Fiscal Year 2010 CDM/JI Feasibility Study
Summary

Study Title:
Feasibility study on multiple CDM of the solid waste intermediate treatment facility and methane gas power generation in Ipoh city, Malaysia

Corporate Name:
Yachiyo Engineering Co., Ltd.

1. Outline of Project:

(1) Project:

Host of Country	Malaysia
Project Area	Ipoh City, Perak State
The contents of a project	1. " Composting of Organic Waste by mechanical and biological treatment (Mechanical Biological Treatment : MBT)" of collected waste 2. "Disposal site gas (Landfill Gas : LFG) recovery and utilization
Facility	1. Composting of Organic Waste : 50t/day 2. LFG recovery and utilization : Max 2 MW
Project owner	LTC ALAM BERSIH SDN.BHD. (LTC)
Project initiation time	Though 2013 were planned, it is undecided for the sake of convenience of Ipoh city council and Project owner.

(2) Application methodology:

Activity	LFG recovery and utilization	Composting of Organic Waste (MBT)
Methodology	ACM0001 "Consolidated baseline and monitoring methodology for landfill gas project activities" (version 11)	AM0025 "Avoided emissions from organic waste through alternative waste treatment processes (version 12)"

2. Method of Study

(1) Investigation implementation organization:

Kajima Corporation	Field survey technological support
Japan Consulting Institute	DOE
LTC ALAM BERSIH SDN.BHD. (LTC)	Counterpart of the project for cooperation of field survey
Ipoh City Council	In charge of municipal solid waste (MSW) management in Ipoh city. Gives permission for site survey, and provides related information.
Ministry of Housing and Local Government (MHLG)	Supervisory authority for MSW management in Malaysia to provide the information on status of MSW management.
Malaysia government Natural Resources Ministry of Environment (MNRE)	In charge of environmental policy. CDM Designated National Authority (DNA) is set within this Ministry. Provides the latest environmental policy and CDM related information.

(2) Research subject:

1. Review of a waste treatment plan, re-installation, and a detailed implementation plan

It was requested to review the waste treatment plan for both projects for reduction of the amount of investment. Especially on the composting, the strong request was issued to the project to consider a small-scale project as a pilot project and to scale up in a new disposal site after the validity of the technique was confirmed. It was judged that there was a risk to be targeted to all waste amount transported to the landfill site at present. And based on the results

till the last year, the capacity of the composting becomes 600t/day and the amount of capital investment also becomes high. The counterpart, who is Project owner, wanted to reduce financing of capital investment, operating cost, and labor cost as much as possible, and to reserve operators after operation. Also it was requested strongly to construct a composting treatment plant in which the existing operators could operate the plants. As a result, we reduced the capacity of the composting treatment plant as 50t/day in the middle of survey.

On the point of the above change, we should have prepared a plan with a capable investment and operation and maintenance costs, and made related agencies understood the project more detailed at the beginning stage and held many joint discussions with a counterpart and an implementation organization for a deep mutual understanding.

2. Facility structure on treatment plant, equipment specification, plant layout, operation management method, cost and financing

The feasibility of facility procurement and construction work by the firms in a host country and overseas was studied. Outline estimation was implemented from the facilities plan, the facilities arrangement and the outline estimation data of required area in which this project could be implemented. Based on this data, financial plan, by which an overseas firm could implement the project, was prepared with a cooperation of the counterpart. However, it was found that the quality of products and schedule control have anxious factors and the manufacture technology of a rotary screen and a belt conveyer, which are used on the operation by hand sorting for composting, was not established completely in Malaysia. Therefore, it is necessary to manufacture these products in Japanese manufacturers.

3. Implementation of Stakeholders Meeting and acquisition of a public comment from the stake holders

At the time of the 1st field survey, Mayor of Ipoh and other concerned persons were gathered and we presented the explanation of this project in August 2010. An understanding about this CDM project was obtained from the Mayor and his cooperation letter was issued on 8th September 2010. Before the issue of this letter, Project owner orally declared the cooperation with the project and then they issued the cooperation letter formally on 26th November 2010 with a reference to the Mayor's letter.

