APEC EXPERT GROUP ON NEW & RENEWABLE ENERGY TECHNOLOGIES (EGNRET)

44th EGNRET Meeting

Laoag City, Ilocos Norte, The Philippines
13-14 April, 2015

Introduction

The 44th meeting of the Expert Group on New and Renewable Energy Technologies (EGNRET) was held on April 13th to 14th, 2015 at, Laoag City, Ilocos Norte, The Philippines. In addition, an APEC Workshops, the Capacity Building for Installers and System Designers for Solar PV Rooftop Installations. A site visit of Rural Electrification project was scheduled on the last day of the APEC event, November 14, 2014 were arranged with the meeting.

The EGNRET 43 meeting was chaired by EGNRET Chair, Dr. Chung-Hsien Chen, Section Chief / Renewable Energy Section, Bureau of Energy, Ministry of Economic Affairs, Chinese Taipei, and the Co-Chair was Dr. Prasert Sinsukprasert, the Executive Director of International Energy Cooperation Bureau, Ministry of Energy, Thailand. Representatives from Japan, Korea, Malaysia, New Zealand, Philippines, Singapore, Chinese Taipei, Thailand, United State, APEC Expert Group on Energy Data Analysis (EGEDA), Asia Pacific Energy Research Centre (APERC), and International Copper Association Ltd. (ICA), and delegates from Chiang Mai University were participated in the meeting.

On behalf of the host of Thailand, Dr. Prasert Sinsukprasert and Prof. Nat Vorayos from University of Chiang Mai welcomed the delegates and gave a quick overview of how Thailand dedicates in new and renewable energy to protect environment and energy security. Afterward, Dr. Chen, the EGNRET Chair, gave a welcome remarks and a brief introduction about the EGNRET 43

meeting agenda. A final agenda distributed by the Chair was reviewed and accepted.

Overview of Renewable Energy in Thailand

The first report was made by Ms. Munlika Sompranon, who is the director of Energy Cooperation Group from Department of Alternative Energy Development and Efficiency (DEDE), Thailand. Ms. Sompranon gave an introduction of the energy situation and an overview of renewable energy status of Thailand. She started with a big picture of energy sector of Thailand. Thailand mostly relies on imported fossil fuel; especially the imported oil counted for about 81% of consumption. The total energy consumption grew 6.7% in 2013. Thailand's final energy consumption has been growing by 2.4% per year since 2009, with renewable energy account for more than 10% of the consumption.

The increased and fluctuated world oil price and limited petroleum reserved are the key challenges for energy development in Thailand. Thailand needs to import about 85% of energy supply, there are 70% of the electricity supply depends on Natural Gas.

However, there are also many solutions under developing. For small hydropower development, 143 MW was installed (expected to be 324 MW by 2021). DEDE dedicates in supporting the constructions of hydropower at community level, especially the very small power plant for non-electrified household, which is off-grid electricity supply.

Thailand has successful development in the power and heat generation from biomass utilization, with 2,351 MW (49% of the target for 2021) of power generation capacity by the first quarter of 2014 and expected to be 5,058 ktoe (60% of target for 2021) heat generation by the end of 2014.

The heat from the biogas is expected to reach 52.8% of target set for 2021 (i.e., 1000 ktoe) by the end of this year.

The development initiatives for biodiesel are: (i) Promote growing palm trees in sustainable areas not competing with food crops; (ii) Develop alternative

energy crops for the production of biodiesel equivalents; (iii) Increase production capacity of crude palm oil. The biodiesel usage was 3.0ML/day by the end of first quarter of 2014 (i.e., 41.7% of goal for 2021).

DEDE has also developed an ESCO fund to reduce the risk and encourage the investment in renewable focused ventures. It's a fund pools capital from the Thailand government's ENCON fund with capital from private investor.

RENEWABLE ENERGY in THAILAND

Following the agenda, Mr. Kris Likit-Anurak from Energy Research and Development Institute – Nakornping CMU (Chiang Mai University) gave a presentation of the Thailand overview of renewable energy specific in Biogas and Photovoltaic system. Mr. Likit-Anurak first gave a quick review of the renewable introduction and definition, and mentioned the Thailand policy goal on the Renewable Energy is 25% of the total energy consumption by 2021.

In the biogas sector, CMU mainly focuses on wastewater treatment technology by methods of physical, chemical, and microorganism systems. The biological waste treatment development is classified as aerobic microorganism and anaerobic microorganism.

