

## The 58th Meeting of APEC Expert Group on Energy Efficiency & Conservation (EGEEC 58) and Associated Workshop

### Meeting Summary

29 March to 1 April, 2022

Virtual Meeting hosted by China

#### 1. Introduction

The 58th Meeting of the APEC Expert Group on Energy Efficiency & Conservation (EGEEC 58) and associated workshop was hosted by China from 29 March to 1 April 2022.

“APEC Workshop on Peer Review on Energy Efficiency (PREE) Phase 11” (EWG 02 2021A)” was organised by APERC on 29 March 2022. The EGEEC 58 was held from 30 March to 1 April 2022.

Delegates from fourteen (14) APEC member economies, namely Australia; China; Hong Kong, China; Indonesia; Japan; Republic of Korea; Malaysia; New Zealand; Peru; The Philippines; Singapore; Chinese Taipei; Thailand; The United States, and representatives from six (6) APEC fora and sub-fora, including APEC Secretariat; Expert Group on Energy Data and Analysis (EGEDA); Expert Group on New and Renewable Energy Technologies (EGNRET); Asia Pacific Energy Research Center (APERC); APEC Sustainable Energy Center (APSEC); and APEC Automotive Dialogue (AD) attended the meeting. Moreover, representatives from four (4) international organisations, namely the Energy Efficiency Hub (EE Hub); World Green Building Council (WGBC); Collaborative Labelling and Appliance Standards Program (CLASP); and the International Copper Association (ICA), participated in the meeting as speakers and observers.

Seventy-eight (78) participants attended the EGEEC 58. The list of EGEEC 58 participants is attached in Appendix A of the meeting summary.

#### 2. The EGEEC 58 (30 March to 1 April, 2022, 09:00 – 12:00, GMT+8)

The EGEEC 58 was co-chaired by Mr Vy Ek-chin, Chair of EGEE&C, and Dr Li Peng-cheng, the host representative and Leader of Energy Conservation and Low Carbon Team China National Institute of Standardisation.

## **2.1 Opening Remarks and Adoption of Meeting Agenda**

Dr Li Pengcheng, on behalf of the host economy China, gave the opening remarks to highlight the importance of energy efficiency in view of the current situation of global energy stability. Dr Li pointed out that energy efficiency was well known to provide multiple benefits, including energy security, cost saving, employment and economic growth. He acknowledged the achievement of the EGEE&C commitment to conduct plenty of productive collaborations to build capacity and technical knowledge on energy intensity reduction in the APEC region since the 1990s. Dr Li highlighted that digital technologies provided a massive potential for member economies to improve energy efficiency smartly and effectively. Through this inspiring meeting, he wished that member economies could share policies and experiences by using emerging technologies to promote energy efficiency and conservation and progress towards the APEC energy intensity reduction goal.

The EGEEC 57 Summary was confirmed, and the EGEEC 58 Agenda was adopted by attending member economies.

## **2.2 Energy Development in China**

China presented the annual energy consumption and GDP growth rate in China from 2007 to 2017, the key challenges and achievements in energy conservation. China also shared the strategy for meeting 2030 - 2060 targets, including peaking CO<sub>2</sub> emission by 2030 and achieving carbon neutrality by 2060, the main tasks to be conducted in the key sectors, and the framework for energy efficiency in the National Comprehensive Plan (2021-2025).

## **2.3 Updates from APEC Secretariat / EWG / EGEDA / EGNRET / APERC / APSEC**

Six (6) presentations were conducted as follows:

### **2.3.1 “APEC Secretariat Update” by Mr Takuo Miyazaki, Program Director, APEC Secretariat**

APEC Secretariat announced the outcome of session 2, 2021. In project session

2, 2021, 74 nos. of concept notes were submitted, with 62 nos. of concept notes (84%) being approved in principle by the BMC. APEC Secretariat introduced the schedule and available project funds for Project Session 1, 2022. APEC Secretariat highlighted 3 key areas for improvement from the Longer-Term Evaluation of APEC projects (LTEAP): Targeting project participants more effectively; greater application of project learning by participants; and increasing participation rates to maximise capacity building outcomes.

### **2.3.2 “Key Outcomes from EWG 62” by Ms Jovian Cheung, EGEE&C Secretariat**

EGEE&C Secretariat reported the key conclusions of the APEC EWG 62 meeting held from 18 to 22 October 2021. EGEE&C Secretariat shared the issues of Thailand’s policy dialogue on “Bio-Circular-Green Model: Energy Transition for Sustainable and Inclusive Growth”; APERC 8<sup>th</sup> edition APEC Energy Demand and Supply Outlook; LCMT project; review of APEC energy intensity reduction and double the share of renewable energy in APEC’s overall energy mix goals; roaster of EWG hosts from 2022 to 2034; and Mr CHU Kei Ming Barry of Hong Kong, China was selected as the EWG Deputy Lead Shepherd for 2021 – 2023.

