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5. ローカル・コンサルタント情報
6. わが国におけるE-wasteリサイクル関連情報とペナン島におけるE-waste潜在回収可能量

MINUTES OF MEETINGS
BETWEEN JAPANESE DETAILED PLANNING SURVEY TEAM
AND AUTHORITIES CONCERNED OF THE GOVERNMENT OF MALAYSIA
ON JAPANESE TECHNICAL COOPERATION FOR
THE PROJECT FOR MODEL DEVELOPMENT FOR E-WASTE COLLECTION,
SEGREGATION AND TRANSPORTATION FROM HOUSEHOLDS FOR RECYCLING

The Japanese Detailed Planning Survey Team (hereinafter referred to as "the Team"), organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Hideo Noda, visited Malaysia from December 7 to December 16, 2010 for the purpose of formulating the technical cooperation on the Project for Model Development for E-Waste Collection, Segregation and Transportation from Households for Recycling (hereinafter referred to as "the Project").

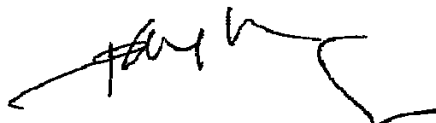
During its stay in Malaysia, the Team had a series of discussions with the Malaysian authorities concerned with respect to the implementation of the Project.

As a result of the discussions, the Team and the Malaysian authorities concerned agreed on the matters referred to in the document attached hereto.

Putrajaya, December 16, 2010



Hideo Noda
Leader
Japanese Detailed Planning Survey
Team
Japan International
Cooperation Agency
JAPAN



Ir. Lee Heng Keng
Deputy Director General (Operations)
Department of Environment
Ministry of Natural Resources and
Environment
MALAYSIA

ATTACHED DOCUMENT

I. TITLE OF THE PROJECT

Both sides agreed that the title of the Project will be "The Project for Model Development for E-Waste Collection, Segregation and Transportation from Households for Recycling".

II. RECORD OF DISCUSSIONS

The draft of Record of Discussions (hereinafter referred to as "R/D"), which stipulates the framework of the Project, will be finalized and signed by the representatives of the Government of Malaysia and JICA Malaysia Office after notification of approval of implementation of the Project by Ministry of Natural Resources and Environment (NRE) and JICA Headquarters. The draft of R/D is shown as Appendix I.

However, it needs to be further discussed and agreed by Malaysian authorities and JICA.

III. TENTATIVE PLAN OF OPERATION

The tentative Plan of Operation (hereinafter referred to as "PO") for the whole project period was agreed by both sides as stipulated in Appendix II. The activities of the Project are subject to change within the scope of the R/D with mutual consent in the course of implementation of the Project.

IV. FRAMEWORK OF THE PROJECT

The Project will be carried out under normal procedure of a technical cooperation between the two governments. During the meetings, the Team and the respective authorities of Malaysia discussed and confirmed the framework of the Project as follows;

1. Project Implementing Agency and Cooperating Organization

Both sides agreed that the project implementing agency and cooperating organization as below;

(1) Malaysian side

- a. Department of Environment (DOE), Ministry of Natural Resources and Environment
- b. Municipal Council of Penang Island (MPPP) (as a cooperating organization)

(2) Japanese side

JICA will dispatch technical cooperation expert(s) on e-waste management.



The tentative structure of project implementation is shown in Appendix III.

2. Cooperation Period of the Project

The duration of the technical cooperation for the Project will be one and a half (1.5) years from the date of signature of R/D.

3. Master Plan of the Project

Both sides agreed on the Master Plan of the Project as stipulated in Appendix IV and Relationship between each output to be achieved for the project in Appendix V.

V. MEASURES TO BE TAKEN BY BOTH SIDES

Both sides agreed that the following measures shall be taken.

(1) Japanese side

- a. Dispatch of Japanese expert(s)
- b. Training of Malaysian personnel in Japan or other countries

(2) Malaysian side

a. Counterpart personnel

The Malaysian side will assign adequate number of staff in DOE Headquarters, DOE Penang State Office and MPPP necessary for the implementation of the Project as counterparts.

b. Office

The Malaysian side will arrange working facilities necessary for implementation of the Project.

c. Vehicle

Malaysian side will arrange a vehicle for the experts for implementation of the Project.

d. Local Cost for the Project (Pilot Project)

Referring to budgetary constraints for the Project in JICA, the Team requested to Malaysian side to make necessary arrangements in order to secure adequate budget for implementation of the Project as follows;

- Expenses for hiring local consultants (for Output 1)
- Expenses for the pilot project (for Output 3)
- Other contingency expenses related to the Project incurred by the Malaysian counterparts

Malaysian side took note of the Team's request and explained that its input for the



Project would be limited to in-kind as explained in the original project proposal. Malaysian side further requested the Team to reconsider to finance the Project other than the in-kind contribution.

Both sides agreed that the Project shall be implemented in an efficient way within the limitation of inputs from both sides.

VI. OTHERS

1. Survey on the present conditions regarding e-waste in Penang

The team confirmed, with existing data provided by Malaysian side that a survey on the present conditions regarding e-waste in Penang is necessary in order to identify the flow and the volume of e-waste generated from households.

Both sides agreed that the survey shall be conducted as a part of the project activities.

2. Timeline

Both sides confirmed that necessary actions below shall be taken before commencement of the Project in consideration that a starting time of the project is subject to the budget approval by JICA.

Necessary actions

- Approval of the result of the detailed planning survey of the Project by JICA Headquarters
- Signature of the R/D between Malaysian authorities and JICA Malaysia Office, and commencement of the Project
- Acceptance of official request from the Government of Malaysia by the Government of Japan for Japanese experts

Appendix I	DRAFT RECORD OF DISCUSSIONS (R/D)
Appendix II	TENTATIVE PLAN OF OPERATION (PO)
Appendix III	TENTATIVE STRUCTURE OF PROJECT IMPLEMENTATION
Appendix IV	MASTER PLAN
Appendix V	RELATIONSHIP BETWEEN EACH OUTPUT TO BE ACHIEVED FOR THE PROJECT
Appendix VI	LIST OF ATTENDANCE



Appendix I

**DRAFT RECORD OF DISCUSSIONS
BETWEEN JAPAN INTERNATIONAL COOPERATION AGENCY AND
AUTHORITIES CONCERNED OF THE GOVERNMENT OF MALAYSIA
ON JAPANESE TECHNICAL COOPERATION FOR
THE PROJECT FOR MODEL DEVELOPMENT FOR E-WASTE COLLECTION,
SEGREGATION AND TRANSPORTATION FROM HOUSEHOLDS FOR RECYCLING**

With regard to the Minutes of Meetings between the Detailed Planning Survey Team (hereinafter referred to as "the Team") and the authorities concerned of the Government of Malaysia dated on December 16, 2010, Japan International Cooperation Agency (hereinafter referred to as "JICA") had a series of discussions through the Chief Representative of JICA Malaysia Office, with Malaysian authorities concerned with respect to desirable measures to be taken by JICA and the Government of Malaysia for the successful implementation of the technical cooperation on the Project for Model Development for E-Waste Collection, Segregation and Transportation from Households for Recycling.

