Summary of the 8th Meeting of the Energy Resiliency Task Force

Tuesday, 21 May 2019
Manila, Philippines (EWG57)

1. **Welcome/Introductions**
   ERTF Co-Chairs Patrick Aquino (PH DOE) and Cary Bloyd (US DOE/PNNL) welcomed EWG delegates to the meeting. The ERTF approved the agenda for ERTF8. The ERTF next approved the meeting minutes from the 7th ERTF meeting held in Lima, Peru at EWG56. The review of the revised implementation plan was postponed until ERTF8.

2. **APEC Energy Resiliency Response since ERTF7**
   Representative were asked to report on significant weather/nation electricity disruption events since ERTF7 and their energy resilience response including potential lessons learned for APEC.

   United States: The United States reported that in 2018 there have been 14 weather and climate disaster events with losses exceeding US$1 billion each occurring across the United States. These included 1 drought event, 8 severe storm events, 2 tropical cyclone event, 1 wildfire event and 2 winter storm events. During 2018, the U.S. has experienced the fourth highest total number of events, only behind the very active years of 2017, 2011, and 2016. The U.S. next reported the summary results from the 2017 National Academy of Science report on Enhancing the Resilience of the U.S. Electrical System. This found that resilience was not just about lessening the likelihood that outages will occur, but also about limiting the scope and impact of outages when the do occur, restoring power rapidly afterwards, and learning from these experiences to better deal with events in the future. Key lesions where also presented from the most recent Quadrennial Energy Review, which included the importance of understanding critical infrastructure interdependencies.

   Philippines: The Philippines reported that in January 2019, a Department Circular titled "Adoption of Energy Resiliency in the Planning and Programming of the Energy Sector to Mitigate Potential Impacts of Disasters" was signed by the Philippine Energy Secretary. The Department Circular will adopt resiliency plans and programs aim to: strengthen energy systems and facilities, incorporate mitigation improvements in rehabilitating damaged infrastructure, improve operational and maintenance standards and practices for quick restoration and develop resiliency standards for future reconstruction of energy facilities and adopt measures for timely recovery. One of the key features of the new policy is the institutionalization of the Resiliency Compliance Plan (RCP), which provides engineering and non-engineering measures to ensure infrastructure and human resource disaster preparedness.

3. **Completed APEC Energy Resiliency Projects**

   Australia: Integrated energy system planning for equitable access to sustainable energy for remote communities in the northern regions of North Sulawesi (EWG 13 2017A).

The project commenced in November 2017 and a November 2018 workshop was held to share best practices for attracting private investment to special economic zones in remote areas. A goal of the project is to deliver an innovative low carbon energy roadmap with the next level of granularity to provide practical information which local government, energy providers (Pertamina and PLN), local businesses and finance institutions can use to support investment decisions, implementation of projects, and policy development.

The project report summarizes findings and outcomes of the integrated energy systems modelling. Referring to the recommendations of the Low-Carbon Model Town Stage 5 Final Report for Special Economic Zone (SEZ) Bitung and the entire North Sulawesi province, the modelling study defines a pathway to lower the system's emissions while serving demand growth through least-cost capacity additions.

Two base scenarios were considered: (i) Business-As-Usual (BAU) which corresponds to PLN's Electricity Supply Business Plan 2018-2027 (RUPTL); (ii) Trend Analysis (TA) which reflects historical demand growth over the period 2013 to 2017 and expected demand from the Bitung SEZ. The TA scenario was created to provide comparisons to RUPTL's growth estimates, which historically tend to have an upward bias. Each of the base scenarios were subject to two levels of energy efficiency intervention, Cost Effective Potential (CEP) and Best-Available-Technology (BAT), reducing demand growth. In total there were six load growth scenarios modelled. The project report was published in March 2019 and is available at: https://www.apec.org/Publications/2019/03/Integrated-Energy-System-Planning-for-Equitable-Access-to-Sustainable-Energy-for-Remote-Communities

