The 60th Meeting of APEC Expert Group on Energy Efficiency & Conservation (EGEEC 60) and Associated Workshop

Meeting Summary

15 to 17 March 2023

Hybrid Meeting hosted by Hong Kong, China

1. Introduction

The 60th Meeting of the APEC Expert Group on Energy Efficiency and Conservation (EGEEC 60) was hosted by Hong Kong, China (HKC) in hybrid mode at the Hong Kong Ocean Park Marriott Hotel on 15-16 March 2023, followed by technical visits to Ocean Park Hong Kong, Hong Kong Palace Museum, O · PARK1 and Peak Tram on 17 March 2023.

Delegates from eleven (11) APEC member economies, namely Australia; China; Hong Kong, China; Japan; Malaysia; The Philippines; Singapore; Chinese Taipei; Thailand; The United States; Viet Nam, and representatives from seven (7) APEC fora and sub-fora, including APEC Secretariat; EWG Secretariat; Asia Pacific Energy Research Center (APERC); APEC Sustainable Energy Center (APSEC); Expert Group on Clean Fossil Energy (EGCFE); Expert Group on Energy Data and Analysis (EGEDA) and Expert Group on New and Renewable Energy Technologies (EGNRET) attended the meeting. Moreover, representatives from four (4) international organisations, namely the International Energy Agency (IEA), the World Green Building Council (WGBC), Collaborative Labelling and Appliance Standards Program (CLASP) and Energy Efficiency Hub (EE Hub), participated in the meeting as speakers and observers.

Fifty-six (56) participants attended the EGEEC 60. The list of EGEEC 60 participants is attached in Appendix A of this meeting summary.

2. EGEEC 60 (15 – 16 March 2023, 09:00 – 16:30, GMT+8)

The EGEEC 60 was co-chaired by Mr VY Ek-chin, Chair of EGEEC, and Mr CHU Kei Ming, Barry, Assistant Director of Electrical and Mechanical Services Department (EMSD), HKC on 15 March 2023 and by Mr VY Ek-chin and Mr LIU Hon Wa, George, Chief Engineer of EMSD, HKC on 16 March 2023.

2.1 Official Welcome, Opening Remarks and Adoption of Meeting Agenda

Mr TSE Chin-wan, the Secretary for Environment and Ecology, HKC, delivered the official welcome. He indicated that HKC's energy intensity had decreased by over 30

per cent from 2005 to 2020. To achieve carbon neutrality before 2050, the Government of HKC published Hong Kong's Climate Action Plan 2050 in October 2021, outlining the strategies and targets for combating climate change and achieving carbon neutrality. The Office of Climate Change and Carbon Neutrality was also set up in January 2023 to strengthen the coordination and promotion of decarbonisation work.

The EGEEC 59 Summary was confirmed. The EGEEC 60 Meeting Agenda was approved by attending members.

2.2 "Energy Development in HKC" by Mr. PANG Yiu-hung, Director of Electrical and Mechanical Services Department (EMSD), HKC

To address the environmental concerns and global warming issues, HKC presented the climate action plan 2050 for combating climate change and achieving carbon neutrality before 2050. HKC will achieve net zero electricity generation by phasing out fossil fuels, striving to develop renewable energy, diversifying and improving the stability of supply sources of natural gas and regional cooperation. HKC also shared energy efficiency enhancement measures, such as promoting green buildings and stepping up efforts to lead a low-carbon lifestyle to reduce total energy consumption, lessen the public's financial burden arising from the foreseeable increase in the use of zero-carbon fuels for electricity generation, and accelerate environmental investment.

2.3 Updates from APEC Secretariat / EWG Secretariat / APERC / APSEC / EGEDA / EGCFE

Six (6) presentations were conducted as follows:

2.3.1 "APEC Secretariat Update" by Mr Takuo MIYAZAKI, Program Director, APEC Secretariat

APEC Secretariat shared the key dates for submission and approval for project session 1, 2023, followed by key projects data for projects completed September 2021 - October 2022, such as distribution of projects across APEC fora and key results in the 2022 longer-term evaluation of APEC projects (LTEAP), etc.

APEC Secretariat also introduced the launch of the APEC Project Administration System (APAS), an online platform for submitting and assessing APEC projects, the schedule and the workflow for Project Session 2, 2023.

2.3.2 "EWG Secretariat Update" by Ms Kate SELLEY, EWG Secretariat

EWG Secretariat shared the EWG's work and the priority "Creating a Resilient and Sustainable Future for All" in 2023, EWG's meeting schedule in 2023, and expected key deliverables expected.

2.3.3 "APERC Update" by Mr Jeongdu KIM, Senior Researcher, APERC

APERC reported their activities for sharing the key findings of the APEC Energy Demand and Supply 8th edition. These included embassy visits, presentations at international events, and APEC economy roadshows. The discussion and feedback in the roadshows were shared.

APERC presented the basic framework for the APEC Energy Outlook 9th edition and its scenario direction. One of the key considerations is "Energy Trilemma", refining the modelling structure for the industry, buildings and transport sectors.

APERC shared the key conclusions from the 6th Energy Efficiency Policy (EEP) Workshop and announced the upcoming 7th EEP workshop will be held tentatively alongside the EGEEC 61 meeting in the second half of 2023.

2.3.4 "APSEC Update" by Mr Steivan DEFILLA, President Assistant, APEC Sustainable Energy Centre

APSEC reported on the progress of APEC projects (as listed below), effort in institution building and proposed flagship research program under the three focus pillars, energy transition solutions (ETS), APEC Cooperative Network of Sustainable Cities (CNSC), and Future Clean Energy Technology (CET).

19 reports were produced during TYP20-22.