For the aerobic microorganism system, CMU is using aerobic digester includes the demonstration test on channel digester (ERDI's CMU-CD System), fixed dome, and CSTR.

For the feedstock issue, Mr. Kris Likit-Anurak said the feedstock from agriculture are seasonal product and really hard to collect them. The possible feedstock for the production of biogas includes animal waste (swine, chicken and cattle), Industrial wastewater (food processing, palm oil, starch, ethanol, and others), Municipal Solid Waste. They are still trying to make a best solution for the feedstock sources, refine manufactures and power plants.

After the presentation, CMU arrange a lab tour of CMU biogas lab and biogas fuel vehicle demonstration.

Recent APEC Activities

The Chair briefed the recent and upcoming APEC activities and developments that occurred after the last meeting of the EGNRET 42 on April 6-7, 2014 in Honolulu, Hawaii, USA including the EGNRET and EGEE&C Joint Meeting held along with the meeting. The EGNRET 42 meeting was co-chaired by Dr. Chung-Hsien Chen, the EGNRET chair from Bureau of Energy, Ministry of Economic Affairs of Chinese Taipei, and Dr. Cary Bloyd from Pacific Northwest National Laboratory (PNNL) of USA. Representatives from China, Hong Kong, China, Indonesia, Japan, Korea, New Zealand, Philippines, Singapore, Chinese Taipei, Thailand, the United States, APEC Energy Working Group (EWG), APEC Expert Group on Energy Data Analysis (EGEDA), Asia Pacific Energy Research Centre (APERC), and International Copper Association Ltd. (ICA) participated in the meeting.

Dr. Chen gave a brief description about the last EGNRET meeting, which was held in April 7-8, 2014 in Honolulu, USA. The Joint Meeting of EGNRET and Expert Group on Energy Efficiency and Conservation (EGEE&C) was held alongside the meeting on April 9th, 2014. There were 30 representatives in EGNRET 42 and 50 attendees in the Joint Meeting.

The meeting theme was “The Promotion of Biofuels in Transportation Sector” and the several invited presentations included APEC Peer Review on Low Carbon Energy Policies (PRLCE) Phase 3 in Malaysia by APERC, Report on Progress of APEC Low-Carbon Model Town Task force by LCMT TF (presented by APERC), Renewable Energy and APEC Energy Statistics by EGEDA and Sustainable Energy Programs by ICA. All the meeting presentations are available on the EGNRET website:

http://www.egnret.ewg.apec.org/meetings/egnret42/index.html.

To clarify and pursue the goal of Doubling Renewable Energy Share in APEC region, EGNRET arranged two discussion topics in EGNRET 42 meeting included Current and Projected Economy Renewable Energy Usage Through 2030 and Renewable Energy Cost and Roadmap. The EGNRET & EGEE&C Joint Meeting discussion topics are “The New APEC Renewable Energy Goal”

and “Asia Pacific Economic Cooperation - Energy Working Group Draft Strategic Plan for 2014 – 2018.”

The discussion results were also reported in the EWG 47 Meeting.

According to the EWG 47 Meeting held in May 19-23, 2014, China, EWG has confirmed the goal of Doubling Renewable Energy Share in APEC region. EWG also assigned EGNRET to take the integration and coordination tasks on this topic. The goal of Doubling Renewable Energy Share in APEC region is then put into the declaration of Energy Ministers Meeting 11 (EMM 11) and APEC Economic Leaders' Meeting (AELM) in Sept. 2014.

In the summary of EWG 47, about the APEC project application and evaluation, the APEC Program Director, Mr. Parkhan, stated APEC EWG projects are classified as funding criteria #2 (support the APEC Leaders’ Growth Strategy – Promotion of Renewable Energy, Energy Efficiency and Low Carbon Technology) which did not have competitive funding status in the first round of 2014. The EWG should reconsider which accounts are applied for and consider projects with trade implications so they can be receive priority rank. Dr. Yoshida also encouraged expert carefully consider funding streams when proposing projects, and emphasized that projects with some self-funding receive higher rank.

For the Goal of Doubling Renewable Energy Share in APEC region, The United States presented the proposed APEC aspirational goal of doubling renewable energy by 2030. The EWG noted that the goal is a collective target and requires refinements in the definition and EWG will review the goal every five years up to 2035. The Lead Shepherd suggested the development of a band of cost ranges for renewable energies to assess cost-competitiveness and track progress towards commercialization. The goal would need to work with other international agencies to make sure that APEC’s viewpoints are expressed in the coming coordination of statistical definitions among international agencies such as IEA and IRENA.

