission or distribution system

Where reliable and accurate data on upstream CO_2 emissions due to fossil fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression of LNG

[20] While using values from this table in the equation 6, make the required corrections in the units.

into a natural gas transmission or distribution system is available, project participants should use this data to determine an average emission factor. Where such data is not available, project participants may assume a default value of 6 tCO_2/TJ as a rough approximation.[21]

Calculation of Emission Reduction:
The reductions shall be calculated in the CPA-DD using the equations provided in the baseline, project and leakage emissions sections above. Emission reductions shall be determined as follows:

$$ER_y = BE_y - \left(PE_y + LE_y \right) \quad \textbf{(10)}$$

Where:

ER_y	emission reduction in year *y* (tCO_2e)
LE_y	leakage emissions in year *y* (tCO_2e)
PE_y	project emissions in year *y* calculated as per equation 8 (tCO_2e)
BE_y	baseline emissions in year *y* calculated as per equation 1 (tCO_2e)

B.6.2. Data and parameters that are to be reported ex-ante

Data / Parameter	NCV_i
Unit	MJ/Unit qty of fuel
Description	Net calorific value of fuel *j*
Source of data	Country specific data or IPCC default value
Value(s) applied	Will be based on type of fuel used in the vehicles. To be determined with respect to each CPA.
Choice of data or Measurement methods and procedures	In line with the requirement of the baseline monitoring methodology
Purpose of data	Calculation of baseline, project and leakage emissions
Additional comment	-

[21] This value has been derived on data published for North American LNG systems. "Barclay, M. and N. Denton, 2005. Selecting offshore LNG process. <http://www.fwc.com/publications/tech_papers/files/LNJ091105p34-36.pdf> (10th April 2006)".

Data / Parameter	$EF_{CO2,j}$
Unit	tCO_2/MJ
Description	CO_2 emission factor of fuel used by baseline vehicle
Source of data	Country specific data or IPCC default value
Value(s) applied	Will be based on type of fuel used in the vehicles. To be determined with respect to each SSC-CPA.
Choice of data or Measurement methods and procedures	In line with the requirement of the baseline monitoring methodology
Purpose of data	Calculation of baseline and project emissions
Additional comment	-

Data / Parameter	$EC_{i,y}$
Unit	kWh
Description	Consumption of electricity by vehicle *i* in year *y*
Source of data	Measured during the project activity
Value(s) applied	To be determined with respect to each SSC-CPA.
Choice of data or Measurement methods and procedures	In line with the requirement of the baseline monitoring methodology
Purpose of data	Calculation of project emissions
Additional comment	-

Data / Parameter	$EF_{NG,upstream,CH4}$
Unit	t CH_4/PJ
Description	Emission factor for upstream fugitive methane emissions from production, transportation and distribution of natural gas supplied to final consumers (2 OSVs)
Source of data	Table 3 of ACM0009 Methodology "Consolidated baseline and monitoring methodology for fuel switching from coal or petroleum fuel to natural gas" Version 3.2
Value(s) applied	160
Choice of data or Measurement methods and procedures	Default values are used because there is no reliable and accurate national data available on fugitive CH_4 emissions associated with the production, the transportation and distribution of natural gas.
Purpose of data	Calculation of leakage emissions
Additional comment	

Data / Parameter	$EF_{diesel,upstream,CH4}$
Unit	t CH_4/PJ
Description	Emission factor for upstream fugitive methane emissions from production of diesel
Source of data	Table 3 of ACM0009 Methodology "Consolidated baseline and monitoring methodology for fuel switching from coal or petroleum fuel to natural gas" Version 3.2
Value(s) applied	4.1
Choice of data or Measurement methods and procedures	Default values are used because there is no reliable and accurate national data available on fugitive CH_4 emissions associated with the production, the transportation and distribution of diesel.
Purpose of data	Calculation of leakage emissions
Additional comment	

Data / Parameter	$EF_{CO2,upstream,LNG}$
Unit	t CO_2/TJ
Description	Emission factor for upstream CO_2 emissions due to fossil fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression of LNG into a natural gas transmission or distribution system
Source of data	ACM0009 Methodology "Consolidated baseline and monitoring methodology for fuel switching from coal or petroleum fuel to natural gas" Version 3.2
Value(s) applied	6
Choice of data or Measurement methods and procedures	There is no reliable and accurate data available on upstream CO_2 emissions due to fossil fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression of LNG into a natural gas transmission or distribution system.
Purpose of data	Calculation of leakage emissions
Additional comment	

Data / Parameter	GWP_{CH4}
Unit	tCO_2e/tCH_4
Description	Global warming potential of methane valid for the relevant commitment period
Source of data	IPCC
Value(s) applied	Default value for the first commitment period = 21 tCO_2e/tCH_4
Choice of data or Measurement methods and procedures	In line with the requirement of the consolidated baseline and monitoring methodology ACM0009 version 04.0.0
Purpose of data	Calculation of leakage emissions
Additional comment	-

B.6.3. Ex-ante calculations of emission reductions

The ex-ante emission reductions are calculated based on AMS-III.S. "Introduction of low-emission vehicles /technologies to commercial vehicle fleets" [XXX] methodology.