<u>On-going Projects:</u>

(i) "Research on means to overcome the shortage of basic urban energy-climate data" (EWG 04 2021S)
(ii) "Research on means to diminish the financing gap for sustainable urban energy" (EWG 09 2021S)
(iii) "Data driven carbon neutral disaster resilient cities" (APEC EWG 04 2022A)
(iv) "Research on energy strategies driving cities through the low-carbon transition" (endorsed on 9 March 2023, APEC EWG 01 2023S)
(v) "Innovative Approaches for Scaling-Up Renewable Energy

Deployment in APEC Region" (EWG 04 2020S)

(vi) "Support Offshore Wind Deployment and Grid Connection in APEC Region" (EWG 06 2021A)

(vii) "Impacts of COVID-19 on Renewable Energy Development in APEC Economies" (EWG 07 2021A)

(viii) "Demonstration and Promotion of Energy Resilience tool based on Solar-Powered Emergency Shelter Solutions (SPESS) for Natural Disaster in APEC" (EWG 01 2022S)

2.3.5 "EGEDA Update" by Mr Edito BARCELONA, Head, EGEDA Secretariat

EGEDA Secretariat reported updates on its activities, which included the regular APEC energy data collection of annual energy supply and demand data, collection of energy efficiency indicators template, the 20th APEC workshop on energy statistics held online on 15-17 November 2022, the 21st APEC workshop on energy statistics to be held in-person in June or July 2023, schedule of EGEDA's training courses as well as the Secretariat's participation in international meetings. EGEDA Secretariat presented the types of data collected in the energy efficiency indicators template and encouraged EGEEC members to provide the data. EGEDA's training courses originally scheduled in 2022 were postponed to 2023. The tracking of the APEC energy intensity reduction goal and APEC renewable energy doubling goal using 2020 data were also presented to the members.

2.3.6 "EGCFE Update" by Ms Reiko EDA, EGCFE Chair

EGCFE Chair shared the background of the selection of the EGCFE Chairperson for the 2023-2024 term, Japan's consideration to chair EGCFE, its subsequent proposal to rescope EGCFE at EWG64 and the revision of ToR.

2.4 Discussion on Meeting Theme: Accelerating Energy Efficiency Enhancement through Technological Innovations

2.4.1 Hong Kong, China

HKC presented the strategies outlined in the Innovation and Technology (I&T) Development Blueprint for HKC's I&T development over the next 5 to 10 years -namely, financial funding, enriching I&T talent resources, supporting I&T startups and fostering global I&T collaboration. HKC also shared I&T pilot projects that help accelerate the energy transition, namely the "Semantic AI on the Building Operation and System Optimization", District Cooling Systems (DCS) and the Regional Digital Control Centre (RDCC).

2.4.2 Malaysia

Malaysia introduced the new Malaysia Energy Transition Outlook Report launched in March 2023, highlighting new investment priorities in electrification, energy efficiency and renewable energy deployment. Malaysia also shared the current and future technologies adopted for the energy transition. Deployment of the smart meter technology, its benefits, the guidelines and the procedures for approval for electricity meters were presented.

2.4.3 The Philippines

The Philippines introduced the Energy Efficiency and Conservation (EEC) Act, the Advanced Energy and Green Building Technologies Curriculum Act, Electric Vehicle Industry Development Act (EVIDA). The Philippines shared the experience in overcoming the challenges of redesigning and expanding the Philippine Energy Labeling Program (PELP), fiscal incentives, modifying tariffs for electric vehicles and mobilising local government units to support and implement policies and guidelines.

2.4.4 Singapore

Singapore shared that the need to manage energy demand has become more pronounced in recent years as their energy demand is expected to rise, mainly due to digitalisation, electrification of their transport sector and a three-year moratorium on building data centres in Singapore that ended in 2022. In this connection, the government issued relevant measures and policies, including:
1) Energy Efficiency Grant which supports SMEs and the manufacturing sector to adopt more energy efficient technologies;
2) Energy Efficiency Technology Centre, which helps building up the energy efficiency capabilities among local industrial SMEs as well as upskilling engineers and energy efficiency practitioners;
3) Green Mark Incentive Scheme for Existing Buildings 2.0 (GMIS-EB 2.0) under the Building and Construction Authority (BCA) which provides funding support for retrofit to raise the performance of existing buildings;
4) Demand Response (DR) program and the Interruptible Load (IL) Programme with Sandbox Initiative for commercial and industrial consumers

to optimise their energy consumption; and

5) Regional collaboration to strengthen capacity in building initiative and to promote energy efficiency practices in the building sector through knowledge sharing.

2.4.5 Chinese Taipei

Chinese Taipei shared a 10-year technology development roadmap (2025-2034) to achieve net-zero carbon emissions by 2050. The technical advantages and applications of innovation such as microchannel heat exchanger (MCHX), electric-vehicles thermal management system, variable refrigerant flow (VRF) system, Organic Rankine Cycle (ORC) power generator, electronic device & data centre cooling system were presented.

2.5 Invited Presentations

Six (6) invited presentations were conducted as follows:

2.5.1 "CLASP Update" by Mr Lei Steven ZENG, CLASP China Program Lead

CLASP shared its mission and report on the "World's Best MEPS", which compares current minimum energy performance standards (MEPS) for six high energy-consuming appliances across ten major economies and identifies the world's most stringent energy performance standards. The global progress on efficiency relative to benchmarks and the scope of analysis were also presented. This tool is to help governments improve MEPS and integrate these new efficiency targets in their energy policies to drive improvements in appliance energy efficiency, thereby decreasing carbon emissions and increasing appliance energy performance worldwide.

