Summary of the Results of Evaluation Study

1 Outline of the Project	
Country: Socialist Republic of Vietnam	Project Title: Project on Establishment of Energy Management Training Center (stage 2)
Thematic Area: Energy	Cooperation Scheme: Technical Cooperation Project
Division in Charge: Industrial Development and Public Policy Department	Total Cost: 350 million Japanese Yen(as of Terminal Evaluation)
Project Period: July 2013 ～ March 2016	Counterpart Agency: Ministry of Industry and Trade (MOIT)
Supporting Organization in Japan**:** Energy Conservation Center, Japan (ECCJ), Nippon Steel & Sumikin Management Co. Ltd. (NSSMC)	

1.1 Background of the Project

In recent years, Vietnam is growing at a GDP growth rate of 6% to 7% per year, yet the energy consumption rate is growing at a faster rate of over 10% per year. From 2008 to 2009, JICA implemented "the study on Master Plan for Energy Conservation and Effective Use" in Vietnam and made a road map of recommendations on energy efficiency policy measures. Upon its completion, GOV decided to utilize the recommendations to formulate "the Law on Economical and Efficient Use of Energy" in January 2011. Under this legal framework, MOIT, Ministry of Industry and Trade of GOV who is responsible for energy efficiency and conservation (EE&C) had recognized that human resources development of energy managers (EM) and energy auditors (EA) and the establishment of Energy Management Training Centers (EMTCs) are one of the key issues for promoting EE&C and officially requested "the Project for Establishment of Energy management Training Center" (herein after referred to as "the Project") to Government of Japan (GOJ) in July 2010. Under the support of JICA, EMTC is expected to provide not only theoretical program but practical training to energy managers and energy auditors who will become the key human resource to promote EE&C in designated enterprises in Vietnam.

For implementing the Project, the Project activities were divided into two stages. "The Project on Establishment of Energy Management Training Center (stage 1) had been implemented during September 2011 to September 2012 as the preparation stage and decided the target site of EMTC in PRET (Plastic-Rubber Technology and Energy Conservation Training Center) , Ho Chi Minh City. Following the stage 1, the stage 2 of the Project has started.

1.2 Project Overview

The Project contributes to the promotion of EE&C activities by designated enterprises through assisting Vietnamese government to establish and manage an EMTC for EM training and EA training.

(1) Overall Goal

Under the Law on Energy Efficiency and Conservation, energy management in designated enterprises is enhanced.

(2) Project Purpose

The Energy Management Training Center is established and managed for training Energy Managers and Energy Auditors.

(3) Outputs

1. Curriculum, textbook and practical training equipment of training course for energy manager and energy auditor are developed.
2. C/Ps are able to implement practical energy manager training.
3. C/Ps are able to implement practical energy auditor training.
4. C/P's capacity to disseminate energy conservation activities for enterprises is strengthen.

(4) Inputs (As of End of November 2015)

(Japanese Side) (in total 350 million Japanese Yen)

- Experts: 16 short-term experts in 15 fields of expertise (55.76 Man/Month)
- Expenses for trainings including Training in Japan (no. of participants; 15 persons): 105 million JPY (approximately US$864,000)
- Provision of Equipment: Approximately 158 million JPY (1,298,450 USD)
- Local Cost: approximately 6 million JPY (approximately US$45,877)

(Cambodian Side)

- Counterpart: 8 persons (including Project Director and Project Manager)
- Provision of Land and Facilities: No special office space is provided for Japanese experts.
- Local Cost: For renovation costs of PRET building, MOIT allocated 3 billion VND (approximately. 16 million JPY) and DOIT Ho Chi Minh City allocated 6 million VND (approximately. 3.21 million JPY).

2 Terminal Evaluation Team

Member of the Evaluation Team

Japanese side

Name	Title	Occupation
Mr. SUZUKI Kaoru	Leader	Senior Advisor to the Director General (Energy), Industrial Development and Public Policy Dept., JICA
Mr. OKAMURA Kenji	Evaluation Planning	Deputy Director, Team1, Energy and Mining Group, Industrial Development and Public Policy Dept., JICA
Mr. MINAGAWA Yasunori	Evaluation Analysis	Senior Consultant, Consulting Dept., SKK Research & Consulting Inc.

