CLEAN DEVELOPMENT MECHANISM
SMALL-SCALE PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM
(CDM-SSC-PoA-DD) Version 01

CONTENTS

Annexes

NOTE:

(i) This form is for the submission of a CDM PoA whose CPAs apply a small scale approved methodology.

(ii) At the time of requesting registration this form must be accompanied by a CDM-SSC-CPA-DD form that has been specified for the proposed PoA, as well as by one completed CDM-SSC-CPA-DD (using a real case).

SECTION A. General description of small-scale programme of activities (PoA)

A.1 Title of the small-scale programme of activities (PoA):

- The title of the project activity

Energy Efficiency Promoting Program using Idling Stop Devices for Public Buses in Shandong, China.

- The current version number of the document

Version 1

- The date when the document was completed.

January 10, 2011

A.2. Description of the small-scale programme of activities (PoA):

1. General operating and implementing framework of PoA

The purpose of the PoA is to reduce CO_2 emissions from buses operating by public bus companies in Shandong Province, China. In each SSC-CPA, the CPA implementer, the public bus company, install the post-fit type idling stop devices to the buses resulting in saving of fuel consumption and reductions of CO_2 emissions while idling of the buses. The CPAs will be basically implemented city by city since each city has one public bus company. The post-fit type idling stop device was developed in Japan, and it is possible to ease driving operation to stop idling compare to manual operations of turning the engine off and on by the ignition key. The emission of air pollutant such as NOx and PM are also reduced.
GE Creation Technologies, Inc. (hereinafter GECT) is the coordinating/managing entity of the PoA. The organization operates and manages the PoA as a whole, and takes charge of necessary communication with the Board and DOE, management of each CPA, quality assurance and quality check of monitored data, calculation of emission reductions. The CPA implementers, the bus companies, monitor data necessary for the calculations of greenhouse gas (GHG) emission reductions at each CPA site.
Revenues from CER will be utilized for installations, operating and maintenance of the devises and training. The crediting period of the PoA is 28 years and that of each CPA is 10 years.

2. Policy/measure or stated goal of the PoA

In 1985, the energy consumption in the transport sector of China was only 919 PJ, however it has been rapidly increased year by year, and in 2004, it reaches up to 3,559 PJ (Ning and Tonooka, 2008). The Chinese government is keen to introduce low carbon emission buses such as hybrid buses or electric buses and replacement of vehicles from the category of EUROII standard to EUROIII. Because the EUROII buses are using for long time, it is important to reduce emission from the buses. Reducing the emissions and fuel consumption by eco-driving are important issues in China, however there is no experience to install and use idling stop devices in China, and it is expected to face the difficulties to diffuse idling stop.
Under these circumstances, the PoA aims to promote reduction of energy consumptions and GHG emissions in the transport sector in China, through introduction of the post-fit type idling stop devices utilizing PoA scheme.

3. Confirmation that the proposed PoA is a voluntary action by the coordinating/managing entity.

There is no mandatory in China or local government to install the devices that the PoA will intend to introduce. GECT has no duty and there has been no incentive to implement the PoA. Without the PoA, GECT has no economic capacity to manage the program because all operating costs related to functioning coordinator will be covered by revenues from PoA in terms of CER. Therefore, the proposed PoA is a voluntary action by GECT.

Definitions:

Idling: Refers only to situations in which a vehicle engine continues running while the vehicle is stopped at traffic lights in traffic jams or at bus stops when passengers are boarding or alighting. Only vehicle stoppages up to a maximum of 3 minutes qualify under this definition and longer duration stoppages (e.g. at the depot, or fueling stops) are excluded. Under this methodology, Idling only includes stoppages that occur:

- When the vehicle is in-service for public transportation; and
- After a vehicle has already been in motion and following which the vehicle will recommence motion; in other words, the vehicle has to be in motion before the Idling Stop period starts and the vehicle has to be in motion after the Idling Stop period ends.

Idling Stop: Refers to the action of turning off the vehicle engine and thus preventing Idling (as specifically defined above) and the associated fuel consumption that would otherwise have occurred while Idling, in absence of the project activity.

A.3. Coordinating/managing entity and participants of SSC-POA:

1. Coordinating or managing entity of the PoA as the entity which communicates with the Board

The PoA coordinating/managing entity is GECT and which takes charge of necessary communication with the Board and DOE.

2. Project participants being registered in relation to the PoA. Project participants may or may not be involved in one of the CPAs related to the PoA.

Name of Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants(*) (as applicable)	Party involved wishes to be considered as project participant (Yes/No)
People's Republic of China (host)	GE Creation Technologies, Inc. (GECT)	No
Japan	ALMEC Corporation	No
(*)In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.		

A.4. Technical description of the small-scale programme of activities:

A.4.1. Location of the programme of activities:

A.4.1.1. Host Party(ies):

People's Republic of China

A.4.1.2. Physical/ Geographical boundary:

The PoA covers Shandon province, China. The physical location of the first CPA will be implemented in Jinan city of Shandon province.

Figure 1 The location of the PoA
Source: Wikipedia

A.4.2. Description of a typical small-scale CDM programme activity (CPA):

The purpose of small-scale CPAs is to reduce GHG emissions from buses operating by public bus companies in Shandong Province, China. In the project activity, CPA implementers will install the post-fit type idling stop devices to in-use buses resulting in saving of fuel consumption while idling of the buses.

The baseline scenario of the project activity is the situation where, in the absence of the project activity, idling will be continued at stoplights or other situations without installing post-fit type idling stop device. On the other hand, the project scenario of the project activity is the situation where, idling stop will be conducted using idling stop device subject to rather long period stop at stoplights or other situations resulting in saving of fuel consumptions with consequent reduction in GHG emissions.

The emission of air atmosphere pollutant of NOx and PM are also reduced at the same time.

