

The 60th APEC Expert Group on New and Renewable Energy Technologies (EGNRET 60) Meeting

The 60th EGNRET Meeting Summary

Hybrid Meeting hosted by Chinese Taipei

From April 23 to 26, 2024.

1. Introduction

The 60th APEC Expert Group on New and Renewable Energy Technologies (EGNRET 60) was hosted by Chinese Taipei from April 23 to 26, 2024, in Kaohsiung, Chinese Taipei.

The 60th EGNRET Meeting was held from 9:00 AM to 4:40 PM on April 24, 2024, and from 9:00 AM to 3:50 PM on April 25, 2024.

Delegates from 11 APEC member economies, namely Canada; Hong Kong, China; Japan; the Republic of Korea; Malaysia; the Philippines; Russia; Chinese Taipei; Thailand; the United States, and Viet Nam, and representatives from 7 APEC fora, including APEC Secretariat; Energy Working Group (EWG) Secretariat; APEC Expert Group on Clean Fossil Energy (EGCFE); APEC Expert Group on Energy Data and Analysis (EGEDA); APEC Expert Group on Energy Efficiency and Conservation (EGEEC); Asia Pacific Energy Research Centre (APEREC); and APEC Sustainable Energy Center (APSEC) attended. In addition, expert representatives from the International Energy Agency (IEA) and the International Renewable Energy Agency (IRENA) participated in the meeting as guest speakers and observers.

The list of the 60th EGNRET Meeting participants is attached in the annex of the meeting summary.

2. The 60th EGNRET Meeting - Day 1 (09:00 AM-04:40 PM on April 24, 2024)

The Meeting was chaired by Dr. Chi-Wen Liao, Chair of EGNRET.

2.1 Official Welcome

On behalf of Chinese Taipei, Ms. Su-Chen Weng, Secretary General from the Energy Administration, Ministry of Economic Affairs, Chinese Taipei welcomed all APEC members, speakers, and participants who attended the 60th EGNRET Meeting. According to her speech, Chinese Taipei has committed to working together with APEC member economies to foster strong collaboration with the international community to fulfill the APEC renewable energy goal by doubling the share of renewable energy in the APEC's energy mix by 2030. To take practical action, Chinese Taipei announced its Pathway to "Net-Zero Emissions by 2050" in March 2022 and has included increasing the share of renewable energy as one of the key strategies in achieving the goal. It has installed mature technologies, such as solar PV and offshore wind power, and has been developing emerging energy technologies, such as biomass, hydrogen, and ocean energy. The share of renewable energy in the electricity supply is expected to reach up to 60%-70% by 2050. Secretary General Weng said that energy transition relies on regional and international cooperation and APEC member economies have always been important partners for Chinese Taipei in moving towards a more sustainable and net-zero future. She looked forward to exchanging views and learning from all members and experts through the meeting discussions on new and renewable energy. Finally, she wished the 2-day meeting to have fruitful outcomes and great success.

2.2 Opening Address and Adoption of Meeting Agenda

Dr. Chi-Wen Liao, Chair of EGNRET, expressed his sincere gratitude to the host economy, Chinese Taipei for organizing the meeting and associated events. Chair Liao said that the goal of doubling the share of the renewable energy mix by 2030 signified a crucial milestone for the APEC region and hoped all

participants could share their views and practices on the progress, achievements, and plans for the development of new and renewable energy through the 2-day meeting. The meeting agenda was adopted by participating member economies at the meeting.

2.3 Host Economy Presentation

Dr. Chung-Hsien Chen, Director of Renewable and Prospective Energy Development Division, Energy Administration, Ministry of Economic Affairs introduced “Net Zero Transition and Renewable Energy in Chinese Taipei.” In 2023, almost 97% of energy in Chinese Taipei was imported, while 3.1% was produced domestically. Dr. Chen pointed out three main challenges for Chinese Taipei, including energy security, an isolated power grid, and carbon emission issues. For the renewable energy situation, the cumulative installed capacity in Chinese Taipei increased to 13.5 GW in February 2024, which was almost three times compared to 2016, which was mainly attributed to solar PV and wind power. For energy efficiency, the energy intensity decreased by 4% in average annually and electricity intensity dropped by 1.8% annually. Chinese Taipei has set a target of 29.4 GW of renewable energy capacity by 2025, including 20 GW for solar PV and 5.6 GW for offshore wind power. By the end of March 2024, a total of 293 wind turbines were completed. Among the prospective development, Chinese Taipei has drafted a floating offshore wind demonstration program. The whole demonstration projects are estimated to have 90 to 180 MW, which are expected to be commissioned by 2028.

2.4 Updates of APEC/ APEC Fora

(1) APEC Secretariat Update by Mr. Takayuki Niikura, Program Director of APEC Secretariat

APEC Secretariat updated that 8 concept notes for Project Session 1 2024 were endorsed in March 2024 and were under concept note eligibility

assessment and scoring by Responsible APEC Fora (RAF). The Secretariat encouraged economies to complete scoring by May 6, 2024. Economies who were unable to submit concept notes for Project Session in time can consider submitting them for Project Session 2 by June 17, 2024.

