

The 59th APEC Expert Group on New and Renewable Energy Technologies (EGNRET 59) Meeting

The 59th EGNRET Meeting Summary

Physical Meeting hosted by The Philippines

From 16 to 19 October 2023

1. Introduction

The Joint Meeting of the 59th APEC Expert Group on New and Renewable Energy Technologies (EGNRET 59) and 61st Meeting of the APEC Expert Group on Energy Efficiency & Conservation (EGEEC 61) was hosted by the Philippines from October 16 to 19 2023.

The Joint Meeting of the 59th EGNRET and 61st EGEEC was held at 9:00 am – 5:00 pm on 17 October and 1:00 pm-2:40 pm on 18 October 2023. The 59th EGNRET Meeting was held at 9:00 am – 11:05 am on 18 October 2023.

As for the joint meeting, delegates from 8 APEC member economies (Hong Kong, China; Japan; Republic of Korea; Malaysia; The Philippines; Chinese Taipei; the United States, and Viet Nam, and representatives from 5 APEC fora, including APEC Secretariat, Expert Group on Energy Data and Analysis (EGEDA), Asia Pacific Energy Research Centre (APEREC), APEC Sustainable Energy Center (APSEC), and APEC Land Experts Group (LEG) attended. In addition, representatives from 4 international organizations, the International Energy Agency (IEA), the World Green Building Council (WorldGBC), the Collaborative Labelling and Appliance Standards Program (CLASP), and ASEAN Centre for Energy (ACE), participated in the Joint Meeting as guest speakers and observers.

The list of the 59th EGNRET Meeting and Joint Meeting participants is attached in Annex A of the meeting summary.

2. Joint Meeting of the 59th EGNRET and 61st EGEEC (09:00 AM-5 PM on 17 October 2023)

The Joint Meeting was co-chaired by Dr. Chi-Wen Liao, Chair of EGNRET, and Mr. Patrick T. Aquino, CESO III, Director IV, Energy Utilization Management Bureau, Department of Energy, the Philippines.

2.1 Official Welcome

On behalf of the Department of Energy, the Philippines, Mr. Patrick T. Aquino CESO III, Director of Energy Utilization Management Bureau, Department of Energy, the Philippines welcomed all APEC members, speakers, and participants who attended the meeting. He mentioned that the Philippines and APEC member economies have committed to fostering strong collaborations with the international community to realize energy sustainability and resiliency in the APEC region. He said that the Philippines has its Energy Plan for 2020 to 2040 that targets a green energy scenario with a 35% to 50% share of renewable energy in the energy mix by 2030 to 2040; electric vehicles would comprise 10% of the total registered vehicles by 2040; and at least 12% reduction in the Greenhouse Gas (GHG) emissions would reduce at least 12% for the Nationally Determined Contribution (NDC). During the Joint Meeting of the 59th EGNRET and 61st EGEEC, he also mentioned that the Philippines proposed “Reinforcing Relevant Laws for a Comprehensive Approach to Energy Efficiency and Conservation, Renewable Energy, Electric Vehicle, and Sustainability in the APEC Region” to be the meeting theme and look forward to exchanging views with APEC members, speakers, and participants on the policies, regulations, and technologies of these areas. Finally, he wished the 2-day Joint Meeting of the 59th EGNRET and 61st EGEEC to have productive discussions and outcomes.

2.2 Opening Address and Adoption of Joint Meeting Agenda

Chair of EGNRET expressed his sincere gratitude to the host economy, the

Philippines, for the meeting arrangement. He also expressed his appreciation to EGEEC for co-organizing the Joint Meeting of the 59th EGNRET and 61st EGEEC. He wished the 2-day Joint Meeting to have fruitful discussions. The joint meeting agenda was adopted by participating member economies during the meeting.

2.3 Host Economy Presentation and Introduction of Meeting Theme

Mr. Patrick T. Aquino introduced the meeting theme “Reinforcing Relevant Laws for a Comprehensive Approach to Energy Efficiency and Conservation, Renewable Energy, Electric Vehicle, and Sustainability in the APEC Region” and shared the plans, programs, and accomplishments of the Department of Energy on energy efficiency and conservation, renewable energy, energy resiliency, and electric vehicle. He shared that the energy mix was dominated by fossil fuels (67%) and renewable share accounted for around 33% in 2022. He also mentioned that the Philippines facilitates private individuals and entities to use renewable energy through its National Renewable Energy Program (NREP). For energy efficiency and conservation (EE&C), he said that the Philippines adopts the National Energy Efficiency and Conservation Plan (NEECP) and the EE&C Roadmap for 2023 to 2050, and short to long-term parallel policy programs across different sectors are being planned under the Plan and Roadmap. In addition, he stated that the Philippines’ Energy Efficiency & Conservation Act also facilitates the improvement of energy consumption, provides incentives for energy efficiency projects, and establishes policies to promote related technologies.

2.4 Updates of APEC/ APEC Fora

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

APEC Secretariat presented updates for APEC projects. In 2023, the total number of Concept Notes submissions was 176, which increased by 48%

compared to 2022 (a total number of 119). The total number of Concept Notes approved in principle by BMC in 2023 was 130, which grew by 18% compared to 2022.