2.5.2 "Net Zero Readiness Framework" by Ms Joy GAI, Programmes Head of the World Green Building Council (WorldGBC) Asia Pacific Region

WorldGBC presented its "Whole Life Carbon Vision 2050" and "Net Zero Readiness Framework", contemplating goals and actions to be implemented in the building sector to contribute to carbon neutrality by 2050. The structure of the Net Zero Readiness Framework consists of 26 readiness goals and 75 indicators spread across five pillars – (i) Government Leadership, (ii) Technical Solutions / Approaches, (iii) Finance, (iv) Data and (v) Mindset. The Net Zero Readiness Framework helps create a full picture of the industry's readiness towards net zero. It identifies the current opportunities, gaps and challenges for the coming years towards the decarbonisation goal. An interactive Net Zero

Readiness Framework is available on the WorldGBC website[1]. Six workshops and surveys have been conducted with seven local green building councils in APEC member economies. The survey data[2] and a list of prioritised actions were presented.

2.5.3 "International Energy Agency (IEA) Presentation"

a) "Energy Efficiency Market Report 2022 and Implications for Southeast Asia" by Ms Natalie KAUF, Southeast Asia Energy Efficiency Analyst, IEA

IEA shared the flagship Energy Efficiency Market Report 2022[3], which gives a broad overview of recent energy efficiency and energy demand trends and some of the policy and technology considerations from that year. The report also highlighted two special focuses: (1) energy efficiency and the energy crisis and (2) a special regional focus on energy efficiency work in ASEAN. IEA shared several key policies that significantly improved the global primary energy intensity last year and encouraged more effort necessary for economies to reach their announced pledges in the coming decades. IEA also shared their work in ASEAN, including two roadmaps, Roadmap Towards Sustainable and Energy-Efficient Space Cooling in ASEAN and Roadmap for Energy Efficiency Buildings and Construction in ASEAN, as well as online training and courses.

b) "Ongoing Work on Grid-interactive Efficient Buildings" by Dr Ksenia PETRICHENKO, Policy Analyst, IEA

IEA presented the concept of efficient grid-interactive buildings and virtual power plant (VPP), and the benefits of applying digitalisation and smart solutions to improve energy efficiency in buildings and grid as energy demand increases. By establishing communication between smart buildings, the grid, and vehicles, a centralised IT system can act as a VPP to monitor demands and manage distributed energy resources (DERs). This optimises their operation and facilitates peer-to-peer (P2P) renewable electricity trading. In a net-zero scenario, the building sector will require the most demand response availability in the next decade. The IEA also presented the benefits of smart technologies in buildings and the necessary policy package to encourage efficient grid-interactive buildings and highlighted a case study on the 2022 California Building Standards and the IEA's study on efficient grid-interactive

[1] https://worldgbc.org/asia-pacific-net-zero-readiness-framework/
[2] https://miro.com/app/board/o9J_l5aPabc=/
[3] https://www.iea.org/reports/energy-efficiency-2022

buildings in ASEAN.

IEA also announced that the 8th Annual Global Conference on Energy Efficiency will be held in Paris in June 2023. IEA will also organise the Energy Efficiency Policy Training Week for Southeast Asia in Indonesia in October and a grid-interactive efficient building workshop in October/November 2023.

2.5.4 "Latest Updates of the Energy Efficiency Hub (EE Hub) & its Task Groups" by Dr Jonathan SINTON, Head of Secretariat, EE Hub

EE Hub has provided an overview of its goals, members, and task groups, including the Digitalisation Working Group (DWG), Super-Efficient Equipment & Appliances Deployment Initiative (SEAD), Ten Energy Efficiency Best Available Technologies and Best Practices (TOP TENs), Energy Management Action Network (EMAK), Energy Efficiency in Buildings (EEB). EE Hub will host a session during the 8th Global Conference on Energy Efficiency on 6 June 2023 focusing on lessons from addressing the energy crisis through energy efficiency measures.

2.5.5 "Conclusion of BCG Economy Model – Thailand's Perspective" by Ms Sukanya NANTA, Plan and Policy Analyst, Strategy and Planning Division, Department of Alternative Energy Development and Efficiency (DEDE), Ministry of Energy, Thailand

Thailand shared the goal to achieve carbon neutrality by 2050 and net-zero emissions by 2065. The National Energy Plan (NEP) outlines five action plans for the Bio-Circular-Green (BCG) Model on Energy, including adjusting power and heat production to a low-carbon way, transitioning the energy consumption and production in the transport sector to a low-carbon pathway, increasing energy efficiency, implementing biorefinery, and increasing CO2 absorption.

2.5.6 "Just Transition" by Dr Cary BLOYD, Senior Advisor, Pacific Northwest National Laboratory, The US.

The US introduced the Interagency Working Group (IWG) on Coal and Power Plant Communities and Economic Revitalization, which released an initial report with recommendations to catalyse economic activity and support workers in the energy sector. The report facilitates economic revitalisation in coal and power plant communities. It supports community needs due to declining coal mining activities and power plant closures through an equitable and just transition. There were 721 coal-fired power plants closed from 2005 to 2020, and another 75 planned to retire by 2050. The main goals of the

initiative are to (1) create good-paying jobs, (2) spur economic revitalisation, (3) remediate environmental degradation, and (4) support energy workers. The US shared a mirror initiative called "Justice40", which identified disadvantaged communities based on 36 indicators. Policies directed at Just Transition were shared to the members.

The US explained further the meaning of "Just Transition" by sharing three drivers for coal plant retirements, the value and meaning of power plants to the communities and the economic impacts of shutting downs the power plants with two case studies. The US share their experiences and best practices for guiding communities through coal plant shutdown, equitable decommissioning criteria, and DOE community benefit plans.

