CDM Feasibility Study 2011: Final Report

CDM PoA Feasibility Study for Fuel Efficiency Improvement through Introduction of Digital Tachograph to Cargo Trucks in Malaysia

by: Nippon Express Co., Ltd.

FS Partners	Nittsu Research Institute and Consulting, Inc.; Mitsubishi UFJ Morgan Stanley Securities Co., Ltd.; NITTSU TRANSPORT SERVICE SDN. BHD.; NIPPON EXPRESS SDN. BHD.
Location of Project Activity	Malaysia
Category of Project Activity	Transportation
Targeted GHG	Carbon Dioxide (CO2)
CDM/JI	CDM
Description of Project Activity	This project aims to improve fuel efficiency by training drivers for effective driving tips through continuous recording of vehicle speed, and functions such as voice alarm to unnecessary idling or sudden acceleration / break by introducing digital tachograph system. This project is implemented as project CDM (PoA). AMS-III.AT Version 01 approved by the board meeting of CDM held in April, 2011 will be applied to the PoA. The first CDM program activity (CPA) of the PoA is a project to install digital tachograph to 46 trucks owned by Nittsu Transport Service SDN. BHD. (hereinafter “NTS”) established in Selangor State, Malaysia. It aims to achieve 255t of CO2 emission reduction per year.
Methodology to be applied	AMS-III.AT Version 01
Baseline Scenario	Baseline scenario is a condition that digital tachograph and feedback system for inefficient driving (= fuel-inefficient) have not been installed in the vehicles yet. Current situation is under this condition.
Monitoring Plan	Monitoring plan is to collect data of transportation and fuel usage of each vehicle as same as the baseline. And CO2 emission is then calculated based on these data. Main monitoring items are as follows: ・ Freight transportation data (each vehicle): route, distance and weight. ・ Fuel usage (each vehicle): fuel type, refueling quantity and refueling date ・ Others: Construction condition of express ways, changes in biofuel blending ratio, etc.
Estimated GHG Emission Reductions	255tCO2/ yr
Duration of Project Activity/ Crediting Period	PoA period is up to 28 years from UN registration. The duration and crediting period of the first CPA is 10 years and the start of the project is expected to be in December, 2012. For inclusion of additional CPAs, currently, there are some problems for collecting baseline data. It is necessary to devote more time preparing those data.

Environmental Impact Analysis	This project will not likely to make any negative impact to the environment since it will not change transport condition, vehicles and fuel. Therefore, it will not bring any additional pollution emission and noise. Then, it is not necessary to cope. It has been confirmed with Malaysia Green Technology Corporation (Malaysia DNA) that the environmental impact assessment will not be required for this project.
Demonstration of Additionality	This project is a voluntary activity implemented by Nippon Express (Japan) as a part of their efforts on corporate social responsibility activity. The methodology applied to this project was developed by Nippon Express Group in collaboration with Mitsubishi UFJ Morgan Stanley Securities, and NTS is the target field of the attached PDD for application. This fact clearly demonstrates that Nittsu originally intended to develop the project on as CDM. Also, through the interviews with MGTC, Ministry of Transport and Fujitsu, a provider of digital tachograph system, it has been confirmed that there is no precedent in Malaysia to install digital tachograph, not only for freight transport, but also for the entire business sectors. The Additionality of this project had been demonstrated by "first of its kind" barrier, while a new guideline was recently approved. The project participants will continue to study the guideline to confirm application of “first of its kind” barrier to their project.
Project Feasibility	This project is expected to start in December, 2012. The validation of PoA-DD is expected to begin in the first half of 2012.
Propagation Scenario of Programmatic CDM	The candidate for additional CPAs is the project for the vehicles owned by Port Kelang branch of Nippon Express Malaysia. At first, the branch will prepare to build a management and operational scheme to enable the data collection and calculation of baseline emission.
“Co-benefits” effect (Improvement effect of Local Environment Problems)	An applicable criterion from “Co-Benefit Quantitative Estimation Manual” to this project is nitrogen oxide (NOx) reduction. From the past study conducted in Japan, a correlation is obtained as below. $y = 0.0057x - 0.0485$ x : CO2 emission (gCO_2), y : NOx emission (gNO_x) If emission reduction of 255tCO2/yr assumed in the 1st CPA is applied in the formula, expected NOx emission reduction is 1.45tNOx/yr.
Contribution to Sustainable Development in Host Country	Referring to the past study conducted in Japan, considerable reduction of traffic accidents is expected by introduction of digital tachograph and eco-driving. If digital tachograph is promoted in Malaysia widely, it is estimated that number of traffic accidents will reduce by 22,649, the number of wounded by 1,406, and the number of deaths by 384.

