19th APEC Energy Statistics Workshop (EWG 01 2021S): APEC-IEA Joint Training Workshop on Energy Efficiency Indicators (Part I) Virtual Workshop, 28-30 June 2021 Tokyo, Japan (Host)

Summary proceedings

The ***19th APEC Energy Statistics Workshop*** was held online on 28-30 June 2021, hosted by Japan with the generous financial support of Japan's Ministry of the Economy, Trade and Industry (METI). The workshop is a 3-day event jointly organised by the Energy Statistics and Training Office (ESTO) of the Asia Pacific Energy Research Centre (APERC) and the International Energy Agency (IEA). The 19th workshop was the second time to be held online due to pandemic. This was also the third of the series of collaboration of APERC with other international agency with the objective of improving energy statistics in APEC.

The workshop was participated in by representatives from Australia; Brunei Darussalam; Hong Kong, China; Indonesia; Japan; Malaysia; New Zealand; Papua New Guinea; Peru, the Philippines; Singapore; Chinese Taipei; Thailand; United States and Viet Nam, as well as members of APERC, APSEC and EGEEC. Seven experts from IEA as well as the chair of the Experts Group on Energy Efficiency and Conservation (EGEEC) were in attendance to serve as experts and speakers of the workshop.

The summary proceedings of the 3-day virtual workshop is as follows:

Day 1— Session 1: Opening session

The Opening session was moderated by **Mr. Edito Barcelona, Head of ESTO/APERC.** The session included opening speeches both from Japan and IEA sides.

On the APERC side, **Dr. Kazutomo Irie, President of APERC**, delivered the Opening Remarks. He highlighted the importance of energy efficiency indicators in policy making and expressed his gratitude to IEA for the collaboration and sharing their experience on this subject. He also thanked the EGEEC Chair for participating in the workshop to present the existing collaboration between APERC and EGEDA. He also expressed his appreciation to the EGEDA members for participating in this workshop despite the huge time differences. He wished that the Part 2 of the workshop can be held physically next year.

Mr. Tetsurou Ito, **Director of International Affairs Division, METI, Japan**, welcomed the participants and thanked IEA for the collaboration. In his Welcome Remarks, he mentioned about the current global issues on climate change, and he hopes that the lectures and presentations in the workshop, especially during the sectoral discussions, could help in addressing these issues. He also mentioned that the Japanese government is striving hard to improve its greenhouse gas emission targets before the COP 26 to be held in Fall of this year. He also hopes that the participants can learn from the workshop and apply

them in their respective works. Finally, he wished everyone's good health and hopes to welcome them physically in the next workshop.

From the IEA side, **Dr. Nick Johnstone, IEA's Chief Statistician** delivered his Opening Remarks. He likewise expressed his gratitude to APERC/METI for the collaboration. In his remarks he affirmed that energy efficiency is very much valued in IEA's works. He also shared that IEA has just released its first comprehensive study on meeting Net-Zero: Net-zero in both secure, sustainable, affordable fashion. A key element of the study is through investment on energy efficiency; with respect to industry, transport, commercial buildings, across the entire sector. According to the study if we are to meet the energy efficiency objectives, there is a need to increase growth rates three-fold relative to the increase seen in recent years, and IEA is happy to support any members in meeting those objectives.

Session 1: Importance of energy efficiency and energy efficiency indicators

The first session was presided by **Ms. Roberta Quadrelli, Head of Energy Balances, Prices, Emissions and Efficiency** of International Energy Agency (IEA). The first session aimed to impart the importance of energy efficiency and its indicators.

To set the tone of the workshop, **Ms. Elvira Gelindon**, **Research Fellow of ESTO/APERC**, delivered a presentation on tracking energy efficiency in the APEC region including APEC goal of reducing its aggregated energy intensity by 45% by 2035 with 2005 as the base year. She reported that the final energy intensity in the region decreased by 21.8% between 2005 and 2018. While the linear extrapolation trend between 2005 and 2018 implies that the APEC energy intensity goal will be met by 2032, actual declines are unlikely to be linear. To learn more about the factors affecting energy consumption (e.g., due to activity, structural, or intensity effects) decomposition analysis was also conducted. The decomposition indicated that between 2005 and 2018, the decline in APEC's final energy consumption was largely due to intensity effect and in part structural effect offsetting the increase brought about by activity effect. At the end of the presentation, she posted several questions for the participants to ponder that can stimulate their interest on the subject matter.

