

FY2014

Project to Support the Large-Scale Formation of JCM Programs
to Realize Low-Carbon Societies in Asia

Report on
JCM Feasibility Study of GHG Mitigation Project
Contributing to Low Carbon Historic City based on
City-to-City Cooperation between Vientiane and Kyoto

March 2015

Global Environment Centre Foundation

(GEC)

I . Summery

1. Project overview

1.1 Project objective

The project objective is to integrate JCM's low-carbon city formation and the maintenance of cultural and historical assets, and construct the operational and maintenance management systems needed for the integration by comprehensively providing Vientiane Capital with Kyoto City's ordinances and planning as well as the practical experiences and environmental technologies obtained through its development as a historical and eco city, in order to promote the overseas deployment as a model for the sustainable development of the numerous historical cities that exist in Asia through the League of Historical Cities, etc..

1.2 Project contents

The project contents are as follows.

- (1) Overall study plan
- (2) Construction of the operational and maintenance management systems aiming at the formation of the low-carbon historical city of Vientiane
 - (A) Create a draft for the Low Carbon Historical City Formation Implementation Plan
 - (B) Promote the inter-city partnership and public-private cooperation
 - a. Hold domestic task force meetings for the cooperation
 - b. Hold international committee meetings and promote human resource development for the partnership
 - c. Field studies
 - d. Domestic progress report meetings
- (3) Implementation of the feasibility study (FS) and the creation of JCM methodology and project design documents (PDD)
 - (A) "Promote electric car usage for taxis and official vehicles"
 - (B) "Generate and leverage biogas through the use of source-separated organic waste"
- (4) Presentations in the Ministry of the Environment (MOE)-specified meetings

The project process is as follows.



1.4 Project implementation system

The project implementation system is as follows.

(1) The low-carbon city promotion system implemented by Vientiane Capital, Kyoto City, and GEC

In Vientiane Capital, a department specialized in the implementation of global warming measures has not been established, and the proposals concerning the need for such a department are continually being made through this project.

In Kyoto City, the Global Warming Management Office of the Environmental Policy Bureau has been set up as the department specialized in the implementation of studies, research, planning, and coordination on global warming measures as well as the promotion of global warming measures, and is responsible for the contacts and coordination, etc. within Kyoto City for the domestic task force.

The Global Environment Centre Foundation (GEC) works as the secretariat for the whole project, and is responsible for the coordination between the two cities as well as for the international committee meetings, etc. In addition, GEC is also responsible for the overall coordination, including the adjustment among the related institutions on the Japanese side such as Kyoto City, the cultivation of local needs, the progress management of the feasibility study, and the development assistance for the JCM methodology and PDD.

(2) The international committee for the partnership

The international committee is composed of Vientiane Capital, Kyoto City, the undertaker of the FS, academic experts, other experts, and the secretariat (GEC). By taking advantage of the formulation and implementation experience and knowledge as well as the knowledge of the private sector regarding the Kyoto City Global Warming Measures Plan of Kyoto City, studies aiming at the formation of a low-carbon historical city and the review for the JCM project feasibility study are currently in progress.

(3) The domestic task force meetings and domestic progress report meetings for the cooperation

The domestic task force meetings and the domestic progress report meetings were held in preparation for the international committee meetings. Studies aiming at the construction of a low-carbon society, information sharing with respect to the project feasibility study, and review of the study contents and results, etc. were carried out among Kyoto City, the undertaker of the FS, academic experts, other professionals, and the secretariat (GEC) to promote cooperation among the parties involved.

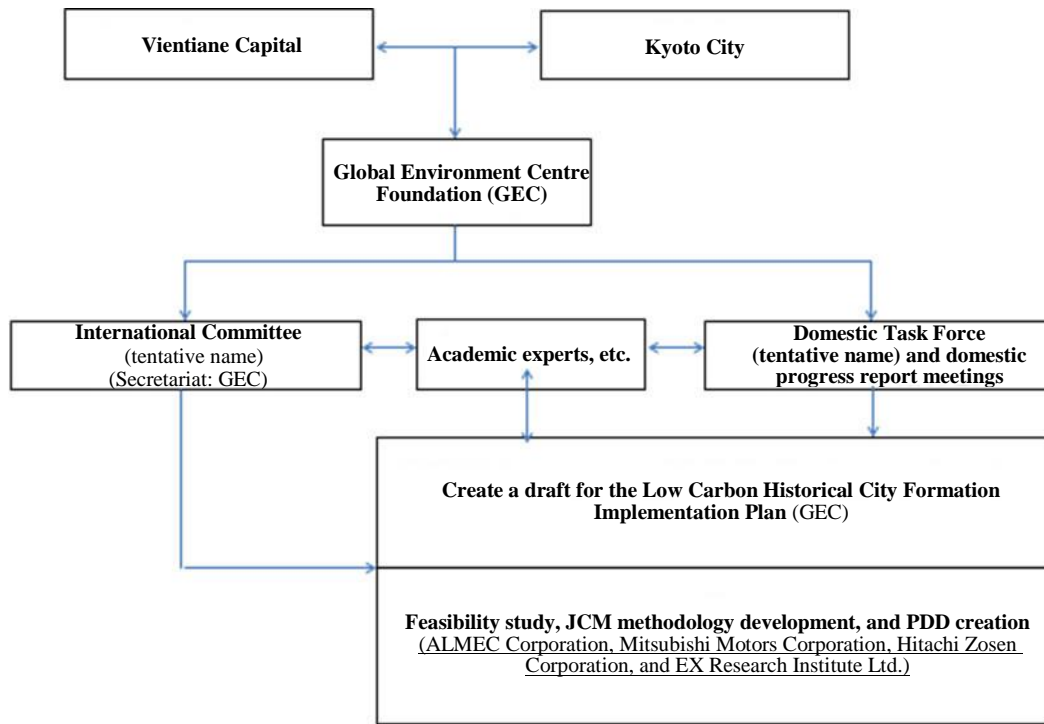


Figure Project implementation system

2. Overall study plan

With GEC at its center, the Study Implementation Plan regarding this project was established in consultation among Vientiane Capital, Kyoto City, the undertaker of the feasibility study, and the other parties involved. Prior to the establishment of the Study Implementation Plan, the domestic task force and international committee meetings (in this project, the "prior domestic meeting" is referred to as the "domestic task force" and the "local workshop" as the "international committee") were held for the refinement of the Study Implementation Plan and for the establishment of agreement among the parties involved.

2.1 Domestic task force

(1) The 1st domestic task force meeting

This meeting served as the opportunity to introduce to one another among the parties involved for the advancement of this fiscal year's project study as well as to conduct information sharing and carry out a discussion about the study overview and schedule of this fiscal year among the parties involved.

[Date and time] Monday, September 8, 2014, 13:30 to 16:00

[Venue] Teramachi Conference Room No. 1, Kyoto City Hall

[Attendees] Kyoto City, Mitsubishi Motors Corporation, ALMEC Corporation, Hitachi Zosen Corporation, EX Research Institute Ltd., and GEC

(2) The 2nd domestic task force meeting

Sharing of the latest local information among the parties involved toward the 1st international committee meeting, confirmation of the presentations at the international committee meeting, and final check on the local schedule were carried out.

[Date and time] Tuesday, October 21, 2014, 16:00 to 18:00

[Venue] Special Conference Room at the Global Environment Centre Foundation

[Attendees] Kyoto City, Mitsubishi Motors Corporation*, ALMEC Corporation*, Hitachi Zosen Corporation, and GEC

* Joined by video conferencing

(3) The 3rd domestic task force meeting

Sharing of the latest local information among the parties involved toward the 2nd international committee meeting, confirmation of the presentations at the international committee meeting, and final check on the local schedule were carried out.

[Date and time] Wednesday, January 28, 2015, 15:00 to 17:00

[Venue] Special Conference Room at the Global Environment Centre Foundation

[Attendees] Kyoto City, Mitsubishi Motors Corporation, ALMEC Corporation, Climate Consulting, LLC, Hitachi Zosen Corporation, and GEC

2.2 International workshop

(1) Preliminary study

A local trip was made during Sunday, October 5 and Thursday, October 9, 2014 for the purpose of final review and adjustment with the Vientiane-side officials for the 1st international workshop.

1. Meeting schedule

Date	Time	Venue	Contents	Local attendees
Mon, October 6	9:00-12:00	DONRE	JCM overview description Project overview description Discussion for the 1st international committee meeting	Approximately 20 members from DONRE, MPWT, VUDAA, DOFA, bus public corporation, etc.
	15:00-16:00	JETRO	JCM overview description Project overview description	Mr. Shibata, Regional Director Mr. Yamada, Technical expert
	17:00-19:00	Japanese Embassy	JCM overview description Project overview description Description of the Embassy Project (Public transport modernization plan)	[Embassy] Mr. Onishi, Councilor [JICA] Mr. Hirafuji and Mr. Mori
Tue, October 7	8:30-9:30	MONRE (DOPC)	JCM overview description Project overview description	Mr. Keobang, Manager
	10:00-12:00	Site visits	Industrial Park (VITA PARK) Development site in the wetlands by foreign capital	-
	16:00-17:00	MPWT	JCM overview description Project overview description (especially on the EV project)	Mr. Bounta, Manager Mr. Putthaxay
Wed, October 8	10:00-12:00	Site visits	Study on the development site conditions along the Mekong River by foreign capital	-

* DONRE: Department of Natural Resources and Environment
MPWT: Ministry of Public Works and Transport
VUDAA: Vientiane Urban Development Administration Authority
DOFA: Department of Foreign Affairs
MONRE: Ministry of Natural Resources and Environment
DOPC: Department of Pollution Control

(2) The first International workshop and field study

We visited the site from Sunday, October 26 to Saturday, November 1, 2014 to hold the first International Committee meeting (kick-off meeting) for the purpose of giving a brief explanation about this project to the Vientiane Capital side and consensus building concerning implementation policies and so on, individual hearing with relevant government agencies to understand the local needs, tour of relevant facilities etc.

In addition to the above, we also gathered information from the Embassy of Japan, JICA, JETRO, etc. and requested their cooperation.

1. Schedule

Date	Time	Location	Details	Local participants
Sunday, 26 Oct	-	-	(Arrival) Confirmation of study schedule, etc.	-
Monday, 27 Oct	11:00-12:00	JETRO	Brief explanation of the project Gathering information about local business activities	Mr. Shibata (Regional Director); Mr. Yamada (expert)
	14:00-15:00	Vientiane Capital government office	Courtesy visit Confirmation of intercity partnership project Announcement of Japanese assistance policies	Mr. Keophilavanh (Vice Governor), etc.
	16:00-19:00	Embassy of Japan	Information gathering about ODA and other assistance Exchange of opinions on intercity partnership	[Embassy] Mr. Onishi (counselor) [JICA] Mr. Yuzurio (Deputy Representative); Mr. Mori (expert)
Tuesday, 28 Oct	9:00-16:30	Vientiane Capital office	The first International Workshop · Intercity partnership project plan · Introduction of JC individual project plan	Mr. Keophilavanh (Vice Governor); Ms. Bangon Deputy Director General, etc.
Wednesday, 29 Oct	9:00-10:45	VUDAA	Brief explanation on JCM Confirmation of projects under the jurisdiction of VUDAA Confirmation of current status on waste and wastewater/sludge disposal	Mr. Khampiane (Deputy Director General), etc.
	11:00-12:10	MPWT-PTI	Brief explanation on JCM Brief explanation on the project Information gathering about urban development plan	Mr. Hasegawa (JICA expert)
	13:45-15:05	Chinaimo water treatment plant	Information gathering about water project and water treatment plant	Mr. Stein (Vice President)
Thursday, 30 Oct	9:50-11:40	KM32 disposal site	Confirmation of current situation of waste disposal site Confirmation of night-soil treatment plant Confirmation of medical waste incineration plant	Three in total including Mr. Bunsen (Kokusai Kogyo Co., Ltd)
	15:00-16:50	MONRE	Brief explanation of JCM Brief explanation of EV project	[MONRE] Mr. Boun, two others [MPWT] Mr. Putthaxay
	17:30-19:00	Embassy of Japan	Report on local activities (Particularly on possibility of EV project)	Mr. Onishi (counselor)
Friday, 31 Oct	9:00-10:20	DPWT	Brief explanation of JCM Brief explanation of the project Confirmation of projects under the jurisdiction of DPWT	Mr. Bounchanh (Vice Director General), and two others
	10:40-12:15	Site tour	Confirmation of current status of wastewater treatment balancing reservoir	Staff in charge of the site
Saturday, 1 Nov	-	-	(Departure)	-

(3) The second International Whorkshop and field study

We visited the site from Sunday, February 1 to Friday, February 6, 2015 to hold the second International Workshop for the purpose of confirming the status of progress of this project at the Vientiane Capital side and consensus building concerning future implementation policies and so on, individual hearings with relevant government agencies to understand the local needs, tours of relevant facilities, etc. In addition to the above, we also visited the Embassy of Japan and JICA, and reported the progress so far, followed by exchange of opinions, etc.

1. Local schedule

Date	Time	Location	Details	Local participants
Sunday, February 1	-	-	(Arrival; two GEC personnel only)	-
Monday, February 2	10:00-11:30	KOLAO corporation	Coordination concerning framework of EV introduction (Tabo)	KOLAO corporation
	10:00-11:45	Kokusai Kogyo LPP-E office (inside MONRE)	Confirmation of the details of local waste management project and coordination (Tanaka)	Mr. Oda
	13:00-14:30	EDL corporation	Coordination for introduction of EV	
	15:00-16:00	MPWT	Coordination for introduction of EV (Tabo)	
	15:15-16:45	DONRE	Preliminary coordination for the second International Committee meeting (Tanaka)	Ms. Bangon (Deputy Director General), Ms. Rotchana
Tuesday, February 3	9:30-11:30	Embassy of Japan	Reporting on progress of the project Exchange of opinions regarding the EV project	[Embassy] Mr. Onishi (Counselor); Mr. Kitagawa (Second Secretary) [JICA] Mr. Yuzurio (Deputy Representative); Mr. Hirafuji
	12:00-13:15	Restaurant in the city	Coordination with JICA LPP-E project (regarding waste management)	Mr. Yuzurio (Deputy Representative); Mr. Kishigami
	13:45-15:30	DONRE	Preliminary coordination for the second International Committee meeting (Tabo, Motoda, and others)	Ms. Bangon (Deputy Director General)
	13:45-15:30	VUDAA	Exchange of opinions regarding improvement on waste collection & transport (Tanaka and others)	Mr. Khampiane (Vice President); Mr. Pudon (Vice President); and two division heads
Wednesday, February 4	8:20-12:15	Vientiane Capital government office	The second International Workshop • Confirmation of progress of the project • Coordination of cooperation agreement document	Mr. Keophilavanh (Vice Governor); Ms. Bangon (Deputy Director General), etc.
	14:00-15:15	DONRE	Confirmation of the content of the cooperation agreement document & signing	Ms. Bangon (Deputy Director General)

Thursday, February 5	9:00-9:45	Office in the city	Hearing session concerning the situation of waste collection (Hotel Restaurant Association)	Mr. Udet (President)
	10:30-11:00	Rice milling plant in the city	Preliminary study on rice husk briquette	Agent of the proprietor
	14:30-15:30	Sinohydro Corporation (plant)	Feasibility study on alternative fuel	Mr. Quin Xiaoyu
Friday, February 6	-	-	(Back to Japan)	-

3. Construction of the operational and maintenance management systems aiming at the formation of low-carbon historical city of Vientiane

By identifying and sorting the environmental issues Vientiane Capital is currently facing, we conducted examination and study, in cooperation with the Vientiane Capital government with participation of private companies, for a program to help with formation of the low carbon historical city which should be carried out preferentially.

Further, on the basis of the result of this study, we, under partnership between Vientiane Capital and Kyoto City, considered the preparation of a draft for the Low Carbon Historical City Formation Implementation Plan.

In addition, through these activities, we considered identification and expansion of JCM large-scale projects which contribute to the formation of the low carbon historical city of Vientiane Capital and can be implemented in the next fiscal year onwards.

3.1 Preparation of a draft for the Low Carbon Historical City Formation Implementation Plan

Towards the formation of the low carbon historical city of Vientiane Capital, we carried out those activities that are listed below. The study was implemented in the form of field study, collection & organization of existing information, hearing session etc. We are planning to share and examine, etc. the details of the study and its results at domestic task force meetings and domestic progress report meetings.

- Understanding the outline of the Vientiane Capital area
- Understanding and sorting out relevant existing laws & regulations and implementation plans
- Understanding and sorting out the needs of Vientiane Capital in relation to environmental issues and conservation of historical and cultural assets
- Consideration of a program to help with formation of the low carbon historical city which should be carried out preferentially
- Consideration of potential JCM projects for the next fiscal year onwards
- Making a proposal regarding the details of assistance program of Kyoto City

On the basis of these activities, we engaged in preparation of a draft for the Low Carbon Historical City Formation Implementation Plan with the cooperation of both cities.

3.2 Promotion of the inter-city partnership and public-private cooperation

We considered the way how to build a basic framework to facilitate transfer of Kyoto City's urban development related experience, knowledge, knowhow, technologies, and systems on the basis of inter-city partnership between Vientiane Capital and Kyoto City and through the Study for Formation of Low Carbon Historical City, while identifying the needs, at the Vientiane Capital side, required for realization of the low carbon historical city and sustainable development. In addition, by promoting information sharing with private business operators, etc. who were interested in implementing JCM projects in Vientiane Capital under the framework of the inter-city partnership between the two cities, we tried to promote further participation of private business operators and identify potential future JCM projects.

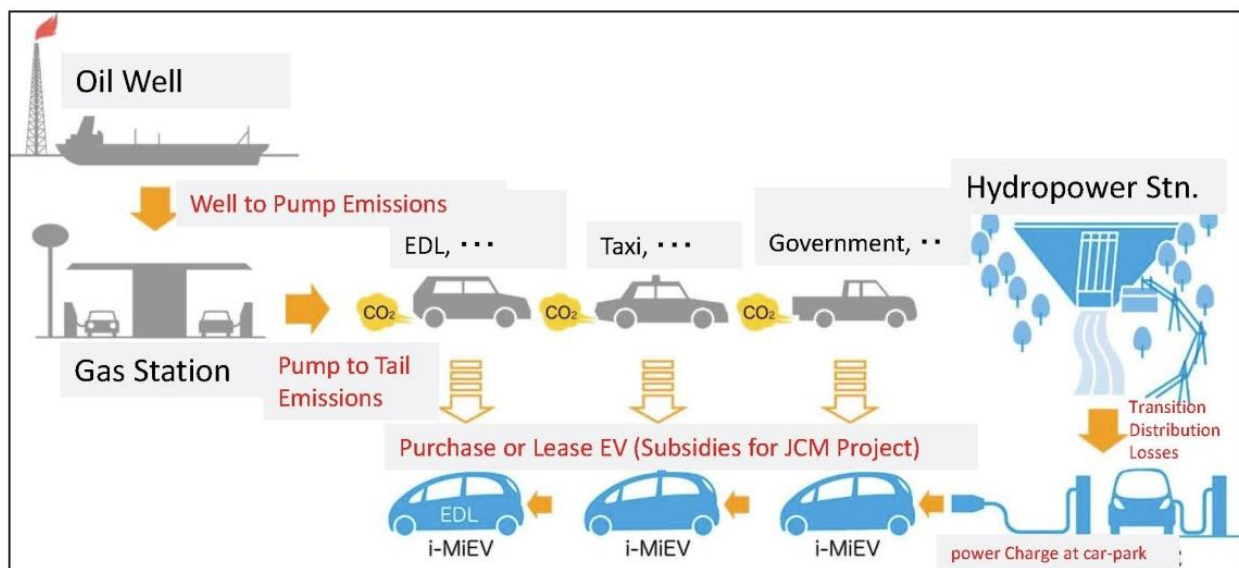
4. Implementation of the feasibility study (FS) and the creation of JCM methodology and project planning documents (PDD)

In response to the request from Vientiane Capital, the following studies were conducted in relation to traffic area and waste area, 4.1 and 4.2, respectively. In addition, assuming that the target project would be registered under JCM, we made preparations for development of JCM methodology (establishment of eligibility requirements, specification & calculation of reference emission, calculation of project emission, establishment of monitoring methodology, establishment of default value, preliminarily established value, etc. required for calculation of quantitative assessment of emissions reduction, and preparation of calculation sheet (Excel spreadsheet)) as well as creation of project planning documents (PDD). In particular, when preparing JCM methodology, we had meticulous discussion with GEC and the undertaker of the study so that we can prepare a high-standard one which would satisfy the approval criteria of the JCM joint committee. In addition, in implementing these feasibility studies, we proceeded with them in consideration that we would be using them when we prepare the above-mentioned Low Carbon Historical City Formation Implementation Plan.

4.1 Promotion of EV Usage for Company Car

(1) Outline of Project

Emissions are reduced through shift from conventional fossil fuel car to i-MiEV of MMC for company car in Vientiane City. The emission reduction mechanism is as the following;



Zero Emissions Tecnologies to be introduced: MMC's EV and EV CHAdeMO charger

■ EV



i-MiEV (upper)

Drive range : 160km/full charge

Battery capacity : 16kWh

PHEV Outlander (Lower)

Drive range 60km/EV over 800km/PHEV

Battery Capacity 12kWh

Electricity consumption rate : 5.9km/kWh

■ Electricity Charger



CHAdeMO Quick Charger(Left)

delivering up to 62.5kw of high-voltage direct current via a special electrical connector.

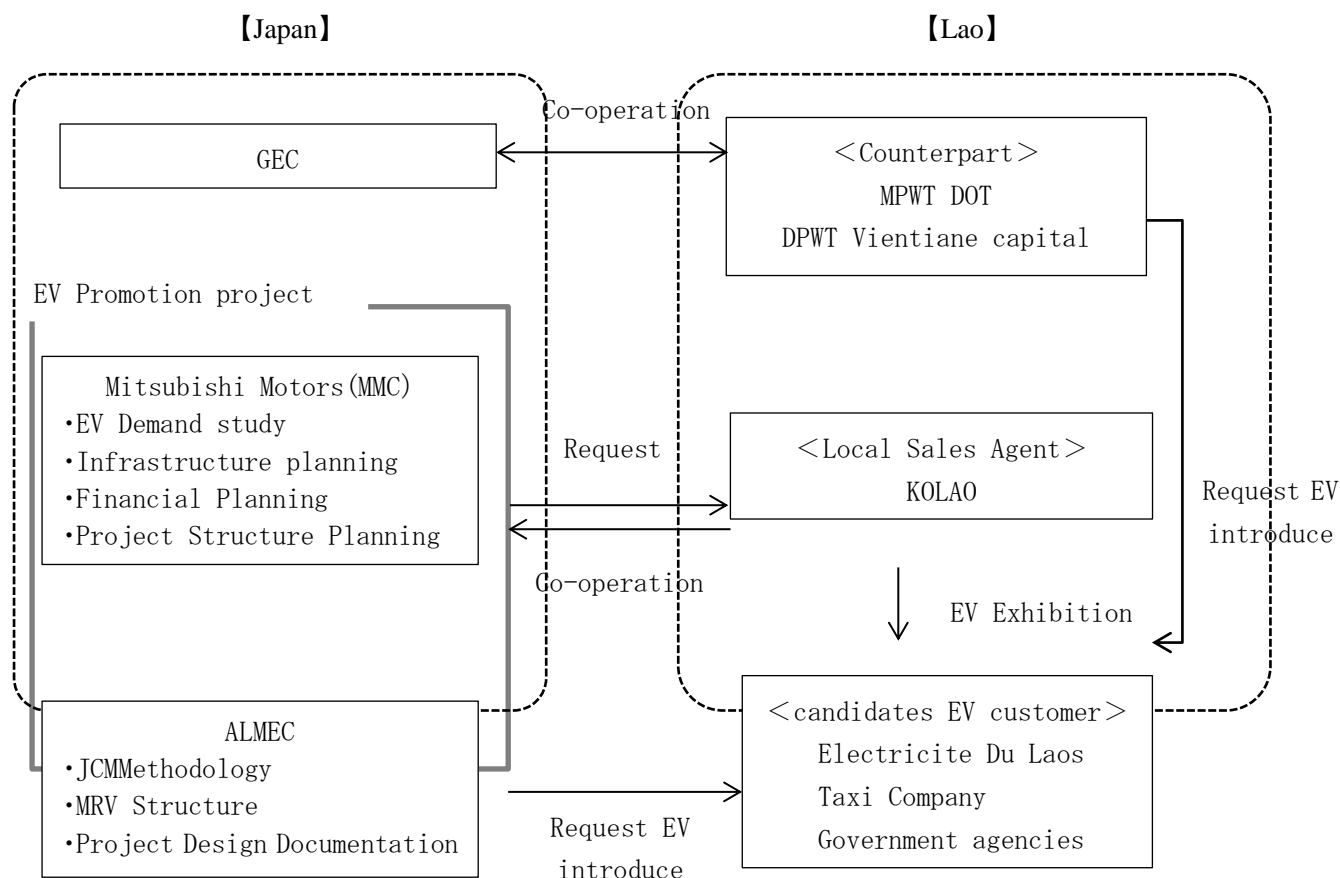
80% charge in 30 minutes

Normal Charger (Right)

8 hours to full charge for i-MiEV

(2) Study Structure

Under GEC JCM Project Survey collaborating Vientiane Capital and Kyoto City for Low carbon Historical Cities Formation, Mitsubishi Motors (MMC) and Almec conduct a survey sharing structure shown in the figure below to cooperate. Ministry of Public Works and Transport (MPWT) in Lao and Public Works Department of Transportation (DPWT) in Vientiane Capital counterpart are joined the survey as the counterpart, and set KOLAO as the local sales company.



Study Schedule

Item	10(D)	11(U)	11(D)	12(U)	12(D)	1(U)	1(D)	2(U)	2(D)
Hearing									
Infra Plan									
Finance Plan									
Implementation P									
Project Struc Pl									
JCM methodology									
MRV structure									
Reporting									
Domestic WG	△			△			△		
International WG	▲							▲	
Seminner				○			○		
Site Survey	●							●	●
Outcome				IR			DFR	FR	

4.2 Generation & use of biogas from source-separated organic waste

As a preliminary study on the amount of generation and composition of general waste, we visited the local JICA office, Embassy of Japan, and JETRO separately and conducted hearing sessions. In addition, concerning the current status of waste disposal and waste disposal technology, we visited the relevant local agency and target facility, VUDAA, and the waste final disposal site (KM32) as well as DPWT and conducted hearing sessions with relevant personnel and took a tour of the site.

From JICA, we obtained such information as grant assistance has commenced to improve rubbish collection, disposal by incineration has commenced with regard to a part of medical waste, and although composting has been implemented in Luang Prabang, it has not been widely practiced in Vientiane. In addition, we were told that industrial waste from the industrial park is being disposed of in Thailand.

From JETRO, we obtained information concerning the current situation of wastewater treatment of a local food plant, treatment of wastewater from general households; in addition, with respect to waste, the use of agricultural waste. In addition, we also obtained such information as currently there is no city gas supply and LPG is used by some.

At VUDAA, we obtained statistical information concerning the status of rubbish collection & transport and outline of drainage ducts, etc. By the way, there is no agency or department in the government in charge of disposal of night soil (septic tank, etc.).

During the tour of KM32 final disposal site, in addition to the management situation such as how much rubbish is received and in what manner, we confirmed the total capacity, status of methane generation, status of night soil disposal, etc. Further, we confirmed the incinerator for medical waste.

At DPWT, we confirmed the outline of household wastewater treatment and the situation of balancing reservoir for night soil and drainage ducts in the City.

5. Public relations activities

5.1 Website

Dissemination of information through website for this study was implemented.

([URL] <http://gec.jp/main.nsf/jp/Activities-IC-vcc-lc20150204>)

6. Cooperating with related operation

6.1 Presentations at Meetings Designated by MOE

(1) JCM Workshop (October 2014)

On 29th October 2014, we attended the JCM Workshop in Yokohama City that was hosted by MOE (and co-hosted by IGES) and presented our operations from the Osaka side along with a display poster.

(2) COP20 side event (December 2014)

At the Japanese Pavilion at the 20th session of the Conference of the Parties (COP20) of the United Nations Framework Convention on Climate Change (UNFCCC) held in Lima, Peru from December 1 – 12, 2014, we held a side event on the second day (Tuesday, December 2) supported by the MOE of Japan and the Ministry of Natural Resources and Energy (MONRE, Laos).

II. Main Text of the Report

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1. Project overview

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1.4 Project implementation system

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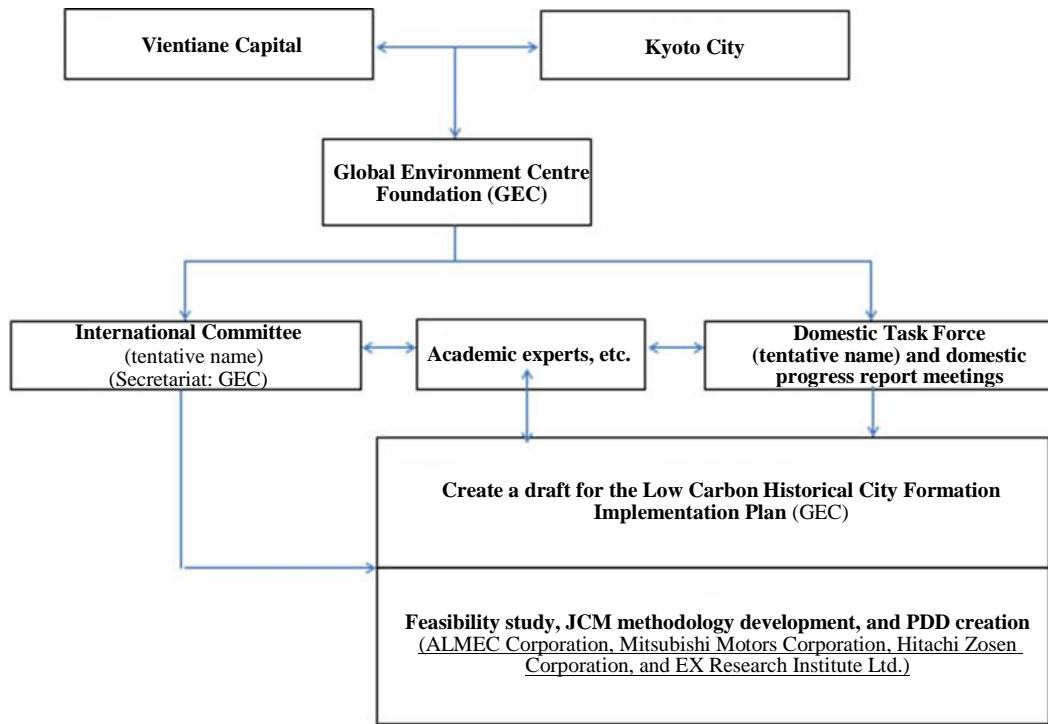


Figure Project implementation system

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[Attendees] Kyoto City, Mitsubishi Motors Corporation, ALMEC Corporation, Hitachi Zosen Corporation, EX Research Institute Ltd., and GEC

[Decisions]

The main decisions are as follows.

- This study project will be advanced outside the framework of the sister-cities relations (to be concluded at the end of this fiscal year or at the beginning of the next fiscal year). If the possibility of a private-private partnership emerges, the project may be carried out within the framework of the sister-cities relations, but in such a case the budgeting by Kyoto City will be impossible, so careful consideration is necessary.
- The 1st international committee trip schedule: To be adjusted between Monday, October 27 and Saturday, November 1.
- Those travelers who are also Kyoto City officials need to be determined at least one month prior to the trip, due to procedural reasons.
- In case GEC conducts a field study prior to the international committee meetings (whether or not to conduct such a study needs to be discussed within GEC), the local needs will be imported from the trip destination.
- The 2nd domestic task force meeting shall be held prior to the 1st international committee meeting in order to share the information that GEC will have collected and to discuss the specific missions, etc. of the international committee.
- JICA experts will be sent to join the pre-conference for the Study on the Improvement of the Water Environment in Vientiane Capital at the end of September, and the resultant information will be shared with the Kyoto City Waterworks Bureau.

[Presentations]

(Kyoto City)

- The conclusion of the sister-cities relations (see Note) is aimed at the time when the Prime Minister of

Laos and the Mayor of Vientiane are visiting Kyoto, at the end of December 2014 or at the beginning of January 2015 (the Mayor's visit to Japan is under discussion).

(Note) Sister-cities relations: Driven by the private-private cooperation. The government backs it up. In addition, City Council approval is not required, and is not budgeted.

- With regard to the water and sewage issue on which a request for assistance was made by Vientiane Capital during the signing process of the sister-cities relations, negotiations are under way between the Kyoto City Waterworks Bureau and the Laotian City (under the public-public exchange) which is outside the framework of the sister-cities relations.
- The present JCM project also considers providing support outside the framework of the sister-cities relations for those environmental issues on which the requests for assistance were made by the Laotian Government and Vientiane Capital during the conclusion process of the sister-cities relations.
- The Prime Minister of Laos and the Mayor of Vientiane have requested Kyoto City to transfer the know-how, etc. to solve Vientiane Capital's environmental issues.
- When the information regarding this matter was provided to the Embassy of Japan in Laos, the Secretary replied that they would fully cooperate.

(GEC)

- Mr. Motoda of GEC gave a description on the mechanism of JCM, etc. and summarized its large-scale development projects conducted by the MOE.
- Mr. Tabo of GEC gave a description on the entire overview of this study project and its implementation policy.

(Mitsubishi Motors Corporation and ALMEC Corporation)

- Ms. Kuraoka of ALMEC Corporation gave a description on the study contents, implementation policy, and study schedule, etc. of the above-mentioned FS project.
- Mr. Sawada of Mitsubishi Motors Corporation gave a description on the i-MiEV, the initiatives to spread EVs, and the status of charging equipment and infrastructure development.

[Discussion details]

<Questions and answers in response to the presentation by Kyoto City on its international exchanges>

- (Mr. Tabo of GEC) Do you mean that it is better not to directly connect this project and the sister-cities issue?
⇒ (Mr. Miura of Kyoto City) If the private-private exchanges in the environmental field advance in the future while the public-public exchanges are promoted, the project could be incorporated into the framework of the sister-cities agreement. However, the budget cannot be secured if it is incorporated into the framework.
- (Mr. Motoda of GEC) If the Japanese side are those in the private sector and the Laotian side is the Government, is it possible to incorporate the project into the framework of the sister-cities agreement? (Example: Waste issue in Hitz, Vientiane Capital)
⇒ (Kyoto City) Laos, is a socialist country, and the concept of private sector organizations by definition does not exist. We would like to consider flexibly with regard to the Laotian Government.
- (Mr. Oishi of GEC) Presumably, an official letter is expected to be required from Kyoto City. Is it possible

to issue, etc. a letter in the name of the Mayor?

⇒ (Kyoto City) Yes.

- (Mr. Oishi of GEC) Will the Laotian trainees be accepted to the Kyoto City Waterworks Bureau with the city budget?

⇒ (Mr. Masuda of Kyoto City) The trainees will be accepted from Laos in October, but they are JICA trainees.

- (Mr. Tabo of GEC) In this project, we are also considering concluding a letter of intent and a memorandum with the Laotian side from the viewpoint of formation of a low-carbon society. Are there any stumbling blocks on the Kyoto City side?

⇒ (Mr. Imai of Kyoto City) We are positively promoting international exchanges, so there will be no significant stumbling blocks. However, when it comes to securing a budget, it will be difficult.

<Questions and answers in response to the presentation by GEC on the present study project>

- (Mr. Masuda of Kyoto City) What do you specifically mean by the "operational and maintenance management systems aiming at the formation of a low-carbon historical city" in the project contents?

⇒ (Mr. Motoda of GEC) As an ambitious goal of this fiscal year, we will set up in Vientiane Capital a Department to address climate change and prepare the administrative mechanism systems to actually operate, maintain, and manage the low-carbon city formation plan. We at least need to achieve the minimum goal of moving forward toward the setting up of the organization within this fiscal year. In addition, in order to cultivate JCM projects for the subsequent fiscal years, we want to conduct a hearing for the local sewerage and wastewater needs for introduction to business operators in Kyoto, etc. when the trainees will be accepted to the Waterworks Bureau during their visit to Japan in October.

- (Mr. Imai of Kyoto City) It needs to be discussed whether to conclude the memorandum within the framework of the sister cities or to conclude it otherwise.

⇒ (Mr. Motoda of GEC) The conclusion of the memorandum is a goal for the next fiscal year, so we want to consult based on this fiscal year's study. This fiscal year's goal is to receive a letter of intent from the Laotian side.

- (Mr. Imai of Kyoto City) In Kyoto, there are only a few environment-related local companies that have expanded overseas.

⇒ (Mr. Motoda of GEC) OMRON Corporation (headquartered in Kyoto), which is also engaged in the traffic and signal maintenance business, etc., is a candidate for development of the traffic policy in Vientiane Capital.

- (Mr. Aibe of Kyoto City) Vientiane Capital seems to be focusing on the development of infrastructure, but do they actually have the sense of "low-carbon"?

⇒ (Mr. Motoda of GEC) The future economic growth potential of Laos is high. Instilling the concept of "low-carbon" in them at this stage is important.

⇒ (Mr. Yajima of ALMEC Corporation) With regard to the transportation sector, the Government is holding up the transport strategy of "low-carbon" and "low-emission" in Environmentally Sustainable Transport (EST).

- (Mr. Masuda of Kyoto City) Are there any cases where there is an inter-city partnership with respect to the

JCM project on water supply and sewerage?

⇒ (Mr. Motoda of GEC) JCM projects on water supply are difficult. With regard to sewage, there is JCM project cultivation potential, such as energy reduction in sewage treatment and the use of alternative energy by the combustion of organic wastewater-derived methane.

⇒ (Mr. Tabo of GEC) GEC staff will be dispatched to join the pre-conference for the Study on the Improvement of the Water Environment in Vientiane Capital as JICA experts at the end of September, and the resultant information will be shared.

⇒ (Mr. Fujikawa of EX Research Institute Ltd.) Sewer personnel of the Osaka City Construction Bureau have been dispatched to Ho Chi Minh City as JICA experts. Kitakyushu City Water and Sewer Bureau staff members have been dispatched to Phnom Penh City Waterworks Bureau as JICA experts.

⇒ (Mr. Yajima of ALMEC Corporation) Saitama City Waterworks Bureau and Vientiane Capital Waterworks Bureau officials have signed a memorandum for technical cooperation.

<Questions and answers in response to the presentation by ALMEC Corporation and Mitsubishi Motors Corporation>

- (Mr. Oishi of GEC) When installing the quick charger, are the conditions of the transformer for the quick charger sufficient? How long is the available driving range of EVs?
 - ⇒ (MMC) Since the charger can only be installed at locations where the equipment is ready to some extent, the conditions are assumed to be sufficient.
 - ⇒ (ALMEC) Because the city is of small size, one charging allows sufficient driving once around the city.

(2) The 2nd domestic task force meeting

Sharing of the latest local information among the parties involved toward the 1st international committee meeting, confirmation of the presentations at the international committee meeting, and final check on the local schedule were carried out.

[Date and time] Tuesday, October 21, 2014, 16:00 to 18:00

[Venue] Special Conference Room at the Global Environment Centre Foundation

[Attendees] Kyoto City, Mitsubishi Motors Corporation*, ALMEC Corporation*, Hitachi Zosen Corporation, and GEC

* Joined by video conferencing

[Summary of the proceedings]

The following contents were confirmed.

- A report was given on the trip that Mr. Motoda and Mr. Tabo of GEC's made to Vientiane during October 6 and 8 for the local pre-conditioning. They visited the local counter parties; namely, the Department of Natural Resources and Environment (DONRE) of Vientiane Capital, and the Ministry of Natural Resources and Environment (MONRE) and the Ministry of Public Works and Transport (MPWT) of the Laotian Government in order to promote coordination toward the 1st international committee meeting. In addition, they also visited the Japanese Embassy and JETRO to obtain the relevant local information.
- The detailed local schedule for the international committee meetings (October 26 to November 1) was confirmed. In addition to the transportation systems-related destinations, a visit to the water supply and

sewage facilities is under discussion.

- Implementation of a local test-ride event on the i-MiEV is being arranged. Where possible, it is to be implemented during the lunch break on the international committee meeting day.
- Each party provided an overview of their presentations at the international committee meeting and reviewed the contents.

(3) The 3rd domestic task force meeting

Sharing of the latest local information among the parties involved toward the 2nd international committee meeting, confirmation of the presentations at the international committee meeting, and final check on the local schedule were carried out.

[Date and time] Wednesday, January 28, 2015, 15:00 to 17:00

[Venue] Special Conference Room at the Global Environment Centre Foundation

[Attendees] Kyoto City, Mitsubishi Motors Corporation, ALMEC Corporation, Climate Consulting, LLC, Hitachi Zosen Corporation, and GEC

[Summary of the proceedings]

The following contents were confirmed.