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Organization name: Nippon Express Co., Ltd

1. Implementation system of the project

- Nittsu Research Institute and Consulting, Inc.
  Basing on CDM methodology - AMS-III.AT, they made discussion on the policy for collecting the baseline data and setting traceable route specified by the methodology based on the data management condition of the project target, and calculated baseline emission.
- Mitsubishi UFJ Morgan Stanley Securities Co., Ltd.
  They made consultation with Nippon Express on the formulation of PDD based on the methodology, and prepared PoA-DD and CPA-DD.
- NITTSU TRANSPORT SERVICE SDN. BHD.
  They made a database of transportation data needed for baseline and monitoring, provided the dataset to Nittsu Research Institute and Consulting, and selected the target vehicles for the project. They also made consultation on setting traceable route for the preparation of CPA-DD.

2. Description of the project

(1) Project outline

This project is implemented as project CDM (PoA), aiming to improve fuel efficiency by training drivers for effective driving tips through continuous recording of vehicle speed, and functions such as voice alarm to unnecessary idling or sudden acceleration / break by introducing digital tachograph system. AMS-III.AT approved by the meeting of CDM executive board held in April, 2011 will be applied to the PoA.

The first CDM program activity (CPA) of the PoA is a project to install digital tachograph to 46 trucks, of which baseline monitoring data applicable to the CDM methodology (AMS-III.AT) can be collected. These trucks are owned by Nittsu Transport Service SDN. BHD. (hereinafter “NTS”) established in Selangor State, Malaysia. The project aims to achieve about 255t of CO2 emission reduction per year.

The first CPA project is expected to start in the first half of 2012. Validation is assumed to be undertaken in accordance with this timing.

The management of PoA in Malaysia is to be conducted mainly by Nippon Express Malaysia, the parent company of NTS, and supported by Nippon Express Japan. Nippon Express will prepare for the possibility of international expansion.

(2) Methodology

AMS-III.AT: “Transportation energy efficiency activities installing digital tachograph systems to commercial freight transport fleets” Version 01

3. Contents of the study

(1) Problems in the study

① Although the description items for setting traceable route provided by the methodology are specified, no detailed description level (e.g. terrain, traffic density, etc.) has been specified. The methodology to be applied is a new one, and there is no precedent for the base methodology (AMS-III.S Introduction of low-emission vehicles/technologies to commercial vehicle fleets), as there is no approved project for the methodology.

② It has been found out that it was difficult to capture the freight data (weight, transport route, etc.) based on the methodology because the project target (NTS) conducted a consolidated transport of urban delivery and multi consignors.

③ Regarding the long-distance transportation other than ①, our initial understanding was that it consisted of 5 routes. However, it was revealed that there had been about 20 constant transport routes after we conducted a detailed hearing on site.

④ According to the methodology, the project vehicles shall be divided into different classes (specified as “class k”, and the dividing method is not clarified), which is specified as “Service Level”. However, only 40ft container is used for long distance transportation in NTS. Therefore the vehicle shape is very similar and there is no different class. Thus, it is not necessary to classify the vehicles in NTS.

⑤ It is difficult to prepare CPA-DD for the 2nd CPA expected target, Port Kelang branch of Nippon Express Malaysia, because they still do not have all the data of the freight weight.

⑥ Since we found that some major transport routes arrive and depart at Singapore after checking NTS’s data, it is necessary to exclude the emission in Singaporean territory from the baseline project emission.

⑦ Other than ⑥, we also found that some project vehicles may run routes other than the traceable route. Therefore, we have to exclude the distance and fuel usage caused by the outside-traceable route.

⑧ We had been discussing to demonstrate the additionality of this project by "first of its kind" barrier, while a new guideline was recently approved while this study period. Basically, we will continue to demonstrate the Additionality by the “first of its kind” barrier. However, because this new guideline has not been adopted by any project before, the interpretation is expected to be a large point of contention in the validation. It is necessary for us to study the guideline and carefully prepare ourselves for the validation.

(2) Study Contents

● 1st on-site study (Aug. 8 to 9, 2011)

○ Details of the study

・ Visit to Port Kelang branch of Nippon Express Malaysia
Study of import and export shipping freight; consultation on data collection

・ Visit to Bukit Jeluton warehouse of Nippon Express Malaysia
Study of incoming and outgoing freight of the warehouse; consultation on data collection

・ Visit to the head office of Nippon Express Malaysia
Overview explanation of the project

・ Visit to NTS
Study of truck transportation in Malaysia and import and export freight of Thailand and Singapore; consultation on data collection

○ Summary of study results

・ Port Kelang branch of Nippon Express Malaysia
Basically, the freight weight data of imported containers can be collected from the paper data received from shipping companies. However, the freight is sent to their destinations from the branch after devanning, and the weight of those delivered freight is not systematically understood. Therefore, it is difficult to obtain the ton-kilometer data.