Mr. Niikura introduced a newly launched online system- the APEC Project Administration System (APAS). He explained that for upcoming projects, part of the application process would be carried out through APAS, while others would be conducted via email. He also updated the status of ongoing EWG projects, information of the ministerial meeting and EWG publications, and upcoming workshops on EWG projects by the end of 2023.

(2) EGNRET Activities and Updates by Dr. Chi-Wen Liao, Chair of EGNRET

EGNRET Chair updated EGNRET's recent activities including the meeting outcomes of the 58th EGNRET Meeting, the highlights of the 65th EWG Meeting, and EGNRET's collaboration with APEC Fora this year. He also reported the current status of EGNRET projects.

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

Mr. Chun-Yin Li from EGEEC Secretariat reported the meeting outcomes of the 60th EGEEC Meeting, which included the fact that the new EGEEC Chair and Vice Chair serving for the tenure from 1 July 2023 to 30 June 2025 were selected and endorsed by members. He shared the announcement of which the EGEEC Chair is represented by Dr. Liu Meng, China; and the EGEEC Vice Chair is represented by Ms. Jovian Cheung, Hong Kong, China.

He also mentioned that given the World Green Building Council

(WorldGBC) has received a 3-year gas status in EGEEC as WorldGBC shares the same goal as EGEEC on reducing building energy consumption, EGEEC members agreed to invite the WorldGBC as a guest member in a 3-year guest status in EGEEC during the 60th EGEEC Meeting.

(4) EGEDA Updates by Mr. Glen Sweetnam, EGEDA Chair/Senior Vice President, APERC

EGEDA Chair, Mr. Sweetnam mentioned that the collection of 2021 annual energy supply and demand data has been completed by the secretariat and the annual energy supply and demand data for 2022 will be collected soon.

He also shared that EGEDA is asking its economies to report on methane emissions from fossil fuels and nitrous oxide emissions to collect data. Given that many APEC economies have committed to reduce GHG emissions, EGEDA encouraged APEC economies to support data collection. In addition, he mentioned that EGEDA has also created an energy efficiency indicators template and invited EGEEC members to provide data through the template.

He introduced the current progress of achieving APEC's energy goals, including that APEC has reduced energy intensity by 27.5% from 2005 to 2021 and will need to reduce by 17.5% more in the next 14 years (2021 to 2035). Meanwhile, APEC increased its renewable energy share in final energy consumption by 3.93% from 2010 to 2021 and will need to increase by just 2.05% more in the next 9 years (2022 to 2030). He highlighted that the data indicated that APEC is well on track to meet its energy intensity and renewable energy goals.

Mr. Sweetnam also mentioned the EGEDA's training courses, and stated that one of the courses was a two-week course to help participants from

different economies improve skills in the data collection and estimation of energy-use energy consumption data. He shared the outcome of its 21st APEC workshop on energy statistics, the meeting outcomes of the 34th and 35th EGEDA meetings, and the EGEDA secretariat's participation in international meetings.

(5) APERC Updates Mr. Ting-Jui Sun, Senior Researcher of APERC

Mr. Sun reported APERC Update, which included updating and recapping the energy intensity and renewable energy share projections from APEC Energy Demand and Supply Outlook 8th Edition, updating recent policy related to energy efficiency and renewable energy, and its ongoing work for preparing the APEC Energy Demand and Supply Outlook 9th Edition.

He shared that energy efficiency and electrification enable energy demand to be 22% lower in 2050 in the Carbon Neutrality (CN) scenario compared to the Reference (REF) scenario. For electricity demand, fossil fuels meet almost 40 to 50% of electricity demand in 2050 in REF and renewable energy sources (such as wind and solar) will keep growing. Besides, he mentioned that fossil fuels will be replaced by new technology such as CCS, gas plus CCS, and coal plus CCS, etc. Natural gas will continue to provide balancing and ancillary services to the electric grid as a substitution for coal.

In addition, Mr. Sun pointed out that renewable energy policies in the APEC region have considered potential challenges, such as the intermittency of renewable energy, to mitigate the impacts on the power grid.

He also mentioned that the projection period for Outlook 9th Edition will be until 2060 and considers the critical technology development trends, which include CCS, Energy storage, hydrogen, etc. In the 9th Edition, the CN scenario pathway will be replaced with the target (TGT) scenario to illustrate a hypothetical pathway for each economy toward realizing energy-related policy targets, even if implementation details are

unavailable.

After APERC's presentation, **Dr. Chung-Hsien Chen, Director of Renewable and Prospective Energy Development Division, Energy Administration, Ministry of Economic Affairs, Chinese Taipei** illustrated that geothermal energy has been amended in the Renewable Energy Development Act of Chinese Taipei. In the Act, bioenergy, offshore wind power, and small hydropower have more flexible mechanisms to promote renewable energy development. Chinese Taipei will share more information with APERC.

Ms. Jovian Cheung, Vice Chair of EGEEC asked if APERC could share more information regarding the contributions of energy policies (information disclosures, incentives, and regulations) among member economies to reduce the energy intensity in the APEC region.

