Report
on
The 10th Energy Management Action Network (EMAK) Workshop
(EMAK10)

"Network to promote Energy Efficiency and conservation method in fast-growing Asian countries"

(Held on 4 December, 2020 in Hanoi, Vietnam connected with satellite venues in Japan and Indonesia)

February 2021

Ministry of Economy, Trade and Industry
The Energy Conservation Center, Japan

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Presentation Materials are available from Asia Energy Efficiency and Conservation Collaboration Center

List of Acronyms

AI :	Artificial Intelligence
AJEEP :	ASEAN-JAPAN Energy Efficiency Partnership
APAEC :	ASEAN Plan of Action for Energy Cooperation
ASEAN :	Association of South-East Asian Nations
BEMS :	Building Energy Management System
EC :	Energy Conservation
EE&C	Energy Efficiency and Conservation
ECCJ :	The Energy Conservation Center, Japan
EM :	Energy Management
EMAK :	Energy Management Action Network for Industrial Efficiency
FEMS :	Factory Energy Management System
IoT :	Internet of Things
IT :	Information Technology
JCM :	Joint Crediting Mechanism
MOIT :	Ministry of Industry and Trade of Vietnam
SDG :	Sustainable Development Goals
UNIDO :	United Nations industrial Development Organization
VNEEP :	National Energy Efficiency Program of Vietnam

Executive Summary

The Ministry of Economy, Trade and Industry of Japan (hereinafter referred to as "METI") and The Energy Conservation Center, Japan (hereinafter referred to as "ECCJ") successfully implemented the 10th workshop of the Energy Management Action Network (EMAK) (hereinafter referred to as "EMAK10") under the G20 Energy Efficiency Leading Programme on 4th December 2020 in Hanoi, Vietnam connecting with satellite venues in Japan and in Indonesia, which was hosted by the Ministry of Industry and Trade of Vietnam ((hereinafter referred to as "MOIT").

The theme of the EMAK10 is "Transition of Energy Management and Energy Efficiency and Conservation". Eighty two (82) representatives of the public and private organizations from Vietnam, Japan and Indonesia participated in the EMAK10 at the venue in Hanoi and online meeting system. In addition, the presentations and discussions in the workshop were shared through on-line internet broadcasting system.
The workshop provided participants with the opportunity to:

(1) Share information about best practices in energy efficiency proven by having implemented energy conservation measures identified under the energy management system and the national policies including programs to promote EnMS and energy efficiency.
(2) Discuss and exchange opinions on the specific issues, requirements and proposals for the future EMAK program

The EMAK10 concluded its success by the following:

(1) EMAK10 disseminated best practiced in EnMS and energy efficient measures / technologies under EnMS among the participants.
(2) The activities under the legal framework and international cooperation established and expanded the among the participated public and private organizations contributed to promoting energy efficiency and conservation (EE&C)
(3) Through the discussions, the conclusion of the EMAK10 also suggested and proposed the future direction of the EMAK program as follows.
    1) Dissemination of specific energy management guidelines certified by energy management systems
    2) Capacity building for carrying out of behavior change to achieve the SDGs (Sustainable Development Goals)

This report was prepared by ECCJ on behalf of METI to summarize and share the above outcomes with more parties and organizations concerned including persons interested in these outcomes.
This report and the presentation materials will be available on the website of Asia Energy Efficiency and Conservation Collaboration Center possible to access by everybody.

1. Introduction

The "Energy Management Action Network for Industrial Efficiency" (EMAK) aims to promote improvement of energy efficiency and energy savings particularly in the industrial sector through promoting energy management with developing the networks among policy makers and practitioners such as energy managers.

The EMAK was established in 2009 by Japan which has led its implementation with the 9 countries (Australia, Brazil, Canada, China, India, Indonesia, Mexico, Russia, Saudi Arabia and The United States of America).

The nine (9) workshops (*) were held before the EMAK10, in order to share and discuss the best practices in energy management and energy efficiency including policy issues related to energy management in each country and region. The EMAK also built and integrated the two groups' networks, namely one comprised of policy makers responsible for promoting best practice policies for energy management and the other consisted of the practitioners actually practicing energy management day to day and improving efficiency in the industry.

(*) Nine (9) workshops held to date

1st: Paris, France – January 26-27, 2010
2nd: Washington, USA – May 10, 2010
3rd: Guilin, China – November 15, 2011
4th: Tokyo, Japan – January 31, 2013
5th: Sydney, Australia – February 27, 2014
6th: New Delhi, India – February 25, 2015
7th: Moscow, Russia – November 19, 2015
8th: Jakarta, Indonesia – February 3, 2017
9th: Sao Paulo, Brazil – November 21, 2018

The EMAK10 was held in Vietnam with the following significance.

(1) The EMAK10 is the first workshop held outside of G20 countries, instead, in Vietnam, which is the center of the fast-growing South East Asia region.
(2) Implementation of the EMAK10 under the COVID-19 pandemic is possible to expect the spreading of best practices in the energy management system to promote EE&C in the industry sector to all countries that are interested in improving energy efficiency in the industry sector.