- The itinerary for the next local study was confirmed. Two GEC members will arrive at the site in advance on February 1, followed by the other members on February 2.
- With regard to the official request from the local side, participants made sure to sign the "Joint Chairs' Summary" at the 2nd international committee meeting.
- With regard to the EV project progress, apart from the initially planned i-MiEV, the Plug-in Hybrid Electric Vehicle (PHEV) Outlander will be added to the plan. In addition, it was also confirmed that Takaoka Toko Co., Ltd. is positively considering the installation of charging facilities. Our views on rental fee setting were also exchanged.
- It was confirmed that reports and views will continue to be exchanged with the local Japanese Embassy and with JICA.

2.2 International workshop

(1) Preliminary study

A local trip was made during Sunday, October 5 and Thursday, October 9, 2014 for the purpose of final review and adjustment with the Vientiane-side officials for the 1st international workshop.

1. Meeting schedule

Date	Time	Venue	Contents	Local attendees
Mon, October 6	9:00-12:00	DONRE	JCM overview description Project overview description Discussion for the 1st international committee meeting	Approximately 20 members from DONRE, MPWT, VUDAA, DOFA, bus public corporation, etc.
	15:00-16:00	JETRO	JCM overview description Project overview description	Mr. Shibata, Regional Director Mr. Yamada, Technical expert
	17:00-19:00	Japanese	JCM overview description	[Embassy]

		Embassy	Project overview description Description of the Embassy Project (Public transport modernization plan)	Mr. Onishi, Councilor [JICA] Mr. Hirafuji and Mr. Mori
Tue, October 7	8:30-9:30	MONRE (DOPC)	JCM overview description Project overview description	Mr. Keobang, Manager
	10:00-12:00	Site visits	Industrial Park (VITA PARK) Development site in the wetlands by foreign capital	-
	16:00-17:00	MPWT	JCM overview description Project overview description (especially on the EV project)	Mr. Bounta, Manager Mr. Putthaxay
Wed, October 8	10:00-12:00	Site visits	Study on the development site conditions along the Mekong River by foreign capital	-

* DONRE: Department of Natural Resources and Environment
 MPWT: Ministry of Public Works and Transport
 VUDAA: Vientiane Urban Development Administration Authority
 DOFA: Department of Foreign Affairs
 MONRE: Ministry of Natural Resources and Environment
 DOPC: Department of Pollution Control

2. Results of the meetings, etc.

1) DONRE plenary meeting

[Date and time] October 6, 9:00 to 12:00

[Attendees] Local side: Approximately 20 members from DONRE, MPWT, VUDAA, DOFA, bus public corporation, etc. (List of attendees being requested)
 Japanese side: Mr. Motoda and Mr. Tabo of GEC

[Contents of the proceedings]

- A description was given of JCM overview and project implementation policy. Understanding for this project was promoted to pave the way toward the 1st international committee meeting at the end of October.
- The Vice Governor was scheduled to attend, but hastily cancelled due to the necessity to attend another meeting. However, Ms. Bangon of DONRE read the message of the Vice Governor on his behalf at the beginning of the meeting.
- The message expressed welcoming of this project, and announced that the resolution of environmental issues was an urgent need and that they were expecting assistance from Kyoto City.
- The local side was very well familiar with Japanese assistance such as JCM-related projects (energy conservation in the beer brewery) and JICA projects (electric vehicle charging stations, garbage collection assistance, etc.), and also seemed to be aware that the Japanese counterpart was different for each project.
- It was confirmed that the transportation and garbage problems in particular were causing deep concern to the local side.
- With regard to the transportation issue, cars are increasing by an annual rate of 15% and they were aware that congestion and air pollution measures were urgently needed. They expressed a particular interest in the projects on small electric vehicles as well as projects on electric buses.
- However, they were also aware that the infrastructure development for charging stations is a problem in the

EV projects. In addition, electric buses are costly, and they were aware of the difficulty related to the project cost.

- As for buses, they had high interest in the introduction of Bus Rapid Transit (BRT).
⇒ We have explained that basically the introduction of BRT will potentially become a JCM project, but since the quantification of the greenhouse gas (GHG) emission reduction is difficult, it is challenging to make it a JCM project. However, the feasibility of the electric bus project is relatively high.
- Indeed, we had the impression that the number of cars was rapidly increasing from our observation of many new cars in the city. The MPWT is regulating the purchase of used cars, and this is considered to be related to the large number of new cars.
- The number of motorcycles on the road was less than we had expected, and we had the impression that cars have become popular faster than have motorcycles.
- With regard to the garbage issue, several attendees gave their opinions and they were aware of the methane fermentation technology.
- The JICA project was introduced as the assistance for garbage problems, in which the provision of trucks (in 2015) and development of relay bases would be implemented.
- In the sewer field, there was the opinion that drainage from the hotels and shopping centers was causing an issue.
⇒ We introduced the biogas fermentation technology that uses organic wastewater.
- In addition, suggestions were presented to carry out tree planting, park development, and solar power generation JCM projects as well.
⇒ We answered that tree planting and park development projects could take advantage of the knowledge and experience of Kyoto City.
⇒ We explained that making solar power generation a JCM project would be difficult, hydropower constitutes a large proportion of total electric power in Laos. However, we have also explained that facilities that use fossil fuels (as boiler heat sources or in-house diesel generation) may be treated under the project.
⇒ We have requested the provision of information on the electric power constitution in Laos.
- As a whole, the attendees of the meeting actively participated to give a variety of questions and suggestions.

[On the 1st international committee meeting]

- Scheduling of the meeting and adjustment of the attendees will be implemented after receiving the official letter from the Japanese side. We would like to request submission of the official letter.
- We have requested the Vientiane side to select the candidate destinations for the individual hearing and site visits.

2) JETRO meeting

[Date and time] October 6, 15:00 to 16:00

[Attendees] Local side: Regional Director Mr. Shibata and Mr. Yamada of JETRO

Japanese side: Mr. Motoda and Mr. Tabo of GEC

[Contents of the proceedings]

- JCM overview and the implementation policy of this project were described. It was also explained that the cooperation of JETRO was needed in the cultivation of JCM projects and in the project matching between the local needs and the private sector.
- In Laos, a tax cut had been introduced for eco-cars in the same way as in Japan, but in order to increase tax revenue and to prevent the rapid spread of cars, it has been abolished and even a tax increase has been imposed.
- Cement and silicon plants have been built outside of the City of Vientiane.
- Coal is mostly dependent on imports, and reducing imports is a critical issue.
⇒ The technology to replace the coal used during cement refinery with waste materials was introduced as a potential JCM project.

3) The Embassy and JICA meeting

[Date and time] October 6, 15:00 to 16:00

[Attendees] Local side: Councilor Mr. Onishi of the Japanese Embassy
Project Development Advisor Mr. Hirafuji and Specialist Mr. Mori of JICA
Japanese side: Mr. Motoda and Mr. Tabo of GEC

[Contents of the proceedings]

- The Embassy is aware that the increase in the number of cars is significant and that the traffic issue is extremely critical. Therefore, in order to urgently advance the modernization of public transport (spread of EVs and introduction of BRT), the Embassy is promoting the public transport modernization plan as part of the project under the concept of "Clean, Green and Beautiful Laos". In the future, the formation of the "Low-Carbon Historical Planning Model City" of Vientiane is aimed for.
- With the diffusion and establishment of ICT and IC tickets, which are a technical strength of Japan, as well as with the establishment as a world standard of the CHAdeMO electric car quick charging system being planned, which is also in line with the next generation automotive strategies of the Ministry of Economy, Trade and Industry, it is considered that they will serve as strategic ODA utilization based on the investment promotion for environment development by Japanese enterprises, the obtainment of global standards, and economic revival strategies.
- The infrastructure development for charging stations is being proposed as a JICA project.
- As a result of the combined effect of the charging station development by JICA and the diffusion of the i-MiEV through this project, it is hoped that the introduction of EVs will accelerate.
- By implementing what can be done before the economic development, it is hoped that emergence of environmental problems will be prevented in advance, in order to construct a low-carbon historical landscape model city.
- During the meeting at the end of October, it is hoped that a workshop will be held with Kyoto City as well as with Mitsubishi Motors and ALMEC, which are the main parties in the FS. Hopefully they would give details.
- It has been decided that Laos will chair ASEAN in 2016, so if the i-MiEV has been introduced by then, it will give a significantly positive effect on automobile sales.
- In addition, the advancement of a pilot project for landscape conservation is also planned, so we want to

learn the know-how and experience from Kyoto City.

- The ASEAN + 3 Environment Ministers Meeting is scheduled on October 31, and the Embassy is considering making a request to the Ministry of Foreign Affairs for the Minister for the Environment to give remarks on this project.
- With regard to the water supply sector, Saitama City has continuously been providing assistance, and there seems to be no need for other cities to intervene.
- The sewerage sector is still underdeveloped, and any city is welcome to provide assistance.
- The sewage treatment plant has a sludge treatment facility, and any project that can cope with both waste and sludge treatment at the same time will be most welcome.

4) MONRE meeting

[Date and time] October 7, 8:30 to 9:30

[Attendees] Local side: Manager Mr. Keobang of the Department of Pollution Control

Japanese side: Mr. Motoda and Mr. Tabo of GEC

[Contents of the proceedings]

- A description of JCM overview and project implementation policy was given, and it was confirmed that MONRE had agreed to cooperate with us.
- The Department of Pollution Control mainly formulates laws and regulations, etc.
- The present situation in which investors can freely engage in development is considered to be problematic, and a request for legislation has now been submitted to the Government to mandate environmental protection (similar to environmental assessment) when investors carry out development.
- It will be presented if the legislation is realized before the meeting at the end of October.
- Regulations are in place for household garbage and hospital waste, but there are no regulations for industrial waste.
- It is hoped that the industrial waste recycling project will be advanced, but it has not been realized, due to the small amount of waste and the high cost. Recycling techniques are sought for.
- It has been recognized as problematic in the waste issue that source-separation is inefficient and that the use of large dump trucks to transport waste materials to the treatment facilities is inefficient.
- In the past, a biogas fermentation study was conducted at the waste treatment facility 32 km away from the City.

5) October 7: MPWT meeting

[Date and time] October 7, 16:00 to 17:00

[Attendees] Local side: Manager Mr. Bounta and Mr. Putthaxay

Japanese side: Mr. Motoda and Mr. Tabo of GEC

[Contents of the proceedings]

- A description of JCM overview and project implementation policy especially on the EV project was given, and it was confirmed that MPWT had agreed to cooperate with us.
- In particular, the sense of crisis against the transportation issue is high, and it is strongly hoped to make the EV project a success.

- Projects on public transportation are promoted, and the BRT project is currently underway. In addition, the 2012 study report by JICA and ALMEC, the Public Transportation System Basic Data Collection Study, was handed over.
- In Laos, the number of vehicles is increasing at an annual rate of 15 to 20%. Used car sales are regulated.
- When consulting with the relevant organizations such as Laos State Power Board, it is also possible for us to make an arrangement.
- We would definitely like to attend the DONRE plenary meeting, but since we have a separate case on Wednesday the 29th when the meeting is scheduled, we would like to request to change the date to Tuesday the 28th.

6) October 7-8: Site visits

[The Industrial Park (VITA PARK) in the suburbs (approximately 20 km from the City) <under construction>]

- The Industrial Park, including the infrastructure, was under construction, and the condition was far from completion.
- Two Japanese companies, Dai-Ichi Denshi Sangyo Co., Ltd. (operating) and Mitsubishi Materials Corporation (constructing), were located.
- Apparently, there were no facilities that were using boilers and fossil fuels.

[Development site in the wetlands by foreign capital <under construction>]

- The district in the wetlands is under development by foreign capital, where the Embassy and JICA are concerned that the development is being carried out by disregarding environmental issues.
- It appears that the construction of large-scale complex facilities such as residential and commercial facilities is underway.

[Development site along the Mekong River by foreign capital <under construction>]

- The district in the wetlands is under development by foreign capital, where the Embassy and JICA are concerned that the development is being carried out by disregarding environmental issues.
- It appears that the construction of large-scale complex facilities such as residential and commercial facilities is underway.

(2) The first International workshop and field study

We visited the site from Sunday, October 26 to Saturday, November 1, 2014 to hold the first International Committee meeting (kick-off meeting) for the purpose of giving a brief explanation about this project to the Vientiane Capital side and consensus building concerning implementation policies and so on, individual hearing with relevant government agencies to understand the local needs, tour of relevant facilities etc.

In addition to the above, we also gathered information from the Embassy of Japan, JICA, JETRO, etc. and requested their cooperation.

1. Schedule

Date	Time	Location	Details	Local participants
Sunday, 26 Oct	-	-	(Arrival) Confirmation of study schedule, etc.	-
Monday, 27 Oct	11:00-12:00	JETRO	Brief explanation of the project Gathering information about local business activities	Mr. Shibata (Regional Director); Mr. Yamada (expert)
	14:00-15:00	Vientiane Capital government office	Courtesy visit Confirmation of intercity partnership project Announcement of Japanese assistance policies	Mr. Keophilavanh (Vice Governor), etc.
	16:00-19:00	Embassy of Japan	Information gathering about ODA and other assistance Exchange of opinions on intercity partnership	[Embassy] Mr. Onishi (counselor) [JICA] Mr. Yuzurio (Deputy Representative); Mr. Mori (expert)
Tuesday, 28 Oct	9:00-16:30	Vientiane Capital office	The first International Workshop · Intercity partnership project plan · Introduction of JC individual project plan	Mr. Keophilavanh (Vice Governor); Ms. Bangon Deputy Director General, etc.
Wednesday, 29 Oct	9:00-10:45	VUDAA	Brief explanation on JCM Confirmation of projects under the jurisdiction of VUDAA Confirmation of current status on waste and wastewater/sludge disposal	Mr. Khampiane (Deputy Director General), etc.
	11:00-12:10	MPWT-PTI	Brief explanation on JCM Brief explanation on the project Information gathering about urban development plan	Mr. Hasegawa (JICA expert)
	13:45-15:05	Chinaimo water treatment plant	Information gathering about water project and water treatment plant	Mr. Stein (Vice President)
Thursday, 30 Oct	9:50-11:40	KM32 disposal site	Confirmation of current situation of waste disposal site Confirmation of night-soil treatment plant Confirmation of medical waste incineration plant	Three in total including Mr. Bunsen (Kokusai Kogyo Co., Ltd)
	15:00-16:50	MONRE	Brief explanation of JCM Brief explanation of EV project	[MONRE] Mr. Boun, two others [MPWT] Mr. Putthaxay
	17:30-19:00	Embassy of Japan	Report on local activities (Particularly on possibility of EV project)	Mr. Onishi (counselor)
Friday, 31 Oct	9:00-10:20	DPWT	Brief explanation of JCM Brief explanation of the project Confirmation of projects under the jurisdiction of DPWT	Mr. Bounchanh (Vice Director General), and two others
	10:40-12:15	Site tour	Confirmation of current status of wastewater treatment balancing reservoir	Staff in charge of the site
Saturday, 1 Nov	-	-	(Departure)	-

2. Details and results

1) JETRO Vientiane office

[Date & time] Monday, October 27, 11:00-12:00

[Attendees] Mr. Shibata (Regional Director), Mr. Yamada (expert), and 12 members of the above-mentioned visiting party (excluding Mr. Sawada of MMC and interpreter)

[Details]

- GEC gave a brief explanation on this project.
- We obtained the following information on the local situation from Mr. Shibata (Regional Director):
 - There are 10 industrial parks, including Vita Park, and some Japanese companies have already started to move in to the free trade zone (preferential tax treatment is available).
 - Power supply is stable and cheap; therefore, there is little awareness of/needs for “energy saving.”
 - The GDP is about 4,000USD/per-capita/Vientiane Capital exceeding the economic level high enough to allow proliferation of automobiles (3,000USD). ⇔ 1,500USD/per-capita /nationally
 - The main industries include mining (gold, copper, bauxite, etc.) and waterpower generation. However, there is a fear of depletion of mining resources in 10 years.
 - The balance of trade is 5.3 (import)/2.9 (export) billion USD. Fuel accounts for a high percentage of the total import amount.
 - There are statistics available for gasoline, but none for industrial fuel (heavy oil?).
 - There is a plan to construct a coal-based power station (expected to commence operation in 2015), as brown coal is mined in Laos.
 - Small-scale solar power generation has been introduced in the mountain area.
 - In terms of business operation in Laos, the retail sector is heavily regulated (restriction on entry of foreign capital).
 - With respect to the status of distribution, there is a friendship bridge between Laos and Thailand and the second friendship bridge between Laos and Vietnam (Da Nang); Nittsu has entered into the market.
 - In the free trade zone, preferential treatment for investment is put in place (cheaper than in Thailand or Cambodia); in addition, Laos has the advantage of a cheap and stable supply of electricity.
 - Keeping pace with proliferation of automobiles, traffic congestion during the morning/evening rush hours has become prominent in recent years. We used to see many Japanese cars, but these days, Korean cars stand out.
 - Chinese investment has increased. There are many shopping mall developers.
- In addition, we obtained the following information through questions and answers:
 - With respect to food processing plants, there are few domestic processing companies; Beer Lao might be the only large-scale operation.
 - In terms of wastewater treatment of the beer brewery, Beer Lao has put in place an appropriate treatment system in accordance with the standards of Carlsberg and their own. They have already started CDM; and, it seems that they are also considering JCM.
 - In the past, there was a case where wastewater from a tapioca starch plant caused a problem; however, although an improvement plan was proposed in cooperation with a Thai company, the operation of the

plant itself was discontinued later on due to slack business conditions.

- Rather, pesticide entering into the river and illegal dumping of waste are considered more problematic.
- With respect to wastewater treatment and water supply in the industrial park, supply of plant water is unreliable, because there tends to be shortage of water resources. In terms of household wastewater, there is no centralized treatment plant; therefore, they are dealing with the problem using septic tanks.
- As for the situation of agricultural waste treatment, they have already started it in sugarcane fields; however, it is not a highly intensive manner of treatment.
- Household energy sources (cooking, etc.) mainly consist of firewood and charcoal. LPG is also used at restaurants, etc. In addition, electric stoves made in China are used widely in recent years.

2) Courtesy visit to the Vice Governor of Vientiane Capital

[Date & time] Monday, October 27, 14:00-15:00

[Attendees] Mr. Keophilavanh, Vice Governor, and eight others (plus several clerical staff members), and 11 members of the above-mentioned visiting party (excluding Mr. Sawada of MMC, Mr. Yajima of ALMEC, and Mr. Ono)

[Details]

The Vice Governor, Mr. Keophilavanh, expressed his sense of expectancy for this project. In particular, it seems that he expects a lot from waste disposal and sewage system upgrading. In addition, he mentioned that about half of the assistance comes in the form of JICA assistance and there has been assistance from Japan to the bus corporation to promote the use of buses.

Mr. Imai, section head, Kyoto City, stated to the effect that he would like to promote this project in such a way that not only Kyoto City, but many other Japanese businesses could also provide long-term support to address urban issues.

3) Embassy of Japan in Laos

[Date & time] Monday, October 27, 16:00-19:00

[Attendees] Embassy: Mr. Onishi, counselor; JICA Laos Office: Mr. Yuzurio, Mr. Kishigami, and Mr. Mori, expert; and 12 members of the above-mentioned visiting party (excluding Mr. Sawada of MMC, Mr. Ono of ALMEC, and interpreter)

[Details]

To start, Mr. Onishi, counselor, proposed that he would like to consider this meeting as an important strategic meeting to materialize the request for assistance to Vientiane, and he also expressed his opinion that he would like to take full advantage not only of ODA, but of JCM, etc. as well and take this opportunity to showcase the overseas expansion of Japanese technologies.

With respect to the recent situation in Laos, we obtained the following information related to this project:

- The country has slogans such as “Land-linked-country” (using its weakness of being a landlocked country as its strength) and “Green-Clean-Laos.”
- Along with modernization, motorization is occurring at a rapid pace; therefore, planned urban development is urgently required. As one of the measures to deal with this problem, they put restrictions on import of

second-hand vehicles and are promoting use of buses run by the Vientiane Corporation. For your information, the buses we are talking about are 48 buses introduced four years ago through one of JICA's assistance programs.

- The three major projects currently underway are supply of 600 million yen worth of materials, capacity building of Bus Corporation; i.e., promotion of bus use through promotion of IC cards, and EST urban planning under a JICA technical assistance program.
- There is a BRT plan between the airport and the CBD by way of a 9 billion yen ADB loan. The study will commence this year.
- A feasibility study by Eagle Bus, a private company in Saitama City, in relation to a JICA small-to-medium enterprise assistance program is scheduled to commence next year.

GEC gave a briefing about the outline of JCM and the objectives & plan of this study.

→ Mr. Onishi, counselor, stated what he expects from this project are as follows: 2015 marks the 60th anniversary of establishment of diplomatic relation between Japan and Laos; Introduction of 100 EVs will have a major impact; and, as Laos will be the chair country of ASEAN in 2016, it is really important that we try to make our presence known here (it is necessary to introduce them by August 2016).

→ To bring the EV project into reality, I would like GEC to give information to MOE and Kyoto City to give information to MOFA.

Mr. Imai, section head, Kyoto City, gave a briefing on inter-city partnership.

→ There was a question from Mr. Onishi, counselor, regarding future policies and Mr. Imai answered that, as this is the first attempt for Kyoto City, no concrete plan has been made and at this stage they are considering what kind of things can be done.

Mr. Tsukahara of Hitz briefed about their efforts to solve the waste problems. He introduced examples in Ho Chi Minh City; i.e., energy recovery from market waste by way of methane gas fermentation, waste power generation, and integrated energy recovery technologies. He also mentioned the possibility of supplying bio-gas similar to city gas.

Mr. Yuzurio of JICA introduced issues associated with the local waste disposal and the content of the grant aid concerning improvement on collection. In addition, he confirmed that, according to previous studies, waste power generation was judged to be difficult.

Mr. Kishigami of JICA mentioned that sorting/incineration of medical waste has commenced as a part of recent technical cooperation; and, although composting has started to be implemented targeting some hotels and restaurants in Luang Prabang, there has not been much progress in Vientiane. In addition, they say that the industrial waste from industrial parks is disposed of in Thailand. We at JICA are trying to find a way to deal with waste problems as a part of the national ODA program.

Mr. Fujii, Kyoto City, gave a briefing about water & sewage.

→ Mr. Kishigami of JICA explained that, with respect to water treatment plants, they, mainly Saitama City, are providing assistance through a technical cooperation project; and, Kawasaki City, Yokohama City, and the Tokyo Metropolitan government are also dispatching their personnel on a short-term basis. As there are some places where there is no supply of tap water, the Lao government sets a national target of making it possible to supply tap water for 70% of the area on a 24/7 basis.

Mr. Mori, JICA expert, explained that, with respect to the sewage system, a project for master plan preparation will commence from this month; for the time being, they are targeting management of septic tanks; in addition, it is desirable to install a separate sewage system, as odor from rivers has become an issue in recent years (particularly in the dry season) and, as a result of rapid urbanization, the drainage of rain water has also become an important issue. However, as such matters are of large scale, they should be dealt with by yen-loan-financed projects (Mr. Onishi, counselor).

Mr. Oshimoto, division head, MMC, explained about EV and its promotion.

→ Mr. Onishi, counselor, presented his opinion that we need to work out how to get in touch with or create an opportunity to talk directly to minister-level officials of MPWT, etc. to convince them of its effectiveness; in addition to the above, the Governor of Vientiane Capital, the Deputy Prime Minister, and so on are the ones we should consider. In addition, a question was asked about KOLAO, the would-be local dealer (in relation to the fact that it is a Korean company). Further, advice was presented that, with respect to “official vehicles,” we should keep in mind that the concept of official vehicles in Laos is different from that of Japan (they are also used for semi-private purposes; official vehicles are given to section managers and above). Someone also presented an opinion that it might be better to promote it for taxis and hotel courtesy cars.

Mr. Kuraoka of ALMEC explained about concrete implementation framework for EV promotion.

→ Mr. Onishi, counselor, proposed the necessity of preferential tax treatment, etc., and he also proposed an approach from MOE and METI.

In addition, we were introduced to Mr. Hasegawa, an expert (originally from MLIT) who is being seconded to a research institute of MPWT as an urban planning specialist.

4) The first International Workshop

[Date & time] Tuesday, October 28, 9:00-16:30

[Venue] Main meeting room, 2F Vientiane Capital government building

[Attendees] Mr. Keophilavanh, Vice Governor, and others 47 members, and 14 members of the above-mentioned visiting party

[Details]

(Opening address)

The Vice Governor gave the opening address. Expectations for this project were expressed.

(Self introduction)

Both sides, the Vientiane side and the Japanese side, introduced their side of participants.

(Presentation)

- Dr. Bangon, Deputy Director General, DONRE, Vientiane Capital
- Mr. Imai, section head, Kyoto City Environment Bureau
- Mr. Fujii, deputy section head, Kyoto City Waterworks Bureau
- Mr. Tabo, planning officer, GEC
- Mr. Kuraoka, ALMEC
- Mr. Oshimoto, division head, MMC
- Mr. Mukai, senior staff member, Hitachi Zosen Corporation

* For details of the presentation, please refer to the attached documents.

(Question & answer, opinion, etc.)

- Mr. Yuzurio of JICA made a proposal to establish a cross-ministerial/cross-agency EV project committee with MPWT as the contact office. For introduction of EV, he would like MPWT to perform a key role in considering implementation of such necessary measures as systematic support such as preferential tax measure, development of charging-related infrastructure by public agencies, public relations/enlightenment activities for citizens, etc. JICA would like to participate in further consideration concerning framework building and a model project in collaboration with MPWT.
- The Japanese side asked the Vientiane side to establish an organizing committee specializing in inter-city partnership for formation of low-carbon historical cities as an organization to promote inter-city partnership between Kyoto City and Vientiane in a comprehensive manner.
 - The Vientiane side stated that they will consider establishment of a committee to manage the inter-city partnership in a comprehensive manner and sub-committees to consider individual issues.
- The adviser to the minister, the Vientiane side, made a request that they would like to discuss road improvement and conservation of historical/cultural townscape in cooperation with the Transport Ministry as well.
- It was confirmed that, with respect to transport-related issues, it is desirable to establish a committee to manage all the traffic issues in a comprehensive manner, appointed, for example, by the Governor.
- The staff in charge, VUDAA, stated that the issue they are facing now is the waste problems; currently 250t out of 600t/day/Vientiane Capital is collected while the rest is being disposed of by each resident. It is scheduled that, as a part of JICA assistance program, 50 trucks for transport use will be provided; apart from this, they would like to expect some intangible assistance from Kyoto City concerning, for example, human resource development and enhancement of resident awareness concerning sorting of rubbish.
 - Mr. Imai, section head, Kyoto City, stated that it is important that they tackle the issue in both infrastructure development and human resource development at the same time; Kyoto City will provide necessary assistance to enable the transfer of its technologies & knowhow.
- Ms. Bangon, Deputy Director General, stated that, as the LPP program supported by JICA aid program will finish in 2015, they would like the Japanese side to consider the next assistance program; with respect to wastewater treatment project, they would like us to deal with the issue before it causes a serious problem; with regard to human resource development, they expect some assistance from Kyoto City, and they would like to also discuss a concrete project plan in the second International Committee meeting scheduled for February next year. In addition, they asked us to consider a plan for the Mayor of Vientiane Capital to visit Kyoto.

(Others)

- Trial ride of i-MiEV, an electric car, was done during lunch time.
- The schedule to hold the second International Committee meeting in February next year was confirmed.

5) VUDAA visit

[Date & time] Thursday, October 29, 9:00-10:45

[Attendees] Mr. Khampiane, Vice President, Mr. Udon, Vice President, and other three officers, and 7 members of the above-mentioned visiting party (excluding MMC, ALMEC, and Mr. Tsukahara,

Hitz)

[Details] As follows:

The VUDAA side briefed about the outline of operation, current situation, etc. based on PPT documentation as follows:

- What they do includes collection/transport of rubbish, conservation of cityscape scenery, waterway management, park management, and so on; they have an audit department.
- In relation to collection/transport, there are 9 operators, including VUDAA, in Vientiane Capital; the other 8 operators are all private companies.
- The capacity of collection/transport is 250-280t/day/66 vehicles, and the amount of rubbish is 350-400t/800,000 residents; the challenge is to increase the rate of collection.
- In charge of management of KM32, the final disposal site; approximately 50% of the site has been used up and construction of a new disposal site is required in the future.
- As they lack experts, they need to train technicians for the site.
- As the fee they charge for having rubbish collected is 15,000 Kip/t (which is very cheap), it is not enough to cover the management costs of the disposal site.
- Medical rubbish 120kg/day is disposed of using the incinerator at said disposal site (introduced by JICA assistance)
- They have a sewage sludge disposal site in said facility
(* The improvement on the final disposal site as mentioned above was carried out as a part of the LPPE project)
- They are in charge of cleaning of the City, cleaning 22 main roads, having a total length of 90 km.. The current problem is insufficient number of sprinkler trucks.
- With respect to park management work, they are not able to do it properly because of lack of equipment (for example, pruning of roadside trees).
- Managing 18 waterways for drainage, total length of 33 km; they have problems in the rainy season.

GEC gave a briefing about the outline of JCM and the objectives of the visit this time. Questions & answers and exchange of opinions took place as follows:

- They are worried about the capacity of KM32, which might not be enough, and said that they feel construction of an incinerator is necessary. However, they need assistance in terms of construction costs.
- All waste administration in Vientiane is under the jurisdiction of VUDAA; however, in terms of relationship with DONRE, they are on equal standing under Vientiane Capital.
- All the operational costs of VUDAA are covered by the budget of Vientiane Capital government. However, all the costs for collection & disposal are charged to the residents (borne by the one who generated the rubbish); the fee is 6,000Kip/20kg (one basket) and their staff collect the fee from each household monthly.
- Approximately 50% of the city rubbish is collected by VUDAA (26 collection vehicles) and the remaining 50% is collected by the other 8 companies.
- Septic tanks are voluntarily managed by each household, and management of drainage canals is outside the jurisdiction of the government (however, it seems that the major waterways are managed by VUDAA).
- The collection of night soil is implemented by the private sector and outside of government jurisdiction.

The destination of disposal is KM32 final disposal site (probably only a small percentage).

- The VUDAA side has a high expectation for staff capacity building.

6) MPWT-PTI visit

[Date & time] Wednesday, 29 October; 11:00-12:10

[Attendees] Mr. Hasegawa, JICA expert, and 6 members of the above-mentioned visiting party (excluding MMC, ALMEC, Mr. Tsukahara of Hitz, Mr. Tabo of GEC, and interpreter)

[Details]

We gathered information on the current status of development in Vientiane Capital. We obtained information concerning the land use plan map, program for historical townscape city, large-scale development plan, industrial parks, etc.

7) Chinaimo water treatment plant visit

[Date & time] Wednesday, October 29, 13:45-15:05

[Attendees] Mr. Stein, Vice President, and 8 members of the above-mentioned visiting party (excluding MMC, ALMEC, and Mr. Tsukahara of Hitz)

[Details]

Mr. Stein, Vice President, introduced their waterworks operation as follows:

- They had water facilities, a simplified system, assisted by France before 1963.
- It started as a Waterworks Bureau in 1963 thanks to Japanese ODA.
- Amount of supply: 60,000 m³ at Kaolieo and 80,000 m³/day at Chinaimo.
- The source of water for the two above facilities is the Mekong River. There are two other small facilities whose water source is the Nam Pun River.
- The turbidity of the Mekong River is high (particularly after July).
- The total amount of supply is 180,000 m³ from four plants against the amount of demand of 320,000 m³.
- The sludge after filtration & sedimentation is released to the Mekong River. They are aware that what they are doing is not very good. However, the amount of water flow of the Mekong River is so large that they think this does not have significant impact on downstream areas. Currently there is no regulation on this.
- All the electricity for the plant is supplied by EDL. They do not have their own electrical power facilities (because it is considered there will be little chance of total blackout, as it receives power supply through multiple power grids.).

After the briefing by the Vice President, we made the tour of the plant. We took a look at the filtration & sedimentation facility and water intake opening at the Mekong River.

Incidentally, Mr. Stein, Vice President, has experience of attending an AOTS (currently HIDA) training course in Japan.

8) KM32 final disposal site visit

[Date & time] Thursday, October 30, 9:50-18:00 and Saturday, March 9, 9:00-11:40

[Attendees] Mr. Bunsen (local permanent staff), Mr. Sato, Mr. Ando, Mr. Ogawa, of Kokusai Kogyo Co., Ltd.

and 8 members of the above-mentioned visiting party (excluding MMC, ALMEC, and Mr. Tsukahara of Hitz)

[Details]

Mr. Bunsen gave a brief outline of the KM32 final disposal site. In addition to general waste, they accept/dispose of medical waste and dispose of sewage sludge as well. The disposal method at the landfill site is, after throwing the rubbish into the pit, they cover the spot with soil once a year only (implemented in the dry season). Out of five pits in the site, two pits have been all used up and currently they are throwing the rubbish into the remaining three pits. The disposal of medical waste has been in operation since May 2009 using the incinerator. Further, they say that the figure 400t/day of household rubbish in Vientiane City is an estimated figure on the basis of 0.7kg/day/person.

(Site tour)

We had a site tour guided by Kokusai Kogyo. The completed landfill site (two years ago) was neatly covered with soil and weeds. At that time, they conducted a study to examine the amount of methane gas generation; however, the amount was not very large.

As the area of the disposal site for night soil is 20 meters by 20 meters or so, it seems that only a fraction of night soil is brought in from Vientiane City. They say that most of it is disposed of by the residents themselves, and some is bought by farmers. The fee for transport (disposal) of night soil is 10,000-20,000Kip/truck (depending on the size of the truck).

The disposal capacity of the incinerator for medical waste is 20kg/h. In recent years, due to increased amount brought in, the monthly disposal amount has increased to become 900 kg (September) and 1,600 kg (October). The hours of operation are 6-8 hours/day and the incineration temperature is 900-1,000 degrees C (At the time of the tour, it was 600 degrees C as it was just after the start of operation).

* After the tour of the disposal site, we had a look at a medium-size market on the way back to the City and checked the situation of market waste. It seemed that the size of the market is not very large and the amount of waste generated there was not very large either (the amount was small enough to be collected by 2t truck twice a day). They say that after sorting recyclable rubbish out at the rubbish depot in the market, the rest of collected rubbish is transported to the KM32 disposal site.

9) Visit to MONRE (section in charge of climate change measures)

[Date & time] Thursday, October 30, 15:00-16:50

[Attendees] Mr. Boun and two other officers of MONRE, Mr. Putthaxay of MPWT and 10 members of the above-mentioned visiting party (excluding Mr. Sawada of MMC, Mr. Yajima of ALMEC, and Mr. Tsukahara of Hitz)

[Details]

Mr. Boun stated that GHG reduction is ranked high in the priority list, as it is considered one of the important missions of MONRE; and a reduction plan has always been included in the development plan up to 2014. In addition, there was a part concerned with public transport policy included in the MOU with the Japanese government in 2012 mentioning promotion of EV as well. In addition, F/S concerning NAMA by the Department of Public Works and JICA has commenced in which MONRE is also involved in a significant way.

ALMEC gave a briefing on the i-MiEV introduction plan. The previous example in Luang Prabang was introduced and an explanation was given in relation to the plan this time to introduce it to official vehicles in Vientiane, targeted number of vehicles, charging facilities installation plan, etc. as well as purchase subsidy by way of JCM scheme.

MMC gave an introduction about i-MiEV. As there were questions about capacity & service life of lithium-ion batteries, price of the vehicle, etc., further explanation was given. In addition, it was mentioned that there is a high demand for larger vehicles as indicated at the time of the visit to various places and Outlander, a PHEV (plug-in highbrid), was also introduced.

Mr. Boun stated his opinion that, for proliferation of electric vehicles, further development of vehicle maintenance and parts supply system is required; and he expressed his wish that JCM project will be continued over a long period of time.

→ With respect to maintenance, etc., MMC replied that as the dealer network (= KOLAO) has increased the number of vehicles they handle, it is expected that there could be further improvement.

In addition, in relation to promotion of the purchase of official vehicles, we confirmed how many vehicles are currently used in each ministry and agency, what sorts of procedures are actually required for the purchase, who has the authority to make the purchase, etc. Further, it was confirmed that we will try to find a way to purchase the EVs as MONRE's own project and that JCM is not a project that can be continued over a long period of time.

10) Visit to Embassy of Japan in Laos

[Date & time] Thursday, October 30, 17:30-19:00

[Attendees] Embassy: Mr. Onishi, counselor; and 5 members of the above-mentioned visiting party (Mr. Oishi/Tabo of GEC, Mr. Oshimoto of MMC, and Mr. Kuraoka of ALMEC)

[Details]

We reported the result of hearing so far and received some advice for future policies.

It was pointed out that ALMEC VPI should continue to give support to the government policies and plans so that introduction of EV and PHEV can be successfully promoted.

It was proposed that, as the 8th National Socio-Economic Development Plan (SEDP), which begins in 2016, is being formulated and a direction has been issued to prepare the 10 year/20 year medium-to-long term plan, we should prepare a draft so that EV official vehicles could be incorporated into them; in addition, it might also be a good idea to mention the role of Vientiane Capital, such as an outline for introduction of low-emission vehicle for official vehicles.

Mr. Thongsing, the Prime Minister, is scheduled to visit Kyoto City in March 2015. It was proposed that we could impress MOE or METI of Japan by asking the Prime Minister to indicate that they have a plan to introduce EVs for their official vehicles.

Although it seems that there is a demand for Outlander, PHEV, I wonder if that is in line with MMC's marketing scheme? It is necessary for us to have a close look at the possibility of MRV methodology concerning PHEV.

It was pointed out that, with respect to charging facilities, as EDL is a government-funded corporation, it is necessary for us to check with MOE whether it is possible to treat it as a private company and include it in the JCM project body.

It was also pointed out that EDL has authority to use those lands that are owned by government agencies.

11) DPWT visit

[Date & time] Friday, October 31, 9:00-12:15

[Attendees] Mr. Bounchanh, Vice Director General, and two other officers of DPWT, and 12 members of the above-mentioned visiting party (excluding Mr. Sawada of MMC and Mr. Tsukahara of Hitz)

[Details]

There was a briefing by Mr. Bounchanh, Vice Director General, to the effect that they are in charge of the river system, the water and sewage system, and other works, including bus operation.

GEC gave a briefing about the outline of JCM; ALMEC and MMC gave a briefing on i-MiEV introduction plan and introduced the vehicle.

(Site tour)

It was a tour of household wastewater treatment facilities and we were shown the balancing reservoir and drainage canals in the City.

It was explained that there are two main drainage canals in the Vientiane Capital, one system for commercial facilities and the other for general households. The wastewater from these drainage canals is released to the main stream of the Mekong River after purification in a natural way through suburban wet land.

They said that, as drainage piping, 1 meter diameter ducts have been installed in some areas; however, as there are many cases where ducts have been destroyed by construction work, etc., they are not functioning properly as a duct network.

From the look of it, the water quality of the balancing reservoir did not seem to be very bad; however, how much household wastewater is flowing into it is not known. In addition, also with respect to the drainage canals in the City, although it was muddy, the smell was not so bad either; and it is not known how much household wastewater is actually flowing into it.

3. Summary

This time, we have done local coordination for introduction/promotion of electric vehicle i-MiEV and gathered local information on waste disposal and the water/sewage system with an eye on identifying F/S for the next fiscal year onward.

With respect to electric vehicles, the response from the Vientiane side was not very favorable and it was found that there are a few things for us to reconsider in relation to introduction & promotion; for example, local needs lie in larger vehicles. It seems that individual agencies/departments do not have authority to purchase their official vehicles; therefore, it was thought that, for proactive introduction, it is necessary to take top-down kinds of measures. In concrete terms, it seems that it is necessary to incorporate EV promotion into the master plan (the 8th Five Year Plan) concerning EST in which Mr. Bunta of MPWT is participating in formulation at the moment. In addition, further cooperation with KOLAO, the would-be local dealer of MMC, is critical.

With respect to waste disposal, we were able to see people's expectation to have incinerating facilities there; however, under current circumstances, it seems that the construction of such facilities would be impossible unless done by ODA. In terms of possibility of methane recovery at the disposal site etc., as the amount of waste generated there was not very large, it turned out that it is not very hopeful. I wonder if it might be possible to consider waste-based private power generation at hotels and shopping malls.

The situation is the same for sewage treatment, although a part of night soil is being transported from septic tanks to the disposal site, most of it disposed of at each household in some natural manner: therefore, we cannot expect to have a large-scale project. Rather, there is room for consideration of a proposal for wastewater disposal system at commercial facilities (motels, hotels, and so on) or, further, a project to establish domestic standards in Laos.

With respect to water treatment plants, operation is fully sourced from waterpower generation and is stable; therefore, it seems that identification of a future project is not easy at this stage.