Mr. Sun replied to Vice Chair Cheung of EGEEC that energy intensity might be impacted by different energy sectors. APERC is trying to support more energy regulations and incentives and ensure the implementation of those policies and programs.

(6) APSEC Updates by Prof. Jinlong Ma, Vice President, APSEC

Prof. Ma presented APSEC work progress updates, including APSEC participation and sharing in the EWG 65 Meeting and associated workshop, the 60th EGEEC Meeting, and the 7th APEC Workshop on Sustainable Cities. He also shared the current progress and summary of EWG projects.

He shared the research program progress. Considering that cities are composed of two-thirds of global energy consumption and 50 to 60% of annual global carbon emissions, city or urban energy is critical for green and low-carbon development to help achieve carbon neutrality goal. The framework for APSEC's research for the next three years (2023 to 2025) will focus on driving cities through the low-carbon transition in 2023; storage

to enable the energy transition with a focus on enabling technologies in 2024; and energy solutions for clean heating and cooling in 2025.

(7) Land Experts Group (LEG) Sharing by Mr. Morgan Watkins, Chair of LEG

Mr. Watkins presented Towards Smart, Resilient and Low/Zero Emissions in the APEC Region. He introduced that LEG focuses on transportation work related to land transport. Its work is guided by its main policy theme towards smart, resilient, and low and zero emissions transport in the APEC region.

Mr. Watkins shared the results of the 11th APEC Transportation Ministerial Meeting, which was held in Detroit, Michigan, the United States in May 2023. Ministers had given the LEG a clear sense of direction and reaffirmed the crucial role of the Transportation Working Group (TPTWG) and directed LEG to engage in specific and tangible areas of work, most relevantly including catalyzing the transition towards low and zero emissions light duty vehicles, and ensuring the innovation and emerging technologies feature prominently in its discussions and work.

In addition, he mentioned that the transportation sector emits one-fifth of global carbon dioxide emissions and therefore effective policy measures are needed to ensure low emission and a sustainable future for land transportation. The key branches of this pathway include vehicle electrification, promoting public shared and active transport, and adopting sustainable energy sources for land transportation.

2.5 U.S. Presentation (Host of APEC 2023)

The United States Presentation was presented by Dr. Cary Bloyd, Senior Advisor, Pacific Northwest National Laboratory, the United States

Dr. Bloyd shared the meeting outcomes of the 13th APEC Energy Ministerial Meeting (EMM), which was held in Seattle, Washington, the United States on 15 to 16 August 2023. The meeting theme was “Creating a Resilient and Sustainable Future for All” focusing on power sector decarbonization, accelerating methane abatement, and supporting a just energy transition.

Dr. Cary Bloyd mentioned that according to the Chair's Statement of the 13th APEC EMM, some discussions were supported by nearly all APEC economies, which included a new collective aspirational goal for the power sector of about 70% electricity generated by carbon free and carbon neutral sources for the APEC region by 2035; and APEC economies are committed to working to achieve their respective announced pledges that collectively comprise at least a 50% reduction methane emissions in the fossil energy sector from 2020 levels by 2030. In addition, EMM also tasked EWG to establish a Just Energy Transition Initiative.

After the U.S. presentation, **Mr. Takao Ikeda, Executive Economist, Renewable Energy Group, the Institute of Energy Economics, Japan** appreciated the US's leadership as chair economy for APEC EMM and its effort for the statement. He mentioned the significance of decarbonization for the electricity sector and working on the APEC region as a whole. He said the non-fossil fuels are expected to reach 59% of the electricity mix in 2030 in Japan based on Japan's current strategic energy plan. Besides, Japan has been continuing its effort to reduce methane emissions for a long time and participating in the Global Methane Pledge established in 2021. Japan would also like to contribute to reducing methane emissions in the LNG supply chain including the APEC region.

2.6 Invited Presentation

- (1) International Energy Agency (IEA) Presentation by Ms. Natalie Kauf, and Ms. Ksenia Petrichenko, Policy Analyst of IEA**

Ms. Kauf, and Ms. Petrichenko from IEA presented Efficient Grid-interactive Buildings and Future Buildings in the ASEAN region. Most energy efficiency gains can be found in emerging and developing economies, such as Southeast Asia. According to IEA's market report in 2022, the ASEAN region has more than 660 million population, is one of the regions experiencing the fastest energy demand growth globally by growing over 3% per year from 2000 to 2020. Therefore, enhancing energy efficiency is vital to align response to sustainable development goals, such as universal access to clean cooking solutions, access to modern energy services, etc.

They also shared the IEA sustainability development scenario which outlines a pathway that government policy can drive more sustainable cooling solutions through efficient air conditioners along with the improvement of building efficiency, which can contribute to 110 TWh of electricity savings by 2040 compared to current policy settings. The energy savings and security of efficient buildings and cooling equipment can be further enhanced through the adoption of smart and digital services to support demand management and a network of air conditioners.

(2) ASEAN Centre for Energy (ACE) Presentation by Mr. Christopher Zamora, Senior Manager, ACE

Mr. Zamora introduced the program of ASEAN Plan of Action for Energy Cooperation (APAEC) Phase 2: 2021 to 2025 and its Energy Efficiency & Conservation and Renewable Energy Targets and Developments.