Baseline Emissions

Baseline Information:

[XXX]

[Including the baseline vehicle fuel efficiency (η_{BLV}) is determination description]

Baseline Emissions Calculation

Baseline vehicle fuel efficiency (η_{BLV}) as below:

$$BEF_i = \frac{\sum_j \sum_I D_i * \eta_{BLV\,i} * NCV_j * EF_{CO2,j}}{P_i * dp_i}$$

Where:

BEF_i	Baseline emission factor per passenger or ton of goods per kilometre for the baseline vehicle *i* (tCO_2/passenger km or tCO_2/ton km)
P_i	Total annual passengers or tons of goods transported by each baseline vehicle *i* (passengers or tons)
dp_i	The annual average distance of transportation per person or tonne of freight by each baseline vehicle *i* (km)
D_i	Total annual distance travelled by each baseline vehicle *i* (km)
$\eta_{BLV\,i}$	Fuel efficiency of baseline vehicle *i* (qty of fuel/km, see paragraph 12)
NCV_j	Net calorific value of fuel *j* (MJ/Unit qty of fuel)
$EF_{CO2,j}$	CO_2 emission factor of fuel used by baseline vehicle (tCO_2/MJ energy content of fuel, country specific data or IPCC default value)

Baseline emission factor per [passenger/goods]

Parameter	Value applied	Unit
P_i		
dp_i		
D_i		
$\eta_{BLV\,i}$		
NCV_j		
$EF_{CO2,j}$		
BEF_i		

The total baseline emissions are calculated on an annual basis using the monitored data as below.

$$BE_y = \sum P_{i,y,k} * BEF_i * dp_{i,y}$$

Where:

$P_{i,y,k}$	Total annual passengers or tons of goods transported by each project vehicle *i* in year *y* on route *k* taking into account provisions of paragraph 20
BEF_i	Total baseline emissions in year *y* (tCO_2/yr)
$dp_{i,y}$	Annual average distance of transportation per passenger or tonne of goods by project vehicle *i* in year *y* (km) taking into account the provisions of paragraph 20

Baseline emission for [passenger/goods]

Parameter	Value applied	Unit
$P_{i,y,k}$		
BEF_i		
$dp_{i,y}$		
BE_y		

BE_y = [XXX] tCO_2/yr

Project Emissions

Project activity information:
[XXX]

Project Emissions Calculation

Project emissions are determined by monitoring the consumption of fuel by the [XXX] introduced, according to the following formula:

$$PE_y = \sum_j \sum_i FC_{i,j,y} * NCV_j * EF_{CO2,j,y}$$

Where:

PE_y	Total project emissions in year *y* (tCO_2/yr)
$FC_{i,j,y}$	Consumption of fuel *j* by vehicle *i* in year *y* (quantity of fuel)
NCV_j	Net calorific value of fuel *j* (as obtained by country specific data or IPCC default value)
$EF_{CO2,j,y}$	CO_2 emission factor of fuel used by vehicle (tCO_2/energy content of fuel, country specific data or IPCC default value)

Project emission from [XXX] **used**

Parameter	Value applied	Unit
$FC_{i,j,y}$		
NCV_j		
$EF_{CO2,j,y}$		
PE_y		

PE_y = [XXX] tCO_2/yr

Leakage Emissions

Leakage information:
[XXX]

$$LE_y = LE_{CH4,y} + LE_{LNG,CO2,y}$$

Where:

LE_y	=	Leakage emissions during the year *y* in t CO_2e
$LE_{CH4,y}$	=	Leakage emissions due to fugitive upstream CH_4 emissions in the year *y* in t CO_2e
$LE_{LNG,CO2,y}$	=	Leakage emissions due to fossil fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression of LNG into a natural gas transmission or distribution system during the year *y* in t CO_2e

Fugitive methane emissions

$$LE_{CH4,y} = \left[FF_{project,y} \cdot NCV_{NG,y} \cdot EF_{NG,upstream,CH4} - \sum_k FF_{baseline,k,y} \cdot NCV_k \cdot EF_{k,upstream,CH4} \right] \cdot GWP_{CH4}$$