Apart from the above, there was a request for cooperation to Kyoto City in relation to conservation of cityscape on the basis of inter-city partnership. Although it is difficult to deal with this directly through JCM scheme, it was confirmed that we will continue to consider it in a broad framework.

(3) The second International Whorkshop and field study

We visited the site from Sunday, February 1 to Friday, February 6, 2015 to hold the second International Workshop for the purpose of confirming the status of progress of this project at the Vientiane Capital side and consensus building concerning future implementation policies and so on, individual hearings with relevant government agencies to understand the local needs, tours of relevant facilities, etc. In addition to the above, we also visited the Embassy of Japan and JICA, and reported the progress so far, followed by exchange of opinions, etc.

1. Local schedule

Date	Time	Location	Details	Local participants
Sunday, February 1	-	-	(Arrival; two GEC personnel only)	-
Monday, February 2	10:00-11:30	KOLAO corporation	Coordination concerning framework of EV introduction (Tabo)	KOLAO corporation
	10:00-11:45	Kokusai Kogyo LPP-E office (inside MONRE)	Confirmation of the details of local waste management project and coordination (Tanaka)	Mr. Oda
	13:00-14:30	EDL corporation	Coordination for introduction of EV	
	15:00-16:00	MPWT	Coordination for introduction of EV (Tabo)	
	15:15-16:45	DONRE	Preliminary coordination for the second International Committee meeting (Tanaka)	Ms. Bangon (Deputy Director General), Ms. Rotchana
Tuesday, February 3	9:30-11:30	Embassy of Japan	Reporting on progress of the project Exchange of opinions regarding the EV project	[Embassy] Mr. Onishi (Counselor); Mr. Kitagawa (Second Secretary) [JICA] Mr. Yuzurio (Deputy Representative); Mr. Hirafuji
	12:00-13:15	Restaurant in the city	Coordination with JICA LPP-E project (regarding waste management)	Mr. Yuzurio (Deputy Representative); Mr. Kishigami
	13:45-15:30	DONRE	Preliminary coordination for the second International Committee meeting (Tabo, Motoda, and	Ms. Bangon (Deputy Director General)

			others)	
	13:45-15:30	VUDAA	Exchange of opinions regarding improvement on waste collection & transport (Tanaka and others)	Mr. Khampiane (Vice President); Mr. Pudon (Vice President); and two division heads
Wednesday, February 4	8:20-12:15	Vientiane Capital government office	The second International Workshop <ul style="list-style-type: none"> Confirmation of progress of the project Coordination of cooperation agreement document 	Mr. Keophilavanh (Vice Governor); Ms. Bangon (Deputy Director General), etc.
	14:00-15:15	DONRE	Confirmation of the content of the cooperation agreement document & signing	Ms. Bangon (Deputy Director General)
Thursday, February 5	9:00-9:45	Office in the city	Hearing session concerning the situation of waste collection (Hotel Restaurant Association)	Mr. Udet (President)
	10:30-11:00	Rice milling plant in the city	Preliminary study on rice husk briquette	Agent of the proprietor
	14:30-15:30	Sinohydro Corporation (plant)	Feasibility study on alternative fuel	Mr. Quin Xiaoyu
Friday, February 6	-	-	(Back to Japan)	-

2. Details and results

1) Meeting with KOLAO Corporation

[Date & time] Monday, February 2, 10:00-11:30

[Venue] KOLAO Corporation

[Attendees] KOLAO Corporation, Mr. Sawada of MMC, Mr. Yajima of ALMEC, Mr. Tabo of GEC, and interpreter)

[Details]

- Confirmed the concrete plan regarding sales and leasing of i-MiEV and Outlander in Laos with KOLAO Corporation, with which MMC has entered into a local sales & distribution agreement

2) Meeting with Kokusai Kogyo

[Date & time] Monday, February 2, 10:00-11:45

[Venue] Kokusai Kogyo local project office (3F, inside MONRE)

[Attendees] Mr. Oda of Kokusai Kogyo and Mr. Tanaka of GEC

[Details]

- With respect to the LPP-E project which JICA is implementing in Laos, we confirmed the outline of their activities in Vientiane City
- In relation to waste management, among other areas of the abovementioned project, we confirmed the details about 3R and collection & transport improvement
- Exchanged opinions regarding the compatibility with JCM project

3) Meeting with Electricite du Laos (EDL)

[Date & time] Monday, February 2, 10:00-11:45

[Venue] Main meeting room, 12F, EDL Corporation

[Attendees] Mr. xxx and three other staff in charge of the site, EDL, Mr. Sawada of MMC, Mr. Yajima of ALMEC, Mr. Tabo & Mr. Tanaka of GEC, and interpreter

[Details]

- We reported on the result of analysis on the driving logs of service vehicles collected from EDL Corporation and exchanged opinions.
- We proposed a lease agreement including regular maintenance for service vehicles including Outlander.
- It was indicated that it might be possible to obtain a decision of the President to go ahead with the contract if we present a more concrete estimation of the costs next time.

4) Meeting with MPWT

[Date & time] Monday, February 2, 15:00-16:00

[Venue] MPWT office

[Attendees] Mr. xxx of MPWT, Mr. Sawada of MMC, Mr. Yajima of ALMEC, and Mr. Tabo of GEC

[Details]

- Reported on the progress of EV project so far
- Exchanged opinions regarding concrete introduction in the future

5) Meeting with DONRE (Ms. Bangon, Deputy Director General)

[Date & time] Monday, February 2, 15:15-16:45

[Venue] The office of Ms. Bangon, Deputy Director General, DONRE

[Attendees] Ms. Bangon, Deputy Director General, Ms. Rotchana, Mr. Tanaka of GEC, and interpreter

[Details]

- Preliminary coordination concerning the second International Committee meeting
- Introduction of those facilities that use fossil fuel in Vientiane City
- Confirmation of procedures concerning joint signing for continuation of project into the future

6) Meeting with Embassy of Japan and JICA

[Date & time] Tuesday, February 3, 9:30-11:30

[Venue] Meeting room, Embassy of Japan

[Attendees] Mr. Onishi (Counsellor) & Mr. Kitagawa (Second Secretary), Embassy of Japan
Mr. Yuzurio (Deputy Representative) & Mr. Hirafuji (project formation advisor), JICA, and 10 members of the visiting party

[Details]

- Report on the status of progress of the project
- Exchange of opinions concerning future policies
- Exchange of opinions concerning use of ODA budget in relation to installation of quick. chargers for EV

7) Meeting with JICA

[Date & time] Tuesday, February 3, 12:00-13:15

[Venue] Restaurant in the city

[Attendees] Mr. Yuzurio (Deputy Representative) & Mr. Kishigami of JICA and the visiting party

[Details]

- Coordination between JCM project and LPP-E project
- Confirmation of continuity of LPP-E individual projects
- Exchange of opinions concerning possibility of JICA grass roots projects

8) Meeting with DONRE (Ms. Bangon, Deputy Director General)

[Date & time] Tuesday, February 3, 13:45-15:30

[Venue] The office of Ms. Bangon, Deputy Director General, DONRE

[Attendees] Ms. Bangon, Deputy Director General, Mr. Tabo & Mr. Tanaka of GEC

[Details]

- Final coordination concerning the second International Committee meeting joint Chairman's Summary

9) Meeting with VUDAA

[Date & time] Tuesday, February 3, 13:45-15:30

[Venue] Meeting room, VUDAA

[Attendees] Mr. Khamplane (Vice President), Mr. Pudon (Vice President), Mr. Shesock (division head), Mr. Sontaby (division head), Mr. Mukai of Hits, Mr. Shirakawa of Climate Consulting, and Mr. Tanaka & Mr. Shimizu of GEC and interpreter

[Details]

- Confirmed the needs of VUDAA side in relation to improvement of waste collection & transport in the city
- Exchanged opinions regarding concrete outcome and continuity etc. of JICA LPP-E project
- Confirmed the collection & disposal method of commercial rubbish from hotels & restaurants and markets

10) The second International Workshop

[Date & time] Wednesday, February 4, 8:20-12:15

[Venue] Main meeting room, 2F Vientiane Capital government building

[Attendees] Mr. Keophilavanh, Vice Governor, and other 44 members, and 10 members of visiting party, and interpreter

[Details]

- The Vice Governor made the opening address, etc.
- Presentation: Three topics from the Japanese side (GEC, Kyoto City, and MMC/ALMEC) and one topic from the Vientiane side (Ms. Bangon, Deputy Director General)
- Confirmed that the following challenges will be taken up as a part of inter-city partnership
 - (1) Proliferation/promotion of EV
 - (2) Reduction of use of fossil fuel such as coal
 - (3) Human resources development

(4) Establishment of steering committee at the Vientiane side

* After this workshop, we mutually confirmed the discussion & proceedings of this workshop by signing the joint Chairman's Summary (Ms. Bangon, Deputy Director General, from Vientiane side and Mr. Imai, Director of Environmental Affairs Department from Kyoto City side)

11) Visit to Hotel & Restaurant Association

[Date & time] Thursday, February 5, 9:00-9:45

[Venue] Office of a sport shop in the city (the shop operated by Mr. Udet, President of the Association)

[Attendees] Mr. Udet, President of the Association, Mr. Mukai of Hits, Mr. Shirakawa of Climate Consulting, and Mr. Motoda & Mr. Tanaka of GEC

[Details]

- Confirmed the situation of rubbish collection from hotels & restaurants in the city
- Presented a proposal concerning possibility of generation and use of bio-gas by separate collection of commercial rubbish from general household rubbish
- Confirmed that it is necessary to proceed with this project while coordinating it with VUDAA

12) Visit to rice milling plant

[Date & time] Thursday, February 5, 10:30-11:00

[Venue] Rice milling plant of Kamphaeng Phet Chungsaowan Import Export Corporation

[Attendees] Agent of the proprietor, the visiting party (8 people excluding MMC and ALMEC), and interpreter

[Details]

- Confirmed the production capacity of the rice milling facilities
- Confirmed the situation of amount of rice husks generated, etc.
- Confirmed the possibility of the use of alternative fuel by making briquettes from rice husks

13) Visit to Sinohydro (Chinese hydroelectric) Mining (Lao) Co., Ltd.

[Date & time] Thursday, February 5, 14:30-15:30

[Venue] Mining resource plant, Sinohydro Corporation

[Attendees] Mr. Qian Xiaoyu (Business Administration Department) and another staff member in charge of the site and the visiting party (8 people excluding MMC and ALMEC), and interpreter

[Details]

- Confirmed the situation of coal use
- Refining potassium chloride, sodium chloride, and magnesium chloride from the mined ore
- Eighty percent of the electricity used in the plant comes from coal fired power generation; and the steam from the boiler is used in the refining process

3. Summary

This time, following the result of field study, etc. carried out last time, we conducted a hearing with a number of stake holders and facilities concerning status of the progress of the project at the Vientiane side so far as well as,

for the purpose of identification of new future project, effective use of waste which is considered to have a high potential.

With regard to the EV project, as the talk between MMC and KOLAO Corporation, local sales agent, is going well, the negotiation with the local side is moving to the next stage where more concrete coordination regarding prices is the focus of attention. In the future, the setting of subsidy ratio would be important in case this becomes one of the projects to assist initial installation of the equipment under JCM. In addition, the response of the local people has become very favorable because we decided to include in this project, in addition to i-MiEV which is a pure electric car, Outlander PHEV, which is a plug-in hybrid car.

With respect to waste management, we tried to coordinate with the LPP-E project implemented by JICA there. Through exchange of opinions with the relevant personnel of the project in question, it was thought that, in relation to collection/transport of rubbish and 3R, the technologies/experience of Kyoto City with their proven track record in that particular field could be used in an effective manner. It was thought that effective use of waste would be promoted in an effective manner in the future by proceeding with an assistance program including training of the staff of the Vientiane side as a part of inter-city partnership.

3. Construction of the operational and maintenance management systems aiming at the formation of low-carbon historical city of Vientiane

By identifying and sorting the environmental issues Vientiane Capital is currently facing, we conducted examination and study, in cooperation with the Vientiane Capital government with participation of private companies, for a program to help with formation of the low carbon historical city which should be carried out preferentially.

Further, on the basis of the result of this study, we, under partnership between Vientiane Capital and Kyoto City, considered the preparation of a draft for the Low Carbon Historical City Formation Implementation Plan.

In addition, through these activities, we considered identification and expansion of JCM large-scale projects which contribute to the formation of the low carbon historical city of Vientiane Capital and can be implemented in the next fiscal year onwards.

3.1 Preparation of a draft for the Low Carbon Historical City Formation Implementation Plan

Towards the formation of the low carbon historical city of Vientiane Capital, we carried out those activities that are listed below. The study was implemented in the form of field study, collection & organization of existing information, hearing session etc. We are planning to share and examine, etc. the details of the study and its results at domestic task force meetings and domestic progress report meetings.

- Understanding the outline of the Vientiane Capital area
- Understanding and sorting out relevant existing laws & regulations and implementation plans
- Understanding and sorting out the needs of Vientiane Capital in relation to environmental issues and conservation of historical and cultural assets
- Consideration of a program to help with formation of the low carbon historical city which should be carried out preferentially
- Consideration of potential JCM projects for the next fiscal year onwards
- Making a proposal regarding the details of assistance program of Kyoto City

On the basis of these activities, we engaged in preparation of a draft for the Low Carbon Historical City Formation Implementation Plan with the cooperation of both cities.

3.2 Promotion of the inter-city partnership and public-private cooperation

We considered the way how to build a basic framework to facilitate transfer of Kyoto City's urban development related experience, knowledge, knowhow, technologies, and systems on the basis of inter-city partnership between Vientiane Capital and Kyoto City and through the Study for Formation of Low Carbon Historical City, while identifying the needs, at the Vientiane Capital side, required for realization of the low carbon historical city and sustainable development. In addition, by promoting information sharing with private business operators, etc. who were interested in implementing JCM projects in Vientiane Capital under the framework of the inter-city partnership between the two cities, we tried to promote further participation of private business operators and identify potential future JCM projects.

a. Hold domestic task force meetings for the cooperation

Prior to the International Committee meeting and field study, a domestic task force for cooperation consisting of Kyoto City, the undertaker of the feasibility study, other experts, and the secretariat (GEC) was established and held meetings three times in total, including the kick-off meeting and two other meetings immediately before the two International Committee meetings & field studies. At the domestic task force meetings, we discussed the study plan and study results of the Study for Formation of the Low Carbon Historical City of Vientiane Capital and JCM Project Feasibility Study on the basis of public-private cooperation and gave feedback to the study plan and study results so that we could help produce an effective outcome.

b. Hold International Committee meetings and promote human resource development for the cooperation

We held the International Committee meeting for cooperation twice at the local site attended by Vientiane Capital, Kyoto City, the undertaker of the feasibility study, academic experts, other experts from both countries, and the secretariat (GEC). At the first International Committee meeting, in addition to clarifying the inter-city partnership and public-private cooperation, we tried to help people understand the content of FY2014 study and facilitate the agreement among stakeholders. At the second International Committee meeting, in addition to mutually confirming the details and progress of the FY2014 study, we reached an agreement concerning framework building in each city towards further expansion and improvement of inter-city partnership in the future.

With respect to human resource development, we confirmed that we would proceed with the plan that contributes to the capacity building of the staff of the Vientiane Capital government so that transfer of Kyoto City's urban development related experience, knowledge, knowhow, technologies, and system could be facilitated.

c. Field study

We implemented a total of four field studies in relation to the Study for Formation of the Low Carbon Historical City of Vientiane Capital and JCM Project Feasibility Study. The field studies were conducted in consideration of human resource development of the staff of Vientiane Capital, and because these studies were also concerned with MRV, which we assumed will be implemented by Vientiane Capital in the future.

d. Domestic progress report meetings

Prior to the field study and prior to the second International Committee meeting, we held the domestic progress report meeting attended by MOE, Kyoto City, the undertaker of the feasibility study, academic experts, other experts, and the secretariat (GEC). At the domestic progress report meetings, we confirmed the progress in relation to the study plan and study results of the Study for Formation of the Low Carbon Historical City of Vientiane Capital and the JCM Project Feasibility Study, considered them on the basis of public-private cooperation, and gave appropriate feedback to the study plan and study results.

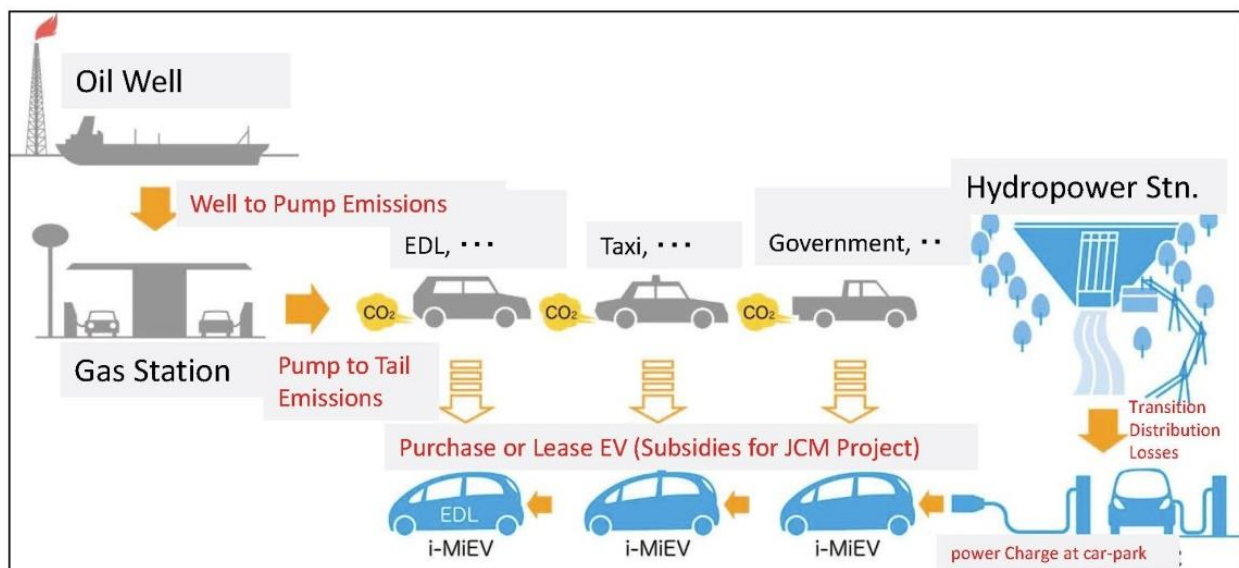
4. Implementation of the feasibility study (FS) and the creation of JCM methodology and project planning documents (PDD)

In response to the request from Vientiane Capital, the following studies were conducted in relation to traffic area and waste area, 4.1 and 4.2, respectively. In addition, assuming that the target project would be registered under JCM, we made preparations for development of JCM methodology (establishment of eligibility requirements, specification & calculation of reference emission, calculation of project emission, establishment of monitoring methodology, establishment of default value, preliminarily established value, etc. required for calculation of quantitative assessment of emissions reduction, and preparation of calculation sheet (Excel spreadsheet)) as well as creation of project planning documents (PDD). In particular, when preparing JCM methodology, we had meticulous discussion with GEC and the undertaker of the study so that we can prepare a high-standard one which would satisfy the approval criteria of the JCM joint committee. In addition, in implementing these feasibility studies, we proceeded with them in consideration that we would be using them when we prepare the above-mentioned Low Carbon Historical City Formation Implementation Plan.

4.1 Promotion of EV Usage for Company Car

(1) Outline of Project

Emissions are reduced through shift from conventional fossil fuel car to i-MiEV of MMC for company car in Vientiane City. The emission reduction mechanism is as the following;



Zero Emissions Tecnologies to be introduced: MMC's EV and EV CHAdEMO charger

■ EV



i-MiEV (upper)

Drive range : 160km/full charge

Battery capacity : 16kWh

PHEV Outlander (Lower)

Drive range 60km/EV over 800km/PHEV

Battery Capacity 12kWh

Electricity consumption rate : 5.9km/kWh

■ Electricity Charger



CHAdeMO Quick Charger(Left)

delivering up to 62.5kw of high-voltage direct current via a special electrical connector.

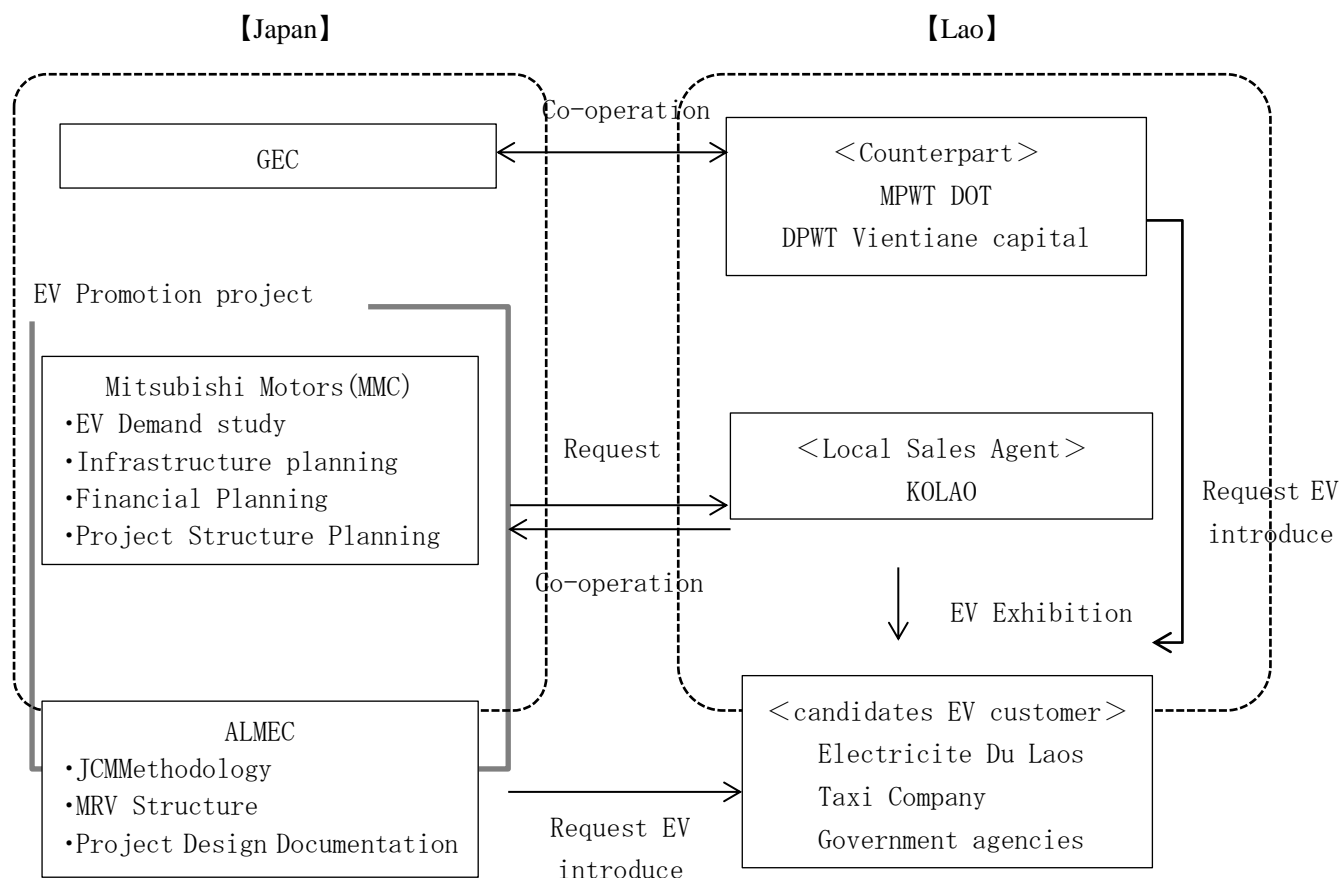
80% charge in 30 minutes

Normal Charger (Right)

8 hours to full charge for i-MiEV

(2) Study Structure

Under GEC JCM Project Survey collaborating Vientiane Capital and Kyoto City for Low carbon Historical Cities Formation, Mitsubishi Motors (MMC) and Almec conduct a survey sharing structure shown in the figure below to cooperate. Ministry of Public Works and Transport (MPWT) in Lao and Public Works Department of Transportation (DPWT) in Vientiane Capital counterpart are joined the survey as the counterpart, and set KOLAO as the local sales company.



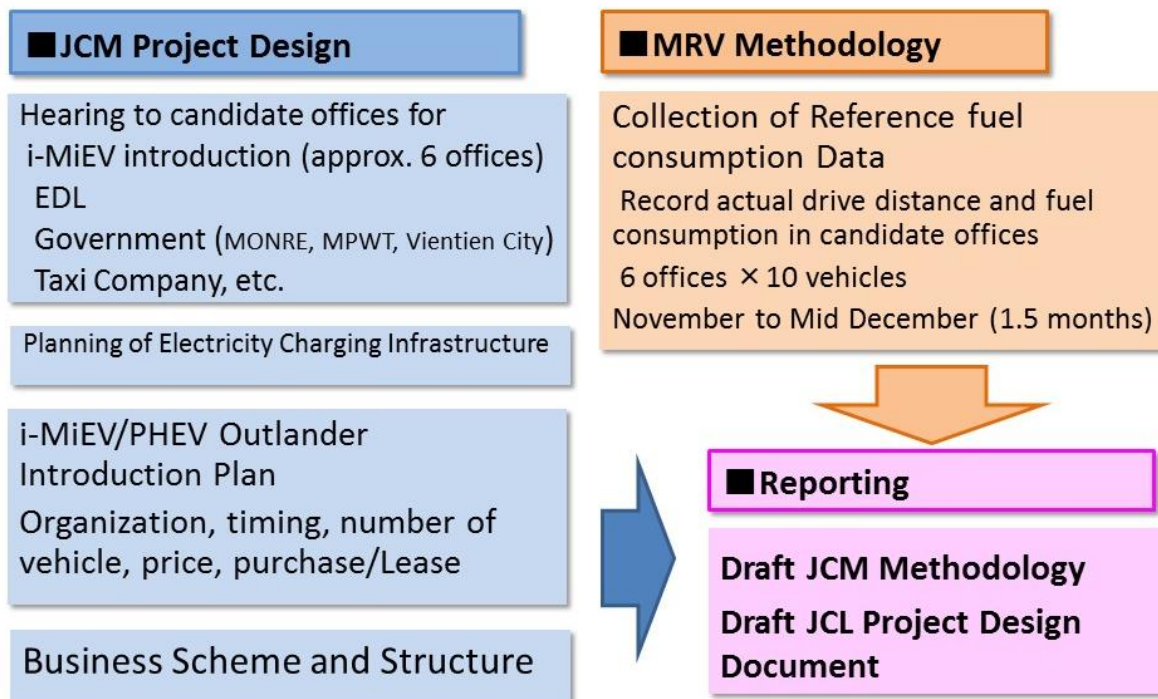
Study Schedule

Item	10(D)	11(U)	11(D)	12(U)	12(D)	1(U)	1(D)	2(U)	2(D)
Hearing									
Infra Plan									
Finance Plan									
Implementation P									
Project Struc Pl									
JCM methodology									
MRV structure									
Reporting									
Domestic WG	△			△			△		
International WG	▲							▲	
Seminner				○			○		
Site Survey	●							●	●
Outcome				IR			DFR	FR	

(3) Contents of Study Conducted

1. Outline of contents conducted

Outline of contents conducted for Study is as shown in below;



3

Study on JCM methodology Development

Develop the JCM Methodology applicable the project referring to the Guideline for PDD and Monitoring report and relevant JCM document including the methodology format. At that time, to conduct a survey especially in mind the following 1-1) - 1-4).

1-1) eligibility criteria

1-2) Calculation of reference emissions and project emissions

1-3) Default value set before project start

1-4) methodology spreadsheet (Methodology Spreadsheet)

Study on Project Design Document (PDD) Development

In accordance with PDD and monitoring reporting guidelines and related JCM documents, etc., also along the contents of the methodology that are developed in (1), to create the PDD of the project. At that time, to conduct a survey in mind the following 2-1) - 2-4).

2-1) environmental impact assessment

2-2) local stakeholder consultation

2-3) monitoring plan

2-4) calibration of measuring equipment

The work schedule and outline of the results during study period are shown in the below

September 8, 2014: 1st domestic Working Group

- Attended the national working group of "Vientiane JCM business research that will contribute to a low-carbon historical cities formation by special City, Kyoto cooperation", reporting and verification for the survey content and implementation policies and process planning, etc. (at Kyoto conference room)

October 21, 2014: 2nd domestic Working Group

- 1st International Committee of enforcement policies, announcements, check and exchanged views on the agenda, etc. (at GEC TV conference)

October 27, 2014 ~ 31, 2011: 1st field survey

- EDL as a candidate destination of electric vehicles use promotion of commercial vehicles (Laos power), MPWT, Taxi Association Vientiane, Lao PDR Ministry of Natural Resources and Environment (MONRE), and conducted a hearing to DPWT, electric vehicles as JCM business (i -MiEV) understand the introduction intention and issues, etc. (at Vientiane City companies)
- EV introduction in Vientiane, local sales, maintenance, towards the implementation of the project, in consultation with the KOLAO a local sales agent, was the understanding of the project (at Vientiane City KOLAO Inc.)
- For MRV methodology to collect the materials contribute to the setting of the reference fuel, EDL created monitoring sheets (Lao) to fill the fuel consumption data of the vehicle that is currently in use, and a hearing location, KOLAO , please MPWT, Taxi Association Vientiane, MONRE, the cooperation of fill to DPWT, distribution (at Vientiane City companies)

October 28, 2014: International Committee of the 1st

- Presentations and exchanged views on the business (at Vientiane City Hall conference room)

January 22, 2015: Survey results briefing

- Adjustment of this year's survey results of the report and the 2015 survey policy (at the Ministry of the Environment)

January 28, 2015: 3rd National Working Group

- Enforcement policies, announcements, check and exchanged views on the agenda of 2nd International Committee of etc. (at GEC)

February 1-5, 2015 : 2nd field survey

- Feb 2 10: 00-11: 30 KOLAO company monitoring results reporting, and adjusted for lease
- Feb 2 13: 00-15: 00 EDL monitoring results reporting, EV introduction request
- Feb 2 15: 00-16: 00 MPWT monitoring results reporting, current situation of official vehicles update plan
- Feb 3 9: 30-12: 00 Japanese Embassy monitoring results reporting, EV introduction promotion of status report
- Feb 3 15: 30-17: 30 JICA monitoring results reporting, EV introduction promotion of status report
- Feb 4 13: 00-14: 00 MPWT VAN information collection relating to MPWT official car update from Mr.
- Feb 4 14: 00-15: 00 MPWT status report of forest experts due to the JCM EV introduction business

February 4, 2015: 2nd International Committee

- presentations and exchanged views on the business (at Vientiane City Hall conference room)

February 23, 2015 ~ 26, 2011: 3rd field survey

- Feb 24 10: 00-11: 00 MPWT charger of introduction, exchange views on how to proceed in the future of introduction
- Feb 24 14: 00-16: 00 MPWT charger of introduction, exchange opinions on how to proceed in the future of the introduction, Vehicle price negotiations
- Feb 25 10: 00-12: 0 JICA charger of introduction, exchange views on how to proceed in the future of introduction
- Feb 25 14: 00-15: 00 Japanese Embassy charger of introduction, exchange views on how to proceed in the future of introduction

2. Study on JCM Methodology Development

By the addition of i-MiEV and PHEV Outlander as the vehicle for achieving widespread, it has become primarily required expansion H25 methodology for the following points.

- H25 methodology primarily for tuktuk (3-wheeled vehicle) was intended for business to convert to EV, the default value of the reference fuel consumption is set to mainly targeted for 3-wheel tuktuk Because this FS covered for achieving widespread of i-MiEV and PHEV Outlander, it is necessary to set additionally the default value and selection criteria of the appropriate reference vehicle.
- FY2013 methodology was intended only for EV as a project vehicle. This time of FS added PHEV as the target of the widespread, there is a need for expansion.
- In FY2013 methodology was to set the default value as a reference fuel consumption default value Option2 on the basis of the actual fuel consumption in Japan. However, this option is expected that the Option1 and Option3 is used because there is likely to be pointed out the problem from the point of view of maintainability. Option2 is not included in the methodology for methodology simplification.
- Regarding CO2 emission factor of national grid of Lao, there are two concepts that the position to zero the only domestic hydroelectric power plant as the target, a non-zero, including the CO2 emissions from fossil fuel imports power. From position to maximize the emission reductions in this FS business, which is the energy conversion business from fossil fuel to power, to create a methodology for zero balance in bilateral committee to determine the decision.

1) Eligibility Criteria

Since Small-scale CDM approved methodology AMS_III_C_ver13 is intended for vehicle conversion project from ICEV to EV and HV, we follow basically the methodology.

“This methodology is for project activities introducing new electric and/or hybrid vehicles that displace the use of fossil fuel vehicles in passenger and freight transportation.”

This methodology is applicable to projects that satisfy all of the following criteria.

Criterion 1	This methodology is applicable for project activities introducing new electric vehicles that displace the use of fossil fuel vehicles in passenger and freight transportation.
Criterion 2	<p>This methodology is applicable for project activities introducing 2-wheels, 3-wheels and/or 4-wheels or more. This methodology is not applicable to electric motor assist cycle (with pedal), but applicable for hybrid vehicles and plug-in-hybrid vehicles.</p> <p>Project participants shall demonstrate in Project Design Document that the project and reference vehicles are comparable, using the following means:</p> <p>(a) Project and reference vehicles belong to the same vehicle category e.g. motorcycle, bus, taxi, truck, tricycle;</p> <p>(b) Project and reference vehicles categories have comparable passenger/load capacity</p>
Criterion 3	<p>Project EVs must comply with the following condition ;</p> <p>a) Vehicle standards and electricity vehicle safety standard in Lao</p> <p>b) Complete vehicle registration and take out automobile insurance</p> <p>c) Sign an agreement of maintenance and vehicle disposal with car dealer or EV maintenance operator.</p> <p>Project participants shall demonstrate in Project Design Document that the project EV comply those conditions described on the above.</p>
Criterion 4	Project EVs must use electricity only supply from national grid in Lao

2) Calculation of Reference Emission and Project Emission

Calculation method of reference emission is as same as that of in FY2013 study.

F.1. Establishment of reference emissions

The reference scenario is the operation of the comparable vehicles that would have been used to provide the same level of transportation service. The comparability of reference and project vehicles should be confirmed by, for example, the seat capacity and the gross vehicle weight.

The reference emission is calculated conservatively, since the default fuel economy of option 1 is set at upper value of 90% confidence interval of the real-world fuel economy data samples, and option 2 uses catalogue fuel economy which is usually better than the real-world fuel economy.

F.2. calculation of reference emissions

The reference emission is calculated as per the equation below:

$$RE_y = \sum_i (SFC_i \times NCV_{RF,i} \times EF_{RF,i} \times DD_{i,y} \times N_{i,y})$$

Where:

RE_y Total reference emissions in year y (tCO₂)

SFC_i Specific fuel consumption of reference vehicle category i (l/km)

$NCV_{RF,i}$ Net calorific value of fossil fuel consumed by reference vehicle (MJ/l)

$EF_{RF,i}$ Emission factor of fossil fuel consumed by reference vehicle (tCO₂/MJ)

$DD_{i,y}$ Annual average distance travelled by project vehicle in the year y (km)

$N_{i,y}$ Number of operational project vehicles in category i in year y

Project emissions corresponding to extension to the HV / PHEV, add the emissions from fossil fuel combustion by project vehicle. This extension follows the small-scale CDM approved methodology AMS_III_C_ver13. Project emissions will include power consumption and fossil fuel according to the project operation, calculated as follows.

$$PE_y = \sum_i (SEC_{PJ,i,y} \times EF_{elect,y} / (1 - TDL_y) \times DD_{i,y} \times N_{i,y}) + \sum_i (SFC_{PJ,i} \times NCV_{PJ,i} \times EF_{PJ,i} \times DD_{i,y} \times N_{i,y})$$

Where:

PE_y Total project emissions in year y (tCO₂)

$SEC_{PJ,i,y}$ Specific electricity consumption by project vehicle category i per km in year y in urban conditions (kWh/km)

$EF_{elect,y}$ CO₂ emission factor of electricity consumed by project vehicle category i in year y (tCO₂/kWh)

TDL_y Average technical transmission and distribution losses for providing electricity in the year

$DD_{i,y}$ Annual average distance travelled by the project vehicle category i in the year y (km)

$N_{i,y}$ Number of operational project vehicles in category i in year y

$SFC_{PJ,i}$ Specific fossil fuel consumption by project vehicle category i per km in year y in urban conditions (l/km)

$NCV_{PJ,i}$ Net calorific value of fossil fuel consumed by project vehicle category i (MJ/l)

$EF_{PJ,i}$ CO₂ Emission factor of fossil fuel consumed by project vehicle category i (tCO₂/MJ)

Since all power plants to be connected to Laos of system power is hydroelectric power plant, when the $EF_{elect,y} = 0$, Project emissions is calculated as follows;

$$PE_y = \sum_i (SFC_{PJ,i} \times NCV_{PJ,i} \times EF_{PJ,i} \times DD_{i,y} \times N_{i,y})$$

3) Default value set before project start

The specific fuel consumption for vehicle category i (SFC_i) shall be determined in order of the following two options considering applicability and appropriateness for the proposed project. Basically, in Lao PDR, option 1 shall be applied, however, specifically for passenger car, option 2 3 can be applied in case it is considered appropriate.

Option (1): Conservative default values based on field measurements

In FY2013 study, conservative values based on measurements of actual fuel consumption by vehicle categories were set as shown in the following table ;

Table Conservative default values based on field measurements ($1/SFC_i$)

Vehicle types	Fuel economy (km/liter)
Motor bike	57.6
Tuk-Tuk	14.2
Jumbo	35.5
Passenger car	10.24

Fuel consumption monitoring survey was carried out for passenger in the offices in Vientiane. As the purpose of the survey is to improve the estimation accuracy of default value of the passenger car fuel consumption, other motorcycles, tuktuk, jumbo accept the last year settings.

Table The number of samples for the reference fuel consumption settings

	Distribute	Collect
DPWT	10	5
KOLAO	10	10
Taxi Assoc.	10	4
EDL	50	46
Total	80	65

The table below shows the average fuel consumption, annual mileage and 95% of the sample value of the day mileage for each office.

Table for DPWT

	km/l	km/year	km/day(95%)
1	11.1	17,040	124
2	10.2	13,645	119
3	11.7	17,425	381
4	14.3	10,822	90
5	11.4	6,661	66
Average	11.7	13,119	156

Table for EDL

	km/l	km/year	km/day(95%)
1	10.3	11,230	51
2	8.8	7,294	33
3	7.5	3,430	55
4	9.8	11,193	63
5	11.1	7,294	173
6	9.2	17,508	55
7	8.6	6,973	29
8	8.1	6,363	31
9	9.2	8,332	20
10	11.7	5,244	75
11	9.5	12,353	47
12	6.0	4,720	29
13	11.4	5,236	91
14	8.2	10,598	42
15	11.4	9,301	77
16	5.1	10,755	166
17	9.5	18,779	31
18	11.0	5,262	44
19	8.6	12,429	69
20	11.1	13,044	49
21	10.5	6,205	118
22	7.0	19,150	21
23	11.1	2,788	175
24	10.0	13,858	21
25	10.2	4,323	50
26	6.2	8,498	126
27	11.3	9,207	42
28	10.1	7,215	39
29	11.5	12,187	76
30	11.4	8,322	33
31	10.9	7,715	168
32	7.9	16,790	26
33	10.1	6,138	26
34	7.6	4,179	21
35	10.9	12,192	120
36	9.5	6,941	66
37	9.0	8,158	49
38	5.1	17,848	90
39	11.3	12,888	175
40	8.3	15,972	64
41	12.1	21,949	362
42	4.8	11,460	128
43	10.8	4,155	21
44	11.1	22,460	123
45	11.6	12,436	93
46	14.9	21,642	102
Average	9.5	10,230	77

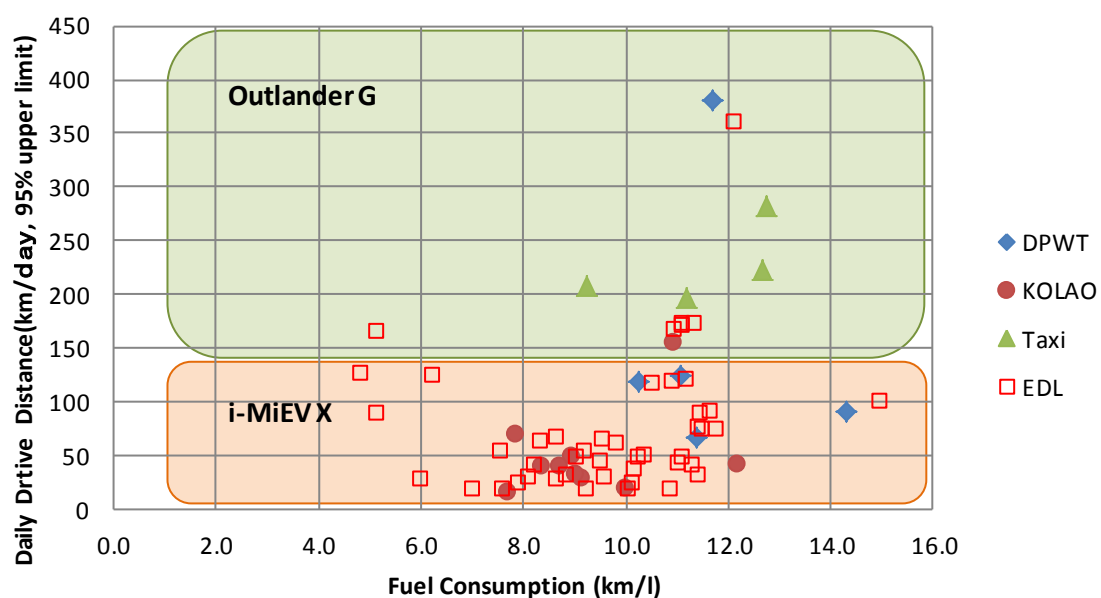
Table for KOLAO

	km/l	km/year	km/day(95%)
1	7.8	9,490	71
2	8.9	6,345	49
3	10.9	11,747	156
4	10.0	4,137	20
5	9.1	4,824	30
6	7.7	3,315	16
7	8.3	5,201	40
8	9.0	6,023	33
9	8.7	6,436	40
10	12.1	9,405	43
Average	9.3	6,692	50

Table for Taxi Association

	km/l	km/year	km/day(95%)
1	11.2	36,626	197
2	12.7	39,785	282
3	12.7	29,917	222
4	9.3	34,260	208
Average	11.5	35,147	227

Table Summary of Monitoring Results (Fuel Consumption and daily mileage)



The followings are Reliability calculation process according to CDM-EB67-A06-GUID, Guideline, Sampling and surveys for CDM project activities and programs of activities, Version 03.0, APPENDIX 4. BEST-PRACTICE EXAMPLES FOR RELIABILITY CALCULATIONS.