The Japan – Vietnam cooperation project on energy conservation (EC) had started in 2009 between METI and MOIT through bilateral and multilateral frameworks. ECCJ, entrusted by METI, implemented the project with the Vietnamese partners led by MOIT.
This cooperation contributed both ① to establishing the legal framework for energy management and ② to encourage capacity building for promoting energy efficiency in Vietnam.

Based on these achievements and visions, METI and MOIT agreed to hold the EMAK10 in Vietnam expecting maximized impact of the EMAK, because the both ministries confirmed that it would be very useful to share their experiences on promoting EC in the EMAK10.
ECCJ was entrusted by METI to implement the EMAK10 with the Vietnamese hosting partner, namely MOIT.
Initially, the EMAK10 was planned to hold on 25 February 2020, however, it was postponed due to the spread of COVID-19 infection. Finally, the EMAK10 was held on Friday, 4 December 2020, at Hotel du Parc in Hanoi, Vietnam, connecting with satellite venues in Japan and Indonesia.
As a conclusion, the EMAK10 was very successful as this workshop achieved its targets with the fruitful outcomes to direct the future EMAK.
The details are explained after this.

2. Plan of The 10th Energy Management Action Network Workshop (EMAK10)

The plan was drafted and finalized by METI and ECCJ, consulting with the Vietnamese side, namely MOIT.

The plan of the 10th Energy Management Action Network Workshop (EMAK10) was developed and established on a basis of the following.

(1) Purpose and target of the EMAK
(2) Subjects covered and results confirmed in the previous 9 EMAK workshops.
(3) Interests related to the EMAK of the government and private organizations in the host country, or Vietnam.
(4) Possible regional (South - East Asian) deployment with impact of outcomes of the EMAK10

2-1. Points of the Plan of EMAK10

Particularly concerning the Item (3) above, under international cooperation, enhancement of energy management by the government and industry under the legal framework will promote energy conservation in Vietnam.

With regard to the Item (4) above, EMAK workshop in Vietnam, a major Southeast Asian country with continued economic growth and increasing energy consumption, will disseminates useful information to countries interested in improving energy efficiency in the industrial sector. Moreover, especially many Japanese companies have also developed and established excellent EnMS since the oil crises happened in the 1970's, which resulted in the dramatic improvement in energy efficiency. Nowadays, these companies and suppliers jointly developed and realized the computerized energy management system using advanced energy efficient technologies including IoT (Internet of Things).

Therefore, with understanding that there exist very useful outcomes to share in the EMAK program, the basic plan of the EMAK10 was developed.

The details of the plan are described below.

2-2. Details of the Basic Plan

The plan was detailed as follows:

2-2-1. Objective of EMAK10

The plan of the EMAK10 established to achieve the following two specific objectives.

(1) Sharing and accelerated dissemination of best practices in energy efficiency and conservation (EE&C) under energy management system (EnMS)

(2) Enhancing network of policy makers and industrial stakeholders, including international cooperation

As for the Item (1), the EMAK 10 designed to provide best practices in EE&C established in Vietnam, Japan and the third countries.
The best practices include establishment effective EnMS and implementation of cutting-edge energy conservation technologies.
As for the Item (2), the EMAK10 was designed to share outcomes in the Japan - Vietnam bilateral and international cooperation project on enhancement of energy management in Vietnam.

2-2-2. Venue and Date of EMAK 10
In Vietnam, Hanoi was chosen as the host city for EMAK10 because many government agencies and international cooperation agencies are based in Hanoi.
Hotel du Parc was chosen as the venue, because it promoted energy efficiency and conservation by Japan - Vietnam cooperation project under JCM scheme.
We also sat up virtual conference facilities for overseas participants who cannot attend the venue.
The EMAK 10 Workshop was originally scheduled for February 2020, but has been postponed due to the COVID-19 pandemic.
Consulting with MOIT, the date of EMAK 10 was setup to be December 4th, 2020.

2-2-3. Participants
It was planned to invite one hundred (100) participants.
The invited participants were both from the public and private organizations in Vietnam, Japan, and the third countries and also from the international organizations conducting EC promotion in Vietnam.

2-2-4. Key Specifics of Program
The basic program of the EMAK10 was designed as follows.

<u>Opening and Keynote</u>
The representative of MOIT was supposed to provide addresses at the opening session, and the representative of the Ministry of Economy, Trade and Industry was scheduled to provide keynote.

The keynote was designed to orient the EMAK 10 to better understand the points of the presentation and facilitate panel discussions by providing participants with the purposes and information on the EMAK including the EMAK10.

Session – 1　Achievements and Immediate Issues of EC Promotion in Vietnamese Industry

This session was to share the achievements of energy conservation promotion in Vietnam through legal framework and international cooperation.