The second presentation on APEC cooperation in energy efficiency was delivered by **Mr. VY Ek Chin**, **the Chair of APEC Expert Group on Energy Efficiency and Conservation (EGEEC)**. He mentioned that in response to unprecedented energy challenges faced by the APEC region, the APEC leaders have agreed to substantially increase the aggregated energy intensity reduction goal from 25% in 2030 to 45% in 2035. He also added that as reported by IEA, 40% of the overall decrease in the emissions would be coming from implementing energy efficiency policies alone. He highlighted that development of well-founded indicators can help in bettering evaluation of impact and achievements of energy efficiency policies. It also helps decision-makers develop policies to close the gap between ambition and target. He also shared APEC cooperation projects that have been completed and are currently in the pipeline.

Mr. Victor Garcia Tapia, **Energy Data Manager of International Energy Agency (IEA)**, presented the importance of data for energy efficiency policy design and monitoring. He emphasized that detailed end-use and activity data are crucial in identifying priorities in setting policy targets and monitor impacts in

certain sectors. He also mentioned that having appropriate energy efficiency indicators can assist in uncovering important trends.

In the chat box, Mr. Catur Budi Kurniadi from Indonesia would like to know how an economy can obtain more detailed data on a regular basis (yearly). Mr. Garcia responded that one of the ways include through digitized infrastructure such as smart meters and other technologies that collect detailed data on a timely manner. Mr. Zaharin Zulkifli from Malaysia asked how to determine whether the energy reduction in 2020 during the pandemic could either be due to the energy efficiency alone or the effect of COVID-19 pandemic. Mr. Garcia mentioned that the current COVID-19 pandemic will surely affect the energy consumption trends in 2020 but there's also a need to know the related indicator on the affected sector. It could also enable us in uncovering new indicators such as relationships of energy consumption against frequency of teleworking activities, etc.

Mr. Garcia continued with an icebreaking exercise which focused on the contribution of energy efficiency to intensity targets.

Mr. Nobuhiro Sawamura, Senior Researcher of ESTO/APERC, delivered a presentation on APEC energy data and balances. He emphasized the importance of more detailed and disaggregated data for better energy efficiency analysis, depending on certain sectors. These datasets are useful in defining relationships between the activity and energy sector, including economic, social, or environmental which will eventually help shape in policy-making process.

Ms. Gelindon presented the template that ESTO/APERC used to collect energy efficiency indicator from EGEDA members. She mentioned that ESTO/APERC first developed one in 2014 and has since undergone several revisions in consultation with the EGEDA members, until the present. The current template is in excel format and covers all the main five sectors and its subsectors, and energy products. The template also provides the definition of terms for reference. The IEA, through **Mr. Thomas Elghozi**, also presented its template, which was the basis of ESTO/APERC's template. He gave his assessment on ESTO/APERC's template and mentioned that the use of very similar templates, based on the same methodology, allows for easy country/economy comparison as well as data sharing between organizations. He also mentioned that both templates used the sectoral definition found on UN's ISIC Revision 4.

The session continued with economy presentations from ***Australia***; ***New Zealand***; the ***Philippines*** and ***Chinese Taipei***.

- **Australia**

  Ms. Allison Ball from the Department of Industry, Science, Energy and Resources, presented Australia's end use energy efficiency data and reporting. She described about the methodologies and challenges in estimating end use consumption for different sectors. She emphasized the importance of good end use sector activity due to the economy's changing energy use landscape, and understanding such changes is critical for future planning. She also added that the government is fully supporting its program on data collection improvement and granted $20 million in setting up National Energy Analytics Research Program (NEAR).