As a result of the discussions, JICA and the Malaysian authorities concerned agreed on the matters referred to in the document attached hereto.

Kuala Lumpur, [MONTH] [DATE], [YEAR]

Tsutomu Nagae
Chief Representative
Malaysia Office
Japan International Cooperation Agency
JAPAN

(Representative from)
Ministry of Natural Resources and
Environment
MALAYSIA



ATTACHED DOCUMENT

I. COOPERATION BETWEEN JICA AND THE GOVERNMENT OF MALAYSIA

1. The Government of Malaysia will implement the technical cooperation on the Project for Model Development for E-Waste Collection, Segregation and Transportation from Households for Recycling in cooperation with JICA.
2. The Project will be implemented in accordance with the Master Plan and Plan of Operation (PO), which are given in Annex I and Annex II.

II. MEASURES TO BE TAKEN BY JICA

In accordance with the laws and regulations in force in Japan, JICA will take, at its own expense, the following measures according to the normal procedures under the Colombo Plan Technical Cooperation Scheme.

1. DISPATCH OF JAPANESE EXPERTS
JICA will provide the services of the Japanese experts as listed in Annex III.
2. TRAINING OF MALAYSIAN PERSONNEL IN JAPAN
JICA will accept Malaysian personnel connected with the Project for technical training in Japan or other countries.

III. MEASURES TO BE TAKEN BY THE GOVERNMENT OF MALAYSIA

1. The Government of Malaysia will take necessary measures to ensure that the self-reliant operation of the Project will be sustained during and after the period of Japanese technical cooperation, through full and active involvement in the Project by all related authorities, beneficiary groups and institutions.
2. The Government of Malaysia will ensure that the technologies and knowledge acquired by the Malaysian nationals as a result of Japanese technical cooperation will contribute to the economic and social development of Malaysia.



3. The Government of Malaysia will grant in Malaysian privileges, exemptions and benefits to the Japanese experts referred to in II-1 above and their families, which are no less favourable than those accorded to experts of third countries working in Malaysia under the Colombo Plan Technical Cooperation Scheme.
4. The Government of Malaysia will take necessary measures to ensure that the knowledge and experience acquired by the Malaysian personnel from technical training in Japan and/or third countries will be utilized effectively for the implementation of the Project.
5. In accordance with the laws and regulations in force in Malaysia, the Government of Malaysia will take necessary measures to provide what are shown below at its own expense.
 - (1) Services of the Malaysian counterpart personnel and administrative personnel as listed in Annex IV
 - (2) Office spaces and facilities as listed in Annex V
 - (3) Supply or replacement of machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than the Equipment provided by JICA
6. In accordance with the laws and regulations in force in Malaysia, the Government of Malaysia will take necessary measures to meet;
 - (1) Running expenses necessary for the implementation of the Project, such as
 - a. Electricity, water and local telecommunication
 - b. Other contingency expenses related to the Project incurred by Malaysian counterparts.

IV. ADMINISTRATION OF THE PROJECT

1. Ministry of Natural Resources and Environment (NRE) shall be the Responsible Agency of the Project.
2. The following organizations shall be the Implementing Agency and cooperating organization of the Project;

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(1) Malaysian side

- a. Department of Environment (DOE), NRE
- b. Municipal Council of Penang Island (MPPP) (as a cooperating organization)

(2) Japanese side

JICA will implement the Project with Japanese expert(s) on e-waste management

"Formation of Project Implementation" with other concerning organizations is shown in Annex VI.

- 3. () as the Project Director, will bear overall responsibility for the administration, coordination and implementation of the Project.
- 4. () will work as the Project Manager and will be responsible for implementation, managerial and technical matters of the Project.
- 5. The Japanese expert(s) will provide the Project Director and Project Manager with necessary recommendations and technical advice of any matters pertaining to the implementation of the Project.
- 6. The Japanese expert(s) will provide Malaysian counterpart personnel necessary technical guidance and advice on technical matters pertaining to the implementation of the Project.
- 7. For the effective and successful implementation of technical cooperation for the Project, Joint Coordinating Committee will be established whose functions and composition are described in Annex VII.

V. JOINT EVALUATION

Evaluation of the Project will be conducted jointly by JICA and the Malaysian authorities concerned, at the middle and end of the cooperation term in order to examine the level of achievement.

VI. CLAIMS AGAINST JAPANESE EXPERT(S)

The Government of Malaysia undertakes to bear claims, if any arises, against the Japanese experts engaged in technical cooperation for the Project resulting from, occurring in the course of, or otherwise connected with the discharge of their



official functions in Malaysia except for those arising from the wilful misconduct or gross negligence of the Japanese experts.

VII. MUTUAL CONSULTATION

There will be mutual consultation between JICA and the Government of Malaysia on any major issues arising from, or in connection with this Attached Document.

VIII. MEASURES TO PROMOTE UNDERSTANDING OF AND SUPPORT FOR THE PROJECT

For the purpose of promoting support for the Project among the people of Malaysia, the Government of Malaysia will take appropriate measures to make the Project widely known to the people of Malaysia.


IX. TERM OF COOPERATION

The duration of the technical cooperation for the Project under this Attached Document will be one and a half (1.5) years from the date of signature of this R/D.

X. OTHERS

Both sides agreed that necessary information and data for smooth implementation of the Project shall be shared among members of the Project.

ANNEX I	MASTER PLAN (see in Appendix IV)
ANNEX II	PLAN OF OPERATION (PO) (see in Appendix II)
ANNEX III	LIST OF JAPANESE EXPERTS
ANNEX IV	LIST OF MALAYSIAN COUNTERPARTS AND ADMINISTRATIVE PERSONNEL
ANNEX V	LIST OF OFFICE SPACES AND FACILITIES
ANNEX VI	STRUCTURE OF PROJECT IMPLEMENTATION
ANNEX VII	JOINT COORDINATING COMMITTEE



ANNEX III LIST OF JAPANESE EXPERTS

1. Short-term experts

The short-term experts, who will take part in the Project as listed below, will be dispatched several times a year during the project period.

1) [Field]

2) [Field]

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ANNEX IV LIST OF MALAYSIAN COUNTERPARTS AND ADMINISTRATIVE PERSONNEL

No	Project Position	Name	Organization	Related Output
1.	Project Director		DOE Headquarters	1,2,3,4,5
2.	Project Manager		DOE Penang State Office	1,2,3,4,5
3.	Counterpart(C/P)		MPPP	1,2,3,5
4.	C/P			
5.	C/P			
6.	C/P			
7.	C/P			
8.	C/P			
9.	C/P			
10.	C/P			

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ANNEX V LIST OF OFFICE SPACES AND FACILITIES

1. Office space necessary for the performance of duties by the Japanese Expert(s)
2. Facilities such as electricity, water, sewerage system, telephones, internet connection and furniture necessary for the Project activities and operational expenses for utilities.
3. A vehicle for the Japanese expert(s) moving for implementation of the Project
4. Other facilities mutually agreed upon as necessary.