In the EMM 11 declaration, about the EGNRET affair, it mentioned:

"We will vigorously facilitate all-round and in-depth cooperation among APEC member economies in renewable energy and seek to eliminate trade protection and restrictive measures that may impede progress in renewable energy technologies and development of this sector. We will encourage innovation, competition and cooperation to promote a sound and sustainable renewable energy sector in the Asia-Pacific and to ensure its energy security, economic growth, poverty eradication and an appropriate response to climate change."

We aspire to the goal of "doubling the share of renewables in the APEC energy mix, including in power generation, from 2010 levels by 2030." To attain this target, member economies will enhance cooperation, promote innovation in renewable energy technologies, so as to reduce costs and improve the competitiveness and sustainability of renewable energy in the energy market.

We reaffirm the UN "Sustainable Energy for All Initiative" and its ten-year action plan, and instruct the EWG through the EGNRET to develop the roadmap for the aspirational goal of doubling the share of renewables in the APEC energy mix, including in power generation by 2030; and, to attain this goal, cooperate with IRENA or other organizations to conduct research on the economic benefits and cost-effectiveness of utilizing renewable energy so as to support R&D, innovation and commercialization of clean energy technologies and to promote practical cooperation on renewable technologies, equipment and services among member economies."

The Chair finally reported the future prospects of EGNRET in the future. EGNRET will continue the implementation of new and renewable energy technology workshops and projects that help build the needed human capacity to implement clean energy development across the APEC region and cooperate with EGEE&C to enhance progress in the Low-Carbon Model Town project. This can demonstrate cost effective low carbon technologies (energy conservation and renewable energy) integration in the urban development, cooperate with APERC to create follow-up PRLCE activities which provide the

necessary technology or training workshops for the host economies to implement the recommendations by the PRLCE review team, and push forward the harmonization of testing standards for products/ system related to the new and renewable energy. This can help in reducing clean energy trade barriers in the APEC region.

Progress on APEC Peer Review on Low-Carbon Energy Supply (PRLCE)

Mr. Martin Brown-Santirso, Researcher at APERC presented a detailed review on overview of the APEC Peer Review on Low Carbon Energy Policies project (PRLCE).

The presentation includes the background and content of APEC PRLCE project, PRLCE processes and stakeholder roles, and the PRLCE carried out in Malaysia.

The objectives of PRLCE is to Assist volunteer APEC member economic in the following issues: (i)to provide a broad review of Low Carbon Energy (LCE) policies and measures to assist with formulating more effective LCE policies; (ii)to provide recommendations on how implementation of action plans could be improved to achieve LCE goals; (iii)PRLCE considers a whole range of Low Carbon Energy policies and measures best suited for the economy under review.

PRLCE is composed by experts, mainly from the APEC region. They visit the volunteer host economy to review its energy situation and policies, and make recommendations for the host economy.

Thailand hosted the first PRLCE-1 on 21-25 May 2012 with the focus on Alternative Energy Development Plan (2008-2022) (AEDP) for solar, wind, biomass, biogas and other renewable energy. Philippines hosted the second PRLCE-2 on 19-23 November 2012 with the focus on National Renewable Energy Program (2011-2030) (including the feed-in tariff system for renewable energy). Indonesia hosted the PRLCE-3 on 13-17 May, 2013 with the focus on Renewable Energy.

A progress report of APEC Peer Review on Low Carbon Energy Policies

(PRLCE) Phase 3 in Malaysia was made by Dr. Isa in EGNRET 42 Meeting. The summary of PRLCE Malaysia project concluded that the PRLCE review team provided 51 recommendations, which are tailored towards overcoming existing, specific challenges in the current system, providing proper signals to end-users and investors to encourage uptake of low-carbon energy supplies, enhancing existing strategies that have been proven to increase LCE uptake.

Due to financial constraints and the significant logistical effort, APERC has been allowed to reduce the number of PRLCE from two to one in each phase. The next PRLCE will be held in Vietnam, in July 2015.

For more information about PRLCE, please visit http://aperc.ieej.or.jp/.

Report on Progress of APEC Low-Carbon Model Town Task Force

The LCMT presentation was made by Dr. Yeong-Chuan Lin from APERC, who gave a presentation on the Progress of APEC Low-Carbon Model Town Task Force on behalf of project overseer, Mr. Shobu Nagatani from Agency for Natural Resources and Energy, METI, Japan..

There are four parts in this presentation: (i)an introduction of APEC LCMT Task Force Meeting; (ii)overview of the APEC Low Carbon Model Town (LCMT) Project; (iii)progress and future development of the LCMT Phase 3 Project; and (iv)progress of the LCMT Phase 4 Project.