At the time of the 3rd field survey, the explanation meeting was implemented again for local officers in Ipoh city in December 2010. We explained the necessity to hold a public hearing for other neighboring residents and stake holders. Then, we requested the Stakeholders Meeting in the end of December 2010 or the beginning of January 2011, and were going to start discussion with the related persons on the detailed schedule. However, the situation was suddenly changed in the discussion with the Mayor of Ipoh on 18th December 2010 and with a counterpart on 20th December 2010. As the result, it was found out that it was impossible to hold Stakeholders Meeting. Details are explained in the following item (3) of survey content.

(3) Survey content:

1. Hearing on recyclability

The data in the last fiscal year were confirmed. The hearing survey to the operation managers of the present final disposal site was implemented. Visual survey of transported wastes was conducted and the structure of the sorting line was examined.

2. Study of schematic flow diagram of LFG recovery and utilization

Based on the outline flow proposed in the last fiscal year, the required facility was selected and the total schematic flow diagram was prepared with a consideration of the geography of the present disposal site, construction location and so on. The pipe line in LFG collection facility needs the confirmation at the time of project commencement because it is decided by the geography after the completion of landfilling.

3. Layout plan of compost plant

We prepared the optimal layout plan proposal with consideration of workability of hand sorting and composting and supposing equipment near the vacant lot in front of the Workshop. The bill of quantities for civil-engineering-and-construction estimation was prepared on the basis of this layout plan. The unit cost based on the bill of quantities was calculated and estimation work was implemented.

4. Study of project cost

After setting the outline specification of each facility, the final specification was decided through the discussion with Malaysian and Japanese companies. It was found that manufacturing of the gas generator facility is difficult in Malaysia, so it is necessary to procure it from an agency of an overseas company. A rotary screen, a conveyor, etc. are manufactured in Malaysia; however the manufacturing technology has not been established yet. It needs to import them from Japan or other countries.

Though the preliminary estimation was prepared based on the above conditions, it is required to acquire an estimate again formally at the time of project implementation.

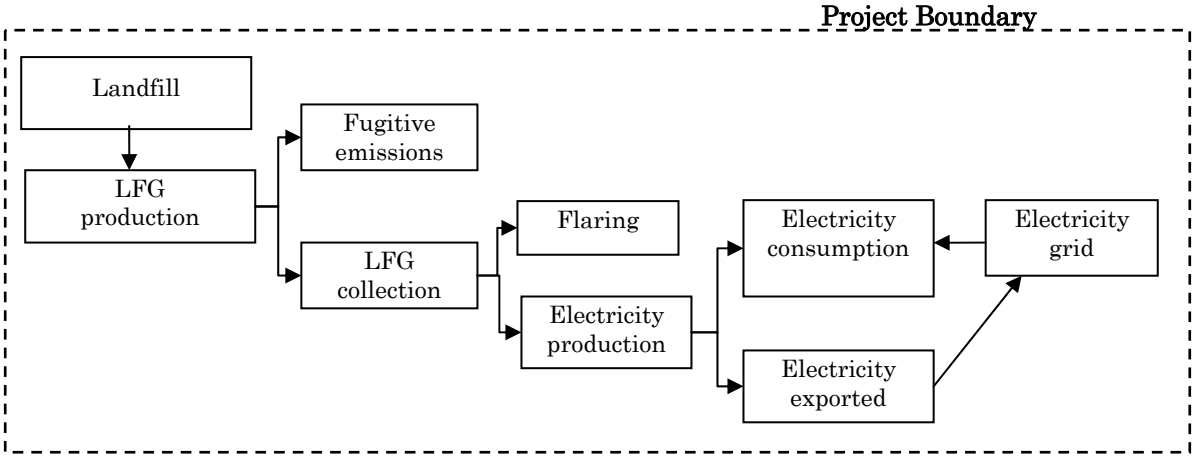
3. Results of Survey for the Implementation of the CDM Project

3-1 LFG recovery and utilization

(1) Setup of a baseline scenario and project Boundary:

Project boundary and its view

ACM 0001 defines the project boundary as the site of the project activity where the gas is recovered and destroyed / used. In addition, since the renewable electricity exported by the project would have been generated by power generation sources connected to the grid, the project boundary includes all these power generation sources as well as the target landfill site in Ipoh city.