・ Bukit Jeluton warehouse of Nippon Express Malaysia
Since this is only a warehouse, not involved in transportation, only the freight weight data of the over land transport handled by Nittsu Transport Service may be obtained.

・ NTS
At this point, it seems realistic to include the long-haul transport as the CDM target

because container weight data of these long-hauls can be obtained. This CDM target group is not very small because the long-haul transport accounts 80% of all freight handled by NTS.

● Consultation on PDD preparation based on the 1st on-site study

○ Study contents

・ Participant: Nippon Express, Nittsu Research Institute and Consulting, Mitsubishi UFJ Morgan Stanley Securities

・ Regarding how to extract only the fuel consumption data of NTS long-haul transport (CDM project target)

・ Regarding how to set the traceable route

・ Checking other information necessary for PDD preparation

○ Summary of study results

・ According to the methodology, the baseline emission factor shall be per transport ton-kilometer. However, trucks may run with no freight (with freight being zero ton, no matter how many kilometers the truck runs, the ton-kilometer factor is still zero). Therefore, we will extract the fuel consumption basing on the travel distance, and maintain a conservative calculation.

・ Since the required listing items for traceable route are specified as differences of terrain, traffic density, etc., the setting for traceable route can be interpreted as between areas (cities), rather than the delivery sites.

● 2nd on-site study

○ Study contents

・ Visit to the head office of Nippon Express Malaysia
Explaining the progress of the project

・ Visit to NTS
Consultation focusing on how to set the traceable route for the long-haul transport as CDM project target

○ Summary of study results

・ NTS
Most of the master data relating to the arrival and departure points are prepared. Once the locations for each transport trip are entered, it will link to the freight weight in trip data, and transport ton-kilometer calculation can be done. NTS will handle it in near future.
After receiving the data, the traceable route setting plan will be discussed and prepared by Japan side.

● 3rd on-site study

○ Study contents

・ Visit to the head office of Nippon Express Malaysia
Explaining the progress of the project

・ Visit to NTS
We undertook consultation on the traceable route setting plan, and also discussed how to handle the case when project vehicles run routes outside the traceable route.

○ Summary of study results

・ We divided the loading and unloading locations in the transport data used for baseline into 12 areas, including Thailand (transshipment at the border) and Singapore (direct transport),

and set traceable routes between these areas.

- We decided that during the baseline data acquisition period, all transport shall be included in the traceable route. During the project period, outside-traceable route running is expected to be less. Even if it does happen, the running distance can be obtained from the GPS log. And because fuel is always refilled in each trip (round trip between NTS and delivery site), even it is a small amount, it is easy to exclude the extra running distance for outside-traceable route and the fuel consumption thereof.

● Measures for the problems in the study (numbers correspond to those in (1) respectively)

① The traceable route will be set between areas (cities), based on the location data in NTS transport data.

② We will exclude the short-distance and consolidated transport based on the travel distance in order to extract the fuel consumption of long-haul transport as the project target, and maintain a conservative calculation.

③ Same as ①.

④ It seems there is no need to classify the vehicles. But we received advice from NTS that we can classify vehicles by the gas emission regulations.

⑤ We will continue to discuss how to obtain the baseline data for the project implementation over next year.

⑥ In order to maintain a conservative calculation, we will exclude the distance between the border of Malaysia and Singapore and the farthest loading and unloading locations in Singapore, as well as the fuel consumption proportional to such distance from the calculation.

⑦ It is possible to exclude the fuel consumption and travel distance of outside-traceable route, based on the current refueling condition of NTS and in combination with using GPS log.

4. Study results for the implementation of CDM project

（1） Methodology of baseline monitoring

The following is the summary of the applicable conditions described in the methodology, AMS-III.AT Version 01, and the responding status of NTS. (Excluding the technical requirements for digital tachograph)

Paragraph	Applicable conditions in methodology	Measuring Status of NTS
3	・ Trucks must be centrally controlled and managed by a single entity. ・ Driver of the truck must be hired by the entity or a contractor. ・ Fuel expenses must be paid by the central business.	・ All project vehicles match the conditions. ・ Un-matched vehicles (transport entrusted to other companies = fuel expenses are paid by other companies) will be excluded from the project.
4	・ The project activity is unlikely to change the level of service provided before the project activity.	・ Stable business from major clients (consignor) and no significant change expected in assignment of vehicles
	・ The project activity does not include measures to bring about a modal shift (e.g. a shift from truck to rail) in transport	・ No expected modal shift

