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**ASIA PACIFIC ENERGY RESEARCH
CENTRE (APERC)**

REPORT ON APERC ACTIVITIES

**THE 56TH MEETING OF
THE APEC ENERGY WORKING GROUP (EWG-56)
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I. ON-GOING WORK PROGRESS

1. Activities Supporting Energy Efficiency Achievements and Other Policy Objectives

A. APEC ENERGY DEMAND AND SUPPLY OUTLOOK

BACKGROUND

APERC has previously produced six editions of the APEC Energy Demand and Supply Outlook, the last publication was the sixth Edition in May 2016.

OBJECTIVE

The key objectives of the APEC Energy Demand and Supply Outlook are to facilitate APEC cooperation by providing policymakers with:

- a useful reference work on energy in the APEC region;
- a statistically-supported review of the challenges and opportunities facing the APEC economies individually and as a region; and
- a source of ideas and approaches for evaluating these energy challenges and identifying potential solutions and opportunities.

PROGRESS

APERC is currently working on the seventh Edition of the APEC Energy Demand and Supply Outlook, including extending the projections to 2050. Numerous improvements to the various outlook models were made, including the development of bottom-up, end-use driven buildings and industry models; development of supply and refinery models and an integrating module; and improvements to the power and transport models. Three scenarios were developed for the next edition of the Outlook, with the Business as Usual (BAU) Scenario remaining the Reference scenario and two Alternative Scenarios, the APEC Target Scenario which combines the APEC Energy Intensity Goal and the Doubling Renewables Share Goal, and a Low Carbon Scenario consistent with limiting global temperature increases to 2 degrees Celsius.

Following the extensive roadshow to APEC Economies for dissemination of the sixth Edition of the APEC Energy Demand and Supply Outlook, APERC initiated an enhanced engagement on the development of the scenarios with energy modelling experts in APEC economies. Preliminary results were shared with economies, EWG members and experts in August and September 2018, receiving valuable feedback, which will help to improve the Outlook analysis.

As with past editions, the Outlook seventh Edition will be comprised of two volumes: Volume I evaluating the APEC-wide results and Volume II covering the outlook for each APEC economy.

MILESTONE

EWG and expert review feedback and comments will be included in the last quarter of the year along with final edits.

Publication will be released at EWG 57 (April 2019).

B. TOPICAL STUDIES

BACKGROUND

Along with the Outlook, APERC has been conducting research on topics relevant to energy affairs and policies in the APEC region.

OBJECTIVE

The objective of the topical studies is to share information on member economies' energy policies, and to provide useful information and insights to policymakers in the region.

PROGRESS

Three separate studies focusing on coal, oil and natural gas have been designed to support the Expert Group on Clean Fossil Energy (EGCFE) in broadening its perspective.. The APERC Coal Report 2017 was published and presented at the EGCFE Coal Meeting in Tokyo in September 2017. The report reviewed supply, demand, trade, and price developments over the past ten years and projected developments over the next three years. Setting the coal market in a global context, the report also highlights the coal situation in particular APEC economies.

The other two publications are the APERC Oil Report 2018 and the APERC Gas Report 2018, they were presented at the EGCFE Oil & Gas Meeting in Tokyo on March 9, 2018. The APERC Oil Report 2018 reviewed APEC oil demand and supply for the past ten years and discussed the key factors that influence oil markets and environmental issues in the next five years. The APERC Gas Report 2018 reviewed APEC natural gas demand and supply over the past ten years with the projection of natural gas trade and price trends in the following five years. It included a case study on US gas exports to Mexico and Mexico's gas market reform.

The 2018-2019 series of these three reports has already begun. The APERC Coal Report 2018, recently finalised, is presented at this EWG 56. Meanwhile, the APERC Oil Report 2019 and APERC Gas Report 2019 are being drafted and expected to be completed in the spring of 2019.

Apart from this series report, APERC also published the Perspectives of Hydrogen in the APEC Region study in June 2018. The study discussed the hydrogen technology and analysed the economics of hydrogen supply and the possibility to implement hydrogen in the APEC region.

Additional research has begun on battery electric and fuel cell electric vehicles in the APEC region.

MILESTONE

Publication of the APERC Oil Report and the APERC Gas Report in the spring of 2019.

Battery electric and fuel cell electric vehicles in the APEC report to be published, December 2018.

APERC will continue research projects on new topics through 2019.

C. APEC ENERGY OVERVIEW 2018

BACKGROUND

At the EGEDA 11th meeting held in March 2000, the APEC Energy Overview was proposed by Australia, and approved at the EWG19 meeting in April 2000.

The APEC Energy Overview is an annual publication, which contains updated energy demand/supply data as well as a description of energy policies and notable energy developments in

energy efficiency, infrastructure development, upstream development, energy source diversification, regulatory reform and environmental protection.

Energy demand/supply data are drawn from the APEC Energy Database. APERC is responsible for coordinating information gathered from member economies and preparing a draft Overview for EGEDA review. The Overview is published on both the APEC and APERC websites.

Since the inaugural issue in 2001, 16 editions have been issued up to 2017.