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ANNEX VII JOINT COORDINATING COMMITTEE

1. FUNCTION

Joint Coordinating Committee (hereinafter referred to as "JCC"), composed of members listed in 2 below, will meet at least once a year and whenever the necessity arises. The main functions of JCC shall be as follows;

- (1) To approve the annual work plan of the Project
- (2) To review the overall progress and achievements of the Project
- (3) To examine major issues arising from or in connection with the Project
- (4) To work out the modification of activities depending on the necessity
- (5) To discuss any other issue(s) pertinent to the smooth implementation of the Project

2. COMMITTEE COMPOSITION

Chairperson: Deputy Director General (Operations), DOE

Project Director: Director of Hazardous Substances Division, DOE Headquarters

Project Manager: Director of DOE Penang State Office

Malaysian side: Representative(s) of NRE, MPPP, MHLG and any other officials appointed by the Chairperson

Japanese side: JICA Expert(s), JICA Malaysia Office and other personnel concerned to be decided and/or dispatched by JICA, if necessary

Observer:

Representative(s) of the Embassy of Japan in Malaysia

Economic Planning Unit (EPU) and other official(s) appointed by the Chairperson.



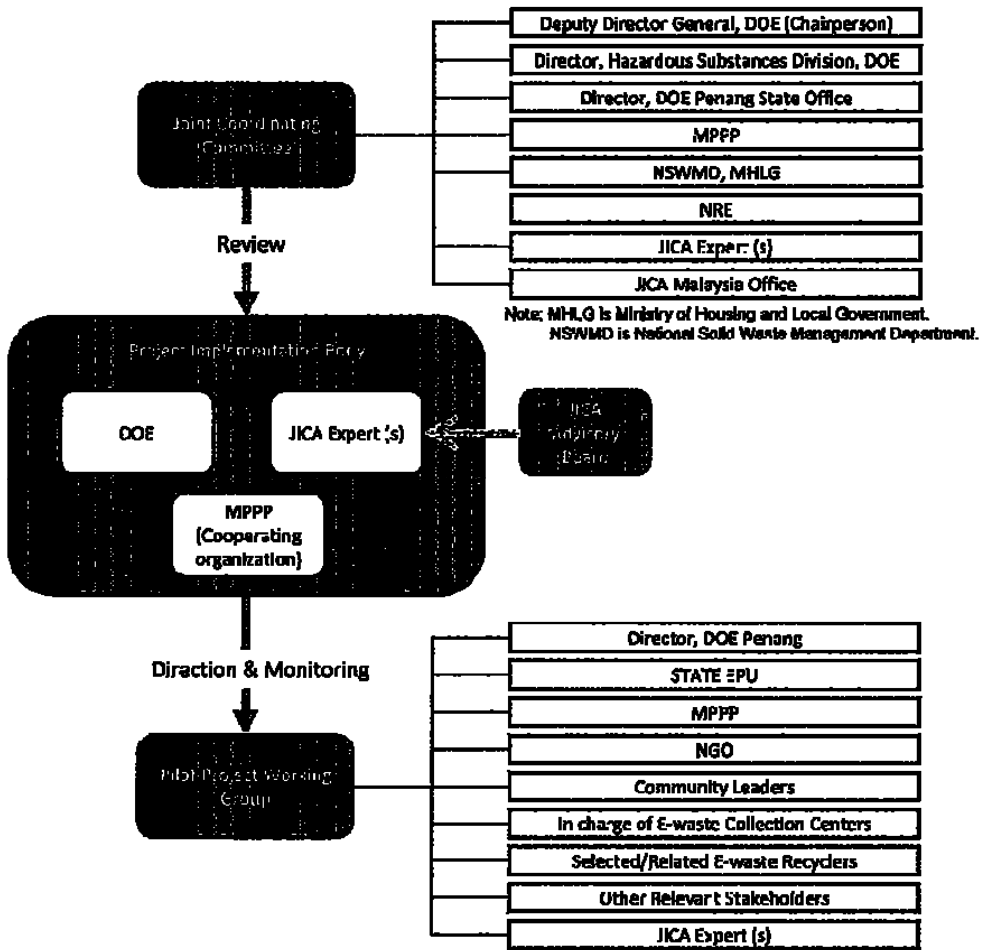
Appendix II PLAN OF OPERATION (PO)

Activity	Schedule (month)																Person in Charge	Technical Assistance	Activity Target		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				17	18
(1) The present status regarding e-waste generation and recycling activities in Penang is studied.																			JICA	DOE, MPPP	-
(1)-1. To survey the present conditions of generation, recycling and disposal regarding e-waste from households in Penang.																			JICA	DOE, MPPP	-
(1)-2. To study the e-waste flow in Penang.																			JICA	DOE, MPPP	-
(2) Collection plan for e-waste recycling in the pilot project area is prepared according to the conditions in Penang.																			JICA	DOE, MPPP	-
(2)-1. To determine pilot project areas and to study the present conditions.																			JICA	DOE, MPPP	-
(2)-2. To propose "Collection plan for e-waste recycling in the pilot project area(s)" based on the actual conditions in Penang.																			JICA	DOE, MPPP	-
(2)-3. To formulate a public awareness campaign program for households for the e-waste collection in the pilot project area(s) of Penang.																			JICA	DOE, MPPP	-
(2)-4. To implement the public awareness campaign program in the pilot project area(s) of Penang.																			JICA	DOE, MPPP	-
(2)-5. To develop the coordination and collaboration mechanism among the stakeholders for the e-waste collection generated from households in the pilot project area(s) of Penang to ensure proper management of e-waste.																			JICA	DOE, MPPP	-
(2)-6. To develop the information management system for the e-waste collection from households in the pilot project area(s) of Penang.																			JICA	DOE, MPPP	-
(3) A pilot project is implemented in Penang according to the "Collection plan for e-waste recycling in the pilot project area(s)".																			JICA	DOE, MPPP	-
(3)-1. To prepare the implementation plan for the pilot project.																			JICA	DOE, MPPP	-
(3)-2. To develop the evaluation indexes and the measurement method for the pilot project.																			JICA	DOE, MPPP	-
(3)-3. To conduct the pilot project in Penang.																			JICA	DOE, MPPP	Residents in Penang
(3)-4. To survey the residents' opinions before and after the pilot project implementation.																			JICA	DOE, MPPP	Residents in Penang
(4) Collection plan for e-waste recycling in the pilot project area(s) is reviewed from the results of the pilot project, and the lessons learnt and recommendations for improvement are presented.																			JICA	DOE, MPPP	-
(4)-1. To evaluate the effectiveness and efficiency of the "Collection plan for e-waste recycling in the pilot project area(s)" based on the results of the pilot project implementation.																			JICA	DOE, MPPP	-
(4)-2. To review the lessons learnt and recommendations for future "Collection plan for e-waste recycling" based on the evaluation of the results of the pilot project.																			JICA	DOE, MPPP	-
(4)-3. To prepare a future collection plan for e-waste recycling in Penang Island.																			JICA	DOE, MPPP	-
(5) Capacity building is achieved for personnel of DOE, local authority and relevant organizations regarding e-waste management.																			JICA	DOE	-
(5)-1. To develop capacity building program for personnel of DOE, local authority and relevant organizations regarding e-waste management.																			JICA	DOE	-
(5)-2. To conduct seminars or workshops on survey method, planning method, implementation method, evaluation method and public awareness raising method on e-waste management.																			JICA	DOE, MPPP	DOE, MPPP
(5)-3. To collect and compile the policy and system of e-waste management in Japan and other countries and present it as a pamphlet/book.																			JICA	DOE, MPPP	DOE, MPPP
(5)-4. To conduct a study tour and/or training course in e-waste management in Japan or other country.																			JICA	DOE, MPPP	DOE, MPPP
(5)-5. To propose main elements for regulatory control of e-waste in Malaysia.																			JICA	DOE	-