A.4.2.1. Technology or measures to be employed by the SSC-CPA:

The device to be employed by the SSC-CPA is post-fit type for in-use vehicles and it enables drivers to stop idling without turning off or on the ignition key. Therefore, it is possible to reduce operations of drivers to stop idling compared to manual operations. The idling stop device installed must be able to record necessary parameters electronically to calculate emission reductions, i.e. idling stop time and idling period of each idling stop. Details of the background and the technology are described below.

Background

"Idling stop" is the action to stop idling, i.e. driving pattern where vehicle speed is zero keeping the vehicle engine running. Doing "Idling stop", fuel consumptions while idling can be saved and therefore CO_2 emissions also can be reduced.

The need to reduce CO_2 in transport sector is increasing, and idling stop is one of the effective measures to reduce CO_2 from individual motor vehicles. Idling stop can be realized by three ways. The first one is to stop idling manually by turning the ignition key. The second one is introducing new type of motor vehicles with pre-installed idling stop system. Very few new car has this system. The third one is the proposed project case, that is installing post-fit type idling stop device. To spread idling stop earlier as possible, it is better to promote the post-fit type idling stop device.

The operational principle of the idling stop device

The idling stop device is post-fit type for in-use vehicles and it enables drivers to stop idling without turning off or on the ignition key. Driver can realize idling stop, just by shifting the gear into neutral position and releasing the clutch pedal when the car stops (Figs 2 and 3). Therefore, it is possible to reduce operations of drivers to stop idling compared to manual operations. It is said that manual idling stop may not be spread widely because it needs engine on and off by turning ignition key manually. These manual operations may have potential to cause operation mistakes and delay of start moving, and may also affect smooth and safe drive.

The idling stop device collect signals such as vehicle speed and engine on/off from ECU (Engine Control Unit) every one second, and once vehicle status determined by these signals, e.g. engine on, start, stop and engine off, is changed, the status and elapsed time and cumulative number of engine restarting are recorded to the data logger. Each idling stop period (in second) can be calculated by analyzing these recorded data. Therefore, it enables to calculate CO_2 emissions while idling, multiplying the idling stop period and emission factors in idling.

Figure 1 shows the connection diagram of the idling stop device. "Controller" is the main unit of the device. The red lines show the new wiring required to install the device. The narrow red line shows communication line and the heavy red line shows electric cable. The black lines are wiring of motor vehicles.

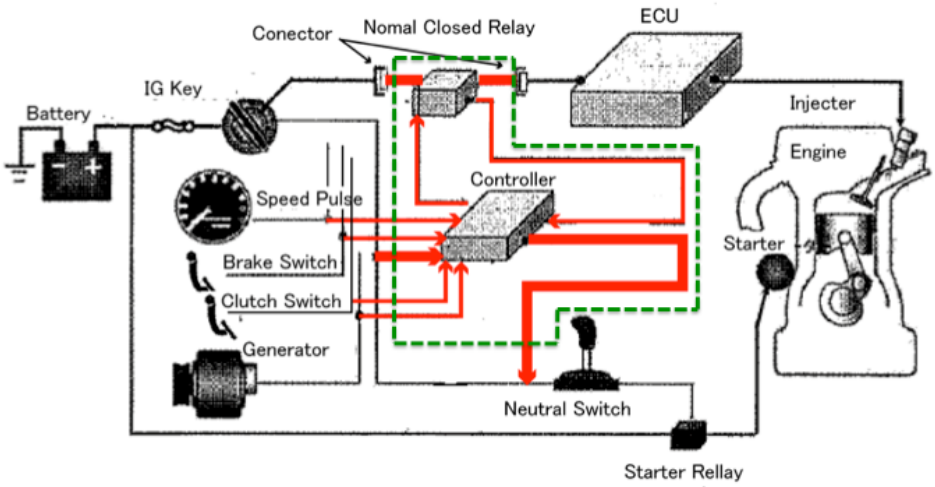

Figure 2 Mechanism of Idling Stop Device

The flow charts of engine stop/restart in the baseline and the project are shown below.