The points of three presentations are as follows;

●Current status of energy management and energy conservation in Vietnam,

●Outcomes of Japan - Vietnam bilateral cooperation on capacity building for energy management.,

●Results of APAEC activities in energy conservation in ASEAN region.

Session – 2　Successful Cases in Vietnam, Japan and in Foreign Countries

This session was to share the advanced EnMS and best practices in EC measures including technologies for EE&C realized in Vietnam, Japan and the third countries.

This session planned to include four presentations.

The required presentation would include the following.

●Realized best practiced EC measures including effective EC technologies

●Systematic energy management practice and implementation of EC measures with use of computerized energy management system (FEMS and BEMS etc.) with use of IoT

●Regarding the companies in the third countries, a company awarded for the "2019 ASEAN Energy Award" was selected.

Session – 3　Panel Discussion and Wrap-up

In order to figure out the future EMAK, this session is planned for the panelists and participants to freely discuss and exchange opinion on how to promote EC under the legal framework and international cooperation.

Finally, the moderator would wrap up the discussions to conclude the future direction of the EMAK including possible projects in order to realize future actions consistent with the identified direction of EMAK.

Closing

The closing was expected that the representatives of METI and MOIT would provide some evaluations of the outcomes of the EMAK 10 and aspects to move forward the EMAK and cooperation among countries as well as the next activities of the EMAK

The finalized program is shown in in the Paragraph 6-1 of the Chapter 6 "Appendix".

2-2-5. Key Points of Requirements for Presentations

In order for the companies and organizations prepared the presentation materials basically consistent with the workshop purposes of EMAK 10, ECCJ have prepared the basic guide including requirements for each presentation.

3. Implementation and Results of EMAK 10

3.1 Overall Results

With eighty two (82) participants, the EMAK 10 was smoothly implemented as per the program. The organizations of the participants are categorized in Table-1. About half of the participants are in the private sector.

Table 3-1 Participants by Category of Organization

Category of Organization		Number of Persons
International		3
Public	Government	8
	Governmental / State Owned Organization	22
Private	Industrial Association	17
	Enterprise	32
	Total	**82**

The presentations were prepared based on the guide given by ECCJ beforehand. Therefore, it was possible to have provided the participants with inputs in accordance with the plan. In addition, the panel discussion was made also as per the plan based on the inputs through presentations, which resulted in reaching the conclusions to appropriately direct the future programs of the EMAK.

The details of the points of the presentations including speeches and discussions are explained below.

3.2 Summary of the Sessions

The details of the points of the actual speeches, presentations and discussions are explained as follows.

3-2-1. Opening and Keynote Address

Opening Remarks

At the opening of the workshop, remarks including welcome addresses were delivered by the representatives of the MOIT. The purposes of the EMAK together with the expectations for the outcomes of the EMAK10 are explained in the speech. The points of the speech are described below.

Wellcome and Opening Remarks by Mr. Trinh Quoc Vu, MOIT

On behalf of the Director General of MOIT who was planned to make the speech, he warmly welcomes the participants and provided the opening speech due to an abrupt absence of the Director General caused by the urgent duty.

He briefed the outline and objectives of the EMAK with introduction of the past achievements, showing his expectations for the international cooperation on EE&C promotion in Vietnam and ASEAN region. The points of his speech were as follows.

(1) With objective to promote energy efficiency and conservation in industry, EMAK has organized several different workshops, to promote energy efficiency and conservation. He was appreciative of the EMAK activities that have been carried out over the past few years in creating a network across developed countries and developing countries through the sharing of solutions, technology, and experiences on energy efficiency.

(2) He expected the EMAK10 to share experiences of Japan's and ASEAN countries' policies in terms of energy efficiency and conservation, especially experiences connected with technological solutions for energy efficiency and experiences that have been successful in industry in countries including Vietnam.

(3) In 2010, the Energy Efficiency and Conservation Law was introduced in Vietnam. In addition to Vietnam's efforts, international cooperation in energy efficiency will be a very important task to save about 5% to 7% in energy consumption planned in 2025 compared to present.

Keynote

With introduction of the past achievements of EMAK, the keynotes provided the participants with expectation for great fruits of the EMAK 10 workshop, including promotion of energy

efficiency based on the networking of by governments and other stakeholders, which will lead to reduction of greenhouse gas emissions.

(K-1) Purpose of EMAK 10 / Effectiveness of EM Experienced in Japan for EC Promotion by Mr. Masaomi Koyama, Director, METI, Japan

He provided the keynotes consisted of the two important points, namely, (1) the purposes and targets of the EMAK and EMAK 10 and (2) the experiences and the future target of the EC promotion in Japan including international cooperation on EC promotion. He explained the following.

(1) The purposes of the EMAK for energy efficiency for sharing best practices of energy management and for establishing networks of policy makers and practitioners.
(2) EMAK10, the first workshop held outside the G20 countries, is expected to extend its outcomes based on public–private cooperation and international cooperation to all countries interested in improving energy efficiency in the industrial sector.
(3) The Japanese experiences to have actually improved energy efficiency by over 40% for these 40 years and the Japanese future target to further improve energy efficiency by 35% until 2030.
(4) Future implementation plan for achieving the goal of carbon neutrality by 2050 is preparing in Japan, to facilitate technological innovation and social implementation.