OBJECTIVE

The objective of the APEC Energy Overview is to share information on government energy policies of member economies, and to provide useful information and insights to policy makers in the region.

PROGRESS

Currently APERC is drafting APEC Overview 2018.

MILESTONE

APEC Energy Overview 2018 is expected to be published in June 2019.

D. PEER REVIEW ON ENERGY EFFICIENCY (PREE)

BACKGROUND

Improving energy efficiency offers many cost-effective opportunities to achieve energy security, improve business productivity and mitigate greenhouse gas emissions. In the Sydney Declaration of September 2007, APEC Leaders agreed to start a peer review of energy efficiency policies through the voluntary APEC Energy Peer Review Mechanism.

At the EWG35 meeting (Iquitos, March 2008), the APEC Peer Review on Energy Efficiency (PREE) was proposed by Japan and endorsed by EWG members.

These activities are undertaken as part of the PREE, namely:

1. Peer Review of volunteer member economies on the progress towards their goals in energy efficiency improvement ('Peer Review of volunteer member economies') including following up of implementation of recommendations at former hosting economies of Peer Review (Follow-up PREE) since 2012; and
2. Energy Efficiency Policy Workshop which provides a capacity building opportunity for robust policy making development in APEC, succeeding the Cooperative Energy Efficiency Design for Sustainability (CEEDS) workshops for the same purpose.

1. PEER REVIEW

OBJECTIVE

The objectives of the APEC Peer Review of Energy Efficiency (PREE) are:

1. To share information on energy efficiency performance as well as policies and measures for improving energy efficiency among member economies;
2. To provide opportunities for learning from other member economies' experiences and for broadening communication among energy efficiency policy experts;

3. To explore how energy efficiency overall/sectorial goals and action plans could be effectively formulated in each APEC economy under review, taking into account the diversity of possible strategies to be used;
4. To monitor progress toward attaining Energy Efficiency goals on an overall and/or sectoral basis and toward implementing action plans; and
5. To provide recommendations on how implementation of action plans could be improved with a view to achieving energy efficiency goals.

PROGRESS

Guidelines for the Peer Review were endorsed by EWG in late 2008.

The inaugural Peer Review for New Zealand was carried out during the period of 23-27 February 2009. This was followed by Peer Review for Chile during the period of 16-20 March 2009. The draft Review Reports of PREE for New Zealand and Chile were discussed and endorsed by EWG members at the EWG37 meeting in Santiago in April 2009.

The third Peer Review on Viet Nam was conducted on 8-12 June 2009. The draft Review Report of PREE for Viet Nam was discussed and endorsed by EWG members at the EWG38 meeting in Bali in November 2009.

The fourth Peer Review on Thailand was carried out on 9-13 November 2009. The draft Review Report of PREE for Thailand was discussed and endorsed by EWG members at the EWG39 meeting in Tokyo in March 2010.

The fifth Peer Review on Chinese Taipei was carried out on 23-27 August 2010. The draft Review Report of PREE for Chinese Taipei was discussed and endorsed by EWG members at the EWG40 meeting in Brunei-Darussalam in November 2010.

The sixth Peer Review on Peru was carried out on 8-12 November 2010. The seventh Peer Review for Malaysia was carried out on 26 November-3 December 2010. The draft Review Reports of PREE for Peru and Malaysia were discussed and endorsed by EWG members at EWG41.

The eighth PREE on Indonesia was carried out on 10-14 October 2011. The draft Review Report of PREE for Indonesia was discussed and endorsed by EWG members at the EWG43 meeting.

The ninth PREE on the Philippines was carried out on 6-10 February 2012. The draft Review Report of PREE for the Philippines was discussed and endorsed by EWG members at the EWG44 meeting.

The first Follow-up PREE activity, a training workshop on analytical methods to monitor the effectiveness of implementing energy efficiency measures, was carried out in Viet Nam on 27 February-2 March in 2012. The Summary Report was submitted to the EWG44 meeting.

The 10th PREE on Brunei Darussalam was carried out on 11-15 June 2013. The draft Review Report of PREE on Brunei Darussalam was discussed and endorsed by EWG members at the EWG46 meeting.

The second Follow-up PREE on the Philippines, focusing on industrial sectors and commercial buildings was carried out on 15-19 September 2014. The draft Review Report was discussed and endorsed by EWG members at the EWG48 meeting.

The third Follow-up PREE on Thailand focused on the transport sector. During 3-7 August 2015 six experts from Australia; Indonesia; Japan; the United States (two); and UNEP participated for the Follow-up Peer Review. The draft Review Report was discussed and endorsed by EWG members before the EWG50 meeting.

The 11th PREE on Mexico was carried out on 6-10 March 2017. The review team completed the workshops in Mexico with the relevant agencies and Ministries. The final report was completed and circulated to the EWG members for their endorsement in October 2017 with 46 recommendations across eight fields of energy efficiency.