	・ The project activity does not involve a fuel switch in existing vehicles, except for an optional switch to biofuel blends where the blending ratio is not greater than 20% by volume.	・ There will not be fuel conversion. ・ It is unlikely that bio diesel with blending ratio over 20% will be sold in Malaysia.
5	・ Not applicable to project activities in locations where the installation of digital tachograph systems is mandatory by law and the existing mandatory policy/regulation has a high level of enforcement.	・ It is not required to introduce the tachograph in Malaysia and there is few in the country.
6(d)	・ The vehicles that are in use on each traceable route should not be part of another CDM project activity.	・ No other similar CDM project is in progress.
7	・ The emission reduction must be less than 60,000tCO2e annually.	・ Currently, the emission reduction is expected to be 255tCO2 or less per year.
8	・ The project design document shall include documentation of procedures to eliminate any potential double counting of emission reductions from other CDM projects or Programmes of Activities.	・ Potential double counting is excluded because project vehicles are all owned, managed and operated by Nippon Express Group.

(2) Setting of baseline scenario and project boundary

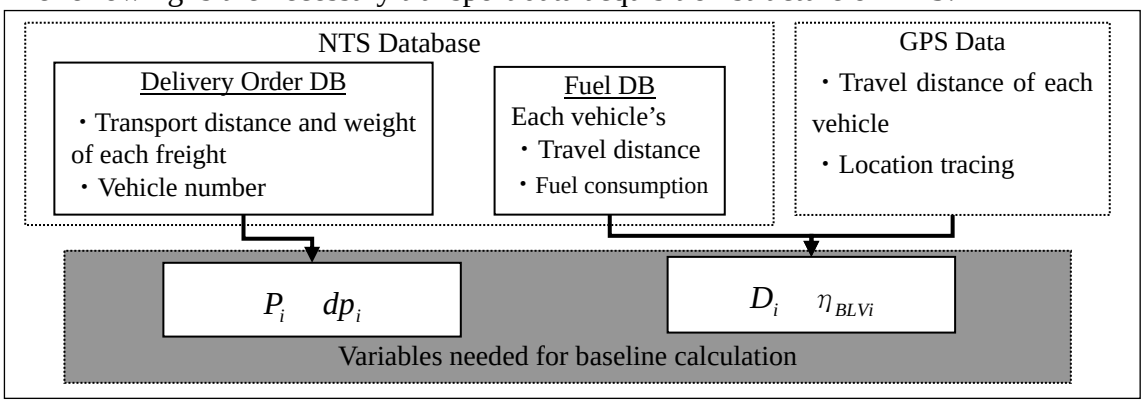
- The baseline scenario is a condition that digital tachograph and feedback system for inefficient driving (= fuel-inefficient) have not been installed in the vehicles yet. Current operating situation of the trucks is under this condition.
- As mentioned above, we have decided how to obtain baseline data and set the traceable routes, which are required by the methodology, AMS-III.AT, after undertaking consultation with the project target businesses.
- The target of the 1st CPA is the 46 trucks (tractors) used for long-haul transport of which data acquisition is possible to meet the requirement of the methodology.
- The boundary of PoA is the entire country of Malaysia, and vehicles owned by Nippon Express Group and travelling in the country. The study target vehicles are owned by NTS, and NTS is a company of Nippon Express Group. Therefore they are inside the boundary.
- It is specified the baseline emission shall be calculated by the following 2 equations.

$$BEF_i = \frac{\sum_j D_i * \eta_{BLVi} * NCV_j * EF_{CO2,j}}{P_i * dp_i} \qquad BE_y = \sum P_{i,y} \times BEF_i \times dp_{i,y}$$

BEF_i	Baseline emission factor per ton-kilometer of vehicle i under baseline conditions (tCO_2/ ton km)
P_i	Total annual transport weight of goods transported by vehicle i under baseline conditions (tonnes)
dp_i	The annual average distance of transportation per ton of freight by vehicle i under baseline conditions (km)

D_i	Total annual transport distance traveled by vehicle i under baseline conditions (km)
η_{BLVi}	Fuel efficiency of vehicle i under baseline conditions (qty of fuel/km; see paragraph 13 for fuel efficiency of new vehicles.)
NCV_j	Net calorific value of fuel j (MJ/ Unit qty of fuel)
$EF_{CO2,j}$	CO_2 emission factor of fuel j used by vehicle (tCO2/ energy content of fuel, country specific data or IPCC default value)
BE_y	Total baseline emission in year y (tCO_2/ yr)
$P_{i,y}$	The annual freight weight transported by each project vehicle in each traceable route in year y (ton)
BEF_i	Baseline emission factor per ton of goods per kilometer for vehicle i (tCO_2/ ton.km) under baseline conditions
$dp_{i,y}$	Annual average avarage distance of transportation per tonne of goods by project vehicle i in year y (km)

- The following is the necessary transport data acquisition structure of NTS.