3-2-2. Session -1: Achievements and Immediate Issues of EC Promotion in Vietnamese Industry under the EC Law and Voluntary Programs

Session – 1, which was chaired by Mr. Trinh Quoc Vu of MOIT, introduced and discussed the outcomes related to policies to promote energy conservation in Vietnam and ASEAN.

(S1-1) Current Status, Development Trend and Potential of Saving Energy in Vietnam by Mr. Nguyen Dinh Hiep, Vice President – General Secretary, the Vietnam Energy Conservation and Energy Efficiency Association

He first explained the current state of energy demand in Vietnam and the potential for energy conservation, and continued to energy conservation policies and laws in Vietnam.
GDP growth rate in Vietnam has been very fast in recent years, with an average GDP growth rate of 6.3% from 2010 to 2019. It is estimated that the average increase of energy demand will increase by 5.7% or more between 2014 and 2030. On the other hand, the energy intensity of power in Vietnam is very high, about five times higher than Japan and more than twice as high

as ASEAN member states. The energy saving potential of industry is about 20%, and the final energy consumption will be reduced to 65 million TOE from 78 million TOE in 2017.
Energy Conservation Act came into force in 2011 in Vietnam and it is an important part of the strategy towards sustainable energy goals. The energy conservation policies and regulations have also helped create open corridors to work with international organizations and other governments. However, energy conservation regulations are not so rigorously enforced. In addition, there is still a lack of support mechanisms to enable enterprises to implement highly efficient and energy-saving technologies. It is also important to implement the National Energy Efficiency Program (VNEEP) on a nationwide scale, which requires essential capacity building at both local and national levels.

(S1-2) Vietnam – Japan EC collaborative program
by Mr. Hideo Kubota, Technical Expert, ECCJ

He first outlined the history of Japan-Vietnam cooperation on energy efficiency and conservation, and then explained the proposal cooperation program for the next step.
The Japanese side has conducted cooperation programs on energy conservation with Vietnam through bilateral and multilateral frameworks and has been developing human resources related to energy conservation. The ASEAN multilateral framework started as PROMEEC in 2000, and EMTC (Energy Management Training Center) was established in Ho Chi Minh City through the bilateral project in 2015.
A proposal for a bilateral cooperation program aimed at supporting MOIT to achieve the goals of VNEEP-3 was explained. This includes capacity building of local government officials and facilitating or accelerating the implementation of effective energy conservation projects using mandatory triennial energy audits under Vietnam's Energy Conservation Act.

(S1-3) Dissemination of EE&C Outcomes within ASEAN Member States
by Mr. Christopher Zamora, Senior Manager of APAEC Secretariat, ASEAN Centre for Energy

He introduced the results of multilateral cooperation and comprehensively explained the purpose and results of APAEC (ASEAN Plan of Action for Energy Cooperation). The points of his speech were:
In Phase 1 of APAEC, activities in four areas (Harmonization of standards and labeling in ASEAN region, Introduction of mechanisms funding energy efficiency projects in energy policies, Participation of the private sector, and Development the Green Building Code) have achieved the goal of reducing energy intensity by 20% in 2020 based on the 2005 level.

In collaboration with international energy agencies, a long-term Building Roadmap for ASEAN and a Sustainable Cooling Roadmap will be created to promote the dissemination and deployment of energy-efficient products. Under AJEEP, trainer training programs were implemented to strengthen energy management in industry and buildings and the scope of the ASEAN Energy Awards has expanded to the areas of zero-energy buildings.
APAEC Phase II aims to reduce energy efficiency by 32% in 2025 by encouraging and supporting ASEAN member states to undertake four OBS (Outcome-based Strategies). It needs more strong collaboration with ASEAN member states, with Dialogue Partners, and with international organizations.

3-2-3 Session -2: Successful Cases in Vietnam, Japan and in Foreign Countries EnMS under EM Legal Framework

Session – 2 presented the outstanding energy conservation achievements in industry achieved in Vietnam, Japanese and Indonesia.
Energy management systems under legal framework, systematic energy management practices and implementation of energy conservation measures and technologies have shown significant energy efficiency benefits.
This session was chaired by Mr. Norihiro Kimura of METI.

(S2-1) Energy Efficiency Boiler in Industry: Case Study from Sites

by Dr. Nguyen Xuan Quang, Hanoi University of Science and Technology

He introduced UNIDO's projects to help promote the adoption and operational practices of energy-efficient industrial boilers in Vietnam, including four case studies. The projects obtained annual fuel savings of 19,589 tons of coal, 115,000 liters of oil, 7,628 tons of biomass, and 435 tons of LPG.
Boiler-related energy conservation activities at 24 factories in industries were carried out.
Training for boiler users for boiler efficiency measurement were conducted and 29 boilers were evaluated in the efficiency.
Measures such as adjustment of combustion and blowdown, heating of feed water and heat insulation of the furnace wall were extracted.
In the energy conservation activities, following three steps have implemented. (1)Evaluation and proposal of energy-saving solutions for boilers and steam supply systems. (2) Detailed discussion on how to implement the boiler energy efficiency project. (3) Evaluation of implementation efficiency of energy-saving solutions.