3 Economy Updates

Nine (9) economies presented the economy updates and were summarized below:

3.1 **Australia** presented their energy policy updates. Australia committed to a 43% emission reduction target on 2005 level by 2030 and net zero by 2050. To achieve the targets, Australia announced the Powering Australia Plan, which outlines the government's plan to create jobs, cut power bills and boost renewables. The Powering the Regions Fund helps businesses invest in energy efficient and low emissions technologies. Australia announced the development of a national energy Performance Strategy in October 2022, which aim at demand-side action to uplift energy performance, improve affordability and reduce emissions. In March 2023, Australia launched the first round of Energy Efficiency Grants for Small and Medium Sized Enterprises to support small and medium businesses to improve their energy efficiency, ease pressure on their energy bills and reduce emissions. Australia shared a report, "*Scoping the Digital Innovation Opportunity for Energy Productivity in Non-Residential Buildings*", which has found significant potential for digitalisation to create energy performance improvements in buildings. In addition, Australia would be expanding the use of large-scale heat pumps in industry to support their uptake of renewable energy. Australia also proposed a policy exchange workshop on heat pumps for the IEA's Energy Efficiency Hub. They also announced the plan to uplift energy efficiency requirements in the residential sector from October 2023.

3.2 **China** presented the background of the operational guidance and action plan, known as the "1+N" Policy Framework, for reaching peak carbon emissions by 2030 and carbon neutrality by 2060. As a result of the action plan, China shared their data for renewable energy capacity, carbon market transaction volume and electricity consumption. China also shared the timetable for the 3-

stages construction of the new-type power system, a new benchmark index to promote energy efficiency in key fields of energy intensive industries, and updating motor and ESG standards to promote energy efficiency.

3.3 **Japan** shared its latest developments in energy conservation policies and the challenges for the future goal. Japan updated its 2030 final energy demand outlook, primary energy demand, and long-term energy efficiency target. Japan also shared the major energy conversation measures to achieve the new target saving of energy consumption by 62 million kl in each sector. An overview, historical development and amendment of the Energy Conservation Law were presented. Japan further explained the class evaluation system for large-scale energy users, the comprehensive coverage of the benchmark system, and improvements in energy efficiency with the Top Runner Programme. Apart from strengthening energy efficiency and expanding non-fossil fuels, Japan will consider adopting CCS, DACCS and BECCS to achieve carbon neutrality by 2050. The Energy Conservation Law was amended to include non-fossil fuel targets by 2030. Japan shared their regulation to promote a demand response programme which encourages the demand to shift to time when RE is surplus. Japan introduced their new voluntary disclosure system of energy efficiency with a view to attracting investment and manpower.

3.4 **Malaysia** presented their National Energy Efficiency Action Plan (NEEAP). It shared the background, policy direction, overview, key initiatives, the potential savings achieved by these key initiatives under the NEEAP and 2016-2022 annual saving achievement of the NEEAP implementation. Malaysia also shared the implementation, achievement (potential saving from each energy audit for the industrial and commercial building sectors) and the reporting system showing the progress of their implementation measures under the Energy Audit Conditional Grant (EACG), which is an energy efficiency programme under the 11th Malaysia Plan (RMK-11) 2016 - 2020. With the successful implementation of the EACG under RMK-11, Malaysia further implemented the second EACG under the 12th Malaysia Plan (RMK-12) for 2021-2025. The eligibility, benefits and approval process of EACG 2.0 were shared.

3.5 **The Philippines** share the implementation status of the Energy Efficiency and Conservation Act in the Philippines. The Minimum Energy Performance for

Products (MEPP) and Philippine Energy Labeling Program (PELP) now cover four products (room air conditioners, lighting products, refrigerating appliances and television sets). Later this year, they will include washing machines, electric fans, electric irons and rice cookers. The government also lead by example to save electricity use under the Government Energy Management Program (GEMP). The Philippines will update the classification of the Designated Establishment (DE) later this year to identify a private entity as an energy-intensive industry. As of February 2023, 45 ESCOs are registered with the government and have implemented EE projects to save 7.65M kWh of energy. The Philippines will issue the Comprehensive Roadmap for Electric Vehicle Industry (CREVI) later this month to accelerate the EV development, commercialisation and utilisation.

3.6 Singapore gave an overview of its energy developments over the past few months. Singapore is targeted to reach 2 gigawatt-peak (Gwp) of solar capacity by 2030 and 200 megawatt-hour of energy storage by 2025. To enhance its solar and energy storage system capacity, Singapore launched a 285 megawatt-hour energy storage system in February 2023. In addition, Singapore considered low-carbon hydrogen as a promising option to decarbonise and achieve net zero by 2050. Considering hydrogen could fulfil 50% of their power needs in 2050, Singapore launched their first National Hydrogen Strategy in October 2022. It sets out key ways to explore and grow opportunities for hydrogen in Singapore, including importing hydrogen, and experimenting with advanced, commercial-ready hydrogen technologies. In Dec 2022, the Energy Market Authority (EMA) and the Maritime and Port Authority of Singapore (MPA) launched an Expression of Interest (EOI) for utilising ammonia for power generation and marine bunkering needs. Singapore is also strengthening the development of regional power grids. For example, the Lao PDR-Thailand-Malaysia-Singapore Power Integration Project (LTMS-PIP) which commenced in June 2022, was a multilateral cross-border electricity trading initiative to strengthen the region's energy security and resiliency. Against this backdrop, Singapore is partnering with the US to conduct a feasibility Study on Regional Energy Connectivity to explain the benefits of energy connectivity and assess the technical, legal and commercial steps to realise the vision of a regional power grid network.

3.7 Chinese Taipei reported the average energy and electricity intensity improvement from 2010 to 2021. In March 2020, the government announced the pathway to net zero emissions in 2050, which illustrated 4 transition

strategies, namely energy transition, industrial transition, lifestyle transition, social transition, and 2 governance foundations, namely technology R&D and climate legislation. Chinese Taipei shared its plan to improve energy efficiency in two phases. The first phase involves implementing existing technologies. The estimated energy saving from 2023 to 2030 by improving energy efficiency in each sector was presented, with the majority saving in the industry sector. The second phase involves expanding the application of innovative technologies. Chinese Taipei then shared its latest update on energy efficiency standards for fluorescent light sources, electric pots and electric storage tank water heaters.