### **2.3.3 “EGEDA Update” by Mr Edito Barcelona, EGEDA Secretariat**

EGEDA reported the status of data collection for the APEC energy statistics, APEC Energy Handbook for 2019 and 2020, and the Energy Efficiency Indicators Template. He provided updates on the 19<sup>th</sup> APEC workshop on energy statistics that was held on 28 to 30 June 2021, the schedule and agenda of training courses on energy statistics in 2022, and a summary of the 32<sup>nd</sup> EGEDA meeting on 12 and 13 October 2021. He informed that the 33<sup>rd</sup> EGEDA meeting would be hosted by the Philippines from 26 to 28 October 2022 with additional agenda on the hydrogen data collection template. EGEDA sought the assistance of EGEE&C members in District Cooling and Heating Systems data collection. In addition, EGEDA would explore with EGEE&C for collaboration area in a workshop on Promoting Energy Efficient and Resilient Data Centres in the APEC Region during the workshop in June 2022.

### **2.3.4 “ENGRET Update” by Dr Tarcy Jhou, ENGRET Secretariat**

ENGRET reported the issues of the 55<sup>th</sup> EGNRET meeting held on 12-14 May 2021. She announced that the 56<sup>th</sup> EGNRET meeting would be hosted by the US on 6 and 7 April 2022. She also updated that the 57<sup>th</sup> EGNRET meeting would be a joint meeting with EGEE&C to be hosted by Thailand in November 2022. A “Capacity Building Workshop on APEC’s Goals of Doubling the Renewable Energy Share in the Energy Mix and Reducing Energy Intensity” alongside the meeting to explore a closer collaboration in achieving APEC’s goals and carbon neutrality.

### **2.3.5 “APERC Update” by Mr Glen Sweetnam, Senior Vice President, APERC**

APERC presented the historical energy intensity results for the APEC region. He revealed that energy intensity declined significantly in 2019 and fell 25.1% between 2005 and 2019. APERC also updated that the 8<sup>th</sup> Edition of APEC Energy Demand and Supply Outlook would include two scenarios, namely Reference Scenario and Net-zero Scenario. The impact of COVID-19 on GDP would be incorporated in the 8<sup>th</sup> edition in the 2020-2025 time frame. The 8<sup>th</sup> edition was scheduled for publishing in Q2 of 2022. Based on preliminary results, APEC would achieve its energy intensity goal by 2035 and 2031 in the Reference and Net-zero scenarios, respectively.

### **2.3.6 “APSEC Update” by Dr Zhexing Yan, Researcher, APSEC**

APSEC presented its research on (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), and (iii) “Research and Demonstration on Key Technologies of Comprehensive Utilisation of Wind, Solar and Geothermal Energy Based on Artificial Intelligence”. He shared the results of the 6<sup>th</sup> APEC Workshop on Sustainable Cities on 6 December 2021 in China and updated that a concept note on “Data-Driven Carbon Neutral Disaster Resilient Cities” was submitted for Session 1, 2022.

## **2.4 Invited Presentations**

Three (3) invited presentations were conducted as follows:

#### **2.4.1 “APEC Automotive Dialogue (AD) Presentation” by Mr Todd Peterson, Chair of the AD**

APEC AD shared the Electric Vehicles (EVs) roadmap, the APEC advanced vehicle technologies technical engagement program and the key recommendations for policymakers to prepare for the transition to EVs. EGEE&C would explore collaboration opportunities with AD on the energy efficiency of transportation, in particular EVs.

Member economies appreciated AD sharing its works and suggested inviting AD to the upcoming EGEE&C meetings to explore collaboration opportunities.

#### **2.4.2 “Energy Efficiency Hub Presentation” by Dr Jonathan Sinton, the Head of Secretariat of the Energy Efficiency Hub (Hub)**

The Energy Efficiency Hub (Hub) Secretariat introduced that the Hub was established in December 2021 as a new platform for global collaboration on energy efficiency. Its Secretariat is hosted at the IEA to take advantage of natural synergies with the work of the Agency. The Hub aims to facilitate government-to-government exchanges on efficiency policy, regulation and implementation, focusing on buildings, industry, appliances, and transport. Currently, the Hub has four Task Groups:

1. The Digitalisation Working Group led by the United States;
2. The Super-Efficient Equipment and Appliance Deployment (SEAD) Initiative led by the UK, Europe Commission, Indian and Sweden;
3. Top Tens, which identifies best technologies and practices led by China; and
4. The Energy Management Action Network (EMAK), devoted to energy management systems in industry and buildings led by Japan.