With

$$FF_{project,y} = \sum_i FF_{project,i,y}$$

and

$$FF_{baseline,k,y} = \sum_i FF_{baseline,i,k,y}$$

Where:

$LE_{CH4,y}$	=	Leakage emissions due to upstream fugitive CH_4 emissions in the year *y*
$FF_{project,y}$	=	Quantity of natural gas combusted in all element processes during the year *y*
$FF_{project,i,y}$	=	Quantity of natural gas combusted in the element process *i* during the year *y*
$NCV_{NG,y}$	=	Average net calorific value of the natural gas combusted during the year *y*
$EF_{NG,upstream,CH4}$	=	Emission factor for upstream fugitive methane emissions from production, transportation and distribution of natural gas supplied to final consumers
$FF_{baseline,k,y}$	=	Quantity of fuel type *k* (a coal or petroleum fuel type) that would be combusted in the absence of the project activity in all element processes during the year *y*
$FF_{baseline,i,k,y}$	=	Quantity of fuel type *k* (a coal or petroleum fuel type) that would be combusted in the absence of the project activity in the element process *i* during the year *y*
NCV_k	=	Average net calorific value of the fuel type *k* (a coal or petroleum fuel type) that would be combusted in the absence of the project activity during the year *y*
$EF_{k,upstream,CH4}$	=	Emission factor for upstream fugitive methane emissions from production of the fuel type *k* (a coal or petroleum fuel type)
GWP_{CH4}	=	Global warming potential of methane valid for the relevant commitment period

Parameter	Value applied	Unit
$FF_{project,y}$		
$NCV_{NG,y}$		
$EF_{NG,upstream,CH4}$		
$FF_{baseline,diesel,y}$		
NCV_{diesel}		
$EF_{diesel,upstream,CH4}$		
GWP_{CH4}		
LE_{CH4}		

CO_2 emissions from LNG

$$LE_{LNG,CO2,y} = FF_{project,y} \cdot EF_{CO2,upstream,LNG}$$

Where:

$LE_{LNG,CO2,y}$ = Leakage emissions due to fossil fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression of LNG into a natural gas transmission or distribution system during the year *y*

$FF_{project,y}$ = Quantity of natural gas combusted in all element processes during the year *y*

$EF_{CO2,upstream,LNG}$ = Emission factor for upstream CO_2 emissions due to fossil fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression of LNG into a natural gas transmission or distribution system

Parameter	Value applied	Unit
$FF_{project,y}$		
$NCV_{NG,y}$		
$EF_{CO2,upstream,LNG}$		
$LE_{LNG,CO2,y}$		

LE_y= [XXX] tCO_2/yr

[Justification and calculation for leakage wherever applicable]

<u>Emissions Reductions</u>

$$ER_{y,ex\,ante} = BE_{y,ex\,ante} - \left(PE_{y,ex\,ante} + LE_{y,ex\,ante}\right)$$

$ER_{y,\,ex\,ante}$= [XXX] tCO_2/yr

B.7. Application of the monitoring methodology and description of the monitoring plan
B.7.1. Data and parameters to be monitored by each generic CPA

Data / Parameter	$DT_{PJ,i,y,k}$
Unit	km/yr
Description	Total distance travelled by vehicle *i* in year *y* on route *k*
Source of data	Measured during the project activity
Value(s) applied	To be determined with respect to each SSC-CPA
Measurement methods and procedures	Driver logs and route maps, confirmed by odometer reading
Monitoring frequency	Daily
QA/QC procedures	• The data will be measured directly • The data are monitored continuously (at least daily measurements are taken) • Data are recorded and stored electronically in a data log file • The odometer undergoes maintenance/calibration per manufacturer's specifications
Purpose of data	Calculation of project emissions
Additional comments	-

Data / Parameter	η_{BLVi}
Unit	m3/km
Description	Efficiency of baseline vehicle
Source of data	Measured during the project activity
Value(s) applied	To be determined with respect to each SSC-CPA
Measurement methods and procedures	As per paragraph 13 of AMS-III.S version 3
Monitoring frequency	Daily
QA/QC procedures	• The data will be measured directly • The data are monitored continuously (at least daily measurements are taken) • Data are recorded and stored electronically in a data log file • The odometer undergoes maintenance/calibration per manufacturer's specifications
Purpose of data	Calculation of project and leakage emissions
Additional comments	-