(S2-2) Energy Efficiency in Vietnam with Hitachi's Solution

by Dr. Yasuyuki Tada, Hitachi, Ltd., Japan

He presented solutions with the information technology (IT) and the knowledge of operational technology (OT) realizing advanced power grid operation.

OPENVQ (Optimized Performance Enabling Network for Volt/var(Q)) can realize online voltage profile optimization with the maintenance of power grid reliability. OPENVQ optimizes voltage reactive power control of the power grid through online, and the transmission loss reduction can reduce emission of CO_2 by thermal power plants.

HERO (Hitachi Energy Resource Optimization) can realize effective local consumption of electrical energy by way of rational operation of distributed energy resource (DER). HERO is one of the information platforms. Optimized local consumption by DER operation control can reduce the burden on the main power grid and at the same time help improve the performance of the transmission network.

(S2-3) Improving the Energy Efficiency of Commercial Buildings by Utilization of High Efficiency Equipment

by Mr. Le Ba Hung, YUKO VIETNAM CO., LTD.

He presented the improvement in energy efficiency of commercial buildings using high efficiency equipment implemented in the JCM project. He included the technologies and their effects introduced by the project and the developed system.

The project aimed to promote energy efficiency by transferring the latest technology from Japan to devices such as air conditioners, lighting systems and heat. Specifically, hot water supply system equipment. These are the hotel's main energy consumption systems. According to JCM, monitoring from April 2016 to May 2017 reduced CO_2 by 260 tons.

In this project BEMS (Building Energy Management System) of less expensive, efficient having advanced software has implemented. The system is focused on air-conditioning because air-conditioning systems account for 60% of total energy consumption in the hotel.

The software can use the AI unit to navigate operations based on the data of previous operation and the information collected from the weather forecast

(S2-4) Improvement on EE&C in Fertilizer Plant through Energy Management System

by Mr. Majus Luther Sirait, PT. Pupuk Kaltim, Indonesia

He presented the best practice in energy management and EE&C measures established by the company which was one of the winners of the "2019 ASEAN Energy Awards". He introduced PT. Pupuk Kaltim having its vision to become a growing and sustainable world-class company in the fertilizer, chemical, and agribusiness industry.

He presented that implementation of EnMS certificated by ISO50001 has achieved continuous improvement of energy, financially reducing the baseline of energy consumption by about 4.39% and succeeding in cost reduction of US $ 20 million, environmentally reduced 208,000 tons CO_2 equivalent GHG emissions.
Strong commitments from top management and supporting energy system management with a detailed energy baseline by competent team have helped improve energy efficiency and strengthen energy culture, increasing competitiveness in the global market.

3-2-1. Session -3: Panel Discussion

Panelist : Mr. Norihiro Kimura, Mr. Trinh Quoc Vu, Mr. Hideo Kubota, Ms. Lê Thanh Thảo (Country Representative of UNIDO in Vietnam), Mr. Septia Buntara Supendi (Manager of REE Department, ASEAN Centre for Energy) - Representatives of Government / Private Sector:

In Session -3, Mr. Kazuhiko Yoshida of ECCJ acted as a moderator and proceeded with the session as follows.

(Step-1) Q&A for presentations provided in Session -1 and Session -2

(Step-2) Discussion on the direction of public-private cooperation to promote energy conservation by establishing an energy management system

- Comments and suggestions from panelists
- Discussion between panelists
- Open discussion

(Step-3) Summarization of the results of discussions by Mr. Yoshida

The following are the points of the panel discussion.

Step-1

Q&A for the presentation are summarized as follows.

① Mr. Yutaka Ogura of ECCJ asked about the applicability of the financial support system for energy conservation in Vietnam, and Mr. Mr. Nguyen Dinh Hiep pointed out that the problem is that there is no source of preferential interest rates to support EE&C activities in Vietnam.

② Mr. Pham Hoang Luong of Hanoi University of Technology provided useful comments for four presentations by Mr. Nguyen Dinh Hiep, Mr. Hideo Kubota, Mr. Christopher Zamora and Dr. Yasuyuki Tada.

Step-2

Five panelists were invited to participate in a panel discussion.

The points identified by the panelists are as follows.

① A combination of providing motivation to improve energy efficiency through regulation and financial support to introduce energy efficient equipment and activities through subsidies and tax incentives.

② Promotion of energy conservation based on the formulation of energy conservation plans based on energy audits

③ Support system such as search for available funds to support the implementation of effective energy saving measures that require investment.

④ Capability building for all stakeholders implementing energy management system, namely Government, top leaders of Vietnamese companies, energy efficiency consulting providers, certification and system audit agencies, is required.