The Secretariat also updated the EGNRET's revised Terms of Reference (ToR) proposal regarding reducing the minimum quorum from 14 to 12 economies was not endorsed by SOMs during SOM 1. Some economies expressed that reducing the minimum quorum should be the last option and more efforts should be made before considering quorum reduction; and the forum should explore alternative methods to attract participants, such as reviewing the agenda to ensure it is appealing to members. The SCE recommended that Senior Officials instruct EWG and EGNRET to consider additional options to boost attendance at EGRNET meetings and proposed that EWG work with EGNRET to explore other courses of action, such as incorporating EGNRET meetings into a SOM cluster, strengthening meeting agenda and work plan, consider joint sessions involving other Expert Groups as well as an amalgamation of Expert Groups, as required. The Secretariat also suggested that EGNRET meetings and APEC-funded workshops be held back-to-back to solve low participation.

(2) EWG Update by Ms. Ariadne BenAissa, EWG Lead Shepherd

EWG Lead Shepherd shared the plans for the rest of 2024, including the 68th EWG Meeting and the 14th APEC Energy Ministerial Meeting (EMM) expected to be held in August this year in Peru. She mentioned that Peru has proposed to hold 2 virtual workshops on low-carbon hydrogen capacity building and the final reports from these workshops will inform the process for establishing APEC policy guidance for developing and implementing low-carbon hydrogen policy frameworks in the Asia Pacific, which will be submitted to Energy Ministers for endorsement ahead of the EMM in August. As hydrogen is the priority for this year and many challenges exist, she said it is important for members to share knowledge. She also shared

that the Energy Smart Community Initiative (ESCI) was accepting award nominations through the end of April and encouraged members to nominate for the awards.

Additionally, the APEC Economies Leaders have committed to contribute to triple renewable energy capacity globally by 2030, which will be a considerable challenge. EWG will work with APERC to track renewable energy capacity growth in the APEC region and encourage EGNRET to submit new projects demonstrating efforts to support this new commitment.

(3) EGNRET Update by Ms. An-Chi Fan, EGNRET Secretariat

EGNRET Secretariat reported the EGNRET's recent activities including the meeting outcomes of the 59th EGNRET Meeting, the EGNRET's contributions and discussions at the 66th and 67th EWG Meeting, the EGNRET's past and future collaborations with APEC Fora. Ms. Fan also updated the new concept notes, and implemented and completed projects since the 59th EGNRET Meeting.

(4) EGCFE Updates by Dr. Kazutomo Irie, Acting Chair of EGCFE

EGCFE Acting Chair shared the past and future EGCFE-related APEC events, including a Joint Meeting with EGEEC 62 and an associated workshop to be held on May 20-23, 2024 in Nanjing, China. The workshop's theme is To Follow up the 1st and 2nd APEC Sectoral Symposia on the Holistic Approach of Decarbonization for Energy Transition. The 3rd symposium is expected to be held in December in Thailand to focus on bioenergy. Considering the topic's relevance to the EGNRET, the EGCFE Acting Chair encouraged EGNRET members to attend the symposium. He also reiterated appreciation to EGNRET and Chinese Taipei for the cooperation on the APERC Clean Hydrogen Workshop associated with the 60th EGNRET Meeting and workshop arrangement.

(5) EGEDA Updates by Mr. Glen Sweetnam, Chair of EGEDA

EGEDA Secretariat has completed the collection of the 2021 annual energy supply and demand data and the relevant information has been published on APEC Secretariat website. EGEDA will continue to track the statistics of new and renewable energy technologies (including solar, carbon capture and sequestration, battery capacity, hydrogen, and etc.) and methane emissions to keep economies updated on a timely basis. The 22nd APEC Workshop on Energy Statistics is targeted to be held on July 23-26, 2024 in Tokyo, Japan. The Chair of EGEDA encouraged all economies to send representatives to attend the workshop. He also shared the outcomes of the 35th EGEDA Meeting and updated that the 36th EGEDA Meeting is expected to be jointly held with EGNRET, EGEEC, and EGCFC in Spring 2025.

(6) EGEEC Activities by Mr. Chun-Yin Li, Co-secretary of EGEEC Secretariat

EGEEC Secretariat shared EGEEC's engagement in the recent EWG activities and the current progress of EGEEC-related APEC projects. For the upcoming EGEEC meeting, the 62th EGEEC Meeting will be hosted by China on May 21-23, 2024 in Nanjing, China. The meeting will be jointly held with EGCFC. The meeting theme will focus on "From the supply side to demand side, utilization of clean energy and energy efficient in realizing energy transition."

2.5 Progress on APEC Energy Goals and Development in APEC Region by Mr. Ting-Jui Sun, Senior Researcher of APERC

APERC shared the progress of the APEC's energy intensity reduction and renewable energy doubling goals and noted that energy intensity reduction and renewable energy production in the APEC region remain on track to meet its goals. APERC also introduced methods for calculating energy intensity and renewable energy share. According to APERC's statistics, the total primary energy supply (TPES) and total final energy consumption (TFEC) have been

decompiling since 2018 due to the supply of primary fossil fuel more than renewables; despite renewables remaining a faster growing trend. APEC's GDP and energy consumption (especially in the transport and commercial sectors) have rebounded following the pandemic. APERC also noted that most economies have low variable renewable energy shares with varying electrification, and how to integrate VRE into the power system while stabilizing the supply and demand of power is a critical issue.