About the background of LCMT, three roles of the LCMT task force were identified in 9th APEC Energy Ministers' Meeting (Fukui, Japan - 19 June, 2010), which includes developing the concept of the low-carbon town in APEC Region (a guideline of LCMT), conducting the feasibility study on selected case town, and sharing best practices for making low-carbon communities a reality.

In 6th APEC LCMT Task Force Meeting on 18 November, 2013, in Da Nang, Viet Nam, there are 15 Economies, Lead Shepherd, EGEDA and EGEEC Chairs, EGNRET representatives, APEC Secretariat and APERC representative attended this meeting. The agreement was made in the meeting that Japan will serve as the Chair and the Secretariat of the LCMT Task Force for the next three

years. The revised “Concept of LCT in the APEC Region”, study on “APEC LCT indicator”, progress of “Feasibility Study on Da Nang”, and selections of “Case for Phase 4 Feasibility Study” are also reported in this meeting.

Dr. Lin showed the mechanism of LCMT project. There three main outcomes of LCMT project: F/S report, concept, and policy recommendations. The feasibility study under F/S report was conducted by urban design consultants. The Study Group A conducted concept part and the Study Group B made the policy recommendation.

Dr. Lin made a progress report about LCMT phase 3. The first step of phase 3 tasks is feasibility study, the Progress Report was presented to LCMT Task Force members and EWG members at EWG 46 in November, 2013 and the final report of feasibility study will be published in 2014. The task of concept (refinement) is “The Concept of the Low Carbon Town in APEC Region” which will be tailored for the redevelopment of existing sites.

The task of “LCT indicator” study is proposed to provide the low-carbon town indicator for each economy a uniform methodology or indicator to review the promotion of their low-carbon town project. A formed comprehensive and integrated Low-Carbon Town Indicator can adequately study the low-carbon town measures and manage the progress of low-carbon town projects by referencing past LCMT outcomes.

The future policy recommendations tasks include the recommendation on regulatory schemes, technical matters, etc. The study Group B will conduct the peer review. The Policy Review Report will be distributed to EWG members.

Mr. Lin also introduced the feasibility study timeline schedule of Phase 4 project and the indicator of Low Carbon Town, which reflects existing APEC LCMT feasibility study results, existing assessment indicators, and international trends.

Summary of the LCMT Phase 3 Project can be download from:
http://publications.apec.org/publication-detail.php?pub_id=1521
http://publications.apec.org/publication-detail.php?pub_id=1518

Member Economy Presentations: Economy Renewable Energy Projections through 2030 and Strategy in Supporting the New Renewable Energy Goal in APEC

A target for Energy Efficiency and Renewable Energy has been set in APEC Region, but there is not yet a systematic way of monitoring and reporting. There are still discrepancies and differences on Renewable Energy definitions, terminologies, and statistical methodologies among economies.

To facilitate the following discussion on the goal, EGNRET set the economy presentation topics as "Economy Renewable Energy Projections Through 2030 and Strategy in Supporting the New Renewable Energy Goal in APEC" to share the experience and projection goal of energy policies and renewable energy development in each economies.

All EGNRET 43 meeting presentations will be available on the website at: http://www.egnret.ewg.apec.org/meetings/egnret43/index.html

Capacity building for installers and system designers for solar PV rooftop installations – Report on consultation workshop (Invited Presentation by ICA)

Mr. Pierre Cazelles made a report for the workshop result from the APEC project EWG 22/2013A, Capacity Building for Installers and System Designers for Solar PV Rooftop Installations, which was held in 11 November 2014.

The objective of this project is to remove barriers for the market development of solar PV rooftop installations in APEC developing economies.

The report indicated the problems of lack of capacity among installers/designers on PV system. The installers are usually not aware of proper installation practices and lack of knowledge of product selection (cables, connectors, etc.) and the system designers don't have the knowledge on safety aspects, selection of products (cables, connectors, inverters, grid-connection issues, etc.), which gives bad performance on PV system, including lower

output-efficiency, higher operation and maintenance cost, lower ROI for investor, the safety issues and grid connection problems. All these problems will cause the market facing a very slow adoption rate. The lack of professionally designed and professional installer for solar PV plants will slow down the actual growth of the market.

The project aims to develop training curriculum (TC) for installers and system designers, identify potential training institutions willing to adopt TC and conduct training (sustainable, self-financed way), transfer TC to training institutions, and provide recommendations to policy makers on national training and certification programs.