3.8 **Thailand** presented its long-term Energy Efficiency Plan (EEP 2022), the energy saving target by sector, updates on the Building Energy Code (BEC), the pilot Zero Energy Building (ZEB) and the 30@30 Electric Vehicle Policy, which sets a target for domestic production of Zero Emission Vehicle (ZEV) to account for at least 30% of total production by 2030.

3.9 **United States** presented the U.S. Department of Energy's national laboratory system and highlighted their commitment to developing long-term research & development in key energy areas to support energy innovation. The U.S. DOE supports targeted energy efficiency demonstrations and deployment through the Better Buildings initiative, which partners with leaders in the public and private sectors to improve the energy efficiency of American homes, commercial buildings, and industrial plants by expanding their investments in energy-saving technologies and sharing best practices. According to the 2022 Better Buildings Progress Report, the Initiative achieved energy savings of USD$15.3 billion. A Transactive Energy System was also introduced, which enhances overall energy system efficiency by harmonising energy availability, consumer needs and cost preferences, and other factors.

4 Project Updates Presentation

The status of eight (8) nos. of the APEC projects was reported during the meeting and summarised below.

4.1.1 Capacity Building Workshop on APEC's Goals of Doubling the Renewable Energy Share in the Energy Mix and Reducing Energy Intensity (EWG 08 2021S – Hong Kong, China) – Status: Ongoing

HKC held a two-half-day online capacity-building workshop in November 2022, which aimed at building the capacity of APEC member economies to accelerate the progress of achieving the APEC energy goals through sharing of knowledge and best practices of energy efficiency and renewable energy policies and application of low-carbon technologies and economic instruments. Over 100 experts and delegates from 15 APEC member economies attended the online workshop. The workshop summary is under preparation and is targeted to be submitted to APEC in the second quarter of 2023.

4.1.2 Promoting Energy Modelling in APEC Region (EWG 05 2022A - Hong Kong, China) – Status: On-going

This project objectives were to build and enhance the APEC member economies' capacity to utilise energy modelling to formulate policy decisions through the workshop. The project commenced in August 2022, and a pre-workshop study through online interviews with several economies and organisations has been conducted to explore the details of different energy forecast models. The pre-workshop study findings, such as the strengths of various energy forecast models and the experiences and practices of APEC economies on their use of energy models, will be shared at the one-day online capacity-building workshop to be organised by HKC in August 2023.

4.1.3 APEC Retro-Commissioning (RCx) Hub: Training and Registration Scheme (EWG 07 2022A - Hong Kong, China) - Status: On-going

Following the APEC Project EWG 09 2020A, it was recognised that Retro-commissioning (RCx) was a systematic and cost-effective process periodically examining the building services system and energy performance. The project objectives were to build the capacity of retro-commissioning of APEC member economies and drive energy-efficient buildings. A website, "APEC RCx Hub", would be developed to share guidelines, policies, best practices, and registration schemes. An online RCx training would be available on this online platform for sharing and capacity building among APEC member economies. The RCx Training Courses will commence in the Q2-Q3 of 2023 and the APEC RCx hub will be launched in the Q4 of 2023.

4.1.4 APEC Workshop Furthering University Collaboration to Support Data Gathering and Analysis in Energy Efficiency, Renewable Energy, and Energy Resiliency (EWG 12 2021A – US) - Status: On-going

The project objective was to build the capacity of workshop participants by developing collaborations between the EWG, APERC, and University faculty

in APEC economies. A hybrid project workshop was held in Bangkok on 11-13 January 2023 for discussion of data gaps and needs in energy efficiency, renewable energy and energy resiliency and developing policy recommendations for the EWG in these areas and sharing examples of collaborative projects that began in June 2021 online workshop by policymakers and Universities in APEC economies. The project is expected to end in June 2023.

4.1.5 Sustainable Mobility: Routes for integrating the Energy and Transport Sectors for Urban Cities (EWG 05 2019A – the US) – Status: Completed, awaiting publication

The project objective was to apply the findings from an existing APEC project proposal and a recent key report that focused on pathways to integrate the energy and transport sectors in APEC islands in APEC cities. A case study on "Planning a transition to electrification of public transit systems – Learnings from the bus rapid system of Metrobus in Mexico City" was submitted to APEC and approved in December 2021. A webinar and panel discussion to disseminate the case study findings were held in February 2021. A capacity-building "virtual" workshop was held in August 2021. This project was completed in Oct 2022 and awaiting the final publication of the case study.

4.1.6 Sustainable Mobility: Routes for integrating the Energy and Transport Sectors for Sustainable Urban Mobility (EWG 02 2022A - The US) – Status: In early implementation

This project would apply the findings from the US recently finished APEC project, which focused on building capacities to better support goals to achieve sustainable mobility solutions in urban cities by integration of the transport and energy sectors. Two to three APEC LAC Economies' cities would receive technical support in improving their planning and implementation of transport decarbonisation policies and strategies and integration with the energy sector. An additional contribution would be to build the knowledge and capacities of decision-makers and technical thought leaders and to engage regional leaders in advancing transport decarbonisation strategies and their integration with the energy sector. The project is in early implementation and is expected to end in December 2023.