Data / Parameter	$FC_{i,j,y}$
Unit	m3
Description	Consumption of fuel *j* by vehicle *i* in year *y*
Source of data	Measured during the project activity
Value(s) applied	To be determined with respect to each SSC-CPA
Measurement methods and procedures	Fuel pump meter confirmed by invoice from fuel supplier.
Monitoring frequency	Daily
QA/QC procedures	• The data will be measured directly • The data are monitored continuously (at least daily measurements are taken) • Data are recorded and stored electronically in a data log file • The fuel pump meter undergoes maintenance/calibration per manufacturer's specifications
Purpose of data	Calculation of project emissions
Additional comments	-

Data / Parameter	$EC_{i,y}$
Unit	kWh
Description	Consumption of electricity by vehicle *i* in year *y*
Source of data	Measured during the project activity
Value(s) applied	To be determined with respect to each SSC-CPA
Measurement methods and procedures	Electricity power meter, confirmed by invoice from electricity power supplier.
Monitoring frequency	Daily
QA/QC procedures	• The data will be measured directly • The data are monitored continuously (at least daily measurements are taken) • Data are recorded and stored electronically in a data log file • The electricity power meter undergoes maintenance and calibration per manufacturer's specifications
Purpose of data	Calculation of project emissions
Additional comments	-

Data / Parameter	NCV_j
Unit	MJ/m3
Description	Net calorific value of fuel *j*
Source of data	Country specific data or IPCC default value
Value(s) applied	The following data sources may be used if the relevant conditions apply: **Data Source** / **Conditions for using the data source** a) Regional or national default values / These sources can only be used for liquid fuels and should be based on well-documented, reliable sources (such as a national energy balances) b) IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories /
Measurement methods and procedures	-
Monitoring frequency	a) Country specific data: Review appropriateness of the values annually b) IPCC default value: Any future revision of the IPCC Guidelines should be taken into account.
QA/QC procedures	-
Purpose of data	Calculation of baseline, project and leakage emissions
Additional comments	Verify if the values under a) are within the uncertainty range of the IPCC default values as provided in Table 1.2, Vol. 2 of the 2006 IPCC Guidelines. If the values fall below this range collect additional information from the testing laboratory to justify the outcome or conduct additional measurements. The laboratories in a) should have ISO17025 accreditation or justify that they can comply with similar quality standards.

Data / Parameter	$EF_{CO2,i,y}$
Unit	tCO_2/MJ
Description	CO_2 emission factor of fuel used by project vehicles for fuel type *i* in year *y*
Source of data	The following data sources may be used if the relevant conditions apply: **Data Source** / **Conditions for using the data source** a) Values provided by the fuel supplier in invoices — This is the preferred source b) Measurements by the project participants — If a) is not available c) Regional or national default values — If a) is not available These sources can only be used for liquid fuels and should be based on well-documented, reliable sources (such as a national energy balances) d) IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories — If a) is not available
Value(s) applied	To be determined with respect to each SSC-CPA
Measurement methods and procedures	For a) and b): Measurements should be undertaken in line with national or international fuel standards
Monitoring frequency	For a) and b): The CO_2 emission factor should be obtained for each fuel delivery, from which weighted average annual values should be calculated. For c): Review appropriateness of the values annually. For d): Any future revision of the IPCC Guidelines should be taken into account.
QA/QC procedures	-
Purpose of data	Calculation of project and leakage emissions
Additional comments	Applicable where option B is used. For a): If the fuel supplier does provide the NCV value and the CO2 emission factor on the invoice and these two values are based on measurements for this specific fuel, this CO2 factor should be used. If another source for the CO2 emission factor is used or no CO2 emission factor is provided, Options b), c) or d) should be used.

Data / Parameter	$EF_{CO2,j}$
Unit	tCO_2/MJ
Description	CO_2 emission factor of fuel used by baseline vehicles
Source of data	The following data sources may be used if the relevant conditions apply: **Data Source** / **Conditions for using the data source** a) Regional or national default values / These sources can only be used for liquid fuels and should be based on well-documented, reliable sources (such as a national energy balances) b) IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories /
Value(s) applied	To be determined with respect to each SSC-CPA
Measurement methods and procedures	-
Monitoring frequency	For a): Review appropriateness of the values annually. For b): Any future revision of the IPCC Guidelines should be taken into account.
QA/QC procedures	-
Purpose of data	Calculation of baseline emissions
Additional comments	-

Data / Parameter	EF_{elec}
Unit	tCO_2/MWh
Description	CO_2 emission factor of grid electricity used by project vehicle
Source of data	As per AMS-I.D Version 17 methodology or future update procedure and "Tool to calculate baseline, project and/or leakage emissions from electricity consumption"
Value(s) applied	To be determined with respect to each CPA
Measurement methods and procedures	Calculate the combined margin emission factor, using the procedures in the latest approved version of the. Tool to calculate the emission factor for an electricity system.
Monitoring frequency	Once for the crediting period
QA/QC procedures	As per the "Tool to calculate the emission factor for an electricity system".
Purpose of data	Calculation of project emissions
Additional comments	-