It will build up the training process for installers and designers, which includes develop training curriculum with practical demonstration, develop practical training materials, and develop train-the-trainers curriculum and materials, transfer training tools to strategic organizations who will conduct training of trainer in each economy. This training curriculum will be transferred freely to training institutions.

The project will finalize the reports on different approaches to be circulated and discussed during next meeting by early 2015. It will also identify the needs for technical assistance in each economic.

APEC Energy Statistics: Issues Related to Monitoring APEC EE and Renewable Energy Targets by EGEDA

Mr. Edito Barcelona gave a presentation about Statistical and Methodological Issues on the APEC Energy Intensity and Renewable Energy Goals on behalf of EGEDA. The presentation included APEC energy intensity (EI) and renewable energy goals, the EGEDA's role, the methodological and statistical issues on these two goals, data gaps in current APEC energy statistics, and EGEDA's effort for the improvement on data completeness and accuracy.

The main task of EGEDA is collecting data from APEC member economies, which includes annual energy supply and demand data, primary supply to final

consumption (fossil fuels, nuclear, new and renewable energy), and Socio-Economic Statistics (World Bank and National Sources). From these data, APEC's performance vis-à-vis targets can be monitored. EGEDA would also ensure completeness and accuracy of these data as much as possible.

EGEDA collects the Energy Data monthly, quarterly, and annually. The monthly data includes oil and gas and the quarterly data includes energy supply section like coal, oil, petroleum products, gas and electricity. Annual data includes energy supply and demand in coal, oil, petroleum products, gas, electricity / heat, new and renewable energy. EGEDA also collects and arranges other energy related data such as CO_2 emission, energy prices, and oil / gas reserve and production / refining capacity as JODI Annual data.

APEC has set an aspirational goal of reducing APEC-wide energy intensity (EI) by 45% by 2035 from 2005 level. Mr. Barcelona mentioned that it is not yet decided whether it should be primary energy intensity or final energy intensity, neither on the value of GDP that should be used – GDP at purchasing power parities (PPP) or GDP based on exchange rates. The APEC goal of "doubling the share of renewable energy in the APEC energy mix, including in power generation, from 2010 levels by 2030" is not clear on primary energy or final energy consumption mix, or the share to total primary energy consumption. If it is defined as the share to total final energy consumption, EGEDA could find ways on how to incorporate electricity and heat from renewable sources

Mr. Barcelona also indicated the methodological issues by primary and final energy intensity and issues on renewable energy target.

For the issues in the doubling renewable energy target, Mr. Barcelona mentioned that we should identify what kind of energy should be doubled. If the doubling renewable energy target is based on the share of primary energy consumption, the "partial substitution method" would be an option for calculating the share. If it is based on the share of final energy consumption, electricity from renewables should be disaggregated from final electricity consumption. This would need more accurate power station use and

transmission and distribution losses data as many renewable energy installations are distributed generation which have very low or even zero losses.

Mr. Barcelona mentioned the types of renewable energy that are currently covered under renewable energy category such as: PV thermal for both electricity generation and water heating, wind turbine for electricity generation, geothermal electricity /space heating, and all kinds of hydro power plants. He mentioned that solar energy and wind energy utilized on other uses like crop drying and clothes drying which are difficult to measure are not covered. Geothermal heat used for crop drying and water heating are also not counted. For the hydro power it might be better to disaggregate by each type of hydro (impoundment, diversion or run-of-river, multi-purpose and pump-storage) instead of by size of capacity.

Mr. Barcelona stated that the current levels of actual new and renewable supply/consumption should be determined accurately. All economies must strive to measure the amount of renewable energy consumed and include the same in their energy statistics and balances.

Mr. Barcelona also reported that there are data gaps in APEC energy statistics such as inconsistencies in historical data series of several economies. Most of data are not available like the consumption of biomass in China, Malaysia and Papua New Guinea and unmonitored or unreported electricity generation in small energy installations such us: rooftop PVs, micro-hydro, etc.

In the conclusion, Mr. Barcelona made a summary that APEC has to improve energy data completeness and accuracy, use the appropriate methodology when calculating EI and renewable energy share using APEC energy statistics, decide on the appropriate conversion factor for electricity generated from nuclear, geothermal, hydro and other renewable energy, define what should and should not be included in the NRE doubling goal, and decide on what additional renewable energy data should be collected. Continuous capacity building of energy statisticians will be important too to ensure the accuracy of energy statistics.