- **New Zealand**

  Mr. Finbar Maunsell from the Ministry of Business, Innovation and Employment, presented methodologies in estimating New Zealand's changes in energy use 1990 – 2020 through DIVISIA in the economy's transport sector. He mentioned that improvements are continuously done to improve estimations through most accurate and simple methods (through a mix of R and Excel applications). He also mentioned that developing clear and simple systems for processing data and calculating estimates is useful to reduce time spent in the future, as well as in documenting the process.

- **The Philippines**

  Mr. Jesus Tamang from the Department of Energy presented the Philippines' collection and estimation process of energy activity indicators for energy efficiency. He described about the economy's different methodological approaches in collecting/estimating indicators in supply and demand sectors, and in addition the economy's programs and initiatives on energy efficiency and conservation (EE&C). He also added that the main challenges in strengthening the economy's EE&C include among others conducting periodic sectoral surveys, energy audits as well as identification of appropriate energy indicators.

- **Chinese Taipei**

  Ms. Chih-Ching Yang from Taiwan Research Institute described the economy's collection of activity indicators and end-use energy consumption data. She mentioned the various references and sites they use in collecting energy efficiency indicators in filling-out the template for different sectors. She also added that the sectoral survey in Chinese Taipei is usually conducted every five years.

Prior to the conclusion of Session 1, some of the questions raised in the chat box during the Q&A session were as follows:

Mr. Anand Krishnan from New Zealand enquired about the reason for deviations in the forecasts and actual data of Australia's energy demand, and what lessons were learned from this. Ms. Ball responded that the demand forecasts were made based on the assumption between economic and population growth as well as energy use. In addition, the Australian Energy Market Operator was not able to distinguish existing energy meters by type (households, offices, etc.). The current legislation also prohibits the Operator to gain access to industrial energy use datasets from the National Greenhouse and Energy Reporting scheme. One of the lessons learned is that there is the need for revision of the current legislation to allow for better data sharing, in addition to recognizing its importance for modelling and forecasting energy end uses.

Mr. Zaharin Zulkifli from Malaysia enquired if legal instrument is key to obtaining detailed data in Australia. Ms. Ball affirmed this as not everyone has access to the datasets, and all the different institutions in the energy market need such datasets for different purposes. Currently there is no legislation that allows for open access to datasets.

Mr. Kim Kong Mak from Hong Kong China asked Mr. Tamang on estimating the GDP in calculating energy intensity in the residential sector (households), while Ms. Quadrelli would like to know the Philippines' plans for next steps in collecting detailed energy data across all the sectors. In response to Mr. Mak, Mr. Tamang mentioned that the households' final consumption expenditure was used to calculate households' energy intensity and these data are usually obtained from Philippines Statistical Authority (PSA). Responding to Ms. Quadrelli's question, he mentioned that several plans are in place which include developing national database that will contain reports from different sectors that will allow various DOE units to get access on these reports. In addition, the DOE is also looking at improving the existing standards for different equipment and buildings, as well as identifying to what extent these standards have been provided and incorporated in these areas. Mr. Tamang also added that the DOE is assisting local governments in building capacities for collecting and validating energy data in buildings within their localities, as well as collaborating with academia on various programs related to energy efficiency, fuel switching, technology development and other aspects.

Ms. Gelindon asked whether the current Energy and Efficiency Conservation Act of the Philippines helps in reducing confidentiality of data access and promote data sharing. Mr. Tamang responded that there is still some level of confidentiality regarding data access that needs to be maintained. However, some data that are energy-specific could be made available. He cited an example where a local industrial company is eligible to gain data on industrial energy use in exchange to submitting its report. This will help promote competition between industries in energy efficiency , among others.

Ms. Narumon Intharak from Thailand enquired to all presenters on the kind of tools and mechanisms used to obtain energy-related data from different organizations. Mr. Maunsell responded that data access is possible through pre-existing networks between agencies and email communications, in addition to open-access official statistics published by governments. Ms. Yang added that for Chinese Taipei, most of the official data are available online and can be easily accessed. Mr. Tamang also added that data access in the Philippines is possible through interdepartmental collaborations, although there are improvements that could be made in terms of processing energy-specific information, for example energy use information in agricultural sector, etc.