Reliability Calculation

The followings present how to estimate a numeric parameter and a proportion and how to check their reliability. The sampling method used is simple random sampling. The project is categorized as small-scale project activities, where the required reliability criteria is 90/10, i.e. 90% confidence and 10% precision.

If calculations are being performed manually, it is important to retain as many decimal places as relevant, until the final calculated figure is reached. Rounding can then be carried out. To emphasize this, the calculations presented here use figures to several decimal places.

We estimate the average fuel consumption of the population from all 66 samples obtained of this monitoring result. National passenger car number 270,000 units in 2015, multiply 10% as national ratio of Vientiane population, estimate 27,000 units of passenger car number in Vientiane. 65 units of average fuel consumption and average mileage data in the simple random sampling from the population were obtained. The average fuel consumption of the entire population is estimated to be equal to 65 units of sample mean 9.81km / l. Conservative upper limit 10.24km / L of 90% confidence interval for estimating the reference fuel consumption of the reference vehicle.

Confidence, precision and reliability

Instead of presenting just a single estimate, it is better to summarize the results of sampling using a confidence interval. In this study the 90% confidence interval is 9.40 to 10.24 km/l. We are 90% sure that the true population mean value for average usage of reference fuel consumption is between 9.40 and 10.24 km/l. Whilst the sample mean is the estimate that will be used in calculations, it is always advisable when presenting it in a report to do so along with its confidence interval. The 90% confidence interval for the population mean is given by the equation: sample mean \pm t-value \times standard error of the mean. The estimate of 9.81km/l is regarded as reliable if the precision of the study as defined by the t-value \times standard error of the mean . is within the pre-specified reliability precision. For small-scale mechanisms this is 10% of the mean. Detailed calculations are presented below. In this example the precision is 4.3% of the mean and so the sample estimate of 9.821km/l is within the required specification.

Table population average estimate and reliability study

	Basic statistics		Average Fuel consumption (km/l, 90% confidence interval)		
				km/l	l/km
. Average	平均	9.821			
. Standard error	標準誤差	0.253	Upper	10.24	0.098
Median (median)	中央値 (メジアン)	10.094	Lower	9.40	0.106
. Mode (mode)	最頻値 (モード)	–			
Standard deviation	標準偏差	2.038			
. Variance	分散	4.152			
. Kurtosis	尖度	0.442			
. Skewness	歪度	–0.331			
. Range	範囲	10.141			
. Minimum	最小	4.806			
Maximum.	最大	14.947			
. Total	合計	638.393			
. Number of sample	標本数	65.000			
. Confidence interval (90.0%)	信頼区間(90.0%)	0.422			
	t-value	1.669013			
	Precision	0.421848			
	the ratio	4.3% less than		10%	

Option (2): Catalogue values provided by manufactures

We estimate using the fuel consumption derived from the manufacturer's specifications equivalent vehicles that are generally common in the project area. The following table is a value that is set in the FY2013 CDM methodology demonstrated study. Since it is considered that there is no significant change as a catalog fuel, as it is used in this study.

Table Catalogue value of Reference vehicle fuel consumption

	Fuel Consumption (km/liter)
Motorbike	53.6
Tuktuk	23.6
Jumbo	35.5
Passenger car	17.3

The reference fuel consumption setting method of AMS_III_C_ver13 is as follows for the reference.

The specific fuel consumption for vehicle category i (i SFC) shall be determined using either of the two following options:

Option (1): Sample measurement

Measure the actual fuel consumption rate of a representative sample of vehicles, for each vehicle category identified for highway driving. Vehicle categories shall be determined conservatively and be based on the fuel type used, the vehicle category, engine model year, power rating, passengers/load capacity auxiliary equipment

(e.g. with and without air conditioners) and other relevant factors to distinguish vehicles with different fuel consumption rates. Sample vehicles shall be randomly chosen in accordance with the latest version of the .General guidelines for sampling and surveys for small-scale CDM project activities. using a 90% confidence interval and a +/- 10% error margin to determine the sample size. The lower bound of 95% confidence interval shall be used as the Specific Fuel Consumption.

Option (2): Top 20% of the comparable vehicles used for public/private transportation

The specific fuel consumption for comparable vehicles is estimated by using the specific fuel consumption for highway driving obtained from manufacturer.s specification of the top 20% of vehicles operated/used for public/private transportation in the project region. The $BL\ km\ i\ EF$, , and $y\ BE$ shall be calculated for each vehicle category associated with the project activity.

Setting the Fuel consumption for plug-in hybrid vehicle

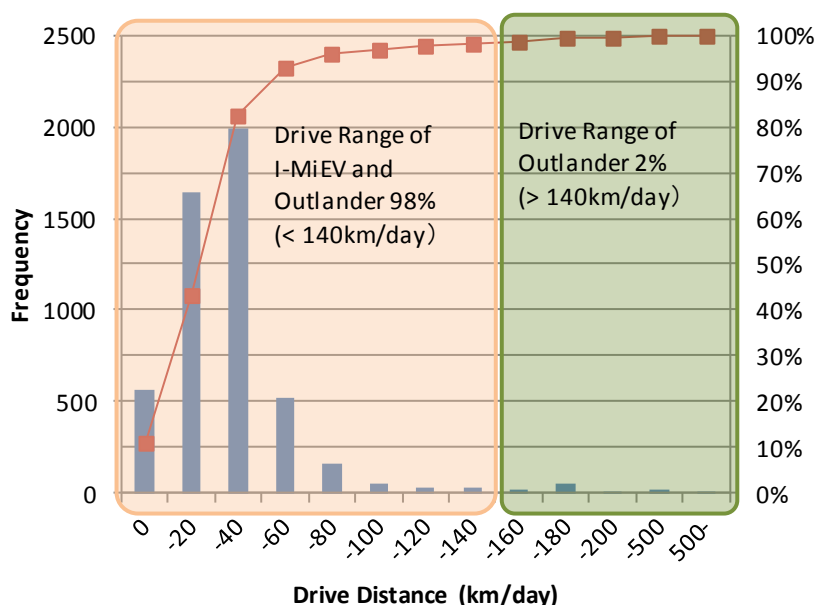
The project emission for i-MiEV which is one of the target vehicle to promote diffusion in the project is pure electric vehicle can be calculated from $\text{mileage} \times \text{electricity consumptions} \times \text{electricity emission factor}$. Also since electricity power in Lao is generated from hydroelectric, the power emission factor and Project emissions are always zero, so that there is no need for consideration of pre-setting and monitoring.

On the other hand, Outlander plug-in hybrid vehicle is an electric vehicle mode, the travels while switching a hybrid vehicle computer mode, to discharge the consumed CO2 fossil fuels. Therefore mileage and fuel economy of a hybrid mode is required. However, it is difficult to divide the total travel distance for each travel distance of the EV mode and HV mode. So, mileage distribution day of the 65 samples \times 2 months due to the monitoring results are considered a standard day mileage, to set the fossil fuel consumption per total mileage of the combined EV and HV mode.

The traveling 52km in electric car mode in the catalog of the Outlander, then becomes a hybrid mode, hybrid fuel consumption rate (JC08 mode) is a 18.6km /l. 52km is EV mode of the day traveling distance as to charge every morning, and the rest is to calculate the fossil fuel cost ratio as HV mode.

Daily mileage less than 40km per day is 82%, as shown in the figure below, it accounts for approximately 88% the day of less than 52km. About nearly 90% of the day is completed in only EV mode.

Table Summary of Monitoring results
(Daily drive range distribution of EDL 45 samples)



For reviews about 2700 day mileage data of EDL45 samples of the daily driving during two months, within 52km and more than 52km in driving distance extension are aggregate.

Sun mileage 52km within driving distance extension 60,277km (84.14%)

Sun mileage in excess of 52km minute of mileage extension 11,992km (15.86%)

45 specimens of the day mileage total 71,635km (100%)

Thus, the average fuel consumption is a $18.6\text{km} / 1 / 15.86\% = 117.3\text{km} / 1$.

In addition, the average annual mileage which was estimated from the traveling distance of two months of all 65 specimens, is 11,617km.

4) Monitoring Item and frequency

Parameter	Item, Unit	Monitoring method/ Item
$DD_{i,y}$	Annual average distance driven by project vehicle i in year y (km/yr)	Measure the annual average distance driven by the project vehicles through: Option (A): monitoring of all vehicles or Option (B): representative sample survey of vehicles for each vehicle category. Sample vehicles shall be chosen in accordance with the latest version of the .General guidelines for sampling and surveys for small-scale CDM project activities. using a 90% confidence interval and a +/- 10% error margin to determine the sample size. The lower bound of 95% confidence interval shall be used as the annual distance travelled.
$SFCPJ \text{ km } i \text{ y}$	Consumption of specific fossil fuel consumption per km per project vehicle category i in	Measure the specific fossil fuel consumption through: Option (A): monitor consumption of all project vehicles or

	year y (g/km and kWh/km)	Option (B): measure the amount of fossil fuels consumed per km travelled for a representative sample of each vehicle category. Sample vehicles shall be randomly chosen using a 90% confidence interval and a +/- 10% error margin to determine the sample size. The upper bound of 95% confidence interval shall be used for the specific fuel/electricity consumed. Cross-checked against vehicle specifications (kWh/km) for urban conditions provided by the manufacturers and use the most conservative of the two values.
$NCVPJ\ i$	Net calorific value of fuel i (J/g)	Country specific data or IPCC default value
$EFPJ\ i$	CO2 emission factor of fuel used by vehicles category i (gCO2/J)	Country specific data or IPCC default value
$N_{i,y}$	Number of project vehicle in operation in year y	Establish the number of the project vehicles in operation through: Option (A): based on annual sales records or official data on registered project vehicles cross-checked against the results from a representative sample survey vehicles to determine the percentage of vehicles in use or Option (B): based on annual sales records or official data for registered project vehicles, multiplied by the default factor 0.9 ^t , where t is year counter for the number of years since the vehicle was introduced (for example: if n vehicles are sold in year 1, in year 2 the number of vehicles still in operation are assumed to be equal to $n*0.9$, and in year 3, $n*0.92$ etc)

5) Calculation of Emission Reductions (or quantity of JCM Credit)

The project emission is calculated as per the equation below:

$$ER_y = RE_y - PE_y$$

$$= \sum_i (SFC_i \times NCV_{RF,i} \times EF_{RF,i} \times DD_{i,y} \times N_{i,y}) - \sum_i (SFC_{PJ,i} \times NCV_{PJ,i} \times EF_{PJ,i} \times DD_{i,y} \times N_{i,y})$$

Since fossil fuel consumed by reference vehicle is considered the same as fossil fuel consumed by the project vehicles, the equation is expressed in simple manner as follows:

$$ER_y = \sum_i \{ (SFC_i - SFC_{PJ,i}) \times NCV_{PJ,i} \times EF_{PJ,i} \times DD_{i,y} \times N_{i,y} \}$$

ER_y Emission reductions in year y (tCO₂/year)

RE_y Reference emissions in year y (tCO₂/year)

PE_y Project emissions in year y (tCO₂/year)

3. Study for JCM Project Design Document (PDD) Development

1) Environmental Impact Assessment

Project to introduce electric vehicles have basically no impact to environmental. However, battery recycling system is necessary to recycle the battery after scrap.

In particular, lead battery is low and is about 300 times the number of charges, also waste amount increases because charge density is small. Further, since the lead in the battery fluid is likely to cause soil pollution, there is a need for recycling. Recycling method, EV purchaser at the time of purchase will buy a battery recycling ticket, keep standing in the vehicle. By presenting the recycle ticket bringing the vehicle to a dealer at the time of scrap, dealer shall recover the battery. Dealer can properly store the waste battery, a few times a year, to request the recovery in the battery manufacturer or battery recycling companies. It was during this period of record keeping, to keep to organize material so that it can be presented at any time during the administrative agency inspection. These procedures as well as institutionalization, to incorporate publication, also grant of authority of administrative penalties such as business stop instruction for violators. Body side is the same procedure as scrap processing of a general automobile.

Lithium-ion battery, because even charge capacity after scrapped holds about 80% of the new, because it is available with a stationary battery in the energy management system, put in recovery network through the dealer.

2) Stakeholders Consultation

Summary of comments received and their consideration are shown in the table below:

Stakeholders	Comments received	Consideration of comments received
MPWT	<p>Prime Minister Directive is necessary to introduce.</p> <p>The renewal program of Government cars are developed in some departments. But no progress due to the limited budget.</p>	<p>Issues for introduction EVs</p> <p>1) No preferential treatment policy for EV purchase and tax exemption/reduction</p> <p>2) Many pickups are in use for government cars. Small but smart i-MiEV is limited to replace the pickups in view of driving range and the size. → MMC's PHEV Outlander, bigger in size and longer in drive range is more acceptable for candidates.</p> <p>3) The investor for electricity charging equipment and the location of the installation.</p> <p>Actions to resolve the issues</p> <p>1) Consult to JICA about the approach to adopt the policy of preferential treatment for EV introduction and tax exemption by Prime Minister's Office, Ministry of Finance, and MPWT</p> <p>2) Proposal for MPWT, Vientiane Capital Governor's office and EDL to adopt old official use vehicles renewal program. Request to claim the cost for EV purchase and charger installation in next fiscal year budget</p> <p>3) Survey to government vehicles to find out the old vehicles possible to replace to i-MiEV and PHEV Outlander.</p> <p>4) Specific business plan including lease price and the other conditions to be established in consultation with local sales</p>

		company KOLAO. The plan will be presented to candidates and re-request the EV introduction
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EDL: Electricite du Laos

MPWT: Ministry of Public Works and Transport

MONRE: Ministry of Natural Resources and Environment

DPWT: Department of Public Works and Transport Vientiane Capital

Issues for Introduction EVs

- 1) No preferential treatment policy for EV purchase and tax exemption/reduction
- 2) Many pickups are in use for government cars.

Small but smart i-MiEV is limited to replace the pickups in view of driving range and the size.

→ MMC's PHEV Outlander, bigger in size and longer in drive range is more acceptable for candidates.

- 3) The investor for electricity charging equipment and the location of the installation.

Actions to resolve the issues

- 1) Consult to JICA about the approach to adopt the policy of preferential treatment for EV introduction and tax exemption by Prime Minister's Office, Ministry of Finance, and MPWT
- 2) Proposal for MPWT, Vientiane Capital Governor's office and EDL to adopt old official use vehicles renewal program. Request to claim the cost for EV purchase and charger installation in next fiscal year budget
- 3) Survey to government vehicles to find out the old vehicles possible to replace to i-MiEV and PHEV Outlander.
- 4) Specific business plan including lease price and the other conditions to be established in consultation with local sales company KOLAO. The plan will be presented to candidates and re-request the EV introduction



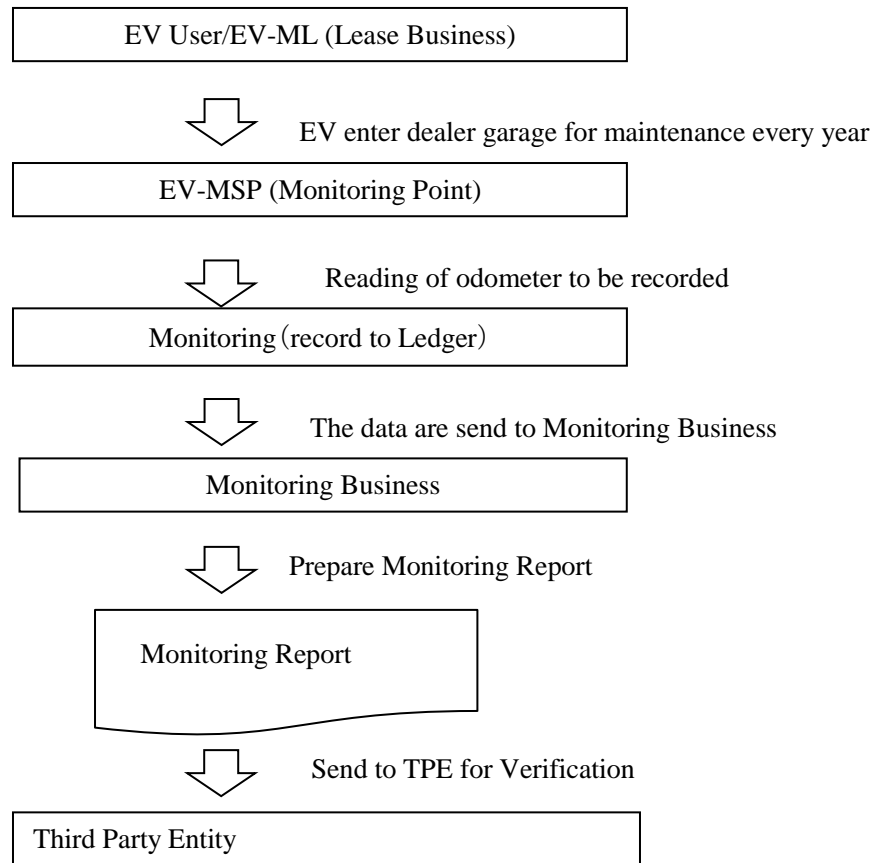
Participants to 1st Bilateral Meeting on 2014/10/25
(at Entrance of Governor Office)

In the 2nd field survey Study team presents a concrete plan of EV / PHEV introduction to candidate operators in order to confirm the introduction intention.

EDL indicates the introduction intention, and request to study team to create and present the specific introduction plan.

3) Monitoring Plan

(a) Monitoring Structure



Monitoring Structure

(b) Required personnel, equipment, cost

- EV maintenance service center that becomes the monitoring point, since it is a feasible business in the record such as the normal service of reading of odometer, special personnel for monitoring, equipment, cost is not required.
- Monitoring operators, to learn by using the expert-created manual how to create a monitoring report.
- No difficulty since only monitoring report itself is input into a spreadsheet it is prepared, but it is necessary to compile and analyze the project EV ledger for proof of compliance with the eligibility requirements. In addition, there is a need for capacity development to a level that can determine the precise correspondence to withstand validated against unexpected events. Monitoring costs and base to be received from the host project (International Consortium).
- Project host (International Consortium), which it is basic to appropriated payment monitoring expenses JCM credit, since the time being is not a tradable credit, it is necessary to separately procured.

(c) The required forms of design

The following forms are designed and used for monitoring.

1) Project EV ledger

- models
- model number (both photos)
- key specifications
- Country of origin
- manufacturer
- seller · EV maintenance lease operators
- EV maintenance service provider name
- sale conditions (quality guarantee period, etc., battery recycling, scrap procedure agency, etc.)
- registration number
- owner (name, address, contact information)
- use headquarters
- project participants date and exit date
- mileage history
- charge (power consumption) history (if necessary)
- annual emission reductions history
- presence or absence of registration of the car found the international traffic (proof)

2) Project the number of vehicles breakdown (by vehicle type, by Type, by owner, by new registration date)

3) By model year mileage summary table (by model number, by the average annual mileage for both models)

4) Scrapped list

(d) Calibration of measuring equipment

Consider in the future for monitoring instrumentation, and to investigate the calibration.

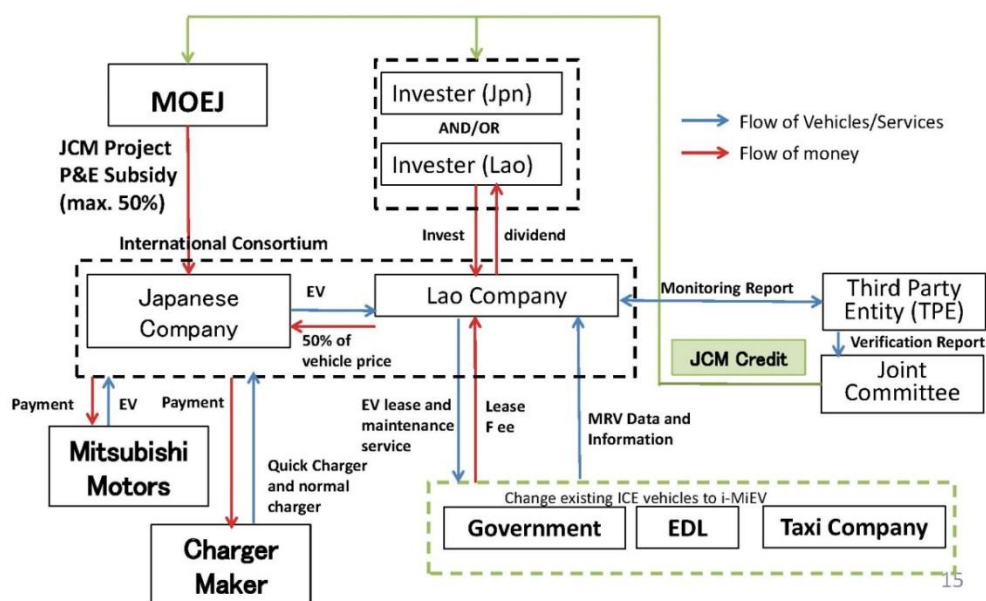
4. Study for realize the project

1) Project Plan

(a) Business Structure

Japanese car leasing company or trading company and local EV leasing company (KOLAO) form an international consortium, with the help of JCM project equipment subsidy to lease an EV to companies and government agencies. Monitoring as a JCM business shall be conducted by a local car leasing company, through the verification of third-party organization, Ministry of the Environment in Japan and investors to get the credit. After equipment subsidy businesses international consortium shall continue the JCM · EV sales business.

Draft JCM Business Structure



The conditions of JCM equipment subsidy especially for members of international consortium are requested to the Ministry of the Environment in Japan to clarify.

- Lease company can be representative operators or local side member of the consortium.
- However, subject to being the member of consortium by the car user (who perform CO₂ reduction, such as government agencies, taxi companies and son on) .

2) Finance Plan

The outlines of the project are as follows:

Outline of JCM Project

■ Target of Equipment to be introduced

i-MiEV: 20 units PHEV Outlander: 30 units (Total) 50 units
(25 units each in FY2015 and)

Quick Charger: 4 units Normal Charger: 50 units

■ Project Cost (approx.)

US\$ 3 million

Schedule to Business

If FY2014 FS results feasible for JCM,

- FY2015: Create business structure and raise necessary funds
Receive subsidy from MOEJ (max. 50% of initial investment)
Start JCM project introducing **25 EVs**
- FY2016: Introduce **25 EVs** (2nd phase)
- FY2016~ : MRV and claim JCM Credits
- FY2018~ : New JCM Business Scheme to promote EV usage without MOEJ subsidy shall be established

Item	2014				2015				2016				2017				2018~			
	1q	2q	3q	4q	1q	2q	3q	4q	1q	2q	3q	4q	1q	2q	3q	4q	1q	2q	3q	4q
JCM Feasibility Study (FS)																				
JCM Project subsidy for Plant and Equipment Introduction																				
JCM Credits																				
New JCM Business scheme without JMOE subsidy																				

■ GHG Emission Reductions

	2015	2016	2017	2018	2019	2020	total
Project Cost (million USD/ year)	1.5	1.5					3.0
Reference emissions(tCO ₂ /y)		52	104	104	104	104	468
Project emissions (tCO ₂ /y)		3	6	6	6	6	27
Emission Reductions (tCO ₂ /y)		49	98	98	98	98	441

Proposed Methodology Spreadsheet (input sheet) [Attachment to Proposed Methodology Form]

Table1: Parameters to be monitored *ex post*

(a) Monitoring point No.	(b) Parameters	(c) Description of data	(d) Estimated Values	(e) Units	(f) Monitoring option	(g) Source of data	(h) Measurement methods and procedures	(i) Monitoring frequency	(j) Other comments
(1)	DD _{i,y}	Annual average distance travelled by project vehicle category i in year y	11,618	km/year	Option B	Operator	Based on odometer or GPS	once a year	
(2)	N _{PJJ,y}	Number of operational project vehicles in category i in year y	30 (I-MIEV) 20 (PHEV Outlander)	Unit	Option B	project vehicles inventory	Collecting purchase amount from retailer invoices and inputting to a spread sheet manually	once a year	
Under the case where the grid emission factor is significant low, simplified method can be applied for calculation of emission reductions without monitoring the following parameters <i>ex post</i>									
(3)	SEC _{PJJ,y}	Sepecific electricity consumption by project vehicles category i per km in year y in urban conditions	0	kWh/km	Option C		Collecting elctricity consumption data with validated/calibrated electricity monitoring devices and inputting to a spread sheet electrically	continuous	
(4)	EF _{elect,y}	CO2 emission factor of electricity consumed by project vehicle category i in year y	Nil	tCO2/kWh	Option A	EDL	calculate using the data in the current version of EDL electricity Statistics	once a year	
(5)	TDL _y	Average technical transmission and distribution losses providing electricity in year y	Nil	%	Option A	EDL	calculate using the data in the current version of EDL electricity Statistics	once a year	
(6)	SFC _{PJJ,y}	Sepecific fuel consumption by project vehicles category i per km in year y in urban conditions	117.3	km/L	Option B		Catalogue data and daily drive distance of EDL passenger cars are combined and estimate the total guel consumption including EV and HV modes.	continuous	

Table2: Project-specific parameters to be fixed *ex ante*

(a) Parameters	(b) Description of data	(c) Estimated Values	(d) Units	(e) Source of data	(f) Other comments
NCV _{RF,i}	Net Calorific value of fossil fuel consumed by reference vehicle category i	31.48	MJ/l	a) Value provided by the fuel supplier b) Regional or national default value c) IPCC default values as provided in Table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories	The parameter is used for baseline as well as project emissions and vehicle owners or operators can buy fuel from a variety of sources (fuel stations). In practice therefore it is considered to be simpler to determine the parameter using options (b)
EF _{RF,i}	CO2 emission factor of fossil fuel consumed by reference vehicle category i	0.0693	kgCO ₂ /MJ		
SFC _i	Specific fuel consumption of reference vehicle category i	0.0267 (jumbo) 0.0171 (motorcycle)	L/km		
				Option (1) : Consevative default values based on field measurement Option (2) : Consevative default values based on existing data Option (3) : Catalogue values provided by manufactures	Control group vehicles are set before project start

Table3: *Ex-ante* estimation of CO₂ emission reductions

CO ₂ emission reductions	Units
97	tCO ₂ /y

[Monitoring option]

OptionA	Based on public data which is measured by entities other than the project participants (Data used: publicly recognized data such as statistical data and specifications)
OptionB	Based on the amount of transaction which is measured directly using measuring equipments (Data used: commercial evidence such as invoices)
OptionC	Based on the actual measurement using measuring equipments (Data used: measured values)

Proposed Methodology Spreadsheet (Calculation Process Sheet) [Attachment to Proposed Methodology Form]					
1. Calculations for emission reductions		Fuel type	Value	Units	Parameter
Emission reductions during the period of year y			97	tCO ₂ /y	ER _y
2. Selected default values, etc.					
Use of the default net calorific value of fuel type x			Yes		NCV _i
Use of the default carbon emission factor for fuel type x			Yes		EF _{CO₂,i}
Use of the default referential fuel consumption of vehicle category i			Yes		SFC _i
Use of the default project electricity consumption of vehicle category i			Yes		SEC _i
3. Calculations for reference emissions					
Reference emissions during the period of year y			104	tCO ₂ /y	RE _y
5:Personal Car	Gasoline				
	Referential fuel consumption of vehicle category i		0.0820	L/km	SFC _i
	CO ₂ emission factor for fuel type x		0.0693	kgCO ₂ /MJ	EF _{RF,i}
	Net Calorific value of fuel type x		31.4800	MJ/l	NCV _{RF,i}
	Annual average distance travelled by project vehicle		11,618	km/y/unit	DD _{i,y}
	Number of operational project vehicle category i		50	unit	N _{RF,i,y}
	CO ₂ emission		104	tCO ₂ /y	RE _y
4. Calculations of the project emissions					
Project emissions during the period of year y			6	tCO ₂ /y	PE _y
5:e-Personal Car	Gasoline				
	Project elctricity consumption of vehicle category i		0.0085	L/km	SEC _{PJ,i}
	CO ₂ emission factor for fuel type x		31.5	MJ/l	-
	Average technical transmission and distribution losses		0.0693	kgCO ₂ /MJ	EF _{elect,y}
	Annual average distance travelled by project vehicle		11,618	km/y/unit	DD _{i,y}
	Number of operational project vehicle category i		30	unit	N _{PJ,i,y}
	CO ₂ emission		6.5	tCO ₂ /y	PE _y

[List of Default Values]

Net calorific value of fuel type	Value	Units
Gasoline	31.48	MJ/l
Diesel	37.70	MJ/l
LPG	50.80	MJ/kg
Natural gas	43.50	MJ/Nm ³
Electricity	1.00	-

CO ₂ emission factor for fuel type	Value	Units
Gasoline	0.0693000	kgCO ₂ /MJ
Diesel	0.0687000	kgCO ₂ /MJ
LPG	0.0599000	kgCO ₂ /MJ
Natural gas	0.0510000	kgCO ₂ /MJ
Electricity	0.1540000	kgCO ₂ /kWh

[Monitoring]

5:Personal Car		
Gasoline	0.0820	L/km
Diesel		L/km
LPG		Nm ³ /l
Natural gas		kg/km
Electricity	0.1200	kwh/km

4.2 Generation & use of biogas from source-separated organic waste

As a preliminary study on the amount of generation and composition of general waste, we visited the local JICA office, Embassy of Japan, and JETRO separately and conducted hearing sessions. In addition, concerning the current status of waste disposal and waste disposal technology, we visited the relevant local agency and target facility, VUDAA, and the waste final disposal site (KM32) as well as DPWT and conducted hearing sessions with relevant personnel and took a tour of the site.

From JICA, we obtained such information as grant assistance has commenced to improve rubbish collection, disposal by incineration has commenced with regard to a part of medical waste, and although composting has been implemented in Luang Prabang, it has not been widely practiced in Vientiane. In addition, we were told that industrial waste from the industrial park is being disposed of in Thailand.

From JETRO, we obtained information concerning the current situation of wastewater treatment of a local food plant, treatment of wastewater from general households; in addition, with respect to waste, the use of agricultural waste. In addition, we also obtained such information as currently there is no city gas supply and LPG is used by some.

At VUDAA, we obtained statistical information concerning the status of rubbish collection & transport and outline of drainage ducts, etc. By the way, there is no agency or department in the government in charge of disposal of night soil (septic tank, etc.).

During the tour of KM32 final disposal site, in addition to the management situation such as how much rubbish is received and in what manner, we confirmed the total capacity, status of methane generation, status of night soil disposal, etc. Further, we confirmed the incinerator for medical waste.

At DPWT, we confirmed the outline of household wastewater treatment and the situation of balancing reservoir for night soil and drainage ducts in the City.

5. Public relations activities

5.1 Website

Dissemination of information through website for this study was implemented.

([URL] <http://gec.jp/main.nsf/jp/Activities-IC-vcc-1c20150204>)

ビエンチャン特別市・京都市連携による低炭素歴史都市形成に資するJCM事業調査国際委員会(第2回会合)の開催結果について International Workshop on Low-Carbon Historic City Development based on the Cooperation between Vientiane Capital and Kyoto City (2015.02.04)

日時	2015年2月4日(木)08:20~12:00
場所	ラオス人民民主共和国ビエンチャン特別市 ビエンチャン特別市知事公館 2階大会議室
総議長	ビエンチャン特別市副知事 Keophilavanh Aphaylath氏 京都市環境政策局環境総務課長 今井邦光氏
共同議長	ビエンチャン特別市天然資源環境局(DONRE) 副局長 Bang On Sayarath氏
司会	ビエンチャン特別市DONRE環境保全課長 Rotchana Phouangmanivong氏 GEO大阪本部国際協力課 総括主任 田中真一
言語	逐次通訳(日本語・ラオ語)
参加機関	【日本国】京都市、GEO、三菱自動車工業、アルメックVPI、日立造船、クライメート・コンサルティング、JICAラオス事務所 【ラオス国】ビエンチャン特別市(副知事、DONRE、その他関連部署)、天然資源環境省(MONRE)、民間事業者ほか
概要	<p>環境省事業「平成26年度アジアの低炭素社会実現のためのJCM大規模案件形成可能性調査」の下で実施された「ビエンチャン特別市・京都市連携による低炭素歴史都市形成に資するJCM事業調査」の本年度調査のとりまとめと、次年度以降の両市連携協力関係の継続、その下での具体的な取組み(JCM案件形成を含む)の協議を行うために、平成26年度(2014年度)第2回目の国際委員会を開催いたしました。</p> <p>本セッションには、日本側より今井京都市環境総務課長ほか関係者11名、ラオス側よりビエンチャン特別市副知事クオビラン氏、DONRE副局長バンオン氏ほか43名が参加し、計57名にご出席いただきました。</p> <p>国際委員会第2回会合では、クオビラン副知事より、会合冒頭に歓迎挨拶が行われ、2014年10月28日に実施された国際委員会第1回会合での議論結果に基づき、ビエンチャン特別市と京都市の都市間連携の重要性について言及されました。また、今井京都市環境総務課長からも開会あいさつをいただき、ビエンチャン特別市と京都市の関係深化の認識について述べられました。</p> <p>同会合は、クオビラン副知事を総議長とし、その下でバンオンDONRE副局長と今井課長が共同議長を務め、進行されました。</p> <p>まず、当該調査プログラムのコーディネーターであるGEOから、2014年度の調査結果の概要(ビエンチャン特別市の低炭素都市化計画の要素案を含む)と2015年度における次期調査内容の提案を発表しました。</p> <p>その後、ビエンチャン特別市DONREより、同特別市が抱える課題・問題(特に環境及び社会経済的な課題・問題)と、それらに対処するための戦略・政策・計画・活動について、現状の紹介が行われました。また、ビエンチャン特別市の低炭素都市形成のための運営委員会設立に向けて準備作業を進めていることが発表されました。</p> <p>京都市からは、同市が過去に直面した環境・社会経済的問題とその克服に関する経験が説明され、それに基づいて、ビエンチャン特別市が同じ轍を踏まずに課題・問題を解決できるよう支援していくことが示されました。</p> <p>具体的なJCMプロジェクトとして、三菱自動車工業株式会社と株式会社アルメックVPIによるビエンチャンでの電気駆動自動車の導入・実践利用を通じた低炭素型交通モードへの転換プロジェクトの実現化を目指した調査結果が報告されました。</p> <p>さらに、将来の緊密な協力を視野に入れ、参加者は以下について議論を行いました。</p> <ul style="list-style-type: none">・ビエンチャン特別市の低炭素歴史都市形成基本計画を策定することの重要性・低炭素歴史都市形成基本計画に含むべき要素としての具体的な実践的活動と、両市による協同・廃棄物の効率的な収集・運搬及び3Rを含む廃棄物適正管理を中心とした、ビエンチャン特別市職員に対する能力開発プログラムの提案・低排出車の導入に向けた国家・自治体の政策・法制度の必要性・両市・両国の緊密な官民連携による新たなJCMプロジェクトの開発促進 <p>低炭素歴史都市ビエンチャンを実現し、ビエンチャンが抱える環境問題・汚染解決の実践的な対応を行うために、ビエンチャン特別市と京都市の都市間連携を継続するとともに、GEOと協力して両国の民間企業とともにJCMプロジェクトの開発・実現を追求し、問題解決に貢献することが会合参加者によって認識されました。</p> <p>最後に、共同議長は、ビエンチャン特別市と京都市の協力の継続と、JCMプロジェクトの開発・実現に向けた努力の継続を、会合の結論として共同議長サマリーにまとめ、本会合を開会しました。</p>

Home page

Article

6. Cooperating with related operation

6.1 Presentations at Meetings Designated by MOE

(1) JCM Workshop (October 2014)

On 29th October 2014, we attended the JCM Workshop in Yokohama City that was hosted by MOE (and co-hosted by IGES) and presented our operations from the Osaka side along with a display poster.



Display Poster

(2) COP20 side event (December 2014)

At the Japanese Pavilion at the 20th session of the Conference of the Parties (COP20) of the United Nations Framework Convention on Climate Change (UNFCCC) held in Lima, Peru from December 1 – 12, 2014, we held a side event on the second day (Tuesday, December 2) supported by the MOE of Japan and the Ministry of Natural Resources and Energy (MONRE, Laos).

The results of the event are shown as follows:



- Title: City-wide Mitigation Project Development in HCMC, Vietnam and Vientiane, Lao PDR Utilizing the Joint Crediting Mechanism (JCM)
- Date & Time: December 2, 2014 (13:00-14:30)
- Organizer(s): Global Environment Centre Foundation (GEC)

■ Outline

This side event presented the JCM recent development and the city-wide mitigation project development under the JCM (Joint Crediting Mechanism), by showing programmes of city-to-city cooperation (cooperation between Ho Chi Minh City (HCMC) (Vietnam) and Osaka City (Japan), and cooperation between Vientiane Capital (Lao PDR) and Kyoto City (Japan)). For these programme, host country representatives presented their perspectives and expectations.

■ Agenda and speakers

- Opening Address (by Mr. Nobuhiro Kino, Director, International Cooperation Office, Ministry of the Environment, Japan (MOEJ))
- Presentation: Overview and Progress of the JCM (by Mr. Kino, MOEJ)
- Presentation: Showcases of MOEJ's Project to Support the Large-Scale Formation of JCM Programs to Realize Low-Carbon Societies in Viet Nam and Lao PDR (by Mr. Tomoya Motoda, Deputy Director, International Cooperation Division, Global Environment Centre Foundation (GEC))
- Presentation: Vietnamese Perspective on JCM and its Upscaling (by Mr. Le Ngoc Tuan, Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment (MONRE), Viet Nam)
- Presentation: JCM Project Introduction on Solid Waste Management in Ho Chi Minh City (by Mr. Taiyo Miyagi, Manager, Global Business Promotion Department, Business Planning Headquarters, Hitachi Zosen Corporation (Hitz))
- Presentation: Lao Perspective on JCM and its Implementation (by Mr. Syamphone Sengchandala, Department of Disaster Management and Climate Change, Ministry of Natural Resources and Environment (MONRE), Lao PDR)
- Q&A (Moderated by Mr. Tomoya Motoda, GEC)



■ Summary

- Mr. Kino, MOEJ, introduced the overview of the JCM and the MOEJ's activities for the development, implementation and upscaling of JCM projects, and expressed their expectation to further promotion and spread of JCM projects.
- Mr. Motoda, GEC, presented the cases of city-to-city cooperation programmes for the large-scale JCM project development: (i) Ho Chi Minh City – Osaka City Cooperation Project for Developing Low Carbon City, and (ii) JCM Feasibility Studies of GHG Mitigation Projects contributing to Low Carbon Historic City based on City-to-City Cooperation between Vientiane and Kyoto. Then he introduced the concrete JCM projects which were to be implemented and whose feasibilities were studied under these programmes. He stressed that the implementation of low-carbon projects in cities were effective due to more GHG emissions from a variety of emission sources based on many economic/industrial activities, and that the city-wide diffusion of JCM projects (in a packaged way) was important through the municipal government (city-to-city) cooperation.
- Mr. Tuan, Vietnamese MONER, presented their perspectives on JCM, including pros and cons of JCM in Viet Nam. He expressed the expectation on low-carbon project implementation and technology transfer promotion through the JCM, and on financial and technological supports provided from Japan, and noted that it should be important to promote the capacity development in Viet Nam, and to further promote the development and upscaling of the JCM projects.
- Mr. Miyagi, Hitz, showcased their waste management JCM projects to be implemented in Ho Chi Minh City, Viet Nam: (i) JCM Model Project “Anaerobic digestion of organic waste for biogas utilization at market in Ho Chi Minh City”; and (ii) JCM Project Planning Study “Introduction of our Energy-from-Waste technology”, and introduced their activities and their own technologies of waste management plants.
- Mr. Sengchandala, Lao MONRE, presented the status of the JCM in Laos, and recognized the contribution of the JCM to the transfer of low-carbon technologies and the establishment of low-carbon society in Laos. He also expressed the expectation to the JCM project development through the city-to-city cooperation between Vientiane and Kyoto, to improve the actual situation with no concrete JCM projects developed up to now.
- In Q&A session, questions about the promotion and PR of the JCM, and the upscaling of the JCM projects were raised. Mr. Kino replied that the partnership between Japan and signed countries should be strengthened and PRed. He added the importance of further development of the JCM projects through the project feasibility studies and the city-to-city cooperation



programmes. Regarding upscaling, Mr. Tuan suggested a possible solution of “tradable” credit scheme after 2020. Mr. Motoda mentioned that successful cases through the city-to-city cooperation programmes would contribute to the upscaling and the PR of the JCM.