⑤ Suitable cooperation project on energy conservation to each country that accepts cooperation projects.

Step-3

The moderator summarized the main points of the panel discussion as follows.

An effective and useful energy management system is very important in establishing "sustainability" and "globalization".

Public-private cooperation for energy efficiency and energy conservation is an effective approach to achieving international goals, especially carbon neutral under the Paris Agreement and the SDGs.

Taking a harmonious and collaborative policy and practical approach between two stakeholders, the public and private sectors, is a very important point in promoting energy conservation.

Based on the above summary and wrap-up, the way forward is described in Chapter 4.

3-2-5. Closing Remarks

Following the panel discussion, Mr. Norihiro Kimura and Mr. Trinh Quoc Vu provided the closing remarks for the workshop. They shared their evaluation of the EMAK10 namely success with fruitful results of the workshop with the participants and thanked all the participants particularly presenters for their contributions.

3-3. Evaluation of EMAK10

The actual performance and impacts of the EMAK10 was evaluated by the participants by asking them to reply the questionnaire consisted of the 3 items, namely (1) usefulness of inputs by the presentations, (2) specific information useful for their activities to promote EC, and (3) overall performance of the workshop. In addition, the questionnaire asked the participants any opinion and suggestions to improve the future program of the EMAK. The questionnaire is a good procedure to objectively evaluate the results.

The evaluation by the participants through the questionnaire, which shows usefulness of information sharing of best practices in EE&C, indicates that it could be conclude that the real success of the EMAK10.

Sixty nine (69) participants replied to the questionnaire.

Next, the results of evaluation are analyzed and explained.

Profile of Participants

The workshop was attended by 82 participants from Vietnam, Japan and Indonesia.

Figure 1 shows the profiles of the participants who responded to the questionnaire. The feature is that the majority (46%) of the participants belong to "company / business"..

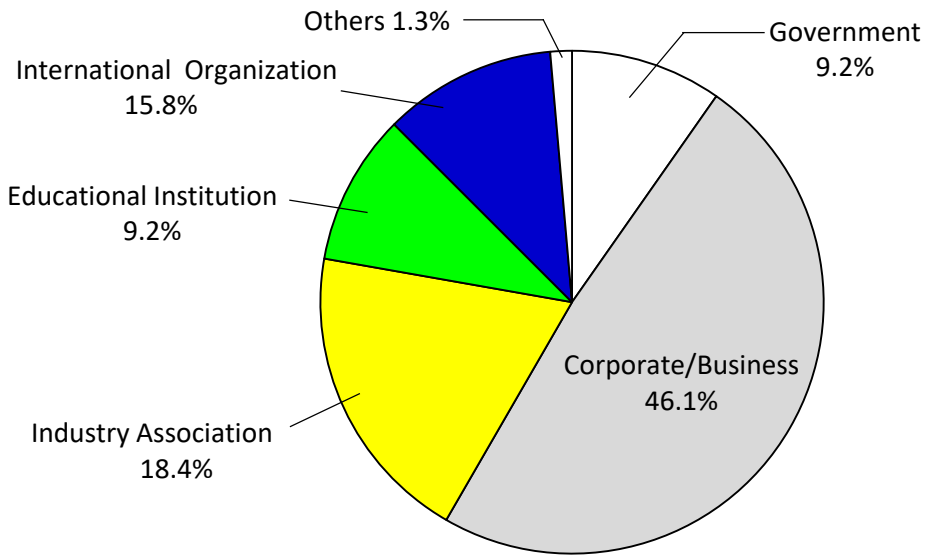

Figure 1. Organization categories of participants evaluate the workshop.

Evaluation of Inputs

The results show that 56 participants found the presentation at EMAK 10 useful.

Figure 2 shows an analysis of the presentations provided at the workshop to help establish an energy management system and promote energy savings. Presentations predominantly selected are achievements in EC Promotion in Vietnamese Industry under the EC law and legal framework (in Session 1), and EC technologies related to IoT applied in Vietnam (in Session 2).