- Since vehicles owned by Nippon Express Malaysia may be included as CPA target vehicle in future, we will prepare PoA-DD with the assumption of such case.

(3) Monitoring plan

- The methodology to be applied is AMS-III.AT "Transportation energy efficiency activities installing digital tachograph systems to commercial freight transport fleets".
- The Monitoring plan is to collect data of transportation and fuel usage of each vehicle in the current transport conditions, and CO2 emission is then calculated based on these data. However, the local project partner shall monitor and collect information regarding any significant change (e.g. construction of high ways, etc.) on the preset traceable routes.
- The emission calculation of the project is basically conducted by collecting the same data itema as those used in the baseline calculation. Therefore, the data collection is carried out daily and continuously. Basically, the emission reduction will be calculated based on these data according to the frequency of verification (expected to be one year at this point).
- Main monitoring items are as follows:
  - Freight transportation data (each vehicle): route, distance and weight
  - Fuel usage (each vehicle): fuel type, refueling quantity and refueling date
  - Others: Construction condition of express ways, changes in biofuel blending ratio
- The monitoring plan of CPA will be in accordance with the small scale methodology, III.AT, same as PoA. Every vehicle data included in CPA are to be collected separately.

Abbreviation	Item, Unit	Monitoring method / Item
$DT_{i,y}$	Total distance travelled by each vehicle *i* in year *y* (km/yr)	Driver logs and route maps, recorded by GPS tracking system
i	The trucks are identified based on the age, characteristics and load capacity and availability of historical data	The data are periodically checked on annual basis and recorded electronically
$dp_{i,y}$	Annual average distance of transportation per tonne of freight by each project vehicle *i*	Monitored through company records
$FC_{i,j,y}$	Consumption of fuel *j* by vehicle *i* in year *y* (quantity of fuel consumed)	Purchase or consumption records, whose higher value is taken to ensure conservativeness
NCV_j	Net calorific value of fuel *j* (energy content of fuel/quantity of fuel)	Country specific data or IPCC default value
$EF_{CO2,j}$	CO2 emission factor of fuel used by baseline vehicle (tCO2/energy content of fuel)	Country specific data or IPCC default value
$P_{i,y}$	Total annual goods transported by each project vehicle in year *y*	Monitored data during the project e.g. driver logs and route maps, plus sales receipts
$SL_{k,y}$	Service level in terms of volume of goods times the average distance of transportation per tonne of freight by truck class *k* in year *y*	Monitored for each truck class, from company/operators records, e.g. driver logs and route maps, plus sales receipts
	Annual monitoring to check if tachograph systems have become a mandatory practice, or that highlyenforced anti-idling policies or legislation have been put into place	To follow the status of government policy and regulations introduction.
	Monitoring to ensure that all tachograph and feedback systems are operating correctly and have not been disabled	If any tachograph system installed in a project vehicle is not operating correctly, no emissions reductions can be attributed to that vehicle for the period that the system has not been operating correctly

(4) Emission reduction amount of greenhouse effect gas

● Baseline emission amount

・ For calculation method, refer to (2) (p.5).

・ 3,636tCO2/yr

● Project emission amount

・ It is specified that the project emission amount shall be calculated by the following equation:

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

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)
$EF_{CO2,j}$	CO_2 emission factor of fuel j used by vehicle i under baseline conditions (tCO2/energy content of fuel, country specific data or IPCC default value)

・ 3,381 tCO2/yr。

● Reduction amount of greenhouse effect gas

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Eco-driving due to introduction of digital tachograph (NTS)	179t CO2	204t CO2	230t CO2	255t CO2	255t CO2	255t CO2	255t CO2	255t CO2	255t CO2	255t CO2
Total	179t CO2	204t CO2	230t CO2	255t CO2	255t CO2	255t CO2	255t CO2	255t CO2	255t CO2	255t CO2

※ Amount may reduce 10% to 20% due to outside-traceable route travelling and fuel consumption.

※ Introduction effect from 2012 to 2014 has been calculated by multiplying a ratio of 70% to 90% .

● Total reduction amount of greenhouse effect gas of the entire PoA

- Port Kelang branch of Nippon Express Malaysia is expected to be the candidate for the second CPA. Since this branch owns about 40 vehicles, the annual reduction amount will be 255tCO2, which is calculated based on the above GHG reduction amount of 46 vehicles. Therefore, the total annual reduction amount of the entire PoA is 477tCO2.
- However, the amount needs to be re-calculated when preparing PDD, because the above amount is not calculated based on the detailed transport data and fuel consumption data of Port Kelang branch.