Setup and the view of the baseline scenario

The optimum baseline scenario for LFG recovery and utilization project is decided based on methodology ACM0001 (version11). Moreover, it verifies using "Tool for the demonstration and assessment of additionally version 5.2" for evaluation of the addition nature by a CDM executive board, and proof.

The formula of the amount of baseline emissions

Based on methodology, it calculates in the following formulas. And, each method number is a number specified by methodology ACM0001, and writes L (initial of LFG) in addition.

$$BE_y = (MD_{project,\,y}) * MD_{BL,\,y} * GWP_{CH4} + EL_{LFG,\,y} * CEF_{elec,\,BL,\,y} \qquad L - (1)$$

$$MD_{project,\,y} = MD_{flared,\,y} + MD_{electricity,\,y} \qquad L - (4)$$

$$MD_{flared\ and\ y} = (LFG_{flare,\,y} * w_{CH4,\,y} * D_{CH4}) - (PE_{flare,\,y} / GWP_{CH4}) \qquad L - (5)$$

$$PE_{flare,\,y} = \Sigma_{(h\,=\,1\sim8760)}\, TM_{RG,\,and\,h} * (1 - \eta_{flare,h} * GWP_{CH4} / 1000 \qquad L - (6)$$

$$MD_{electricity,\,y} = LFG_{electricity,\,and\,y} * w_{CH4,\,y} * D_{CH4} \qquad L - (7)$$

$$MD_{project,\,y} = BE_{CH4,\,SWDS,\,y} / GWP_{CH4} \qquad L - (8)$$

$$MD_{BL,\,y} = MD_{project,\,y} * AF \qquad L - (3)$$

(2) The amount of project emissions:

The formula of the amount of project emissions

Based on methodology, the amount of project emissions is considered as the sum total of the electric power consumed by project activities and the amount of CO_2 discharge from a fossil fuel, and is computed in the following formulas.

$$PE_y = PE_{EC,\,y} + PE_{FC,\,y} \qquad L - (11)$$

$$PE_{EC,\,y} = EC_{PJ,\,y} * EF_{grid,\,y} * (1+TDL_y) \qquad L - (12)$$

$$PE_{FC,\,j,\,y} = FC_{diesel,\,y} * COEF_{diesel,\,y} \qquad L - (13)$$

The formula of leakage

There is no leakage in this methodology of ACM0001.

(3) Monitoring plan:

It is necessary to manage the amount of methane actually collected ($MD_{project,\,y}$), the amount of methane of flare combustion ($MD_{flare,\,y}$), the amount of methane used for power generation ($MD_{electricity,\,y}$), the amount of power generated by LFG ($EL_{LFG,\,y}$, $ET_{LFG,\,y}$), the amount of energy consumption through project activities, etc. based on the theory of monitoring procedures in the methodology of ACM0001.

(4) Estimation of GHG emission reductions:

The amount of greenhouse gas reduction is shown in the following table.

Year	The amount of baseline emissions (BEy)	The amount of project emissions (PEy)	Leakage (Ly)	The amount of emissions reduction (ER)
	tCO_2e	tCO_2e	tCO_2e	tCO_2e
2013	91,512	6.8	0	91,505
2014	74,323	6.8	0	74,316
2015	61,796	6.8	0	61,789
2017	52,488	6.8	0	52,481
2018	45,422	6.8	0	45,415
2019	39,933	6.8	0	39,927
2020	35,569	6.8	0	35,562
Total	401,042	47.9	0	400,995

(5) Project period and crediting period:

Project period and crediting period

The usable years of present final landfill site and the plan of new final landfill site were discussed with related persons of Ipoh city and Project owner. The plan of new final landfill site is delayed and not yet started. In LFG recovery and power generation in a final landfill site, the recovery gas volume is decreased with time. Since the recovery gas volume is decrease to 1/3 after seven years, both the project period and the crediting period was set with seven years considering the operation cost.