4.1.7 Achieving Carbon Neutrality through Bio-Circular-Green (BCG) Model (EWG 10 2021A – Thailand) – Status: In Implementation

The project would review the methodology and the framework of carbon neutral plans around the world, share best practices and lessons learned on carbon neutral policy formulation under BCG Economy Principle, and build

capacity on carbon neutral policy formulation with a balanced integration of RE/EE technologies and regulation with an aim to have one APEC economy as a case study. Documentation studies on carbon neutral policy on power, transport and building sectors with case studies from APEC economies in conjunction with the BCG Economy Model and selected low-carbon technologies with corresponding policy mechanisms were conducted from November 2022 to February 2023. A two-day workshop will in Hawaii along with the Joint EGNRET 58-EGEDA35 Meeting in April 2023 to share best practices on policy formulation and build capacity among APEC economies. The Final Report with Policy Recommendations on achieving carbon neutrality through BCG Economy Model will be submitted in July 2023.

4.1.8 Research on Energy Strategies driving APEC Cities through the Low-carbon Transition (EWG 01 2023S – APSEC / China)

This project aims at researching challenges and formulating strategies for driving APEC cities through the low-carbon transition. Two workshops will be organised. One workshop, co-organised with Hong Kong Polytechnic University, was held alongside the EGEEC60 to explore financing models for collecting city carbon neutrality data. The other workshop will be held at the 9th Anniversary Forum of APSEC and aims at exemplifying a green finance tool specifically for promoting renewable energy and carbon neutrality in cities. The results will be collected in the 2023 APSEC Flagship Report and published by APEC.

4.2 Concept Notes Presentation

One (1) nos. concept note was presented at the meeting and summarised below:

4.2.1 Capacity Building on Energy Performance in APEC region through ISO 50001 Energy Management System Standard

The project aims to build capacity on energy performance in the industry sector by using an energy management system – ISO 50001 as a guideline. The key activities and outputs include a one-day seminar in Thailand to promote the benefits of energy performance improvement and a 5-day group training in Thailand on energy performance improvement according to ISO 50001, which would help the factories and buildings understand the concept

of energy performance improvement by using ISO 50001 as a guideline and improve their energy performance systematically. A report summary of energy performance and a best practice guidebook will be published for sharing with other enterprises in APEC member economies. Lastly, a one-day seminar on experience sharing of successful cases of energy performance improvement among factories and buildings of APEC member economies will be conducted in Thailand.

5 Discussion

5.1 Primary Drivers of Energy Intensity Reduction (APERC)

APERC reported that the APEC energy intensity fell 26.1% between 2005 and 2020. APEC is expected to achieve the energy intensity reduction target in 2034, one year ahead of the goal of reducing energy intensity by 45% by 2035. The modelling in the 8th edition of APEC Energy Demand and Supply Outlook believes that China and the US would show key roles in the future energy intensity reduction as they are the biggest energy consumers, and their total share in the energy intensity reduction is more than half in the future. The Transport, Buildings and Industry sectors accounted for about 26% of the energy intensity reduction in the past decade. The subsector contributors of the transport, buildings and industry sector were presented. The primary drivers of energy intensity reduction were technology improvement, economic structure, energy prices, consumer behaviour, and policies and regulations. Finally, APERC shared two case studies of adopting data analytic technology to optimise energy consumption in China, and Japan's energy conversation policy framework and energy efficiency improvement cases in China were shared as examples of energy intensity reductions.

5.2 Potential New APEC Energy Goals

The EGEEC Chair recapped the work of the small group led by Deputy Lead Shepherd to explore potential new energy-related goal(s) under the EWG63 meeting Agenda item 14(b)(ii). An options paper was prepared to collect broader views from EWG members. The EGEEC Chair briefed the options paper and the pros and cons of the options to facilitate discussion between members.

- Option 1 – Remain unchanged with current goals and explore new goals when data are available.
- Option 2 – Continue to explore new goals.

5.2.1 APSEC

APSEC expressed their support for Option 2. APSEC proposed focusing on an integrated qualitative long-term aspirational goal in connection with carbon neutrality by 2050 for developed economies and 2060 for developing economies.

5.2.2 Malaysia

Malaysia preferred Option 1 given the uncertainties in the post-pandemic recovery period after the COVID-19 pandemic, where many economies have struggled a lot to recover after COVID-19. Research groups are expected to collect more data to provide relevant analysis for future energy goals.

5.2.3 Philippines

Philippines shared the same view with Malaysia that most economies, including the Philippines, were in the post-pandemic recovery period and therefore expressed support for Option 1. However, they added that they had been updating their Energy Plan (with new goals) this year.

5.2.4 Chinese Taipei

Chinese Taipei would choose Option 1. By 2026 the European Union's Carbon Border Adjustment Mechanism will be in force. Chinese Taipei opined that, because of this Mechanism, all the industries and manufacturing firms, such as the steel and cement industries, would focus on carbon reduction issues in their plants. Hence, Chinese Taipei believes they would continue to watch whether the Mechanism would have significantly impact for the whole world or the industry. By then, they may consider setting a new goal, especially for the Asia-Pacific area as many factories are located there.

5.2.5 China

China cited that the Energy Efficiency 2022, recently released by IEA, recorded increased energy efficiency globally. However, it is pointed out that the increase in energy efficiency in many countries was because people had to use less energy due to energy crisis rather than due to the energy efficiency improvement. As almost all the members in the APEC region are recovering from the COVID-19 pandemic, and, likely, they are also facing many different challenges, e.g. financial, especially for some developing members. A holistic approach to consider whether to explore new goals from different angles is suggested instead of merely focusing on energy efficiency improvement.

5.3 Key Areas for Collaboration with APEC Working Groups, Expert Groups, Research Centres and Task Forces

EGEEC Chair encouraged APEC member economies to express their views about collaboration opportunities among APEC Working Groups, Expert Groups, Research Centres and Task Forces as follows:

5.3.1 APEC Automotive Dialogue (AD)

Philippines suggested members or expert groups should have more regular contact and discussions with the representatives from the Transportation Working Group as transportation is one of the major energy consumption sectors for most economies and accounts for a substantial portion of the energy intensity reduction target. EGEEC would contact and explore collaboration opportunities with the Transportation Working Group (TPTWG) and Automotive Dialogue (AD) on the energy efficiency of transportation, such as sharing opportunities, joint workshops or projects.