Member economies appreciated the Hub sharing its developments and suggested inviting the Task Groups to the EGEE&C meetings and sharing their works to explore collaboration opportunities.

### 2.4.3 “World Green Building Council Presentation” by Dr Cary CHAN, Chair of World Green Building Council’s Asia Pacific Regional Network (WGBC)

WGBC shared the “Whole Life Carbon Vision by 2030 and 2050” initiative, its strategy and action by various economies, and the net-zero readiness framework to aid gap analysis with examples of some member economies.

Member economies valued WGBC sharing its initiatives and acknowledged the importance of net-zero energy building to achieve future low carbon goals. Member economies also suggested inviting WGBC to future meetings with a continual role in EGEE&C.

## 3 Project Updates Presentation

The status of thirteen (13) nos. of the APEC projects were reported during the meeting and summarised below.

APEC Project Title		Proposing Economy	Project No.	Status
1	APEC Workshop on Evaluation of Energy Technologies, Programs and Policies	The US	EWG 12 2019A	Completed
2	Routes for integrating the Energy and Transport Sectors for Urban Cities	The US	EWG 05 2019A	On-going
3	APEC Workshop Furthering University Collaboration to Support Data Gathering and Analysis in Energy Efficiency, Renewable Energy, and Energy Resiliency	The US	EWG 12 2021A	On-going
4	Exploring Co-Benefit Opportunities for Renewable and Energy Efficiency Projects in the APEC Region	Thailand	EWG 04 2019A	On-going
5	Accommodating Disruptive Technology into RE&EE Policy for Energy Security	Thailand	EWG 11 2019A	On-going
6	Integrating Electrical Vehicles and Solar Rooftop PV in Electricity Distribution Systems with Continued Performance of Distribution Transformers	Thailand	EWG 03 2020A	On-going
7	Energy Intensity Reduction in the APEC Region’s Urbanised Cities	Hong Kong, China	EWG 08 2019A	Completed

8	APEC Capacity Building Workshop on Retro-commissioning (RCx)	Hong Kong, China	EWG 09 2020A	On-going
9	Promoting Energy Efficient and Resilient Data Centres in the APEC Region	Hong Kong, China	EWG 05 2021A	On-going
10	Capacity Building Workshop on APEC's Goals of Doubling the Renewable Energy Share in the Energy Mix and Reducing Energy Intensity	Hong Kong, China	EWG 08 2021S	On-going
11	APEC Best Practice Guidelines for Establishing and Enhancing Energy Efficiency Incentive (EEI) Schemes	Australia	EWG 09 2018A	Completed
12	Research on means to overcome the shortage of basic urban energy-climate data - APEC CNSC Workshop held on 16 Sept 2021	China	EWG 04 2021S	On-going
13	Research on means to diminish the financing gap for sustainable urban energy - 6th APEC Workshop on Sustainable Cities held on 9 Dec 2021 on Green Finance for Sustainable Urban Energy	China	EWG 09 2021S	On-going

### **3.1.1 Evaluation of Energy Technologies, Programs and Policies (EWG 12 2019A – the US) – Status: Completed**

The objectives of this project were to bring together policymakers and evaluation practitioners to highlight evaluation methods and analysis and evaluate energy technologies, programs and policies. Four 2-hour webinar sessions were held in September 2021 to assess and collect data for effective evaluations, strengthening evaluation value, and capacity building. The final report was approved and published on the APEC website in February 2022.

### **3.1.2 Sustainable Mobility: Routes for integrating the Energy and Transport Sectors for Urban Cities (EWG 05 2019A – the US) – Status: On-going**

The objective of this project was to find integrated pathways for sustainable mobility, specifically finding key coordination points between the transport and energy sectors at the initial planning stages – that would enable greater deployment of clean transport options. 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 carried out. A webinar and panel discussion to disseminate the case study findings was held in February 2021, and a capacity

building virtual workshop was held in August 2021. The final project report was under review for approval.

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

The overall objective of this project was to build the capacity of workshop participants by developing a network between the EWG, APERC, APSEC and University faculty in APEC economies. The EWG could continue the discussion of data gaps and needs in EE, RE and ER and develop policy recommendations for EWG. A 3-day in-person workshop was planned to be held in Bangkok, Thailand, tentatively in August 2022, with a site visit to King Mongkut’s University of Technology Thonburi (KMUTT).