The date of project commencement

It is advancing to commence a project after the completion of U.N. registration process. It also takes into consideration that the CDM approval process of the Ministry of Nature Resources and Environment, which is DNA of Malaysia was simplified somewhat, and the U.N. registration expects the end of 2011. Since the construction works in this project is a scale which can be completed within one year including equipment manufacture, field erection works and trial operations, the construction work of this project is being planned at the end of 2012.

(6) Environmental impact and indirect influence of others:

The environmental impact assessment (EIA) for this CDM project to build facilities in the existing final landfill site is unnecessary and it is confirmed that it is satisfactory by presentation of the simple environmental report called Preliminary EIA. Furthermore, the appeal letter which omits Preliminary EIA is submitted to the Director General of Ministry of Natural Resources and Environment and it was confirmed that if approved it is not necessary.

(7) The stakeholders' comments:

Hearing to the stakeholders on the project, which is required for the Project Design Document (PDD), was conducting and their views from stakeholders on project implementation was collected.

1) Ministry of Natural Resources and Environment (MNRE), Malaysia

This multiple CDM project welcomes very much not only to MNRE but to the Malaysian Government. Especially composting is interesting project and if not only existing area but a new final landfill site is constructed, this Ministry wants it to expand a scale and to advance it as a durable project.

The governmental basic policy on the CDM procedure is two steps of processes, 1) acquisition of PIN approval and 2) acquisition of PDD approval. However, the

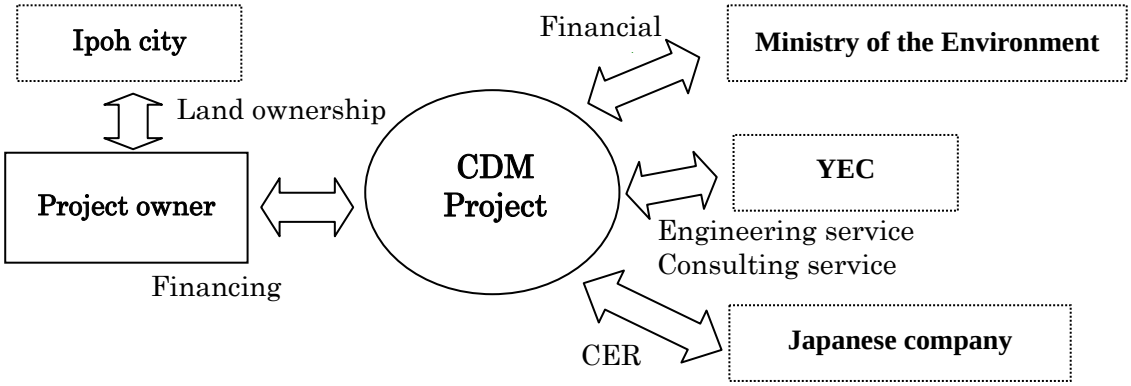
acquisition of PIN approval is not always necessary and only the acquisition process of PDD approval is taken considering the purpose of early project implementation.

2) Ipoh city
The supplementary and concrete presentation to the fiscal year 2009 was presented in August 2010 and Ipoh city had interested in the CDM project in the solid waste management sector. Acceptance Letter on this business promotion also had been issued on 8th September 2010. Then, through several presentations, Ipoh city hopes the early commencement.

3) Project owner
Project owner got a deep understanding on this project through several presentations and the acceptance letter on business promotion also obtained on 26th November 2010 with reference to the letter from Ipoh city dated on 8th September 2010.
However, although it was a very delicate feel about the amount of investment as SPC, there is no change to advance this project and early commencement.

(8) Enforcement organization of a project:

The business plan by investment of Project owner is assumed and the organization of this project is shown bellow.