He shared that the theme and the sub-theme of APAEC Phase 2: 2021 to 2025 is “Enhancing Energy Connectivity and Market Integration in ASEAN to Achieve Energy Security, Accessibility, Affordability and Sustainability for All and Accelerating Energy Transition and Strengthening Resilience Through Greater Innovation and Cooperation”. The areas of the program include the power grid, gas pipeline, clean coal technology, energy efficiency, renewable energy, energy policy and planning, and civilian

nuclear energy in the ASEAN region. The renewable energy target of APAEC is to increase the renewable energy share to 23% in the total primary energy supply (TPES) and 35% in installed power capacity by 2025.

In 2021, the share of APAEC renewable energy in TPES and total installed power capacity reached 14.4% and 32.8% respectively. While the installed capacity share is projected to be achieved beyond the 2025 target, the primary energy target is a challenge. In the program, the strategies for renewable energy development include advancing policy and decarbonization pathway, conducting high-level policy dialogue, enhancing R&D, promoting renewable energy financing schemes and mechanisms, supporting biofuel and bioenergy development, and enhancing information and training center. However, long-term strategies and accelerated actions are also needed to balance energy security, emission reduction, and economic growth. Currently, a long-term renewable energy roadmap for ASEAN is under planning and preparation, which is expected to be completed in 2024.

After ACE's presentation, **Dr. Chung-Hsien Chen, Director of Renewable and Prospective Energy Development Division, Energy Administration, Ministry of Economic Affairs, Chinese Taipei** suggested that APEC EWG, EGNRET, and/or EGCFE can have cooperation with ASEAN on power grid, clean coal, new and renewable energy, and energy data.

Mr. Takao Ikeda, Executive Economist, Renewable Energy Group, the Institute of Energy Economics, Japan mentioned the importance of ASEAN to APEC, since 7 APEC economies are also the members of ASEAN. Mr. Ikeda asked if there are any discussions about renewable energy targets for the next phase, such as for 2030 or 2040.

Mr. Christopher Zamora, Senior Manager, the ASEAN Centre for Energy (ACE) replied to Mr. Ikeda that ACE recently had lots of meetings

and consultations with ASEAN members on establishing a new target for renewable energy. ACE is also preparing for the next phase (2026 to 2035). The document is planned to seek endorsement by 2025. By that time, it should have a clear target and strategies for renewable energy.

Ms. Jovian Cheung, Vice Chair of EGEEC asked ACE if it has a target for carbon neutrality or any other initiatives apart from renewable energy and energy intensity. ACE replied that they are considering to include a Carbon Neutrality Scenario in the upcoming 8th ASEAN Energy Outlook.

Dr. Zulfikar Yurnaidi, Manager of Energy Modelling and Policy Planning, the ASEAN Centre for Energy (ACE) elaborated that ASEAN carbon neutrality strategies have been released with several key points including renewable energy. However, there has not yet a carbon neutrality target for ASEAN since the exploration scenario for carbon neutrality has yet been endorsed by ministerial officials.

(3) World Green Energy Council (WorldGBC) Presentation by Mr. Christopher C. de la Cruz, Vice Chairman, WorldGBC Asia Pacific Network

Mr. Cruz shared the WorldGBC-APN Advancing Net Zero Readiness Framework, Asia-Pacific knowledge hub, the discussion outcomes of WorldGBC Asia-Pacific Network Meeting 2023, and Philippine Green Building Council (PHILGBC) rating and certification tools.

The WorldGBC-APN Advancing Net Zero Readiness Framework provides guidance for organizations to transition towards net-zero buildings by 2050 and focus on government leadership, technical approaches, finance, data, and mindset. Each category has a specific goal to accelerate net zero practices.

The discussion outcomes of the WorldGBC Asia-Pacific Network Meeting 2023 pointed out that the reduction of carbon emissions requires tailored

strategies and solutions at each stage of the process, addressing the unique considerations and difficulties at each stage. Also, setting ambitious targets for carbon reduction can feel overwhelming due to the scale of the challenge. The targets can be achieved by breaking them down into manageable steps for tangible progress.

2.7 Member Economy Presentation: Reinforcing Relevant Laws for a Comprehensive Approach to Energy Efficiency and Conservation, Renewable Energy, Electric Vehicle, and Sustainability in the APEC Region

The meeting theme was "Reinforcing Relevant Laws for a Comprehensive Approach to Energy Efficiency and Conservation, Renewable Energy, Electric Vehicle, and Sustainability in the APEC Region," which was presented by six (6), namely Hong Kong, China, Japan, Republic of Korea, Malaysia, Chinese Taipei, and the United States.