Engine stopping

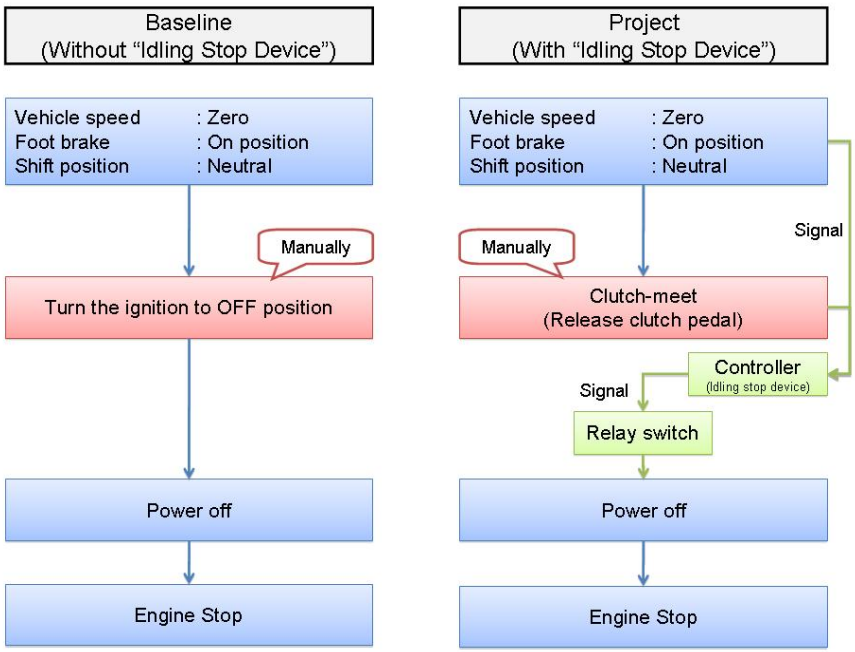

Figure 3 Flow chart of engine stopping

Engine restarting

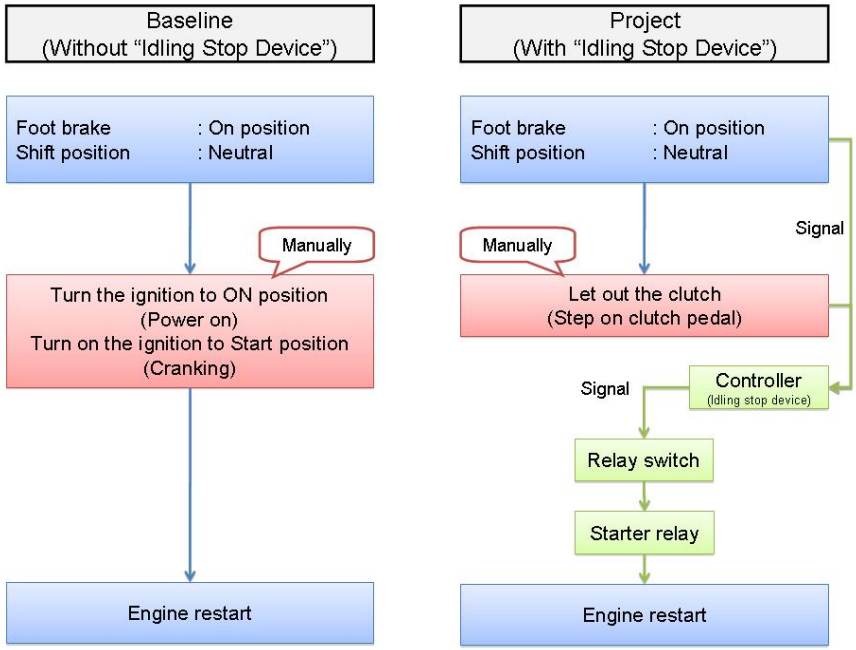

Figure 4 Flow chart of engine restarting

A.4.2.2. Eligibility criteria for inclusion of a SSC-CPA in the PoA:

The CPA under the PoA shall meet the following criteria:

1) Installations of the post-fit type idling stop devices to in-use public buses in Shandon province. Installation of Idling Stop devices in new vehicles only if it can be demonstrated that at the time of new vehicle acquisition there are no vehicles, of a type similar to those in the baseline or project activity, available for sale in the country of the project activity, that are sold with automatic Idling Stop devices installed as a standard feature.

2) Vehicles used for public transportation, such as buses that are centrally owned and managed by a single entity and are driven by contractors or employees of the central entity.

3) Vehicles using petrodiesel as fuel.

4) The bus company involved has no existing anti-idling policy

5) The aggregate emission reductions of a single CPA may not exceed 60 ktCO2 equivalent annually.

6) Any bus installed with the device under the CPA does not belong to another CPA under this PoA, another registered CDM project activity or another CDM PoA.

A.4.3. Description of how the anthropogenic emissions of GHG by sources are reduced by a SSC-CPA below those that would have occurred in the absence of the registered PoA (assessment and demonstration of additionality):

(i) The proposed PoA is a voluntary coordinated action;

The PoA is not enforced or mandated by laws or ordinances or national programs, but is a voluntary coordinated action aiming to contribute to realize energy conservation in the public transportation in Shandon province, China.

(ii) If the PoA is implementing a voluntary coordinated action, it would not be implemented in the absence of the PoA;

Each CPA under the PoA can not be realized without the CER revenue and technical supports and trainings, and the PoA will also be operated and managed utilizing these revenue. It would not be implemented in the absence of the PoA.

(iii) If the PoA is implementing a mandatory policy/regulation, this would/is not enforced;

Not applicable.

(iv) If mandatory a policy/regulation is enforced, the PoA will lead to a greater level of enforcement of the existing mandatory policy/regulation.

Not applicable.

A.4.4. Operational, management and monitoring plan for the programme of activities (PoA):

A.4.4.1. Operational and management plan:

Operational and management structure of the PoA is shown in Figure below.

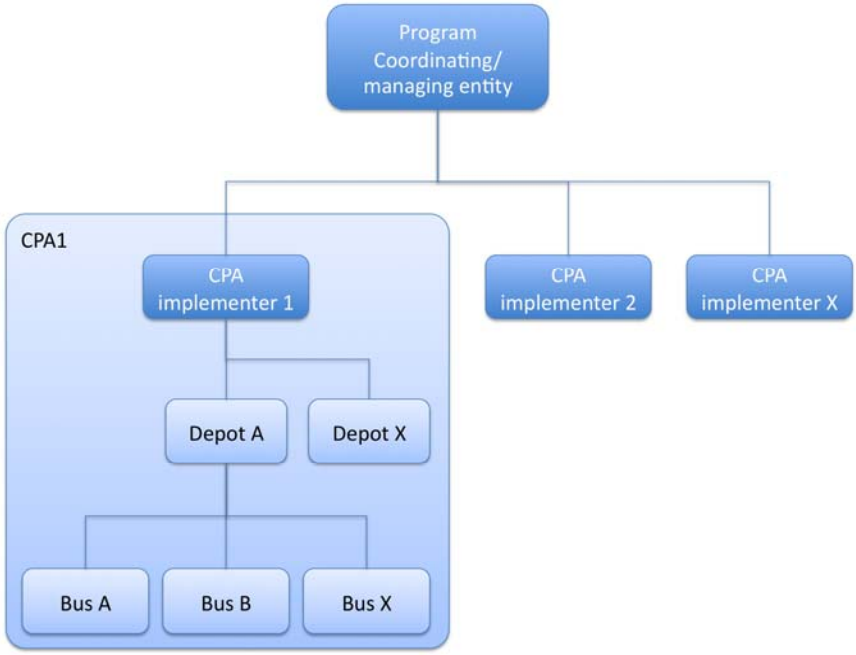

Figure 5 Operational and management structure of the PoA

GECT is in charge of coordinating all project participants of the PoA, collecting necessary data and information from each CPA for the purpose of monitoring, and also communicating with DOE and CDM Executive Board, and also implement quality assurance and quality check of monitored data, calculation of emission reductions. Each CPA implementer reports monitored data to GECT.