Vietnamese side

Name	Title	Occupation
Mr. Trinh Quoc Vu	Leader	Director, DSTEE, MOIT
Mr. Nguyen Hoang Linh	Member	DSTEE, MOIT
Dr. Duong Trung Kien	Member	Dean, Faculty of Engineering, EPU

Period of Evaluation	06 December 2015～ 25 December 2015	Type of Evaluation:	Terminal Evaluation

3 Project Performance

3.1 Achievements of Outputs

(1) Output 1: Achieved

Narrative summary	Achievement
Output 1: Curriculum, textbook and practical training equipment of training course for energy manager and energy auditor are developed.	high[1]
Verifiable Indicators	Achievement
1-1: C/Ps establish curriculum and program of practical training course.	Achieved
1-2: C/Ps are able to develop textbook and materials of practical training course.	Achieved
1-3: C/Ps are able to operate training equipment for practical training course.	Achieved

Based on confirmation below that all indicators of Output 1 have been achieved, the degree of achievement of Output 1 is evaluated as high.

A training course for EM and that for EA are closely related with Law on EE&C and other related regulations. For amending those regulations, a working group (WG) whose members consists of MOIT, the Project team and members from EPU was established under MOIT. The WG finalized the revision of training curriculum, text books and teaching materials, and submitted them to MOIT in December 2015 (Indicator1.1 and Indicator1.2). Equipment for practical training such as Furnace unit and steam trap system were handed over to PRET in February 2015. Training course on the operation and maintenance of equipment was implemented in PRET in April – May 2015 and seven (7) staff of PRET participated in the course. Therefore, it was confirmed that equipment for practical training has been utilized in actual conditions of training activities in PRET (Indicator1.3).

(2) Output 2: Achieved

Narrative summary	Achievement
Output 2: C/Ps are able to implement practical energy manager training.	high
Verifiable Indicators	Achievement
2-1: C/Ps are assigned for training course.	Achieved
2-2: C/Ps are able to utilize training facilities and equipment efficiently.	Achieved
2-3: C/Ps are able to maintain training facilities and equipment sufficiently.	Achieved

Based on confirmation below that all indicators of Output 2 have been achieved, it is evaluated that the degree of achievement of Output 2 is high.

Candidates of trainers who are to be in charge of EM training have been assigned and participated in necessary training courses. Nine (9) persons have been assigned as trainers of EMTC (PRET) in HCMC. On the other hand, although the construction of EMTC building has just started in Hanoi, MOIT nominated seven (7) persons as the candidate of trainers on EM training course (Indicator2.1). The candidates of

[1] The rating is set for high, slightly high, fair, slightly low, and low.

trainers participated in training of trainers (TOT) course implemented in June 2015. According to NSSMC who designed and implemented the TOT, all the participants of the TOT passed the final knowledge acquisition test with the score of 80 and over (Indicator2.2). Also, a training on operation and maintenance of the equipment was implemented for technical staff of PRET in April - May 2015. According to NSSMC, similar to Indicator2.2, all the participants of the training course passed the final knowledge acquisition test with the score of 80 and over and were certified as capable persons for maintaining the training equipment (Indicator2.3).

(3) Output 3: Achieved

Narrative summary	Achievement
Output 3: C/Ps are able to implement practical energy auditor training.	high
Verifiable Indicators	Achievement
3-1: C/Ps are assigned for training course.	Achieved
3-2: C/Ps are able to instruct energy audit report of factories and building in accordance with Circular 09/2012/TT-BCT.	Mostly achieved
3-3: C/Ps are able to implement training course	Mostly achieved

Based on confirmation below that all indicators of Output 3 have been achieved, it is evaluated that the degree of achievement of Output 3 is high.

Output 2 is for the capacity building of trainers for EM training course, while Output 3 is for that of trainers for EA training course. Trainers are trained to cover not only EM training course but also EA training course in the Project. The activities of Output 3 were almost as same as that of Output 2. Trainers group consists of 7 persons from Hanoi and 9 persons from HCMC (Indicator3.1). The trainers participated in three training courses for capacity building; Training in Japan in August 2014, TOT conducted in June 2015, in which all the participants passed the final test (Indicator3.3), and On-site EA training course conducted in HCMC in October – November 2015 (Trainers from Hanoi did not participated in On-site EA training course). The training course was OJT type training in which the participants experienced actual energy audit on site and, according to ECCJ who implemented the training course, the Japanese experts observed the participants' performance through EA reports and reporting seminars, and evaluated them as high capability of EA. So, they are already capable for trainers for EA training (Indicator3.2).