### **3.1.4 Exploring Co-Benefit Opportunities for Renewable and Energy Efficiency Projects in the APEC Region (EWG 04 2019A - Thailand) – Status: On-going**

The objectives of this project were:

1. To share best practices of successful joint projects for RE & EE implementation with co-benefits;
2. To develop guidelines with criteria and framework for RE&EE projects with co-benefits;
3. To share an example of cost benefit analysis (CBA) on successful projects; and
4. To build capacity and network for potential co-benefitting EE&RE project developers.

Two workshops were organised from 18 to 19 March 2021 and 19 to 20 July 2021, respectively, in virtual-hybrid format. Key success factors were extracted from successful RE & EE projects & policy criteria in APEC. Technical criteria for RE & EE co-benefit were finalised through Eligibility-Priority-Scoring APEC proposal evaluation. Eighty-two (82) participants from thirteen (13) member economies attended the first workshop, and fifty-three (53) attendees from nine (9) member economies participated the second workshop. The final report was under revision for endorsement.



### **3.1.5 Accommodating Disruptive Technology into RE&EE Policy for Energy Security (EWG 11 2019A - Thailand) – Status: On-going**

The objectives of this project were:

1. To review the impact of disruptive technologies on the power generation and distribution, transport, and buildings sector;
2. To share best practices on RE&EE policy to accommodate the disruptive technologies; and
3. To build capacity on the integration of disruptive technologies for energy security.

A workshop was organised on 29 and 30 April 2021 in a virtual format with ninety-eight (98) participants from thirteen (13) APEC member economies. Best practices on disruptive technology supporting RE & EE policies were shared at the workshop. In addition, participants brainstormed on RE & EE policies for the smooth integration of disruptive technologies. The final report with policy recommendations was submitted and is pending endorsement.

### **3.1.6 Integrating Electrical Vehicles and Solar Rooftop PV in Electricity Distribution Systems with Continued Performance of Distribution Transformers (EWG 03 2020A - Thailand) – Status: On-going**

The project aimed to promote the EV charging stations and solar rooftop PV connected to the grid, address the performance of distribution transformers, and enhance the grid stability. The objectives of this project were to describe and quantify the problems and propose technical and policy solutions to mitigate the issues. The project would review international and APEC experiences. The key findings on the potential impact of solar PV and EV on distribution networks and transformers were presented. A workshop would be organised in virtual format on 22 April 2022.

### **3.1.7 APEC Workshop on Energy Intensity Reduction in the APEC Region's Urbanised Cities (EWG 08 2019A - Hong Kong, China) – Status: Completed**

The objective of this project was to develop a guide for policymakers, particularly for developing economies, to urbanise their cities to a low aggregated energy

intensity in one sitting. The energy efficiency policies and energy intensity reduction performance of seven selected urbanised cities in APEC member economies were analysed. The conceptual study was completed and the study report was submitted to APEC on 24 August 2020. Furthermore, a workshop was conducted on 23 March 2021 with over 100 participants from twelve (12) APEC member economies and seven organisations. The final study report was under reviewed for endorsement.

### **3.1.8 APEC Capacity Building Workshop on Retro-commissioning (RCx) (EWG 09 2020A - Hong Kong, China) - Status: On-going**

This project aimed to promote RCx in the APEC region by providing a platform for fostering the growing importance of RCx from the perspective of improving energy efficiency in driving progress toward APEC's energy intensity reduction goal and increasing employment opportunities and economic activities post COVID-19. An online workshop cum training was held on 20 and 21 January 2022, with over 100 participants from 11 APEC member economies. Key insights from the Workshop were presented including (i) RCx played an important role in motivating the development of low carbon and high performance in existing buildings; and (ii) suggestion to form a RCx Resources Hub to facilitate further collaboration and knowledge sharing among the APEC member economies. The workshop summary was targeted to be submitted in early April 2022.

### **3.1.9 Promoting Energy Efficient and Resilient Data Centres in the APEC Region (EWG 05 2021A - Hong Kong, China) - Status: On-going**

This project aimed to analyse the energy efficiency and resilience policies, international guidelines and standards, practices and the deployment of innovative technologies for the data centre to progress toward a "Digital Economy". A capacity building workshop would be organised on 28 and 29 June 2022 to share policies, standards, guidelines, best practices and advanced technology for the deployment of green data centres.