Our company carries out the engineering service and consulting service. Detailed deliberations are required although the Japanese company is assumed about CER dealings.

(9) Cash planning:

In this project, the initial investment by local partner (Project owner) is assumed. Half of the investment is planning to cover by the "Co-benefit CDM model project" of Ministry of the Environment, Japan. In this project, it is in contact with the Japanese companies and several companies show the interest to this CDM project. Although the financing by the syndicated loan by the local bank which Project owner supplies is assumed, it is necessary to have consultations with the banks considering a plans, designs and profit simulations.

(10) Economic analysis:

In this project, an internal rate of return (IRR) estimates economic efficiency. In analyzing and evaluating, the detailed examination was performed based on the latest information. The preconditions for the economic analysis are shown in below;

(1) Preconditions for economic analysis

Item	Precondition
Project implementation period	7 years
The amount of waste receiving	600t/day (no fluctuation)
The amount of waste treatment	50t/day
Corporation tax	25% (Malaysia standard tax rate)
Exchange rate	1.00RM = 27yen

(2) Internal rate of return

The economic analysis was performed based on the above-mentioned preconditions. When LFG recovery is undertaken, profits are a "CER profit on sales" and a "profit on electricity sales". The calculation result of IRR is 10.9%. In this LFG recovery, as the LFG gas may decrease during an operation period, it is in the tendency for a "profit" to decrease in connection with this.

Profit and Loss Statement (Unit; RM)

			1	2	3	4	5	6	7	Total
Sales	Electricity Sales		2,262,666	1,796,256	1,456,308	1,324,701	1,132,950	984,039	865,578	9,822,498
	CDM Credit		3,559,270	2,890,669	2,403,407	2,056,679	1,781,833	1,568,327	1,398,581	15,658,765
Total Sales			5,821,936	4,686,925	3,859,715	3,381,380	2,914,783	2,552,366	2,264,159	25,481,263
Initial Cost		13,000,000								0
O&M cost			782,726	798,913	815,492	832,476	849,878	867,708	885,979	5,833,172
Depreciation			1,857,143	1,857,143	1,857,143	1,857,143	1,857,143	1,857,143	1,857,143	13,000,000
Corporation tax (25%)			795,517	507,718	296,770	172,940	51,941	-43,121	-119,741	1,662,023
P/L Current		-13,000,000	4,243,693	3,380,295	2,747,453	2,375,963	2,012,965	1,727,780	1,497,920	17,986,069

IRR (7 year) 10.9%

(11) Demonstration of additionality:

In order to prove the additionality of this project, the Tool for the demonstration and assessment of additionality, version 5.2 is used for evaluation of the additionality by a CDM executive board for evaluation and proof.

The following scenario proposals are assumed as alternatives of project activities.

Scenario 1: Maintain the present conditions. That is, the diffusion to the atmosphere of LFG from a landfill site is neglected.

Scenario 2: To collect generated LFG from landfill site and carry out flare combustion.

Scenario 3: This project is performed without a CDM project.

There is no chance that a similar to this project will be carried out from the above examination, and since being registered as a CDM project is indispensable to implementation of this project, it can be judged that there is additionality in this project.

(12) Expectation of CDM project:

As project profitability, when not assuming a CER profit on sale, there is no business potential, however, since both projects can expect profits (profit on electricity sales or a

recycling) other than a CER profit on sale. If it becomes CDM project, there will also be profitability and the expectation of project will increase. Also except profitability, the expectation as "environmental social consideration" is also great in the countries in Southeast Asia to which the environmental pollution accompanying economic development occurs.

The persons concerned of the counterpart and the government show interest and expectation very much to this CDM project. However, the counterpart wants to make a project fund is cheaper than the facility performance. On the other hand, the government shows the interest of this CDM project itself, and the similar CDM projects of the other companies are also advancing simultaneous examination. Moreover, it can be said that the adjustment of the person concerned is still insufficient in order to realize the CDM projects. In addition to this situation, the plan of new landfill site has surfaced in Ipoh city and detailed contents have not been determined yet. Therefore, the great influence to the project implementation will be predicted from now on. Although there is a possibility of project implementation in a technical side and a funding side, it can be said that it is necessary to judge the final project implementation after confirming the social conditions or the intention of person concerned.