5.4 Cross-Fora and Organisations Cooperation

CLASP suggested topics for exchanging knowledge, best practices, and case studies to support capacity building in energy efficiency labels and standards of appliances and equipment among APEC economies. These include new efficiency standard development, upgrade of existing standards, identifying the trigger to revise standards, setting the right target, product testing capacity, public communication and consumer education for purchasing high-efficiency appliances to drive market transformation, regional harmonisation of standards, regulation of products sold online, and promotion of high-efficiency products.

China suggested potential collaboration with TOP TENS of EE Hub, who published two sets of best energy-efficiency technologies and practices in key-consuming sectors that governments can promote through their policy measures. Given both TOP TENS and EGEEC both focus on energy efficiency and most of the TOP TENS members are also APEC member economies, China suggested that APEC member economies could have more profound information exchange and discussion with TOP TENS so that more energy efficient technologies and best practices could be introduced to APEC to reduce energy demand and emission.

EGEEC Chair recapped future collaboration opportunities with IEA and EE Hub, which included the Energy Efficiency training week in October 2023 in Indonesia and a workshop on grid-interactive efficient buildings around October/November 2023, organised by IEA, and an exchange lesson from the energy crisis in

accelerating energy efficiency during the 8th Global Conference on Energy Efficiency on 6 June 2023, organised by EE Hub. EGEEC will contact IEA for more details on the training and workshop and build more regular contact with EE Hub to get the latest information updates to share with members.

5.5 EGEEC Governance Issues

5.5.1 EGEEC Contact List

EGEEC Chair reported that the EGEEC Contact List was updated and circulated to members on 9 March 2023. EGEEC Chair encouraged members to nominate experts from APEC economic members to join the EGEEC and regularly review and update the EGEEC contact list to build capacity and share knowledge in energy efficiency and conservation-related policy.

5.5.2 EGEEC Website

EGEEC Chair reported that the meeting documents of the EGEEC 59 had been uploaded to the EGEEC Website. He also encouraged members to send the presentation materials for EGEEC 60 to the EGEEC Secretariat for uploading on the EGEEC website.

5.5.3 Review of EGEEC Terms of Reference

The EGEEC ToR was endorsed on 26 November 2021. The EGEEC ToR has four-year term starting from 1 January 2022 to 31 December 2025. EGEEC Chair encouraged members to review and share if they have any suggestions for amendments.

5.5.4 EGEEC Chair and Vice Chair Selection

EGEEC Chair and Vice Chair Selection for the term 2023 to 2025 were conducted. Two nominations were received during the nomination period from 1 to 28 February 2023. Ms CHEUNG Man Chit Jovian from Hong Kong, China was nominated for the Vice-chair position and Dr LIU Meng from China was nominated for the Chair position. No objections were received before the Selection and participating members reached a consensus to endorse the two nominations for the EGEEC Chair and Vice Chair to start tenure from 1 July 2023 to 30 June 2025. The selection results would be circulated to all EGEEC members for official endorsement within one week of the EGEEC 60 meeting as some member economies were absent in the selection process.

5.5.5 Upcoming EGEEC Meetings

EGEEC Chair announced that the Philippines would host the upcoming Joint EGEEC 61 and EGNRET 59 meetings in October 2023.

EGEEC Chair encouraged member economies to host the upcoming EGEEC meetings in the first and second half of 2024. China expressed their interests in hosting a joint meeting in 2024.

5.5.6 Upcoming Energy Working Group & Energy Ministers' Meetings

EGEEC Chair announced that the United States would host the 65th Meeting of APEC Energy Working Group (EWG 65) in conjunction with the 2023 2nd Senior Officials Meeting (SOM2) in Detroit, the United States, from 19 to 22 May 2023. The United States will host the 13th Energy Ministers' Meeting on 16 August 2023 in conjunction with the 2023 3rd Senior Officials Meeting (SOM3) in Seattle.

5.5.7 EGEEC 60 Report

The EGEEC Secretariat presented the EGEEC 60 outcomes, key conclusions and actions to be reported to EWG at the EWG65.

5.5.8 EGEEC 61

Philippines shared the details, including the indicative theme and program, about the Joint EGEEC 61 and EGNRET 59 Meetings in October 2023.

5.5.9 Any Other Business

The current EGEEC Chairman, Mr VY and Vice-chair, Dr LI Peng Cheng, were invited to give a farewell speech as they would finish their terms of service by the end of June 2023.

6 Closing Remarks

Mr PANG Yiu-hung, Director of the Electrical and Mechanical Services Department (EMSD), Hong Kong China, gave the closing remarks. He thanked all the speakers and delegates for their participation and sharing of information in the 60th EGEEC hybrid meeting, which could contribute to the advancements in the work of energy efficiency and the success of this meeting. He expressed gratitude to My VY, the current EGEEC Chair and Dr LI Peng-cheng, the current Vice-chair, for their contributions to the EGEEC during their two consecutive terms of office in the past

four years and congratulated the new EGEEC Chair and Vice-chair for the coming term from 2023 to 2025. Mr Pang hoped that the participants would continue with the mission and passion of enhancing energy efficiency and exploring improvement measures to achieve APEC's energy intensity reduction goal. He stressed that Hong Kong would continue to play a leading role in the EGEEC and participate in the APEC work to strengthen collaboration with other APEC member economies and international organisations. Lastly, he announced that Hong Kong would host the 35th Meeting of the APEC Expert Group on Energy Data and Analysis in the first half of 2024 and welcomed the participants to join.

