



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

REPORT ON APERC ACTIVITIES

**THE 60TH MEETING OF
THE APEC ENERGY WORKING GROUP (EWG-60)
9-11 DECEMBER 2020**

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I. PROGRESS IN ON-GOING WORK

1. Research Activities

A. APEC ENERGY DEMAND AND SUPPLY OUTLOOK

BACKGROUND

APERC has previously produced seven editions of the APEC Energy Demand and Supply Outlook. The latest version is the seventh edition published in May 2019.

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 completed the seventh edition of the APEC Energy Demand and Supply Outlook, which now includes projections extending to 2050. As with past editions, the Outlook seventh edition is comprised of two volumes: Volume I provides APEC-wide results and Volume II provides the outlook for each APEC economy. Outlook results were disseminated to each economy during Roadshow events. APERC researchers have visited all 21 APEC economies since the report's release.

Work on the eighth edition Outlook is in progress. Preliminary results for the baseline scenario are complete and will be sent for economy review in December 2020. Work will continue on the two alternative scenarios. Results for those scenarios will be sent for review in the second quarter of 2021.

The eighth edition Outlook utilises APEC energy data, instead of IEA, to underpin its analysis. Other improvements to the analysis include increasing the role of price in supply and demand decisions in the sector models. The modelling tools developed for the Outlook will also be used for training activities in APEC economies.

Data collection and model development are ongoing.

MILESTONES

- The eighth edition is planned for release in the first half of 2022 at EWG 63.

B. TOPICAL STUDIES

BACKGROUND

Along with the Outlook, APERC has been conducting research on topics relevant to energy issues 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

Since 2017 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 reports review supply, demand, trade, and price developments over the past ten years and projected developments over the next five years.

A paper on fossil fuel quality standards in APEC that had its origin in the 2019 oil report was presented at the 2020 IAEE Asia-Oceania Conference in Auckland, NZ, and was presented at the APERC Workshop at EWG59. The paper explores the costs and benefits of imposing stricter gasoline and diesel quality standards. Another paper presented at the IAEE Asia-Oceania Conference is based on the 2018 APERC report, *Perspectives on Hydrogen in the APEC Region*.

Apart from this series of fuel reports, APERC has recently published *Challenges and perspectives on deployment of BEVs and FCEVs*. The study discusses the current situation of battery electric and fuel cell electric vehicles in the APEC region; the impact of BEVs and FCEVs on electricity supply, demand, and CO₂ emissions; and a comparative analysis of BEVs and FCEVs.

MILESTONE

While APERC Oil Report 2020 and the APERC Coal Report 2020 were published in September 2020 and October 2020 respectively, APERC Gas Report 2020 will be published in early 2021.

C. APEC ENERGY OVERVIEW

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 of the 2001 edition, 19 editions have been issued up to 2020.

OBJECTIVE

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

PROGRESS

APEC Overview 2019 was completed and published in September 2020.

MILESTONE

APEC Energy Overview 2020 is expected to be published in August 2021.

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 FY2019, APERC experts were dispatched to Indonesia in two seminars. The first was the energy statistics training course on 25-29 November 2019. The second was advanced electricity demand and supply planning using APERC GAMS electricity model on 2-6 December 2019.

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 through this cooperation course. This is the fifth year in which APERC dispatches their researchers to give lectures to Waseda University graduate students, though the course is suspended due to COVID-19.

Due to travel restrictions brought about by the COVID-19 pandemic, APERC held online training courses for Indonesia and the Philippines in September and October 2020, respectively, instead of dispatching of experts to other economies.

MILESTONE

The seminar on energy modelling will be held on 25-29 January 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 2017 annual energy supply and demand data from the 21 member economies. The APEC Energy Statistics 2017 and APEC Energy Handbook 2017 was published in March 2020.