The fourth Follow-up PREE for Malaysia (PREE Phase 7), a collaboration between APERC and the Ministry of Energy, Science, Technology, Environment and Climate Change of Malaysia (formerly known as the Ministry of Energy, Green Technology and Water), was carried out on 26-30 March 2018. The focus sector for the peer review are transportation and industry sectors. Six experts from Australia, Indonesia, Malaysia, Thailand, USA and International Energy Agency (IEA) joined the Follow-Up PREE Malaysia. The findings were divided into three broad group – challenges on overarching issues, transportation and thermal use in industrial sector. The draft report was approved by the Malaysian government in October and the full report is expected to be released by the end of 2018.

MILESTONE

The concept note of the 12th PREE for Russia (PREE Phase 8) was submitted to the project session 1, 2018 for the implementation of the on-site review in 2019, pending coordination with the Russian government.

The concept note of the fifth Follow-up PREE in Peru (PREE Phase 9) was submitted to the project session 2, 2018 for the implementation of the on-site review in March 2019.

2. ENERGY EFFICIENCY POLICY (EEP) WORKSHOP

OBJECTIVE

In order to streamline and prioritise its activities, APERC decided to integrate the Cooperative Energy Efficiency Design for Sustainability (CEEDS) project into PREE as a forum to further discuss key issues in the previous PREEs and to hold an ‘Energy Efficiency Policy (EEP) Workshop’ once a year in cooperation with EGEE&C instead of CEEDS workshops.

PROGRESS

A trial EEP Workshop in conjunction with EGEE&C45 in Singapore was held on 23 March 2015 as a Self-Funded project. The focus was on the fundamentals of energy efficiency policy making and the development of stable funding mechanisms for agencies and programmes.

The first EEP Workshop was held in conjunction with EGEE&C47 as part of PREE Phase 5, focusing on energy efficiency policy and program evaluation.

The second EEP Workshop was carried out in Jeju Island, Korea alongside the EGEE&C 49 meeting. Based on feedback from economies, the topic of energy efficiency policy evaluation was selected again, but in greater depth and with more specific practical applications. This workshop was attended by 30 participants from 15 APEC member economies. The feedback was very positive including verbal encouragement to continue with this from several attendees. The EEP Workshop Summary Report: Policy and Program Evaluation II was published in June 2017.

The third EEP Workshop was held in Washington, D.C., USA on 10 April 2018 alongside the EGEE&C51 meeting. The workshop focused on conformity assessment – the process of ensuring a product or service meets the standards or regulations it is designed or advertised for – and was delivered mainly by the CLASP consultancy with additional presentations by several invited experts. There were 29 participants from 11 economies. A summary report was published on the APEC and APERC websites in early September 2018..

MILESTONE

APERC is in the early stages of soliciting suggestions for topics for the fourth EEP Workshop, which is planned to be held in conjunction with EGEE&C53 as part of PREE Phase 8.

E. PEER REVIEW ON LOW-CARBON ENERGY POLICIES (PRLCE)

BACKGROUND

In their Fukui Declaration in June 2010 on ‘Low-Carbon Paths to Energy Security: Cooperative Energy Solutions for a Sustainable APEC’, the APEC Energy Ministers instructed the EWG to ‘explore mechanisms to encourage economies to set individual goals and action plans for introducing low-emission power sources, building upon the success of the PREE, with assistance from APERC and relevant technology expert groups.’

Modelled on the successful Peer Review of Energy Efficiency (PREE), PRLCE assists volunteer economies to develop policies that support energy security and environmental protection through promoting low-carbon energy supply (e.g. renewable energies).

OBJECTIVE

The objectives of the PRLCE are:

1. To share experiences and knowledge among APEC economies on the best practices to promote low-emission power sources by means of the elaboration of a Peer Review Report on Low-Carbon Energy Policies;
2. To elaborate a Peer Review Report on Low-Carbon Energy Policies for APEC economies, attending to their particular circumstances and conditions, so that the strategies and measures recommended are the most efficient for contributing to the design of effective public policies in this field; and
3. To provide peer-reviewed recommendations that might be voluntarily adopted to encourage APEC economies to introduce or accelerate their power supply from low-emission sources, monitoring their progress to assess their effectiveness.

PROGRESS

Guidelines for PRLCE were endorsed by EWG members in August 2011.

The first PRLCE focused on renewable energy was held in Thailand on 21-25 May 2012. The peer review was conducted by a team of nine experts (from China; Japan; Malaysia; Chinese Taipei; the United States; Viet Nam; IRENA; and APERC). The draft Review Report of PRLCE in Thailand was discussed and endorsed by EWG members at the EWG44 meeting.

The second PRLCE focused on the National Renewable Energy Program (including the Feed-in Tariff (FIT) system for renewable energy) was held in the Philippines on 19-23 November 2012. The peer review was conducted by a team of nine experts (from China; Japan; Malaysia; New Zealand; Thailand; IRENA; and APERC). The draft Review Report of PRLCE for the Philippines was discussed and endorsed by EWG members at the EWG46 meeting.

The third PRLCE focused on renewable energy was held in Indonesia on 13-17 May 2013. The peer review was conducted by a team of eight experts (from China; Japan; Malaysia; Thailand; the United States; and APERC). The draft Review Report of PRLCE for Indonesia was discussed and endorsed by EWG members at the EWG46 meeting.

