ASIA PACIFIC ENERGY RESEARCH CENTRE (APERC)

REPORT ON APERC ACTIVITIES

THE 67TH MEETING OF

THE APEC ENERGY WORKING GROUP (EWG-67)

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CONTENTS

I. PROGRESS IN ONGOING WORK

1. Research Activities

A. APEC ENERGY DEMAND AND SUPPLY OUTLOOK

BACKGROUND

APERC had previously produced eight editions of the APEC Energy Demand and Supply Outlook.

OBJECTIVE

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

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

PROGRESS

The Outlook 8th edition was published in September 2022 after approval by EWG. APERC researchers have shared the findings with member economies and other stakeholders and continue to engage with multiple parties about the issues highlighted in the report.

The Outlook 8th edition used APEC energy data instead of IEA to underpin its analysis. The analysis is a more transparent and open-source approach than previous editions. The modelling tools developed for Outlook are being used for training activities in APEC economies.

Work on the Outlook 9th edition is underway. APERC researchers are undertaking modelling of two scenarios for all economies, with the intention to send to economies for review in the first half of 2024.

They have completed the preliminary modelling of about half of APEC economies.

MILESTONES

The Outlook 9th edition is scheduled to be published in 2025.

B. 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, 21 editions have been issued up to 2022.

OBJECTIVE

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

PROGRESS

APEC Energy Overview 2023 was published in August 2023.

MILESTONE

The drafting of APEC Energy Overview 2024 is ongoing and its publication is expected in June 2024.

C. TOPICAL STUDIES

BACKGROUND

Along with the Outlook and the Overview, 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 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. This year a fourth report focusing on hydrogen was added to the series. The reports review supply, demand, trade, and price developments over the past 10-20 years and projected developments over the next 5-7 years.

The APERC Coal Report 2023 and Oil Report 2023 were published in early February 2024. A summary of the draft APERC Hydrogen Report 2023 was presented at the APERC Workshop on the margins of EWG67 in Lima, Peru in February 2024.

MILESTONE

The Gas Report 2023 and Hydrogen Report 2023 are scheduled to be published in late February 2024 or early March 2024. The Hydrogen Report 2023 is scheduled to be presented at EGNRET 60 meeting in April in Tainan, Chinese Taipei. All four APERC Reports 2023 are scheduled to be presented at the EGCFE 2024 meeting in May in Nanjing, China. Summaries of Coal, Oil and Gas Reports 2023 are planned to be presented at the APERC Workshop on the margins of EWG68 in Lima, Peru in August 2024.

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

After the relaxation of travel restrictions due to the COVID-19 pandemic, APERC organized the 29th Seminar on Energy Modelling on 6-10 March 2023 in Tokyo.

In 2023, APERC dispatched experts to Thailand's Energy Policy and Planning Office to provide training on energy modelling using the OSeMOSYS software.

APERC also dispatched electricity modelling experts to Thailand's Energy Research Institute (ERI) as part of the memorandum of understanding (MOU) between ERI and APERC on expert exchange.

The cooperation course on "Energy Future of the Asia Pacific Region" at Kyoto University Graduate School of Energy Science for the schoolyear 2023-2024 started on 14 April and was completed on 21 July 2023.

MILESTONE

APERC will organize the 30th Seminar on Energy Modelling on 4-8 March 2024.

APERC will dispatch a team of experts to Malaysia for a training on energy modelling using the LEAP software on 22-26 April 2024. Another team of experts could be dispatched upon request of interested member economies.

The cooperation course at Kyoto University Graduate School of Energy Science for the school year 2024-2025 will start in October 2024.

3. Building Energy Data Management Networks

BACKGROUND

APERC has built an online communication network with energy organizations 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 the 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 under the EGEDA Training Program on Energy Statistics. 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, manage and review the operation of an up-to-date and consistent APEC Energy Database, principally covering energy demand and supply data.
2. To continue to develop an APEC energy data collection and dissemination network.
3. To participate in international cooperation/collaboration activities on energy statistics with the United Nations Statistics Division (UNSD), International Energy Agency (IEA), The International Renewable Energy Agency (IRENA), the Joint Organisations Data Initiative (JODI) and other international organizations.
4. To implement energy statistics training courses for APEC member economies.
5. To track the APEC aspirational goals on reducing energy intensity by 45% in 2035 from 2005 levels and doubling the 2010 share of renewable energy in the APEC energy mix by 2030 and other similar measurable goals that may be set by the energy ministers.
6. To report to and advise the APEC EWG on each of the above activities.