After the presentation, Dr. Cary Bloyd from USA gave a comment that EGNRET should not recreate the definition of doubling Renewable Energy. The direction about the UN and IRENA would be the best reference to follow. Dr. Yang, secretariat of EGNRET also mentioned that EGNRET sent some suggestion in the EWG 47 meeting, but there was no discussion on final definition of renewable energy.

EGNRET Project Update: Progress/Status of Current EGNRET Projects

The EGNRET has a variety of projects underway to facilitate the use of renewable energy technologies in the APEC region. EGNRET is currently having 2 completed projects, 17 on-going projects and 1 project going to send full proposal to APEC Secretariat for the session 2 2014.

The 2 completed projects are listed below:

Project Title	Project Number	Economy
2014 APEC Workshop on Biodiesel Application Experiences	EWG 01 2014S	Chinese Taipei
APEC Workshop on Promoting the Development of Wind Energy	EWG 14 2013A	Viet Nam

[C1] 2014 APEC Workshop on Biodiesel Application Experiences (EWG 01 2014S) (Chinese Taipei)

The APEC Workshop on Biodiesel Application Experiences was held in Sep. 10, 2014, Chinese Taipei. It was a closed-door meeting with 30 experts from Chinese Taipei, Thailand, and Korea. The practical benefits of effective biodiesel supply chain management of biodiesel quality control are the key factors to biofuel promotion policy on consumers.

Applications of biodiesel in different economies are reported and discussed. Experts shared the international practical experience and enhancing the quality control of the supply chain management.

A close meeting was also arranged on Sept. 11, 2014 to discuss the follow up of the topics and practices of workshop

[C2] APEC Workshop on Promoting the Development of Wind Energy (EWG 14 2013A) (Viet Nam)

In the context of significant industrial and population growth, increasing shortages of conventional energy and sharp fluctuation of price, renewable energy, including wind energy appears to be an efficient and sustainable alternative. The APEC Workshop on Facilitating the Development of Wind Energy aims to:

- identify obstacles for a wide application of wind energy;
- exchange and discuss current strategies, policies and technologies in the APEC region which also creates a platform for member economies, especially developing ones to build up capacity for government officials in the process of policy making and implementation of wind energy projects;
- explore further cooperation opportunities among APEC member economies, with the ultimate goal of ensuring energy security for the sake of APEC's sustainable growth

The 17 on-going projects:

Project Title	Project Number	Economy
APEC Smart DC Community Power Opportunity Assessment	EWG 06 2013A	Thailand
APEC Low Carbon Model Town Capacity Building Development	EWG 05 2013A	China
Promote APEC Low Carbon Town Development with District Energy System	EWG 07 2013A	China
APEC Low Carbon Town Plan and Design Contest	EWG 01 2013S	China
APEC Low Carbon Model Town (LCMT) Promotion through Eco-Point Program (LCMT-EPP)	EWG 10 2013A	Thailand
APEC Low-Carbon Model Town Development Model and Tool Kit Study (LCMT-DMTK)	EWG 13 2013A	China

APEC Photovoltaic Application Roadmap and Model Study (PVARM)	EWG 11 2013A	China
APEC Photovoltaic Communication and Cooperation Platform (PVCCP)	EWG 16 2013A	China
Capacity building for installers and system designers for solar PV rooftop installations	EWG 22 2013A	USA
APEC Conference on Facilitating the Solar Supply Chain	EWG 23 2013A	Viet Nam
Study of APEC Low Carbon Model Town Development Index System	EWG 21 2013A	China
APEC Low-Carbon Model Town Energy Management System Development and Application Research	EWG 20 2013A	China
APEC Low-Carbon Model Town Heating System Application Model and Best Practices	EWG 25 2013A	China
District Energy Systems Development Roadmap Study in APEC Economies	EWG 24 2013A	China
APEC Photovoltaic System Best Practices and Latest Development Comparative Study (PV-BPLD)	EWG 03 2014A	China
APEC Public-Private Dialogue on Addressing Impediments in Financing Renewable Energy	EWG 02 2014A	Viet Nam
APEC Peer Review on Low-Carbon Energy Policies (PRLCE), Phase 3	EWG 01 2014A	Japan

The only project got approved from the first evaluation of session 2 2014 is the Thailand's project "Realization of APEC Low Carbon Model Town through Smart Grid Development (LCMT-SGD)", which has sent the full proposal to APEC Secretariat and the result will be distributed by December 12.

After reporting the processed project, there were 5 new proposals were presented in the following session.