China: Off Grid Off Grid Electrification Option for Remote Regions in APEC Economies (EWG 07 2016A) (through EGNRET). This project was to study the off-grid electrification option in remote regions in APEC economies. The project team has on-site investigated at three representative regions for the feasibility study, and to investigate the current off-grid electricity option, the cost, problem and obstacles of providing electricity, and to assess the technology and economical advantages of adopting solar, battery, microgrid and DC microgrid to these regions. At the end of project, a one-day workshop was held in Chang Mai, Thailand in September 2018 to facilitate in-depth discussions, sharing ideas and developing strategies to implement clean and efficient energy solution in these regions. The final report was published in March 2019 and is available at: https://www.apec.org/Publications/2019/03/Off-Grid-Electrification-Option-for-Remote-Regions-in-APEC-Economies

4. APEC Energy Resiliency Project Updates

USA: Ethanol for Reliable Energy Access (EWG 02 2018S)
The workshop will focus on the important role that increased ethanol use holds for improving energy access in member economies and in supporting environmental and human health benefits. The goal of the workshop is to further the dialogue around the expanded use of ethanol as member economies seek to improve energy access and to meet APEC's ambitious 2030 goals of doubling the share of renewables in their energy mix. This workshop builds off

previous work completed by the Energy Working Group in developing a roadmap for best practices in developing an ethanol industry in member economies, and individual economy case studies of challenges and opportunities of developing ethanol policies. The workshop will also workshop will foster collaboration across relevant APEC ministry officials and industry representatives to consider and share the benefits and opportunities ethanol holds for achieving energy access for APEC member economies.
Status: The project is currently on hold.

USA: APEC Workshop on Integrated Energy-Water Planning and Policy Formulation (EWG 13 2018A)
This project will bring together representatives and practitioners from all APEC economies to exchange experiences on local energy-water issues and challenges, and on measures that have or could be taken to enhance energy-water resilience and sustainability. The goal of the workshop is to promote a greater understanding of energy-water interdependencies and potential impacts on energy system and water system operation and performance, and ways to minimize the potential economic and social impacts of new energy projects.
Status: The project workshop was held in Honolulu, Hawaii in the May 7-9, 2019.

USA: APEC Energy Resilience Smart Grid Workshop (EWG 09 2019S). Under the U.S.-Philippines co-chaired APEC Energy Resiliency Task Force (ERTF), this project aims to bring together representatives and practitioners from all economies to exchange experience on methodologies for evaluation and planning for natural disaster risks to power system resources, infrastructure, and communities. This project will promote greater energy resilience in power systems and project-level planning. The workshop will also provide an opportunity to demonstrate how cutting-edge smart grid technologies can enhance reliability and resilience of electric grid in the APEC region.
Status: The project workshop is planned for the third quarter of 2019.

China: Establishment of a Cloud-based Sharing Platform of Multi-Energy Microgrids for APEC Economies Grid Off Grid Electrification Option for Remote Regions in APEC Economies (EWG 03 2018S) This self-funded project on the Establishment of a Cloud-based Sharing Platform of Multi-Energy Microgrids for APEC Economies was approved by the APEC EWG at the end of June 2018. Currently, the Cloud-based Sharing Platform of Multi-Energy Microgrids, named CM2, has been fully tested with functionalities of real-time monitoring, data sharing among partners, energy management system visualization, historical data analysis etc. So far, 15 existing microgrid projects have been connected on the platform including Tohoku University microgrid, Japan; Cardiff University microgrid, UK; Environment and Energy Research Institute microgrid, Qatar; and several microgrids from mainland. China is targeting to connect 100+ multi-energy microgrids across the world.
Status: Plans for the next stage include contacting additional potential APEC partners and organizing a workshop regarding microgrid design, planning, energy management and optimal operation and control.