On the 6th year of the EGEDA Training Program on Energy Statistics, APERC held the short-term course on 19-30 August 2019 with eight participants from six APEC member economies. There was no nomination for the middle-term course. In lieu of this, a special training course on energy statistics for Viet Nam will be on 28 September to 2 October 2020, most probably via online. This course was offered to Viet Nam so that the three government agencies in the economy involved in the preparation of energy statistics can harmonise their efforts in the collection, processing, analysis and dissemination of energy statistics. These agencies are the Electricity and Renewable Energy Authority (EREA) and the Institute of Energy (IE) of the Ministry of Industry and Trade (MOIT) and the General Statistics Office (GSO).

The 17th APEC Workshop on Energy Statistics, a joint workshop with JODI, was held in Tokyo on 11-13 June 2019. Participants were from 15 APEC members and JODI partners (IEA, IEF, GECF, OPEC, and UNSD). Generally, the objective of the joint workshop is to improve monthly oil and gas data. Specifically, following were the topics discussed:

- Importance of energy commodity data transparency
- Oil and gas flows and related statistics
- Data quality assessment
- Interaction with the oil and gas business sector
- Dealing with confidentiality

MILESTONE

APERC is currently verifying the collected 2018 annual energy supply and demand data and will publish the APEC Energy Statistics 2018 and APEC Energy Handbook 2018 in the second half of 2020.

The EGEDA Training Program on Energy Statistics for 2020 will be postponed due to the COVID-19 pandemic. The short-term course and the middle-term course, scheduled to be held in 2020, are postponed to the second half of 2021. .

The 18th APEC Workshop on Energy Statistics, a joint workshop on renewable energy with IRENA, will be held on 15-17 December 2020 via online. APERC is considering focusing the workshop on renewable energy statistics with the objective of improving data quality and accuracy and ultimately, to accurately track the progress of the APEC renewable share doubling goal.

4. Policy Cooperative Activities

A. 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 tenth 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 in 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 in Thailand was 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 in 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 Follow-up PREE in Malaysia (PREE Phase 7) was carried out on 26-30 March 2018. The focus sector for the peer review were transportation and industry sectors. Six experts from Australia, Indonesia, Malaysia, Thailand, USA and International Energy Agency (IEA) joined the Follow-Up PREE Malaysia. The final report was published on November 2018.

The 12th PREE, planned to take place in Russia (PREE Phase 8) was originally scheduled for October 2018. However, due to the restructuring of the federal government of Russia, it was cancelled.

The Follow-up PREE in Peru (PREE Phase 9) was conducted on 18-22 March 2019 in Lima, Peru. The Review Expert Team was composed by six experts from five APEC economies (Hong Kong, China; Mexico; New Zealand; Thailand and USA) and an expert from the German Corporation for International Development (GIZ). Unlike previous Follow-up PREEs, this one was not focused on a specific sector and was an overall assessment of energy efficiency, as per request of the Peruvian government. The Expert Team gave 47 preliminary recommendations on 6 subsectors. Around 40 participants attended the peer review meeting and 26 presentations from 12 different relevant organisations were made. The Follow-Up PREE report was drafted by APERC and was endorsed by EWG in February 2020. The final report is available at the APEC and APERC websites.

MILESTONE

The Follow-up PREE in Indonesia (PREE Phase 10) will be held tentatively in October 2021 in Tangerang, a city on the western border of Jakarta, Indonesia. The event was rescheduled from the original plan (29 June - 3 July) to 19 - 23 October 2020 and rescheduled again due to travel restrictions and quarantine impositions associated with the COVID-19 pandemic. The focus sector for the review will be the transport, industry, buildings, home appliances and energy supply sectors. Six experts are planning to join the peer review team for the Follow-Up PREE in Indonesia.

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 EGEEC instead of CEEDS workshops.

PROGRESS

A trial EEP Workshop in conjunction with EGEEC45 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 EGEEC47 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 EGEEC 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 EGEEC51 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.

The fourth EEP Workshop was held in Hong Kong, China on 18 March 2019 alongside the EGEEC53 meeting. The workshop was titled “Energy Efficiency in the Transport Sector: developing policy for fuel economy regulation” and was delivered mainly by the Retyna consultancy with additional presentations by invited experts and economy representative. There were 41 participants from nine economies. A summary report was published on the APEC and APERC websites.