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STRUCTURE OF PROJECT IMPLEMENTATION



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Appendix IV MASTER PLAN

Overall Goal	
E-waste collection programs for recycling e-waste generated from households are implemented nationwide.	
Project Purpose	
An e-waste collection, segregation and transportation model for recycling e-waste generated from households is developed through a pilot project in Penang.	
Outputs	
1	The present status regarding e-waste generation and recycling activities in Penang is studied.
2	"Collection plan for e-waste recycling in the pilot project area" is prepared according to the conditions in Penang.
3	A pilot project is implemented in Penang according to the "Collection plan for e-waste recycling in the pilot project area(s)".
4	"Collection plan for e-waste recycling in the pilot project area(s)" is reviewed from the results of the pilot project, and the lessons learnt and recommendations for improvement are presented.
5	Capacity building is achieved for personnel of DOE, local authority and relevant organizations regarding e-waste management.
Activities	
1-1	To survey the present conditions of generation, recycling and disposal regarding e-waste from households in Penang
1-2	To study the e-waste flow in Penang
2-1	To determine pilot project area(s) and to study the present conditions
2-2	To propose "Collection plan for e-waste recycling in the pilot project area(s)" based on the actual conditions in Penang
2-3	To formulate a public awareness campaign program for households for the e-waste collection in the pilot project area(s) of Penang
2-4	To implement the public awareness campaign program in the pilot project area(s) of Penang
2-5	To develop the coordination and collaboration mechanism among the stakeholders for the e-waste collection generated from households in the pilot project area(s) of Penang to ensure proper management of e-waste
2-6	To develop the information management system for the e-waste collection from households in the pilot project area(s) of Penang
3-1	To prepare the implementation plan for the pilot project

Signature

Signature

3-2	To develop the evaluation indexes and the measurement method for the pilot project
3-3	To conduct the pilot project in Penang
3-4	To survey the residents' opinions before and after the pilot project implementation
4-1	To evaluate the effectiveness and efficiency of the "Collection plan for e-waste recycling in the pilot project area(s)" based on the results of the pilot project implementation
4-2	To review the lessons learnt and recommendations for future "Collection plan for e-waste recycling" based on the evaluation of the results of the pilot project
4-3	To prepare a future collection plan for e-waste recycling in Penang Island
5-1	To develop capacity building program for personnel of DOE, local authority and relevant organizations regarding e-waste management
5-2	To conduct seminars or workshops on survey method, planning method, implementation method, evaluation method and public awareness raising method on e-waste management
5-3	To collect and compile the policy and system of e-waste management in Japan and other countries and present in a seminar/workshop.
5-4	To conduct a study tour and/or training course in e-waste management in Japan or other country
5-5	To propose main elements for regulatory control of e-waste in Malaysia

NOTE

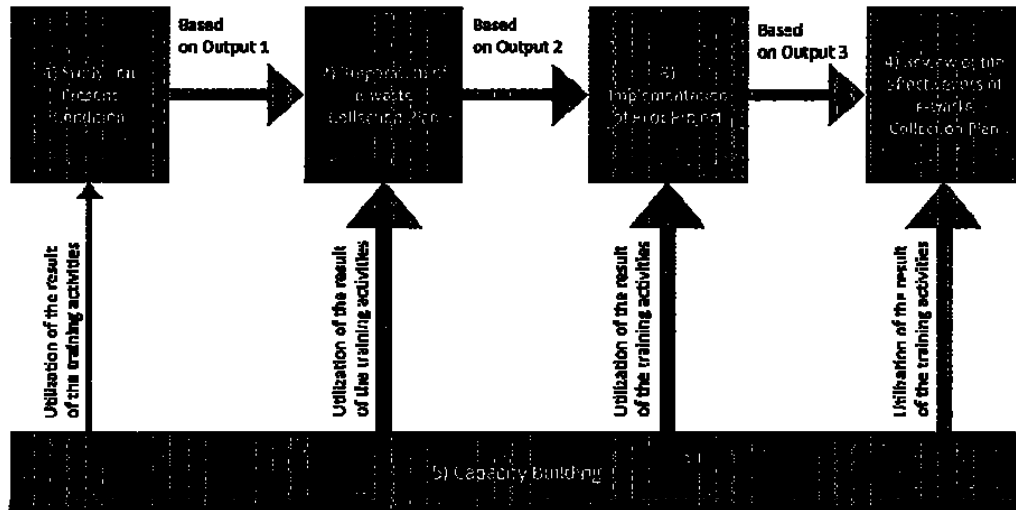
- 1) "Collection" means collection, segregation and transportation of e-waste from households only for recycling.

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Appendix V

RELATIONSHIP BETWEEN EACH OUTPUT TO BE ACHIEVED FOR THE PROJECT



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Appendix VI

LIST OF ATTENDANCE

	Name	Organization
1	Ir. Lee Heng Keng	Deputy Director General (Operations) DOE Headquarters
2	Mr. Mohd Firdaus B. Mohamad Zakaria	Assistant Director Social Services Section Economic Planning Unit
3	Mr. Lim Wei Urn	Assistant Director Environment and Natural Resource Economic Section Economic Planning Unit
4	Ms. Marlana Mohsin	Assistant Secretary Environmental Management and Climate Change Division Ministry of Natural Resources and Environment
5	Dr. Ab. Rahman bin Awang	Director Hazardous Substances Division, DOE Headquarters
6	Y. H Dato' Hassan bin Mat	Director DOE Penang State Office
7	Mr. Selva A/L Pichaimuthu	Assistant Director State Economic Planning Unit Penang
8	Mr. Geh Thuan Tek	Assistant Director Municipal Urban Services Division Municipal Council of Penang Island
9	Mr. Ruslan bin Mohamad	Principal Assistant Director Hazardous Substances Division DOE Headquarters
10	Ms. Norazlina Abd Halim	Environmental Control Officer Hazardous Substances Division DOE Headquarters
11	En. Badlishah bin Ahmad	Principal Assistant Director DOE Penang State Office
12	Mr. Mohd Fitri Mokthar	Environmental Control Officer DOE Penang State Office
13	Mr. Paul Wong Kok Kiong	Senior Principle Assistant Secretary Policy Division Ministry of Housing and Local Government
14	Mr. Masayuki Hayashi	Representative JICA Malaysia Office
15	Ms. Florence Tan	Senior Program Manager JICA Malaysia Office
16	Ms. Teoh Siew Keng	Program Manager JICA Malaysia Office
17	Mr. Hideo Noda	Director Environmental Management Division 1 JICA Headquarters
18	Dr. Mitsuo Yoshida	Senior Advisor JICA Headquarters