Chile: Technological Challenges and Opportunities to Supply Flexibility to Electric Systems (EWG15 2018A). This project intends to conduct a seminar in which expert speakers and participants will review analysis and the experience of APEC economies regarding the deployment of the latest technological tendencies aimed to improve the electric system flexibility, particularly given scenarios with high share of variable renewable energies, baseload power plants decommissioning and with changes in energy consumptions patterns due new forms of energy demands as electric mobility.
Status: This project workshop is planned for the third or fourth quarter of 2019.

Chile: Distributed energy resources regulation and rate design (EWG 17 2018A). This project intends to conduct a seminar and workshop where expert speakers and participants will discuss distributed energy resource integration issues, which will help build a base for the discussions on new tendencies in distribution sector regulation.
Status: This project workshop is planned for the third or fourth quarter of 2019

5. New/Planned APEC Energy Resiliency Project Proposals

The Philippines reported that their new Energy Resiliency Policy includes the development of an energy resiliency roadmap, which they could share with ERTF as it is developed.

Australia reported that they are a new concept note on pumped hydro energy storage that supports energy resiliency to be tabled for APEC project session 2, 2019.

6. Energy Resilience Work Program

Energy Resilience Principals: Japan proposed a new work program based on energy resiliency principals. The purpose of the Principles is to provide an exhaustive list of elements necessary for considering energy resilience. Also, not all the items and elements are necessary for all economies, but the Principles are intended to be used as a material for promoting efforts on appropriate resilience improvement according to the circumstance of each economy based on these Principles. Following a general presentation on the Principles, Japan presented the Energy Resiliency Principles Draft Template which presented an outline of their proposed Energy Resilience Principles report. Following a general discussion of the proposal by the ERTF, the EWG Lead Shephard requested that Japan develop a summary of their proposal and circulate it to the ERTF prior to EWG58 and that the summary then be discussed at ERTF8 in Chile. Japan accepted this request and said they would develop the summary and circulate it prior to EWG58.

Grid Resilience: The United States give an overview of the Grid Modernization Initiative (GMI) which is a multi-year program which began in 2016. The program is based on obtaining greater *resilienc*e to hazards of all type, improved *reliability* for everyday operations, enhanced *security* form an increasing and evolving number of threats, additional *affordability* to maintain economic prosperity, superior *flexibility* to respond to the variability and uncertainty of conditions at one or more timescales, including a range of energy futures,

and increased *sustainability* through additional clean energy and energy-efficient futures. A review was also presented of the Alaska Microgrid Partnership, which was a recent GMI project which had created a development pathway for islanded microgrids which could reduce imported energy by at least 50%.

Strengthening Infrastructure: The chairs noted that several ongoing projects were related to strengthening infrastructure and that there was close linkage between the this workstream and the Energy Resilience Work Principles proposed by Japan.

Energy-Water Nexus: The United States provided a brief update on recent and new work on the energy-water nexus, which included their recently completed project *APEC Workshop on Integrated Energy-Water Planning and Policy Formulation (EWG 13 2018A).*

Energy Access: China presented their revised questionnaire on energy access of the Asia-Pacific Region that includes the present situation of development, demand, success cases and experience. Based on the feedback of questionnaires, the Chinese will select an appropriate topic to apply for an APEC self-funded project to speed up the realization of regional energy access.

Ideas for collaboration with EPWG, other APEC and non-APEC fora: There was a general discussion of ideas for collaboration with other APEC fora. The Lead Shephard noted that the he had talked to the EPWG, however, they had an issue with not having a quorum at their last two meetings, so we needed to wait to see their status before talking further.

7. Next Steps/Wrap Up

The chairs invited all members to provide updates on the workshops and efforts discussed at the meeting. The 9th meeting of the ERTF will be held in Antofagasta, Chile in October 2019, alongside EWG57.

The task force members thanked the Philippines Department of Energy for hosting the meeting. The co-chairs asked if there was any other business, their being none, the co-chairs closed the 8th meeting of the Energy Resiliency Task Force. Meeting minutes will be distributed out of session and approved at ERTF9.