The fourth PRLCE for Malaysia focused on renewable energy was held on 9-13 December 2013. The peer review was conducted by a team of nine experts (from Australia; China; Japan; New Zealand; Chinese Taipei; Thailand; and APERC). The draft Review Report of PRLCE for Malaysia was discussed and endorsed by EWG members at the EWG47 meeting.

The fifth PRLCE for Viet Nam focused on renewable energy was held on 18-22 January 2016. The peer review was conducted by a team of 12 experts (from Australia; Japan; Korea; New Zealand; the Philippines; Chinese Taipei; Thailand; and APERC). The draft Review Report of PRLCE for Viet Nam was endorsed by EWG members through circulation and published in APEC website as well as APERC website.

The sixth PRLCE for Papua New Guinea focused on hydropower resource was held on 1-4 August 2017. The peer review was conducted by a team of 11 experts (Hong Kong China; Indonesia; New Zealand; the Philippines; Chinese Taipei; Thailand, the US and APERC). The Review Report of PRLCE for PNG was endorsed and posted on the APEC and APERC websites.

MILESTONE

APERC will invite all eligible economies to host next PRLCE.

F. LOW-CARBON MODEL TOWN (LCMT) PROJECT

BACKGROUND

This project directly responds to the declaration at the ninth APEC Energy Ministers Meeting, held in Fukui, Japan on 19 June 2010.

Ministers discussed low-carbon paths to energy security, which provide cooperative energy solutions for a sustainable APEC as well as economic growth. They noted that the introduction of low-carbon technologies in city planning to boost energy efficiency and reduce fossil energy use is vital to manage rapidly growing energy consumption in the urban areas of APEC.

APEC Energy Ministers therefore agreed to launch an ‘APEC Low-Carbon Model Town (LCMT) Project’ to present successful models for coordinated usage of advanced low-carbon technologies. This project is considered a priority project for APEC.

OBJECTIVE

The key objectives of LCMT are:

1. To disseminate the basic ideas and effective approaches of the Concept through utilizing the LCT-I System, which helps evaluate the progress and status of low-carbon development of various areas in the APEC region;
2. To provide Feasibility Studies of a specified area of low-carbon development projects selected as the LCT-I volunteer towns in the LCMT Project Phase 7 and identify how to improve the low-carbon development plans through the Feasibility Studies; and
3. To share best practices and real-world experiences of low-carbon town design with planners and policymakers throughout the APEC region.

PROGRESS

LCMT Phase 1: Tianjin, China

Tianjin, China was selected as the case study for the LCMT Phase 1 Project. The feasibility study was conducted and completed by a private consulting company in November 2011.

The ‘Concept’ was completed by the Low-Carbon Model Town Task Force in October 2011.

The policy review for Tianjin, China was carried out on 30 August-1 September 2011.

LCMT Phase 2: Samui Island, Thailand

Samui Island, Thailand, was selected as the case for the LCMT Phase 2 Project.

The refinement of the 'Concept' was completed by Study Group-A and assisted by APERC.

The feasibility study was carried out by qualified urban design consultants and a progress report was made at the LCMT Task Force meeting held in conjunction with the EWG44 meeting.

The policy review for Samui Island, Thailand was conducted by Study Group-B assisted by APERC on 24-28 September 2012.

LCMT Phase 3: Da Nang, Viet Nam

Da Nang, Viet Nam, was selected as the case for the LCMT Phase 3 Project.

The refinement of the 'Concept' was considered by Study Group-A and assisted by APERC, and its third Edition was completed in January 2014.

The feasibility study was carried out by qualified urban design consultants.

A policy review was conducted by Study Group-B and assisted by APERC on 4-6 December 2013. The policy review report was presented at the seventh LCMT Task Force meeting held in conjunction with the EWG47 meeting.

LCMT Phase 4: San Borja, Peru

San Borja, Peru, was selected as the case for the LCMT Phase 4 Project at the EWG46 meeting.

The refinement of the 'Concept' was considered by Study Group-A assisted by APERC, and its fourth Edition was presented at the LCMT Task Force meeting held in conjunction with the EWG48 meeting. APEC Low-Carbon Town Indicator (LCT-I) System was drafted and presented at the said meeting too.

The feasibility study for the case of San Borja was carried out by qualified urban design consultants and the results was reported to the ninth LCMT Task Force meeting held in conjunction with the EWG49 meeting.

A policy review for San Borja was conducted by Study Group-B assisted by APERC on 19-21 January 2015. The policy review report was endorsed and published in January 2016 on the APERC website.

LCMT Phase5: Bitung City, Indonesia

Bitung, Indonesia was selected as the case for the LCMT Phase 5 Project at the EWG48 meeting.

The 'Concept' refinement was considered with a focus on Low-Carbon Measures. In order to finalise and create the guidelines for the LCT-I System, several trials including the previous LCMT case towns were conducted. The project also sought to incorporate the elements of the LCT-I System in the Indicators for City Services and Quality of Life discussed in the Working Group 2 of the Technical Committee 268 for Sustainable Development in Communities in International Organization for Standardization (ISO). The 5th Edition of the 'Concept' was presented at the 10th LCMT Task Force meeting held in conjunction with the EWG50 meeting.