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 2021 annual energy supply and demand data from the 21 member economies. The APEC Energy Statistics 2021 and APEC Energy Handbook 2021 are now being drafted and to be published in March 2024. APERC decided that only the latter will be printed while the former will be made available online.

The 21st APEC Workshop on Energy Statistics, focusing on data collection on new energy products and technologies, was held on 12-14 September 2023 in Tokyo, Japan. The workshop aimed to enhance the participants' knowledge of hydrogen, district cooling, and other emerging new energy technologies, such as large-scale battery electricity storage, etc., to facilitate data collection on these new energy products and technologies. Experts from international organisations, IEA, IRENA and the APEC Transportation Working Group were invited to provide detailed information on new energy technologies. This is the 1st collaboration between EGEDA, EGNRET and EGCFE.

As for the EGEDA Training Program on Energy Statistics for the fiscal year 2023/2024, the short-term course was held from 22 January to 2 February 2024. In addition, APERC held an 8-week course on energy statistics for an energy analyst from Papua New Guinea in June to July 2023. The course was an on-the-job training on which the trainee was given lectures on energy products and flows, unit conversion, energy balance tables, GHG emissions from energy, estimating/collecting renewable energy and energy efficiency indicators data, and review and revision of Papua New Guinea's energy and economic statistics. APERC hopes that the trainee obtained sufficient skills and knowledge for developing an energy data collection system in the economy.

MILESTONE

The APEC Energy Statistics 2021 and APEC Energy Handbook 2021 will be published in the first quarter of 2024. While the APEC Energy Handbook will continue to be printed, the APEC Energy Statistics 2021 will be made available only online.

The 22nd APEC Workshop on Energy Statistics will be held in Tokyo in July 2024. The objective of the workshop is to build on the gains from the 18th to the 21st workshop to further enhance the member's knowledge on energy efficiency indicators, renewable energy, and new and emerging energy products and technologies. It is expected that with knowledge acquired during the workshop, members would be able to collect data and report them to the EGEDA secretariat, enriching the APEC energy database and providing more information for modelling energy transition.

As for the EGEDA Training Program on Energy Statistics for the fiscal year 2024/2025, the short-term course will be held in January or February 2025. APERC will not hold the 8-weeks middle-term course during this fiscal year to review the effectiveness of the course and to lessen the workload of the ESTO staff for training. The review is still ongoing.

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 policymaking 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 the implementation of action plans could be improved to achieve 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 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 in 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 was the transportation and industry sectors. Six experts from Australia; Indonesia; Malaysia; Thailand; the USA, and International Energy Agency (IEA) joined the Follow-Up PREE Malaysia. The final report was published in November 2018.

The 12th PREE planned to take place in Russia (PREE Phase 8), was initially 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 of six experts from five APEC economies (Hong Kong, China; Mexico; New Zealand; Thailand and the 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 the request of the Peruvian government. The Expert Team gave 47 preliminary recommendations on six subsectors. Around 40 participants attended the peer review meeting, and 26 presentations from 12 different relevant organizations were made. The Follow-Up PREE report was drafted by APERC and was endorsed by EWG in February 2020. The final report is available on the APEC and APERC websites.

The Follow-up PREE for Indonesia (PREE Phase 10) was held online on 9-11 November 2021. The focus sector for the review were the transport, industry, buildings, home appliances and energy supply sectors. The final report of the Follow-up PREE in Indonesia (PREE Phase 10) was published in June 2022 and is available both on APEC and APERC websites.

The project proposal for PREE Phase 13, including Follow-up PREE in Chile, was approved for implementation.

MILESTONE

The Follow-up PREE in Chile will be held on 6-10 May 2024.

2. ENERGY EFFICIENCY POLICY (EEP) WORKSHOP

OBJECTIVE

In order to streamline and prioritize its activities, APERC decided to integrate the Cooperative Energy Efficiency Design for Sustainability (CEEDS) project into PREE as a forum to discuss key issues in the previous PREEs further 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 policymaking 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 representatives. There were 41 participants from nine economies. A summary report was published on the APEC and APERC websites.

The fifth EEP Workshop was held on 18 November 2020 in conjunction with the 55th EGEEC meeting online. The workshop was 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. A summary report of the workshop was published in January 2021.

The sixth EEP Workshop (PREE Phase 11) was held online on 29 March 2022 in conjunction with the EGEEC58 meeting which was hosted by China. Its theme was energy efficiency project financing. 47 participants from 13 APEC economies attended the workshop and they discussed investment expansion tools and financing models for energy efficiency projects. A summary report was published in July 2022 and its main points were presented at EWG64 through the APERC workshop.