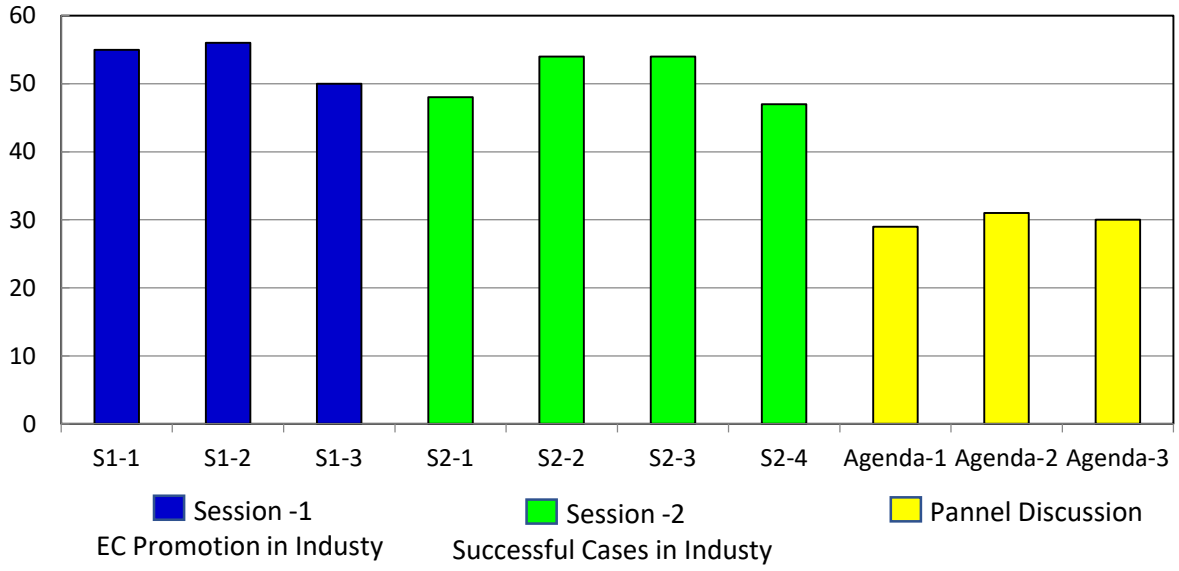

Figure 2. Histogram of useful presentation in the workshop

A further analysis in terms of items of interest for each organization is shown in Figure 3.

The analysis clarified useful information shared with the government officials is "Understanding of energy-saving investment from Top Management" (④).

"Capacity Building for Energy Management" (①) is recognized as useful by Corporate / Business and Industry Association.

In addition, "How to build technical knowledge for Energy Management" (②) and "Awareness and understanding of energy-saving from other department" (③) are useful to share with Educational Institution and International Organization respectively.

Furthermore, Interest in energy efficiency standards and building codes in the construction sector was shown.

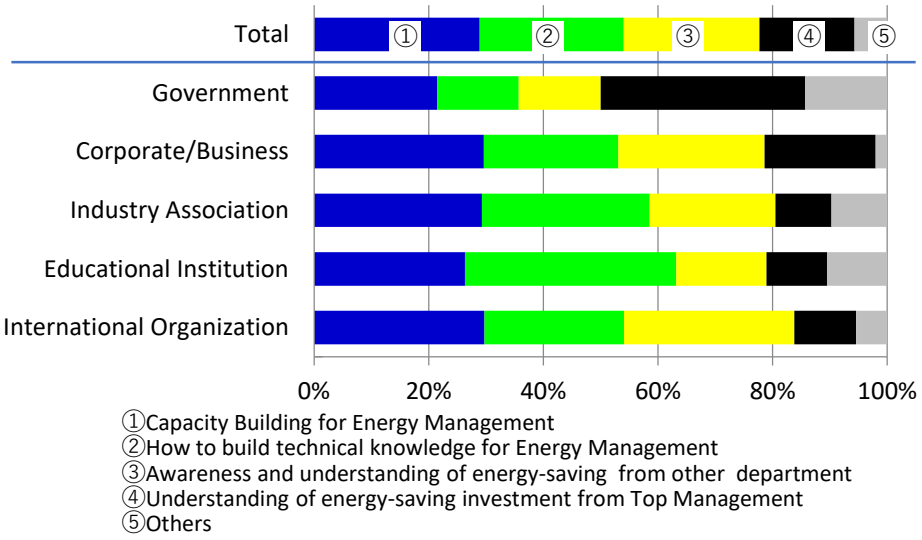

Figure 3. Useful information provided in the workshop

Overall Evaluation

75% of the participants evaluated the EMAK 10 to be “Very Useful” and “Useful” as a whole. Under the Covid 19 epidemic, organizing seminars in combination of online and offline proved to be very modern and effective.

Performance of Facility and Operation

The secretariat of the EMAK 10 Workshop satisfies with the operation of the venue and online conferencing system.

Due to the time difference between Vietnam and Japan, the workshop could not provide enough time to build a network between participants.

4. Way Forward – Recommendations

The summary and wrap -up including the "Way Forward" was made by the moderator of the Session - 3 (Panel Discussion.).
Based on the identification shown above and discussion made in the panel discussion, the way forward of EMAK would be proposed as follows.
By sharing different best practices, EMAK can offer several possible future programs, including:
Establishment and sharing several demonstration programs, including effective energy management systems based on ISO 50001 with energy conservation best practices,
Dissemination of specific energy management guidelines certified by energy management systems,
Development of an information system for sharing effective energy management system and EE&C best practices,
Capacity building for carrying out of behavior change to achieve the SDGs (Sustainable Development Goals).

5. Conclusion

The EMAK10 was successfully completed with 69 participants who gathered the workshop venue together with 13 participants joined through on-line meeting system outside the venue. Namely, the EMAK 10 achieved its objective hence the objectives of EMAK with the outcomes as follows.