Appendix A – EGEEC 60 List of Participants

No	Full Name		Economy / APEC Sub-fora / Organisation	Organization
	First Name	Last Name		
1	Ek-chin	VY	EGEEC Chair	Electrical and Mechanical Services Department
2	Peng-cheng	LI	EGEEC Vice-chair	China National Institution of Standardization
3	Jovian	CHEUNG	EGEEC Secretariat	Electrical and Mechanical Services Department
4	Chun-yin	LI	EGEEC Secretariat	Electrical and Mechanical Services Department
5	Cassie	BENFELL	Australia	Department of Climate Change, Energy, the Environment and Water
6	Lesley	DOWLING	Australia	Department of Climate Change, Energy, the Environment and Water
7	Matt	MARCHESI	Australia	Department of Climate Change, Energy, the Environment and Water
8	Micah	SPRY	Australia	Department of Climate Change, Energy, the Environment and Water
9	Nicholas	WING	Australia	Department of Climate Change, Energy, the Environment and Water
10	Meng	LIU	China	China National Institution of Standardization
11	Chin-wan	TSE	Hong Kong, China	Environment and Ecology Bureau
12	Dragon	LI	Hong Kong, China	Environment and Ecology Bureau
13	Yiu-hung, Eric	PANG	Hong Kong, China	Electrical and Mechanical Services Department
14	Kei-ming, Barry	CHU	Hong Kong, China	Electrical and Mechanical Services Department
15	Hon-wa, George	LIU	Hong Kong, China	Electrical and Mechanical Services Department
16	Oscar	AU	Hong Kong, China	Electrical and Mechanical Services Department
17	Sin-man Becky	CHIM	Hong Kong, China	Electrical and Mechanical Services Department
18	Wai-ling, Elaine	YIP	Hong Kong, China	Electrical and Mechanical Services Department
19	Klaus	TSANG	Hong Kong, China	Electrical and Mechanical Services Department
20	Patrick	YIM	Hong Kong, China	Electrical and Mechanical Services Department
21	Jamie	CHIM	Hong Kong, China	Trade and Industry Department
22	Joanie	FOK	Hong Kong, China	Trade and Industry Department
23	John	LAM	Hong Kong, China	Trade and Industry Department
24	Naoko	DOI	Japan	The Institute of Energy Economics, Japan
25	Norazrin	RUPADI	Malaysia	Energy Commission
26	Siti Sarah	SHARUDDIN	Malaysia	Ministry of Natural Resources, Environment and Climate Change
27	Patrick	AQUINO	Philippines	Department of Energy, Philippines
28	Jimwel	BALUNDAY	Philippines	Department of Energy, Philippines
29	Lucius	TAN	Singapore	Energy Market Authority
30	Henry	LO	Chinese Taipei	Industrial Technology Research Institute (ITRI)
31	Chun-yen, Clement	OU	Chinese Taipei	Industrial Technology Research Institute (ITRI)

No	Full Name		Economy / APEC Sub-fora / Organisation	Organization
	First Name	Last Name		
32	Warote	CHAINTARAWONG	Thailand	Department of Alternative of Energy Development and Efficiency (DEDE), Ministry of Energy
33	Sutthasini	GLAWGITIGUL	Thailand	Department of Alternative of Energy Development and Efficiency (DEDE), Ministry of Energy
34	Lapatsatorn	JIENGWAREEWONG	Thailand	Department of Alternative of Energy Development and Efficiency (DEDE), Ministry of Energy
35	Kittiya	KAEWMEE	Thailand	Department of Alternative of Energy Development and Efficiency (DEDE), Ministry of Energy
36	Wisaruth	MAETHASITH	Thailand	Department of Alternative of Energy Development and Efficiency (DEDE), Ministry of Energy
37	Sukanya	NANTA	Thailand	Department of Alternative of Energy Development and Efficiency (DEDE), Ministry of Energy
38	Thiti	RATCHADATIKUN	Thailand	Department of Alternative of Energy Development and Efficiency (DEDE), Ministry of Energy
39	Patcharee	SATTAYARANGSAN	Thailand	Department of Alternative of Energy Development and Efficiency (DEDE), Ministry of Energy
40	Munlika	SOMPRANON	Thailand	Department of Alternative of Energy Development and Efficiency (DEDE), Ministry of Energy
41	Cary	BLOYD	United States	Pacific Northwest National Laboratory (PNNL)
42	Tuan	NGUYEN	Viet Nam	Viet Nam EWG Office, Ministry of Industry and Trade
43	Takuo	MIYAZAKI	APEC Secretariat	APEC Secretariat
44	Kate	SELLEY	EWG Secretariat	The United States Department of Energy
45	Edito	BARCELONA	EGEDA	Asia Pacific Energy Research Centre (APERC)
46	Kung Wen (Raven)	CHIANG	EGNRET	Industrial Technology Research Institute (ITRI)
47	Reiko	EDA	EGCFE	Ministry of Economy, Trade and Industry (METI)
48	Jeongdu	KIM	APERC	Asia Pacific Energy Research Centre (APERC)
49	Zhichao	LI	APERC	Asia Pacific Energy Research Centre (APERC)
50	Steivan	DEFILLA	APSEC	APEC Sustainable Energy Center (APSEC)
51	Zhexing	YAN	APSEC	APEC Sustainable Energy Center (APSEC)
52	Natalie	KAUF	IEA	International Energy Agency
53	Ksenia	PETRICHENKO	IEA	International Energy Agency
54	Jonathan	SINTON	EE Hub	Energy Efficiency Hub
55	Lei (Steven)	ZENG	CLASP	Collaborative Labeling and Appliance Standards Program
56	Joy	GAI	WGBC	World Green Building Council