19	Ms. Kazumi Sato	Program Officer Environmental Management Division 1 JICA Headquarters
20	Mr. Hideki Wada	President Sustainable System Design Institute

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2. 主要面談者リスト

所属	氏名	役職	面談日
DOE/NRE (天然資源・環境省環境局)	Ir. Lee Heng Keng	Deputy Director General	12/8,15,16
	Dr. Ab. Rahman bin Awang	Director of Hazardous Substances Division	12/8,9,10,15,16
	Mr. Ruslan bin Mohamad		12/8,9,10,14,15,16
	Ms. Norazlina Abd Halim		12/8,9,10,14,15,16
NRE	Pn. Marlianabt.Mohsin	Assistant Secretary, Environmental Management & Climate Change Division	12/8,16
DOE Penang State Office (環境局ペナン州事務所)	Y.H Dato' Hassan bin Mat	Director	12/9,14
	En. Badlishah bin Ahmad		12/8,9,10,14,16
	Mr. Mohod Fitri Mokthar		12/9,10,13,14
	Mr. Azhar Zainal Abidin		12/9,10
MPPP (ペナン島市)	Mr. Geh Thuan Tek	Assistant Director, Municipal Service Division	12/9,10,13,14,16
Penang Environment Working Group(PEWOG) ペナン環境ワーキンググループ	Ms. Rose Ng		12/13
Socio-Economic and Environmental Research Institute (SERI)	Mr. Khor Hung Teik		12/13
EPU (内閣府経済企画庁)	Mr. Mohd Firdaus B. Mohamad Zakaria	Assistant Director, Social Services Section	12/8,16
	Mr. Lim Wein Urn	Assistant Director, Environment & Natural Resource Economic Section	12/8,16
State Economic Planning Unit, Penang	Selva a/l Pichaimutuhu	Assistant Director	12/9,16
Ministry of Housing and Local Government	Mr. Paul Wong Kok Kiong		12/8
在マレーシア日本大使館	高橋 美佐子	経済部長 参事官	12/8
	福地 真美	二等書記官	12/8
	入谷 貴也	二等書記官	12/8
JICA マレーシア事務所	永江 勉	所長	12/8,16
	松本 勝男	次長	12/8
	林 将幸	所員	12/8-10,15,16
	Florence Tan Li Chin	ナショナルスタッフ	12/8,15,16

■ペナンのリサイクル業者

所属	氏名	役職	面談日
TES-AMM(Malaysia) Sdn. Bhd.	John Ashok		12/9
IRM(Reclaimtek) Sdn.Bhd.	Dato' Goh Eng Hoe	President	12/13
	LB Tan	Vice President, Admin & Finance	12/13
	Amiruddin Shukri bin Omar		12/9

Cycle Trend Industries Sdn. Bhd.	Kang Chun Kiong		12/9
Ming Engineering Sdn. Bhd.	Khaw Lay Ying		12/9
	Mohd Amin Ismail		12/9

■ 製造業企業

所属	氏名	役職	面談日
DELL Global Business Center Sdn. Bhd.	Anne Cheong		12/9
EPSON Singapore PTE LTD	Richard Yeo Seok Kiat		12/9
Konica Minolta Business Solutions (Malaysia) Sdn. Bhd.	S.K.Ong		12/9
Canon Singapore Pte Ltd	Esther The Shirley Lee		12/9 12/9
NOKIA	Francis Cheong		12/9
Hewlett-Packard Asia Pacific Pte.Ltd	Bu Fan		12/9
Brother International Singapore Pte Ltd	Milton Toh		12/9
Panasonic Management Malaysia Sdn. Bhd.	岩城 宏之	Director	12/9
Panasonic Asia Pacific Pte.Ltd	盛田 真耶		12/9

3 . 収集資料リスト

番号	著者・発行者	タイトル	概要	言語	資料形態	入手元
1	Ab. Rahman Awang, DOE, NRE	E-waste Management in Malaysia	マレーシアの E-waste 関連政策を示したPPT	英語	PDF	UNEP ホームページ http://www.unep.or.jp/ietc/spc/news-jul10/Malaysia_(Dr.RahmanAwang).pdf
2	DOE, NRE	Environmental Quality Report 2009	環境白書	英語	PDF	DOE ホームページ http://www.doe.gov.my/sub/publication/
3	DOE, NRE	E-waste Collection Centres	E-waste の回収拠点を明示	英語	PDF	DOE ホームページ http://www.doe.gov.my/files/u1/E-Waste_list.pdf
4	DOE, NRE	Guidelines for the classification of used electrical and electronic equipment in Malaysia	E-Waste の種類を明示	英語	PDF	DOE ホームページ http://www.doe.gov.my/files/u1/ELECTRICAL_AND_ELECTRONIC_EQUIPMENTIN_MALAYSIA.pdf (2010年11月16日確認)
5	DOE, NRE	List of scheduled waste contractors in Malaysia(Full recovery and Partial recovery)	E-waste 許可業者リスト	英語	PDF	DOE ホームページ http://www.doe.gov.my/old/?q=en/content/list-scheduled-waste-contractors-malaysia-2009-2010
6	Government of Malaysia	Environmental Quality Act 1974	法令	英語	PDF	DOE ホームページ http://www.doe.gov.my/v2/files/legislation/a0127.pdf
7	Government of Malaysia	P.U.(A)204/2005, Environmental Quality (Scheduled Wastes) Regulations 2005	法令	英語	PDF	DOE ホームページ http://www.doe.gov.my/v2/files/legislation/pua0294y2005.pdf
8	Government of Malaysia	Solid Waste and Public Cleansing Management Bill 2007	法令	英語	PDF	MHLG ホームページ http://www.kpkt.gov.my/kpkt_en/main.php?Content=sections&SectionID=73
9	Government of Malaysia	Solid Waste and Public Cleansing Management Corporation Bill 2007	法令	英語	Microsoft Word	MHLG ホームページ http://www.kpkt.gov.my/kpkt_en/main.php?Content=sections&SectionID=73