Day 2— Session 2A: Sectoral energy use and energy indicators

The second session of the workshop was moderated by Ms. Elvira Gelindon of ESTO/APERC. The session covered presentation and discussion on sectoral indicators; namely, industry and buildings (commercial and residential sectors combined).

The first presenter, **Mr. Jungyu Park, Energy Data Officer from IEA** explained about energy efficiency indicators in residential and services sectors. He showed a comparison of buildings consumption among APEC member economies (29% of final energy consumption) and IEA members (35%).The presentation showed the variation of residential energy consumption by economy and that fuels share may vary depending on condition and activity (Japan and Chile as examples). Mr. Park also mentioned that detailed data provides more information and explains basic consumption pattern such as which sector contribute the most to energy intensity reduction or the drivers of energy consumption (activity,

structure, etc.). He also mentioned and showed the importance of temperature correction when calculating space cooling or heating. Lastly, he showed various methods and sources of collecting data such as administrative sources, survey, metering and measuring as well as through modeling.

In addition to tracking energy efficiency in the buildings sector, the next speaker, **Mr. Alexandre Bizeul, Energy Data Officer from IEA** presented a free platform of weather database that has been developed by IEA in collaboration with Fondazione Euro-Mediterraneo sui Cambiamenti Climatici (CMCC) database. He showed and explained the content of the platform, data repository and the potential use of it.

Following the presentations were hands on exercises on how to calculate the indicators for the residential sector led by Mr. Park. As the exercises needed more time for Excel computation, he just showed the most relevant activity data that could drive the energy consumption as well as how to apply temperature correction for space heating and cooling consumption.

For the presentation by economy, **Mr. Kim Kong Mak, Senior Engineer of EMSD of Hong Kong, China**, shared his experience in the energy surveys for residential and commercial sectors and the presentation of survey results in the HKEEUD publication. He presented the type of end use and activity data that can be obtained from energy surveys, as well as their available sources. Mr. Mak also demonstrated a case evaluation of the effectiveness of energy efficiency and conservation initiatives with the end-use data.

Moving on, Mr. Barcelona delivered a presentation on tracking energy efficiency in industry sector. His presentation showed that calculating energy intensity in industry was by sub-sector disaggregation so that it would be easy to determine which among the sub-sectors of industry are less- or energy-intensive.

Following his presentation was an economy presentation from **Dr. Ian Mead, Director of EIA of the United States**. Dr. Mead's presentation covered EIA's (Energy Information Administration) experience in collecting data on commercial building, manufacturing and residential sectors through energy consumption surveys. He explained that the Commercial Building Energy Consumption Survey (CBECS) collects the number of commercial buildings and average building size while the Manufacturing Energy Consumption Survey (MECS) is a multi-year activity from 2018-2021, and it has been conducted six times since 1998. Meanwhile the Residential Energy Consumption Survey (RECS), collects data on US homes built after 2000, and some of the result included houses built after 2000 were twice as large as those they built in the 1960s but with the same total energy use.

During Q&A session, participants were interested about temperature data; the surveys conducted by Hong Kong, China and the United States including the cost and online methods. It was also shared by both by APERC and IEA that the disaggregation of energy consumption follows the UN-ISIC. IEA was happy to note that the weather database platform was developed to help members with analysis involving temperature. Dr. Mead was happy to collaborate further and share their knowledge in conducting surveys with the members.

Day 3— Session 2B : Sectoral energy use and energy indicators

The third day had two sessions. The 1st part continued with presentation and discussion on sectoral energy use and energy indicators. The session was moderated by Ms. Quadrelli, with IEA presentation on tracking energy efficiency in the transport sector and an economy presentation on collection/estimation of energy and activity indicators in the transport sector of Japan.