The seventh EEP Workshop (PREE Phase 12) was held in the Philippines on 16 October 2023 in conjunction with the EGEEC61 and EGNRET59. The workshop was titled "Electrification and Energy Efficiency." 28 participants from 10 economies attended the workshop discussing and exchanging the issues on energy efficiency and electrification toward a decarbonized power system.

MILESTONE

The seventh EEP Workshop summary report was endorsed by EWG members in February and is expected to be published in April 2024.

The eighth EEP Workshop is planned to be held tentatively in the second half of 2024 in conjunction with EGEEC63.

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 in developing 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 on the APEC website as well as the APERC website.

The sixth PRLCE for Papua New Guinea focused on hydropower resources 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.

PRLCE Phase 5 was hosted by Peru on 5-7 December 2023.

MILESTONE

Drafting of the report of PRLCE Phase 5 in Peru is ongoing.

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 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 were 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 the International Organization for Standardization (ISO). The fifth 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 the 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 in 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 the APERC website in February 2019.

A 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 in August 2018 and ended in June 2020.

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

The consulting agency, represented by the 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.

LCMT Dissemination Phase 3 (Phase 10):

The project proposal for LCMT Dissemination Phase 3 was approved in October 2019. This phase was the last phase of the LCMT Project, to conclude the ten years of implementation. Nikken Sekkei Research Institute finished the focused feasibility study for the three volunteer towns (La Molina of Peru, Khon Kaen of Thailand, and Phu Quoc of Viet Nam), and its feasibility study summary report was published in December 2022. The wrap-up symposium was held online on 10 September 2021 and its summary report was published in October 2022.

D. OIL & GAS SECURITY INITIATIVE (OGSI)

BACKGROUND

APEC Energy Ministers met in St. Petersburg, Russia, on 24-25 June 2012. They 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 organized 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. The 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 was 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 a 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, focusing on oil and gas supply emergencies. 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. 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 on the APEC and APERC's websites in July 2018.

The fourth OGSE in Chile was held in Santiago on 13-15 March 2019. It was a 'blind' exercise where participants were briefed about hypothetical oil and gas supply disruptions without prior notice, with seven experts from different institutions forming the Review Expert Team. The final report was endorsed by EWG and has been available on the APEC and APERC websites since December 2019.

The fifth OGSE which was postponed in 2020 due to the COVID-19 pandemic took place in Bangkok on 6-8 September 2023 hosted by the Ministry of Energy of Thailand. The exercise covered the supply emergency scenarios in oil and gas.

The OGS Newsletter, which is part of the Oil and Gas Security Network (OGSN), is being produced and has been circulated bi-monthly since December 2014. To date, 54 OGS Newsletters have been released. In conjunction with APERC's independence in April 2020, all articles in OGS Newsletter have been solely written by the 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 APERC reported the implementation of OGSE in the Philippines, the results and the progress of OGSS. Representatives from 19 APEC economies and five international and regional energy organizations 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 Oil & Gas meeting on 9 March 2018. The fifth OGSN Forum was held in Sendai City, Japan, on 10-12 April 2019 in conjunction with the second EGCFE Oil and Gas meeting. The sixth OGSN Forum was virtually held on 21 April 2023 after four years of postponement due to the COVID-19 pandemic in conjunction with EGCFE 2023 on 20 April 2023, which was the first meeting after the rescoping of the expert group.

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 pand Gas Security Indexation, Impact of Low Oil Price on Energy Security, Natural Gas Security in pAPEC, 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. The 17th OGSS report entitled "Changing LNG Market Dynamics – Impacts on Supply Security in the APEC Region" was published in September 2020. The 18th OGSS report entitled "Impact of COVID-19 on Oil and Gas Security" was published in April 2022. The 19th OGSS report entitled "Oil and Gas Security During the Energy Transition" was published in September 2023.

The summary report of the 5th OGSE in Thailand was approved in February 2024 and published on both APEC and APERC websites.

MILESTONE

The OGS Newsletter will continue to be published every other month, and the next issue (Issue No 56) is scheduled to be published in February 2024.

The seventh OGSN Forum is planned to be held in person in Osaka, Japan, on 20-21 March 2024.

The draft of the 20th OGSS report entitled "What are the energy security implications of recent declines in both APEC and global spare petroleum refining capacity?" will be presented at the OGSN Forum in March 2024 and the final report will be presented at EGCFE 2024 in May 2024 and at EWG 68 in August 2024.

The topic of the 21st OGSS will be discussed at the OGSN Forum in March and asked for approval at EGCFE in May 2024.