10	Government of Malaysia	Tenth Malaysia Plan 2011-2015	2011-2015 開発計画	英語	PDF	EPU ホームページ http://www.epu.gov.my/html/themes/epu/html/RMKE10/rmke10_english.html
11	Ministry of Environment, Japan	The E-Waste inventory project in Malaysia	E-waste インベントリ調査報告書	英語	PDF	バーゼル条約ホームページ http://www.basel.int/techmatters/e_wastes/projReport30-07-09.pdf (2010年11月15日確認)
12	Dr. Ong Hean Tee, State Recycling Coordinator, Penang, Malaysia	ESM of Collection and Separation of E-waste at Community and Informal Sector in Penang, Malaysia (E-waste Training Workshop for Asia and the Pacific on Environmentally Sound Management (ESM) of E-waste Hanoi, August 10-14, 2009)	PEWONG による E-waste 回収への取り組み概要を示したPPTハンドアウト	英語	PDF	JICA
13	UNEP	E-Waste Volume I, Inventory Assessment Manual	E-waste 管理マニュアル	英語	PDF	UNEP ホームページ http://www.unep.or.jp/ietc/Publications/spc/EWasteManual_Vol1.pdf (2010年11月15日確認)
14	UNEP	E-Waste Volume II, E-Waste Management Manual	E-waste 管理マニュアル	英語	PDF	UNEP ホームページ http://www.unep.or.jp/ietc/Publications/spc/EWasteManual_Vol2.pdf (2010年11月15日確認)
15	経済産業省	平成 21 年度産業技術研究開発委託費アジア大の3Rネットワーク構築プロジェクト アセアンにおけるリサイクルシステム構築のための地域間協力可能性調査 報告書、平成 22 年 3 月	アジアにおけるエコタウン協力の可能性を検討	日本語	PDF	経済産業省ホームページ http://www.meti.go.jp/meti_lib/report/2010fy01/0020817.pdf

16	財団法人地球環境戦略研究機関	平成 21 年度環境省委託請負事業 平成 21 年度クリーンアジア・イニシアティブ推進事務局運営等業務 マレーシア3R事業化準備調査報告書、平成 22 年 3 月	マレーシアにおける3R関連プロジェクトの可能性を検討	日本語	紙	
17	TES-AMM	-	TES-AMM 会社案内	英語	紙	TES-AMM 社より入手
18	パソコン拠点回収リスト及び年別パソコン回収実績(総重量)表	-	-	英語	紙	MPPP より
19	Sunshine(ペナン市でE-wasteの拠点回収を実施しているスーパーマーケット)	PUSAT KUTIPAN KOMPUTER TERPAKAI (使用済みコンピュータ回収)	E-waste 回収プログラム・パンフレット	英語	紙	Sunshine 社より入手
20	DOE, NRE	DOE 認可のペナンのリサイクル業者リスト	—	英語	紙	DOE より
21	パソコン拠点別回収量	-	-	英語	紙	MPPP より
22	Reclaimtek 会社案内 PPT ハンドアウト	-	-	英語	紙	Reclaimtek 社より
23	拠点回収の場所(概略図)	-	-	英語	紙	MPPP より
24	PEWOG 団体案内	-	-	英語	紙	PEWOG より
25	パソコン回収パンフレット	-	-	マレーシア語	紙	Sunshine 社より
26	エコバッグ運動パンフレット	-	-	マレーシア語	紙	Sunshine 社より

5. ローカル・コンサルタント情報

廃棄物分野に実績を有する代表的なローカル・コンサルタントは以下のとおりである。

■ クアラルンプール

- ・ SoluWaste Sdn Bhd
- ・ Eco-Ideal Consulting Sdn. Bhd.
- ・ Perunding Good Earth Sdn Bhd

■ ペナン

- ・ Socio-Economic and Environmental Research Institute (SERI)

■ ローカル・コンサルタントの関連実績

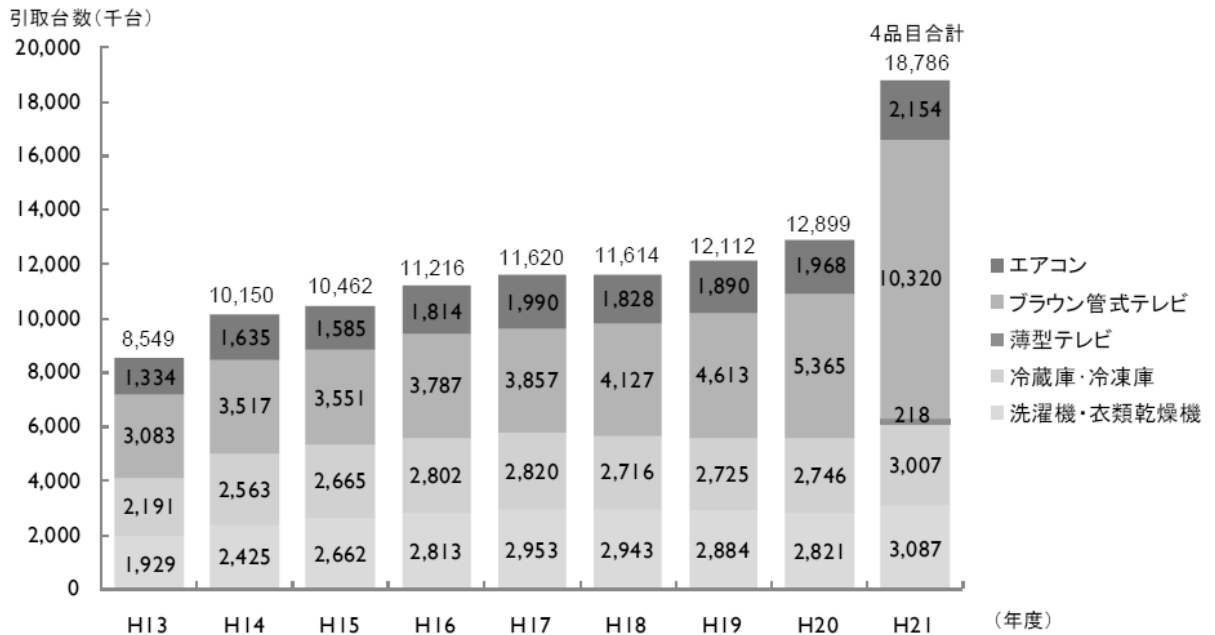
	概要	主な廃棄物関連実績
SoluWaste Sdn Bhd	廃棄物を中心にJICAも含め、援助機関の実績を多数有する。	<ul style="list-style-type: none"> ◆ DANIDA廃棄物支援（2006～） ◆ JICA廃棄物減量化計画（2005-2006） ◆ 日本国環境省コミュニティにおける有機廃棄物回収可能性調査（2010-）
Eco-Ideal Consulting Sdn. Bhd.	廃棄物、CDM、汚水、再生エネルギーを専門とし、JICAも含め、援助機関の実績を多数有する。	<ul style="list-style-type: none"> ◆ DANIDA廃棄物支援（2006～） ◆ EPUサバ州廃棄物基本計画（2007） ◆ JICA廃棄物減量化計画（2005-2006） ◆ DANIDA廃棄物発電政策形成（2005） ◆ 日本国環境省E-waste発生量調査（2007） ◆ 他多数
Perunding Good Earth Sdn Bhd	EMS関連コンサルティングを中心に広く環境関連コンサルティングを実施。わが国環境省が実施したE-waste Inventory調査の請負コンサルタント会社である。	<ul style="list-style-type: none"> ◆ 日本国環境省The E-Waste inventory project in Malaysia
SERI	ペナン島で環境関連の豊富な実績を有するNGO。ペナン島で実施されているE-waste回収システム立ち上げにも参加。	<ul style="list-style-type: none"> ◆ UNEPペナンにおけるエコタウンフレームワーク検討調査（2007） ◆ DANIDAペナンにおけるリサイクルバンク推進調査（2007） ◆ CIDA（カナダ援助機関）-AIT（アジア工科大学）ペナンにおける分別収集意識に関する共同調査（2005） ◆ 他多数