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

Each CPA will follow the record keeping and monitoring requirements stipulated in the methodology applied and detailed in Section E below. Each CPA implementer collect data from and report to GECT based on the operation and monitoring manual prepared by GECT. GECT has the role of the coordinating entity, will be responsible for the management of records, quality assurance and quality check of monitored data associated with each CPA. All data regarding calculations of emission reductions will be stored electronically.

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

On the formulation and inclusion of new CPA, it will be verified to avoid double accounting via asking to related organizations such as the project implementer, China DNA and checking UNFCC website.

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

According to "Guidelines on Assessment of Debundling for SSC Project Activities (ver. 03)",[1] it is specified that

If each of the independent subsystems/measures (e.g., biogas digesters, residential solar energy systems, kerosene or incandescent lighting replacements) included in one or more CDM project activities is no greater than 1% of the small scale thresholds defined by the applied methodology and the subsystems/measures are indicated in the PDDs to be each implemented at or in multiple locations (e.g., installed at or in multiple homes) then these CDM project activities are exempted from performing a de-bundling check, i.e., considered as being not a de-bundled component of a large scale activity.

So far, annual emission reduction from an bus installed with the device is estimated as less than 1 ton CO_2e per a bus in average for the proposed SSC-CPA. The 1 ton CO_2e per system is far less than the threshold mentioned above (600 ton CO_2e per year) for exemption of de-bundling check. Therefore, any CPA of the PoA is exempted from performing de-bundling check.

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

As explained above, under the record keeping system, the CPA implementers are aware of and have agreed to their activity under the PoA. Furthermore, provisions speculated in the agreements, between GECT, ALMEC Corporation and CPA operators, ensure operation of any CPA under their awareness and understanding. For instance, any CPA under the PoA is recommended and

[1] http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid17.pdf.

planned by GECT and ALMEC Corporation.

A.4.4.2. Monitoring plan:

In the PoA, monitoring will be done for each CPA. The monitoring plan is provided as follows.

1) Monitoring framework

GECT manage the monitoring. The structure and the roles are shown in Figure ** and Table **, respectively.

2) The role of the program coordinating/managing entity and the CPA implementers

The following table shows the role of the coordinating/managing entity and the CPA implementers.

Table 1 The role of the coordinating/managing entity and the CPA implementers

	CPA level (The CPA implementers)	PoA level (The coordinating/managing entity)
Monitoring management	- Implement and manage monitoring of CPAs	- Operation and management of the PoA and supervision of each CPA - Develop the operation and monitoring manual for CPAs. - Develop and establish data collection and reporting system for parameters monitored in every CPAs.
Data collection and reporting	- Implement data collection of the CPA - Prepare daily and monthly report - Check data quality and collection procedures regularly	- Check data quality and collection procedures of each CPAs regularly - Prepare monthly and annual report
Data storage and management	- Collect memory cards. - Implement data management of CPA. - Store and maintain records.	- Develop database format of CPA. - Check the reported data from each CPAs. - Calculate emission reductions based on the data reported by each CPA implementer. - Implement data management of PoA. - Store and maintain records.
Quality assurance	- Undertake regular maintenance of the devices - Receive necessary training for operation of the system and quality assurance of monitoring data	- Request regular maintenance of the devices to each CPA implementer. - Implement training for operation of the system and quality assurance and quality control of monitoring data

3) Monitored data

The data that shall be monitored are described in section E.7.1.

4) Errors and failures while monitoring

In case if there are any errors or failures in measuring monitoring items of the CPA, emission reduction of the period shall be set as zero and do not claim CER.

A.4.5. Public funding of the programme of activities (PoA):

No public funding is utilized in the PoA.

SECTION B. Duration of the programme of activities (PoA)

B.1. Starting date of the programme of activities (PoA):

January 1, 2012

B.2. Length of the programme of activities (PoA):

28 years

SECTION C. Environmental Analysis

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C.1. Please indicate the level at which environmental analysis as per requirements of the CDM modalities and procedures is undertaken. Justify the choice of level at which the environmental analysis is undertaken:

1. Environmental Analysis is done at PoA level ☐
2. Environmental Analysis is done at SSC-CPA level ☑

C.2. Documentation on the analysis of the environmental impacts, including transboundary impacts:

Not applicable. The analysis is done at CPA level.

C.3. Please state whether in accordance with the host Party laws/regulations, an environmental impact assessment is required for a typical CPA, included in the programme of activities (PoA),:

No environmental impact assessment is required for each CPA, because no construction works are accompanied. In the program, the idling stop devices are installed in buses, and the system can contribute to improve the air pollutants (e.g. NOx, PM) in the project area.

SECTION D. Stakeholders' comments

D.1. Please indicate the level at which local stakeholder comments are invited. Justify the choice:

1. Local stakeholder consultation is done at PoA level ☐
2. Local stakeholder consultation is done at SSC-CPA level ☑

Stakeholder's meetings are done at CPA level, since the locations of CPAs are geographically spread and the implementers are different.

D.2. Brief description how comments by local stakeholders have been invited and compiled:

Not applicable. Local stakeholder consultation is done at CPA level.

D.3. Summary of the comments received:

Not applicable.

D.4. Report on how due account was taken of any comments received:

Not applicable.

SECTION E. Application of a baseline and monitoring methodology

E.1. Title and reference of the approved SSC baseline and monitoring methodology applied to a SSC-CPA included in the PoA:

The following approved SSC baseline and monitoring methodology is applied to a SSC-CPA in the PoA:

AMS-III.AP. Transport energy efficiency activities using post - fit Idling Stop device / version 2

E.2. Justification of the choice of the methodology and why it is applicable to a SSC-CPA:

The choice of the methodology is appropriate and it is applicable, since each CPA satisfies the following conditioned provided in the methodology as the table below.