2.6 Member Economy Presentation: Policy Making and Technologies Deployment of New and Renewable Energy to Achieve APEC Doubling Goal

The meeting theme was "Policy Making and Technologies Deployment of New and Renewable Energy to Achieve APEC Doubling Goal," which was presented by nine (9), namely Hong Kong, China, Japan, The Republic of Korea, the Philippines, Russia, Chinese Taipei, Thailand, The United States, and Viet Nam.

- (1) **Hong Kong, China** aims to increase the share of renewable energy in electricity generation to 7.5%-10% by 2035 and 15% by 2050 to achieve carbon neutrality by 2050. The economy has various measures to promote renewable energy applications, such as the Feed-in Tariff scheme, publishing technical guidelines, and holding a number of seminars related to solar energy. The government will launch a pilot scheme on building-integrated photovoltaics (BIPV) to explore the applications of such technology in the building sector. Additionally, the government has established the Inter-departmental Working Group on Using Hydrogen as Fuels to explore different paths for applying hydrogen technologies. The Working Group has currently approved 14 applications in the area of transportation, hydrogen fueling stations, power generation, and construction sites.
- (2) **Japan** aims to achieve carbon neutrality by 2050 and has set out its strategic energy plan for 2030, which aims to increase the share of

renewable energy in the power generation mix to approximately 36%-38% and hydrogen to about 1% by 2030. Japan mentioned that a strategic energy plan for 2040 will be discussed soon. To expand solar energy deployment with location constraints, Japan is developing next-generation solar cells (perovskite solar cells) that can be installed on walls and window glasses of buildings, which is expected to be commercial in two or three years. To expand hydrogen supply, the economy has set a new volume target at 12 Mt/p.a. by 2040 to facilitate cost reduction and create demand in power generation, fuel cells, industrial use, and home use. The government also expand the use of renewable energy and scale up hydrogen supply chain with support of Green Transformation (GX) Bond.

- (3) **The Republic of Korea** elaborated that the government of the Republic of Korea has announced its new vision of energy policy and considers nuclear power as the center of its power composition and aims to achieve rational integration of nuclear power and renewable energy sources with the support of feasible projects. The government also announced its 10th master plan for long-term electricity supply and demand for 2022-2036. In the plan, the government adjusted the proportion of new and renewable energy to a feasible level by 2030, with increasing the share of RE in electricity generation from 20.8% to 21.6%; and adjusted solar and wind power electricity generation ratio from 87:13 to 60:40 by 2030 to balance the distribution of solar and wind power. The economy is also developing a 10 MW semi-submersible floating model to expand the potential of offshore wind development.
- (4) **The Philippines** shared the overview of its energy development. In 2022, the cumulative installed capacity and power generation of renewable energy reached 8,264 MW (29.2%) and 24,684 GWh (22.1%), respectively. The Philippines also introduced its draft Philippines Energy Plan (PEP) 2023-2050 and scenarios. In the reference scenario, the economy aims to achieve a 35% renewable energy share in the power generation mix by

2030, and 50% by 2040-2050. The Philippines also introduced its proposed 4-Point Strategy for Energy Transition Program for the power sector, including accelerating the deployment of RE projects and clean energy technologies, developing green and smart transmission systems, building and expanding port infrastructure to support offshore wind and marine-based energy resources, and early decommissioning and/or repurposing existing coal-fired power plants.

- (5) **Russia** stated that it follows a balanced approach that takes into account the energy characteristics of each economy based on the principle of technology neutrality. Within the framework of Russia's clean energy federal project, the installed capacity of wind, solar, and small hydropower facilities is expected to be doubled to 12.16 GW. Russia mentioned the efforts to triple renewable energy globally stated in the 2023 APEC Leaders' Declaration requires additional incentives and conditions. Additionally, it highlighted that the current development of renewable energy and energy transition is hindered due to intellectual restrictions, illegal barriers, and other difficulties and technological advancements should not be impeded.
- (6) **Thailand** shared that Thailand's government has set a target to increase the share of renewable energy to 30% in the final energy consumption by 2037. In 2023, the total renewable energy installed capacity in the power sector reached 12,905 MW and biomass energy held the highest share in RE power generation, followed by solar PV and hydropower. Thailand's government is preparing its energy master plan with aim to promote clean energy and achieve net zero carbon emissions within 2065 to 2070. Thailand plans to promote clean energy in the transport sector by increasing the utilization of EVs and has targeted at least a 30% share of EVs by 2030. The economy aspires to increase the share of renewable energy in power generation by at least 30% by 2040 and reach 80% by 2050 to achieve its carbon neutrality goal. Thailand has also established a 4D1E to support its energy transition, which consists of digitalization,

decentralization, deregulation, decarbonization, and electrification.