■ Photograph



(Reporter: Tomoya Motoda, GEC)

To access the Side Event Reports and presentation files, please refer to the following link:

http://www.mmechanisms.org/e/cop20_japanpavilion/

III. Presentation Materials

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2. The Second International Workshop ·····	35

1. The First International Workshop (International Inaugural Workshop)



Vision for ESC of Vientiane Capital and Activities for ESC (Environmentally Sustainable City)

The Workshop for Formulation of the National Guidelines for ESC Guidelines in Cambodia


October 28, 2014
 By: Mrs. BangOn SAYARATH
 Deputy Director, Department of Natural Resource and Environmental (DONRE), Vientiane Capital

Topics

- I. Introduction of Vientiane Capital (VTE)
- II. Formulation of Vision of ESC for VTE
- III. Implementation of the Vision
- IV. Application of the ESC guidelines (ESC_GL) in Lao PDR

I. Introduction of Vientiane Capital (VTE) (1)

Map of VTE Capital



- Area: 3,920 km²
- Population: 972,000 (2012)
- Pop. Density: 248/ km²
- Administration : 9 Districts and 483 Villages.
- Nos. of Household: 126,977

I. Introduction of Vientiane Capital (2)

Current Challenges

In general ,the urban environment is in good Condition, peace and safety. However, urban City are in rapid growth trends causing some Environmental concerns such as increased Migration from rural area into city, lack of Public utilities to meet the demands, many Forms of pollution in the air, water, soil and Distractions ,persistent chemical residue, high Temperature, dust, solid waste, dirty water, Disorder of societies, absence of green landpublic parks.



II. Formulation of Vision of ESC for VTE (1): Issues

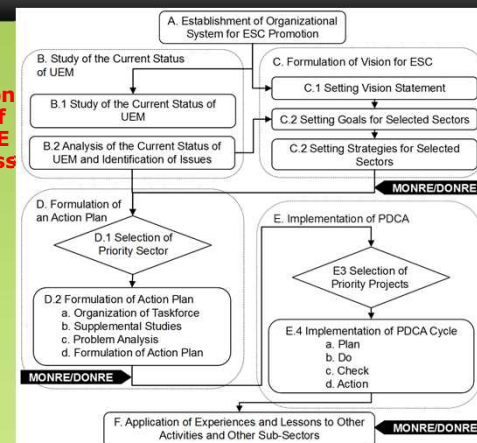
□ Meaning of ESC

The ESC in Lao PDR shall be encouraged to be clean air, clean water, clean land and rich fauna and flora, etc. without compromising the quality of living of the next generation.

□ Issues for Formulation of Vision

Vision of ESC shall integrate all UEM (urban environmental management) which cover broad areas of urban activities. Formulation of the Vision of ESC for VTE, the capital city of Lao PDR, needs to involve all stakeholders, from both public and private sector and individual.

II. Formulation of Vision of ESC for VTE (2): Process Flow of ESC_GL



II. Formulation of Vision of ESC for VTE (2): Procedure (1)

A) Establishment of Organizational System for ESC Promotion:

DONRE together with VUDAA organized an ESC unit for the formulation.

B) Study of the Current Status of Urban Environmental Management (UEM):

- The First step was the overall understanding about the current Urban Environmental Status quickly, but comprehensively. Baseline survey was carried out from September to December 2011 By DONRE, DPWT, and VUDAA, and experts dispatched by JICA.
- The information and data collected, was then analyzed to assess the present condition of UEM according to the 29 subsectors as shown in the next slide.

II. Formulation of Vision of ESC for VTE (3): Procedure (2)

Social Environment

1. Local economy
2. Land use
3. Traffic and road condition
4. UEM policy implementation
5. Poverty
6. Ethnic people
7. Landscape
8. Gender
9. Children's rights
10. Cultural heritage
11. Health
12. Environmental awareness

Natural Environment

1. Stormwater management
2. Biodiversity
3. Forest resources
4. Urban green area
5. Nature reserve
6. Global warming
7. Mineral resources development

Socio-living Environmental

1. Air quality
2. Water quality
3. Safe drinking water
4. Sanitation
5. Soil contamination
6. Solid waste management
7. Noise/Vibration
8. Land subsidence
9. Odor
10. Accident

II. Formulation of Vision of ESC for VTE (4): Procedure (3)

C) Formulation of Vision for ESC

The vision, goals and strategies has been discussed among DONRE, DPWT, and VUDAA, and Experts dispatched by JICA

1. Setting a vision statement:

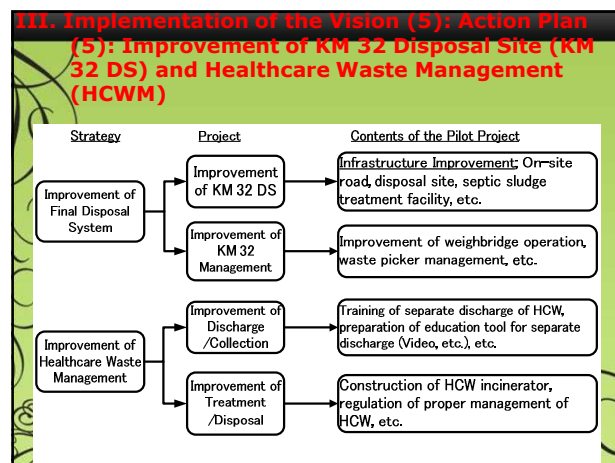
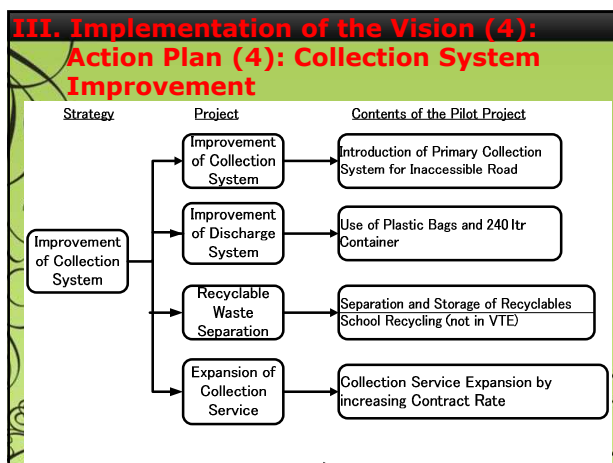
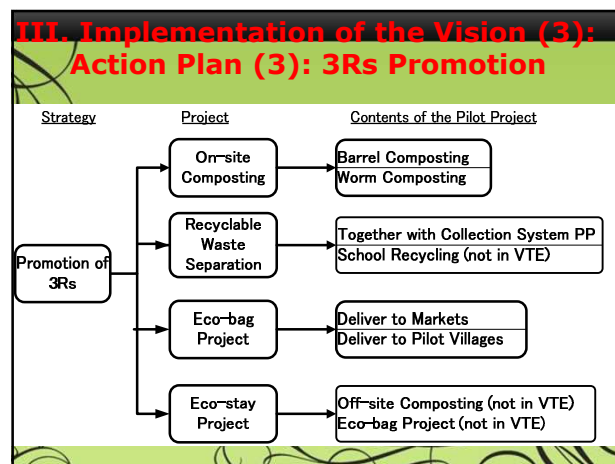
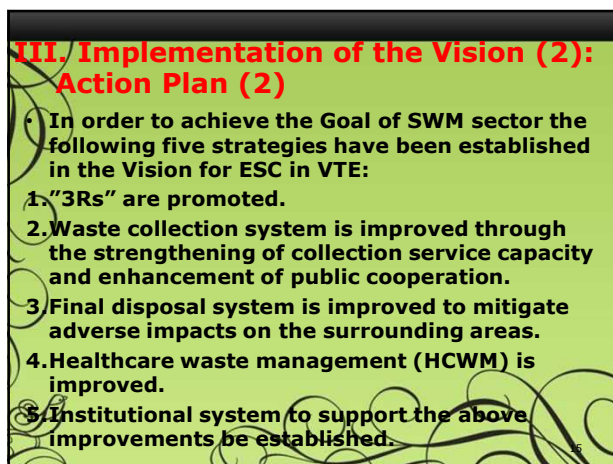
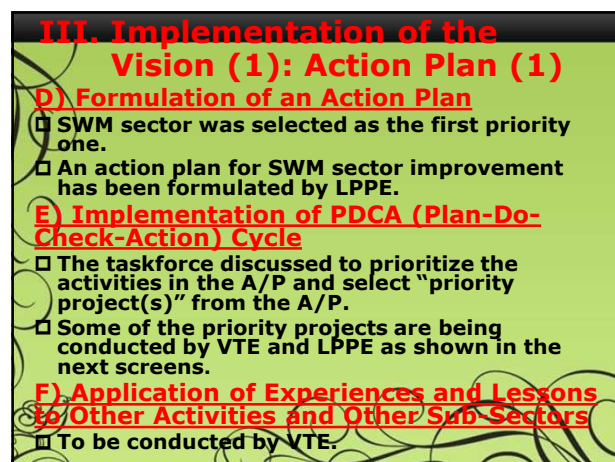
Safe, lighted, clean, green, civilized and charming Vientiane; it is the sustainable city.

2. Setting goals towards the vision statement, or expected future status, for each of the important environmental sub-sectors.

3. Setting strategies to achieve the goals for the sub-sectors.

□ See next screen

II. Formulation of Vision of ESC for VTE (5): Procedure (4)



III. Implementation of the Vision (6): Implementation of PP (Pilot Project) (1)



III. Implementation of the Vision (7): Implementation of PP (2)



III. Implementation of the Vision (8): Implementation of PP (3)



III. Implementation of the Vision (9): Implementation of PP (4): Leaflet of Collection System Improvement



III. Implementation of the Vision (10): Implementation of PP (5): Before & After PP of KM 32 DS (1)



III. Implementation of the Vision (11): Implementation of A/P (6): Before & After PP of KM 32 DS (2)



III. Implementation of the Vision (12): Implementation of PP (7): Healthcare Waste Incinerator



Seminar for Proper HCW
Separation



HCW Incinerator and Its Operation

IV. Application of the ESC guidelines (ESC_GL) in Lao PDR

- ESC_GL is the fundamental tool for formulation of the Vision for ESC which shall be **shared by all stakeholders**. Once the vision is formulated, **all stakeholders will be able to make efforts towards the ESC step by step.**
- **The vision will be first step to develop further action plans** and other projects in VTE, and further promotion of ESC in future.
- ESC_GL also indicates how to implement the vision.
- Provincial organizations, such as DONRE, DPWT, VUDAA, are the key leader on use of ESC guideline

ຂອບໃຈ


Thank you

City of Kyoto

Challenges and Efforts in Historic City of Kyoto ~Focus on Environmental Policy~

Oct. 2014

Director of General Affairs Section,
Environment Policy Bureau, Kyoto City
Kunimitsu IMAI (Mr.)




1

City of Kyoto

Kyoto Citizens' Appreciation

Citizens of Kyoto are looking forward to 4 lively elephants coming to Kyoto next month.



Kadokawa, Mayor of Kyoto and 2 elephants




Kyoto City Zoo
"Forest of Elephants"
(Conceptual Drawing)

2

City of Kyoto

Today's Presentation

- 1 Streets of Kyoto
- 2 Challenges that Kyoto are facing
- 3 Efforts for realizing sustainable historic city of Kyoto



3

City of Kyoto

1. Streets of Kyoto



4

City of Kyoto

Kyoto – World treasure


World Heritage 20-year anniversary for "Historic City Kyoto's Cultural Heritage"



5

City of Kyoto

Kyoto – Historic and living city



6

About Kyoto City

Population: 1,470,000
Area: 827.9 km²

More than 1,000 years' history,
Many cultures as an ancient capital

More than 50 million visitors
(domestic and overseas)

Innovative city with
manufacturers and University

3/4 of area is forest,
Beautiful city with nature

Self-governance of citizen
and strong community

7

Birth place of "Kyoto Protocol"

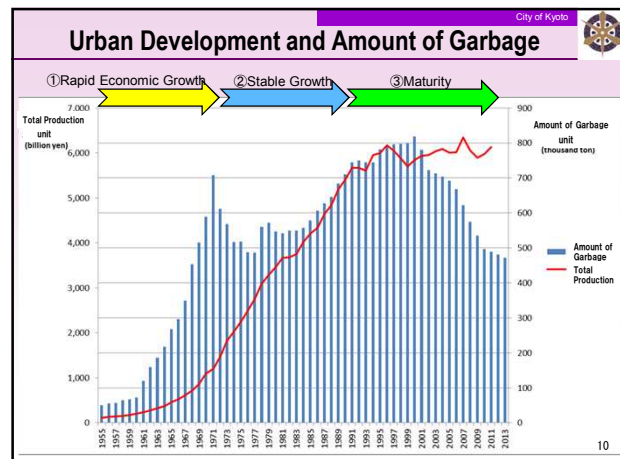
COP3 (Dec.1997)

As a host city of COP3 and Kyoto Protocol,
many trials have been done for tackling global warming

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2. Challenges that Kyoto are facing

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Changes in Socio-Economic Circumstance and Waste Policy

- Rapid Economic Growth (1955~1973)**
 - Increased garbage production beyond the capacity of economic growth → **Improvement of disposal facilities**
 - Pollution became a serious concern, significantly increased environmental load
 - Mass production, mass consumption, and mass disposal
- Stable Growth (1974~1990)**
 - Garbage production in parallel with the capacity of economic growth → **Promoting proper disposal**
 - Change in industrial structure after the Oil Shock
 - Moving towards energy-saving society
- Maturity (1991~)**
 - Reduced amount of garbage → **Promoting 3R (reduce/reuse/recycle)**
 - Super-aging society with low economic growth, and raised awareness for environmental issues
 - Moving towards resource recycling and sustainable society

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Challenges that Modern Kyoto are Facing

Damaging the Streetscape

Signature streetscape of Kyoto with low-rise wooden houses in rows

Urbanization led the City to construct middle- and high-rise apartment buildings

Streetscape Crisis in Kyoto

Conserved Historical Architecture


Historical architecture with middle- and high-rise buildings behind

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City of Kyoto


Challenges that Kyoto has been Facing

Sightseeing and Traffic Congestion




Tramcars used to run in every direction within the City
Withdrawn due to progressive motorization (1978)

However



Incoming vehicles create heavy traffic (Arashiyama)

Approximately 30% of tourists come in by private cars (2000)




Frequent traffic congestion caused problems including a decrease in tourist satisfaction, interfering with citizens' life, and automobile pollution

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City of Kyoto

3. Efforts for Realizing Sustainable Historic City of Kyoto



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City of Kyoto

Global Warming Countermeasure in Kyoto City

Japan's first local Global Warming Countermeasure Ordinance

December 2004: Enacting Global Warming Countermeasure Ordinance

◆ Reduction Target 10% reduction by 2010 (compared to 1990)

September 2010: Full Revision of Global Warming Countermeasure Ordinance

1 Reduction Target Only 4 municipalities specify their own reduction targets

- ◆ FY2050 (long-term target) Realizing low carbon society by large reduction
- ◆ FY2030 (mid-term target) 40% reduction (compared to 1990)
- ◆ FY2020 (progress target) 25% reduction (compared to 1990)

2 Characteristic Obligations

- ◆ Obligation applied to large-scale businesses to introduce eco-cars
- ◆ Obligation applied to large-scale buildings to introduce renewable energy (first in Japan)
- ◆ Obligation applied to large-scale buildings to use locally-produced wood materials (first in Japan)

December 2013: Strategy for promoting local Energy Policy

◆ What we aim is to create sustainable energy society without relying on nuclear power stations

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City of Kyoto

Promoting the Use of Renewable Energy

Economically Support Citizens' Proactive Efforts

- Subsidy for Installation of Residential Photovoltaic System**
In order to promote installation of residential photovoltaic system, subsidies have been paid to cover part of installation cost for applicable households since 2003 20,000JPY per 1kW, 80,000JPY at maximum
> FY2013: 1580 households in total (approximately 110 million JPY)
- Subsidy for Installation of Electricity Storage System** (50,000JPY/kW (300,000JPY at maximum))
> FY2013: 81 households in total (approximately 23 million JPY)
- Subsidy for Installation of Solar Thermal System** (50,000 - 100,000JPY/household)
> FY2013: 15 households in total (approximately 1.5 million JPY)
- Subsidy for Installation of Fuel Cell System** (100,000JPY/household)
- Subsidy for Installation of HEMS** (20,000JPY/household)


New Subsidy in 2014 FY

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City of Kyoto

Environmental education

Children's Eco-life Challenge Promotion Project



- The purpose is to review the lifestyle of each home from the perspective of a child by better understanding the problem of global warming
- The study class instructor is a volunteer citizen who conducts the study class in a lesson at elementary school
- Environmental household account books for children are used and the whole family practices the eco-life in the summer or winter vacation
- A retrospective study class is then held

① Pre-study class → ② Practice activity → ③ Diagnosis creation → ④ Post-project study class

FY2005: Starts in 1 school
→ FY2010: Conducted in all (166) elementary schools in Kyoto City

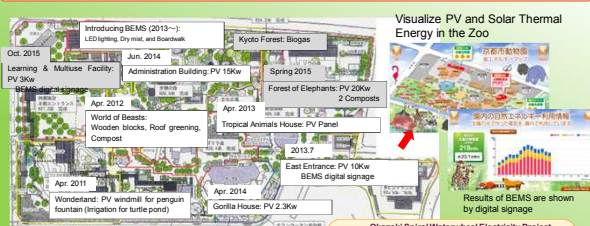
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City of Kyoto

Kyoto City Zoo: Creating Eco-Zoo

- Promotion of "Showcasing" energy and ecology in Okazaki, the most famous area of cultural exchange in Kyoto
- Development of Eco-Zoo at Kyoto City Zoo as the center of showcasing promotion

Introducing Renewable, Energy Saving, and Eco-friendly facilities along with Improving the Zoo



Visualize PV and Solar Thermal Energy in the Zoo

Utilizing Elephants' Feces
→ Making compost
→ Planning to utilize energy generated by biogas generator

Okazaki Spiral Waterwheel Electricity Project
Installing canals from Lake Biwa
Utilizing Electricity at Zoo
Waterwheels made by students of Fushimi Technical High School

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Problems of waste management in Kyoto city

- Annual waste generation: 472,000 ton (2013)
- Annual cost for waste management: 28 billions yen (2012)
- Landfill site: Only one site in Kyoto city as inland city (50 years)
- Challenge to reduce GHG emissions

↓

◎Reduction of waste generation
◎Energy recovery from waste biomass

Waste treatment plants in Kyoto city

North Clean Center (From 2004, 400t/day)
Recycling of waste cooking oil
South Recycling Center
South CC (From 1995, 600t/day)
East North CC (From 2001, 700t/day)
East landfill site (From 2000, 4500,000m³)
CC: Clean Center

Reduction of waste
Half reduction, together!

42% reduction of total waste amount from the peak (2000)

Peak
Pay for waste collection bag
Now
Target

Reduction of waste
→ Environmentally friendly material cycle society

- Reduction of waste incineration plants: 5 plants (2004) → 3 plants (2012)
- Reduction of related cost: 9,400 million JPYen (2006) → 5,400 million JPYen (2013)

Biodiesel fuel (BDF)

Cycle of BDF

Vegetable oil
Stabilization of CO₂ in Fuel plants
CO₂ generation from BDF
CO₂ reduction: 3,300t/year
Low carbon society
Material cycle society
Active community
Avoidance of competition with food
Clean exhausted gas
Avoidance of river pollution
Collection from household: 1,760 station
Collection: 200,000 L/year
BDF production 5,000 L/day
92 City bus (B5)
136 waste collection vehicle (B100)
BDF oil station in the clean center
Fuel plant of waste cooking oil (Kyoto City) (From 2003)

Waste to energy
– waste incineration plant is a high tech power plant

- Surplus waste heat is used for electric power generation in 3 waste incineration plants [FY2013]
- Total power generation: 173,870,000 kWh (= Electricity consumption by 40,000 households)
- Sales of electricity: 85,660,000kWh (1,584 million JPYen)

Also, solar panels on the roof

Bio-gasification from food waste

Progress of energy recovery rate in incineration

20 years ago
Current
Reduction and recycle of food waste

Reduction and recycling of food waste push up the calorie of remaining waste and promote the efficiency of thermal recovery in waste incineration

Reduction and recycling of food waste in the urban area

- Reduction of food waste, and recycling them
- Composting and feeding is not easy, because of the balance of supply and demand etc.

→ Main recycling is Bio-gasification

Progress in whole energy recovery in waste management and expansion of renewable energy

Bio-gasification from food waste in "New South Clean Center"

City of Kyoto

For New South CC which will complete in 2019, incineration plant (500 t/day) and Bio-gasification and power generation plant (60t-food waste/day) is planned.

- Total cost: 37,800 million yen (For bio-gasification plant: 3 billion yen)
- Bio-gas generation amount: 9,000 m³/day
- Electric power: 1,000kW ※referenced value: waste to energy = 14,000kW

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Bio-gasification from food waste in "New South Clean Center"

City of Kyoto

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Enacting City's Unique "Landscape Policy"

City of Kyoto

Conserve and Foster Superior Landscape of Kyoto for the Next Century

With dramatically revising urban planning and local ordinances, new Landscape Policy has been enacted since September 2007

- ◆ Height regulation (45m→31m, 31m→15m etc.)
- ◆ Design regulations for entire city streets and for the city center
- ◆ Conservation of scenic landscape and borrowed scenery of temples and shrines
- ◆ Outdoor advertisement (ban rooftop billboards, illuminated signs etc.)
- ◆ Conservation and reproduction of historical streets

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Promoting "Arukumachi (walking town) Kyoto": Prioritizing People and Public Transport

City of Kyoto

Enacting "Arukumachi (walking town) Kyoto" Comprehensive Transport Strategy (Jan. 2010)

88 Projects to promote the strategy

Promoting Park-and-Ride System

Reducing Car Dividing Rates

Reducing Ratio of Tourists coming from Outside of the City by Car

in 2000: 30%

in 2013: 15%

28

Economic Growth and City's Identity

City of Kyoto

What has been lost in the City of Kyoto through economic growth? °°

- Beautiful natural environment
- Traditional streetscape
- Tramcars as citizens' main transportation
- Life in harmony with nature
- and ...

Although we have earned a lot instead...

- Will we be able to recover what has been lost?
- What is the best identity the city should prioritize?

Sustainable Development in Harmony with Environment

29

For realizing sustainable historic city of Kyoto

City of Kyoto

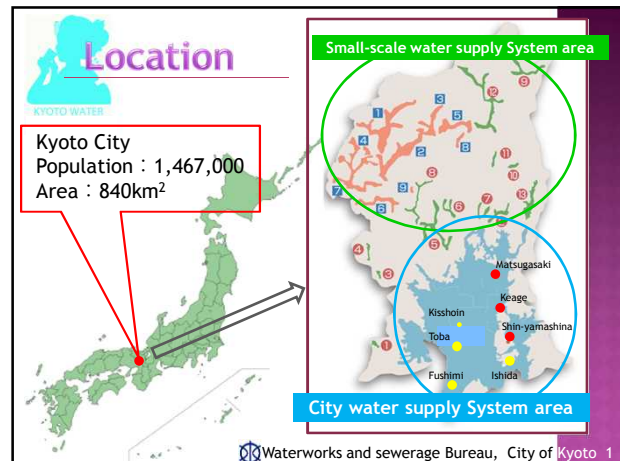
Thank you for your kind attention!

30

Water works and Sewage works of Kyoto City

Keisuke Fujii

Waterworks and Sewerage Bureau, City of Kyoto



Status Water Works

- Started water supply in 1912

- Status of Waterworks(2013)

Item	Value
Service population	1,455,000 people
Supplied coverage	99.9%
Facilities capacity	771,000m ³ /day
Average daily supply	531,000m ³ /day
Water Leakage rate	6.8%

Waterworks and sewerage Bureau, City of Kyoto 2

The Water Resource

- Lake Biwa

Lake Biwa is Japan's largest lake

- Problem of Water Quality

- eutrophication
- low-turbidity, high-pH



the Lake Biwa Waterway

- about 8km long ·natural flow

Waterworks and sewerage Bureau, City of Kyoto 3

Water Purification Plant

Keage Purification Plant



Established in 1912
Capacity:
198,000m³/day

Matsugasaki Purification Plant



Established in 1927
Capacity:
211,000m³/day

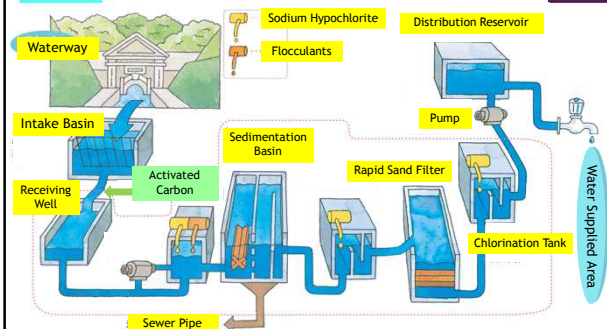
Shin-Yamashina Purification Plant



Established in 1970
Capacity:
362,000m³/day

Waterworks and sewerage Bureau, City of Kyoto 4

Water Treatment Process



Waterworks and sewerage Bureau, City of Kyoto 5

Distribution Facilities

○ Distribution Area : 4

(Low Area, High Area,
Highest Area,
Special Highest Area)

- almost : natural flow area,
- other: pumping area,
Negative pressure area

○ Distribution Pipe

($\phi 75 \sim 2000$) Length : 3,800km



Waterworks and sewerage Bureau, City of Kyoto 6

Challenging Issues

○ Reinforcement of the management base

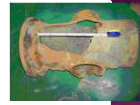
Decrease in revenue of water charge
with decline in water demand

○ Improving earthquake resistance

Aged deterioration of waterworks facilities

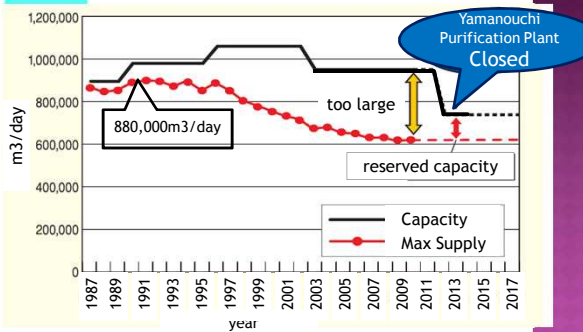
○ Introduction of Advanced Purification Treatment

Solve the taste and odor problem



Waterworks and sewerage Bureau, City of Kyoto 7

Decline in water demand



Waterworks and sewerage Bureau, City of Kyoto 8

Status

Sewage Works

○ Started sewage works in 1930

○ Status of Sewage works (2013)

Item	Value
Service population	1,406,000 people
Supplied coverage	99.5%
Facilities capacity	1,255,000m³/day
Average daily supply	863,000m³/day
Pipe Length	5,500km

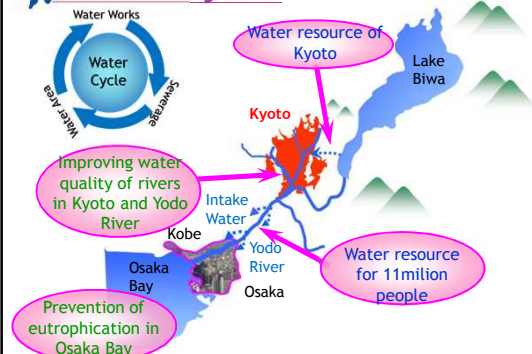
Waterworks and sewerage Bureau, City of Kyoto 9

Objectives of Sewage works



Waterworks and sewerage Bureau, City of Kyoto 10

Water Cycle



Waterworks and sewerage Bureau, City of Kyoto 11

Wastewater Treatment Plant



Toba W.T.P. 907,000m³/day (1939)



Kisshoin W.T.P.
74,000m³/day (1934)

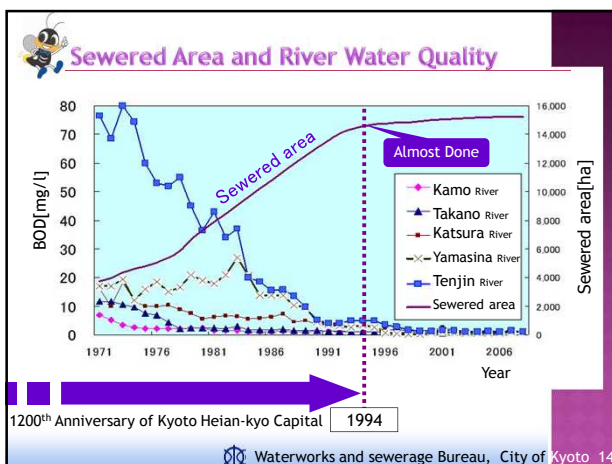
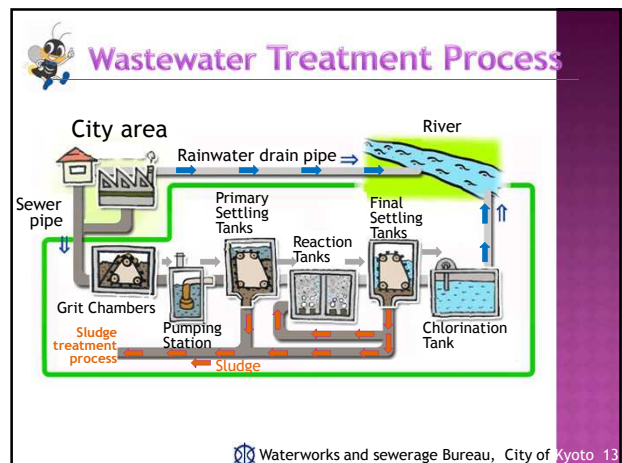


Fushimi W.T.P.
148,000m³/day (1973)



Ishida W.T.P.
126,000m³/day (1981)

Waterworks and sewerage Bureau, City of Kyoto 12



Recent Development of The Joint Crediting Mechanism (JCM)

July 2014
Government of Japan

All ideas are subject to further consideration and discussion with host countries

Low-Carbon Growth

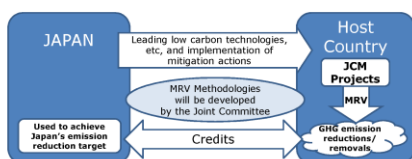
- In order to effectively address the issue of climate change, it is necessary for both developed and developing countries to achieve low-carbon growth all around the world by fully mobilizing technology, markets and finance.
- Widespread use of advanced low-carbon technologies and products in various fields including renewable energy, highly efficient power generation, home electronics, low-emission vehicles, and energy-savings in factories must be accelerated.
- Realizing a low carbon society by combining these technologies and products with appropriate systems, services, and infrastructure is also crucial.



2

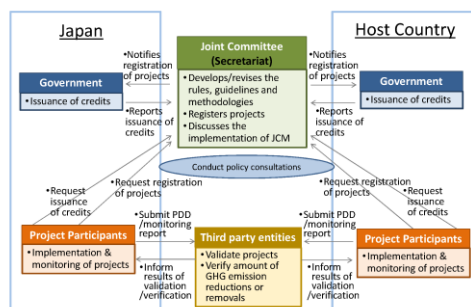
Basic Concept of the JCM

- Facilitating diffusion of leading low carbon technologies, products, systems, services, and infrastructure as well as implementation of mitigation actions, and contributing to sustainable development of developing countries.
- Appropriately evaluating contributions to GHG emission reductions or removals from Japan in a quantitative manner, by applying measurement, reporting and verification (MRV) methodologies, and use them to achieve Japan's emission reduction target.
- Contributing to the ultimate objective of the UNFCCC by facilitating global actions for GHG emission reductions or removals, complementing the CDM.



3

Scheme of the JCM



4

The role of the Joint Committee and each Government

- The Joint Committee (JC) consists of representatives from both Governments.
- The JC develops rules and guidelines necessary for the implementation of the JCM.
- The JC determines either to approve or reject the proposed methodologies, as well as develops JCM methodologies.
- The JC designates the third-party entities (TPEs).
- The JC decides on whether to register JCM projects which have been validated by the TPEs.
- Each Government establishes and maintains a registry.
- On the basis of notification for issuance of credits by the JC, each Government issues the notified amount of credits to its registry.

5

Approaches of the JCM

- The JCM should be designed and implemented, taking into account the followings:
 - (1) Ensuring the robust methodologies, transparency and the environmental integrity;
 - (2) Maintaining simplicity and practicality based on the rules and guidelines;
 - (3) Promoting concrete actions for global GHG emission reductions or removals;
 - (4) Preventing uses of any mitigation projects registered under the JCM for the purpose of any other international climate mitigation mechanisms to avoid double counting on GHG emission reductions or removals.

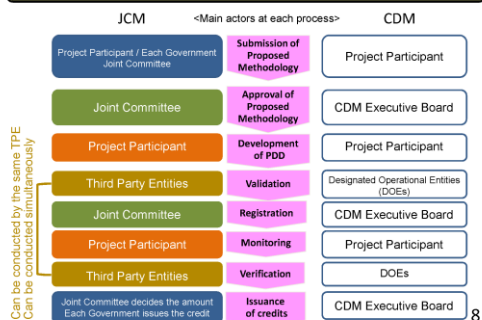
6

Features of the JCM

- (1) The JCM starts its operation as the non-tradable credit type mechanism.
- (2) Both Governments continue consultation for the transition to the tradable credit type mechanism and reach a conclusion at the earliest possible timing, taking account of implementation of the JCM.
- (3) The JCM aims for concrete contributions to assisting adaptation efforts of developing countries after the JCM is converted to the tradable credit type mechanism.
- (4) The JCM covers the period until a possible coming into effect of a new international framework under the UNFCCC.

7

Project Cycle of the JCM and the CDM



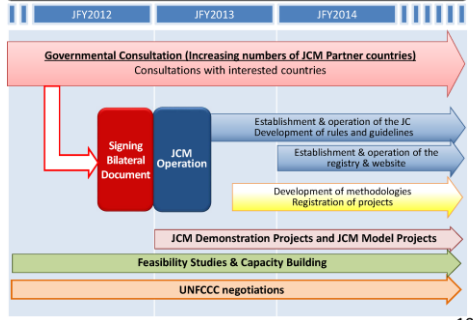
8

Key features of the JCM in comparison with the CDM

	JCM	CDM
Governance	- "de-centralized" structure (Each Government, Joint Committee)	- "centralized" structure (CMP, CDM Executive Board)
Sector/project Coverage	- Broader coverage	- Specific projects are difficult to implement in practice (e.g. USC coal-fired power generation)
Validation of projects	- In addition to DOEs, ISO14065 certification bodies can conduct - Checking whether a proposed project fits eligibility criteria which can be examined objectively	- Only DOEs can conduct - Assessment of additionality of each proposed project against hypothetical scenarios
Calculation of Emission Reductions	- Spreadsheets are provided - Default values can be used in conservative manner when monitored parameters are limited.	- Various formulas are listed - Strict requirements for measurement of parameters
Verification of projects	- The entity which validated the project can conduct verification - Validation & verification can be conducted simultaneously	- In principle, the entity which validated the project can not conduct verification - Validation & verification must be conducted separately

9

Roadmap for the JCM



10

Countries with which Japan has signed on bilateral documents

➤ Japan has held consultations for the JCM with developing countries since 2011 and signed the bilateral document for the JCM with Mongolia, Bangladesh, Ethiopia, Kenya, Maldives, Viet Nam, Lao PDR, Indonesia, Costa Rica, Palau and Cambodia.



➤ Japan held the Joint Committee with Mongolia, Bangladesh, Ethiopia, Kenya, Maldives, Viet Nam, Indonesia and Palau respectively.

11

The current status of UNFCCC negotiation (1/2)

Decision 1/CP.18

41. Acknowledges that **Parties, individually or jointly, may develop and implement various approaches, including opportunities for using markets and non-markets**, to enhance the cost-effectiveness of, and to promote, mitigation actions, bearing in mind different circumstances of developed and developing countries;
42. **Re-emphasizes** that, as set out in decision 2/CP.17, paragraph 79, **all such approaches must meet standards that deliver real, permanent, additional and verified mitigation outcomes, avoid double counting of effort and achieve a net decrease and/or avoidance of GHG emissions**;
44. Requests the SBSTA to conduct a work programme to elaborate a framework for such approaches, drawing on the work of the AWG-LCA on this matter, including the relevant workshop reports and technical paper, and experience of existing mechanisms, with a view to recommending a draft decision to the COP for adoption at its 19th session;
45. Considers that any such framework will be developed under the authority and guidance of the Conference of the Parties;

12

Decision 19/CP.18

Table 4(b) Reporting on progress

- The JCM is one of various approaches Japan and partner countries are jointly developing and implementing, and Japan intends to contribute to elaborating the framework for such approaches under the UNFCCC.
- Japan will report to the COP the use of the JCM in Biennial Reports including the Common Tabular in line with Decision 19/CP.18.

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(Subject to further consideration and discussion with host countries)

14

(Subject to further consideration and discussion with host countries)

15

(Subject to further consideration and discussion with host countries)



16

(Subject to further consideration and discussion with host countries)



(Subject to further consideration and discussion with host countries)



Rules of Procedures for the Joint Committee

(Subject to further consideration and discussion with host countries)

Members

- The Joint Committee (JC) consists of representatives from both Governments.
- Each Government designates members, which may not exceed [10].
- The JC has two Co-Chairs to be appointed by each government (one from the host country and the other from Japan). Each Co-Chair can designate an alternate from members of the JC.

Decision making in the JC

- The JC meets no less than once a year and decision by the JC is adopted by consensus.
- The JC may adopt decisions by electronic means in the following procedure:
 - (a) The proposed decisions are distributed by the Co-Chairs to all members of the JC.
 - (b) The proposed decision is deemed as adopted when,
 - i) no member of the JC has provided negative assertion within [20] calendar days after distribution and both Co-Chairs have made affirmative assertion, or
 - ii) all members of the JC have made affirmative assertion.
- If a negative assertion is made by one of the JC members, the Co-Chairs take into account the opinion of the member and take appropriate actions.
- The JC may hold conference calls to assist making decisions by electronic means.

External assistance

- The JC may establish panels and appoint external experts to assist part of its work.

Languages: English **Secretariat:** The secretariat services the JC.

Confidentiality: Members of the JC, Secretariat, etc. respect confidentiality.

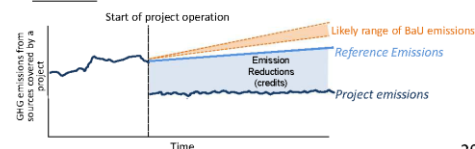
Record of the meeting: The full text of all decisions of the JC is made publicly available.

19

Basic Concept for Crediting under the JCM

(Subject to further consideration and discussion with host countries)

- In the JCM, emission reductions to be credited are defined as the difference between "reference emissions" and project emissions.
- The reference emissions are calculated below business-as-usual (BaU) emissions which represent plausible emissions in providing the same outputs or service level of the proposed JCM project in the host country.
- This approach will ensure a net decrease and/or avoidance of GHG emissions.