Applicability conditions	Each CPA
5. The methodology is applicable to the	Buses in each CPA are centrally owned

following types of vehicles. (a) Vehicles used for public transportation, such as buses that are centrally owned and managed by a single entity and are driven by contractors or employees of the central entity; (b) Vehicles using gasoline or petrodiesel as fuel; and (c) Vehicles in which it is possible to install post-fit Idling Stop device.	and managed by a single entity, a public bus company. The buses use perodiesel as their fuel. It is mechanically possible to install the devices to these buses.
6. This methodology is applicable only to: (a) Installation of Idling Stop devices in in-service, operational vehicles; or (b) Installation of Idling Stop devices in new vehicles only if it can be demonstrated that at the time of new vehicle acquisition there are no vehicles, of a type similar to those in the baseline or project activity, available for sale in the country of the project activity, that are sold with automatic Idling Stop devices installed as a standard feature.	The devices will be installed to in-use buses owned by each CPA implementer.
7. This methodology is not applicable to: (a) Private vehicles or taxis; (b) Vehicles that have electronic push-button starters or automatic Idling Stop devices installed prior to the project activity; (c) Project activities promoting manual Idling Stop, i.e. turning the ignition key off and on; (d) Project activities in locations where there are government regulations in place that prohibit Idling of the type of vehicles involved in the project activity, or where the transport company involved has an existing anti-idling policy.	The devices will be installed to in-use public buses that do not have electronic push-button starters or automatic Idling Stop devices. The public bus company of each CPA have not been promoting manual Idling Stop. Shandon province and the public bus company do not have any regulation to prohibit Idling.
8. Measures are limited to those that result in emission reductions of less than or equal to 60 kt CO2 equivalent annually.	The emission reductions of each CPA do not exceed 60 kt CO_2 equivalent annually.
9. The project design document shall include documentation of procedures to eliminate any potential double counting of emission reductions from, for example, manufacturers, wholesale providers or others claiming credit for emission reductions from the project, or due to the same vehicles participating in other CDM projects or Programmes of Activities.	The procedure to eliminate any potential double counting of emission reductions is included in the PoA-DD and CPA-DD.

E.3. Description of the sources and gases included in the SSC-CPA boundary

The project boundary includes roads where the buses installed with the devices will be driven. In the table below, all sources of the baseline and the project activity are listed.

Table 2 Sources and gases included in the baseline and the project activity

	Source	Gas	Included?	Justification / Explanation
Baseline emissions	Emissions at idling	CO_2	Yes	Major emission source.
		CH_4	No	Not significant. Excluded for simplification and conservativeness
		N_2O	No	Not significant. Excluded for simplification and conservativeness
Project emissions	Emissions at re-starting the engine	CO_2	Yes	Major emission source.
		CH_4	No	Not significant. Excluded for simplification
		N_2O	No	Not significant. Excluded for simplification

E.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:

According to the methodology applied, the baseline scenario of each CPA shall be "the scenario where, in the absence of the project activity, the majority of project vehicles will continue idling". The buses, that will be installed with the idling stop devices, will continue idling at stoplights or other situations in the absence of the proposed project activity.

Plausible scenarios of the baseline are as follows. Baseline scenario is determined as Scenario 1 through the assessments elaborated in B.5.

Scenario 1: Continuation of current practice
Scenario 2: Implementation of manual idling stop by behavioural changes not using the post-fit type device
Scenario 3: Introduction of new buses with pre-installed idling stop device
Scenario 4: Implementation of the proposed project without CDM

E.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the SSC-CPA being included as registered PoA (assessment and demonstration of additionality of SSC-CPA): >>

E.5.1. Assessment and demonstration of additionality for a typical SSC-CPA:

In order to demonstrate the additionality of the SSC-CPA, the project proponents shall identified plausible project alternatives, which include all possible courses of action that could be adopted. These plausible options are further analyzed as per the guidance in Attachment A to Appendix B of the small scale modalities and procedures to establish project additionality and determine an appropriate and conservative baseline scenario.

In line with the Attachment A to Appendix B of "The simplified modalities and procedures for small-scale CDM project activities", a project is deemed as additional if project participants can provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:

(a) Investment barriers
(b) Technological barriers
(c) Barrier due to prevailing practice
(d) Other barriers

To identify the baseline scenario and demonstrate additionality of each SSC-CPA, the following steps have been applied;

Step 1. Identification of alternative scenarios including consistency with mandatory applicable laws and regulations
Step 2. Barrier analysis
Step 3. Evaluation of alternative scenarios

The followings are an example of the demonstration of additionality in CPA1 case.

Step 1. Identification of alternative scenarios:

There are four (4) plausible alternative scenarios for the proposed project. These scenarios all comply with mandatory and regulations of China and Shandon province and the public bus companies.

Scenario 1: Continuation of current practice
Scenario 2: Implementation of manual idling stop by behavioural changes not using the post-fit type device
Scenario 3: Introduction of new buses with pre-installed idling stop device
Scenario 4: Implementation of the proposed project without CDM

Step 2. Barrier analysis:

Among four (4) barriers in the Attachment A to Appendix B of "The simplified modalities and procedures for small-scale CDM project activities", the proposed project faces the following barriers

Technological barriers:
The post-fit type idling stop device was invented by ECO-MOTION, Ltd of Japan, and is considered to be state-of-the-art technologies based upon the experience and know-how obtained from more than ten years use in Japan. Since the device are connected to vehicle electronic control unit (ECU), very high and sensitive skills and knowledge are required to keep vehicle operation safely and smoothly. The post-fit type idling stop device has not been introduced in China, and this is the first project to introduce the device in China. In installing the device to accommodate buses in China, not only reading the installation manual but special skills and know how are required. JPTGC(Jinan Public Transport Group Company) has no local staff with enough knowledge and experience to properly install the device. In the operation phase, training of the driver is also needed to understand the skills how to drive safely preventing any influences or damages on buses. These local staff training and education programs for them will be implemented in the project activity by Japanese side. Before implementing the proposed project, not only JPTGC, but also JPTGC Institute of science and technology and the bus company who provides buses to JPTGC are also participate to install the devices to the buses, and find out problems and issues in the installation and operation phase, and also analyze the effect such as reduction of fuel consumptions and impact to the engine or battery. These tests have been implemented with the technical support by Japanese side including ECO-MOTION, Ltd.