- (1) **Hong Kong, China** presented its targets for energy intensity, renewable energy, and electricity saving in buildings to achieve carbon neutrality by 2050. The economy has various measures to promote RE applications, such as the Feed-in Tariff scheme. It also promotes energy efficiency through different measures including policy, ordinance, as well as relevant programs.
- (2) **Japan** presented its 2050 carbon-neutral declaration which aims to reduce its GHG emission by 46% in 2030 from the level of 2013 and continue efforts to meet the goal of cutting its emissions by 50% in 2030. Japan has also been implementing the Feed-in-Premium since April 2022 as one of its key RE promotion schemes to facilitate the well development of renewable energy. The economy also shared its Green Transformation (GX) Basic Policy which focuses on regulatory, financing, and technology development for green transformation of various industrial sectors.
- (3) **The Republic of Korea** elaborated the energy intensity was improved

slowly over the years (from 2015 to 2021) due to the large share of energy-intensive industries and rapid electrification. Efficiency of electricity consumption is one of the keys to reducing GHG emissions. The Republic of Korea has applied various policy measures, which include incentives, regulations, information provisions, etc. to industry, infrastructure, transport, building, and appliance sectors. It has also mentioned its EE target for 2030 NDC and 2050 net zero emissions.

- (4) **Malaysia** updates its energy efficiency legislation and initiatives. The economy introduced its energy transition roadmap that focuses on optimizing EE, increasing usage of renewables, and abating industrial emissions with carbon capture, utilization and storage (CCUS) to drive energy transition and socio-economic advancement. Malaysia also introduced the Energy Efficiency and Conservation Act with objectives to reduce emissions, promote efficient and sustainable energy consumption, improve energy efficiency initiatives, and reach net zero by 2050. The bill is undergoing few process before it is approved to gazette.
- (5) **Chinese Taipei** shared its key regulation, the Renewable Energy Development Act, with Feed-in Tariff (FiT) rates as its core strategy to promote renewable energy development. The economy also published its 12 key strategies in 2022 to achieve net zero emissions by 2050 and has set a target of increasing the share of renewable energy in the electricity generation structure to up to 60 to 70% by 2050. Chinese Taipei also improves energy efficiency in key sectors under the pathway toward net zero transition and implements policies to promote energy efficiency management for equipment and apparatuses. Moreover, it provides subsidies for green appliances and introduces the Digital and Automated Review System to shorten examination procedures of online applications.
- (6) The United States shared the electric vehicle (EV) systems and safety challenges while connecting to the grid, charging stations, and internet networks. In addition, the economy highlighted the safety of EV systems

and EV supply equipment supply chain through performance testing, certification services, and other key measures. It is important to manage the deployment of these technologies in the market on a system level while ensuring consumers' safety through approaches, such as compliance with standards.

3. The 59th EGNRET Meeting (09:00 AM-11:05 AM on 18 October 2023)

3.1 Opening Address and Adoption of the 59th EGNRET Meeting Agenda

Mr. Ariel Fronda, Chief Science Research Specialist, Department of Energy, the Philippines welcomed the delegates from APEC member economies, APEC fora, and invited speakers. The meeting agenda was adopted by participating member economies.

3.2 Submission Process and Current Progress of EGNRET Projects by Ms. An-Chi Fan, EGNRET Secretariat

Ms. Fan introduced the project submission process including the newly launched APEC Project Administration System (APAS) and project development cycle as well as updated the status of EGNRET projects. As of 17 October 2023, EGNRET had 8 projects under implementation and 6 projects completed since EGNRET 58 Meeting in April 2023.

3.3 EGNRET Projects Report

7 projects presented by four (4) member economies, namely China, Hong Kong China, Chinese Taipei, and the United States 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

Proposed Economy	Project Number	Project Title
	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
	EWG 14 2021A	Empowering Indigenous Social Awareness on Renewable Energy and Increasing Inclusion Sustainability for Green Recovery in APEC Regions
The United States	EWG 04 2021A	Lessons Learned on Resiliency and Uptake of Variable Energy Resources from Islanded Grids that Support APEC Clean Energy Goals
	EWG 12 2021A	APEC Workshop Furthering University Collaboration to Support Data Gathering and Analysis in Energy Efficiency, Renewable Energy, and Energy Resiliency

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

Considering offshore wind has a strong requirement for grid connection, the project objective aims to support power grid integration of offshore wind and analyze the challenges, barriers, and opportunities to increase large-scale offshore wind deployment, as well as provide recommendations on policies and technical solutions to promote offshore wind in the APEC region.

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

The project aims to look into the situation of renewable energy development over the pandemic period and identify and analyze the strategies and plans of different economies in terms of recovering from the COVID-19 period and post-

COVID-19 period to support renewable energy development in the APEC region.

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

The project objective aims to advance digital technology and enhance the capacity of APEC economies in deploying and developing renewables, particularly solar energy. Based on the project, a one-day APEC workshop has been scheduled to be held in the second half of 2024 in Hong Kong, China.

3.3.4 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 objectives aims to build the capacity of participants through workshops that better supports the “multi-functional usage in ocean space” and produce legislation recommendation for further developing energy security, resilience and meets the APEC Leaders Meeting in Kuala Lumpur in 2020 to collaborate to facilitate access to affordable energy and enhancing energy security using the widest variety of technologies to support sustainable economic growth.

Based on the project, a one-day self-fund workshop was held alongside the Joint Meeting of the 59th EGRNET and 61st EGEEC in Manila, the Philippines on 16 October 2023 to collect data and suggestions for the project.