The Feasibility Study for Bitung City, North Sulawesi Province, Indonesia was carried out by a qualified urban design consultant and reported to the 10th LCMT Task Force meeting.

A policy review was conducted by Study Group-B and assisted by APERC on 30 November -2 December 2015. The policy review report was endorsed and published in June 2016 on the APEC website as well as APERC website.

LCMT Phase 6: Mandaue City, the Philippines

Mandaue, the Philippines, was selected as the case for the LCMT Phase 6 at the EWG49 meeting.

The Feasibility Study for Mandaue City, the Philippines was carried out by a qualified urban design consultant and the report was published in June 2017 on the APEC website.

The first Edition of the LCT-I System was established together with the sixth Edition of the 'Concept'. The sixth Edition of the 'Concept' is the final edition for the time being and it was presented at the 12th LCMT Task Force meeting held in conjunction with the EWG52 meeting. The APEC liaison officer attended the ISO meetings to share information.

A policy review was conducted by Study Group-B and assisted by APERC on 7-9 December 2016. The policy review report was endorsed and published on the APEC and APERC websites in May 2017.

LCMT Phase 7: Krasnoyarsk City, Russia

Krasnoyarsk, Russia, was selected as the case for the LCMT Phase 7 at the EWG49 meeting.

The Feasibility Study for Krasnoyarsk City, Russia was conducted by a qualified urban design consultant and the report was endorsed by the EWG member in April 2018.

The first LCMT Symposium was held on 14-15 September 2017 in Jakarta, Indonesia for the dissemination of LCT through utilising the LCT-I System. The summary report was endorsed and published on the APEC and PAERC websites in April 2018.

A policy review was conducted by Study Group-B and assisted by APERC on 5-7 December 2017. The policy review report was published on the APEC and APERC websites in October 2018.

The APEC liaison officer attended the ISO meetings to follow up the discussion for establishing the global standard.

LCMT Dissemination Phase 1 (Phase 8):

The feasibility studies on specific LCT-I System assessment items to be improved are underway for Banda Aceh in Indonesia, Shah Alam and Hang Tuah Jaya in Malaysia.

The second LCMT Symposium was held on 20-21 September 2018 in Da Nang, Viet Nam for the dissemination of LCT through utilising the LCT-I System.

MILESTONE

LCMT Dissemination Phase 2:

The concept note for LCMT Dissemination Phase 2 was submitted to project session 1, 2018 for the implementation of the project in 2018-2019.

G. OIL & GAS SECURITY INITIATIVE (OGSI)

BACKGROUND

APEC Energy Ministers met in St. Petersburg, Russia on 24-25 June 2012, and encouraged the EWG and APERC to work on activities to improve the response to oil and gas emergency situations, including emergency response workshops and exercises. EWG and APERC are expected to perform these activities in collaboration with the International Energy Agency (IEA) and the Association of Southeast Asian Nations (ASEAN).

This instruction by energy ministers was confirmed at the highest level: APEC leaders agreed to promote activities to improve the response to oil and gas emergency situations in the APEC region at Vladivostok, Russia on 8-9 September 2012.

As part of the APEC Oil & Gas Security Exercises (OGSE), APERC organised two fora and two exercises. The first Security Forum, a kick-off meeting, was held on 18-19 April 2013 in Tokyo. Scenarios for the Security Case Study Exercises were developed by APERC with the cooperation of outside experts. The first Exercise was a joint exercise by Southeast Asian APEC economies on 17-19 September 2013, held in Bangkok, Thailand. The second Exercise was carried out for Indonesia on 22-24 October 2013 in Jakarta. Results of the two Exercises were presented at the second Security Forum, a wrap-up meeting, held on 25 March 2014 in Tokyo. Likewise, the APERC's survey on the Development of APEC's Approach to Oil and Gas Security were drafted and discussed during the said Forum. Results of the Exercises and the survey were compiled into a Final Report, which was presented to the EWG47 meeting.

In reporting the result of OGSE to the EWG47 meeting, APERC proposed the APEC Oil & Gas Security Initiative (OGSI), a new project which succeeded OGSE. OGSI consists of three pillars: Oil & Gas Security Exercise (OGSE) on voluntary basis and not on a scheduled basis, Oil & Gas Security Network (OGSN) by officials in charge of oil and gas security policy in each economy, and Oil & Gas Security Studies (OGSS) on research topics related to oil and gas security in the APEC region.

OGSI was endorsed as an APEC Self-Funded project at the EWG48 meeting.

OBJECTIVE

The key objectives of OGSI's major pillars are:

1. To provide vital information on global developments and issues on oil and gas security;
2. To share experiences and insights on the challenges confronting the APEC economies relating to oil and gas security and supply emergency threats; and
3. To establish and apply APEC Oil and Gas Security Exercise Model Procedure as a guiding framework to address different emergency supply scenarios.