Data / Parameter	P_i
Unit	Passenger or tons
Description	Total annual passengers or ton goods transported by each baseline vehicle *i*
Source of data	a) Historical data b) Manufacturer specifications c) Control group d) Existing statistics
Value(s) applied	To be determined with respect to each SSC-CPA
Measurement methods and procedures	Monitored data before project begins.
Monitoring frequency	Once for the crediting period
QA/QC procedures	• The data will be based on the source as above in descending order • Data are recorded and stored electronically in a data log
Purpose of data	Calculation of baseline emissions
Additional comments	-

Data / Parameter	$P_{i,y,k}$
Unit	Passenger or tons
Description	Total annual passengers or ton goods transported by each project vehicle *i* in year *y* on route *k*
Source of data	Measured during the project activity
Value(s) applied	To be determined with respect to each SSC-CPA
Measurement methods and procedures	Monitored data during the project e.g. driver logs and route maps, plus sales receipts
Monitoring frequency	Daily
QA/QC procedures	• The data will be measured directly • The data are monitored continuously (at least daily measurements are taken) • Data are recorded and stored electronically in a data log
Purpose of data	Calculation of project emissions
Additional comments	-

Data / Parameter	D_i
Unit	km
Description	Total annual distance travelled by each baseline vehicle
Source of data	Based on routes specifications or using historical values
Value(s) applied	To be determined with respect to each SSC-CPA
Measurement methods and procedures	Monitored data before project begins.
Monitoring frequency	Daily
QA/QC procedures	• The data will be measured directly • The data are monitored continuously (at least daily measurements are taken) • Data are recorded and stored electronically in a data log
Purpose of data	Calculation of baseline emissions
Additional comments	-

Data / Parameter	dp_i
Unit	km
Description	Annual average distance of transportation per person or tonne of freight by each baseline vehicle *i*
Source of data	Measured during the project activity
Value(s) applied	To be determined with respect to each SSC-CPA
Measurement methods and procedures	Monitored through company/operators records
Monitoring frequency	Daily
QA/QC procedures	• The data will be measured directly • The data are monitored continuously (at least daily measurements are taken) • Data are recorded and stored electronically in a data log
Purpose of data	Calculation of baseline emissions
Additional comments	-

Data / Parameter	$dp_{i,y}$
Unit	km
Description	Annual average distance of transportation per person or tonne of freight by each project vehicle *i*
Source of data	Measured during the project activity
Value(s) applied	To be determined with respect to each SSC-CPA
Measurement methods and procedures	Monitored through company/operators records
Monitoring frequency	Daily
QA/QC procedures	• The data will be measured directly • The data are monitored continuously (at least daily measurements are taken) • Data are recorded and stored electronically in a data log
Purpose of data	Calculation of project emissions
Additional comments	-

Data / Parameter	$D_{k,y}$
Unit	km
Description	Distance of route *k* in year *y*
Source of data	Based on routes specifications or using historical values
Value(s) applied	To be determined with respect to each SSC-CPA
Measurement methods and procedures	Monitored through company/operators records
Monitoring frequency	Daily
QA/QC procedures	• The data will be measured directly • The data are monitored continuously (at least daily measurements are taken) • Data are recorded and stored electronically in a data log
Purpose of data	Calculation of project emissions
Additional comments	-

Data / Parameter	$SL_{k,y}$
Unit	km/passenger or km/ton
Description	Service level in terms of total passengers or volume of goods on route *k* in year *y*
Source of data	Monitored for each route, from company/operators records, e.g. driver logs and route maps, plus sales receipts
Value(s) applied	To be determined with respect to each SSC-CPA
Measurement methods and procedures	Service level determined by number of passengers or volume of goods times the average distance of transportation per person or tonne of freight
Monitoring frequency	Daily
QA/QC procedures	• The data will be measured directly • The data are monitored continuously (at least daily measurements are taken) • Data are recorded and stored electronically in a data log
Purpose of data	Calculation of project emissions
Additional comments	($SL_{k,y}$) shall be capped at baseline level ($SL_{BL,k}$). Emission reductions beyond this level will not be counted.