6. わが国における E-waste リサイクル関連情報とペナン島における E-waste 潜在回収可能量

(1) 家電リサイクル法対象品目

1) 引き取り台数の推移

引き取り台数は家電リサイクル法の年々微増傾向にあったが、平成21年度は地上アナログ放送廃止の影響を受けてテレビの引き取り台数が急増している。同年度には薄型テレビの引き取りも開始されたがその台数はまだ少ない。



(注) 冷蔵庫・冷凍庫の H13～15 年度は冷蔵庫のみの値(以下、同)。

洗濯機・衣類乾燥機の H13～20 年度は洗濯機のみの値(以下、同)。

(出典) 財団法人家電製品協会：家電リサイクル年次報告書平成21年度版

■指定引取場所における引取台数の推移

2) 1人当たりの廃棄重量の推定

地上波デジタル化の影響がまだ少ない平成20年度のデータを分析する。指定引取場所で引き取られたもののほとんどは再商品化等処理が行われ、その重要は下表のとおりである。再商品化等処理重量を人口で除すことにより、1人当たりの再商品化等重量(≒廃棄重量)を計算した。

しかしながら、この1人当たり再商品化等重量は廃棄重量と等しくはない。経済産業省の調査によると再使用目的で流れている台数がかかなりあり、家電リサイクル法上の再商品化等処理が行われるのは全体のおおむね半分程度であるといわれている。

そこで先の1人当たり再商品化等重要を2倍して、下表に示すとおり、年間1人当たりの廃棄重量をエアコン、テレビ、冷蔵庫・冷凍庫、洗濯機、それぞれ1.3、2.5、2.6、1.5kg、合計7.8kgとして得た。

■品目別引取台数（平成20年度）

		エアコン	テレビ	冷蔵庫・ 冷凍庫	洗濯機
指定引取場所での引取台数	千台	1,968	5,365	2,746	2,821
再商品化等処理台数	千台	1,968	5,210	2,733	2,818
再商品化等処理重量	t	82,746	156,546	163,056	94,010
人口	千人	127,692	127,692	127,692	127,692
1人当たり再商品化等処理重量	kg/人	0.65	1.23	1.28	0.74
【想定】1人当たり廃棄重量	kg/人	1.3	2.5	2.6	1.5

（資料）財団法人家電製品協会：家電リサイクル年次報告書平成20年度版（人口以外）、人口：統計局ホームページ各年度10月1日人口

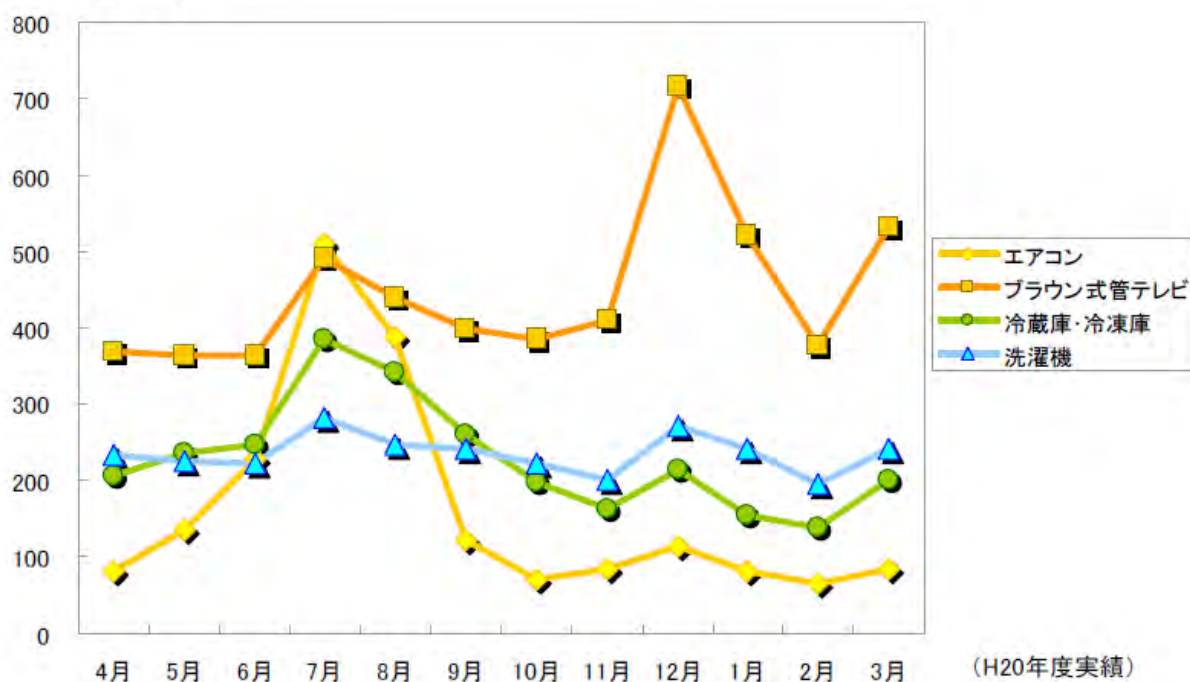
3) 引き取り台数の月別変化（平成20年度）

引取台数の月別変化を平成20年度でみたものが次図である。以下の特徴がみられる。
7月と12月にピークがある。

エアコン、冷蔵庫・冷凍庫のピークは12月よりも7月の方が大きい。

これらの特徴は賞与の時期と季節によって特徴づけられているものと考えられ、マレーシアにおいて回収パイロット・プロジェクトを評価する際には月変動に影響を与える因子を分析して、回収台数など得られたデータを補正する必要がある。ちなみにマレーシアにおける賞与の支給時期は年1回で12月である。

引取台数(千台)



(出典) 財団法人家電製品協会：家電リサイクル年次報告書平成21年度版

■ 指定引取場所における引取台数の月別推移

(2) パーソナルコンピュータ (資源有効利用促進法対象品目)

パーソナルコンピュータの回収は資源有効利用促進法を根拠として業界が自ら取り組んでいる。リサイクル経費をパソコン購入時に取得しているにもかかわらず、回収量の低さが課題となっており、1人当たり年間回収重量は数十グラムにすぎない。これは消費者の退蔵と中古市場の存在が主たる原因である。

■ パーソナルコンピュータ回収台数と重量 (平成21年度)