PROGRESS

The Philippines volunteered to undertake the first APEC Oil and Gas Security Exercise (OGSE), under the Oil and Gas Security Initiative, which focused on oil and gas supply emergency. The OGSE in the Philippines was held in Manila on 7-9 December 2015. This OGSE was also the first case to apply and test the implementation of the APEC Oil and Gas Security Exercise Model Procedure (EMP). The report of OGSE in the Philippines was presented at the second Energy Resiliency Task Force meeting held in conjunction with the EWG51 meeting. The second OGSE in Australia was held in Melbourne on 29-31 March 2017 with a focus on regional capacity building. The representatives from Indonesia, the Philippines and Thailand also participated. The third OGSE in Peru was held in Lima on 6-8 November 2017. Its final report was presented at the EWG 55 in Hong Kong, China. It was published in the APEC and APERC's website on July 2018.

The OGS Newsletter, which is part of the Oil and Gas Security Network (OGSN), is being produced and has been circulated on bi-monthly since December 2014. To date, 24 OGS Newsletters have been released.

The first OGSN Forum was held in Kitakyushu City, Japan, on 23-24 April 2015 and the initial results of the OGSS as well as EMP were presented. The second OGSN Forum was held in Kagoshima City, Japan, on 10-11 March 2016 and the APERC reported the implementation of OGSE in the Philippines, the results and progress of OGSS. Representatives from 19 APEC economies and 5 international and regional energy organisations participated in the Forum. Australia held a session on the risk management principles for energy security. The third OGSN Forum was

held in Irkutsk City, Russia on 29-30 June 2017. The fourth OGSN Forum was held in Tokyo, Japan on 7-8 March 2018 in conjunction with the EGCFE meeting on 9 March 2018.

Six OGSS reports on Oil Supply Security and Emergency Policy in the APEC region, the Impact on Oil Distribution, the Energy Reform in Mexico, Prospects and Compromise Points of the Arab Spring, Petroleum Product Trading and Security, and Melting of the Arctic Sea Ice were published on the APERC website in November 2015. One report on Plans for Fuel Supplies during Disasters in Expectation of Nankai Megathrust Earthquakes was published in October 2016. Four studies on Oil and Gas Security Indexation, Impact of Low Oil Price on Energy Security, Natural Gas Security in APEC, and Superiority of LPG: A Disaster-Resistant Energy Source were published in 2017. Three more reports were completed and published in the summer of 2018: Energy security of APEC economies and changing downstream oil environment, Investments in Natural Gas Supply Chain under the Low Price Environment, and APEC Oil and Gas Security Indexation 2017 Update. New research for 2018/2019 is underway on emerging energy security risks in changing global energy landscape, and small-scale LNG in the Asia-Pacific region.

MILESTONE

Chile has shown its interest in hosting the next OGSE. It is planned to take place on March 2019,

The OGS Newsletter will continue to be published every other month and the next issue is scheduled to be published by the end of December 2018.

Two new OGSS projects are currently underway and those reports will be published by the summer of 2019.

The fifth OGSN Forum is planned to be held in Sendai City, Japan, in April 2019 in conjunction with the next EGCFE oil and gas meeting.

2. Accepting Trainees and Dispatching Experts

BACKGROUND

APERC accepts energy modelling trainees, chiefly from developing economies in the APEC region. These trainees learn about preparing energy demand and supply outlooks, and related matters.

APERC also sends experts to APEC economies to help develop energy data and prepare energy demand and supply outlooks, including experts on modelling techniques such as data management, energy balance preparation, macroeconomic modelling, and energy supply planning.

OBJECTIVE

The objective is to build the capacity of APEC economies in energy data management and projecting energy demand and supply.

PROGRESS

In FY2018, APERC experts were dispatched to Chinese Taipei on 13-17 August and to Indonesia from 27 August to 7 September. The training in Chinese Taipei was in response to the request of EGNRET while the one in Indonesia was a more intensive training for the Directorate General for Electricity of the Ministry of Energy and Mineral Resources (MEMR) and the province of Sulawesi and the Centre for Data on Energy and Mineral Resources of MEMR.

APERC established a cooperation course on 'Energy Issues in Asia-Pacific Region' at the Graduate School of Asia-Pacific Studies, Waseda University in 2016, in commemoration of the 20th anniversary of APERC. As a part of APERC's training activities, APERC will enhance 'energy literacy' of future leaders of Asia-Pacific region in general and invite candidates of energy experts to further energy

studies particular, through this cooperation course. This is the third year in which APERC dispatches their researchers to give lectures to Waseda University graduate students.

MILESTONE

Further dispatching experts to other economies is under consideration, as happened earlier this year with the training in Indonesia and in 2017 in Mexico, Papua New Guinea and Peru. Additional dispatch of experts to other economies will also be carried out depending on requests.

The seminar on energy modelling in Tokyo for the year 2018 will be held on 5-13 November. The seminar is lengthened by two days to give more hands-on exercises to trainees.

The cooperation course at Waseda University will continue for three more years from 2019 to 2021.

3. Building Energy Data Management Networks

BACKGROUND

APERC has built an online communication network with energy organisations in APEC member economies. The network allows uniform management of energy data submitted by APEC economies and the preparation of energy balance tables based on this data.