There are 4 concept notes (including 1 self-funded) were discussed during EGNRET 43rd meeting and 4 were endorsed and will submit during 2015. For the project [NRE151-3], Chinese Taipei, USA and Japan are going to be the project co-sponsors. For the project [NRE151-4], Philippines and U.S.A will be

the project co-sponsors.

[NRE151-1] Development of the market for fuel ethanol as part of APEC's renewable fuel strategy (USA, self-funded)

[NRE151-2] Establishment of ethanol as part of APEC's renewable fuel strategy (USA)

[NRE151-3] APEC PV system database in APEC Region (Thailand)

[NRE151-4] Safety guideline for renewable energy technology in APEC (Thailand)

The other one is related to the nuclear power (Is Nuclear Power still a Viable Option for the APEC Region by Thailand) was suggested to submit to EWG directly.

APEC Renewable Energy Goal: Definitional Issues

Before the discussion, EGNRET Chair invited APERC and USA to present the views on the goal of doubling renewable energy in APEC Region.

Mr. Martin Brown-Santirso from APERC gave a presentation about the definition issues of APEC renewable energy goal.

Mr. Brown-Santirso mentioned the goal of doubling renewable energy in APEC Region was originally from the Sustainable Energy for All (SE4ALL) Initiative that the UN has set a goal of doubling the share of renewable energy in the global energy mix by 2030 in September, 2011. At the First Senior Officials Meeting (SOM1) in China, members discussed the possibility of committing to a regional energy goal that is in line with the SE4ALL initiative. Afterwards, at the Joint EGNRET and EGEE&C Meeting in Hawaii, delegates from each economic discussed the technical aspects of renewable energy goal as well as technology cost goals. EGEDA and APERC were tasked to prepare a memorandum to facilitate the discussions on APEC renewable energy share doubling goal at the APEC EWG 47 Meeting in Kunming, China.

He also pointed out the objective of the definition issues on the topic:

traditional biomass and large hydro are unclear whether to be included in the renewable energy category or not. Data availability is another difficulty for collecting and statistics.

It was stated that traditional biomass is not considered as renewable energy due to lack of energy security and sustainable development. The large hydro power is also have the problem of environment. It is not for sustainable development because of the danger of deforestation.

In the EWG 47, APERC gave a presentation mentioned that the APEC goal "Sustainable Energy" could consists of small-scale hydro (run-of-river hydro), wind, solar (photovoltaic and solar heat), geothermal, bioenergy excluding traditional firewood and charcoal for households. EGEDA also had the more detail description about which kind of solar, wind or geothermal usage is not considered as renewable energy usage.

The definitions of renewable energy are already different from IRES, IRENA, IEA and APEC. The definitions of hydro power in APEC should be harmonized to IEA and IRENA.

For the issue of denominator in share calculation of renewable energy, both Total Primary Energy Supply (TPES) and Total Final Energy Consumption (TFEC) are possible methods. However, in order to avoid overestimating the role of renewable energy when low efficiency accounting method is assumed (or conversely), it is proposed that APEC uses TFEC as the denominator in renewable energy share calculation.

After the presentation, the Co-Chair expressed that the traditional biomass should be excluded from renewable energy and the definition of traditional biomass should be more clearly stated. He also expressed that all the hydro type should be included.

The Chair indicated that the large hydro is not good for environment sustainability. EGNRET may need more detail study about the relation between large hydro development and environmental sustainability. In Chinese Taipei, there are 75% area covered by mountains and large hydro is excluded as an

option of renewable energy development in Chinese Taipei. Japan representative, Mr. Ikeda expressed the same opinion. He also mentioned the issue that the heat generated by biomass is difficult to calculate.

Dr. Cary Bloyd mentioned that some economies already include large hydro development as their energy development roadmap that may increase the issue of definition complexity.

The Co-Chair from Thailand mentioned that in terms of the definition, biogas for heat is definitely included in the renewable energy. However, the definition doesn't mean all the economies have to encourage every item of renewable energy in each economy. It depends on the situation of each economy. The definition is just for tracking the calculation of renewable energy goal.

Establishment of an APEC Renewable Energy Goal by USA

Dr. Cary Bloyd gave a presentation which was reported in EWG 47. The presentation also stated that to support the UN Secretary-General's SE4ALL initiative, APEC economies will endeavor to double the share of renewables in the APEC energy mix, including power generation by 2030. It also mentioned the wide variations in estimation of future global renewable energy use and future energy mix will always be uncertain. The issues include the importance of the development of biofuel and batteries, and the financial systems are continuing to evolve to recognize the value of renewable energy in an economy's energy portfolio

Since total energy use is critical, the renewable energy goal is linked to the existing energy efficiency goal of reducing aggregate energy intensity by 45% by 2035.