Data / Parameter	$SL_{BL,y}$
Unit	passenger or ton
Description	Service level in terms of total passengers or volume of goods carried on route *k* before the beginning of project
Source of data	Determined from company/ operators records, e.g. driver logs and route maps, plus sales receipts
Value(s) applied	To be determined with respect to each SSC-CPA
Measurement methods and procedures	Service level determined by number of passengers or volume of goods times the average distance of transportation per person or tonne of freight
Monitoring frequency	Daily
QA/QC procedures	• The data will be measured directly • The data are monitored continuously (at least daily measurements are taken) • Data are recorded and stored electronically in a data log
Purpose of data	Calculation of baseline emissions
Additional comments	-

Data / Parameter	$FF_{project,i,y}$
Unit	m^3
Description	Quantity of natural gas combusted in the element process *i* during the year *y*
Source of data	Measured during the project activity
Value(s) applied	To be determined with respect to each SSC-CPA
Measurement methods and procedures	Use volume meters
Monitoring frequency	Continuously
QA/QC procedures	The consistency of metered fuel consumption quantities should be crosschecked by an annual energy balance that is based on purchased quantities and stock changes. Where the purchased fuel invoices can be identified specifically for the CDM project, the metered fuel consumption quantities should also be cross-checked with available purchase invoices from the financial records
Purpose of data	Calculation of leakage emissions
Additional comments	-

B.7.2. Description of the monitoring plan for a generic CPA

MONITORING PLAN

The purpose of this Monitoring Plan (MP) is to provide a standard monitoring procedure to all SSC-CPAs under this PoA. The CME will manage the monitoring done by each SSC-CPA to ensure that each SSC-CPA will meet the requirements for data collection, processing and reporting. The MP shall be in accordance with all relevant rules and regulations of the CDM. The MP is an integral part of this design document and can be utilized to facilitate accurate and consistent monitoring of the project's Certified Emission Reductions (CERs).

The MP will be followed for the duration of the project activity in order to measure and track the impacts of the project activity and at the same time, prepare for the periodic verification process required confirming the amount of CERs achieved.

Specifically, the MP facilitates the following:

- Establishing and maintaining a suitable monitoring system
- Establishing and maintaining a reliable and accurate monitoring system
- Guide for the implementation of necessary measurement and management operations
- Guide for meeting CDM requirements for verification and certification

The CME will ensure all individual SSC-CPAs are verified based on each unique identification number as a reference to assure single counting of the CERs. The SSC-CPA with the reference will be linked with geographic coordinates marked by GPS coordinates based on each specific fixed site location.

Monitoring obligations

In order to facilitate an accurate CER determination, each SSC-CPA must fulfill a number of operational and data collection obligations. This will ensure that CERs are calculated in a transparent manner and monitoring is carried out as specified in the CDM Operations and Monitoring Manual which will be

prepared before the start of the first crediting period. All data required for baseline and emission reduction determination shall be monitored as described in each SSC-CPA-DD.

The CME will maintain all monitoring reports for all SSC-CPAs in accordance with the record keeping system and also make available all monitoring reports requested by the DOE for verification purposes.

Management and operational systems

The project participant of each SSC-CPA will have a well-defined management and operational system that meets the requirements of the project activity to ensure successful operation of the SSC-CPA and the credibility and verifiability of the CERs achieved. This includes:

Data handling

- Each SSC-CPA will develop and implement a protocol that establishes a transparent system for the collection, computation and storage of data, including adequate record keeping and data monitoring systems which will be fit for an independent auditing and verification process
- Every individual SSC-CPA will maintain its own monitoring system, data collection system and record keeping system
- The CME will oversee and ensure that each SSC-CPA maintains standard record documenting, archives the monitored data in a secure database and keeps the records during the entire crediting period of each SSC-CPA and two years after the crediting period
- Data (paper & electronic) will be transmitted semi-annually to the CME who is responsible for the compilation of the Monitoring Reports. The CME will conduct a data audit and compliance review utilizing the MP at least twice a year for each SSC-CPA

Quality assurance

- Key personnel will be assigned for overall project management, operation, monitoring and reporting as required by the project activity
- A competent manager will be appointed to be in charge of and accountable for the generation of CERs including monitoring, record keeping, computation of ERs, audits and verification. The person will officially sign-off on all GHG Emission worksheets
- Well-defined protocols and routine procedures, with good, professional data entry, extraction and reporting will be encouraged to maximize transparency of data archiving
- Proper management processes and recording of official data

Training

- Internal training will be made available to the new dedicated operational staff to enable them to undertake the tasks required by this MP. Initial staff training will be provided before the Project starts operating and generating CERs
- Health and safety requirements also will be given priority

If corrective action or improvement is required, then the project proponent will inform the managing entity for corrective or enhancement measures.