### **3.1.10 APEC Workshop on 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: On-going**

Hong Kong, China would collaborate with EGEE&C and EGNRET to organise a capacity building workshop on APEC's Goals of Doubling the Renewable Energy Share in the Energy Mix and Reducing Energy Intensity. The project aimed to review and project the APEC regional goals progress, promote the effective energy intensity reduction and renewable energy policies and best practices, and highlight new EE & RE policy and framework with a view to accelerating the progress toward achieving the APEC goals in combating the climate challenges. A capacity building workshop would be organised alongside the joint EGEE&C and EGNRET meeting in November 2022.

### **3.1.11 APEC Best Practice Guidelines for Establishing and Enhancing Energy Efficiency Incentive (EEI) Schemes (EWG 09 2018A - Australia) - Status: Completed**

The objective of the project was to identify and document best practice guides for the design and review of energy efficiency incentive schemes. The project overseer provided an update on the Best Practice Handbook for Establishing and Enhancing Energy Efficiency Obligation Schemes, which was published [online](#) in December 2021. The handbook will help policy makers in establishing an energy efficiency obligation scheme, and reviewing and enhancing established schemes.

### **3.1.12 Research on the Role of Urban Planning for Addressing Climate Change and Disasters (EWG 09 2019S - China/APSEC) - Status: Completed**

This self-funded project aimed to identify how urban planning of APEC cities can be improved for creating resilience to the increasing number of extreme climate events and other disasters. The APEC Report on Integrated Urban Planning for Climate and Disaster Resilience was released in July 2020.

### 3.1.13 Research on Means to Overcome Shortage of Basic Urban Energy – Climate Data (EWG 04 2021S - China/APSEC) - Status: On-going

This self-funded project aimed at exploring the feasibility of constructing an urban Sustainable Development Goals (SDG) database for APEC cities provisionally called “APEC Urban SDG Tracker for Energy and Climate”. The purpose of this database was to contribute to filling the data shortage of SDG-relevant urban data as described in project reports EWG 11 2018S and EWG 09 2019S. The latter also explained the benefits of simultaneously addressing local SDG indicators and Disaster Resilience Scorecard criteria for Cities. The planned activities comprised (i) discussing the definition of the feasible input data sets and the desired output visualisation tools with a group of APEC pilot cities and a data user group; (ii) programming the input and output portals and the database; (iii) receiving feedback from the test runs; and (iv) discussing how knowledge transfer and capacity building would be organised for further development.

## 3.2 Concept Notes Presentation

Three (3) nos. of concept notes were presented at the meeting and summarised below:

APEC Concept Notes		Proposing Economy
1	Routes for integrating the Energy and Transport Sectors for Sustainable Urban Mobility	The US
2	Data Driven Carbon Neutral Disaster Resilient Cities	China
3	Promoting Energy Modelling in APEC Region	Hong Kong, China

### 3.2.1 Routes for integrating the Energy and Transport Sectors for Sustainable Urban Mobility (US)

This project would apply the findings from the US recently finished APEC project "Sustainable Mobility: Routes for Integrating the Energy and Transport Sectors for Urban Cities (EWG 05 2019A)" to generate at least two Technical Assistance (TA) to two or three selected cities in Latin-American APEC economies to address policy/technical/planning barriers and solutions for the implementation of transport decarbonisation projects. An additional contribution to building regional knowledge and expertise in the development of transport decarbonising

strategies would be shared and disseminated through this project.

### **3.2.2 Data Driven Carbon Neutral Disaster Resilient Cities (China)**

The objectives of this project were to accelerate the development toward carbon neutrality by increasing the number of APEC cities or municipalities having the capacity to collect relevant data by training local planning officers in cooperation with a local university and using a multi-stakeholder dialogue to become carbon neutral and energy inclusive.

### **3.2.3 Promoting Energy Modelling in APEC Region (Hong Kong, China)**

Energy modelling would be indispensable for forecasting energy consumption and tracking low carbon transition progress. This project would organise a one-day capacity building workshop to share the pre-workshop study findings, the strengths of various energy forecast models and the experiences and practices of APEC member economies on their use of energy models.

## **4 Economy Updates**

A meeting theme, “Energy Efficiency and Digitalisation”, was proposed by the host, China. Nine (9) economies presented the economy updates and were summarized below:

**4.1 Australia** outlined updates to its Annual Low Emissions Technology Statement, Minimum Energy Performance Standards. Australia also introduced its Industrial Energy Tools and Grant Program, and Food and Beverage Grants. Australia further introduced the Clean Energy Finance Corporation, which was Australia’s specialist clean energy investor.