USA will propose a workshop in 2015 to exchange best practices in setting and achieving government wide renewable energy consumption targets. The EWG will recognize the examples of the best practices in moving towards the renewable goal which will be presented at the Annual Leaders Meeting. The

EWG will also track the adoption of the recognized best practices in subsequent years as we move towards 2030.

It is important to have international collaboration under the goal. He suggested that the International Renewable Energy Agency (IRENA) is the renewable energy hub of the SE4ALL initiative and supports SE4ALL partners, and thus can be a strategic partner. Synergies can be drawn from cooperative work with both ASEAN's Renewable Energy Support Program and the East Asia Summit's Renewable and Alternative Power Generation Work stream. The roles of APEC Energy Working Group were also suggested in the presentation.

Discussion on the topic of "Role of EGNRET toward the Doubling Renewable Energy Goal in APEC Region"

After all the economy presentation and the reports on the goal of doubling renewable energy goal in APEC Region, the discussion began with the definition of renewable energy. Mr. Gavin Yu, the Korea representative indicated that in the biogas sector, hydrogen is important in APEC area since APEC has lots of byproducts from biomass to produce hydrogen. Although in the United State, hydrogen is considered as "energy carrier".

Dr. Yang, Chinese Taipei representative mentioned the source of hydrogen should be considered and hydrogen is just a final product used as fuel. The Thailand co-Chair supported the statement.

Dr. Chen, the EGNRET Chair, indicated that for easy monitoring and reporting the doubling renewable energy goal, we should identify the key issues related to the pursue of the doubling goal and summarize our concerns and discussion, I will deliver these results to next EWG meeting for further discussion and action. Then, we can discuss more detail about the role of EGNRET in our next meeting.

The next step after the renewable energy definition will be the priority of renewable energy technology and strategies.

To sum up, the major concern points raised during the discussion are summarized in the following statement:

- The delegates exchange the view on the definition of different renewable energy especial for traditional biomass and large hydro. We understand that each Economy have different environment situation and concern about the implementation of different kind of renewable energy. It is a little difficulty to use the same definition to cover all the APEC Region.
- We also discuss about the denominator in share calculation. We also understand that either Total Primary Energy Supply (TPES) or Total Final Energy Consumption (TFEC) is possible for the calculation. This will depend on what is our major concern in the promotion of renewable energy.
- The other issue is the monitor system and report mechanism that needed in the future.
- We need to expand the experience exchange or share of best practices for each economy to access the enough technology to further promote the renewable energy.
- More financial mechanism need to be developed or provided for private sector to make the contribution to the implementation of renewable energy.
- EGNRET will continue work with EGEDA, EGEE&C, and APERC in the APEC Region. EGNRET will also try to communicate with IRENA, IEA, and ASEAN to get the most useful information for push forward the doubling goal.
- EGNRET will continue to discuss and look into the priority of different technology and/or strategy is required for all APEC Region or each Economy.
- We will also encourage each economy to submit the proposal based on the identified priority in order to remove the barrier and speed up the implementation of renewable energy.

We also understand the regular reviewing of this double goal is needed in order to make the necessary revise for the new technology development or environment variation.

Administration and Operation

The 2015-2016 Chair election was held in the EGNRET 43 Meeting. Chinese Taipei was elected as the EGNRET Chair and Korea as the vice Chair for the next term.

Philippine representative, Mr. Gaspar G. Escobar, Jr, expressed that Philippine is willing to hold the next EGNRET meeting. The detail information will be released in the near future.

Dr. Chen, the Chair of EGNRET adjourns the meeting after expressed his sincerely thanks to all the participated delegates and Thailand colleagues for their hosting the meeting. Special gratitude is due to Ms. Munlika Sompranon, Dr. Prasert Sinsukprasert and all their colleagues for their kind assistance and arrangement on meeting affairs.

All the meeting materials have been distributed online.
http://www.egnret.ewg.apec.org/meetings/egnret43/index.html

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Malaysia	Ms. Azah Ahmad	SEDA Malaysia
Philippines	Mr. Gaspar G. Escobar, Jr.	Department Of Energy
Singapore	Mr. Brandon Loh	EnergyMarket Authority
	Ms. Agnes Koh	EnergyMarket Authority
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ICA	Mr. Mayur Karmarkar	International Copper Association, Asia
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