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Crediting Threshold

(Subject to further consideration and discussion with host countries)

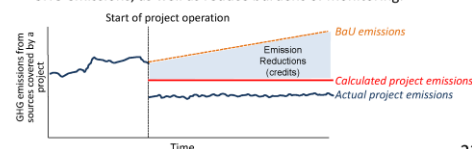
- Reference emissions are calculated by multiplying a "crediting threshold" which is typically expressed as GHG emissions per unit of output by total outputs.
- A crediting threshold should be established *ex ante* in the methodology applicable for the same project type in the host country. It should also be established conservatively in order to calculate reference emissions below BaU emissions.
- This standardized approach will greatly reduce the burden of analyzing many hypothetical scenarios for demonstrating additionality of the proposed project such as under the CDM, whereas increase transparency for calculating GHG emission reductions.

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Addendum: ways to realize net reduction

(Subject to further consideration and discussion with host countries)

- A net decrease and/or avoidance of GHG emissions can be realized in alternative way, instead of calculating the reference emissions below BaU emissions.
- Using conservative default values in parameters to calculate project emissions instead of measuring actual values, will lead calculated project emissions larger than actual project emissions.
- This approach will also ensure a net decrease and/or avoidance of GHG emissions, as well as reduce burdens of monitoring.



22

JCM Methodology

Key Features of the JCM methodology

- The JCM methodologies are designed in such a way that project participants can use them easily and verifiers can verify the data easily.
- In order to reduce monitoring burden, default values are widely used in a conservative manner.
- Eligibility criteria clearly defined in the methodology can reduce the risks of rejection of the projects proposed by project participants.

Eligibility criteria	<ul style="list-style-type: none"> • A "check list" will allow easy determination of eligibility of a proposed project under the JCM and applicability of JCM methodologies to the project.
Data (parameter)	<ul style="list-style-type: none"> • List of parameters will inform project participants of what data is necessary to calculate GHG emission reductions/removals with JCM methodologies. • Default values for specific country and sector are provided beforehand.
Calculation	<ul style="list-style-type: none"> • Premade spreadsheets will help calculate GHG emission reductions/removals automatically by inputting relevant values for parameters, in accordance with methodologies.

23

Basic concept of Eligibility criteria in JCM methodology

(Subject to further consideration and discussion with host countries)

The eligibility criteria in each JCM methodology should be established, in order to reduce emissions by:

- accelerating the deployment of low carbon technologies, products and services, which will contribute to achieving net emission reductions;
- facilitating the nationally appropriate mitigation actions (NAMAs) in host countries.

1. Both Governments determine what technologies, products, etc should be included in the eligibility criteria through the approval process of the JCM methodologies by the Joint Committee.

2. Project participants can use the list of approved JCM methodologies, similar to positive list, when applying for the JCM project registration.

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Eligibility Criteria of the JCM

(Subject to further consideration and discussion with host countries)

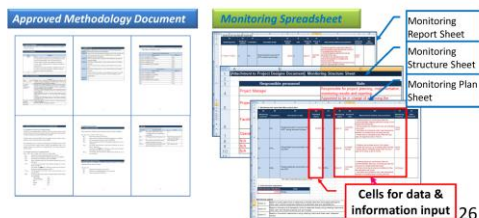
- Eligibility criteria in JCM methodologies shall contain the following:
 1. The requirements for the project in order to be registered as a JCM project. <Basis for the assessment of validation and registration of a proposed project>
 2. The requirements for the project to be able to apply the JCM methodology. <same as "applicability condition of the methodology" under the CDM>
- Examples of eligibility criteria 1.
 - Introduction of xx (products/technologies) whose design efficiency is above xx (e.g. output/kWh) <Benchmark Approach>
 - Introduction of xx (specific high efficient products/technologies, such as air conditioner with inverter, electric vehicles, or PV combined with battery) <Positive List Approach>
- Examples of eligibility criteria 2.
 - Existence of historical data for x year(s)
 - Electricity generation by xx (e.g. PV, wind turbine) connected to the grid
 - Retrofit of the existing boiler

25

Overview of JCM Methodology, Monitoring Plan and Monitoring Report

(Subject to further consideration and discussion with host countries)

- JCM methodology consists of the followings.
 - Approved Methodology Document
 - Monitoring Spreadsheet
 - Monitoring Plan Sheet (including Input Sheet & Calculation Process Sheet)
 - Monitoring Structure Sheet
 - Monitoring Report Sheet (including Input Sheet & Calculation Process Sheet)

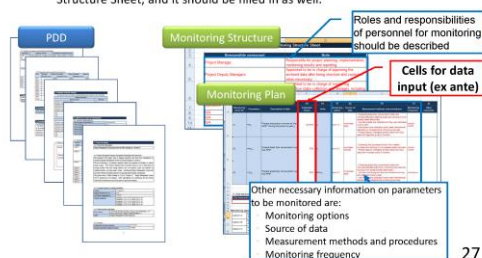


26

PDD and Monitoring Plan

(Subject to further consideration and discussion with host countries)

- Developing a Project Design Document (PDD) and a Monitoring Plan
 - A PDD form should be filled in with information of the proposed project.
 - A Monitoring Plan consists of Monitoring Plan Sheet and Monitoring Structure Sheet, and it should be filled in as well.

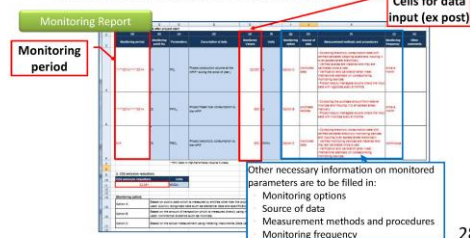


27

Monitoring Report

(Subject to further consideration and discussion with host countries)

- Making a Monitoring Report
 - A Monitoring Report should be made by filling cells for data input (ex post) in the Monitoring Report Sheet with monitored values.
 - Project participants prepare supporting documents which include evidence for stated values in the cells for data input.



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Possible Contents of the JCM PDD

(Subject to further consideration and discussion with host countries)

- A. Project description
 - A.1. Title of the JCM project
 - A.2. General description of project and applied technologies and/or measures
 - A.3. Location of project, including coordinates
 - A.4. Name of project participants
 - A.5. Duration
 - A.6. Contribution from developed countries
- B. Application of an approved JCM methodology(ies)
 - B.1. Selection of JCM methodology(ies)
 - B.2. Explanation of how the project meets eligibility criteria of the approved methodology
- C. Calculation of emission reductions
 - C.1. All emission sources and their associated greenhouse gases relevant to the JCM project
 - C.2. Figure of all emission sources and monitoring points relevant to the JCM project
 - C.3. Estimated emissions reductions in each year
- D. Environmental impact assessment
- E. Local Stakeholder consultation
 - E.1. Solicitation of comments from local stakeholders
 - E.2. Summary of comments received and their consideration
- F. References

Annex

Approved Methodology Spreadsheet consists of Monitoring Plan Sheet, Monitoring Structure Sheet and Monitoring Report Sheet, and it shall be attached to the PDD.

29

References

- ◆ JCM Demonstration Projects and JCM Model Projects
- ◆ Feasibility Studies
- ◆ Capacity Building

JCM Promotion Scheme by METI

JCM Demonstration Projects

- JCM Demonstration Projects are implemented by NEDO (New Energy and Industrial Technology Development Organization), which supports the project costs necessary to verify the amount of GHG emission reduction in line with JCM rules and guidelines.
- The budget for FY 2014: 6billion JPY (approximately \$61million)
- Coverage of project cost: Cost of the JCM Demonstration Projects necessary for MRV
 - e.g. Cost of design, machines, materials, labor, travel, etc.
- Eligibility for the JCM Demonstration Projects:
 - Concrete Projects to demonstrate the effectiveness of leading Japanese technologies and/or products installed and operated in the projects, and the amount of their GHG emission reduction with MRV methodology by actual operation
 - Project Participants consist of entities from both countries, only the Japanese entities can apply for the JCM Demonstration projects. The projects shall be completed within 3 years.

JCM Feasibility Study (FS)

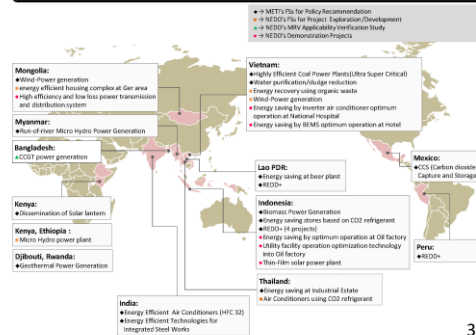
- The study to promote potential JCM projects and to survey their feasibility as well as to check the practicality of the MRV methodology.

Capacity Building Programmes

- Variety of capacity building activities to increase technical experts (e.g.) Experts on measuring amount of emission reductions by introducing low carbon technologies and products in the host country.

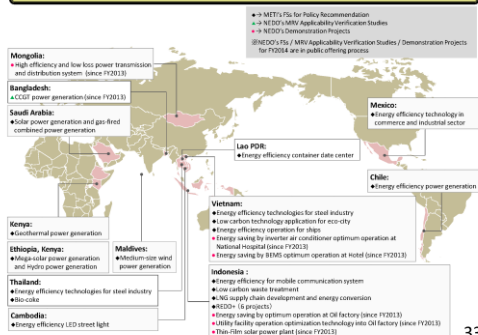
31

JCM Feasibility Studies, MRV Applicability Verification Study and Demonstration Projects by METI & NEDO in FY2013



32

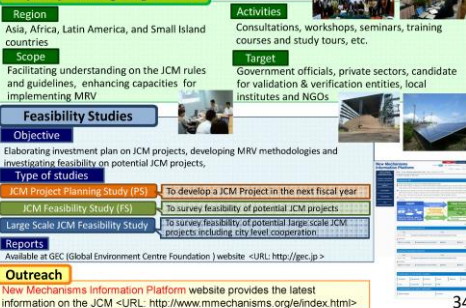
JCM Feasibility Studies, MRV Applicability Verification Studies and Demonstration Projects by METI & NEDO in FY2014



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Capacity Building Programmes & Feasibility Studies by MOE

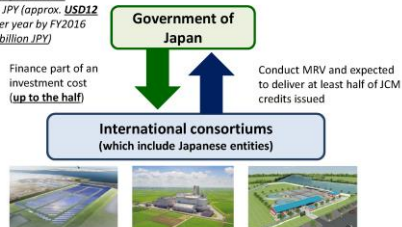
Capacity Building Programmes



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Financing Programme for JCM Model Projects by MOE

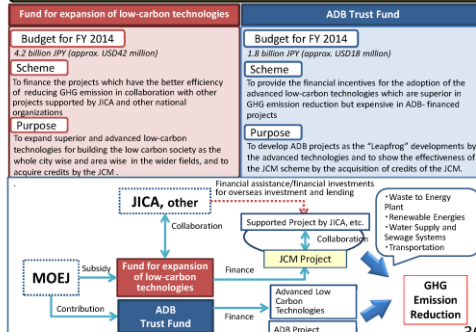
The budget for FY 2014
1.2 billion JPY (approx. USD12 million) per year by FY2016
(total 3.6 billion JPY)



- Scope of the financing: facilities, equipment, vehicles, etc. which reduce CO₂ from fossil fuel combustion as well as construction cost for installing those facilities, etc.
- Eligible Projects : starting installation after the adoption of the financing and finishing installation within three years.

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New Support Program Enabling "Leapfrog" Development (Fund/ADB) by MOE



36

JCM Model Projects in 2014 by MOEJ

Viet Nam:
Methane Digestion of Organic Waste for Biogas Utilization at Market
 Organic waste discharged from a market is used to generate biogas in a methane fermentation system. The biogas is then supplied to a seafood processing factory.
•Eco-driving by Utilizing Digital Technology System
 Trucks are fitted with eco-drive improving system using digital technology, reducing CO2 emission reduction and safe-driving.

Indonesia:
Waste-to-Energy by Waste Heat Recovery in Cement Industry
 Waste heat recovery system with superheater preheater boiler and air preheating cooler boiler is installed in cement production process and generate electricity (20 MW) to be used in the cement plant.
•Palm Waste Biomass Power Generation Project
 Purified bagasse is installed in a biomass power generation plant (8.2 MW) utilizing EFB (Empty Fruit Bunch) as a fuel.
•Solar Power Hybrid System Installation to Existing Base Transceiver Stations in Off-grid Area
 Solar power (500 kW) and lithium ion batteries are installed to replace inefficient diesel generators at mobile base stations.
•Energy Saving through Introduction of Regenerative Burners to the Aluminum Holding Furnace of the Automotive Components Manufacturer
 Regenerative burners which recover heat from exhaust gas efficiently are installed in a casting process.
•Energy Saving for Textile Factory Facility Cooling by High Efficiency Centrifugal Chiller
 Chiller with a high efficiency compressor and economizer cycle are installed.

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JCM Model Projects in 2013 by MOEJ

Mongolia:
Upgrading and Installation of Centralized Control System of High-Efficiency Heat Only Boiler (HOB)
 The high-efficiency Heat Only Boiler (HOB) will replace outdated low-efficiency HOBs to supply heated water for winter indoor heating. The project will also introduce centralized control system for the integrated heat supply in collective buildings.

Bangladesh:
Brick Production based on Non-Firing Solidification Technology
 In place of the existing brick production with the firing process with the combustion of coal, the new brick production with the non-firing solidification technology will be introduced.

Viet Nam:
•Integrated Energy Efficiency Improvement at Beer Factory
 A set of high performance equipment for energy efficiency improvement and renewable energy generation will be introduced in beer factories. Before the installation, the potential of energy saving and possible high potential points in the beer production process will be identified by using the energy structure analysis simulation technology.
•Energy Efficient NG Heat Pumps to Marine Products Processing Industry
 The high efficient heat pump using ammonia (NH3) as a refrigerant will be introduced to solve their energy consumption.

Cambodia:
•Small scale Biomass Power Generation by Using Stirling Engines
 The introduction of small scale biomass power generation systems with Stirling engines will replace diesel based power generation at rice mills. The Stirling engine, external combustion engine, is suitable for the utilization of biomass such as rice husk.

Indonesia:
•Energy Saving for Air-Conditioning and Process Cooling at Textile Factory (in Batang Cey)
 The high performance refrigerating machine with efficient compressor and economizer cycle will be introduced for factory air-conditioning.
•Energy Savings at Convenience Stores
 The latest high-efficiency chiller with natural refrigerant (CO2 refrigerant), inverter-controlled air-conditioners, and LED lighting will be introduced in convenience stores. Rooftop photovoltaic power generation systems will also be introduced.
•Energy Efficient Refrigerants to Cold Chain Industry
 The advanced energy efficient fluorocarbon cooling system using HFO and CO2 will be introduced in the food industry and logistics industry. A screw compressor and an IPM (interior permanent magnet synchronous) motor are adopted and operated integrally, to achieve high-efficient operation of the cooling facility.
•Energy Saving by Double Bundle-Type Heat Pump at Beverage Plant
 A double bundle-type heat pump, generating both heating and cooling energy, will be installed to reduce energy consumption.
•Energy Saving for Air-Conditioning and Process Cooling at Textile Factory (in West Java province & Bandung province)
 The high performance refrigerating machine with efficient compressor and economizer cycle will be introduced for factory air-conditioning.

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Overview of JCM Project Planning/Feasibility/REDD+ Studies in 2014 by MOEJ

Mongolia:
•100MW scale Solar Power Generation for Stable Power Supply
•Efficiency Improvement of Combined Heat and Power Plant by Thermal Insulation
•Waste Heat Recovery and Utilization in Textile and Garment Factories

Bangladesh:
•Waste Heat Recovery and Utilization in Textile and Garment Factories

Ken Lanka:
•100MW scale Biomass based Power Generation

Maldives:
•Installation of Solar PV and Storage Battery with Energy Management System (EMS)

Ethiopia:
•100MW scale Geothermal Power Generation

Kenya:
•Energy Saving by Micro Flush Toilet

Myanmar:
•Introduction of Waste to Energy Plant in Yangon City
•Environment Improvement through Utilization of Biogas from POE Fermentation System

•JCM Project Planning Study (PS)
•JCM Feasibility Study (FS)
•REDD+ Demonstration Study (REDD+)

Laos PDR:
•Biomass Utilization in Cement Kiln
•REDD+ in Luang Prabang Province

Cambodia:
•Energy Saving by Efficiency Improvement of Water Treatment Plants of Phnom Penh Water Supply Authority
•REDD+ in Prey Long Area and Salma Area

Palau:
•Solar Power Generation System

Costa Rica:
•Promotion of Electric Vehicle for Taxi Usage

Viet Nam:
•Introduction of Energy from Waste Project in Ho Chi Minh City
•Energy Saving for Irrigation Facility by Introducing High-efficiency Pumps
•100MW scale Hydropower Generation in Lao Cai Province
•Recovery and Utilization of Biogas from Mixed-treatment of Waste and Sewage
•Introduction of Co-generation System Using Bagasse in Sugar Factory

Indonesia:
•Installation of Combined Heat and Power System in Hotel
•Waste Heat Recovery and Electricity Generation in Flat Glass Production Plant
•Introduction of High Efficient Old Corrugated Cartons Process at Paper Factory
•7.1MW Run-of-river Hydropower Generation in Sulawesi
•Improvement of REDD+ Implementation Using ICT Technology

Large Scale JCM Feasibility Study in 2014 by MOEJ

Selected Studies

1. Financing Scheme Development for Promoting Energy Efficiency Equipment Installation in Indonesia (Jakarta, Bali etc.)
2. Low Carbon City Planning in Surabaya, Indonesia (Surabaya)
3. Eco-Lease Scheme for Low Carbon Vehicle (Indonesia National Level)
4. Developing a Low Carbon Society under Collaboration between Bandung City and Kawasaki City (Bandung)
5. Developing Environmentally and Culturally Sustainable in Angkor Park (Siem Reap)
6. Accelerating Implementation of Bangkok Master Plan on Climate Change (Bangkok)
7. Strategic Promotion of Recovery and Destruction of Fluorocarbons (Bangkok/Johor Bahru)
8. Installing an Evacuation Shelter with Renewable Energy as a "Low-Carbon/Resilient Model for Small Island Countries" (Palau etc.)
9. Comprehensive Resource Circulation System for Low Carbon Society (Palau)
10. Eco-Island in Cooperation between Kien Giang Province and Kobe City (Phu Quoc Island)
11. Hai Phong Green Growth Action Plan Development in Association with Kintyre City (Hai Phong City)
12. Ho Chi Minh City - Osaka City Cooperation for Developing Low Carbon City (Ho Chi Minh City)
13. Large-Scale GHG Emission-Reduction Project Development in the Iskandar Development Region, Malaysia (Iskandar)
14. Comprehensive Improvements in the Power Generation, Transmission and Distribution Systems in Gianbaratar City and on the Possibility of Nationwide Horizontal Application of the Same Improvement Model (Gianbaratar)
15. Programme-type Finance Scheme for the JCM (Ulaanbaatar)



Global Environment Centre Foundation

MOEJ "Large-scale Project Development
for Greenhouse Gas Reduction Projects in Asia" 2014

**JCM Feasibility Study of
GHG Mitigation Project Contributing to Low
Carbon Historic City based on City-to-City
Cooperation between Vientiane and Kyoto**

**INTERNATIONAL INAUGURAL WORKSHOP
on 28th October 2014, at Vientiane, Lao PDR**

Global Environment Centre Foundation (GEC)




Global Environment Centre Foundation

Background
Under consultation for conclusion of Partner City Agreements between Vientiane and Kyoto

Kyoto City	Vientiane Capital
<p>Birth place of Kyoto Protocol, and World famous historic and environmental city with the sustainable development practice</p> <ul style="list-style-type: none"> Continuous conservation of cultural and historic heritage Practice of advanced and unique environmental preservation Continuous development in urban plan and economic aspects, with lots of tourist visitors from all over the world <p>Take leadership as the Chairman of "League of historic Cities"</p>	<ul style="list-style-type: none"> historic city with plenty of historic and cultural heritage Emerging urban problems (disordered urban exploitation, traffic jams, waste increase) due to economic growth and increased tourists with lack of infrastructures → Supports should be important for solving these problems Request Kyoto City Mayor to provide support to tackle similar challenges experienced in Kyoto

☆Support from MOEJ☆

- "MoU on JCM implementation" signed by Laos and Japan in Aug. 2013
- Adopted this study (2014-)



Kyoto mayor visited Vientiane Capital in April 2014 (source: Mayor's blog)

2

Global Environment Centre Foundation

Field Survey (Oct. 2014)

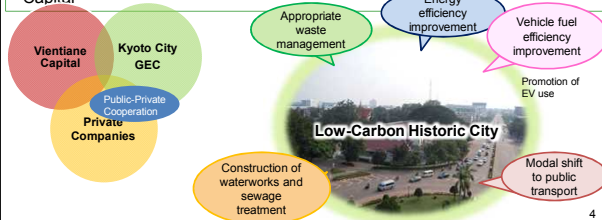
[Status quo of city] 	[Industrial park (VITA park)] 
[Development of Camp ground] 	[Development of Mekong river side] 

3

Global Environment Centre Foundation

Objectives
Objectives of the study

- To provide advanced Japanese and/or Kyoto's environmental sound technology and environmental administration, as a packaged system
- To establish an operation and management scheme to formulate Low Carbon Historic City Vientiane Capital, as the centre of low-carbon historic city
- To utilize financial resources for JCM project development and implementation, to realize the technology transfer and diffusion in Vientiane Capital



4

Global Environment Centre Foundation

Contents of the study

Based on the experiences of Kyoto City, following activities will be conducted:

- Investigation of Vientiane's needs, and identification of elements of a plan for Low Carbon Historic City Vientiane, in the context of the formulation of the Low-Carbon Historic City Vientiane, and the implementation of JCM projects
- Provision of practical experiences (ordinances, programmes) and technological knowledge owned by Kyoto City in an integrated manner, through International Workshop (tentative title) and workshops
- Development of large-scale (widespread-type and/or package-type) JCM project candidates for 2015 and forward, etc.

Establishment of operation and management scheme for low-carbon historic city

FS for JCM project candidates
(including development of JCM methodologies and project design documents (PDDs))

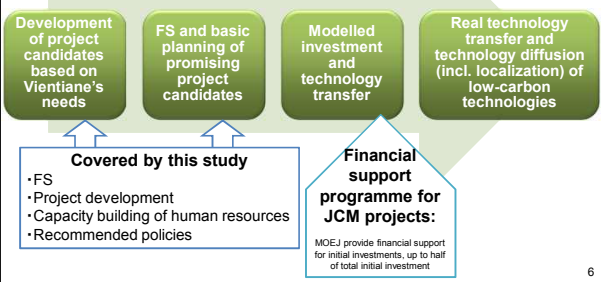
Promising JCM project candidate, with high local needs and high expectation for widespread and early implementation

- "EV Introduction and Promotion Project" (studied by Mitsubishi Motors, and Almec)

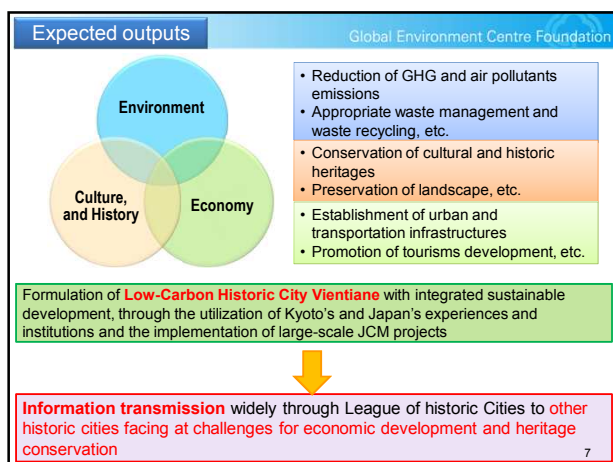
Environment Centre Foundation

Flow chart of JCM Project implementation

JCM utilization for the low-carbon technology transfer, implementation, and wide diffusion



6



Global Environment Centre Foundation

Concrete contents of 2014

① Establishing an operation and management scheme for formulation of Low-Carbon Historic City Vientiane Capital

(1) Identification of elements of Low-Carbon Historic City Formulation Plan

- Grasping sub-regional characteristics and existing strategies, plans, programmes in Vientiane Capital
- Investigation of local needs: grasping local needs of Vientiane Capital for solutions of environmental problems and for conservation of cultural and historic heritages
- Considering priority measures to be early executed toward the realization of low-carbon historic capital city
- Consulting about concrete contents of supports to be provided from Kyoto City

8

Global Environment Centre Foundation

Concrete contents of 2014

① Establishing an operation and management scheme for formulation of Low-Carbon Historic City Vientiane Capital

(2) Promotion of City-to-City Cooperation and Public-Private Cooperation

- Considering the practical scheme of Vientiane Capital
→ through the promotion of transfer and/or share of experiences, knowledge, know-how, technologies, and institutions of Kyoto City's urban development
- Promoting the private sector participation and the JCM project candidate development
- Holding meetings:
 - International Workshop (Kick-off in October, and Reporting in February)
 - Field survey

9

Global Environment Centre Foundation

Concrete contents of 2014

① Establishing an operation and management scheme for formulation of Low-Carbon Historic City Vientiane Capital

(3) Public Relations Activity

- Transmitting information through website
- Sharing information with relevant industrial/commercial organizations

→ to raise awareness and deepen understandings on this study and JCM

10

Global Environment Centre Foundation

Concrete contents of 2014

② FS of JCM Project Candidate, including the development of JCM methodology and project design document (PDD)

(1) Proposed project for EV introduction and diffusion

- Implementing FS of JCM proposed project aiming at **GHG emission reduction by fuel change from fossil fuel to hydro-based electricity**.
→ EV "i-MiEV" (made by Mitsubishi Motors) will be sold and/or leased to private enterprises in Vientiane
- Developing **JCM methodology** applicable to the project and its **PDD**
→ The project will be stepped to the **implementation stage (in 2015)**, and be registered as a JCM project.

11

Global Environment Centre Foundation

Targeted goals of 2014 activities

Collaboration with Vientiane Capital

1. Requesting **one-stop focal point in DONRE**, who is expected to **incorporate and coordinate information (including local needs)** provided by other relevant departments/authorities of Vientiane Capital
2. **Raising awareness** at Vientiane Capital on necessity of environmental conservation and low-carbon historic city formulation
3. **Providing recommendation from Kyoto City, according to Vientiane's local needs**
4. Agreeing **city-to-city cooperation continuation**, to be concluded in a written form in 2015

12

Global Environment Centre Foundation

Targeted goals of 2014 activities

Collaboration with relevant entities and private sectors

1. Finding and developing **new JCM project candidates** fitting the local needs and elements of low-carbon city plan.
→ **New JCM project on waste management** should be focused, based on the Vientiane's request to Kyoto.
2. Exploring collaborative relationship with industrial/commercial organizations, and relevant Japanese organizations located in Vientiane, such as:
 - JICA Lao Office
 - JETRO Lao Vientiane Office
 - Japanese Chamber of Commerce and Industry, Vientiane
 - Japanese Embassy in Lao PDR

→ **Business matching seminar to be held in Vientiane in 2015**

13

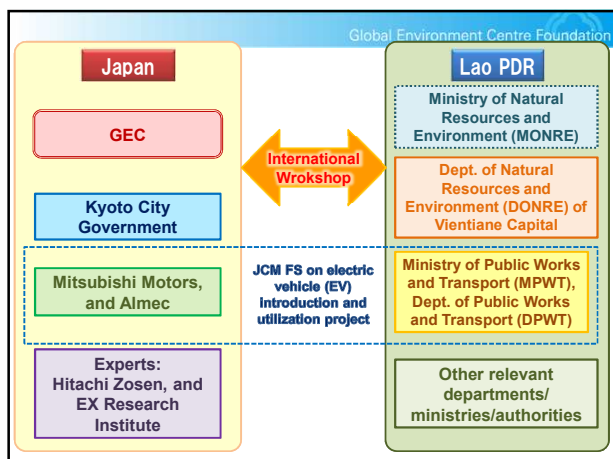
Global Environment Centre Foundation

Japanese implementers

Representative entity: GEC
Total coordination

GEC	Kyoto City Government	Mitsubishi Motors, and Almec
<ul style="list-style-type: none"> Coordinating the entire study Considering elements for low-carbon city plan Investing local needs Finding new JCM project candidate Managing FS progress Promoting city-to-city cooperation Promoting public-private cooperation 	<ul style="list-style-type: none"> Promoting city-to-city cooperation Considering elements for low-carbon city plan Investing local needs Promoting public-private cooperation Providing how to develop capacity and human resources 	Implementing JCM FS of EV project <ul style="list-style-type: none"> ✓ investing project feasibility ✓ developing applicable JCM methodology ✓ drafting PDD ✓ establishing project financial plan etc.

14



Global Environment Centre Foundation

Golden Combination !

KYOTO

VIENTIANE

16

Global Environment Centre Foundation

Global Environment Centre Foundation (GEC)

International Cooperation Division
(Contact person: Mr. Masaaki Tabo, tabo@gec.jp)

Tel: +81-6-6915-4126
Fax: +81-6-6915-0181
Email: vcc-lc@gec.jp
Web: <http://gec.jp>

17

ALMECVP

JCM Project Feasibility Study Promotion of EV Usage for Company Car

— Outline of Study —

October 28, 2014
ALMEC CORPORATION

1

ALMECVP

Background of Project

Development Issues

Annual 8% of GDP growth occurs rapid increase of vehicles ownership and fuel consumption .

Issues for development

- 1) Environmental pollution
- 2) Short on foreign currency reserves for fuel import
- 3) Threat to energy security

To resolve the issues, rich and potential hydropower should be utilized

Policy and Strategy

In order to realize a balanced economic growth, Japan provides its assistance to build a environmentally harmonious and comfortable society.
(JMOFA, 2012, Assistance Policy to Lao)

By the promotion of EV usage, issues on environment, national economy and energy security to be improved comprehensively.
(EV Promotion Strategy, JICA, 2012)

2

ALMECVP

Toward SMART-LAOS

Towards SMART-LAOS and widespread of EVs, a systematic efforts has been deployed around the JICA. This project is positioned as efforts to spread advanced four-wheel passenger EV.

	FY2012	FY2013	FY2014	FY2015	FY2016
			1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12
JICA Development Study (DS)	EV promotion strategy				
JICA Technical Cooperation (TC)	EV promotion plan				
JICA Support to SME overseas operation Demonstration Project (SME-OP)					
Needs Study					
JMOE Low carbon technology Innovation Project					
JMOE JCM-FS by Almeo					
JMOE Large Scale JCM FS					
JMETI JCM FS (SU/Toronto/Taisho)					
HEV/PHEV E-Bike 4 wheel E-Bike (1000w)					

A B C D

3

ALMECVP

Mechanism of Emission Reduction

Emissions are reduced through shift from conventional fossil fuel car to i-MiEV of MMC for company car in Vientiane City. The emission reduction mechanism is as the following;

4

ALMECVP

Study Contents

JCM Project Design

Hearing to candidate offices for i-MiEV introduction (approx. 6 offices)
EDL
Government (MONRE, MPWT, Vientian City)
Taxi Company, etc.

Planning of Electricity Charging Infrastructure

i-MiEV Introduction Plan
Organization, timing, number of vehicle, price, purchase/Lease
Target; 50 units in 2015
50 units in 2016

Business Scheme and Structure

MRV Methodology

Collection of Reference fuel consumption Data
Record actual drive distance and fuel consumption in candidate offices
6 offices × 10 vehicles
November to Mid December (1.5 months)

Reporting

Draft JCM Methodology
Draft JCL Project Design Document

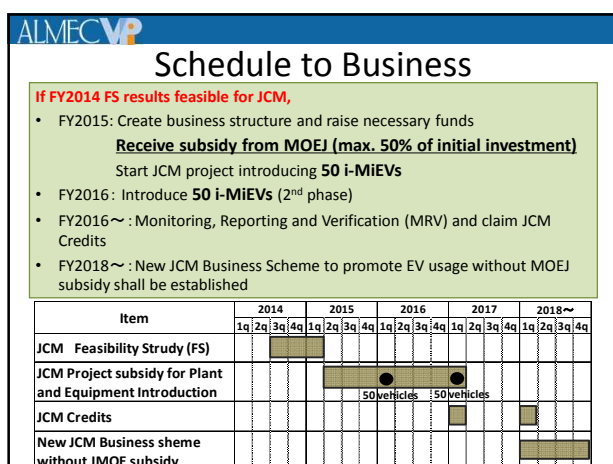
5

ALMECVP

Study Schedule


Item	09	10	11	12	2015.01	02	03
Hearing to Offices							
Infrastructure Plan							
Monetary Plan							
Introduction Plan							
Business Structure Plan							
Reference Data Collection							
JCM Methodology							
MRV Structure							
Reporting							
Working Group in Japan	△	△				△	
Joint Working Group		▲					▲
JCM Seminar in nJapan						○	
Visit to Vientiane		●		●		●	
Outcome Report						DFR	FR

6




Zero-Emission Technologies

■ Electric Vehicle

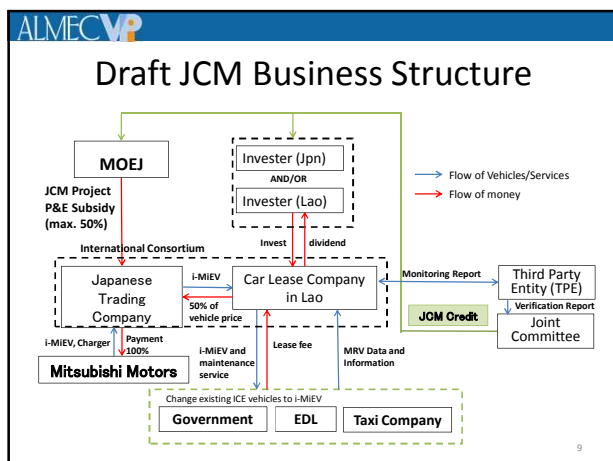


i-MiEV
Cruising Range: 160km/charge
Traction Battery Energy: 16kWh
Battery Warranty: 5years/100,000km

■ Power charge equipment



CHAdemo DC Quick Charger (left)
80% full in 30 minutes
AC 230V Normal Charger (right)
8 hours to Full



Outline of Project

- Main Equipment introduced (Target)
 - i-MiEV 100 vehicles (FY2015•FY2016 50 vehicles each)
 - Quick Charger 10 nos. (Level 3)
 - Normal Charger 100 nos. (Level 1 or 2)
- Project Cost (tentative)
 - US\$3 million
- Emission Reduction

FY	2015	2016	2017	2018-
Project Cost (Million US\$/year)	1.5	1.5	0	0
Emission Reduction (t-CO ₂ /year)	0	200	400	400

MRV Methodology

Reference emissions will be quantified by

$$RE_y = \sum_i (SFC_i \times NCV_{RF,i} \times EF_{RF,i} \times DD_{i,y} \times N_{RF,i,y})$$

RE_y : Total reference emissions in year y (tCO₂/year)
 SFC_i : Specific fuel consumption of reference vehicle category i (l/km)
 $NCV_{RF,i}$: Net calorific value of fossil fuel consumed by reference vehicle category i (MJ/l)
 $EF_{RF,i}$: Emission factor of fossil fuel consumed by reference vehicle category i (tCO₂/MJ)
 $DD_{i,y}$: Annual average distance travelled by project vehicle category i in the year y (km/year)
 $N_{RF,i,y}$: Number of reference vehicles in category i in year y

- $NCV_{RF,i}$ is cited from Thai Ministry of Energy (31.48MJ/liter).
- $EF_{RF,i}$ is based on IPCC default value (69,300kgCO₂/TJ).
- SFC_i will be set through the result of fuel consumption/efficiency investigation in the FS.
 - Option 1: based on actual measurement
 - Option 2: based on a regression model based on Japanese actual fuel efficiency estimation
 - Option 3: Catalogue value

Project emissions will be quantified by

$$PE_y = \sum_i (SEC_{PJ,i,y} \times EF_{elect,y} / (1 - TD_{i,y}) \times DD_{i,y} \times N_{PJ,i,y})$$

PE_y : Total project emissions in year y (tCO₂/year)
 $SEC_{PJ,i,y}$: Specific electricity consumption of project vehicle category i (kWh/km)
 $EF_{elect,y}$: Grid emission (tCO₂/kWh)
 $TD_{i,y}$: Loss ratio of electricity transmission (%)
 $DD_{i,y}$: Annual average distance travelled by project vehicle category i in the year y (km/year)
 $N_{PJ,i,y}$: Number of project vehicles category i in year y

Data collection of Reference Fuel Consumption

- Request to monitor drive distance and fuel consumption of existing cars in candidate offices. (6 offices x 10 vehicles)
- Monitoring period: November~ mid December (1.5 months)
- Full-fill Fueling Method
 - During monitoring period, full-fill vehicle tank when fueling in station. The driver records the quantity of fuel and reading of odometer to monitoring sheet.
 - In order to monitor daily drive distance and the variation, the driver records the reading of odometer when he closes vehicle drive everyday.
- Study team collects the monitoring sheets at 2nd site visit in end of December.
- Refer the monitoring sheets showing on next slide.

ALMEC

Monitoring Record Sheet

Company Name	Car Maker
Driver Name	Car Name
Number Plate	Displacement (cc)
	Model Year

Daily monitoring record sheet in 2014
<November>

		1.Odometer (end of a day)	Fueling(gasolin)		5.Remark
			2.Odometer (when fueling)	3.Fuel Quantity(L)	
1	Sat	28992	28942	29.13	✓
2	Sun	29083			
3	Mon	29144			
4	Tue	29172			
5	Wed	29216			
6	Thu	29227			
7	Fri	29236			
8	Sat	29248			
9	Sun	29267			
10	Mon	29280			
11	Tue	29386			
12	Wed	29301			
13	Thu	29327	29327	17.38	✓
14	Fri	29343			

13

ALMEC

Thank you for your attention !

Akiko Kuraoka (Ms.)
ALMEC Corporation
28 October, 2014

14

MMC Suggestion for EV

Oct, 2014
Mitsubishi Motors Corporation

MMC EV Business

EV Best practice

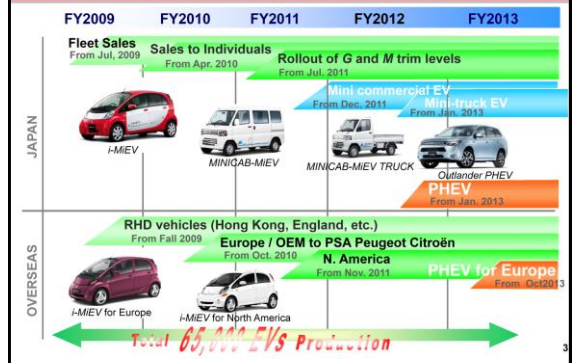
V2X

1

MMC EV Business

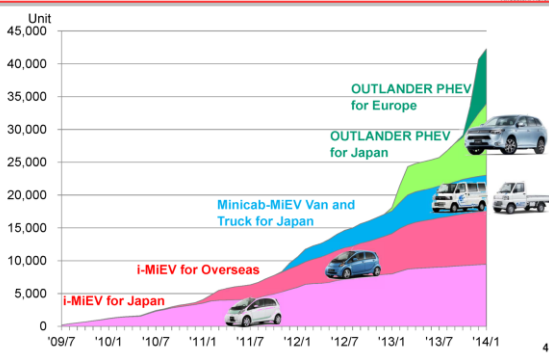
2

Mitsubishi Electric-powered Models line-up



3

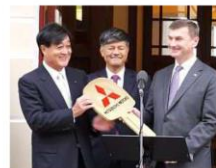
Sales of Mitsubishi EV/PHEV all over the world



4

Case in Estonia

507 units of Mitsubishi i-MiEV to be provided to Estonian Government (shipped by end of 2011FY)
- The first case of Provision of EV under Green Investment Scheme -
Support for EV popularization
Subsidy for purchasing
Charging Infrastructure expansion



Delivery Ceremony in November



Case in Norway



More than 2,000 i-MiEVs were sold in Norway

- Top Share in A-segment in 2011
- Key factor for success...
 - ❑ Tax (road and registration) and VAT exemption
 - ❑ Free parking
 - ❑ No motorway toll
 - ❑ Well established charging infrastructures
 - ❑ Access to bus lane
 - ❑ High interest for EV



EV- exclusive parking



2,000th i-MiEV sales

6

Lyon Confluence Smart Community Demonstration



- MMC & PSA provided 15/15 units for car share project
- Fleet and Private user
- Combination of energy management system testing



6 stations with normal charger and
3 Quick chargers



Opening Ceremony
Oct. 2013

EV Best practice

8

EV usage



Government officials
Municipality



Business
Tourism



Logistics

9

For government officials, municipalities



- For official car
- For sales person
- For service / Maintenance
- For patrol



Official car
MINICAB-MiEV and Quick Charger
installed by Saitama prefecture in Japan



Maintenance car
waterworks department of
Yokohama city



Patrol car
Kanagawa Police office

10

For business, tourism



- Pick up children, family
- Shopping
- Go to hospital



sharing in condominium



School



Hospital



Shopping



11

Logistics Service



- Suitable for regular route driving
- Less running cost
- Stable and Quiet
- Advertisement
- Wrapping service



12

Other Idea of introduction of EV

- Airport



- Hospital



- Hotel



Four seasons hotel at Langkawi

13

As the Global Air Hub <Eco-airport>

Environmental consideration must be paid to nearby residents

Noise

CO2 emission

Vibration



i-MiEV

- ◆ Usage:
 - Travel for terminal-to-terminal,
 - Travel for restricted areas, maintenance service car
 - Etc.