**4.2 China** reported its energy efficiency status, energy policies under the 14th Five-Year Plan (2021 – 2025) and 15th Five-Year Plan (2026 – 2030), energy efficiency priority and the digitalisation in the energy efficiency sector.

**4.3 Hong Kong, China** reported its carbon neutrality target, energy intensity reduction and carbon emission reduction status. Hong Kong, China further shared the energy efficiency initiatives, including green energy target, district cooling systems, mandatory energy efficiency labelling scheme, building energy efficiency ordinance, retro-commissioning, green school 2.0 programme, Green Welfare NGOs, Green Tech Fund and Green I&T Day.

**4.4 Japan** shared its latest developments in energy conservation policies and the challenges for the future goal. An overview and historical development of the Energy Conservation Law, demand-side actions for carbon neutrality, changing electricity supply structure, and demand response of optimal use of electricity were introduced by Japan.

**4.5 Malaysia** reported its energy efficiency initiatives, Efficient Management of Electrical Energy Regulation, Minimum Energy Performance Standards, National Energy Efficiency Action Plan 2016-2025, and Way Forward for Energy Efficiency.

**4.6 Singapore** shared its net zero carbon emission timeline and the carbon tax initiative to support decarbonisation efforts. Singapore further shared the energy saving programs in the industrial sector, including raising the grant support cap and enhancing energy generation facilities.

**4.7 Chinese Taipei** reported its energy conservation goal and the energy intensity improvement from 2017 to 2025. Chinese Taipei also introduced mandatory and voluntary labelling programs, energy transition indicators, and the energy labelling customised automated auxiliary online market surveillance system.

**4.8 Thailand** introduced its National Energy Plan, including the energy efficiency target and the 4D1E policy (Digitalisation, Decarbonisation, Decentralisation, Deregulation and Electrification). Thailand further introduced its energy-related

projects, including the digitalisation of energy conservation and energy efficiency platform.

**4.9 The United States** reported its funding for clean energy under the Bipartisan Infrastructure Law and the Bipartisan Infrastructure programs. The US further introduced the role of digitalisation across the advanced grid R&D portfolio.

## 5 Discussion

### 5.1 APEC Energy Intensity Reduction Goal

APERC presented the APEC energy intensity trends from 2005 to 2019. Results showed that final energy intensity declined every year since 2005 and 2019 had the most significant reduction. The energy intensity fell 25.1% between 2005 and 2019.

The sub-sector comparison of total final energy consumption (TFEC) (i.e. growth of the TFEC vs growth of GDP) of four subsectors, including industrial, road transport, commercial and residential, was also presented. There were only five economies, namely Australia, Hong Kong, China, Japan, Chinese Taipei and the United States, in which the growth of the energy consumption in all subsectors was lower than the growth of the related indicator. Case studies of two economies, namely Japan and Chinese Taipei, were introduced.

In the APEC Energy Outlook 8th edition draft results, APEC was expected to reach its 2035 energy intensity target in 2035 for the Reference Scenario and 2031 for the Carbon Neutral Scenario although each member economy took its own path.

### 5.2 Cross Fora and Organisations Cooperation

EGEE&C Chair reported the cooperation with the APEC Automotive Dialogue (AD), the Energy Efficiency Hub (Hub) and the World Green Building Council (WGBC) at the EGEE&C 58.

EGEE&C Chair suggested continuing the collaboration with the three organisations,

particularly inviting the Task Groups of the EE Hub to introduce their works at the upcoming EGEE&C meetings with a view to exploring further collaboration opportunities.

### **5.3 Key Areas for Collaboration with APEC Expert Groups**

EGEE&C Chair reported the areas for collaborative actions / joint activities between Expert Groups as follows:

#### **Collaboration with EGEDA**

EGEDA Secretariat updated that the data collection for the energy efficiency indicators template was completed and the result would be announced in July 2022.

EGEDA Secretariat pledged support from EGEE&C member economies to provide District Cooling and Heating System data.

#### **Collaboration with EGNRET**

EGEE&C and EGNRET would organise the joint EGEE&C 59 and EGNRET 57 meetings and joint workshop. The joint workshop would be a capacity building workshop on APEC's Goals of Doubling the Renewable Energy Share in the Energy Mix and Reducing Energy Intensity (EWG 08 2021S)

Thailand would host the joint meetings and workshop in November 2022.