From above reasons, without the technology transfer from the Japanese side, it is impossible to implement the proposed project.

Barrier due to prevailing practice:
Currently, JPTGC has no plan to stop idling manually or automatically in their current practice. They have no plan to introduce new type of buses with pre-installed idling stop system. As for post-fit type idling stop device, it is first time for JPTGC to access and test the device, and this was realized by the proposal from Japanese side for this CDM project. Moreover, this type of equipment is first of its kind in China. There is no regulation or mandatory of Chinese government or Shandon province or Jinan city to stop idling for vehicles driving in cities. In addition, JPTGC had been misunderstood that the post-fit type idling stop devices can not apply to Chinese buses and had a negative perception to introduce the devices. Therefore, the buses of JPTGC will continue idling at stoplights or other situations in the absence of the proposed project activity.

From above considerations, there exist technological barrier and barrier due to prevailing practice.

Step 3. Evaluation of alternative scenarios

Each scenario identified in Step 1 was assessed as follows.

Scenario 1: Continuation of current practice
The scenario do not install any devices, therefore it requires minimal investment and operational costs. It is no need to establish training programs for drivers, and there is no additional skills required for drivers.

Scenario 2: Implementation of manual idling stop by behavioural changes not using the post-fit type device
There is no regulation or mandatory in China or Shandon province or Jinan city for motor vehicles to stop idling manually at stoplights or other situations. There is also no measures or plans to promote stop idling in JPTGC. It is said that manual idling stop may not be spread widely, because it needs engine on and off by turning ignition key manually. These manual operations may have potential to cause operation mistakes and delay of start moving, and may also affect smooth and safe drive. Therefore, his scenario can not be the baseline scenario.

Scenario 3: Introduction of new buses with pre-installed idling stop device
JPTGC has no plan to introduce new type of buses with pre-installed idling stop system. Moreover, bus manufacturers who provide buses to JPTGC do not have any plan to produce buses with pre-installed idling stop system. Therefore, this scenario can not be the baseline scenario.

Scenario 4: Implementation of the proposed project without CDM
As elaborated in Step 2, the proposed project faces technological barrier and barrier due to prevailing practice. Therefore, this scenario can not be the baseline scenario.

From the above analysis, the baseline scenario is identified as Scenario 1, continuation of current practice. As elaborated in Step 2, the proposed project faces technological barrier and barrier due to prevailing practice. Therefore, the proposed project is considered as additional.

E.5.2. Key criteria and data for assessing additionality of a SSC-CPA:

	Key information and data	Criteria

Technological barriers	First opportunity to install the devices in the CPA.	It should be elaborated that the CPA implementer do not have any experience to install the device.
	Technological transfer from Japanese side is essential to install the devices.	It should be elaborated that the CPA implementer can not install the device by their own skills.
Barrier due to prevailing practice	Current practice on stop idling	The CPA implementer do not have any plan to stop idling manually or automatically, and no plan to introduce new type of buses with pre-installed idling stop system.

E.6. Estimation of Emission reductions of a CPA:

E.6.1. Explanation of methodological choices, provided in the approved baseline and monitoring methodology applied, selected for a typical SSC-CPA:

Methodological choices selected for a typical SSC-CPA are as follows.

In the determination of the parameter Fuel Consumption Rate at Idling for vehicle category *i* (FCR_i) (paragraph 14 of the methodology), "Option (1): Measurement of all project vehicles" is selected.

Option (1): Measurement of all project vehicles. Measure the actual fuel consumption rate of all vehicles in which the project devices are installed.

In the determination of the parameter "Baseline Idling Factor in Year 1 (BIF_1)" (paragraph 18 of the methodology), the default value 0.95 is chosen.

E.6.2. Equations, including fixed parametric values, to be used for calculation of emission reductions of a SSC-CPA:

(I) Baseline emissions

Annual baseline emissions are the summation of the annual cumulative Idling Stop period times the baseline emission factor for each vehicle, multiplied by a Baseline Idling Stop default Factor or *BIF* (i.e. the estimated percentage of vehicles that in the baseline would manually turn off their engines.) The *BIF* is revised annually using an Annual Escalation Factor (AEF) that reflects the estimated annual increase in the number of baseline vehicles that manually turn off their engines.

$$BE_y = \sum_i \left(BEF_i \times CIP_{i,y} \times 10^{-6} \right) \times BIF \qquad (1)$$

Where:

BE_y Total baseline emissions in the year *y* (tCO_2/year)

$CIP_{i,y}$ Cumulative Idling Stop period for all vehicles of type *i* in the year *y* (seconds/year)

BIF Baseline Idling Stop Factor (The default value of 0.95)

BEF_i Baseline Emission Factor when Idling for vehicle type *i* (gCO_2/second)

The Baseline Emission Factor when Idling (BEF_i) for each type of project vehicle *i* is determined as:

$$BEF_i = FCR_i \times D_j \times NCV_j \times EF_{CO2\,j} \times 10^3 \quad (2)$$

Where:

j Fuel type for vehicle type i, determined from engine specifications

FCR_i Fuel Consumption Rate at Idling condition of baseline vehicle *i* (litres/second) ("Option (1): Measurement of all project vehicles" will be chosen. 0.000556 (2 litters per hour) is used for ex-ante calculations of this version of PoA-DD.)