14

V2X

15

i-MiEV in Tohoku disaster area



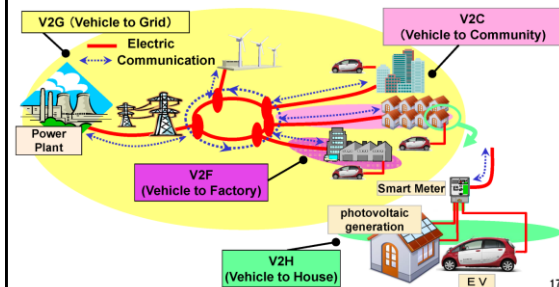
89 i-MiEV were sent to the disaster area for reconstruction.

Iwate pref. Photo: Masashi Kawada

16

Link with Power and Communication Network

Vehicles will link with power and communication network and create new added value.



17

MMC Project "M-tech Labo"

Install experimental system equipped with PV, PCS, and reuse battery at Mitsubishi Motors R&D center in Okazaki, Japan. The test started from 12th April 2012.



Charging Posts for EVs

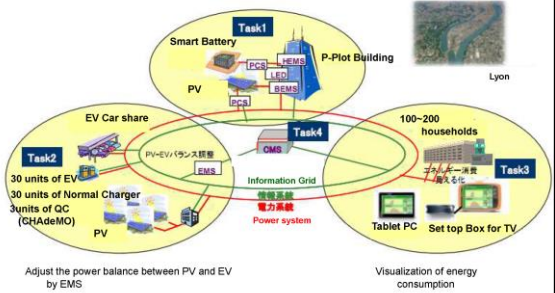


Reused Battery

18

Lyon Confluence Smart Community Demonstration

Toshiba and Toshiba solutions were selected as contractors of Lyon project by NEDO. MMC join the project as a car supplier in task 2.



Smart Community Project in Spain

Smart Community Project between



under the Japan and Spain Innovation Program funded by NEDO and CDTI



Smart Community System Demonstration Project in Spain (Gisga)
Source: press release from NEDO as of 8 March 2011

- ✓ Focus on the transportation and power sectors from 2011 to 2015
- ✓ Introduction of a platform to collaborate with the Malaga Smartcity Project, which integrates information from energy management systems for renewable energy and the existing power infrastructure.
- ✓ Establishment of new infrastructure including EV management systems, EV charging facilities and information services
- ✓ Aiming improvement of the efficiency of Malaga's grid management system

Drive@earth








JCM Project in Southeast Asia

2014. 10. 28

Hitachi Zosen corporation


1



Methane utilization project in Wholesale Market

2


PROJECT OVERVIEW



The project will set up the source separation and collection system of organic waste within Wholesale market.


The organic waste will be treated by way of anaerobic digestion within the wholesale market. The methane from anaerobic digestion would be supplied to the wholesale market to replace fossil fuel.

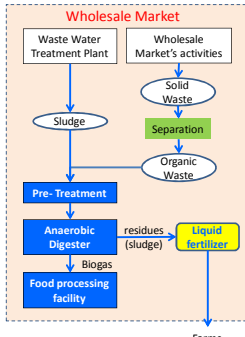
The digested sludge from the digestion reactor will be distributed to the nearby farmers as liquid fertilizer.




Copyright Hitachi Zosen Corp.

PROCESS FLOW






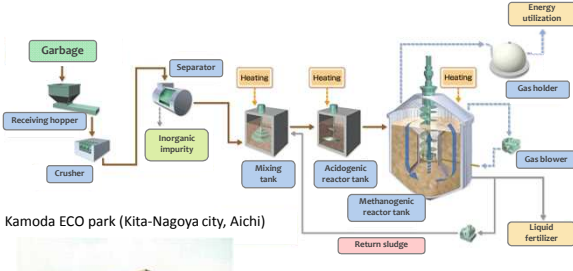
プロジェクトにおけるプロセスフロー図




Copyright Hitachi Zosen Corp.

TYPICAL FLOW DIAGRAM






Kamoda ECO park (Kita-Nagoya city, Aichi)



Copyright Hitachi Zosen Corp.

PROJECT SCHEME



JAPAN

Japanese Government

Hitachi Zosen
KKS

VIETNAM

Vietnamese Government

National Company

JV/SPC

Agreement between Japanese and Vietnamese Governments


Investment from National Company to Wholesale market

Investment from Hitachi Zosen and KKS to JV/SPC

Waste/Sludge from Wholesale market to JV/SPC

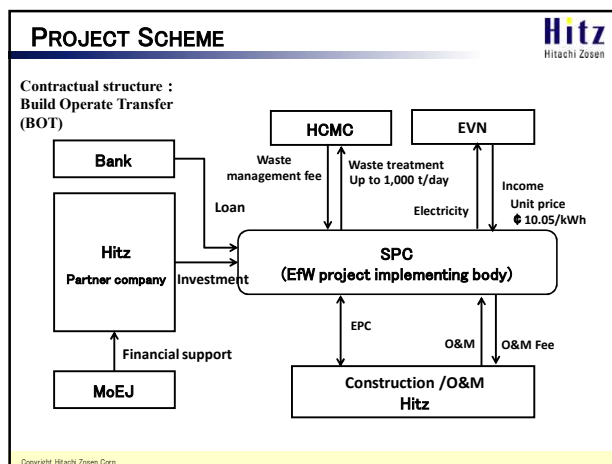
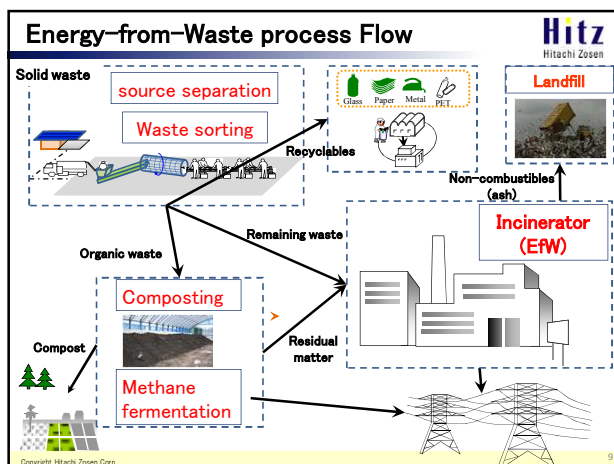
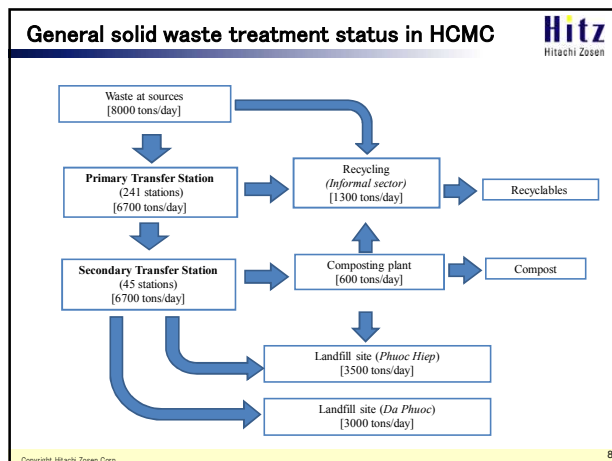
Energy fee, Waste management fee, Biogas as fuel from JV/SPC to Wholesale market


Copyright Hitachi Zosen Corp.



Energy-from-Waste project


7





CORPORATE PROFILE

11



COMPANY OUTLINE

- > Name: Hitachi Zosen Corporation
- > Date of founding: April 1, 1881
- > Date of establishment: May 29, 1934
- > Head office: Osaka, Tokyo
- > President: Takashi Tanisho, President & COO
- > Capital: 45,442,365,005 JPY
- > Employees: 9,039 (consolidated)
- > Net sales: 333,433 million JPY (consolidated)
- > Business:
 - Design and construction of environmental systems
 - Industrial plants
 - Industrial machinery
 - Process equipment
 - Infrastructure-related equipment
 - Disaster prevention systems
 - Precision machinery

Environmental systems

- Energy-from-Waste plants
- Material recycling systems
- Water treatment system

Industrial plant

- Desalination plants
- Power generator systems
- Biodiesel fuel production facility

Infrastructure-related equipment


- Shield tunneling machines
- Bridges
- Earthquake protection


Process equipment

- Pressure vessels
- Nuclear fuel cycling-related equipment

Machinery

- Marine diesel engines
- Press machine
- Precision Machinery




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2. The Second International Workshop


Global Environment Centre Foundation

**MOEJ "Large-scale Project Development
for Greenhouse Gas Reduction Projects in Asia" 2014
JCM Feasibility Study of
GHG Mitigation Project Contributing to Low
Carbon Historic City based on City-to-City
Cooperation between Vientiane and Kyoto**

**Working Report of 2014
and Proposal for 2015**

2nd International Workshop
on 4 February 2015, at Vientiane Capital, Lao PDR

Global Environment Centre Foundation (GEC)




Global Environment Centre Foundation

Background
Under consultation for conclusion of Partner City Agreements between Vientiane and Kyoto

Kyoto City	Vientiane Capital
<p>Birth place of Kyoto Protocol, and World famous historic and environmental city with the sustainable development practice</p> <ul style="list-style-type: none"> Continuous conservation of cultural and historic heritage Practice of advanced and unique environmental preservation Continuous development in urban plan and economic aspects, with lots of tourist visitors from all over the world <p>Take leadership as the Chairman of "League of historic Cities"</p>	<ul style="list-style-type: none"> historic city with plenty of historic and cultural heritage Emerging urban problems (disordered urban exploitation, traffic jams, waste increase) due to economic growth and increased tourists with lack of infrastructures → Supports should be important for solving these problems Request Kyoto City Mayor to provide support to tackle similar challenges experienced in Kyoto

☆Support from MOEJ☆

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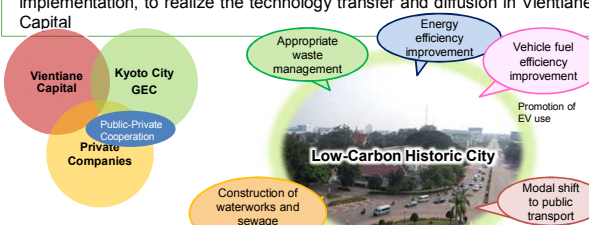
Kyoto mayor visited Vientiane Capital in April 2014 (source: Mayor's blog)

2

Global Environment Centre Foundation

Objectives of the study

- To provide advanced Japanese and/or Kyoto's environmental sound technology and environmental administration, as a packaged system
- To establish an operation and management scheme to formulate Low Carbon Historic City Vientiane Capital, as the centre of low-carbon historic city
- To utilize financial resources for JCM project development and implementation, to realize the technology transfer and diffusion in Vientiane Capital



3

Global Environment Centre Foundation

Contents of the study

Based on the experiences of Kyoto City, following activities will be conducted:

- Investigation of Vientiane's needs, and identification of elements of a plan for Low Carbon Historic City Vientiane, in the context of the formulation of the Low-Carbon Historic City Vientiane, and the implementation of JCM projects
- Provision of practical experiences (ordinances, programmes) and technological knowledge owned by Kyoto City in an integrated manner, through International Workshop (tentative title) and workshops
- Development of large-scale (widespread-type and/or package-type) JCM project candidates for 2015 and forward, etc.

Establishment of operation and management scheme for low-carbon historic city


FS for JCM project candidates (including development of JCM methodologies and project design documents (PBDs))

Promising JCM project candidate, with high local needs and high expectation for widespread and early implementation

- "EV Introduction and Promotion Project" (studied by Mitsubishi Motors, and Aimec)

Global Environment Centre Foundation

Expected outputs



- Reduction of GHG and air pollutants emissions
- Appropriate waste management and waste recycling, etc.
- Conservation of cultural and historic heritages
- Preservation of landscape, etc.
- Establishment of urban and transportation infrastructures
- Promotion of tourism development, etc.

Formulation of **Low-Carbon Historic City Vientiane** with integrated sustainable development, through the utilization of Kyoto's and Japan's experiences and institutions and the implementation of large-scale JCM projects

↓

Information transmission widely through League of historic Cities to other historic cities facing at challenges for economic development and heritage conservation

5

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Concrete Activities in 2014

Collaboration with Vientiane Capital

- Holding 1st International Workshop
 - ✓ As a kick-off meeting with Vientiane and Japan sides
 - ✓ Opinion exchange about the needs in Vientiane Capital and the following targeting activities
 - ✓ Confirm the intensive interest in this project by Vientiane side; not only in EV project, but also in the field of waste management and sewage treatment
 - ✓ Request to establish a steering committee to manage this project, as well as sub-committees to handle each specific issue by relevant departments/authorities of Vientiane Capital
- Surveys and Interviews for Individual Needs
- Site Visits and Field Surveys

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Concrete Activities in 2014

Collaboration with Vientiane Capital (cont.)

2. Surveys and Interviews for Individual Needs
 - Identify individual needs against environmental issues at
 - ✓ DONRE, VUDAA,
 - ✓ MPWT, DPWT, and
 - ✓ MONRE
3. Site Visits and Field Surveys
 - ✓ Landfill Site (KM32),
 - ✓ Waterworks Plant (Chinaimo),

7

Global Environment Centre Foundation

Concrete Activities in 2014

Collaboration with Relevant Entities and Private Sectors

1. Request Collaboration to the Following Entities
 - ✓ JICA Laos Office
 - ✓ JETRO Vientiane Office
 - ✓ Japanese Embassy in Lao PDR
2. Site Visits and Field Surveys

To find out new JCM project candidates fitting the local needs and elements of low-carbon city plan

Individual interview at following places;

 - ✓ markets,
 - ✓ tapioca factory, and
 - ✓ large scale hotels

➔ New JCM project focusing on waste management (waste-to-energy) should be developed, based on the Vientiane's request to Kyoto.

8

Global Environment Centre Foundation

Photos in Each Activity

<Courtesy Visit>



<1st International WS>



<Individual Interview>



<Final Disposal Site KM32>



<Market in VTE>



<Street View>



9

Global Environment Centre Foundation

Results of Activities in 2014

- Identification of challenges and problems of Vientiane Capital**
 - Increased automobiles (congestion of road traffic)
 - Increased import of vehicle fuel (i.e. fossil fuel)
 - Fossil fuel (e.g. coal) consumption to be reduced
 - Incremental waste emissions
 - Necessity of appropriate waste management (incl. collection, transport, and intermediate treatment)
 - Necessity of efficient waterworks facilities
 - Necessity of effective sewage and wastewater treatment infrastructures
 - Necessity to enhance human resources and their capacity
- Actions taken to address challenges and problems**
 - Environmentally Sustainable Transport (EST) project, supported by JICA
 - Electric Vehicle (EV) project under the JCM, and its linkage with EST project for synergy
 - Solid waste management under the LPP-E Programme (JICA and Kokusai Kogyo)
 - Waterworks expansion plan and capacity building programme, supported JICA and Saitama Prefecture
 - Proposal for the establishment of 'Vientiane Climate Change Committee' as an inter-departmental institution
 - Proposal: Capacity development for 3R Programme and for waste management policy/programme
 - (Future expectation) Sewage treatment plant to be constructed

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Outcomes of Activities in 2014

1. Elements of a plan for Low Carbon Historic City in Vientiane

Based on the needs assessment, following elements are to be addressed:

 - solid waste management
 - transportation system
 - fossil fuel-based energy
 - water resource management
 - wastewater and sewage treatment

and so forth...
2. JCM projects

1 EV project whose feasibility was studied.

Some new projects could be developed:

 - ✓ biomass utilization, and
 - ✓ solid waste management

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Global Environment Centre Foundation

Proposed Objectives in 2015

- **Developing a draft fundamental plan for Low-carbon Historic City in Vientiane Capital**
 - ➔ Elaborating draft components to be crystalized in the plan, based on the results of 2014
 - ➔ Making policies for low carbon development in Vientiane Capital
 - ➔ Particularly focusing on the appropriate waste management, based on Kyoto's experience and know-how
- **Implementing the JCM Project**
 - ➔ Electric Vehicle (EV) Project to be stepped forward into the implementation stage, with the JCM financial support
 - ➔ EV project to be incorporated in the smart transportation system development supported by JICA
- **Formulating new JCM Project candidates**
 - ➔ Continuing local needs assessments and hearings/interviews with local entities
 - ➔ Implementing new FS of JCM Projects, such as biomass-based fuel utilization

12



**Lao PDR
Implementing Reduce
Green House Gas
Emissions To Low-Carbon
And Sustainable City
Development**

MS BANG ON SAYARAT

**Deputy of Natural Resource
And Environment
Department
Vientiane Capital City.**

**Lao PDR has 18 provinces:
Vientiane Capital is the main province**

Area: Total : 236,800 km²


Population: 2012 estimate 6,500,000 people

Density: 26.7/km²


GDP—per capita: 875 USD in 2009 (National Socio—Economic Development Plan 2008—2009)

Religion: Buddhism , ghost, Christian and other

Lao PDR, shares a 505 km border with China to the north, 435 km of border with Cambodia to the south, 2,069 km of border with Vietnam to the east, 1,835 km of border with Thailand to the west, and a 236 km border with Myanmar to the northwest




Introduction Vientiane



- **Area:** 3,920 km²
- **Population:** 972,000 (2012)
- **Pop. Density:** 248/ km²
- **Administration :** 9 Districts and 483 Villages.
- **Nos. of Household:** 126,977

Socio-Economic And Environment Situation:

Population: In addition of accelerate the development of industry and service sector People migrate to cities to seek better opportunities for live, work and study. The population in rural Is very low they live scattered which provision of public infrastructure difficult and in efficient .



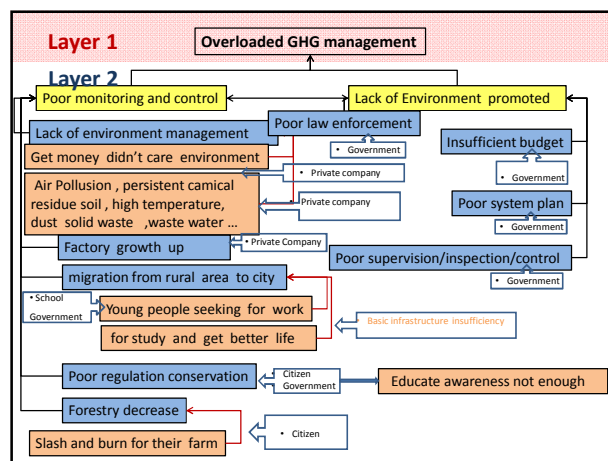


Introduction

Economy: Main economic activities are rice cultivation, electricity generation and tourism

GDP—per capital: highest USD 2,148 in 2006-2010
Lowest USD 397

Trade: main export goods are : Minerals (45%) electricity(10%) Garment (13%)
Main import are: machineries and product equipment (47%) Petroleum products (17.2%)

Problem And Challenge



Problem And Challenge



Problem And Challenge



Problem And Challenge



Problem And Challenge



Problem And Challenge



Law and Regulation



- National Strategy on Climate Change and GHG Mitigation of the Lao PDR was approved by Government in March 2010;
- Guideline development consideration CDM projects approved Nov 2012;



Low And Regulation



- National Criteria of Environment approved Dec 2010 .



- Environmental Protection Law, approved Dec 2012;

❖ Mitigation Strategy On GHG

Focus in 6 Sectors:

1. Agriculture
2. Land Use Change and Forestry
3. Energy
4. Transportation
5. Industry
6. Urban Development



Mitigation aspects

Agriculture

- Reducing methane emissions from rice paddies
- Reducing emissions methane from livestock manure
- Promote technology transfer by using agricultural residue to energy

Mitigation aspects

Land Use Change & Forestry

- Reducing “slash and burn” agriculture
- Reducing forest fires by setting regulation
- Mapping and planning for sustainable land use
- Promote forest plantation

Mitigation aspects

Energy

- **Electrification:** Increase electricity service to rural and remote areas
- **Renewable energy:** accelerating development energy sources such as solar and wind as well as hydropower including mini-hydro
- **Cleaner energy:** making use of the coal-bed methane and coal-mine methane, seeking cleaner technologies for development

Mitigation aspects

Transport

- **Low-carbon transport:** promote using alternate energy operated motor vehicles pursuing EST;
- **Fuel efficiency:** controlling the imports, using second hand vehicles and promote using fuel-efficient vehicle and battery car
- Seeking the opportunities under the CDM or other flexible programmatic related to **non-emission transport**

Mitigation aspects

Industry

- **Promote industrial process :** Reducing pollutants and promote clean production industry
- **Waste minimization:** Reduce wood waste from wood processing plants
- **Energy from waste:** promote using waste biomass to produce renewable energy

Mitigation aspects

Urban Development/Solid Waste

- Reduction of GHG emissions from solid waste through applying the 3Rs (reduces, reuse and recycle);
- Upgrading solid waste collection services and neighbourhoods to avoid GHG releases from open burning
- Building recycling facilities in order to reduce the amount of wastes to be disposed in landfills.

Implemented Mitigate GHG Emission To low car-bon Vientiane Capital City



Implemented Mitigate GHG Emission To low car-bon Vientiane Capital City



Clean, Green Schools program



Bio Gas



Implementation of the pilot project (LPPE)

Under 5 Strategy :

1. promote 3Rs principle
2. Improve Waste collection
3. Improve Final Disposal
4. Healthcare Waste management
5. Institutional system improvement



Implementation of LPPE landfill : Before & After PP of KM 32



Implementation of the pilot project (Cont)

Promote 3 R consists:

1. composting
2. Recyclable separation
3. Plastic bag reduction

In Vientiane capital selected as the pilot villages : 4 villages (NoneSavang, HongSoupharp, NoneSaVanh ,Amone)





City of Kyoto

Challenges and Efforts in Historic City of Kyoto ~Focus on Solid Waste Management~



Feb. 2015

Director of General Affairs Section,
Environment Policy Bureau, Kyoto City
Kunimitsu IMAI (Mr.)

1

City of Kyoto

Goal of Waste Management in Kyoto City

【Basic Goal of Waste Management】

- Quality living environment and improved public health
 - (1) Efficient waste collection and transport
 - (2) Sanitary disposal of waste

Almost achieved the basic goal.
Toward the more ambitious goal to be set

- (3) Promotion of reduction and recycling of waste
- (4) Waste to energy
- (5) Beautification of the city

2

City of Kyoto

Overview of Kyoto's Waste Management

Waste amount (2013) 472,000t/year

Households: 236,000t (collected by Kyoto City Gov.)
* Note that part of waste collection is committed private entities

Industries & businesses: 236,000t
(Emitters took contacts with private collection entities)

Collection & Transport of household waste
7 collection offices, and 188 waste collection vehicles

combustible (2/week) → 3 Clean Centers → Landfilling of incineration ash → 1 Final Landfill

can/bin/PET (1/week) → 2 Recycling Centers → Recycling

package (1/week) → 2 Compression Facilities → Recycling

2 Transfer Facilities

3

City of Kyoto

Waste treatment plants in Kyoto city



North Clean Center (From 2004, 400t/day)

East North CC (From 2001, 700t/day)

East landfill site (From 2000, 4500,000m³)

Recycling of waste cooking oil

South Recycling Center

South CC (From 1985, 600t/d)

CC: Clean Center

4

City of Kyoto

(1) Efficient Collection of Transport



Emitted from individual households

- Fees for waste collection are levied through the sales of official collection bags (JPYen 1 per liter)



Waste collection

- 188 collection vehicles equipped to 7 offices (1 driver and 2 collecting workers in 1 vehicle)
- 1 vehicle per 1 day: 4-time collections of combustibles, and 1-time collections of recyclables

5

City of Kyoto

(2) Sanitary Disposal of Waste



Transport to Clean Centers

- Household waste collected is transported to 3 Clean Centers
- Transported waste is thrown into pooling pits



Waste pooling pit and crane

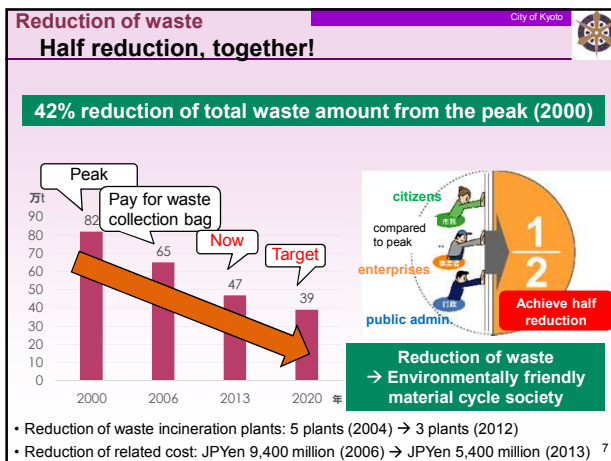


Incinerator

Waste Incineration

- Waste is thrown into incinerators by using cranes
- High-temperature (900 C-degrees) combustion
- Incineration ash is landfilled at the final disposal (landfill) site.

6



(3) Reduction and Recycling of Waste

City of Kyoto

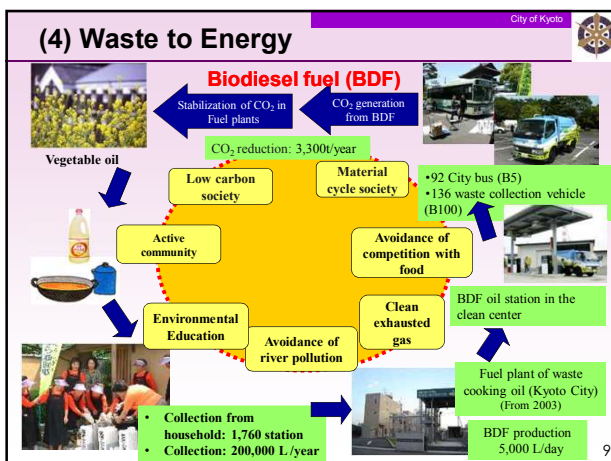
Transport of Recyclables to Recycling Facilities

- Collected recyclable waste (cans, bins, PETs, and plastic packages) is transported to 4 Recycling Facilities
- Recycling of the recyclable waste after segregation process

Opportunities for waste segregation

- Campaign to promote the segregation of household waste (metals, used clothing, used paper, compact appliance, etc.) and the recycling
- Visiting collection service
- Free-access collection points where citizens can bring waste

8



(4) Waste to Energy

City of Kyoto

Waste to energy
– waste incineration plant is a high tech power plant

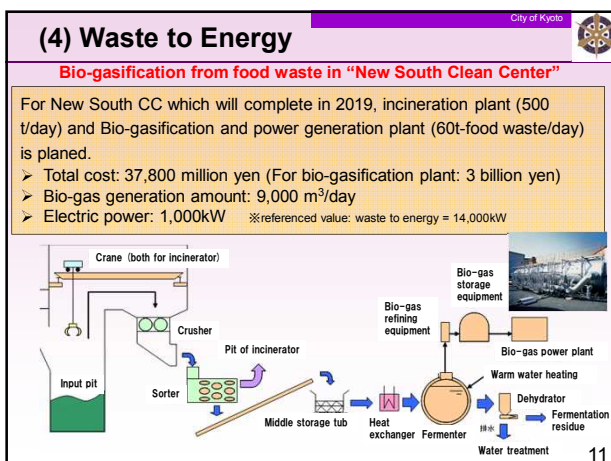
- Surplus waste heat is used for electric power generation in 3 waste incineration plants

[FY2013]

- Total power generation : 173,870,000 kWh
(= Electricity consumption by 40,000 households)
- Sales of electricity: 85,660,000kWh (1,584 million JPYen)

Also, solar panels on the roof

10



(5) Beautification of the City

City of Kyoto

Promoting "World's Most Beautiful City, Kyoto"

門掃き: Kado Haki (= Entrance clean-up)
Kyoto's traditional customs of citizens' life to clean up the surrounding of own houses by sweeping out every morning

Promotion of city beautification (cleaning-up) activities with citizens' voluntary

- Holding participatory event "All citizens' actions for city beautification"
- Inheriting traditional customs "Kado Haki" to the present lifestyle

12

(5) Beautification of the City

City of Kyoto



Beautiful city attracting to tourists from all over the world

- "Omotenashi" (=hospitality) to visitors, with no trash on the streets
- Extremely high satisfaction of foreign tourists to "beauty and cleanliness of the city"

World best city by "Travel + Leisure" Magazine

Kyoto got high scores on various aspects, and No. 1 in 2014



— "Travel + Leisure" Magazine —
Impressive monthly travel magazine issued million copies in North America. The world's best award, started in 1995, is the ranking based on readers' votes.

● 2013			● 2014		
Rank	City	Score	Rank	City	Score
1	Bangkok (Thailand)	90.40	1	Kyoto	90.21
2	Istanbul (Turkey)	89.96	2	Charleston (USA)	90.18
3	Florence (Italy)	89.84	3	Florence (Italy)	89.99
4	Cape Town (South Africa)	89.57	4	Siem Reap (Cambodia)	89.82
5	Kyoto	89.31	5	Rome (Italy)	89.61
6	Rome (Italy)	89.09	6	Istanbul (Turkey)	89.58
7	Charleston (USA)	88.65	7	Sevilla (Spain)	89.28
8	Barcelona (Spain)	88.45	8	Barcelona (Spain)	89.18
9	Paris (France)	88.35	9	Mexico City (Mexico)	89.07
10	Chiang Mai (Thailand)	88.15	10	New Orleans (USA)	88.74

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For realizing sustainable historic city of Kyoto



Thank you for your kind attention!

14

JCM Project Feasibility Study Promotion of EV Usage for Company Car — Outline of Study Results —

February 4, 2015

Mitsubishi Motors Corporation
Almec Corporation

1

Mechanism of Emission Reduction

Emissions are reduced through shift from conventional fossil fuel car to i-MiEV and Outlander(PHEV) of MMC for company car in Vientiane City. The emission reduction mechanism is as the following;



2

Study Contents

JCM Project Design

Hearing to candidate offices for i-MiEV introduction (approx. 6 offices)
EDL
Government (MONRE, MPWT, Vientiane City)
Taxi Company, etc.

Planning of Electricity Charging Infrastructure

i-MiEV/PHEV Outlander Introduction Plan
Organization, timing, number of vehicle, price, purchase/Lease

Business Scheme and Structure

MRV Methodology

Collection of Reference fuel consumption Data
Record actual drive distance and fuel consumption in candidate offices
6 offices × 10 vehicles
November to Mid December (1.5 months)

Reporting

Draft JCM Methodology
Draft JCL Project Design Document

3

Hearing to Candidates

(2014/10/27~31)

MPWT	Prime Minister Directive is necessary to introduce. The renewal program of Government cars are developed in some departments. But no progress due to the limited budget.
EDL	High level Directive such as Minister of MPWT or MEM is necessary to introduce. Interested in Electricity Charge business to EVs.
PM office	Two i-MiEVs donated by KOLAO are in use now.
MONRE	Government initiative for EV use is good to make national consensus for environmentally sustainable Lao.
DPWT	High level Directive such as Minister or Governor is necessary to introduce. EVs are possible to introduce for a part of government use.
Taxi Association	100 taxis are joining the Association in Vientiane. Test for technical and financial evaluation is necessary to introduce.
KOLAO	Possible to sale and lease EVs including maintenance and Electricity charging equipment sales and installation work.

4

Hearing to candidates Issues for introduction EVs

- 1) No preferential treatment policy for EV purchase and tax exemption/reduction
- 2) Many pickups are in use for government cars. Small but smart i-MiEV is limited to replace the pickups in view of driving range and the size.
→ MMC's PHEV Outlander, bigger in size and longer in drive range is more acceptable for candidates.
- 3) The investor for electricity charging equipment and the location of the installation.

5

Hearing to Candidates Actions to resolve the issues

- 1) Consult to JICA about the approach to adopt the policy of preferential treatment for EV introduction and tax exemption by Prime Minister's Office, Ministry of Finance, and MPWT
- 2) Proposal for MPWT, Vientiane Capital Governor's office and EDL to adopt old official use vehicles renewal program. Request to claim the cost for EV purchase and charger installation in next fiscal year budget
- 3) Survey to government vehicles to find out the old vehicles possible to replace to i-MiEV and PHEV Outlander.
- 4) Specific business plan including lease price and the other conditions to be established in consultation with local sales company KOLAO. The plan will be presented to candidates and re-request the EV introduction

6

Hearing to candidatess Governor Office of Vientiane Capital



Participants to 1st Bilateral Meeting
on 2014/10/25
(at Entrance of Governor Office)



Exibition and Trial Run of i-MiEV

7

Hearing to Candidates



Hearing to DPWT



Hearing to MONRE

8

Policy and Institution for Promotion of Low-Emission Vehicles in Japan

- **Legal system: the "Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services by the Government and Other (Green Purchasing Law)" (2001.4)**
 - Government and others are taking the lead by promoting the procurement of environmental friendly goods, etc. (products and services that contribute to the reduction of negative environmental impacts)
- **MOE•METI•MLIT: "Action Plan for Development and Promotion of Low-Emission Vehicles" (2001.7)**
 - National Government replace all the vehicles to Low-Emission Vehicles
 - Request for Local Government to replace the vehicles to Low-Emission Vehicles
 - Establish the tax system and financial support scheme for promotion of Low-Emission vehicles, etc
- **Kyoto City: "model selection guidelines relating to the official car purchase in Kyoto City"**
 - By providing the fuel economy standards and emission standards, a pre-consultation system upon purchase of official vehicles has implemented

9

EV/PHEV Incentives

Monetary incentives to accelerate EV/PHEV deployment has started from Japan. After tightening environmental regulation, this policy has expanded to US and Europe. In addition some emerging countries has adopted some as well.

Region	Monetary benefit	Other country
Japan	<ul style="list-style-type: none"> • Government subsidy (Max. 850,000 yen) • Autonomy subsidy (Max. 400,000 yen) • Auto tax and weight tax exemption (approx. 100,000 yen) 	
Europe	<ul style="list-style-type: none"> • [Netherlands] : BIK(benefit in kind) tax merit in 5 years(Max.€16,000) • [UK] : CO2 tax (£7,300) exemption • [UK] : Subsidy Max. £5,000, BIK tax exemption in 5years (£14,000) • [France] : Subsidy Max. €6,300(EV), €4,000(PHEV) • [France] : BIK tax merit in 3 years(€5,000) • [Sweden] : Subsidy SEK 40,000, Road tax exemption • [Sweden] : BIK tax merit in 3 years(SEK 36,000) • [Norway] : VAT 25% exemption(EV), Registration tax exemption 	Ireland Spain Italy Belgium Portugal Finland Denmark
U.S.A	<ul style="list-style-type: none"> • Subsidy Max. \$7,500, Monetary benefit in each state (Max.\$7,500) 	
Canada	<ul style="list-style-type: none"> • Subsidy Max. C\$8,500 	
Asia	<ul style="list-style-type: none"> • [China] : Consumer tax exemption • [Thailand] : Commodity tax (17.50%=>10%) • [Malaysia] : Import tax, Commodity tax exemption 	Hong Kong Singapore Sri Lanka
Middle & South America	<ul style="list-style-type: none"> • [Colombia, Aruba] : Import tax exemption 	

Study Results for Monitoring Emission Reductions

Collection of Actual Fuel Consumption for Reference

- Request to make record of daily drive distance and fuel consumption in candidate office.
- Total about 100 vehicles in 6 offices including EDL and DPWT. Monitoring 2 months in Nov. and Dec. 2014.

Development of JCM Methodology and PDD

- Based on the methodology developed and demonstrated in the study on Luang Prabang in 2013. Extension of eligibility criteria to PHEV is added referring to AMS III-C.
- Define the default value of reference fuel consumption
- Add the calculation formula for emission from Project vehicle fuel consumption and the monitoring

Outline of Products to be Introduced

EV



i-MiEV (upper)

Drive range : 160km/full charge
Battery capacity : 16kWh

PHEV Outlander (Lower)

Drive range 60km/EV over 800km/PHEV
Battery Capacity 12kwh
Electricity consumption rate : 5.9km/kWh

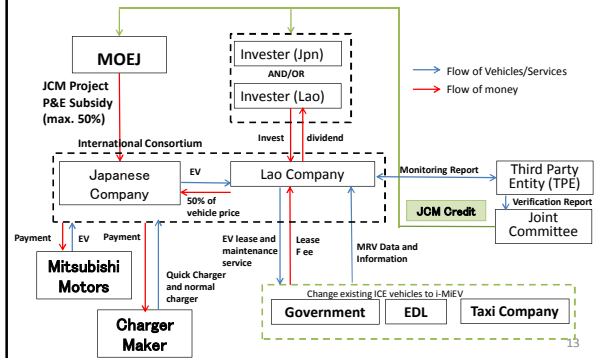
Electricity Charger



CHAdeMO Quick Charger(Left)
delivering up to 62.5kw of high-voltage direct current via a special electrical connector.

80% charge in 30 minutes
Normal Charger (Right)
8 hours to full charge for i-MiEV.

Draft JCM Business Structure



Schedule to Business

If FY2014 FS results feasible for JCM,

- FY2015: Create business structure and raise necessary funds
Receive subsidy from MOEJ (max. 50% of initial investment)
Start JCM project introducing 25 EVs
- FY2016: Introduce 25 EVs (2nd phase)
- FY2016~: MRV and claim JCM Credits
- FY2018~: New JCM Business Scheme to promote EV usage without MOEJ subsidy shall be established

Item	2014				2015				2016				2017				2018~			
	1q	2q	3q	4q	1q	2q	3q	4q	1q	2q	3q	4q	1q	2q	3q	4q	1q	2q	3q	4q
JCM Feasibility Study (FS)																				
JCM Project subsidy for Plant and Equipment Introduction																				
JCM Credits																				
New JCM Business scheme without JMOE subsidy																				

Outline of JCM Project

Target of Equipment to be introduced

i-MiEV: 20units PHEV Outlander: 30units (Total) 50 units
(25 units each in FY2015 and)
Quick Charger: 4 units Normal Charger: 50 units

Project Cost (approx.)

US\$ 3 million

GHG Emission Reductions

	FY2015	FY2016	FY2017	FY2018 -
Project Cost (million USD/ year)	150	150	0	0
Emission Reductions (t-CO ₂ /year)	0	55	110	110

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MRV Methodology (1)

Reference emissions will be quantified by

$$RE_y = \sum_i (SFC_i \times NCV_{RF,i} \times EF_{RF,i} \times DD_{i,y} \times N_{RF,i,y})$$

RE_y	Total reference emissions in year y (tCO ₂ /year)
SFC_i	Specific fuel consumption of reference vehicle category i (l/km)
$NCV_{RF,i}$	Net calorific value of fossil fuel consumed by reference vehicle category i (MJ/l)
$EF_{RF,i}$	Emission factor of fossil fuel consumed by reference vehicle category i (tCO ₂ /MJ)
$DD_{i,y}$	Annual average distance travelled by project vehicle category i in the year y (km/year)
$N_{RF,i,y}$	Number of reference vehicles in category i in year y

- There is no value for NCV for gasoline in Lao. 31.48MJ/liter as published value of MOE in Thailand to be applied.
- CO₂ emission factor for gasoline applied the default value of IPCC 69,300kgCO₂/TJ
- The reference fuel consumption to be set according to the option in the methodology. In the study, actual monitoring value in Vientiane is applied (option 1). If Option 1 is not applicable, the value of fuel consumption in catalogue is also applicable.