		デスクトップ型 パソコン 本体	ノートブック型 パソコン	CRT ディスプレイ 装置	液晶ディスプレイ 装置	計
回収台数 (台)	家庭由来	120,525	81,414	74,987	75,890	352,816
	事業所由来	165,705	118,993	46,210	112,006	442,914
回収重量 (t)	家庭由来	1,379	286	1,269	594	3,528
	事業所由来	1,691	375	660	595	3,321
人口 (平成21年度) (千人)		127,510	127,510	127,510	127,510	127,510
1人当たり 回収台数 (台/人)	家庭由来	0.00095	0.00064	0.00059	0.00060	0.0028
	事業所由来	0.0013	0.00093	0.00036	0.00088	0.0035
1人当たり 回収重量 (kg/人)	家庭由来	0.011	0.0023	0.010	0.0047	0.028
	事業所由来	0.013	0.0029	0.0052	0.0047	0.026

(資料) 一般社団法人パソコン3R推進協議会ホームページ
(http://www.pc3r.jp/association/recycle_result.html)

(3) 携帯電話（資源有効利用足品法対象品目）

携帯電話はパソコンと同様のスキームによって回収されているが、ただしパソコンと異なりリサイクル経費は徴収されていない。携帯電話も退蔵されやすく、回収量の増大が課題となっている。

■携帯電話等の回収実績（平成21年度）

	本体	電池	充電器	合計
回収台数（千台）	6920	9188	6255	-
回収重量（t）	602	191	467	1260
人口（平成21年度）（千人）	127,510	127,510	127,510	127,510
人口1人当たり回収台数（台/人）	0.054	0.072	0.049	-
人口1人当たり回収重量（kg/人）	0.004721	0.001498	0.003662	0.009882

(4) こでん（小型電気・電子機器）

秋田県では経済産業省・環境省の事業としてこでん（小型電気・電子機器）回収のためのパイロット・プロジェクトが実施されている。その実績を下表に示す。年度合計で約10t回収されている。

秋田県の人口は約110万人（秋田県ホームページ、平成21年10月1日人口）であり、1人当たり回収量は0.00875kg/人となる。

■秋田県における小型電気・電子機器回収実績（平成21年度）

	回収個数 （個）	回収重量 （kg）	1個当たり重 量（kg/個）
オーディオ・映像機器	3726	1836.3	0.49
カメラ・映写機器	541	152.3	0.28
IT・通信機器	3805	1161.6	0.31
パソコン・周辺機器	5663	2003	0.35
調理器具	43	51.6	1.20
生活器具	5011	537.9	0.11
健康・ボディケア器具	1075	271.5	0.25
アダプターケーブル器具	10794	1550.9	0.14
照明器具	255	50.7	0.20
電気・電子工具	41	15	0.37
電子玩具	1323	479.6	0.36
電子楽器	2	1.4	0.70
コントロール機器・モニター機器	99	45.9	0.46
電子・金属部品	2575	788.8	0.31
ごみ	4150	115.4	0.03
その他	1914	545.5	0.29
合計	41017	9607.4	0.23

（出典）こでんリサイクルホームページ（<http://www.coden.jp/project/>）

(5) その他

そのほかのE-wasteはわが国においては強制的・自主的に回収システムが整備されているものはない。家庭・中小事業所から排出されるものは主として自治体によって処理されている。

東京都の粗大ゴミ収集実績は年間523万台でそのうちE-wasteは69万台を占める。1台当たり5kgと想定すると3455tとなる。東京都の人口は8802067人（平成21年10月1日、東京都ホームページによる）なので、1人当たりの排出量は0.39kg/人となる。

■粗大ゴミ収集実績（東京都区部、平成21年度）

番号	品目名	収集台数	構成比 (%)	E-Waste
1	ふとん	620450	11.9	
2	箱物家具	516796	9.9	
3	いす（ソファ）	417670	8.0	
4	衣装箱	222582	4.3	
5	自転車	208434	4.0	
6	テーブル	191233	3.7	
7	敷物	154515	3.0	
8	ストーブ	133482	2.6	
9	掃除機	127612	2.4	○
10	オーディオ機器	112592	2.2	○
11	ビデオデッキ	100354	1.9	○
12	電子レンジ	93099	1.8	○
13	ガステーブル	84145	1.6	
14	扇風機	76609	1.5	○
15	ベッド	74892	1.4	
16	スーツケース	69597	1.3	
17	OA機器 （パソコン、ワープロを除く）	68966	1.3	○
18	ベッドマット	66546	1.3	
19	照明器具	64465	1.2	○
20	乳児用具	54906	1.0	
21	ゴルフ用品	53124	1.0	
22	こたつ板	45572	0.9	
23	机	44478	0.8	
24	畳	44395	0.8	
25	スキー板	40444	0.8	
26	電気こたつ	40263	0.8	
27	建具	35275	0.7	
28	除湿機	29810	0.6	○
29	子供用遊具	19403	0.4	
30	ミシン	17403	0.3	○
31	その他	1404899	26.8	
	合計	5234011	100.0	690910

(6) まとめ

以上に示したE-wasteの種類ごとの原単位を下表に整理した。わが国の家電リサイクル法対応の四品目で全体の約94%を占める。

パソコン、携帯電話等は退蔵されているとはいっても全体に占める割合は小さく、マレーシアにおいても退蔵される比率や中古市場に流れる比率はわが国以上に高いと考えられるので、全体に占める比率は重要ではないと考えられる。

下表においては小型電子・電気機器は一部その他電子・電子機器に含まれると考えられ、多くても5%程度である。

このようにE-waste回収において排出量の観点から重要なのは冷蔵庫、テレビ、洗濯機、エアコンの4品目である。なお、合計の回収原単位は1人当たり10kg未満のオーダーであると考えられる。

■わが国におけるE-waste回収原単位のまとめ

	原単位 (kg/人)	構成比 (%)	累積 構成比 (%)
冷蔵庫等	2.55	31.0	31.0
テレビ	2.45	29.8	60.8
洗濯機	1.47	17.9	78.6
エアコン	1.30	15.7	94.4
パソコン	0.054	0.7	95.0
携帯電話等	0.00988	0.1	95.1
小型電子・電気機器	0.00875	0.1	95.2
その他電子・電気機器	0.392	4.8	100.0
合計	8.24	100.0	-

(7) ペナン島における潜在的回収可能量

以上の原単位を用いペナン島における潜在的回収可能量を見積もった。結果を下表に示す。

■ペナン島における対象人口カバー率と潜在的回収可能量・運搬経費（参考）

ペナン島人口（人）	740000	740,000	740,000	740,000
PP対象人口比率	0.02	0.05	0.1	0.2
PP対象人口	14,800	37,000	74,000	111,000
中古市場に回る比率	0.5	0.5	0.5	0.5
排出E-waste重量（t/年）	61	152	305	457
排出E-waste重量（t/月）	5	13	25	38
10t車積載可能重量（t/台）	2	2	2	2
必要車両台数（10 t車）	3	6	13	19
（想定）10 t車雇いあげ経費（円/台）	10,000	10,000.0	10000	10000
（参考）月当たり運搬経費（円/月）	25,404	63,510	127,020	190,530