(5) Duration of Project Activity/ Crediting Period

- The period of this program (PoA) is up to 28 years from the date PoA is registered at UN.
- The CPA implementation duration of NTS project and crediting period is10 years and it is still under consultation with the local business.
- The start of the project is expected to be in December, 2012. As described above, the target vehicles of this project are those used for long-haul transport in NTS. Based on our local on-site studies, it is estimated that baseline data of these vehicles can be collected by then. Therefore, start timing being Dec. 2012 is considered reasonable.
- As for additional CPAs, there are some problems for collecting baseline data, basing on our on-site studies. It is necessary to devote more time preparing those data.
- The validation of PoA is scheduled to start in the second half of 2012, which is earlier than the start of the first CPA project mentioned above. Therefore, there is no problem with the current start timing of CPA project. In addition, Nippon Express, the main participant of this project, has made application and obtained approval of the methodology necessary for the implementation of CDM. This can be evidence document demonstrating that the project has been originally developed as CDM. Furthermore, the development of the methodology was selected for FS study of NEDO in 2009, which may be used as an important evidence document.

(6) Environment impact / other indirect impact

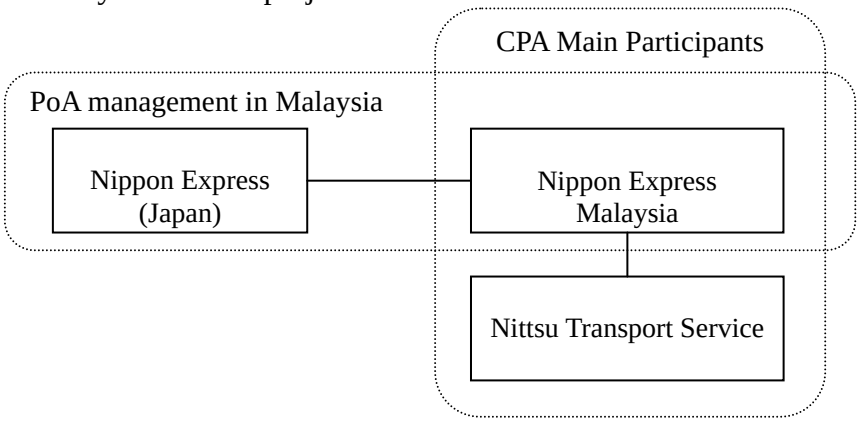
- This project will not likely to make any negative impact to the environment that need to be dealt with, since it will not change transport condition, vehicles, and fuel. Therefore, it will not bring in any additional pollutant emission and noise.
- It was confirmed with Malaysia Green Technology Corporation (MGTC: CDM energy secretariat) that the environmental impact assessment would not be required for this project.
- Eventually, it is necessary to be mentioned in the description of Malaysia criteria in PDD.

(7) Comments from stakeholders

- Comments from manager of truck drivers
  - Basically, the drivers won't like it. However, if it is introduced as the company's system, they will try to understand little by little, and eventually comply with it.
  - It may catch the enthusiasm of some drivers by the fact that it is environmentally friendly, reduces traffic accidents, and improve the social status.
  - As a manager, I think it is very helpful to use graphs to train drivers how to drive properly. It will be useful for the training of drivers and the project is welcome.
- Comments from the Ministry of Transport
  - MOT has much interest in this project. We hope it will be brought into shape. Should you have any inquiry in the future, please feel free to contact us.
  - Measures for preventing public bus accidents have become an important issue for the public administration. If the digital tachograph is effective for safe driving, we'd like to spread the system widely in the country. We would appreciate your sharing information with us in the future.
- We asked advice from SIRIM QAS, the DOE that can carry out validation of transportation industry in Malaysia, about who should be involved in the stakeholder meeting. They suggested drivers, relevant ministries, industrial organizations, and NGO. They also suggested the specific candidate institutions except for the industrial organizations.

(8) Implementation system of the project:

● Implementation system of the project



- Nippon Express Malaysia is a subsidiary of Nippon Express and NTS is a subsidiary of Nippon Express Malaysia. They are working closely as Nippon Express Group companies, with recent achievement of "SS7000", a project relating land transport in East Asia.
- The CPA project aims to reduce CO2 emission by eco-driving through the introduction of digital tachograph to vehicles owned by NTS. Therefore, NTS and its parent company, Nippon Express Malaysia are the main participants of this project.
- PoA management in Malaysia is mainly conducted by Nippon Express Malaysia, and supported by Nippon Express (Japan). Nippon Express will prepare for the possibility of international expansion in the future.

(9) Financial planning

We are conducting study on the business conditions of the operators, but we have been focusing on the baseline data acquisition, traceable route selecting for long-haul transport only. Thus, at this point, the analysis of the following items is conducted based on the long-haul transport only.