APERC has just held the fifth EEP workshop on 18 November 2020 in conjunction with the 55th EGEEC meeting via online. The workshop is titled "economic recovery through energy efficiency" and it covers some ways in which strengthening energy efficiency policy and making investments in energy efficiency can stimulate economic growth. More than 60 participants were present.

MILESTONE

A summary report of the fifth EEP workshop will be published the first quarter of 2021.

B. 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.

C. 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 utilising 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 1 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 APERC 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):

LCMT Dissemination Phase 1 started from August 2017 and ended in March 2019.

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. The summary report was published on APERC website in February 2019.

Focused feasibility study for three volunteer towns of the Dissemination Phase 1 (Banda Aceh of Indonesia, Hang Tuah Jaya and Shah Alam of Malaysia) was led by Nikken Sekkei Research Institute. The report was approved in May 2019.

LCMT Dissemination Phase 2 (Phase 9):

LCMT Dissemination Phase 2 started from August 2018 and ended in June 2020.

The third LCMT Symposium was held in San Borja, Lima, Peru on October 21-22, 2019 and its summary report was approved and published on APERC website in June 2020. It was the first outdoor meeting of LCMT project.

The consulting agency, represented by Institute of Regional Sustainable Development (Viet Nam), conducted the feasibility study for Davao of the Philippines and Da Lat of Viet Nam. Two feasibility study reports were also approved in June 2020.

MILESTONE

LCMT Dissemination Phase 3 (Phase 10):

The project proposal for LCMT Dissemination Phase 3 was approved in October 2019. This phase is expected to be the last phase of the LCMT Project, to conclude the 10 years of implementation. Dissemination Phase 3 will provide each of the three volunteer towns selected in the Dissemination Phase 2 (La Molina of Peru, Khon Kaen of Thailand and Phu Quoc of Viet Nam) a focused feasibility study; and hold a wrap-up symposium in Japan. Although the exact date has not been decided due to COVID-19, the preparation for the wrap-up symposium will be done in due course by APERC. The selection process of agency to conduct feasibility study is delayed.

D. 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:

4. To provide vital information on global developments and issues on oil and gas security;
5. To share experiences and insights on the challenges confronting the APEC economies relating to oil and gas security and supply emergency threats; and
6. 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 published in the APEC and APERC's website on July 2018.

Finally, the **Oil and Gas Security Exercise in Chile (4th OGSE)** was held in Santiago on 13-15 March 2019. The OGSE in Chile was a 'blind' type exercise where participants were briefed about hypothetical oil and gas supply disruptions without prior notice, with seven experts from different institutions conforming the Review Expert Team. The final report was endorsed by EWG and is available at the APEC and APERC websites since December 2019.

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, 34 OGS Newsletters have been released. In conjunction with APERC's independence in April 2020, all articles in OGS Newsletter have been solely written by APERC Researchers starting from the 33rd issue released in the same month.

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. **The fifth OGSN Forum** was held in **Sendai City, Japan, in April 10-12, 2019** in conjunction with the second EGCFE oil and gas meeting.

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 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. In 2019, two reports were completed and published in September: Small-scale LNG in Asia Pacific and Emerging energy security risks in changing energy landscape.

MILESTONE

The 5th OGSE scheduled to be hosted by Thailand was postponed. Thailand will discuss with APERC what date would be best to re-organize the activity. The Minister of Energy or the Permanent Secretary of Ministry of Energy will host this exercise at the Ministry of Energy, Energy Complex in Bangkok. The Exercise will cover the supply emergency scenarios in two stages - the first stage of scenario is on oil and the second is on gas. The 6th OGSN Forum will be held in Japan, though its schedule is not decided yet.

The OGS Newsletter will continue to be published every other month and the next issue (Issue No 37) is scheduled to be published by the end of December 2020.