(4) Output 4: Achieved

Narrative summary	Achievement
Output 4: C/P's capacity to disseminate energy conservation activities for enterprises is strengthen.	high
Verifiable Indicators	Achievement
4-1: C/Ps disseminate energy conservation technology and case studies to designated enterprises.	Mostly achieved
4-2: Network of DOIT, MOIT, universities and factories on energy management is established.	Mostly achieved

Based on confirmation below that all indicators of Output 4 have been achieved, it is evaluated that the degree of achievement of Output 4 is high.

The opening ceremony of EMTC in HCMC was broadcasted by TV in June 2015 and the center's activities were disseminated widely. MOIT continues its publicity work such as dissemination of regulations on EE&C in Vietnam and official news on EE&C through their homepage, www.vneec (Indicator4.1). The information sharing and exchange of opinions among universities, enterprises and institutions related to EE&C was well done through training activities and WG's activities in the Project. As a result, a new training course on EM and EA whose targets are students from engineering universities is under discussion among the people in the networks. Furthermore, People's Committee in HCMC issued an instruction letter on participation in EM and EA to be done by PRET to the designated enterprises in the city around PRET for promoting EE&C training courses in PRET (Indicator4.2).

3.2 Achievement of the Project Purpose

Considering the extension of the Project period described below, Project Purpose is expected to be achieved by the Project completion.

As mentioned above, equipment for practical training has been installed in EMTC in HCMC. Candidates of trainers for EM and EA training courses also have been trained through some training courses implemented in the Project, and necessary technology transfer to Vietnamese side was carried out (Indicator1). As for MOIT Circular 39, the revision on practical training for EM and EA, related curriculum and examination of certification were drafted and submitted to MOIT. In the interview to MOIT, it was confirmed that the draft Circular of No.39 revision will be set in process in 2016 and will be enacted in 2017 (Indicator2). Vietnamese side and Japanese side have agreed to extend the Project period for January – March 2016. During the extension period, since PRET are planning to implement EM and EA training independently, it is expected that more effective capacity building of trainers will be made with advice and comments from Japanese experts.

4 Review Based on the 5 Criteria

4.1 Relevance: High

Since Vietnam Government enacted Law on Energy Efficiency and Conservation and established NTPEEC 2012-2015 to further promote EE&C activities in the country, it is clear that the Project is in line with the national policies of Vietnam. The Project is also dealing with technical assistance and human resource development in the field of EE&C, the Project is closely related with a development issue of "stable supply of natural resources and energy", one of GOJ assistance policies toward Vietnam. Advantage of Japan's Technical Experiences. Most of laws and regulation in the field of EE&C to be introduced in Vietnam have already been enforced in Japan. Moreover, Japan had a lot of experience of JICA's technical cooperation on EE&C in other countries in the past could be best utilized in Vietnam through the Project.

4.2 Effectiveness: High

EMTC was established with expected functions in PRET in HCMC in June 2015 and equipment for practical training for EM and EA installed is working with expected performance (Output 1). Trainers training for EM training and EA training, including practical training using equipment provided by Japan has been implemented to the candidates of trainers in June 2015. Revision of training curriculum

and training textbooks on EM and EA training has been completed and necessary technology has been transferred to Vietnam (Output2 & 3). Training implementation plan on EM and EA for next year, 2016, has been prepared by PRET with their initiative and the preparation of the training course has been completed (Output 4). Based on the observation above, it was confirmed that main results of the Project contributed to the achievement of Project Purpose and, thus, the effectiveness of the Project is evaluated as high.