Prerequisites			In: Ringgit		
Initial investment			Management cost (Annual)		
Amount of initial investment (46 vehicles)	Depreciable	309,925	Depreciation	(average)	47,493
	Expense	6,600	Software maintenance		16,500
			Communications		5,465
			Labor fee addition	(Incentive average)	39,478
sub total		316,525	Sub total		108,935

Fuel consumption improvement, etc.

Effect		Other Prerequisite		
Fuel consumption improvement	-7.0%	Fuel	Currently 1.8 ringgit / L	
CO2 reduction (annual)	255t	* expected to rise 3% per year		
		Corporation tax		26.0%
		Indirect tax		10.0%
		Depreciation (hardware)	Initial year	20.0%
			2nd year and after	14.0%
			Remains	Nil
		Depreciation (software)	Initial year	20.0%
			2nd year and after	40.0%
			Remains	Nil

Since they decided to purchase the server used for operating software of the tachograph system by themselves, the purchasing fee and cost for purchasing the right to use the software are the additional expenses from the initial estimation.

Fundraising will be conducted internally as planned; no negotiation with external institution is undertaken.

(10) Economic analysis

As described above, we are conducting study on the business conditions of the operators, but we have been focusing on the baseline data acquisition, traceable route selecting for long-haul transport only. Thus, at this point, this analysis is conducted based on the long-haul transport only. The analysis summary is as follow:

Profitability analysis In: Ringgit

		IRR calculation (10 years)			Payback period
		Initial investment	Accumulated income	IRR	
Without credit	Income-based	316,525	617,914	12.48%	7th year
	CF based	316,525	684,885	27.33%	4th year
With credit	Income-based	316,525	660,113	13.42%	7th year
	CF based	316,525	716,112	28.33%	4th year

- The effect of fuel consumption improvement is set to be a reduction of 7% based on the results of previous studies.
- In theory, the nominal price of credit shall be calculated based on the prices in the previous years. However, we decided that it should be more appropriate to use the trading price after the Seventeenth Session of the Conference of Parties to the United Nations Framework Convention on Climate Change, in which framework and directions for next term had been indicated. Thus, we used the average price of carbon credit quotation by Nikkei and JBIC after December 2012, which is 455.4 yen.
- The investment return and IRR calculations are conducted separately for income statement (income-based), investment payback year, and cash flow based.
- In the calculations, because it may take some time to introduce the system and for the drivers to start eco-driving, the estimated effect in the first 3 years has been multiplied by a certain ratio respectively. For the 4th year and after, the estimated effect is 7%. However, as described in the methodology, the project will show its effect only if the driving method of the drivers has been improved. But we cannot guarantee a certain level of improvement will be maintained. It is the biggest factor to make it harder to judge if the project is effective or not. In addition, there is no precedent of continuous measurement for the effect of the system and eco-driving in Malaysia. We have to say that it is difficult to decide if a stable performance can be maintained during the project period and to quantify the effect.
- According to the Finance Ministry ordinance (Ministerial Ordinance concerning Durability of Depreciable Assets) of Japan, life-span of vehicles with a total emission of 3L or more used for transportation industry in Japan is 5 years. This means that 5 years is an important benchmark for a business to recoup the purchasing investment of the vehicles as depreciation occurs for only 5 years. Based on this reason, any investment to ancillary equipment with a payback period of more than 5 years is normally considered unprofitable. This idea regarding the relation between the investment of transportation business and its payback period is believed to be very reasonable. On the other hand, in Malaysia, depreciation for accounting is left to the judgment of each business but the limit on deductible expenses for each year is prescribed by the depreciation system (capital allowance) for tax purpose. According to the depreciation system for tax purpose, two kinds of depreciation can be deducted: depreciation on acquisition (initial allowance) and annual depreciation (annual allowance). For heavy machineries and vehicles, the initial allowance is 20% and annual allowance is 20% for 4 years. This means, in Malaysia, depreciation period of vehicles is 5 years from the acquisition year, and it is appropriate to determine the actual profitability of an investment by 5 years.
- Therefore, based on the profitability calculation by quantitative analysis, the payback period of the investment is too long. In addition, this project is the first of its kind in Malaysia, and it has high uncertainty of effect continuity and stability. The conclusion is that this project is not an investment a private sector can carry out alone.
- For more information, please refer to the attached document.

(11) Demonstration of Additionality

- This project is a voluntary activity implemented by Nippon Express (Japan) as a part of their efforts on corporate social responsibility activity, aiming to contribute to energy conservation in transportation industry. From the beginning, we expected to obtain the results of this project only in the form of credit (CER), and if it had not been CDM, we would not have started the project.
- The methodology applied to this project was developed by Nippon Express Group in

collaboration with Mitsubishi UFJ Morgan Stanley Securities, since there was no applicable methodology for the project. NTS has been set as the target field in the PDD attached to the application of the project. This fact clearly demonstrates that we originally intended to develop this project only as CDM. This also demonstrates that Nippon Express wouldn't have promoted this project as a normal project (without CDM). Development of methodology was necessary to move forward with CDM procedure.