APERC is also the Secretariat of the APEC Expert Group on Energy Data and Analysis (EGEDA) that meets once a year.

APERC supplies data provided by APEC member economies to the Joint Organisations Data Initiative's (JODI) database and works jointly with member economies to improve data quality.

In addition, in order to upgrade Energy Data Management Networks, APERC started to accept energy statistics trainees from developing APEC economies. APERC also started to send experts to APEC economies to help improve the quality of their energy statistics.

OBJECTIVE

The key objectives are:

1. To improve the availability and consistency of energy data and to develop an up-to-date and consistent APEC Energy Data Base, principally covering energy demand and supply data.
2. To develop an APEC energy data collection and dissemination network.
3. To be responsible for managing and reviewing the operation of the APEC Energy Data Base through data analysis and related economic analysis.
4. To collect policy relevant information.
5. To participate in "Joint Organisations Data Initiative", as a joint activity of APEC, EUROSTAT, GECF, IEA, IEF, OLADE, OPEC and UNSD.
6. To implement energy statistics training courses.

PROGRESS

In April 2015, APERC established the internal Energy Statistics & Training Office (ESTO) to ensure efficient progress with activities described under points 3 and 4 above.

APERC collected and processed the 2016 annual energy supply and demand data from the 21 member economies. The APEC Energy Statistics 2016 and APEC Energy Handbook 2016 were published in October 2018.

On the fifth year of the EGEDA Training Program on Energy Statistics, APERC held the short-term course on 20-31 August 2018 while the middle-term course commenced on the same date and finished on 12 October 2018.

APERC held the 16th APEC Workshop on Energy Statistics on 10-12 July 2018 in Tokyo. Delegates from 16 member economies and four international organisations participated in the workshop. The following were the topics in the workshop:

- District cooling facilities in APEC economies and inclusion of related data in the APEC energy balance tables. Sharing of experiences in data collection and filling in the APEC energy efficiency template
- Sharing of experiences in new and renewable energy data collection and tracking the APEC NRE doubling goal
- Improving APEC JODI data
- Next Steps for further exchanges and capacity building.

MILESTONE

APERC will start collecting the 2017 annual energy supply and demand data and will publish the APEC Energy Statistics 2017 and APEC Energy Handbook 2017 in the second half of 2019.

APERC is hosting the 25th Seminar on energy Demand and Supply Outlook on 5-13 November 2018 in Tokyo.

II. FUTURE WORK PLAN

APERC's Future Work Plan is designed to assist EWG in responding to the instructions by APEC Energy Ministers for coming years as described in Part I.

APERC conducts research activities, particularly producing the *APEC Energy Demand and Supply Outlook*. In addition, APERC, as the designated executants, assists project overseers by carrying out APEC projects, on the condition that budget from the APEC fund is approved for those projects by the APEC BMC.

As agreed in EWG47, APERC is now directly responsible to EWG. APERC will keep close cooperation with Expert Group of Energy Data and Analysis (EGEDA) as well as other expert groups under EWG in planning and implementing its activities.

1. Activities to Support the Achievement of Energy Efficiency and Other Policy Objectives

A. APEC ENERGY DEMAND AND SUPPLY OUTLOOK 7TH EDITION

APERC will continue to work on the Outlook seventh Edition toward the release of its publication at EWG57 (April 2019).

B. TOPICAL STUDIES

APERC will encourage its researchers to conduct research on energy affairs and policies in the APEC region for the interest of APEC economies as well as for the preparation of the Outlook seventh Edition.

C. APEC ENERGY OVERVIEW

APERC will prepare for the APEC Energy Overview 2018 to be published in June 2019.

D. PREE

With the approval of PREE Phase 8 and 9 proposals, APERC will start working on the preparation of PREE in Russia and Follow-up PREE in Peru, respectively.

APERC will hold the fourth Energy Efficiency Policy (EEP) Workshop in conjunction with EGEE&C53 as a part of PREE Phase 8.

E. PRLCE

The PRLCE will be a very important instrument to achieve the APEC aspirational goal to double the share of renewable energy in energy (or power) mix in the APEC region. APERC will invite all eligible economies to host next PRLCE.

F. LOW-CARBON MODEL TOWN (LCMT) PROJECT

The third LCMT Symposium is planned to be held in San Borja, Peru in 2019 as a part of the LCMT Dissemination Phase 2.

G. OIL & GAS SECURITY INITIATIVE (OGSI)

APERC will coordinate the fourth OGSE, under OGSI framework in Chile. It is planned to take place in March 2019.

APERC will prepare for the fifth OGSN Forum in Sendai City, Japan, in April 2019 in conjunction with the next EGCFE oil and gas meeting.

APERC will continue activities for OGSI including issuing OGS Newsletter and publishing results of OGSS.

2. Accepting Trainees and Dispatching Experts

Dispatching experts in 2019 upon request of interested economies is under consideration.

APERC will continue the cooperation course at Waseda University.