E. ENERGY RESILIENCY ENHANCEMENT PROJECT

BACKGROUND

In recent years, APEC member economies have been suffering from natural disasters such as earthquakes and typhoons, causing severe damage to the energy infrastructure. In this narrative, EWG established APEC Energy Resiliency Principle (the Principle) with the great help of Energy Resilience Task Force and APEC member economies. Under the Principle, three virtual workshops were held in Chile and Chinese Taipei in January 2022, and in the Philippines in February 2022 and the APEC Energy Resiliency Guidelines were approved by EWG in January 2023.

APERC supported Japan's Ministry of Economy, Trade and Industr CORE, the project contractor, to prepare for holding three workshops smoothly, especially logistics matters.

OBJECTIVE

As the follow-up actions based on the Principle, the Energy Resiliency Enhancement Project aims to enhance the ability to secure a stable energy supply by effectively dealing with disasters and implements the following key activities as the first phase project (the Project).

1) Develop an evaluation model by identifying, collecting, and assessing indicators to evaluate energy resiliency,
2) Create Energy Resiliency Sectoral Guidelines for energy infrastructure companies to promote initiatives in the public and private sectors, and
3) Hold a workshop to raise awareness and knowledge of energy resiliency in the region.

PROGRESS

The Workshop on Energy Resiliency Enhancement was held in person in San Francisco, the USA, in November 2023.

The Project was delayed because of the contracting process with the contractor and the unexpected change in the contractor's organization. The extension request of the Project period was submitted and approved to change the Project end date from December 2023 to May 2024.

MILESTONE

APERC continues to support Japan's Ministry of Economy, Trade and Industry (METI) with the Institute of Energy Economics, Japan (IEEJ), the project contractor, to prepare the project summary report and to produce the sectoral guidelines in March 2024.

F. SYMPOSIA ON HOLISTIC APPROACH OF DECARBONIZATION FOR ENERGY TRANSITION

BACKGROUND

Regarding energy transitions, there is no "single best solution" for achieving carbon neutrality, as each economy has different economic and social structures and geographical situations. APERC considers that various, pragmatic, and sustainable energy transitions, that reflect the different circumstances of each economy, are essential. To achieve such energy transitions, sharing knowledge and experience among members is important.
APERC organized the APEC Symposium on the Holistic Approach of Decarbonization towards Carbon Neutrality as an APEC project under the auspices of Japan's METI. It was held online on 30-31 August 2021 and its summary report was endorsed in February 2023.

OBJECTIVE

The objective of this Project is to hold sectoral symposia to follow up the APEC Symposium on the Holistic Approach of Decarbonization towards Carbon Neutrality held in 2021 to further discuss two issues, which are important elements of that holistic approach. One is the decarbonization of fossil fuel use including hydrogen, ammonia and CCUS, and the other is energy efficiency and energy management system.

PROGRESS

Two symposia were originally planned to be held in the third quarter of 2022 and/or the first half of 2023. However, due to the effects of Covid-19 and the Ukraine situation, both two symposia were delayed and postponed.

The first sectoral Symposium on Decarbonizing Fossil Fuels was held in person in Kobe, Japan in October 2023.

The second sectoral Symposium on Promoting Energy Efficiency and Energy Management System was held in person in Tokyo, Japan, in January 2024.

MILESTONE

The project summary report is expected to be drafted in February 2024.

The 3rd sectoral Symposium on Bioenergy will be co-organized with Ministry of Energy, Thailand in October 2024.

II. FUTURE WORK PLAN

APERC's Future Work Plan is designed to assist EWG in responding to the instructions by APEC Energy Ministers for the 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 executant, assists project overseers by carrying out APEC projects on the condition that a 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 the Expert Group of Energy Data and Analysis (EGEDA) as well as other expert groups and taskforces under EWG in planning and implementing its activities.

1. Research Activities

A. APEC ENERGY DEMAND AND SUPPLY OUTLOOK

The Outlook 9th edition is scheduled to be published in 2025. APERC is currently modelling two scenarios, Reference and Target, to share with economies in the first half of 2024.

B. APEC ENERGY OVERVIEW

The APEC Energy Overview 2024 will be published in June 2024.

C. TOPICAL STUDIES

APERC will publish three Fossil Fuel Reports (Coal, Gas, and Oil) in support of the EGCFE and a Hydrogen Report in 2023 in support of both the EGCFE and EGNRET. In addition, 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 9th edition.

2. Accepting Trainees and Dispatching Experts

APERC will organize the 30th Seminar on Energy Modelling in March 2024. Experts will be dispatched to Malaysia for a seminar on energy modelling using the LEAP software in April 2024.