- (7) **The United States** presented that the U.S. Department of Energy is focusing on three areas, including continuing to deploy and increasing renewable energy sources, fostering innovation to reduce costs, and improving grid interconnection to unlock further growth of renewables. Through the funding and incentives of the Inflation Reduction Act (IRA), the U.S. aims to reduce 40% of GHG emissions below the 2005 level in the U.S. and increase the share of electricity produced by clean sources up to 80% by 2030. For innovation, there are eight initiatives focusing on hydrogen, long-duration storage, carbon negative, enhanced geothermal, floating offshore wind, industrial heat, clean fuels and products, and affordable home energy to accomplish innovation goals and reduce costs. The U.S. and Japan have agreed to a partnership in an aggressive attempt to decrease the cost of offshore wind power to USD 45 per MWh. The U.S. also released an interconnection roadmap that aims to transform bulk transformation by 2035 to address the challenges posed by the integration of a substantial volume of renewable energy into the grid.
- (8) **Viet Nam** presented that its cumulative renewable energy installed capacity in 2023 reached 21,664 MW thanks to solar and wind power. Considering hydropower has reached limitations, Viet Nam mentioned exploiting small-scale hydropower sites to expand sources. To reduce coal usage, The economy has announced to convert coal-fired power plants that have operated for 20 years to use biomass or ammonia as fuel, while shutting down coal-fired power plants that have been operated for over 40 years. This initiative aims to eliminate coal usage for electricity generation and fully transition to biomass or ammonia by 2050. It has targeted to reach 32% renewable energy (including large and small hydropower) share in the total electricity production and 43% by 2050. It has also shared the advantages and challenges in renewable energy development and came up with some specific solutions for RE development from the perspectives

of relevant laws and regulations, incentives, and mechanisms.

3. The 60th EGNRET Meeting - Day 2 (09:00 AM-03:50 PM on April 25, 2024)

3.1 APERC Activities by Mr. Mathew Horne, Senior Researcher of APERC

Mr. Mathew Horne shared that APERC's 9th Edition Outlook will be published in 2025, and preliminary results are being shared with APEC member economies, with projections extending to 2060. He also mentioned that the APEC Energy Overview highlighted the current energy situation in each APEC economy and monitored the progress to meet APEC's aspirational energy goals. He also shared APERC's recent activities, including a peer review on low-carbon energy in Peru in 2023, carbon neutrality symposia, and oil and gas security relationship with new and renewable energy. He also mentioned that an APERC hydrogen report will be available soon.

3.2 APSEC Updates by Mr. Jinlong Ma, Vice President of APSEC

Mr. Jinlong Ma shared the highlights of APSEC activities, including attending the 66th and 67th EWG Meetings, APEC project updates, the APSEC Urban Energy Report, and APSEC's contributions to Peru's Policy Dialogue. APSEC has set up a green hydrogen advisory team to work with scholars and experts to provide advice and feedback on Peru's Policy Dialogue concept note on the hydrogen issue. In terms of APSEC's research work, Mr. Ma introduced the APSEC Flagship Report — APEC Energy Report 2023, which focuses on low-carbon energy transition and urban energy in the APEC region to drive cities towards carbon neutrality. The report is at the final stage of being published. He also shared that the APEC Energy Report 2024 will focus on energy storage technologies and the role of energy storage in enabling the energy transition.

3.3 IRENA Presentation by Ms. Ann-Kathrin Lipponer, Associate Programme Officer, Innovation and Technology Centre of IRENA

Ms. Ann-Kathrin Lipponer presented the topic of Shaping Sustainable International Hydrogen Value Chains. She mentioned that scaling green

hydrogen production will be a major challenge for economies as most of the current hydrogen production is fossil-derived. However, most global hydrogen production in 2050 should come from renewables and therefore many actions need to be taken. For future hydrogen trade, she elaborated on a projection scenario for green hydrogen trade by 2050 aligned with a 1.5-degree temperature increase, emphasizing the need for global trade across the entire green hydrogen value chain and for hydrogen and its derivatives. Ms. Lipponer summarized five key actions to foster green hydrogen trade: increasing international cooperation, using sustainable government procurement, reducing tariff and non-tariff barriers, developing sound quality infrastructure, and implementing support policies through targeted and non-discriminatory environmental subsidies. She also mentioned that IRENA will soon publish a report on a comparison of accounting guidelines, standards, and certification for hydrogen and its derivatives.

After Ms. Lipponer's presentation, Dr. Kazutomo Irie, Acting Chair of EGCFE, asked about the types of renewable energy discussed in her presentation and how IRENA addressed energy storage and grid stabilization. Ms. Lipponer replied that it includes almost all renewable electricity sources instead of pumped storage. Also, she said energy storage options depend on the local system, requiring smart electrification and flexible energy storage systems tailored to local contexts. She recommended IRENA's report on the innovation landscape for smart electrification, which provides a comprehensive toolbox and highlights necessary innovations for energy storage and grid stability. It is available on IRENA's website.

In addition, Mr. Glen Sweetnam, Chair of EGEDA, asked about the reasons behind the increase in hydrogen imports and which economies are leading this trend. Ms. Lipponer replied that there was an increase between 2021 and 2022 shown in the graph of her slides due to the increase in the value of hydrogen imports by the Netherlands from Belgium, so it's a regional increase reflected in those numbers. The graph on the slide was to show the interrelation between the different commodities.

3.4 Submission Process and Progress of EGNRET Projects by Ms. An-

Chi Fan, EGNRET Secretariat

Ms. An-Chi Fan introduced the project submission process, including the project development cycle, eligibility criteria for the assessment of Energy Efficiency, Low Carbon and Energy Resiliency Measures (EELCER) sub-fund, and reminders for project submissions. She also updated the current progress of EGNRET-related projects. As of April 2024, 3 concept notes submitted for Project Session 1 2024 were endorsed by EWG members in March. Additionally, 8 projects are under implementation, and 8 projects have been completed since the 59th EGNRET Meeting in October 2023.