### **5.4 EGEE&C Governance Issues**

#### **5.4.1 Review of Terms of Reference (ToR)**

EGEE&C Chair reported that the Terms of Reference (ToR) for the EWG and its six subsidiary bodies, including EGEE&C ToR, were endorsed by SCE and renewed on 26 November 2021. The renewed EGEE&C ToR was effective from 1 January 2022 to 31 December 2025.



#### **5.4.2 EGEE&C Contact List**

EGEE&C Chair reported that the EGEE&C Contact List was updated and circulated to members on 10 March 2022.

#### **5.4.3 EGEE&C Website**

EGEE&C Chair reported that the APEC website upgrading was completed in mid-March 2022. The meeting documents of the EGEE&C 57 were uploaded to the EGEE&C Website. He also encouraged member economies to share the EGEE&C policies by posting that information on the EGEE&C website.

#### **5.4.4 Date and Venue for Upcoming EGEE&C Meetings**

EGEE&C Chair announced that Thailand would host the 59<sup>th</sup> EGEE&C in November 2022. Thailand gave a brief introduction of the coming meeting. The EGEE&C Secretariat would liaise with Thailand on the meeting arrangement.

EGEE&C Chair encouraged member economies to host the EGEE&C meetings in 2023 and 2024.

#### **5.4.5 Date and Venue for Upcoming EWG Meeting**

EGEE&C Chair announced that the 63<sup>rd</sup> Meeting of APEC Energy Working Group (EWG 63) would be hosted by Chinese Taipei from 20 to 24 June 2022.

#### **5.4.6 EGEE&C 58 Outcomes**

The EGEE&C Secretariat presented the key conclusions and actions to be reported to EWG at the EWG63.

## **6 Closing Remarks**

Mr Lei Xiang, Deputy Director, National Energy Administration of China, gave the closing

remarks. Mr Lei thanked all delegates for participation in the 58th EGEE&C. He addressed that energy was one of the pillars of economic and social development and addressed that China had been actively carrying forward the revolution in energy production and consumption. He shared that China has played an active role in international cooperation on energy efficiency and encouraged member economies to exchange knowledge and practices in enhancing energy efficiency in the APEC region and fostering green and low carbon development in response to climate change.



Asia-Pacific  
Economic Cooperation

APEC Expert Group on Energy Efficiency and Conservation (EGEE&C)  
Under the APEC Energy Working Group

## Appendix A – EGEEC 58 List of Participants

No	Full Name		Economy / APEC Sub-fora / Organisation	Organization
1	Vanessa	Morris	Australia	Department of Industry, Science, Energy and Resources
2	Leonardo	Hronsky	Australia	Department of Industry, Science, Energy and Resources
3	Claire	Lewis	Australia	Department of Industry, Science, Energy and Resources
4	Lauren	Mackaway	Australia	Department of Industry, Science, Energy and Resources
5	Vanessa	Morris	Australia	Department of Industry, Science, Energy and Resources
6	George	Sagris	Australia	Department of Industry, Science, Energy and Resources
7	Lesley	Dowling	Australia	Department of Industry, Science, Energy and Resources
8	Pengcheng	LI	China	CNIS
9	Ren	LIU	China	CNIS
10	Meng	LIU	China	CNIS
11	Arthur	LEE	Hong Kong, China	Electrical and Mechanical Services Department
12	Chun-yin	LI	Hong Kong, China	Electrical and Mechanical Services Department
13	Barry	CHU	Hong Kong, China	Electrical and Mechanical Services Department
14	Tony	Chan	Hong Kong, China	CLP Power Hong Kong Limited
15	Johnny	Kam	Hong Kong, China	CLP Power Hong Kong Limited
16	Hendro	Gunawan	Indonesia	Ministry of Energy and Mineral Resources
17	Kunaefi		Indonesia	Ministry of Energy and Mineral Resources
18	Dewi	Puspa	Indonesia	Ministry of Energy and Mineral Resources
19	Arif	Santoso Imam	Indonesia	Ministry of Energy and Mineral Resources
20	Elrika	Hamdi	Indonesia	Institute for Energy Economics and Financial Analysis
21	Nurcahyanto	Nurcahyanto	Indonesia	Ministry of Energy and Mineral Resources
22	Naoko	Doi	Japan	The Institute of Energy Economics, Japan
23	Tetsuro	ITO	Japan	Ministry of Economy, Trade and Industry
24	Juheon	SEOK	Republic of Korea	Korea Energy Economics Institute
25	Zulkiflee	Umar	Malaysia	Energy Commission Malaysia
26	Zamzurina	Zulkifli	Malaysia	Ministry of Energy and Natural Resources
27	Asdirhyme	Abd Rasib	Malaysia	Ministry of Energy and Natural Resources
28	Kumareshan	Mardappan	Malaysia	Energy Commission, Malaysia
29	NORAZRIN	RUPADI	Malaysia	ENERGY COMMISSION
30	Syafiqah	Hazmi	Malaysia	Suruhanjaya Tenaga
31	Symraina	Pandey	New Zealand	The Ministry of Business, Innovation and Employment
32	Vincent	Smart Charles	New Zealand	EECA