3. Building Energy Data Management Networks

The following are the plans for FY2024/2025:

1. Collect, process and analyze the 2022 annual energy demand and supply data,
2. Publish the APEC Energy Statistics 2022 and APEC Energy Handbook 2022,
3. Hold the EGEDA short-term training course on energy statistics in January or February 2025,
4. Participate in international cooperation on energy statistics such as the Energy Statistics Development Group (ESDG) of IEA, JODI, International Energy Statistics (InterEnerStat) meetings, etc.

4. Policy Cooperative Activities

A. PREE

Follow-up PREE in Chile is scheduled on 6-10 May 2024, and the eighth EEP Workshop is in the second half of 2024 in conjunction with the EGEEC63 meeting.

B. PRLCE

Preparation of the PRLCE in Peru Final report and Completion report after the peer review.

C. OIL & GAS SECURITY INITIATIVE (OGSI)

APERC is encouraging an economy to host the sixth OGSE in 2024.

APERC will continue to issue OGS Newsletter every other month. The seventh OGSN Forum will be held in Osaka, Japan, on 20-21 March 2024.

The 20th OGSS report will be completed and presented to the EGCFE 2024 in May and published after circulation to EWG members for their review. Then, the study for the 21st OGSS report will start after the discussion at the OGSN Forum in March and approval from EGCFE in May.

D. ENERGY RESILIENCY ENHANCEMENT PROJECT

APERC will assist Japan's METI to prepare the sectoral guidelines and the project summary report .

E. SYMPOSIA ON THE HOLISTIC APPROACH OF DECARBONIZATION FOR ENERGY TRANSITION

The project summary report is expected to be drafted in February 2024.

The 3rd sectoral Symposium on Bioenergy will be co-organized with Ministry of Energy, Thailand in October 2024.

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 2024 APERC Annual Conference will take place on 17-18 April 2024.

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 facilitate APERC's cooperative research. Its primary role is to give professional advice on APERC's ongoing 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.

Next Advisory Board Meeting will be held on 17 April 2024 in conjunction with the APERC Annual Conference.

IV. APERC RESEARCH STAFF

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

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

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

As of 25 February 2024, APERC has a total of 28 research staff, of which 17 are visiting researchers from APEC economies.

Table 1: APERC Research Staff

Name
Kazutomo IRIE (President)
Glen SWEETNAM (Senior Vice President)*
Munehisa YAMASHIRO (Vice President/General Manager)
Yoshiaki IMAIZUMI (Deputy General Manager)
Edito BARCELONA
Thanan MARUKATAT*
Elvira Torres GELINDON
Mathew Charles HORNE*
Alexander Konstantinovich IZHBULDIN*
Manuel Antonio Heredia HEREDIA MUNOZ*
PHUNG Quoc Huy*
Zhichao LI*
Ting Jui SUN*
Juniko Parlinggman PARHUSIP*
Mohd Shah Hambali Bin ARIFIN*
Jungyoon KIM*
Nobuhiro SAWAMURA
Muhammad Nabih Fahkri MATUSSIN*
Rodrigo MARTINEZ PICAZO*
Noriel Christopher Regis REYES*
Leanne Nicole SARGENT*
Risa PANCHO
Finbar Barton MAUNSELL*
TRAN Le Kieu Ly*
Phawida JONGSUWANWATTANA
Hyuga KASAI
Takako HANNON
Ikuno YAMAGUCHI

* 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	2008	2009	2010
Revenue from:															
Japanese Government	374	626	681	729	619	634	594	547	525	528	498	446	447	418	409
Australian Government									8	8	8				
Total of Revenue	374	626	681	729	619	634	594	547	533	536	506	446	447	418	409
Expenses:															
Energy Efficiency/APEC Energy Demand & Supply Outlook/ Related Research Programmes	227	443	494	550	455	469	434	390	379	377	377	338	339	318	315
Oil & Gas Security															
Energy Data Network & Know-How Transfer	147	183	187	179	164	165	160	157	154	159	129	108	107	100	94
Total of Expenses	374	626	681	729	619	634	594	547	533	536	506	446	447	418	409

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Revenue from:														
Japanese Government	425	494	580	657	653	689	672	672	672	672	672	672	672	556 [TBC]
Total of Revenue	425	494	580	657	653	689	672	672	672	672	672	672	672	556
Expenses:														
Energy Efficiency/APEC Energy Demand & Supply Outlook/ Related Research Programmes	308	325	325	432	501	522	423	388	406	338	330	474	492	421
Oil & Gas Security			107	68	183	124	161	119	100	59	43	224	263	175
Energy Data Network & Know-How Transfer	94	86	68	100	97	91	86	73	44	40	90	90	82	79
Total of Expenses	402	411	500	600	781	737	670	580	550	437	463	788	837	675