3.5 Project Updates

10 projects presented by five (5) member economies, namely China, Hong Kong China, Chinese Taipei, the United States, and Viet Nam are listed in the table below.

Proposed Economy	Project Number	Project Title
China	EWG 06 2021A	Support Offshore Wind Deployment and Grid Connection in APEC Region
	EWG 07 2021A	Impacts of COVID-19 on Renewable Energy Development in APEC Economies
Hong Kong, China	EWG 01 2023A	Promoting Digital Solar Resource Maps and Management Technologies in Advancing Renewables Growth in APEC
Chinese Taipei	EWG 13 2021A	The Legislation Recommendation and Promotion of Multifunctional Ocean Space Usage: Combine Floating PV Installations at Offshore Wind Farms
	-	Benchmark of Facilitated Actions to Fulfill the Energy Efficiency Benefit of AMI in the APEC Region
	EWG 04 2023S	Microgrids for a Just Energy Transition

Proposed Economy	Project Number	Project Title
The United States	EWG 208 2023A	Driving Trade & Investment for DC Power Systems and Microgrid Frameworks Through Public Policy Alignment
	EWG 07 2021S	Promoting Net Zero or Carbon Neutral Commitments in APEC
Viet Nam	EWG 08 2022A	APEC Workshop on Sustainable Energy Transition: Opportunities and Challenges
	EWG 02 2023A	APEC Workshop on Promoting Technology to Contribute to Sustainable Energy Transition

3.5.1 Support Offshore Wind Deployment and Grid Connection in APEC Region (EWG 06 2021A / China)

The project aims to support power grid integration of offshore wind, analyze the challenges and opportunities to increase large-scale offshore wind deployment, and provide recommendations on policies and technical solutions to promote offshore wind in the APEC region. The key project outputs include relevant research work, a project workshop, and a project report. The project has been completed and is in the process of finalizing the completion report.

3.5.2 Impacts of COVID-19 on Renewable Energy Development in APEC Economies (EWG 07 2021A / China)

The project aims to look into renewable energy development during the pandemic and analyze the strategies and plans of different economies to support post-COVID-19 period renewable energy growth. The key project outputs include research work, a project workshop, recommendations to facilitate sustainable recovery and support renewable energy development, and a project report. The tasks of the project were completed. The project is in the

process of finalizing the completion report.

3.5.3 Promoting Digital Solar Resource Maps and Management Technologies in Advancing Renewables Growth in APEC (EWG 01 2023A / Hong Kong, China)

The project aims to promote digital technology and enhance the capacity of APEC economies to deploy and develop renewables, particularly solar energy. Based on the project, a one-day workshop is expected to be held on July 8, 2024, in Hong Kong, China, aiming to inspire APEC economies to embrace digital technologies in renewable energy generation.

3.5.4 The Legislation Recommendation and Promotion of Multifunctional Ocean Space Usage: Combine Floating PV Installations at Offshore Wind Farms (EWG 13 2021A / Chinese Taipei)

The project aims to build the capacity of participants through workshops that better support multi-functional usage in ocean space and produce legislation recommendations for further developing energy security and resilience to collaborate to facilitate access to affordable energy and enhance energy security using various technologies to support sustainable economic growth. Based on the project, a 2-day workshop was held in February 2024 in Taichung, Chinese Taipei to focus on legislation recommendations on ocean space management. The project was expected to be completed by May 2024.

3.5.5 Benchmark of Facilitated Actions to Fulfill the Energy Efficiency Benefit of AMI in the APEC Region (Chinese Taipei)

The concept note of the project was endorsed by EWG members in March 2024. It aims to offer a guided list of actions for economies implementing advanced metering infrastructure (AMI), especially during the early stages, to maximize the benefits of AMI adoption in the APEC region. It also emphasizes the improvement of behavior feedback to enhance energy efficiency across APEC

economies and conducts a real-case survey on early adopters of AMI within the APEC region.

3.5.6 Microgrids for a Just Energy Transition (EWG 04 2023S / The United States)

The project aims to build the capacity of APEC economies to leverage microgrids and related technologies towards a just energy transition. The project was completed with three key outputs, including a half-day workshop, a summary report, and a final report. The project workshop helped participants identify key outcomes and recommendations for the effective long-term deployment of microgrids, including ensuring their sustainability, security, and safety.

3.5.7 Driving Trade & Investment for DC Power Systems and Microgrid Frameworks Through Public Policy Alignment (EWG 208 2023A / The United States)

The project aims to build the regulatory capacity of APEC economies and promote energy security and low-carbon energy systems by fostering harmonization of regulatory and conformity assessment approaches for DC power and microgrid systems. It helps APEC economies achieve resiliency, efficiency, climate, and safety benefits by distributing power to rural areas through DC power and microgrids. The key outputs of the project will include a workshop and summary report.

3.5.8 Promoting Net Zero or Carbon Neutral Commitments in APEC (EWG 07 2021S / The United States)

The project is a multi-year workstream for information sharing and capacity building to support APEC economies seeking to make net zero or carbon-neutral commitments. The current outputs include a compendium of best practices and guidelines to conduct voluntary peer reviews for net zero or

carbon neutral commitments.