Asia-Pacific  
Economic Cooperation

APEC Expert Group on Energy Efficiency and Conservation (EGEE&C)  
Under the APEC Energy Working Group

No	Full Name		Economy / APEC Sub-fora / Organisation	Organization
33	CARLOS	BONILLA	Peru	MINISTRY ENERGY AND MINES
34	JAVIER	CAMPOS David	Peru	MINISTRY OF ENERGY AND MINES
35	Christian Harris	Hernaez Tena	Philippines	Department of Energy
36	Daniel Collin	Jornales Gonzales	Philippines	Department of Energy
37	Michael	Sinacruz Ochoada	Philippines	Department of Energy
38	Rowena	Villanueva T	Philippines	Department of Energy
39	Patrick	Aquino	Philippines	Department of Energy
40	Darryl	Ang	Singapore	Energy Market Authority
41	Regina	Lee	Singapore	Energy Market Authority
42	Deebagar	T	Singapore	Energy Market Authority
43	Zheng-Hong	Hsu	Chinese Taipei	Bureau of Energy
44	Kao	Shao Hui	Chinese Taipei	Industrial Technology Research Institute
45	Ching-Yu	Li	Chinese Taipei	Industrial Technology Research Institute
46	Wei-Chieh	Wang	Chinese Taipei	Industrial Technology Research Institute
47	Shu-Mei	Peng	Chinese Taipei	Bureau of Energy
48	Henry	Lo	Chinese Taipei	Industrial Technology Research Institute
49	Warote	Chaintarawong	Thailand	Department of Alternative Energy Development and Efficiency
50	Sutthasini	Glawgitigul	Thailand	Department of Alternative Energy Development and Efficiency
51	Wisaruth	Maethasith	Thailand	Department of Alternative of Energy Development and Efficiency (DEDE), Ministry of Energy
52	Sukanya	Nanta	Thailand	Department of Alternative Energy Development and Efficiency (DEDE)
53	Somma	Phon-Amnuaisuk	Thailand	Asia-Pacific International Institute for Energy Conservation
54	Munlika	Sompranon	Thailand	Department of Alternative Energy Development and Efficiency
55	Cary	Bloyd	USA	PNNL
56	Ron	CHERRY	USA	U.S. DOE, Office of International Affairs
57	Derek	Greenauer	USA	UL LLC
58	Ek-chin	VY	EGEEC	Electrical and Mechanical Services Department
59	Jovian	CHEUNG	EGEEC	Electrical and Mechanical Services Department



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No	Full Name		Economy / APEC Sub-fora / Organisation	Organization
60	Willy	YU	EGEEC	Electrical and Mechanical Services Department
61	Takuo	Miyazaki	APEC Secretariat	APEC Secretariat
62	Alexander	Izhbuldin	APERC	Asia Pacific Energy Research Centre
63	Elvira	Gelindon Torres	APERC	Asia Pacific Energy Research Centre
64	Munehisa	Yamashiro	APERC	Asia Pacific Energy Research Centre
65	Jeongdu	Kim	APERC	Asia Pacific Energy Research Centre
66	Glen	Sweetnam	APERC	Asia Pacific Energy Research Centre
67	Reiko	Chiyoya	APERC	Asia Pacific Energy Research Centre
68	Finbar	Maunsell	APERC	Asia Pacific Energy Research Centre
69	Steivan	DEFILLA	APSEC	APEC Sustainable Energy Center
70	YAN	Zhexing	APSEC	APEC Sustainable Energy Center
71	Li	ZHU	APSEC	APEC Sustainable Energy Center
72	Edito	Barcelona	EGEDA	EGEDA Secretariat
73	Tarcy Sih-Ting	Jhou	EGNRET	Industrial Technology Research Institute
74	Zeng	Lei	CLASP	CLASP
75	Bo	Hu	CLASP	CLASP
76	Muhammad	Wijaya Ery	Climate Policy Initiative	Climate Policy Initiative
77	PIERRE	CAZELLES	ICA	INTERNATIONAL COPPER ASSOCIATION
78	Cary	Chan	WGBC	WGBC