4.3 Efficiency: Slightly High

For the technical contents and the setting of equipment provided from Japanese side, JICA's other projects related to EMTC in the past were reviewed and the know-how obtained in the projects were utilized, such as the list of necessary equipment and the specifications. WG utilized textbooks written originally in Vietnamese as a basic reference and added materials and textbooks from Japan to the textbooks so that the WG could revise teaching materials efficiently. The Project team tried to pay attention to Vietnamese initiative in managing the WG activities so that documentation by Vietnamese was done quickly and efficiently. For solving the problems, countermeasures should have been discussed among members concerned such as extension of the stay of some short-term expert in Vietnam. Furthermore, the candidates of trainers in Hanoi were given the opportunity to join TOT for EM and EA, even though EMTC in Hanoi is still under construction stage of the buildings. It is a case of efficient implementation of trainings. On the other hand, The delay of renovation work of the building of EMTC HCMC affected the delay of the installation of equipment for practical training for EM and EA. Also, since a long-term expert responsible for coordination work among JICA, the Project team and institutions concerned in Vietnam was not assigned in the Project, arrangement of schedule did not go sometimes smoothly and the change of schedule was occurred frequently. The efficiency of the Project is considered as slightly high, based on the observation above.

4.4 Impact: High positive impact

As for Overall Goal, according to MOIT, they have expected positively that more effective EM training as well as EA training will be conducted after the Project, importance of energy management is expanded positively in the society and, as a result, the improvement of energy intensity of designated enterprises will be realized. In addition, each industry has more 20% of potential for energy saving so that 5% improvement of specific energy consumption of designated enterprises could be realized.

The following aspects were pointed out as the expansion of effects through the interviews. As mentioned in NTPEEC 2012-2015, the construction of next EMTC in Hanoi is one of the goals of the national government and it is planned to construct it in 2016 and to open in 2017. MOIT has already allocated the budget of a building construction for EMTC Hanoi as the national budget and is supporting it aggressively. Also, PRET explained that it is scheduled to conduct energy audit training including practical training in PRET in January 2016 to an electric power company in HCMC. Like this, needs for new training have come out. Furthermore, JICA is providing Vietnam Government in the field of EE&C with the financial support through Support Program Respond to Climate Change (SPRCC) and is requesting GOV implementation of "Training of EM and EA more than 100 persons per year. Thus, the results of the Project is expected to contribute the achievement of the policy action.

4.5 Sustainability: Slightly High

Political and institutional sustainability: Since the establishment of EMTC is provided by Law on

EE&C, the support of Vietnam Government to activities of the training center continues; and MOIT has already decided to construct a building of the second EMTC in Hanoi and MOIT sent members from Hanoi to participate in trainers training for EM and EA training which was conducted in HCMC. So, continuous development of human resource on EM and EA in Vietnam is being supported by the GOV. Organizational and financial sustainability: Ho Chi Minh City's Peoples Committee issued an instruction to designated enterprises in HCMC that designated enterprises in the City should participate in EM and EA training courses to be conducted in EMTC HCMC (PRET). Through the training program, PRET is expected to collect training fee from the participants to strengthen the financial base. In addition, since the establishment of EMTC is a national policy, the national government allocates the necessary budget of course. As the budget, however, is not always sufficient, MOIT and DOIT-HCMC is discussing the issue in positive manner that DOIT-HCMC will share a part of the budget with PRET if MOIT will issue a letter requesting it officially. Technical sustainability: Training textbooks were prepared by WG whose main members are from EPU. It is, therefore, expected that the EPU members is able to revise the textbooks independently when necessity arise. On the other hand, PRET needs more information on suppliers of machinery and materials at the Japanese side is requested by the Vietnam side for the procurement of spare parts, for example.

4.6 Factors that have promoted or hindered the implementation of Project

Promoting factors

(1) Factors Concerning the Planning: N/A

(2) Factors Concerning the Implementation Process:

In the Project, a WG which consists of MOIT, Japanese experts and the specialists nominated by MOIT was organized and worked for the revision of curriculum and textbooks, and the legal arrangements. Through the activities of the WG, the Project's activities were implemented efficiently, such as the revision of textbooks done in Vietnamese as a main language (minimum cost of translation); securing an initiative of Vietnamese side; and the utilization of opportunity of training of trainers for EMTC in Hanoi.

Hindering factors

(1) Factors Concerning the Planning: N/A

(2) Factors Concerning the Implementation Process:

The equipment from Japan was installed in February 2015 with three month delay, due to a half year delay of the renovation work of PRET building at Vietnamese side. The delay did not influenced very much for the implementation of training activities which were planned to utilize the equipment in the Project..