3.5.9 APEC Workshop on Sustainable Energy Transition: Opportunities and Challenges (EWG 08 2022A/ Viet Nam)

The project workshop was held on November 23-24, 2023, in Hanoi, Viet Nam to focus on the opportunities and challenges of energy transition towards a low carbon economy. Through the workshop, some key recommendations have been highlighted to promote the transition for sustainable growth, including greater collaboration among economies, formulating a clear framework for sustainable energy transition, ensuring financial sources for implementation, providing more incentives for sustainable energy projects, etc.

3.5.10 APEC Workshop on Promoting Technology to Contribute to Sustainable Energy Transition (EWG 02 2023A / Viet Nam)

The project aims to share opportunities and challenges in energy transition toward a low-carbon economy. Based on the project, a 2-day workshop will be held on May 30-31, 2024, in Hanoi, Viet Nam to focus on experience and good practice sharing in promoting technology to facilitate sustainable energy transition.

3.6 Administration and Operation

3.6.1 Terms of Reference (ToR)

- (1) For the missions, our member economy, the United States, proposed to delete the APEC 21st Century Renewable Energy Development Initiative during the 59th EGNRET Meeting, which has been endorsed by EGNRET and EWG members. In addition, during the 66th EWG Meeting, China expressed that the Just Energy Transition Initiative (JETI) is still under discussion and recommended not including the initiative in the Mission until it has been finalized.
- (2) For the objectives, the Low-Carbon Model Town Task Force has completed

its projects and missions, so EGRNET Secretariat proposed to delete it from the ToR at the 59th EGRNET Meeting, which was also endorsed by EGNRET and EWG members.

- (3) For the quorum, considering that the participation records of the past EGRNET meetings were difficult to reach 14 economies, which is the current minimum requirement, the EGNRET proposed to reduce the quorum from 14 to 12 economies. Although this revision was endorsed by EGRNET and EWG members, it was not endorsed by Senior Officials at the SCE Meeting during SOM 1.

According to the SCE Chair's Report, the SCE recommended that Senior Officials instruct EWG and EGRNET to consider additional options to boost attendance at EGRNET meetings. SCE proposed that EWG works with EGNRET to explore other courses of action, such as incorporating EGRNET meetings into the SOM cluster; strengthening the meeting agenda and work plan; considering joint sessions involving other expert groups as well as the amalgamation of Expert Groups as required. Senior Officials endorsed the above instructions.

Based on the SCE's recommendations, APEC Secretariat provided several suggestions: EGNRET may conduct a survey among economies to create a more attractive agenda to encourage participation; consider incorporating the EGNRET Meeting into the SOM cluster (one meeting outside the SOM cluster and the other within the SOM cluster each year); continually hold joint meetings with other Expert Groups; and hold EGNRET meeting in conjunction with APEC-funded Workshop, allowing participants from travel eligible economies to attend workshops EGNRET meeting with their airfare costs covered by APEC.

3.6.2 EGNRET Secretariat List Update

EGNRET Secretariat updated EGNRET Secretariat list at the meeting as Ms. Raven Chiang has left her position at EGNRET Secretariat. The updated

EGNRET Secretariat list has also been endorsed by members.

3.6.3 Coming Event

As of the day of the 60th EGNRET Meeting, no member expressed interest in hosting the next EGNRET meeting (the 61st EGNRET Meeting). EGNRET Secretariat highly encouraged member economies to consider hosting the next meeting.

For the upcoming EWG event, the 68th EWG Meeting will be hosted by Peru on August 12-15, 2024, in Lima.

3.6.4 Timeline and Process of Chair and Vice Chair Selection

EGNRET Secretariat elaborated on the key timeline for the next chair and vice chair selection for the tenure 2025-2026. The selection will take place at the 61st EGNRET Meeting. Firstly, the selection will be announced and open for nomination 2 months before the 61st EGNRET Meeting. The deadline for the nomination will be 1 month before the meeting. After the meeting, EGNRET Secretariat will notify the outcomes and seek members' approval. If there are no adverse comments from members, the new chair and vice chair will be finalized and take office. EGNRET Secretariat welcomed members to nominate candidates for the next selection.

3.6.5 Suggestions for the Next Meeting Theme

EGNRET Secretariat categorized the past meeting themes and frequency over the past decade from 2015 to 2024 for historical review. Based on discussions in the past meetings, EGNRET Secretariat collated potential and interested focuses for the future meeting themes suggested by members: including new and renewable energy policies (such as incentives for new and renewable energy), laws and regulations; renewable energy doubling goal; distributed renewable energy integration (such as microgrid, energy storage, and electrification); decarbonization of electricity sector; energy transition; key topics from EWG projects; and capacity building on new and renewable energy.

Moreover, APEC Land Expert Group also suggested collaborating with EGRNET on adopting sustainable energy sources for land transport at the 59th EGNRET Meeting. EGNRET Secretariat also encouraged members to provide some suggestions for the next meeting theme.

3.7 Discussion: Key Areas for Cross-Fora Collaboration

The collaborative actions were discussed by the attending economies, APEC fora, and research centers as listed below.