3-2 Composting (MBT) of Organic Waste

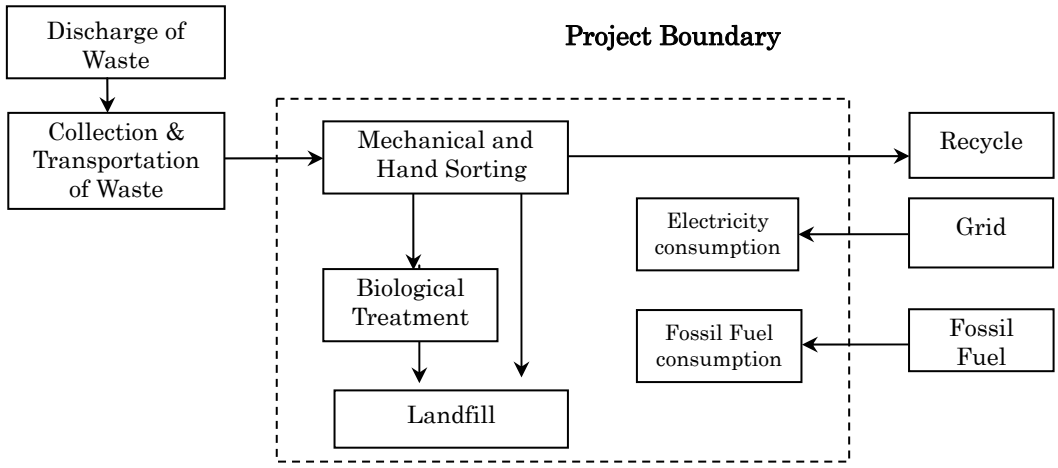
(1) Setup of a baseline scenario and project Boundary:

Project boundary and its view

In the methodology of AM0025, the project boundary defines as follows,

Project boundary shows a place in which waste treatment is carried out and it includes the solid waste treatment facility, the power generation and consumption, use of the fuel in the site, thermal energy power generation, waste water treatment facility and final landfill site. However, the waste collection and transportation facility to the site does not include.

Based on the methodology, the project boundary in this project is the intermediate facility which is shown inside the following dotted line.



Setup and the view of the baseline scenario

Based on the process which methodology AM0025 specifies, the following proposals were studied as an alternative when there are no project activities.

The formula of the amount of baseline emissions

Based on methodology, it calculates in the following formulas. And, each method number is a number specified by methodology AM0025, and writes C (initial of Compost) in addition.

$$BE_y = \left(MB_y - MD_{reg,y}\right) + BE_{ENy} \qquad C - (8)$$

$$MB_y = BE_{CH4,\ SWDSy} \qquad C - (10)$$

$$BE_{CH4,SWDS,y} = \varphi \cdot (1-f) \cdot GWP_{CH4} \cdot (1-OX) \cdot \frac{16}{12} \cdot F \cdot DOC_f \cdot MCF \cdot \sum_{x=l}^{y} \sum_{j} W_{j,x} \cdot DOC_j \cdot e^{-k_j \cdot (y-x)} \cdot \left(1 - e^{-k_j}\right) \qquad C - (11)$$

(2) The amount of project emissions:

The formula of the amount of project emissions

The items applicable to this project of the components of the project discharge defined by AM0025 are 1) discharge by the power consumption related to project activities, 2) discharge by fuel consumption, and 3) discharge in a compost process. Therefore, the project discharge of this project is calculated by the following formulas.