5 Results of the Terminal Evaluation

5.1 Conclusion

The Team has confirmed that the expected outputs have largely been achieved without any critical problem. Since EMTC in Ho Chi Minh City has already established the implementation system for EM and EA training in January 2016, the effectiveness is assessed high and positive impacts have been confirmed though the Project. On the other hand, as the delay of installation of training equipment was recognized, the efficiency of the Project was evaluated as slightly high. Also, since the budget for management of new

EM and EA training is not secured certainly in EMTC and the budget sharing is currently under discussion between MOIT and DOIT-HCMC in positive manner, the sustainability is evaluated as slightly high. Based on the evaluation result above, it is concluded that the Project would successfully achieve its expected purpose within the cooperation period.

5.2 Recommendations

Recommendation for Remaining Period of the Project (mainly for PRET and Japanese experts)

(1) Extension period of the Project (for PRET & Japanese experts)

Both Japanese and Vietnamese sides have already agreed that the Project is extended until the end of March of 2016 for 3 months. During the extended period, PRET is planning to implement some training courses such as EM training course for the city electric power company. Therefore, it is recommended that the Project team will dispatch some Japanese experts to training courses above as observers and the experts will make advice or comments for improving the training courses.

Recommendation for Future (mainly for MOIT)

(2) Promotion of information sharing among EMTCs on the management (for MOIT)

EMTC in HCMC is only a training center whose activities is on-going in Vietnam at the present moment and the know-how of practical training implementation will be accumulated in PRET. In order for EMTC Hanoi to share the know-how for the management of EMTC, it is recommended that MOIT should keep initiative to promote information sharing among EMTCs such as holding workshops and observation trip.

(3) Continuous publicity work on EMTC activities (for MOIT and EMTCs)

Several comments about necessity of aggressive participation by a Vietnamese national level about energy conservation and environmental issues, etc. have been heard from the interviewees in the Study. It's recommended to continue the publicity campaign on which MOIT is working to utilize the rise of the interest of Vietnamese people and secure the spread of energy conservation measures and manifestation of the certain energy conservation effect through EMTCs.

(4) Continuous monitoring by the Overall Goal's indicator (for MOIT)

In JICA, Ex-Post evaluation is to be implemented about three years later after the termination of the Project. For the evaluation, the recipient country is requested to conduct continuous monitoring by the Overall Goal's indicator. In the Project, an indicator of "Energy Intensity of designated enterprises is reduced by 5%, comparing the data between 2016 and 2020" is set up as a monitoring one and ECCJ has proposed a tracing method for monitoring in the report of baseline survey. It is, therefore, important that Institutions concerned in Vietnam including MOIT, DOIT-HCMC and PRET apply the monitoring method to collect necessary data and report it to JICA for sharing data between Japan and Vietnam.

(5) Secure institutional, organizational and financial sustainability (for MOIT-GDE)

MOIT should issue the revision of "Regulation of Training and Certification for Energy Manager and Energy Auditor" (Circular 39) to be enacted in 2017. Vietnamese side should allocate necessary budget for operation and maintenance of equipment for practical training in EMTC.

5.3 Lessons learned

(1) High sustainability in institutional aspect of the Project by legal arrangement of Vietnam

In Vietnam, a legal system related to EE&C has been already arranged. For example, Law on EE&C was enacted in 2011, followed by MOIT Circular 39 related to EM and EA training .and its qualification system. Therefore, the Project just focused on the revision of the legal system based on the current system with Vietnamese strong ownership on their legal system and was evaluated as high in the institutional aspect of the sustainability. Smooth implementation of project activities and securing high sustainability request high law arrangement in other country.

(2) WG activities with Vietnamese strong ownership

In the Project, a WG which consists of MOIT, Japanese experts and the specialists nominated by MOIT was organized and worked for the revision of curriculum and textbooks, and the legal arrangements. For managing WG's activities, Since the Project team tried to pay attention to the ownership of Vietnam side, the WG has drafted the revision of MOIT Circular 39 as scheduled. It is, therefore, effective to ensure the ownership of other country in developing or revising their legal system smoothly in a project.