- (1) **Dr. Chi-Wen Liao, Chair of EGRNET**, suggested that Expert Groups can collaborate to develop a workplan to contribute expert support to deliberations for Peru's 2024 Policy Dialogue on green and low-carbon hydrogen issues and focus the topics on the definition of green and low-carbon hydrogen, green energy certificate, etc. Moreover, energy storage and innovation in thermal power using CCUS and ammonia can also be potential collaborative topics. He also recommended that Expert Groups initiate project concept notes to hold joint activities to invite APEC fora and external experts for a constructive dialogue.
- (2) **Ms. BenAissa Ariadne, EWG Lead Shepherd**, elaborated that Just Energy Transition is one of EWG's new priorities and is another area to be discussed. She suggested member economies may consider involving more than one Expert Group in their projects, and encouraged Expert Groups to reach out to member economies. We have some projects already proposed on this topic, but combining the Expert Groups' meetings with this kind of project would be beneficial for the Group as a whole.
- (3) **Mr. Takayuki Niikura, Program Director of APEC Secretariat**, suggested that EGNRET may consider collaborating with other APEC forums (such as APEC Business Advisory Council) that share the same missions and/or goals to share information and experiences on key issues related to EWG and EGNRET, such as financial support on energy transition, Carbon Border Adjustment Mechanism (CBAM), etc.
- (4) **Dr. Kazutomo Irie, Acting Chair of EGCFE**, said the policy capacity of APEC economies must be improved to move toward energy transition.

APEREC is planning to launch new capacity building workshops in conjunction with Expert Groups' meetings to enhance the capacity building for energy transition and relevant areas with support from Expert Groups.

- (5) **Mr. Glen Sweetnam, Senior Vice President of APERC**, mentioned the energy trilemma and adoption of new technologies. He emphasized the importance of balancing “affordability and equity,” “sustainability and clean power,” and “reliability and resilience,” and suggested that Expert Groups collaborate to find solutions. He also elaborated that due to the interruptible characteristics of renewable energy, electricity price goes up in Europe along with the increase in the percentage of renewable energy. He suggested that Expert Groups can discuss this issue to explore factors affecting electricity prices beyond renewable energy and find ways to keep energy prices reasonable.

He mentioned that Expert Groups may consider discussing how much renewable energy reduces emissions compared to transferring emissions from one to another economy. He also encouraged Expert Groups can collaborate to organize forums to share real-world experiences.

Additionally, he suggested selecting one or two topics and consulting with economies to submit the concept note for 2024 Project Session 2 to hold a workshop on the margin of the Joint Meeting of four Expert Groups in 2025 in Hong Kong, China.

- (6) **Mr. Chun-Yin Li, Co-Secretary of EGEEC Secretariat**, shared EGEEC's collaboration with Expert Groups in the past and suggested potential collaborative areas in the future, such as energy storage, grid interaction between vehicles and buildings, emerging low-carbon technologies, which play crucial roles in integrating renewable energy and charging facilities to support vehicle electrification.
- (7) **Mr. Takao Ikeda, Senior Economist, The Institute of Energy Economics, Japan**, indicated that Japan recognizes hydrogen as one of the important elements of energy transition. He represented Japan to welcome APERC support green hydrogen workshop between EGNRET and EGCFE and continuous collaborations with EGCFE and EGEDA.

- (8) **Dr. Tom H.T. Lee, Secretary of EGNRET Secretariat**, echoed Mr. Sweetnam and Dr. Irie on holding forums to encourage real-world experiences and Expert Groups' meetings along with capacity building workshop respectively to share experiences. He also suggested that expert groups may consider lessons learned on specific technologies for energy transition when planning themes or agendas for future meetings.
- (9) **Dr. Chi-Wen Liao, Chair of EGRNET**, agreed with Mr. Sweetnam on consulting with economies for support and submitting a concept note for organizing a workshop in conjunction with the Joint Meeting of the four Expert Groups. He suggested that four Expert Groups invite EWG and APEC Secretariat to discuss this after the meeting.

3.8 Global Trends in Renewable Energy and Energy Efficiency by Mr. Piotr Bojek, Renewable Energy Analyst; and Mr. Federico Callioni, Energy Efficiency Policy Analyst, IEA

IEA presented the Renewables 2023 Report, which focuses on recent energy market development and forecasts for the next 5 years. In 2023, the renewable energy growth was primarily driven by China, where solar PV acceleration accounted for two-thirds of the global growth. Based on future projections, solar PV and wind energy are expected to account for 95% of the expansion from 2023 to 2028; wind and solar PV are expected to generate more electricity than hydropower by 2024; and renewable energy is expected to generate over 42% of global electricity, with wind and solar PV making up 25%. APEC economies are expected to account for nearly three-quarters of capacity additions in the next 5 years. IEA said that achieving the goal of tripling renewable capacity by 2030 is possible but requires increased efforts and improved policies can push renewables to be on track with the tripling pledge. Policies on de-risking investment and low-cost financing are also key to unlocking the full potential of emerging markets and developing economies.

3.9 EGNRET Report

EGNRET Secretariat reported the outcomes of the 60th EGNRET Meeting,

including meeting highlights, discussions, and conclusions. 5 member economies, namely China, Hong Kong China, Chinese Taipei, the United States, and Viet Nam shared the progress of their projects.

3.10 Closing Remarks by Mr. Chun-Li Lee, Deputy Director General, Energy Administration, Ministry of Economic Affairs, Chinese Taipei and Dr. Chi-Wen Liao, Chair of EGNRET

Mr. Chun-Li Lee, Deputy Director General, Energy Administration, Ministry of Economic Affairs, Chinese Taipei extended his gratitude to all participants for their participation and knowledge sharing. He mentioned that Chinese Taipei has been making progress in implementing its energy transition target and looks forward to further collaboration with APEC economies to boost renewable energy development and economic prosperity in the Asia-Pacific region.