For future project movement, an APEC-fund workshop is expected to be held in February 2024 in Taichung, Chinese Taipei.

3.3.5 Empowering Indigenous Social Awareness on Renewable Energy

and increasing Inclusion Sustainability for Green Energy Applications in APEC Regions (EWG 14 2021A / Chinese Taipei)

The project objectives aims to empower the indigenous people on social awareness of renewable energy technologies and develop their knowledge, skills, ability, and technical know-how through conducting a hybrid training course. Under the project, a 3-day event was held and the agenda included policy dialogue, workshops, and a real case practice visit to facilitate the view of exchange and cooperation with other APEC member economies. The event aims to foster the inclusion and empowerment of the Indigenous people in the green energy sector, promoting sustainable development, economic opportunities, and cultural preservation for Indigenous communities within the APEC region. The project report has been submitted for review on 23 September 2023.

3.3.6 Lessons learned on resiliency and uptake of variable energy resources from islanded grids that support APEC clean energy goals (EWG 04 2021A)

The project objective aims to increase the amount of renewable energy utilized in the APEC region by providing a real operating experience that will enable better grid expansion planning. The project report has been completed. The project outputs include a summary of the costs and operational experiences of providing reliable electricity while utilizing maximum variable energy resources from islanded grids in the APEC region; and a one-day virtual meeting held to gain feedback from the participants to be incorporated into research as well as the final report.

3.3.7 APEC Workshop Furthering University Collaboration to Support Data Gathering and Analysis in Energy Efficiency, Renewable Energy, and Energy Resiliency (EWG 12 2021A)

The project objectives include: building the capacity of workshop participants by continuing to develop collaborations between EWG, APERC, and university

faculty in APEC economies; continuing discussion of data gaps and needs in energy efficiency, renewable energy, and energy resiliency and developing policy recommendations for the EWG in these areas; sharing examples of collaborative projects that address APEC energy efficiency, renewable energy, and energy resiliency goals; identifying other methods of analysis to be included in projects; and discussing potential ideas for new collaborative projects. The final report has been completed and published on the APEC website.

3.4 Administration and Operation

3.4.1 Terms of Reference (ToR)

- (1) Given that the 13th APEC EMM has tasked EWG to establish a Just Energy Transition Initiative to promote efforts to accelerate energy transition within APEC economies, our member economy, the United States, proposed including Just Energy Transition Initiative in the EGNRET's ToR; and deleted the APEC 21st Century Renewable Energy Development Initiative from the ToR.
- (2) Based on the records of the total number of economies participating in the past EGNRET meetings, EGNRET Secretariat found that it is hard to reach the current quorum, which has to be constituted of 14 economies, for EGNRET meetings and therefore proposed to adjust the quorum from 14 to 12 economies.
- (3) Since the LCMT taskforce has completed its projects and missions, and no longer exists, EGNRET Secretariat proposed to delete it from the ToR.
- (4) The proposed ToR will be circulated within EGNRET member economies via email to seek for the endorsement of the member economies after the 59th EGNRET Meeting.

3.4.2 Coming Event

EGNRET Secretariat announced that the upcoming 66th Energy Working Group Meeting (EWG 66) will be hosted by Thailand on 27 November to 1 December

2023 in physical format.

3.4.3 Timeline and Process of Chair and Vice Chair Selection

EGNRET Secretariat elaborated on the timeline and process for the next Chair and Vice Chair selection for the tenure 2024 to 2025. The Selection will be held in the 61st EGNRET Meeting. The selection will be announced 2 months before the 61st EGNRET Meeting. EGNRET Secretariat encouraged members to nominate candidates for the chair and vice chair selection.

3.4.4 EGNRET Secretariat List Update

EGNRET Secretariat announced to add Ms. An-Chi Fan to EGNRET Secretariat list, which has been endorsed by EGNRET member economies. In addition, Dr. Keng-Tung Wu will not serve as the secretary of EGNRET Secretariat. The updated EGNRET Secretariat list will be circulating within member economies for endorsement after the 59th EGNRET Meeting.

3.5 Discussion: Key Areas for Collaboration with APEC Expert Groups and Other Cross Fora

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

- (1) **Dr. Cary Bloyd, Senior Advisor, Pacific Northwest National Laboratory, the United States** suggested setting a single specific theme for the EGNRET meeting to encourage experts and specific economies to exchange views and have more technical discussions.
- (2) **Prof. Jinlong Ma, Vice President of APSEC** agreed with Dr. Cary's advice and suggested that workshops can be organized to focus on one particular topic from EWG projects and invite experts from APEC fora and external experts to join.
- (3) **Dr. Chung-Hsien Chen, Director of Renewable and Prospective Energy Development Division, Energy Administration, Ministry of Economic Affairs, Chinese Taipei** suggested EGNRET to seek opportunities to collaborate between APEC fora, such as EGCFE and EGNRET to cooperate on hydrogen or other topics to share technologies,

policy, and other key aspects.

4. Joint Meeting of the 59th EGNRET and 61st EGEEC (1:00 PM – 3:00 AM on 18 October 2023)

The Joint Meeting was co-chaired by Ms. Jovian Cheung, Vice Chair of EGEEC and Mr. Patrick T. Aquino CESO III, Director of Energy Utilization Management Bureau, Department of Energy, the Philippines.