- In addition, it has been confirmed by the interview of MGTC at the end of last year that not only in the logistics industry of Malaysia, but in the whole country, digital tachograph has not been introduced.
- MGTC is an organization promoting environmental technologies in Malaysia, and they have sectors for transportation industry. The projects they are working include green car (hybrid, electric vehicle, ethanol vehicle, hydrogen vehicle, and fuel cell vehicle), biofuel, and public transportation. Digital tachograph has not been mentioned in none of these projects.
- We also had comment in the meeting with the Ministry of Transportation that there is no precedent of digital tachograph in Malaysia. In addition, we had comments from Fujitsu and Transtron- manufactures of digital tachograph- that they had not sold any digital tachograph in Malaysia. And so far, we don't have any information that any manufacturer has ever sold a tachograph in Malaysia.
- The Additionality of this project had been demonstrated by "First of its kind" barrier. However, "Guidelines on Additionality of First-of-its-kind project activities" was approved on the 63rd CDM boarding meeting, and under these guidelines, requirements for the demonstration of Additionality by "First of its kind" barrier became more stringent. As a result, we will continue to work on it and reflect the results to PDD submitted for validation.

(12) Prospects of the project

- The project is expected to start in December of 2012. We are having consultation with the local operators and at this point, the starting schedule remains unchanged.
- The validation of PoA-DD is expected to start in the first half of 2012.
- We have contacted the local operators about the necessary tasks for promoting the project, which include contacting Malaysia Green Technology Corporation and Ministry of Transportation, holding stakeholder meeting, making inquiry to DOE, etc. Nippon Express and other partners have agreed to carry out these tasks collectively.
- We will begin working on these tasks when we have a clear prospect about the baseline data acquisition.

(13) Study on propagation scenario of programmatic CDM

- The candidate for additional CPAs is the project for the vehicles owned by Port Kelang branch of Nippon Express Malaysia. However, as mentioned above, there are some problems on the baseline data acquisition.
- At first, the branch shall improve their operational management to start collecting data on daily basis. They shall also build a management and operational scheme to accumulate those data and calculate the baseline emission.
- On the other hand, vehicles in NTS and Port Kelang branch have been increased to meet the growing demand for transportation in Malaysia. There is a big possibility that additional CPA targeted these increased vehicles will be established. Therefore, we will continue to consult with the local operators in the future.
- The first PoA implementation in Malaysia is expected to bring some spread effects to

conduct the same project in other branches of Nippon Express. And it is expected to bring the spread effects not only to the operators in Nippon Express Group, but also to other logistics businesses and the entire sector in the future.

5. Study results on Co-benefit

- An applicable criterion from "Co-Benefit Quantitative Estimation Manual" to this project is nitrogen oxide (NOx) from mobile source, and we conducted a quantitative assessment study on it.
- According to the existing studies conducted inside Japan, the actual measurements indicate correlation between CO2 and NOx emission amounts. The following equation has been obtained.

$y = 0.0057x - 0.0485$

x CO2 emission（gCO_2）、 y NOx emission（gNO_x）

- According to this equation, NOx reduction amount is proportional to CO2 emission as well. By substituting 255tCO2/y, the CO2 emission reduction estimated in the 1st CPA, into the equation, we obtain 1.45tNOx/y as the NOx emission reduction.
- Regarding the NOx from vehicles, it is important to find the area with high NOx environmental concentration and reduce the NOx emission in the area to eventually reduce the environmental concentration. Therefore, establishing an assessment method considering regional factors is our future challenge.

6. Study results on Contribution to Sustainable Development

- According to the existing studies conducted inside Japan, a certain percentage reduction of traffic accident can be expected by the introduction of digital tachograph and eco-driving. The following is the results of a rough estimation of the effect.

	Item	Value	Remarks
(1)	Percentage of truck among vehicles	16.2%	
(2)	Accident prevention effect of introduction of digital-tachograph and eco-driving to trucks	35%	(set based on existing studies)
(3)	Accident reduction rate by digital tachograph and eco-driving (estimation)	5.7%	(1)×(2)
(4)	Traffic accident reduction effect in Malaysia	Accident -22,649 Wounded -1,406 Death -384	Occurrence×(3)

- It involves a lot of factors to prevent traffic accident. For Japanese truck operators, it is believed that the establishment and operation of operational manager system can bring big effect.
- The Ministry of Transportation of Malaysia commented that if it can contribute to road safety, they would consider expanding the system to public buses.