(1) Shared the activities for promotion in Energy Conservation under the legal framework and international cooperation.
(2) Shared and disseminated both the advanced and well functioned EnMS and the best practices in EE&C measures / technologies which were established by the Vietnamese, Japanese and Indonesian companies.
(3) Provided the participants with the opportunities and activities to expand and/or newly build personal and organizational networks among participants for future cooperation or their business.
(4) Identified the future direction of the EMAK program.

Based on the results and outcomes of the EMAK10, EMAK will build on its existing work for the FY2021 to:

- Host workshops to facilitate exchange on EnMS best practice among policy makers and energy managers. Participating countries will explore potential themes/topics for future workshops, which could focus on a specific region or geographic area.
- Strengthen networks across developed and developing countries to share energy efficiency solutions, technologies and experiences for achieving SDGs (Sustainable Development Goals).
- Continue identifying options (tools and best practices) available for implementing EnMS to overcome energy efficiency barriers, both through workshops and by sharing workshop outcomes and reports.

6. Appendix

6-1. Workshop agenda

Time (ICT)	Agenda
13:00-13:30	**Reception**
13:35-13:55	**Opening and Keynote Address**
13:35-13:40	Welcome and Opening Remarks (Mr. Trinh Quoc Vu, Deputy Director General, MOIT, Vietnam)
13:40-13:45	Keynote (Mr. Masaomi Koyama, Director, METI, Japan) Purpose of EMAK 10 / Effectiveness of EM Experienced in Japan for EC Promotion
13:45-13:55	Photo Session
13:55-14:40	**Session – 1 : Achievements and Immediate Issues of EC Promotion in Vietnamese Industry under the EC Law and Voluntary Programs** **(Chaired by Mr. Trinh Quoc Vu, Deputy Director General, MOIT)**
13:55-14:10	S1-1 Current Status, Development Trend and Potential of Saving Energy in Vietnam (Mr. Nguyen Dinh Hiep, Vice President – General Secretary, the Vietnam Energy Conservation and Energy Efficiency Association)
14:10-14:25	S1-2 Vietnam – Japan EC collaborative program (Mr. Hideo Kubota, Technical Expert, ECCJ)
14:25-14:40	S1-3 Dissemination of EE&C Outcomes within ASEAN Member States (Mr. Christopher Zamora, Senior Manager of APAEC Secretariat, ASEAN Centre for Energy)
14:40-14:55	**Networking Coffee Break**
14:55-15:55	**Session – 2 : Successful Cases in Vietnam, Japan and in Foreign Countries** **EnMS under EM Legal Framework : Systematic Energy Management Practice and Implementation of EC Measures including Effective EC Technologies** **(Chaired by Mr. Norihiro Kimura, Deputy Director, METI, Japan)**
14:55-15:10	S2-1 Energy Efficiency Boiler in Industry: Case Study from Sites (Dr. Nguyen Xuan Quang, Hanoi University of Science and Technology)
15:10-15:25	S2-2 Energy Efficiency in Vietnam with Hitachi's Solution (Dr. Yasuyuki Tada, Hitachi, Ltd., Japan)
15:25-15:40	S2-3 Improving the Energy Efficiency of Commercial Buildings by Utilization of High Efficiency Equipment (Mr. Le Ba Hung, YUKO VIETNAM CO., LTD.)
15:40-15:55	S2-4 Improvement on EE&C in Fertilizer Plant through Energy Management System (Mr. Majus Luther Sirait, PT. Pupuk Kaltim, Indonesia)
15:55-16:50	**Session – 3 : Panel Discussion and Wrap-up (Speakers / Representatives)** **Direction of Public – Private Cooperation to Promote EC by Establishing EnMS** **(Chaired by Mr. Kazuhiko Yoshida, ECCJ)**
15:55-16:10	Q&A

16:10-16:40	Panel Discussion Representatives of Government / Private Sector: Mr. Norihiro Kimura, Mr. Trinh Quoc Vu, Mr. Hideo Kubota, Ms. Lê Thanh Thảo (Country Representative of UNIDO in Vietnam) Mr. Septia Buntara Supendi (Manager of REE Department, ASEAN Centre for Energy), Agenda-1 : Issues and Requirements Agenda-2 : Challenges – Proposed solution and actions Agenda-3 : Areas and Subjects for Next Step
16:40-16:50	Wrap-up (Chairperson) Summary and Way Forward – Direction of Possible Cooperation in Vietnam and ASEAN
16:50-17:00	**Closing**
16:50-16:55	Closing Remarks (Mr. Norihiro Kimura, Deputy Director, METI, Japan)
16:55-17:00	Closing Remarks (Mr. Trinh Quoc Vu, Deputy Director General, MOIT, Vietnam)
	END of Workshop

6-2. Album of Snapshots

Reception & Networking









Opening & Keynote Session, Assembly Photo of Speakers with Guests





Presentations




Q&A, Discussion

Workshop Venue & Participants