4.1 Progress on Possible New Energy Goals for APEC by Mr. Glen Sweetnam, EGEDA Chair/Senior Vice Present, APERC

Mr. Sweetnam mentioned that three new energy goals for APEC were proposed in the 13th EMM, which included: approximately 70% of electricity generated by carbon free and carbon neutral sources for the APEC region by 2035; at least 50% methane emissions reduction in the fossil energy sector from 2020 levels by 2030; and tasking EWG to establish a Just Energy Transition Initiative to promote efforts to accelerated energy transitions within APEC economies.

According to the APERC's research, the decarbonized share of power generation rose from 31% to 35% from 2000 to 2020. From 2020 to 2035, the decarbonized share was projected to rise by 17% in the REF scenario and 27% in the CN scenario. According to the trend of the scenarios, the decarbonization of the United States can have a substantial effect on APEC.

4.2 Discussion: APEC Fora Collaboration

The collaborative opportunities and actions were discussed by the attending economies, expert groups, research centers, and international/regional organizations as listed below.

- Japan suggested EGNRET to collaborate with EGCFE on hydrogen, such

as utilization and transportation.

- The Philippines mentioned that most requirements of land electrification of LEG is consistent with the Philippines' push to meet energy consumption for transportation more efficiently. It would be great for EGNRET and other expert groups to collaborate with LEG on key topics, such as infrastructure and RE technologies.
- Chinese Taipei proposed the possibility of expert groups collaborating with the APEC Policy Partnership on Science, Technology, and Innovation (PPSTI) considering that PPSTI has a research center to focus on advanced hydrogen technology, which is one of the important energy sources.
- The United States suggested the collaboration among more APEC expert groups and fora to organize a big meeting to have more members share information, find common issues, and address core issues on EE and RE to gain more fruitful outcomes.
- EGNRET mentioned that EGNRET was invited by Asia-Pacific Metrology Programme (APMP) to share the APEC renewable energy goal, energy development, and EGNRET works on APMP's workshop Measurement for Sustainable Energy in August 2023. EGNRET Chair suggested that EGNRET can explore further collaboration with APMP.
- EGEEC suggested that expert EGNRET and EGEEC chairs can send an email to members and EWG to suggest members host meetings frequently to share knowledge and explore fora collaborations. Also, the APEC fora can have further collaboration with international and regional organizations in the future.
- APSEC suggested that APEC fora can collaborate with international organizations, such as the United Nations (UN), to co-organize forums to develop certain topics and also open the door for the public to enhance capacity building and knowledge-sharing to focus on broader areas and help achieve the APEC goals.
- Land Expert Group (LEG) sought cooperation with EGEEC and EGNRET.

LEG proposed the potential areas for the collaboration could be:

- Interface between surface transportation, land use, energy use, and nature to drive efficiencies and transit, freight or other areas that can grow the health of cities.
- Climate resilience and adaptation in particular, future net transport infrastructure challenges in the APEC region.
- Topics that fall within the scope of the main policy theme.
- Policy Brief 55, which aims to power up on vehicle electrification, promote public, share and active transport, and adopt sustainable energy sources for land transport; or transport minister directions.
- ASEAN expressed its interest in cooperating with APEC expert groups and proposed possible activities for the collaboration including ASEAN and APEC expert groups pursuing information sharing and simulation of best practices for RE, EE&C, or other key topics; conducting joint research to include regional energy policy and planning, ASEAN power grids for RE, and exploration of EE in power sector; or jointly conducting capacity building and training. And also for APEC public and business sector to coordinate and network.
- CLASP proposed the collaboration between CLASP and expert groups on joint research to improve EE on energy-consuming products and sharing views with economies on EE&C, standards, labeling, policy, etc. to learn from each other.

4.3 EGEEC Report

EGEEC Secretariat reported the outcomes of the 61st EGEEC Meeting and the Joint Meeting of the 59th EGNRET and 61st EGEEC including key discussions and conclusions. The EGEEC Secretariat also announced that the 62nd EGEEC Meeting will be hosted by China in May 2024, tentatively.

4.4 EGNRET Report

EGNRET Secretariat reported the outcomes of the 59th EGNRET Meeting and

the Joint Meeting of the 59th EGNRET and 61st EGEEC including key highlights, discussions, and conclusions. 4 member economies, namely China, Hong Kong China, Chinese Taipei, and the United States shared the status/progress of their EGNRET projects.

4.5 Closing Remarks by Mr. Patrick T. Aquino, CESO III, Director IV, Energy Utilization Management Bureau, Department of Energy, the Philippines and Ms. Jovian Cheung, Vice Chair of EGEEC

Mr. Patrick T. Aquino, CESO III, Director IV, Energy Utilization Management Bureau, Department of Energy, the Philippines gave closing remarks to express deep appreciation to the speakers and delegates for their participation and valuable insights and knowledge sharing. Mr. Aquino also mentioned the members have committed to advancing energy efficiency and renewable energy in the APEC region. The fruitful discussions strengthened the collective efforts to address the energy challenges and explored multiple solutions on the policy framework and strategies to promote EE&C, RE, and sustainability.