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MRV Methodology (2)

Project emissions will be quantified by

$$PE_y = \sum_i (SEC_{PJ,i,y} \times EF_{elect,y} / (1 - TDL_y) \times DD_{i,y} \times N_{i,y}) + \sum_i (SFC_{PJ,i} \times NCV_{PJ,i} \times EF_{PJ,i} \times DD_{i,y} \times N_{i,y})$$

PE_y	Total project emissions in year y (tCO ₂)
$SEC_{PJ,i,y}$	Specific electricity consumption by project vehicle category i per km in year y in urban conditions (kWh/km)
$EF_{elect,y}$	CO ₂ emission factor of electricity consumed by project vehicle category i in year y (tCO ₂ /kWh)
TDL_y	Average technical transmission and distribution losses for providing electricity in the year
$DD_{i,y}$	Annual average distance travelled by the project vehicle category i in the year y (km)
$N_{i,y}$	Number of operational project vehicles in category i in year y
$SFC_{PJ,i}$	Specific fossil fuel consumption by project vehicle category i per km in year y in urban conditions (l/km)
$NCV_{PJ,i}$	Net calorific value of fossil fuel consumed by project vehicle category i (MJ/l)
$EF_{PJ,i}$	CO ₂ Emission factor of fossil fuel consumed by project vehicle category i (tCO ₂ /MJ)

Since all power plants connected to Laos national grid is hydropower, when $EF_{elect,y} = 0$, Project emissions can be simplified by the following equation.

$$PE_y = \sum_i (SFC_{PJ,i} \times NCV_{PJ,i} \times EF_{PJ,i} \times DD_{i,y} \times N_{i,y})$$

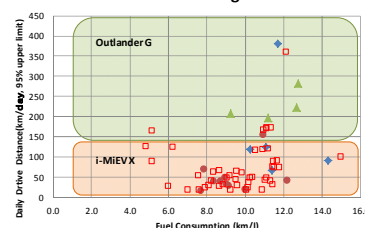
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Pre-setting of Reference Fuel Consumption

(Monitoring)

	Distribute	Collect
DPWT	10	5
KLM	10	10
Taxi Assoc.	10	4
EDL	50	46
MPWT	10	-
MONRE	10	-
Total	100	65

Monitoring Data



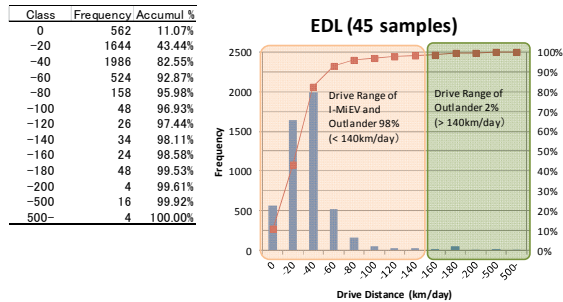
Average Fuel consumption

	km/l	l/km
Upper	10.24	0.098
Lower	9.40	0.106

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Distribution of Daily Drive Distance

Histogram of daily drive distance for 45 samples from EDL during two months monitoring. Over 98% of daily drive is within the range of full charged i-MiEV (140km)




Plan for Study in FY2015

- Decide EV introduction organization/office, schedule, number of EV and the lease price
- Develop project management structure (International consortium)
- Charging equipment installation plan

20

Dimensions and Specifications i MiEV


Overall Length x Width x Height(mm)		3475 x 1475 x 1610
Curb Weight		1085 kg
Seating Capacity		4
Max. Speed		130 km/h
Driving Range (EU mode = NEDC)		160 km
Motor	Type	Permanent magnet synchronous
	Max. Output	49 kW
	Max. Torque	196 N·m
Drive System		Rear wheel drive
Battery	Type	Lithium-ion
	Total Voltage	330 V
	Total Energy	16 kWh



0

Outlander PHEV

Overall Length x Width x Height(mm)		4655 x 1800 x 1680
Curb Weight		1810 kg
Seating Capacity		5
Electric Driving Range		52 km
Total Driving Range (full charge battery + gasoline)		824 km
Motor	Type	Permanent magnet synchronous
	Max. Output Fr/Rr	60/60 kW
	Max. Torque Fr/Rr	137/195 N·m
Drive System		4 wheel drive
Battery	Type	Lithium-ion
	Total Voltage	300 V
	Total Energy	12 kWh

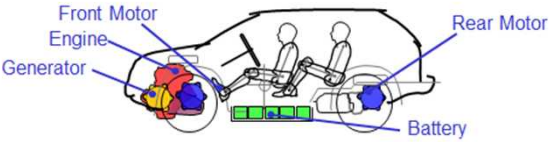


Fuel Consumption (combine battery mode + Hybrid mode)
1.9L/100km (52km battery only + 25km hybrid)

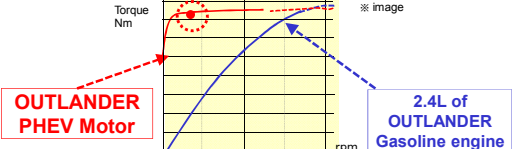
1

Powerful and Quick Responsive Motor Drive

Electric twin motors provide quick response, smooth and dynamic drive.



Quick Torque performance




OUTLANDER PHEV Motor

2.4L of OUTLANDER Gasoline engine

Silent, Smooth & Seamless Driving


Silent Running

- ✓ Outstanding quietness of electric motor drive
- ✓ Less vibration



Smooth and Seamless Driving

- ✓ Stable and Smooth ride
- ✓ Lower center of gravity
- ✓ No Transmission
- ✓ No shift shock

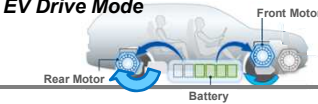


Lower center of gravity

The Mitsubishi Plug-in Hybrid EV System

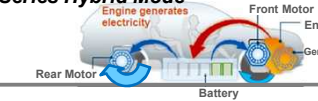
The most efficient drive mode is selected automatically.

EV Drive Mode




- 50km EV driving range
- No gasoline
- Runs by electric power only

Series Hybrid Mode



- When the battery level is low and/or rapidly acceleration
- Runs by electric power + engine assistance

Parallel Hybrid Mode




- Driving in high-speed
- Runs by engine power + motor assistance

4

Accessible to Varying Lifestyles

- 50km of EV driving range → Long enough for weekday
- Efficient fuel consumption with Hybrid mode
- Ample cruising distance for weekend leisure
- Higher economy from plug-in charging



EV for Weekdays
for Commuting, Shopping

PHEV for Weekend
Leisure, Long drive

5

IV. JCM Proposed Methodology ▪ Project Design Document

Promotion of EV Usage for Company Car

Cover sheet of the Proposed Methodology Form

Form for submitting the proposed methodology

Host Country	Lao People's Democratic Republic
Name of the methodology proponents submitting this form	Mitsuro Yajima, Yasuki Shirakawa
Sectoral scope(s) to which the Proposed Methodology applies	Transportation
Title of the proposed methodology, and version number	Emission reduction by electric vehicles, ver. 2.0
List of documents to be attached to this form (please check)	<input checked="" type="checkbox"/> The attached draft JCM-PDD: <input type="checkbox"/> Additional information
Date of completion	2015/2/27

History of the proposed methodology

Version	Date	Contents revised
Version 1.0	2013/9/30	First edition of draft new methodology
Version 1.1	2013/10/18	Minor amendment on eligibility criteria and monitoring parameter list.
Version 2	2014/1/16	Revision of the methodology in accordance with the comments on P/R
Version 3	2014/3/3	Revision of the methodology in accordance with the comments on DFR
Version 4	2014/12/5	Extension to cover the HV, PHEV
Version 4.1	2015/2/27	Incorporate monitoring results for default value of reference fuel consumption

A. Title of the methodology

Emission reduction by electric vehicles

B. Terms and definitions

Terms	Definitions
Electric vehicles (EV)	Electric vehicles refer the vehicles driven by electricity supplied from on-board battery. Those vehicles that are supplied from energy from out of vehicles such as trolley bus or generator mount vehicles are excluded. Generally electric vehicles correspond to those vehicles that are charging electricity from grid to secondary battery and drive the motor during driving. The electric vehicles not charging electricity to battery but swap the battery is included in the EV category.
Hybrid vehicles (HV)	Hybrid vehicles combine an internal combustion engine and one or more electric motors.
Plug-in-Hybrid Vehicles(PHEV)	A plug-in hybrid electric vehicle (PHEV) is a hybrid vehicle which utilizes rechargeable batteries, or another energy storage device, that can be restored to full charge by connecting a plug to an external electric power source.
ICE vehicles	ICE vehicles refer to vehicle using internal combustion engine that can replace human force for transportation such as motorcycle, motor vehicle, goods transport vehicle, bus.
Motorcycles	Motorcycle refers to two wheels, three wheel vehicles or motorcycle that has been converted to two wheels or three wheels moving by engine.
General motor vehicles	General motor vehicles refers to vehicle that has been designed for especially transporting people moving by engine such as car for transport individual, entities which has 15 seats or less including driver such as minivan, pick up car, sedan, SUV.
Bus	Bus refers to vehicle that has been designed for carrying passenger which has 16 seats or more including driver.
Goods transport	Goods transport vehicle refers to vehicle that has been designed for carrying goods

vehicles	especially transporting gravel, earth, sand, wood, cement, metal, water, fuel and other vehicles such as refrigerator truck, garbage truck and goods transport vehicle and vehicles for transporting other materials
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C. Summary of the methodology

Items	Summary
<i>GHG emission reduction measures</i>	This methodology is for project activities introducing new electric vehicles that displace the use of ICE vehicles in passenger transportation. Emission reductions are realized because of improvement of fuel efficiency. Electric vehicles use less fossil fuel (indirectly or upstream consumptions) than conventional ICE vehicles.
<i>Calculation of reference emissions</i>	<p>F.1. Establishment of reference emissions The reference scenario is the operation of the comparable vehicles that would have been used to provide the same level of transportation service.</p> <p>F.2. Calculation of reference emissions The reference emissions are calculated as per the formula below:</p> $RE_y = \sum_i (SFC_i \times NCV_{RF,i} \times EF_{RF,i} \times DD_{i,y} \times N_{RF,i,y})$ <p>Where:</p> <p>RE_y Total reference emissions in year y (tCO₂/year)</p> <p>SFC_i Specific fuel consumption of reference vehicle category i (l/km)</p> <p>$NCV_{RF,i}$ Net calorific value of fossil fuel consumed by reference vehicle category i (MJ/l)</p> <p>$EF_{RF,i}$ Emission factor of fossil fuel consumed by reference vehicle category i (tCO₂/MJ)</p> <p>$DD_{i,y}$ Annual average distance travelled by project vehicle category i in the year y (km/year)</p> <p>$N_{RF,i,y}$ Number of reference vehicles in category i in year y</p>
<i>Calculation of project emissions</i>	<p>Project emissions are from the electricity consumption associated with the operation of project vehicles and calculated as per the formula below:</p> $PE_y = \sum_i (SEC_{PJ,i,y} \times EF_{elect,y} / (1 - TDL_y) \times DD_{i,y} \times N_{i,y}) + \sum_i (SFC_{PJ,i} \times NCV_{PJ,i} \times EF_{PJ,i} \times DD_{i,y} \times N_{i,y})$ <p>Where:</p> <p>PE_y Total project emissions in year y (tCO₂)</p> <p>$SEC_{PJ,i,y}$ Specific electricity consumption by project vehicle category i per km in year y in urban conditions (kWh/km)</p> <p>$EF_{elect,y}$ CO₂ emission factor of electricity consumed by project vehicle category i in year y (tCO₂/kWh)</p> <p>TDL_y Average technical transmission and distribution losses for providing electricity in the year</p> <p>$DD_{i,y}$ Annual average distance travelled by the project vehicle category i in the year y (km)</p> <p>$N_{i,y}$ Number of operational project vehicles in category i in year y</p> <p>$SFC_{PJ,i}$ Specific fossil fuel consumption by project vehicle category i per km in year y in urban conditions (l/km)</p> <p>$NCV_{PJ,i}$ Net calorific value of fossil fuel consumed by project vehicle category i (MJ/l)</p> <p>$EF_{PJ,i}$ CO₂ Emission factor of fossil fuel consumed by project vehicle category i (tCO₂/MJ)</p> <p>Because all the power stations in Lao PDR are hydropower, $EF_{elect,y}$ is zero.</p>

	$PE_y = \sum_i (SFC_{PJ,i} \times NCV_{PJ,i} \times EF_{PJ,i} \times DD_{i,y} \times N_{i,y})$
<i>Monitoring parameters</i>	<p>$DD_{i,y}$: Annual average distance travelled by the project vehicle category i in the year y (km/year)</p> <p>$SFC_{PJ,i}$: Specific fossil fuel consumption by project vehicle category i per km in urban conditions (l/km)</p> <p>$N_{PJ,i,y}$: Number of operational project vehicles in category i in year y</p>

D. Eligibility criteria

This methodology is applicable to projects that satisfy all of the following criteria.

Criterion 1	This methodology is applicable for project activities introducing new electric vehicles that displace the use of fossil fuel vehicles in passenger and freight transportation.
Criterion 2	<p>This methodology is applicable for project activities introducing 2-wheels, 3-wheels and/or 4-wheels or more. This methodology is not applicable to electric motor assist cycle (with pedal), but applicable for hybrid vehicles and plug-in-hybrid vehicles.</p> <p>Project participants shall demonstrate in Project Design Document that the project and reference vehicles are comparable, using the following means:</p> <p>(a) Project and reference vehicles belong to the same vehicle category e.g. motorcycle, bus, taxi, truck, tricycle;</p> <p>(b) Project and reference vehicles categories have comparable passenger/load capacity</p>
Criterion 3	<p>Project EVs must comply with the following condition ;</p> <p>a) Vehicle standards and electricity vehicle safety standard in Lao</p> <p>b) Complete vehicle registration and take out automobile insurance</p> <p>c) Sign an agreement of maintenance and vehicle disposal with car dealer or EV maintenance operator.</p> <p>Project participants shall demonstrate in Project Design Document that the project EV comply those conditions described on the above.</p>
Criterion 4	Project EVs must use electricity only supply from national grid in Lao

E. Emission Sources and GHG types

Reference emissions

Emission sources	GHG types
Emission from reference ICE vehicles due to internal combustion engine from displaced vehicles	CO ₂

Project emissions

Emission sources	GHG types
Emission from power generation of the electricity for project vehicles	CO ₂

F. Establishment and calculation of reference emissions

F.1. Establishment of reference emissions

The reference scenario is the operation of the comparable vehicles that would have been used to provide the same level of transportation service. The comparability of reference and project vehicles should be confirmed by, for example, the seat capacity and the gross vehicle weight.

The reference emission is calculated conservatively, since the default fuel economy of option 1 is set at upper value of 90% confidence interval of the real-world fuel economy data samples, and option 2 uses catalogue fuel economy which is usually better than the real-world fuel economy.

F.2. Calculation of reference emissions

The reference emission is calculated as per the equation below:

$$RE_y = \sum_i (SFC_i \times NCV_{RF,i} \times EF_{RF,i} \times DD_{i,y} \times N_{RF,i,y})$$

RE_y	Total reference emissions in year y (tCO ₂ /year)
SFC_i	Specific fuel consumption of reference vehicle category i (l/km)
$NCV_{RF,i}$	Net calorific value of fossil fuel consumed by reference vehicle category i (MJ/l)
$EF_{RF,i}$	Emission factor of fossil fuel consumed by reference vehicle category i (tCO ₂ /MJ)
$DD_{i,y}$	Annual average distance travelled by project vehicle category i in the year y (km/year)
$N_{RF,i,y}$	Number of reference vehicles in category i in year y

The vehicle category shall be defined by fuel type, vehicle type, number of seat for passengers, with/without of air-conditioner and the other characteristics which influence fuel consumption of vehicle.

The specific fuel consumption for vehicle category i (SFC_i) shall be determined in order of the following three options considering applicability and appropriateness for the proposed project. Basically, in Lao PDR, option 1 shall be applied, however, specifically for passenger car, option 2 or option 3 can be applied in case it is considered appropriate.

Option (1): Conservative default values based on field measurements

Conservative values based on measurements of actual fuel consumption by vehicle categories in Laos shown in the following table can be used.

1. Table Conservative default values based on field measurements (1/ SFC_i)

Vehicle types	Fuel economy (km/liter)
Motor bike	57.6
Tuk-Tuk	14.2
Jumbo	35.5
Passenger car	10.24

The following formula can be used to determine the number of samples, if a new field measurement is needed to implement (90% confidence interval and 10% precision).

$$n = \frac{1.645^2 \times V}{0.1^2} = \frac{1.645^2}{0.1^2} \times \left(\frac{SD}{mean} \right)^2$$

Source: CDM EB 67 Annex 6 (Best practice examples focusing on sample size and reliability calculations)

Option (2): Catalogue values provided by manufactures

Catalogue fuel consumption of the representative vehicle of each vehicle category provided below can be used. Commonly, Catalogue fuel consumption is better (lower) than actual real-world fuel consumption. In Japanese case, the actual fuel consumptions are 30% higher than the catalogue value on average (comparing with 10.15 mode. If comparing with JC08 mode, the actual fuel consumptions are 20% higher than the catalogue value on average)¹. Therefore, using catalogue values are significantly conservative.

a) Passenger car

The default value is calculated using the following formula. The table shows the default values for some engine displacements.

$$FE = 1.3 \times 10^{-6} \times ED^2 - 0.01035 \times ED + 29.85$$

FE: Fuel economy (km/liter)

ED: Engine displacement (cc)

¹“Statistical Analysis on Transition of Actual Fuel Consumption by Improvement of Japanese 10 15 Mode Fuel Consumption, Kudoh et al., Journal of the Japan Institute of Energy, 87, 930-937, 2008”, “Fuel Economy of Passenger Car, Japan Automobile Manufacturers Association, Inc.”

2. Table Catalogue values provided by manufactures ($1/SFC_i$) (Passenger car)

Engine displacement (cc)	Fuel economy (km/liter)
660	23.6
1400	17.9
1800	15.4
2000	14.4
2500	12.1

b) Motor bike

3. Table Catalogue values provided by manufactures ($1/SFC_i$) (Motor bike)

	Fuel economy (km/liter)
100~125cc	53.6

G. Calculation of project emissions

The project emission is calculated as per the equation below:

$$PE_y = \sum_i (SFC_{Pj,i} \times NCV_{Pj,i} \times EF_{Pj,i} \times DD_{i,y} \times N_{i,y})$$

PE_y	Total project emissions in year y (tCO ₂ /year)
$SFC_{Pj,i}$	Specific electricity consumption by project vehicle category i per km in year y in urban conditions (kWh/km)
$EF_{Pj,i}$	CO ₂ emission factor of fossil fuel consumed by project vehicle category i (l/km)
$NVC_{Pj,i}$	Net calorific value of fossil fuel consumed by project vehicle category i (MJ/l)
$DD_{i,y}$	Annual average distance travelled by the project vehicle category i in the year y (km/year)
$N_{i,y}$	Number of operational project vehicles in category i in year y

H. Calculation of emissions reductions

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:

ER_y	Emission reductions in year y (tCO ₂ /year)
BE_y	Reference emissions in year y (tCO ₂ /year)
PE_y	Project emissions in year y (tCO ₂ /year)

I. Data and parameters fixed *ex ante*

The source of each data and parameter fixed *ex ante* is listed as below.

Parameter	Description of data	Source
$NCV_{RF,i}$	Net calorific value of fossil fuel consumed by reference vehicle category i (MJ/l)	Country or neighboring countries specific data or IPCC default value e.g. 31.48 MJ/liter (Thailand data, Ministry of Thailand)
$EF_{RF,i}$	Emission factor of fossil fuel consumed by reference vehicle category i (tCO ₂ /MJ)	Country specific data or IPCC default value e.g. 69,300 kgCO ₂ /TJ (IPCC 2006)
SFC_i	Specific fuel consumption of reference vehicle category i (l/km)	Shall be determined in order of the following two options. The default values are shown in “Section F”. Option (1): Conservative default values based on field measurements Option (2): Catalogue values provided by manufactures

The monitoring method/item of each data and parameter set *ex-post* is listed as below:

Parameter	Description of data	Source / Monitoring method/item
$DD_{i,y}$	Annual average distance driven by project vehicle i in year y (km/yr)	Measure the annual average distance driven by the project vehicles through: Option (A): monitoring of all vehicles or Option (B): representative sample survey of vehicles for each vehicle category. Sample vehicles shall be chosen in accordance with the latest version of the .General guidelines for sampling and surveys for small-scale CDM project activities. using a 90% confidence interval and a +/- 10% error margin to determine the sample size. The lower bound of 95% confidence interval shall be used as the annual distance travelled.
$SFC_{PJ\ km\ i\ y}$	Consumption of specific fossil fuel consumption per km per project vehicle category i in year y (g/km and kWh/km)	Measure the specific fossil fuel consumption through: Option (A): monitor consumption of all project vehicles or Option (B): measure the amount of fossil fuels consumed per km travelled for a representative sample of each vehicle category. Sample vehicles shall be randomly chosen using a 90% confidence interval and a +/- 10% error margin to determine the sample size. The upper bound of 95% confidence interval shall be used for the specific fuel/electricity consumed. Cross-checked against vehicle specifications (kWh/km) for urban conditions provided by the manufacturers and use the most conservative of the two values.
$NCV_{PJ\ i}$	Net calorific value of fuel i (J/g)	Country specific data or IPCC default value
$EF_{PJ\ i}$	CO ₂ emission factor of fuel used by vehicles category i (gCO ₂ /J)	Country specific data or IPCC default value
$N_{i,y}$	Number of project vehicle in operation in year y	Establish the number of the project vehicles in operation through: Option (A): based on annual sales records or official

		<p>data on registered project vehicles cross-checked against the results from a representative sample survey vehicles to determine the percentage of vehicles in use</p> <p>or</p> <p>Option (B): based on annual sales records or official data for registered project vehicles, multiplied by the default factor 0.9^t, where t is year counter for the number of years since the vehicle was introduced (for example: if n vehicles are sold in year 1, in year 2 the number of vehicles still in operation are assumed to be equal to $n*0.9$, and in year 3, $n*0.9^2$ etc)</p>
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Proposed Methodology Spreadsheet (input sheet) [Attachment to Proposed Methodology Form]

Table1: Parameters to be monitored ex post

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Monitoring point No.	Parameters	Description of data	Estimated Values	Units	Monitoring option	Source of data	Measurement methods and procedures	Monitoring frequency	Other comments
(1)	$DD_{i,y}$	Annual average distance travelled by project vehicle category i in year y	11,618	km/year	Option B	Operator	Based on odometer or GPS	once a year	
(2)	$N_{e,i,y}$	Number of operational project vehicles in category i in year y	30 (i-MEV) 20 (PHEV) Outlander	Unit	Option B	project vehicles inventory	Collecting purchase amount from retailer invoices and inputting to a spread sheet manually	once a year	
Under the case where the grid emission factor is significant low, simplified method can be applied for calculation of emission reductions without monitoring the following parameters ex post									
(3)	$SEC_{e,i,y}$	Specific electricity consumption by project vehicles category i per km in year y in urban conditions	0	kWh/km	Option C		Collecting electricity consumption data with validated/calibrated electricity monitoring devices and inputting to a spread sheet electronically	continuous	
(4)	$EF_{e,i,y}$	CO2 emission factor of electricity consumed by project vehicle category i in year y	Nil	tCO2/kWh	Option A	EDL	calculate using the data in the current version of EDL electricity Statistics	once a year	
(5)	TDL_y	Average technical transmission and distribution losses providing electricity in year y	Nil	%	Option A	EDL	calculate using the data in the current version of EDL electricity Statistics	once a year	
(6)	$SFC_{e,i,y}$	Specific fuel consumption by project vehicles category i per km in year y in urban conditions	117.3	km/L	Option B		Catalogue data and daily drive distance of EDL passenger cars are combined and estimate the total fuel consumption including EV and HV modes.	continuous	

Table2: Project-specific parameters to be fixed ex ante

(a)	(b)	(c)	(d)	(e)	(f)
Parameters	Description of data	Estimated Values	Units	Source of data	Other comments
$NCV_{ref,i}$	Net Calorific value of fossil fuel consumed by reference vehicle category i	31.48	MJ/l	a) Value provided by the fuel supplier b) Regional or national default value c) IPCC default values as provided in Table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories	The parameter is used for baseline as well as project emissions and vehicle owners or operators can buy fuel from a variety of sources (fuel stations). In practice therefore it is considered to be simpler to determine the parameter using options (b) or (c)
$EF_{ref,i}$	CO2 emission factor of fossil fuel consumed by reference vehicle category i	0.0893	kgCO2/MJ		
SFC_i	Specific fuel consumption of reference vehicle category i	0.0267 (jumbo) 0.0171 (motorcycle)	L/km	Option (1) : Conservative default values based on field measurement Option (2) : Conservative default values based on existing data Option (3) : Catalogue values provided by manufactures	Control group vehicles are set before project start

Table3: Ex-ante estimation of CO2 emission reductions

CO2 emission reductions	Units
97	tCO2/y

[Monitoring option]

OptionA	Based on public data which is measured by entities other than the project participants (Data used: publicly recognized data such as statistical data and specifications)
OptionB	Based on the amount of transaction which is measured directly using measuring equipments (Data used: commercial evidence such as invoices)
OptionC	Based on the actual measurement using measuring equipments (Data used: measured values)

Proposed Methodology Spreadsheet (Calculation Process Sheet) [Attachment to Proposed Methodology Form]				
1. Calculations for emission reductions	Fuel type	Value	Units	Parameter
Emission reductions during the period of year y		97	tCO ₂ /y	ER _y
2. Selected default values, etc.				
Use of the default net calorific value of fuel type x		Yes		NCV _i
Use of the default carbon emission factor for fuel type x		Yes		EF _{CO₂,i}
Use of the default referential fuel consumption of vehicle category i		Yes		SFC _i
Use of the default project electricity consumption of vehicle category i		Yes		SEC _i
3. Calculations for reference emissions				
Reference emissions during the period of year y		104	tCO ₂ /y	RE _y
1:Motorcycle	Gasoline			
Referential fuel consumption of vehicle category i		0.0174	L/km	SFC _i
CO ₂ emission factor for fuel type x		0.0693	kgCO ₂ /MJ	EF _{RF,i}
Net Calorific value of fuel type x		31.4800	MJ/l	NCV _{RF,i}
Annual average distance travelled by project vehicle			km/y/unit	DD _{i,y}
Number of operational project vehicle category i			unit	N _{RF,i,y}
CO ₂ emission		0	tCO ₂ /y	RE _y
2:Jumbo	Gasoline			
Referential fuel consumption of vehicle category i		0.0282	L/km	SFC _i
CO ₂ emission factor for fuel type x		0.0693	kgCO ₂ /MJ	EF _{RF,i}
Net Calorific value of fuel type x		31.4800	MJ/l	NCV _{RF,i}
Annual average distance travelled by project vehicle			km/y/unit	DD _{i,y}
Number of operational project vehicle category i			unit	N _{RF,i,y}
CO ₂ emission		0	tCO ₂ /y	RE _y
3:TukTuk				
Referential fuel consumption of vehicle category i				SFC _i
CO ₂ emission factor for fuel type x				EF _{RF,i}
Net Calorific value of fuel type x				NCV _{RF,i}
Annual average distance travelled by project vehicle			km/y/unit	DD _{i,y}
Number of operational project vehicle category i			unit	N _{RF,i,y}
CO ₂ emission		0	tCO ₂ /y	RE _y
4:Minibus				
Referential fuel consumption of vehicle category i				SFC _i
CO ₂ emission factor for fuel type x				EF _{RF,i}
Net Calorific value of fuel type x				NCV _{RF,i}
Annual average distance travelled by project vehicle			km/y/unit	DD _{i,y}
Number of operational project vehicle category i			unit	N _{RF,i,y}
CO ₂ emission		0	tCO ₂ /y	RE _y
5:Personal Car	Gasoline			
Referential fuel consumption of vehicle category i		0.0820	L/km	SFC _i
CO ₂ emission factor for fuel type x		0.0693	kgCO ₂ /MJ	EF _{RF,i}
Net Calorific value of fuel type x		31.4800	MJ/l	NCV _{RF,i}
Annual average distance travelled by project vehicle		11,618	km/y/unit	DD _{i,y}
Number of operational project vehicle category i		50	unit	N _{RF,i,y}
CO ₂ emission		104	tCO ₂ /y	RE _y
6: Taxi	Gasoline			
Referential fuel consumption of vehicle category i		0.0820	L/km	SFC _i
CO ₂ emission factor for fuel type x		0.0693	kgCO ₂ /MJ	EF _{RF,i}
Net Calorific value of fuel type x		31.4800	MJ/l	NCV _{RF,i}
Annual average distance travelled by project vehicle			km/y/unit	DD _{i,y}
Number of operational project vehicle category i		0	unit	N _{RF,i,y}
CO ₂ emission		0	tCO ₂ /y	RE _y

4. Calculations of the project emissions

Project emissions during the period of year y		6	tCO ₂ /y	PE _y
1:e-Motorcycle				
Project electricity consumption of vehicle category i				SEC _{PJ,i}
CO ₂ emission factor for fuel type x				-
Average technical transmission and distribution losses				EF _{elect,y}
Annual average distance travelled by project vehicle			km/y/unit	DD _{i,y}
Number of operational project vehicle category i			unit	N _{PJ,i,y}
CO ₂ emission		0.0	tCO ₂ /y	PE _y
2:e-Jumbo				
Project electricity consumption of vehicle category i				SEC _{PJ,i}
CO ₂ emission factor for fuel type x				-
Average technical transmission and distribution losses				EF _{elect,y}
Annual average distance travelled by project vehicle		0	km/y/unit	DD _{i,y}
Number of operational project vehicle category i		100	unit	N _{PJ,i,y}
CO ₂ emission		0.0	tCO ₂ /y	PE _y
3:e-TukTuk				
Project electricity consumption of vehicle category i				SEC _{PJ,i}
CO ₂ emission factor for fuel type x				-
Average technical transmission and distribution losses				EF _{elect,y}
Annual average distance travelled by project vehicle			km/y/unit	DD _{i,y}
Number of operational project vehicle category i			unit	N _{PJ,i,y}
CO ₂ emission		0.0	tCO ₂ /y	PE _y
4:e-Minibus				
Project electricity consumption of vehicle category i				SEC _{PJ,i}
CO ₂ emission factor for fuel type x				-
Average technical transmission and distribution losses				EF _{elect,y}
Annual average distance travelled by project vehicle			km/y/unit	DD _{i,y}
Number of operational project vehicle category i			unit	N _{PJ,i,y}
CO ₂ emission		0.0	tCO ₂ /y	PE _y
5:e-Personal Car		Gasoline		
Project electricity consumption of vehicle category i		0.0085	L/km	SEC _{PJ,i}
CO ₂ emission factor for fuel type x		31.5	MJ/l	-
Average technical transmission and distribution losses		0.0693	kgCO ₂ /MJ	EF _{elect,y}
Annual average distance travelled by project vehicle		11,618	km/y/unit	DD _{i,y}
Number of operational project vehicle category i		30	unit	N _{PJ,i,y}
CO ₂ emission		6.5	tCO ₂ /y	PE _y
6:e- Taxi				
Project electricity consumption of vehicle category i				SEC _{PJ,i}
CO ₂ emission factor for fuel type x				-
Average technical transmission and distribution losses				EF _{elect,y}
Annual average distance travelled by project vehicle		20,000	km/y/unit	DD _{i,y}
Number of operational project vehicle category i		0	unit	N _{PJ,i,y}
CO ₂ emission		0.0	tCO ₂ /y	PE _y

[List of Default Values]

Net calorific value of fuel type	Value	Units
Gasoline	31.48	MJ/l
Diesel	37.70	MJ/l
LPG	50.80	MJ/kg
Natural gas	43.50	MJ/Nm ³
Electricity	1.00	-

CO ₂ emission factor for fuel type	Value	Units
Gasoline	0.0693000	kgCO ₂ /MJ
Diesel	0.0687000	kgCO ₂ /MJ
LPG	0.0599000	kgCO ₂ /MJ
Natural gas	0.0510000	kgCO ₂ /MJ
Electricity	0.1540000	kgCO ₂ /kWh

[Monitoring]

Fuel consumption of vehicle category i	Value	Units
1:Motorcycle		
Gasoline	0.0174	L/km
Diesel		L/km
LPG		Nm ³ /lm
Natural gas		kg/km
Electricity	0.0206	kwh/km
2:Jumbo		
Gasoline	0.0282	L/km
Diesel		L/km
LPG		Nm ³ /lm
Natural gas		kg/km
Electricity	0.1266	kwh/km
3:TukTuk		
Gasoline	0.0680	L/km
Diesel		L/km
LPG		Nm ³ /lm
Natural gas		kg/km
Electricity	0.1266	kwh/km
4:Minibus		
Gasoline	0.1250	L/km
Diesel		L/km
LPG		Nm ³ /lm
Natural gas		kg/km
Electricity		kwh/km
5:Personal Car		
Gasoline	0.0820	L/km
Diesel		L/km
LPG		Nm ³ /lm
Natural gas		kg/km
Electricity	0.1200	kwh/km
6: Taxi		
Gasoline	0.0820	L/km
Diesel		L/km
LPG		Nm ³ /lm
Natural gas		kg/km
Electricity	0.1200	kwh/km

JCM Project Design Document Form

A. Project description

A.1. Title of the JCM project

Promotion of EV usage for Company Car in Vientiane Capital, Laos

A.2. General description of project and applied technologies and/or measures

Mitsubishi Motors Corporation (hereinafter referred to as MMC.) Local sales company KOLAO sell or lease 50 units the MMC-made electric car i-MiEV and PHEV Outlander to EDL, government agencies and/or taxi association in Vientiane Capital. With the result, CO2 emission to shall be reduced upon conversion from conventional fossil fuels.

A.3. Location of project, including coordinates

Country	Laos
Region/State/Province etc.:	N/A
City/Town/Community etc:	Vientiane Capital
Latitude, longitude	17° 58' N 102° 36' E

A.4. Name of project participants

The Lao People's Democratic Republic	KLM Import-Export Co., Ltd
Japan	To Be Determined

A.5. Duration

Starting date of project operation	01/01/2016
Expected operational lifetime of project	5 years

A.6. Contribution from developed countries

By implementing a JCM project, the price, maintenance and performances of Japanese EVs are confirmed. We aim the wide spread of electric vehicles in Laos through the development of EV dissemination system such as tax incentives. The dissemination of electric vehicles contributes to Lao through the energy conversion from fossil fuel to hydraulic power of a pure domestic renewable energy. Reduce emissions of global greenhouse gas, prevention of automobile pollution, saving in foreign currency expenditure, conservation of urban environment and son on. When advancing the JCM project of EV introduction, public charging infrastructure and charging outlet installation shall create jobs such as charging service. In addition, it can be expected ripple effect, such as capital investment in parts for maintenance and car maintenance field. Localization of assembly and auto parts supply is realized as the progress of EV spread, further employment, born economic effect, also advance further human capacity development.

B. Application of an approved methodology(ies)

B.1. Selection of methodology(ies)

Selected approved methodology No.	JCM-JP-LA-001
Version number	Draft
Selected approved methodology No.	N/A
Version number	N/A
Selected approved methodology No.	N/A
Version number	N/A
Selected approved methodology No.	N/A
Version number	N/A

Selected approved methodology No.	N/A
Version number	N/A

B.2. Explanation of how the project meets eligibility criteria of the approved methodology

Eligibility criteria	Descriptions specified in the methodology	Project information
Criterion 1	This methodology is applicable for project activities introducing new electric vehicles that displace the use of fossil fuel vehicles in passenger and freight transportation.	Project vehicles are EV and/or HV only and substitute internal combustion engine vehicles.
Criterion 2	<p>This methodology is applicable for project activities introducing 2-wheels, 3-wheels and/or 4-wheels or more. This methodology is not applicable to electric motor assist cycle (with pedal), but applicable for hybrid vehicles and plug-in-hybrid vehicles.</p> <p>Project participants shall demonstrate in Project Design Document that the project and reference vehicles are comparable, using the following means:</p> <p>(a) Project and reference vehicles belong to the same vehicle category e.g. motorcycle, bus, taxi, truck, tricycle;</p> <p>(b) Project and reference vehicles categories have comparable passenger/load capacity</p>	Both project vehicles and reference vehicles are 4-wheels passenger cars with passenger capacity 4 to 5 persons.
Criterion 3	<p>Project EVs must comply with the following condition ;</p> <p>a) Vehicle standards and electricity vehicle safety standard in Lao</p> <p>b) Complete vehicle registration and take out automobile insurance</p> <p>c) Sign an agreement of maintenance and vehicle disposal with car dealer or EV maintenance operator.</p> <p>Project participants shall demonstrate in Project Design Document that the project EV comply those conditions described on the above.</p>	The EVs introducing to project are import cars permitted by MPWT. All the Project EVs are registered project vehicles ledger after vehicle registration. After statutory scrapping procedure completion, the EVs are deleted from the project vehicle ledger.
Criterion 4	Project EVs must use electricity only supply from national grid in Lao	Project EVs use electricity only supply from national grid in Lao
Criterion 5	N/A	N/A
Criterion 6	N/A	N/A
Criterion 7	N/A	N/A
Criterion 8	N/A	N/A
Criterion 9	N/A	N/A

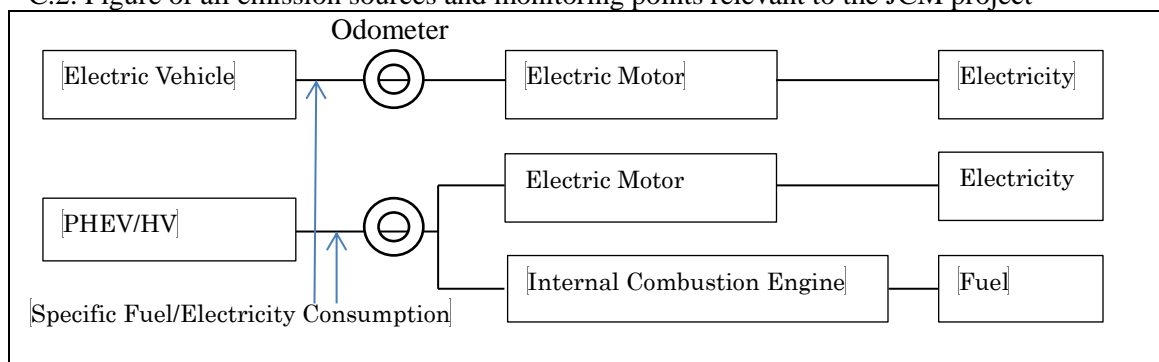
Criterion 10	N/A	N/A
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C. Calculation of emission reductions

C.1. All emission sources and their associated greenhouse gases relevant to the JCM project

Reference emissions	
Emission sources	GHG type
Fuel consumption by internal combustion engine vehicles	CO2
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
Project emissions	
Emission sources	GHG type
Fuel consumption by project vehicle EV/HV	CO2
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

C.2. Figure of all emission sources and monitoring points relevant to the JCM project



C.3. Estimated emissions reductions in each year

Year	Estimated Reference emissions (tCO _{2e})	Estimated Project Emissions (tCO _{2e})	Estimated Emission Reductions (tCO _{2e})
2013	N/A	N/A	N/A
2014	N/A	N/A	N/A
2015	N/A	N/A	N/A
2016	52.0	3.0	49.0
2017	104.0	6.0	98.0
2018	104.0	6.0	98.0
2019	104.0	6.0	98.0
2020	104.0	6.0	98.0
Total (tCO _{2e})	468.0	27.0	441.0

D. Environmental impact assessment

Legal requirement of environmental impact assessment for the proposed project	NO
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E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

地元の利害関係者からのコメントの勧誘

E.2. Summary of comments received and their consideration

Stakeholders	Comments received	Consideration of comments received
MPWT	Prime Minister Directive is necessary to introduce. The renewal program of Government cars are developed in some departments. But no progress due to the limited budget.	<p>Issues for introduction EVs</p> <ol style="list-style-type: none"> 1) No preferential treatment policy for EV purchase and tax exemption/reduction 2) Many pickups are in use for government cars. Small but smart i-MiEV is limited to replace the pickups in view of driving range and the size. → MMC's PHEV Outlander, bigger in size and longer in drive range is more acceptable for candidates. 3) The investor for electricity charging equipment and the location of the installation. <p>Actions to resolve the issues</p> <ol style="list-style-type: none"> 1) Consult to JICA about the approach to adopt the policy of preferential treatment for EV introduction and tax exemption by Prime Minister's Office, Ministry of Finance, and MPWT 2) Proposal for MPWT, Vientiane Capital Governor's office and EDL to adopt old official use vehicles renewal program. Request to claim the cost for EV purchase and charger installation in next fiscal year budget 3) Survey to government vehicles to find out the old vehicles possible to replace to i-MiEV and PHEV Outlander. 4) Specific business plan including lease price and the other conditions to be established in consultation with
EDL	High level Directive such as Minister of MPWT or MEM is necessary to introduce. Interested in Electricity Charge business to EVs	
PM Office	Two i-MiEVs donated by KOLAO are in use now	
MONRE	Government initiative for EV use is good to make national consensus for environmentally sustainable Lao	
DPWT	High level Directive such as Minister or Governor is necessary to introduce. EVs are possible to introduce for a part of government use.	
Taxi Assoc.	100 taxis are joining the Association in Vientiane. Test for technical and financial evaluation is necessary to introduce.	
KOLAO	Possible to sale and lease EVs including maintenance and Electricity charging equipment sales and installation work.	

		local sales company KOLAO. The plan will be presented to candidates and re-request the EV introduction
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F. References

EDL Electricity Statistics 2013
 CDM-EB67-A06-GUID, Guideline, Sampling and surveys for CDM project activities and programmes of activities, Version 03.0
 III.C. Emission reductions by electric and hybrid vehicles Ver.13 EB 61, Annex 19
 3 June 2011

Reference lists to support descriptions in the PDD, if any.

Annex

Revision history of PDD

Version	Date	Contents revised
01.0	04/02/2015	First Edition
01.1	27/02/2014	Study results ate incorporated and described indetail