Mr. Thomas Elghozi, Energy Data Officer of IEA delivered a presentation on tracking efficiency in the transport sector and mentioned that we can learn the characteristics of the transport sector by energy balances. His presentation included comparison of energy efficiency indicators between Republic of Korea and USA. He also showed several examples by splitting transport data into different modes and vehicle types and breaking it into different intensity for each mode (cars, buses, rail, and air). Finally, he explained methods used in collecting data and analysis by using charts, calculations, and figures.

Mr. Elghozi led the hands-on exercise in calculating indicators for the transport sector. It included calculating vehicle-kilometres, passenger-kilometres, and energy consumption of passenger cars, energy intensity of the five transport modes, energy intensity of bus transport, fuel efficiency policy and fuel efficiency in freight transport.

Dr. Ryo Eto, Senior Researcher of IEEJ, Japan delivered a presentation on collection/estimation of energy and activity indicators in the transport sector in Japan. He explained about the transportation sector consumption in the Energy Balance Table (EBT) prepared by METI and submitted to IEA. He explained about Japan's statistics system in transport sector and introduced data sources and types of statistics used in EBT. He also mentioned about the challenges and current issues that Japan experienced in collecting data in transport such as low feedback rate of sample survey, how to collect data on electric vehicle, and how to allocate transportation consumption by region.

Mr. JunGyu Park and Mr. Matthieu Prin, Energy Data Officers from IEA introduced the online tools to support country/economy's work such as the IEA energy efficiency indicators and the weather for energy tracker. They also explained about IEA online training opportunities and e-learning courses for capacity building on energy efficiency data.

Session 3— Summary and way forward

The 2nd part of the last session was an open discussion and co-moderated by EGEDA Vice Chair Mr. Jen-yi Hou and Ms. Roberta Quadrelli of IEA.

In the roundtable discussion, **Mr. Jen-yi Hou, the EGEDA Vice-Chair** asked the member economies to comment on the following:

1. How would the workshop improve the capacity of participants' economies in filling-in the EEI template?
2. How could participants encourage their respective governments to improve data collection for a more accurate evaluation of government's EE programs?

The participating economies found the workshop useful as they learned from it especially during the sharing of experiences and best practices by some economies and the hands-on exercises where they learned the importance of detailed data to calculate energy efficiency indicators.

Participants also noted that it is the task of the statisticians to provide accurate data for energy policy analysis. They also recognized the importance of dialogue between the statisticians and policy analysis group to understand the data that are needed and how the data are used. They are also pleased to know that online training courses are available not only for energy statisticians but to policy staff as well.

Participants also shared the challenges they are facing in collecting energy efficiency indicators data. These are obtaining funds for surveys, collecting activity indicators in the transport sector and electricity consumption of electric vehicles. To address these challenges, it was suggested that member economies continue their collaboration and share respective experiences and best practices.

During wrap-up and closing, in her closing remarks, Ms. Roberta Quadrelli of IEA, shared that the workshop was a wonderful experience as it was the first time that IEA designed a workshop together with APEC/APERC. She appreciated the opportunities presented to collaborate for sharing of strengths of both organizations. She thanked the participants, especially that, while experiencing difficulty in collecting data their cooperation made a difference to international organizations. IEA is looking forward to support APEC in the development and improvement of energy efficiency data. She also thanked the EGEDA secretariat and IEA team for the lecture presentations.

The EGEDA Vice-chair, Mr. Jen-yi Hou, thanked IEA for collaborating with EGEDA for sharing their knowledge and experiences that are very helpful to all APEC member economies. He also thanked presenters from members economies for sharing their respective experiences. He also mentioned that some economies already have net-zero targets, and these could make accurate data more important for policy makers to figure out strategies to achieve them. Statisticians in APEC economies have very important roles in supporting policy making. Dialog between statistical team and policy team is likewise very important.

The EGEDA Secretariat thanked the IEA for the technical support and mentioned that ESTO trusted IEA's vast experience in energy efficiency indicators. The secretariat also mentioned that it is not only the member economies that learned from the workshop but ESTO/APERC as well. The secretariat also announced about the Phase 2 of the workshop to be held the following year, which would hopefully be a physical workshop.