Dr. Chi-Wen Liao, Chair of EGNRET, expressed his sincere gratitude to all participants for their participation and continuous support and dedication to EGNRET. He also thanked to Chinese Taipei for hosting the 60th EGNRET Meeting and looks forward to the next EGNRET Meeting and continued collaboration with all members.

ANNEX: LIST OF The 60th EGNRET MEETING PARTICIPANTS

No	Full Name		Economy / APEC Sub-fora	Organization
	First Name	Last Name		
1	Jessica	Li	Canada	Natural Resources Canada
2	Kin Tam, Anthony	WONG	Hong Kong, China	Electrical and Mechanical Services Dept
3	Kam Wai, Kelvin	Fong	Hong Kong, China	Electrical and Mechanical Services Dept
4	Wai Ling, Elaine	YIP	Hong Kong, China	Electrical and Mechanical Services Dept
5	Chi Wang, Jasper	MO	Hong Kong, China	Electrical and Mechanical Services Dept
6	Takao	IKEDA	Japan	The Institute of Energy Economics, Japan
7	Sungyeon	Kang	Republic of Korea	Korea Energy Agency
8	MUHAMAF HAFIZ WILDAN	HASSAN	Malaysia	MINISTRY OF ENERGY TRANSITION AND WATER TRANSFORMATION
9	Afroza Banu Abd	Halim	Malaysia	MINISTRY OF ENERGY TRANSITION AND WATER TRANSFORMATION
10	Mylene	Capongcol	Republic of Philippines	Department of Energy Philippines
11	Anna Mikko	Realo	Republic of Philippines	Department of Energy Philippines
12	Anabel	Elmaga	Republic of Philippines	Department of Energy Philippines
13	Catherine	Cadiz	Republic of Philippines	Department of Energy Philippines
14	Liudmila	Chizh	Russia	The Ministry of Energy of the Russian Federation
15	Yana	Smagina	Russia	The Ministry of Energy of the Russian Federation
16	Chun-Li	Lee	Chinese Taipei	Energy Administration, Ministry of Economic Affairs
17	Su-Chen	Weng	Chinese Taipei	Energy Administration, Ministry of Economic Affairs
18	Chung-Hsien	Chen	Chinese Taipei	Energy Administration, Ministry of Economic Affairs
19	Ju-Min	Cheng	Chinese Taipei	Energy Administration, Ministry of Economic Affairs



Asia-Pacific
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No	Full Name		Economy / APEC Sub-fora	Organization
	First Name	Last Name		
20	Bo-Ru	Chen	Chinese Taipei	Energy Administration, Ministry of Economic Affairs
21	Yu-Chi	Liu	Chinese Taipei	Energy Administration, Ministry of Economic Affairs
22	Shih-Hua	Hsu	Chinese Taipei	Energy Administration, Ministry of Economic Affairs
23	Yun-Chu	Chen	Chinese Taipei	Energy Administration, Ministry of Economic Affairs
24	Chian-Yu	Chen	Chinese Taipei	Energy Administration, Ministry of Economic Affairs
25	Pei-Chu	Tu	Chinese Taipei	Energy Administration, Ministry of Economic Affairs
26	Han-Ying	Wang	Chinese Taipei	Industrial Technology Research Institute
27	Tzu-Yar	Liu	Chinese Taipei	Industrial Technology Research Institute
28	Keng-Tung	Wu	Chinese Taipei	Industrial Technology Research Institute
29	Yaowateera	Achawangkul	Thailand	Department of Alternative Energy Development and Efficiency
30	Daniel	Vega	The United States	U.S. Department of Energy
31	Tuan	NGUYEN	Viet Nam	Ministry of Industry and Trade
32	Quach Quang	Dong	Viet Nam	Ministry of Industry and Trade
33	Takayuki	Niikura	APEC Secretariat	APEC Secretariat
34	BenAissa	Ariadne	EWG Secretariat	EWG Secretariat
35	Chi-Wen	Liao	EGNRET	EGNRET Secretariat
36	Tom H.T.	Lee	EGNRET Secretariat	EGNRET Secretariat
37	AN-Chi	Fan	EGNRET Secretariat	EGNRET Secretariat
38	Kazutomo	IRIE	EGCFE/APERC	EGCFE/APERC
39	Glen	Sweetnam	EGEDA	EGEDA
40	Chun Yin	LI	EGEEC Secretariat	EGEEC Secretariat
41	Ting-Jui	Sun	APERC	APERC
42	Mathew	Horne	APERC	APERC



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No	Full Name		Economy / APEC Sub-fora	Organization
	First Name	Last Name		
43	Manuel Antonio	Heredia Muñoz	APERC	APERC
44	Finbar Barton	Maunsell	APERC	APERC
45	Noriel Christopher	Reyes	APERC	APERC
46	Phung Quoc	Huy	APERC	APERC
47	Jinlong	MA	China	APSEC
48	Yong	SUN	China	APSEC
49	Piotr	Bojek	IEA	IEA
50	Federico	Callioni	IEA	IEA
51	Ann-Kathrin	Lipponer	IRENA	IRENA
52	Kenji	Kato	IRENA	IRENA