D_j Density of fuel *j* (kg/litre), determined from national or international values (Density of diesel: 0.8397 kg/l)

NCV_j Net Calorific Value of fuel *j* (MJ/t), determined from reliable local or national data shall be used. IPCC default values (lower value of 95% CI) shall be used only when country or project specific data are not available or demonstrably difficult to obtain. Values shall be updated if national values or IPCC values change (Net calorific value of diesel: 42,652 kJ/kg (42,652 MJ/t))

$EF_{CO2\,j}$ CO_2 emission factor of fuel *j* (tCO_2/MJ), determined from reliable local or national data shall be used. IPCC default values (lower value of 95% CI) shall be used only when country or project specific data are not available or demonstrably difficult to obtain. Values shall be updated if national values or IPCC values change (CO_2 emission factor of diesel: 72,600 $kgCO_2$/TJ ($72.6*10^{-6}$ tCO_2/MJ))

(II) Project emissions

Project emissions are the emissions from fuel consumed in restarting the engine immediately after each Idling Stop.

$$PE_y = \sum_i \left(NT_{i,y} \times PEF_i \times 10^{-6} \right) \quad (3)$$

Where:

PE_y Total project emissions in the year *y* (tCO_2/year)

$NT_{i,y}$ Total number of Idling Stops of all vehicles of type *i* in the year *y* (times/year)

PEF_i Project Emission Factor per Idling Stop for vehicle type *i* (gCO_2/time)

Project Emission Factor per Idling Stop (PEF_i) is calculated according to the equation below:

$$PEF_i = BEF_i \times ST_i \quad (4)$$

Where:

ST_i Start-up compensation time. Idling Stop period in seconds to compensate for fuel consumed in restarting the engine after each Idling Stop (seconds/Idling Stop) (The default value of 10 seconds)

(III) Leakages

As per the methodology AMS.III.AP./Ver.1, no leakage calculation is required.

(IV) Emission reductions

The amount of emission reductions ER_y in year y is given by

$$ER_y = BE_y - PE_y \quad (5)$$

Where:

ER_y Emission reductions in year *y* (tCO_2e)

E.6.3. Data and parameters that are to be reported in CDM-SSC-CPA-DD form:

Data / Parameter:	BIF
Data unit:	-
Description:	Baseline Idling Stop Factor
Source of data used:	The methodology
Value applied:	0.95
Justification of the choice of data or description of measurement methods and procedures actually applied :	The default value provided in the methodology is chosen for SSC-CPAs.
Any comment:	-

Data / Parameter:	FCR_i
Data unit:	litres/second
Description:	Fuel Consumption Rate at Idling condition of baseline vehicle *i*
Source of data used:	Measurements
Value applied:	Provided in each CPA-DD (0.000556 (2 litters per hour) is used for ex-ante calculations of this version of PoA-DD. The figure is based on the direct measurements of sample buses)
Justification of the choice of data or description of measurement methods and procedures actually applied :	Provided in each CPA-DD
Any comment:	-

Data / Parameter:	D_j
Data unit:	kg/liter
Description:	Density of fuel j
Source of data used:	The Energy Statistics Working Group Meeting report of International Energy Agency
Value applied:	0.8397 for diesel oil
Justification of the choice of data or description of measurement methods and procedures actually applied :	International value prepared by International Energy Agency. http://www.iea.org/Textbase/work/2004/eswg/22_Oil%20Densities.pdf.
Any comment:	-

Data / Parameter:	NCV_j
Data unit:	MJ/t
Description:	Net calorific value of fuel j
Source of data used:	China Energy Statistical Yearbook 2007
Value applied:	42,652 MJ/t for diesel oil
Justification of the choice of data or description of measurement methods and procedures actually applied :	National official value. 42,652 kJ/kg for diesel oil.
Any comment:	-

Data / Parameter:	$EF_{CO2,j}$
Data unit:	tCO_2/MJ
Description:	CO_2 emission factor of fuel j
Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2: Energy, Chapter 1: Introduction, Table 1.4
Value applied:	$72.6*10^{-6}$ for diesel oil
Justification of the choice of data or description of measurement methods and procedures actually applied :	IPCC default value (lower value of 95% CI). 72,600 $kgCO_2/TJ$ for diesel oil.
Any comment:	-

Data / Parameter:	ST_i
Data unit:	seconds/Idling Stop
Description:	Start-up compensation time
Source of data used:	The methodology
Value applied:	10
Justification of the choice of data or	The default value provided in the methodology.

description of measurement methods and procedures actually applied :	
Any comment:	-

E.7. Application of the monitoring methodology and description of the monitoring plan:

E.7.1. Data and parameters to be monitored by each SSC-CPA:

Data / Parameter:	$CIP_{i,y}$
Data unit:	seconds/year
Description:	Cumulative Idling Period of all vehicles of type *i* in year *y*
Source of data to be used:	Electronically recorded to the idling stop device, ECO STARTER
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Provided in each CPA-DD
Description of measurement methods and procedures to be applied:	Signals of vehicle speed and engine on/off will be electronically collected by the post-fit type idling stop device (ECO STARTER), and each idling stop time will be calculated automatically. Data will be collected monthly and the cumulative idling period is calculated by summing up each idling stop time in a year. Only vehicle stoppages up to a maximum of 3 minutes qualify under this definition and longer duration stoppages (e.g. at the depot, or fueling stops) are excluded.
QA/QC procedures to be applied:	Data will be collected using a software every month and will be stored for crediting period and an additional 2 years.
Any comment:	-

Data / Parameter:	$NT_{i,y}$
Data unit:	times/year
Description:	Total number of times of Idling Stop of vehicle *i* in the year *y*
Source of data to be used:	Electronically recorded to the idling stop device, ECO STARTER
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Provided in each CPA-DD
Description of measurement methods and procedures to be applied:	Signals of vehicle speed and engine on/off will be electronically collected by the post-fit type idling stop device (ECO STARTER), and number of idling stop will be counted automatically. Data will be collected monthly and total number of times of Idling Stop is calculated by summing up monthly data.
QA/QC procedures to be applied:	Data will be collected using reliable software every month and will be stored for crediting period and an additional 2 years.