$$PE_y = PE_{elec,\ y} + PE_{fuel,\ on\text{-}site,\ y} + PE_{c,\ y} \qquad C - (1)$$

$$PE_{elec,\ y} = EG_{PJ,\ FF,\ y} * CEF_{elec} \qquad C - (2)$$

$$PE_{fuel,\ on\text{-}site,\ y} = F_{\ cons,\ y} * NCV_{fuel} * EF_{fuel} \qquad C - (3)$$

$$PE_{c,\ y} = PE_{c,\ N2O,\ y} + PE_{c,\ CH4,\ and\ y} \qquad C - (4)$$

$$PE_{c,\ N2O,\ y} = M_{compost,\ y} * EF_{c,\ N2O} * GWP_{N2O} \qquad C - (5)$$

$$PE_{c,\ CH4,\ y} = MB_{compost,\ y} * S_{a,\ y} \qquad C - (6)$$

The formula of leakage

Leakage has 1) leakage discharge by the increase in transportation, 2) residue from anaerobic digestion, combustion residue from gasification and RDF-SB and from the compost in the case of being disposed to the landfill site and 3) leakage discharge from the end use of SB. Where, among these three cases, 3) is not applicable in this project. And, the forward leakage of an alternative of the fossil fuel base compost by organic compost is not verified. Leakage is calculated by the following formulas.

$$L_y = L_{t,\ y} + L_{r,\ y} \qquad C - (13)$$

$$L_{t,\ y} = NO_{vehicles,\ i,\ y} * DT_{i,\ y} * VF_{cons,\ i} * NCV_{fuel} * D_{fuel} * EF_{fuel} \qquad C - (14)$$

(3) Monitoring plan

In the methodology of monitoring of AM0025, electric power, the consumption of a fuel, the volume of compost, the oxygen-deficiency sample number of a compost process and others are measured directly to the project activities related to calculation of a project discharge. And, when there are no project activities, the survey in the condition of a final disposal site of waste reclamation (1 time per year) is also included.

(4) Estimation of GHG emission reductions:

The amount of greenhouse gas reduction is shown in the following table.

Year	The amount of baseline emissions (BEy)	The amount of project emissions (PEy)	Leakage (Ly)	The amount of emissions reduction (ER)
	tCO_2e	tCO_2e	tCO_2e	tCO_2e
2013	2,635	189	1,069	1,377
2014	4,589	189	1,866	2,534
2015	6,071	189	2,474	3,408
2016	7,222	189	2,949	4,084
2017	8,139	189	3,330	4,620
2018	8,888	189	3,642	5057
2019	9,513	189	3,905	5,420
2020	10,047	189	4,219	5,728
2021	10,510	189	4,325	5,996
2022	11,919	189	4,499	6,231
Total	79,533	1,890	32,278	44,455

(5) Project period and crediting period:

Refer to the above 3-1 (5). However, both the project period and the crediting period were set with ten years in MBT.

(6) Environmental impact and indirect influence of others:

Refer to the above 3-1 (6).

(7) The stakeholders' comments:

Refer to the above 3-1 (7).

(8) Enforcement organization of a project:

Refer to the above 3-1 (8).

(9) Cash planning:

Refer to the above 3-1 (9).

(10) Economic analysis:

In this project, an internal rate of return (IRR) estimates economic efficiency. In analyzing and evaluating, the detailed examination was performed based on the latest information. The preconditions for the economic analysis are shown in below;

(1) Preconditions for economic analysis

Item	Precondition
Project implementation period	10 years
The amount of waste receiving	600t/day (no fluctuation)
The amount of waste treatment	50t/day
Corporation tax	25% (Malaysia standard tax rate)
Exchange rate	1.00RM = 27 yen

(2) Internal rate of return

As in the composting project, IRR was made into indication, and it did the economic analysis.

The profits of a compost project are a "CER profit on sale", a "recycling sales return", and the "economy effect of a soil cover." The result of IRR was a negative value. For this

project, as the waste is receiving to the landfill site and the project is proceeding simultaneously for a compost project, a profit can be taken stably, but it is a subject to raise a rate of return more from now on.