The 17th OGSS project entitled “*Changing LNG market dynamics – impacts on supply security in the APEC region*” was published in September 2020.

The 18th OGSS project entitled “*Impact of COVID-19 on energy security*” is scheduled to be published in October 2021.

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. Research Activities

A. APEC ENERGY DEMAND AND SUPPLY OUTLOOK

Assumptions and scenarios for the Outlook eighth edition will contribute to the ongoing techno-economic analysis of efficiency and intensity objectives.

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 eighth edition.

C. APEC ENERGY OVERVIEW

The APEC Energy Overview 2020 will be published in August 2021.

2. Accepting Trainees and Dispatching Experts

APERC will organise the seminar on energy modelling on 25-29 January 2021 via online.

APERC will continue the cooperation course at Waseda University.

3. Building Energy Data Management Networks

The following are the plans for FY2020-2021:

1. Collect, process and analyse the 2018 annual energy demand and supply data;
2. Publish the APEC Energy Statistics 2018 and APEC Energy Handbook 2018;
3. 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.

4. Policy Cooperative Activities

A. PREE

Follow-up PREE in Indonesia is expected to be held in October 2021.

B. 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.

C. LOW-CARBON MODEL TOWN (LCMT) PROJECT

The new date for a wrap-up symposium to be held in Japan will be discussed.

D. OIL & GAS SECURITY INITIATIVE (OGSI)

The 6th OGSN Forum will be held in Japan, though its schedule is not decided yet. This will probably be held in conjunction with the next EGCFF oil and gas meeting.

The new date of the 5th OGSE will be discussed between Thailand and APERC.

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

III. RESEARCH MANAGEMENT

1. APERC Annual Conference

The APERC Annual Conference is held to gather experts from around the world to help APERC's research activities.

The 2020 APERC Annual Conference took place on 11, 14-16 September 2020 via online.

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 latest Advisory Board Meeting was held on 17 September 2020 in conjunction with the APERC Annual Conference.

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 November 2020, APERC has a total of 19 research staff, of which 12 are Visiting Researchers from APEC economies.

Table 1: APERC Research Staff

Name
Kazutomo Irie (President)
Glen Sweetnam (Senior Vice President) *
Munehisa Yamashiro (Vice President)
David Michael Wogan (Assistant Vice President) *
Edito Barcelona
Ruengsak Thitiratsakul*
Elvira Torres Gelindon
Fifi Indarwati*
Nobuhiro Sawamura
Victor Martinez Aranza*
Alexander Izhbuldin*
Manuel Antonio Heredia Munoz*
Xin Liu*
Diego Rivera Rivota*
Hugh Marshall-Tate*
Christopher James Doleman*
Mathew Horne*
Takako Hannon
Yuka Hayashi

* 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	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
	9mns												
Revenue from:													
Japanese Government	374	626	681	729	619	634	594	547	525	528	498	446	447
Australian Government									8	8	8		
Total of Revenue	374	626	681	729	619	634	594	547	533	536	506	446	447
Expenses:													
Energy Efficiency/APEC Energy Demand & Supply Outlook/ Related Research Programmes	227	443	494	550	455	469	434	390	379	377	377	338	339
Oil & Gas Security													
Energy Data Network & Know-How Transfer	147	183	187	179	164	165	160	157	154	159	129	108	107
Total of Expenses	374	626	681	729	619	634	594	547	533	536	506	446	447
Fiscal Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Revenue from:													
Japanese Government	418	409	425	494	580	657	653	689	672	672	672	672	
Total of Revenue	418	409	425	494	580	657	653	689	672	672	672	672	
Expenses:													
Energy Efficiency/APEC Energy Demand & Supply Outlook/ Related Research Programmes	318	315	308	325	325	432	501	522	423	388	406	423	
Oil & Gas Security					107	68	183	124	161	119	100	163	
Energy Data Network & Know-How Transfer	100	94	94	86	68	100	97	91	86	73	44	86	
Total of Expenses	418	409	402	411	500	600	781	737	670	580	550	672	