Ms. Jovian Cheung, Vice Chair of EGEEC expressed thankfulness to the Philippines for hosting the meetings and workshops and all participants for their participation and contributions. Ms. Cheung said that the meetings have put forward and demonstrated the commitment of all member economies to achieving APEC's energy efficiency and renewable energy goals. In addition, all presentation materials will be uploaded to EGNRET and EGEEC websites for sharing with participants and the meeting summary will also be circulated among members of EGNRET and EGEEC after the meeting.

ANNEX A: LIST OF The 59th EGNRET MEETING and JOINT MEETING PARTICIPANTS

No	Full Name		Economy / APEC Sub-fora	Organization
	First Name	Last Name		
1	Marco	LUI	Hong Kong, China	EMSD
2	Takao	IKEDA	Japan	The Institute of Energy Economics, Japan
3	Iwai	Masami	Japan	The Institute of Energy Economics, Japan
4	Jongwoo	Kim	Republic of Korea	Korea Energy Economics Institute
5	Amirul	Hamzah	Malaysia	Energy Commission Malaysia
6	Syafiqah	Binti Hazmi	Malaysia	Energy Commission Malaysia
7	Patrick	Aquino	the Philippines	Department of Energy
8	Lana Rose	Manaligod	the Philippines	Department of Energy
9	Daniel Collin	Jornales	the Philippines	Department of Energy
10	Christian Harris	Hernaes	the Philippines	Department of Energy
11	Mara Camille	Galos	the Philippines	Department of Energy
12	Sienna Mae	Hortaleza	the Philippines	Department of Energy
13	Dave Angelo	Cabalteja	the Philippines	Department of Energy
14	Vittorio Leif Ericson	Santos	the Philippines	Department of Energy
15	Mary Mae	Hernandez	the Philippines	Department of Energy
16	Mary Grace	Razonable	the Philippines	Department of Energy
17	Cephas Olivier	Cabatit	the Philippines	Department of Energy
18	Jovelle	Medina	the Philippines	Department of Energy
19	Erwin	Esperanza	the Philippines	Department of Energy
20	Mark Jezekiah	Abalos	the Philippines	Department of Energy
21	Omar	Alegre	the Philippines	Department of Energy
22	Richard	Asaytuno	the Philippines	Department of Energy
23	Ariel	Frona	the Philippines	Department of Energy
24	Winifredo	Malabanan	the Philippines	Department of Energy
25	Joselito	Calip	the Philippines	Department of Energy



Asia-Pacific
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**APEC EXPERT GROUP ON
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No	Full Name		Economy / APEC Sub-fora	Organization
	First Name	Last Name		
26	Aylmer	Marbello	the Philippines	Department of Energy
27	Lesly Kim	De Vera	the Philippines	Department of Energy
28	Jaime	Planas	the Philippines	Department of Energy
29	Chung-Hsien	Chen	Chinese Taipei	Energy Administration, Ministry of Economic Affairs
30	Shih-Hua	HSU	Chinese Taipei	Energy Administration, Ministry of Economic Affairs
31	Cho-Ting	TSAI	Chinese Taipei	Industrial Technology Research Institute
32	Shin-Hang	LO	Chinese Taipei	Industrial Technology Research Institute
33	Cary	Bloyd	USA	Pacific Northwest National Laboratory
34	Christian	Roatta	USA	UL Solutions
35	Thi Ngoc Thanh	Hoang	Viet Nam	Ministry of Industry and Trade
36	Takayuki	Niikura	APEC Secretariat	APEC Secretariat
37	Keng-Tung	Wu	EGNRET	EGNRET
38	Sih-Ting	Jhou	EGNRET	EGNRET
39	Chi-Wen	Liao	EGNRET	EGNRET
40	An-Chi	Fan	EGNRET	EGNRET
41	Jovian	CHEUNG	EGEEC	EGEEC
42	CHUN YIN	LI	EGEEC	EGEEC
43	Glen	SWEETNAM	EGEDA/APERC	EGEDA/APERC
44	Munehisa	YAMASHIRO	APERC	APERC
45	Jeongdu	KIM	APERC	APERC
46	Ting Jui	SUN	APERC	APERC
47	Alexander	IZHBULDIN	APERC	APERC
48	Finbar	MAUNSELL	APERC	APERC
49	Jinlong	MA	APSEC	APSEC
50	Morgan	Watkins	Land Experts Group	Land Experts Group
51	Natalie	Kauf	IEA	IEA
52	Petrichenko	Ksenia	IEA	IEA
53	Christopher C.	Cruz	WorldGBC/PHILGBC	WorldGBC/PHILGBC



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No	Full Name		Economy / APEC Sub-fora	Organization
	First Name	Last Name		
54	Anna	Tungol	PhilGBC	PHILGBC
55	CHRISTOPHER	ZAMORA	ASEAN CENTRE FOR ENERGY	ASEAN CENTRE FOR ENERGY
56	Zulfikar	Yurnaidi	ASEAN CENTRE FOR ENERGY	ASEAN CENTRE FOR ENERGY
57	Lei	Zeng	China	CLASP