- - - - -

Appendix 1: Contact information on entity/individual responsible for the PoA

Organization	Integra Carbon Sdn Bhd
Street/P.O. Box	Level 28
Building	The Gardens South Tower, Mid Valley City, Lingkaran Syed Putra
City	Kuala Lumpur
State/Region	Wilayah Persekutuan
Postcode	59200
Country	Malaysia
Telephone	+6-03-2298-7209
Fax	+6-03-2298-7333
E-mail	azhar@integra-group.com.my
Website	
Contact person	
Title	Managing Director
Salutation	Mr.
Last name	Anas
Middle name	
First name	Azhar
Department	
Mobile	+6-012-209-8084
Direct fax	+6-03-2298-7333
Direct tel.	+6-03-2298-7209
Personal e-mail	azhar@integra-group.com.my

Organization	Landfill Gas Canada Ltd
Street/P.O. Box	200 N Service Rd. W
Building	Unit 1, Ste. 410
City	Oakville
State/Region	Ontario
Postcode	L6M 2Y1
Country	Canada
Telephone	+1-905-334-6127
Fax	+1-905-827-6177
E-mail	projectnet@cogeco.ca
Website	
Contact person	
Title	Senior Engineer
Salutation	Eng.
Last name	Hamaliuk
Middle name	Peter
First name	Gerald
Department	Technical
Mobile	
Direct fax	+1-905-827-6177
Direct tel.	+1-905-334-6177
Personal e-mail	projectnet@cogeco.ca

Appendix 2: Affirmation regarding public funding

No public funding from Annex 1 is involved in this PoA and related CPAs.

Appendix 3: Application of methodology(ies)

No additional information.

Appendix 4: Further background information on ex ante calculation of emission reductions

No additional information.

Appendix 5: Further background information on the monitoring plan

No additional information.

Attachment 1: PoA Management System Documentation

integra CARBON

PoA Management Documentation (Version 2.0) 19 May 2012

GREEN COMMERICAL VEHICLES PROJECTS POA MANAGEMENT DOCUMENTATION

Note:

- *Developed per the requirement of EB65 Annex 3 section 17*
- *Annual assessment and update, per most up-to-date standards/ guidelines/ procedures, etc*

Sections 17a: Definition of role – CME	
Coordinating Managing Entity (CME)	Green Commercial Verhicles Projects
CME Manager	Azhar Anas
Responsibility	▪ Developed eligibility criteria ▪ Initial assessment of CPA for inclusion into PoA (CPA starting date and compliance to eligibility criteria) ▪ Technical review of technologies for inclusion into PoA ▪ Training – initiate, conduct, manage
Competence	▪ Managing Director for Integra Carbon Sdn Bhd ▪ Actively pursuing CDM opportunities in the transport and power sectors since 2010 ▪ Jointly developed CDM projects with CER buyers, currently with 2 projects under validation
Sections 17a: Definition of role – Program Manager	
Program Manager	Chak Tze Chin
Responsibility	▪ Collation and assessment of CPA data ▪ Populate CPA inclusion form ▪ Development of CPA-DD ▪ Coordination with validation and verificaiton processes ▪ Coordination with project participant on monitoring plans, generationg of monitoring data and required regulatory works
Competence	▪ Involved in CDM sector since 2009 ▪ Participated in validations projects – hydro, co-composting and methane recovery in Malaysia ▪ Developed 2 large scale biogas monitoring report and 1 has been successfully issued CERs in June, 2011 ▪ Developed 3 biogas CPA-DD – 2 in Malaysia and 1 in Indonesia
Section 17b: Records of training	
16 December 2011	Training for CPA inclusion documentation - Hangzhou Carbon Trade Environmental Engineering Co. Ltd
19 May 2012	Training for CPA inclusion documentation - AST Climate Sdn Bhd

Section 17f: Measures for continuous improvement	
Version 1	01 Jan 2012
Version 2	19 May 2012
Next update	19 May 2013

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Attachment 2: CPA Inclusion Form

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PoA-CPA Inclusion (Version 2.0)

GREEN COMMERCIAL VEHICLES PROJECTS POA INCLUSION FORM/CHECKLIST

Note to the user:

- *This form/checklist has been designed, inline to Green Commercial Vehicles Projects PoA-DD B.2. Eligibility criteria for inclusion of a CPA in the PoA and CPA-DD D.5. Demonstration of eligibility for a CPA.*
- *The main objective is to check and assess whether the project (CPA) fulfills the eligibility criteria and additionality requirements set up by Green Commercial Vehicles Projects PoA.*
- *The managing & coordinating entity (CME) or authorized representative will do the checking and assessment work. All the information will be based on the data and details given by the company/person involved. Provided information will be treated confidential and only be used for the purpose of inclusion of the CPA into the PoA.*
- *Every CPA will have to meet all the criteria mentioned below to ensure eligibility to participate in this PoA.*