Profit and Loss Statement (Unit: RM)

			1	2	3	4	5	6	7	8	9	10	Total
Sales	Recyclables sales		309,520	314,782	320,133	325,575	331,110	336,739	342,464	348,285	354,206	360,228	3,343,043
	Cover soil saving cost		152,850	155,448	158,091	160,779	163,512	166,292	169,119	171,994	174,917	177,891	1,650,892
	CDM Credit		53,543	98,550	132,550	158,855	179,720	196,684	210,804	222,811	233,214	242,370	1,729,101
Total Sales			515,913	568,781	610,774	645,209	674,342	699,715	722,387	743,090	762,337	780,489	6,723,036
Initial Cost		4,368,650											0
O&M cost			648,877	671,342	694,657	718,857	743,975	770,050	797,119	825,221	854,397	884,690	7,609,185
Depreciation			436,865	436,865	436,865	436,865	436,865	436,865	436,865	436,865	436,865	436,865	4,368,650
Corporation tax (25%)			0	0	0	0	0	0	0	0	0	0	0
P/L Current		-4,368,650	-132,964	-102,561	-83,883	-73,648	-69,634	-70,336	-74,732	-82,130	-92,060	-104,201	

IRR(10year) negative
IRR (20 year) negative

(11) Demonstration of additionality:

It verified based on methodology AM0025 and "tool version 05.2 (Tool for the demonstration and assessment of additionality) for evaluation of addition nature, and proof."

Based on methodology AM0025, the following scenario proposals are mentioned as alternatives of these project activities.

Scenario 1: Composting processing is not as a CDM project and it performs.
Scenario 2: It reclaims land LFG from garbage in the disposal site which is collecting and burning.
Scenario 3: It reclaims land LFG from garbage in the disposal site which is not collecting and burning. (Status quo)

There is no chance that a similar to this project will be carried out from the above examination, and since being registered as a CDM project is indispensable to implementation of this project, it can be judged that there is additionality in this project.

(12) Expectation of CDM project:

Refer to the above 3-1 (12).

4. Validation Examination (Pre Validation)

(1) Outline of validation examination (pre validation):

Japan Consulting Institute which is DOE performed the desk review about PDD of composting (MBT) of organic waste from the middle of October, 2010.

(2) Progress of the communication with DOE:

As a result of Completeness Check for checking the completeness of PDD, the biggest comment was a defect of summary of the comment from a stakeholder.

5. Result of implementation on Co-benefit

The baseline scenario and project scenario on this proposed project are as being shown in the following table.

	LFG recovery and utilization	Composting of Organic Waste (MBT)
Baseline Scenario	Discharging LFG to atmosphere, electric power uses the existing or new electric power by which grid connection was made.	Direct dumping of the waste to the disposal site which is not collecting LFG is continued.
Project Scenario	Collection of LFG, and power generation and flare combustion are done.	Waste is continuously received in the disposal site which is not collecting LFG, and aerobic fermentation treatment by MBT is done.

After project implementation has the 1.0th edition of a Co-benefit fixed-quantity evaluation manual. And, there are the following improvements as Co-benefit indication by undertaking "LFG recovery and utilization project (ACM0001 application)" and "Composting of Organic Waste project (AM0025 application)" in a proposal project (the evaluation field is a "waste management").

- Odor -> Existing application [Odor, ignition, waste scattering, falling prevention]
- Volume of wastes -> [Waste loss in quantity]
- COD -> [Water pollution control]

These Co-benefit indications are categorized into below.

- Odor -> It can hope, when "LFG recovery and utilization" is undertaken.
- Volume of wastes -> It can hope, when "Composting of Organic Waste" is undertaken.
- COD -> It can hope, when "Composting of Organic Waste" is undertaken.

However, the modification is possible on the Co-benefit effect hope depending on selection of a future project. And, about performance indices, other than the odor of "odor" -> [an odor, ignition, waste scattering, and protection from fall], for the soil cover of the whole area of the surface of a disposal site after project implementation, it is hoped that these all will decrease. But, since it is not taken into consideration by the performance index in a manual, the survey for evaluation has been seen off on this time.