3. Building Energy Data Management Networks

The following are the plans for FY2018 and preliminary for FY2019:

- Start the collection of the 2017 annual energy demand and supply data from December 2018;
- Publish the APEC Energy Statistics 2017 and APEC Energy Handbook 2017;
- Organise the 25th Seminar on energy Demand and Supply Outlook on 5-13 November 2018 in Tokyo, Japan;
- Participate in international cooperation on energy statistics such as the Energy Statistics Development Group (ESDG) of IEA, JODI, International Energy Statistics (InterEnerStat) meetings, etc.; and
- Run the EGEDA Training Program on Energy Statistics.
 - The short-term and middle-term training courses will be held in summer 2019.

III. RESEARCH MANAGEMENT

1. APERC Annual Conference

The APERC Annual Conference is held to gather expert input to help APERC's research activities. In 2018, it was held on 30-31 May in Tokyo with the participation of experts from around the world that discussed:

- Impacts of decreasing energy intensity and increasing renewable energy use on energy scenario projections; Impacts of transitioning to a low-carbon energy system; Implications of the three scenarios on energy sector investment, trade, and geopolitics; and
- Key topics that could be explored in the eighth Edition of the APEC Outlook and identifying existing and potential research gaps.

The 2019 APERC Annual Conference is planned to take place in May 2019.

2. APERC Advisory Board

Establishing the APERC Advisory Board was endorsed by the EWG16 meeting in Cairns, Australia, in August 1998. The Terms of Reference were endorsed by the EWG17 meeting in Oakland, the United States, in April 1999.

The Advisory Board is a group of representatives of major research institutions located in the APEC region, who help to facilitate the conduct of APERC's cooperative research. Its primary role is to give professional advice on APERC's on-going and proposed research, such as methodologies, approaches, databases, and information sources, as well as relevant experts to be involved. APERC carefully considers the advice provided by its Advisory Board members in proposing its research plan to the EWG.

The Advisory Board Meeting was held on 31 May 2018 in conjunction with the APERC Annual Conference. The next Advisory Board Meeting is planned to take place in May 2019.

IV. APERC RESEARCH STAFF

APERC researchers are generally drawn from energy research organisations, both government and non-government, in APEC member economies. The minimum term of researchers supported by APERC's budget is one year, which may be extended subject to consultations with the relevant organisations in member economies.

APERC would like to invite all economies to nominate researchers to serve at APERC. In principle, APERC accepts one researcher from each APEC member economy.

APERC offers to the researchers: 1) living allowance; 2) furnished housing in Tokyo; 3) family, education, commuting and moving allowances; and 4) health insurance.

As of 26 October 2018, APERC had a total of 23 research staff, of which 15 are Visiting Researchers from APEC economies.

Table 1: APERC Research Staff

Name
Kazutomo Irie(President)
James Michael Kendell (Senior Vice President)*
Munehisa Yamashiro (Vice President)
Melissa Christenberry Lott (Assistant Vice President)*
Kaoru Yamaguchi
Edito Barcelona
Goichi Komori
Elvira Torres Gelindon
Takashi Otsuki
Takako Hannon
Ruengsak Thitiratsakul*
Gigih Udi Atmo*
HyunJoo Song*
Muhamad Izham ABD. Shukor*
Alexey Kabalinskiy*
Atikah Ismail*
Fang-Chia Lee*
Nguyen Linh Dan*
Diego Rivera Rivota*
Thomas Willcock*
Juan Ignacio Alarcon Marambio*
Hugh Marshall-Tate*
Jun Fang*

* Visiting Researchers from APEC economies.

V. REVENUE AND EXPENSES

Since its inception, APERC's budget has been provided by the Japanese Government and, in fiscal 2004, 2005 and 2006, also by the Australian Government.

This budget has been used to facilitate research activities, cooperative efforts, know-how transfer programmes to the member governments, and the energy data network service.

The table below is a summary of annual financial statements since APERC was established in July 1996.

Table 2: APERC Revenues and Expenses

Unit: million yen

Fiscal Year	1996 9mns	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Revenue from:												
Japanese Government	374	626	681	729	619	634	594	547	525	528	498	446
Australian Government									8	8	8	
Total of Revenue	374	626	681	729	619	634	594	547	533	536	506	446
Expenses:												
Energy Efficiency/APEC Energy Demand & Supply Outlook/ Related Research Programmes	227	443	494	550	455	469	434	390	379	377	377	338
Oil & Gas Security												
Energy Data Network & Know-How Transfer	147	183	187	179	164	165	160	157	154	159	129	108
Total of Expenses	374	626	681	729	619	634	594	547	533	536	506	446

Fiscal Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018 (plan)
Revenue from:											
Japanese Government	447	418	409	425	494	580	657	653	689	672	672
Total of Revenue	447	418	409	425	494	580	657	653	689	672	672
Expenses:											
Energy Efficiency/APEC Energy Demand & Supply Outlook/ Related Research Programmes	339	318	315	308	325	325	432	501	522	423	423
Oil & Gas Security						107	68	183	124	161	163
Energy Data Network & Know-How Transfer	107	100	94	94	86	68	100	97	91	86	86
Total of Expenses	447	418	409	402	411	500	600	781	737	670	672