Sections A: Information about the PoA	
PoA name	Green Commercial Vehicles Projects
Version	1
Methodology	AMS-III.S Version 03.0
Host Country	Malaysia
Sections A: Information about the Project (CPA)	
CPA name	
Number of vehicle	
Station	
GPS coordinate	
Is the project registered as a CDM project activity	
Is the project included as a CPA of another PoA.	
Is the project a de-bundled component of another CDM programme activity (CPA) or CDM project activity set up in the PoA	
Section B: Contact information of the client for assessment	
Name of the company	
Name and position of the company representative filling in this form	
Phone and email of the person/company	
Address of the company	
Date of the completion of this form	
Section C: Contact information of the project owner for assessment	
Name of the company	
Name and position of the company representative filling in this form	
Phone and email of the person/company	
Address of the company	
Date of the completion of this form	

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PoA-CPA Inclusion (Version 2.0)

Section D: Eligibility criteria assessment	
The geographical boundary of the SSC-CPA must be within Malaysia.	
Each SSC-CPA included in this PoA will have a unique identification number as a reference. To avoid double counting, each included SSC-CPA with its reference number will be linked with the geographic coordinates of the vehicle's station marked by GPS.	
The project must comprise measures that reduce GHG from vehicles by means of the following options: (a) Energy efficiency (b) Fuel switch.	
The start date of each SSC-CPA will be based on vehicle purchasing documentary evidence.	
Each SSC-CPA must be adhered to the applicability, baseline and monitoring methodology of AMS III.S. "Introduction of low-emission vehicles/technologies to commercial vehicle fleets" Version 3 methodology or future update. Multiple methodologies are not applicable to the SSC-CPA & PoA.	
Each SSC-CPA must demonstrate the project's additionality by applying the "Attachment A to Appendix B" or future updates. If the SSC-CPA aims to achieve emission reductions at a scale of no more than 20 ktCO2e per year, the "Guidelines for demonstrating additionality of microscale project activities" Version 3 or future update can be used. The SSC-CPA must fullfil both conditions (i) and (ii) below: (i) Each of the independent subsystems/measures in the project activity achieves an estimated annual emission reduction equal to or less than 600 tCO2e per year; and (ii) End users of the subsystems or measures are communities or SMEs.	
The PoA-specific requirements stipulated by the CME: (i) Local stakeholder meeting shall be conducted at the PoA level. (ii) Environmental impact assessment is not required for the implementation of energy efficient technologies per the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987. (iii) The CME has approved the participation of the SSC-CPA into the PoA, with the signing of Emission Reduction Purchase Agreement (ERPA).	
Each SSC-CPA will provide written affirmation that funding from Annex 1 parties, if any, does not result in a diversion of official development assistance.	
The target group is commercial and/or public transport	

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PoA-CPA Inclusion (Version 2.0)

vehicles. The distribution mechanism is either by direct installation or contractual installation.	
Each SSC-CPA is anticipated to be verified individually. If the SSC-CPA opted to do sampling within SSC-CPA, a sampling and survey requirements shall adhere to the "Standard for sampling and surveys for CDM project activities and programme of activities" Version 2 or future updates.	
Every SSC-CPA in aggregate meets the small scale or microscale threshold criteria and remains within those thresholds throughout the crediting period of the SSC-CPA.	
Each SSC-CPA shall satisfy the latest version of de-bundling rules for PoA, adhering to the "Guidelines on assessment of de-bundling for SSC Project activities" version 03 or future updates.	
Section E: Additionality assesment	
Define credible possible alternative scenarios to the project activity. Ensure that the proposed CPA is not the only alternative amongst those considered that is in compliance with mandatory regulations.	
Determine most relevant barrier in terms of investment analysis and barrier analysis to make sure the project activity is additional.	☐ Investment analysis ☐ Barrier analysis ☐ First of its kind/Prevailing Practice ☐ Others
If investment analysis is selected, either simple cost analysis, investment comparison analysis or benchmark analysis will be carried out to demonstrate the additionality of the project.	
The CPA participation is voluntary and there is no requirement or enforcement under existing national/state/local regulations to introduce a low GHG emitting vehicles or retrofit an existing vehicles (switching to low GHG intensive fuel)	
Section F: Completeness check of the enquiry (CME use only)	
Checked by	
Signature	
Dated	
Conclusion	
Allocated CPA reference number	
CPA number	

History of the document

Version	Date	Nature of revision(s)
02.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the programme design document form for small-scale CDM programmes of activities" (EB 66, Annex 13).
01	EB33, Annex43 27 July 2007	Initial adoption.
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