Any comment:	Annually

Data / Parameter:	Information regarding the project vehicles installing the Idling Stop devices, i.e. fuel types, vehicle types, engine displacements, engine model year, with or without air conditioner
Data unit:	-
Description:	-
Source of data to be used:	Bus ledger of Jinan Public Transport Group Company (JPTGC)
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Necessary information shall be collected and aggregated in a database.
QA/QC procedures to be applied:	-
Any comment:	Annually monitored.

E.7.2. Description of the monitoring plan for a SSC-CPA:

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E.8 Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)

In the PoA, monitoring will be done for each CPA. The monitoring plan is provided as follows.

1) The role of the CPA implementers

The following table shows the role of the CPA implementers.

Table 3 The role of the CPA implementers

	The CPA implementers
Monitoring management	- Implement and manage monitoring of CPAs
Data collection and reporting	- Implement data collection of the CPA - Prepare daily and monthly report - Check data quality and collection procedures regularly
Data storage and management	- Collect memory cards. - Implement data management of CPA. - Store and maintain records.
Quality assurance	- Undertake regular maintenance of the devices - Receive necessary training for operation of the system and quality assurance of monitoring data

2) Monitored data

The data that shall be monitored by each CPA are described in section E.7.1.

3) The outline of the monitoring by each CPA

The followings are outline of monitoring plan based on the methodology applied. The monitoring structure for the project activity is shown below.

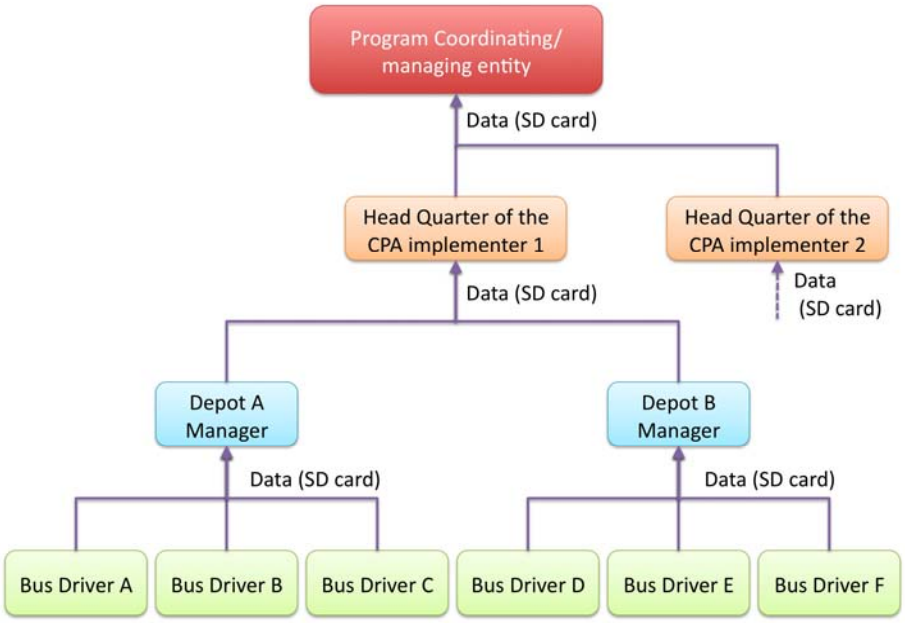

Figure 6 The monitoring structure of the CPA

The data of each monitoring parameter is recorded to the SD card to be installed to the idling-stop device. The following items will be recorded.
i) Elapsed time in second from ignition key “On”.
ii) Driving status: 1;Engine On 2;Velocity non-Zero 3;Velocity Zero 4;Engine Off
iii) Total number of starting starter motor.

The bus driver will collect the SD card and pass it to the depot manager. The head quarter of the CPA implementer will collect these SD card (or copied data) from each depot manager. The head quarter will send these collected data to the program coordinating/managing entity. These data collection will be done monthly. The head quarter of the CPA implementer will also copy, store and maintain theses data.

The Idling Stop devices installed in the vehicles shall be subjected to regular maintenance and calibration as per the manufacturer´s recommendation to ensure appropriate performance. After installing the Idling Stop devices, the devices should be subjected to an operational check, including a test drive, according to an appropriate check sheet to ensure proper operation. The driving data shall be recorded by a data logger and be protected such that it cannot be modified artificially. The logged data should be analyzed at least monthly to check for any irregular data by comparing it with previous data or data from other vehicles.

In order to ensure that the output values are reliable and not manipulated, the Idling Stop periods and Idling Stop frequencies recorded by the electronic devices shall be cross checked with another

measurement method, such as manual on-board measurement. This cross check should be done once a year for a sample of project vehicles.

E.8 Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)

>>

Date of completion of the application of the methodology: 17/2/2011

Dr. Taiko Kudo, Mr. Komei Yamaguchi
Japan Weather Association
E-mail: kudoh@jwa.or.jp, koumei@jwa.or.jp

Mr. Mitsuro Yajima, Mr. Isamu Koike
Almec Corporation
E-mail: yajima@almec.co.jp, koike@almec.co.jp

Dr. Yasuki Shirakawa
Climate Consulting, LLC.
E-mail: yasuki@climate-c.co.jp

Annex 1

CONTACT INFORMATION ON COORDINATING/MANAGING ENTITY and PARTICIPANTS IN THE PROGRAMME of ACTIVITIES

Organization:	GE Creation Technologies, Inc.
Street/P.O.Box:	
Building:	
City:	
State/Region:	
Postfix/ZIP:	
Country:	
Telephone:	
FAX:	
E-Mail:	
URL:	
Represented by:	
Title:	
Salutation:	
Last Name:	
Middle Name:	
First Name:	
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

The PoA does not utilize any public funding.

Annex 3

BASELINE INFORMATION

Annex 4

MONITORING INFORMATION

See A.4.4.2 and E.7.2 for details about monitoring plan.