

# **Asia Pacific Economic Cooperation - Energy Working Group Strategic Plan for 2019 - 2023**

## **Energy Challenges and Opportunities in the APEC Region**

A variety of trends and recent events have converged in ways that present unprecedented energy challenges and opportunities for APEC member economies over the next five years. Volatility in world oil markets, unconventional gas reserves, the growth of developing economies and rapid changes in technology have all contributed to a landscape that involves significant threats to regional energy security, but also present new enormous opportunities and pathways.

Major concerns in the APEC region involve insufficient oil production and rising electricity demand. Since 1990, overall oil demand in the APEC region has increased more than twice as fast as oil production. As a result, oil imports into the APEC region have grown faster than production. Despite some significant increases in APEC's own oil production, the APEC region is expected to become more dependent upon oil imported from outside the region, exposing the region to possible additional supply shocks.

The region has also seen several encouraging trends, including progress on reducing energy intensity, greater access to large natural gas reserves and the acceleration of renewable energy technology deployment. The APEC energy intensity reduction goal is expected to be achieved 6 years ahead of target year, according to the Asia Pacific Energy Research Centre (APEREC)'s APEC Energy Demand and Supply Outlook 7<sup>th</sup> edition. This decline since the 6<sup>th</sup> edition primarily reflects improvements in technology driven by market forces (including rising energy prices) and the impacts of existing government policies promoting energy efficiency, particularly in the buildings sector. In addition, although the forecast show that APEC renewable energy doubling goal is unlikely to be reached under Business-as-Usual scenario, the gap is closer than the 6<sup>th</sup> edition, as a result of a rapid decline in costs and favourable government policies such as feed-in tariffs, auctions and RPS.

Meanwhile, the growing production of unconventional gas, is promising in the following years. This is primarily the result of more widespread use of technology for producing shale gas, including horizontal drilling and hydraulic fracturing. Intraregional LNG trade is expected to prosper. Nevertheless, gas imports from outside APEC region will increase in coming years because of rapidly growing gas demand.

APEC continues to focus on energy access as part of its goals for achieving affordable, reliable, resilient and sustainable energy supply. APEC's energy access challenges include complex geographical conditions, the need for innovative technologies, frequent natural disasters, limited sources of funding and financing, insufficient region-wide coordination and collaboration. Energy access will remain an important issue in the Asia-Pacific region. APEC economies need to work together to accelerate the realization of regional energy access to promote sustainable economic development and energy security of the APEC region.

Finally, many APEC member economies also are responding to climate change challenges with policies to promote renewable energy development, and the responsible development and use of fossil fuels. An ongoing commitment to develop new technologies and accelerate innovation will help balance energy needs with protecting the environment and economic growth. This commitment is particularly important as the region will remain dependent on fossil fuels for decades to come. Hence, the deployment of high-efficiency, low-emission (HELE) coal power generation, and other technologies, such as carbon capture, utilization, and storage (CCUS), is imperative. CCUS can also drive increased oil production, via enhanced oil recovery (EOR), which can help to reduce fuel import costs. Technological improvement also continues to reduce the cost and improve the performance of renewable energy. While APERC expects renewable electricity generation to grow faster than any other form of electricity generation in the region, the overall role of renewables in the regional energy supply will remain modest absent policies and investment that accelerate growth even further.

### **Vision Statement**

We envision an APEC region that has strong energy security and energy efficient and sustainable economies, and that strives for the development of cleaner energy resources, an equipped workforce, and open trade and investment in energy goods and services.

More specifically, we envision an APEC region that will:

1. Achieve greater energy security and energy access through the use of a wide variety of energy sources that are developed in a safe, clean, efficient and sustainable manner;
2. Rationalize and phase out inefficient fossil fuel subsidies that encourage wasteful consumption while providing energy services to those in need;
3. Strengthen coordination and cooperation through sharing best practices, accelerating innovation and promoting the deployment of advanced technologies, including renewable energy, energy efficiency, cleaner and more efficient fossil fuels, hydrogen, and nuclear energy for interested economies, adhering to nuclear safety, security, safeguards, and peaceful use;
4. Create competitive, transparent and innovative markets, and reduce barriers to energy trade, financing and investment;
5. Transition to a lower carbon economy through the continued development of cleaner energy sources and technologies, to achieve our individual and regional energy aspirations and goals;
6. Accelerate affordable, sustainable, reliable and clean energy access throughout the region, as well as improved quality of supply.
7. Improve energy resiliency across the APEC region to cope with potential energy supply disruptions through effective, well-targeted market and governmental response mechanisms, and integrated resource resilience planning; and

8. Strengthen dialogues and cooperation with related APEC sub fora, international organizations and institutions on cross-cutting issues like electric vehicles, energy transparency, green financing and women's economic participation.

### **Mission Statement**

*Our mission is to build the capacity of APEC members to strengthen domestic and regional energy security and lower the carbon intensity of energy supply and use across the region, facilitated by information and data exchanges, joint research and development, and open trade and investment.*

The EWG is composed of policy officials and technical experts from APEC member economies who work with other experts in other APEC fora, academia, private industry, and regional and international organizations to build the capacity of APEC member economies aimed at:

- Accelerating regional energy access
- Fostering domestic and regional energy security
- Promoting clean and efficient energy sources and usage
- Supporting innovative technology deployment of clean and efficient energy source and usage
- Pursuing sustainable and resilient energy development
- Facilitating energy-related trade and investment

The EWG achieves this mission through workshops, seminars, exchanging views, developing best practice guides and manuals, demonstrations, peer reviews, research, data collection and analysis, and dissemination of information.

### **Objectives**

#### **1. Strengthen Energy Security:**

- Conduct oil and gas security exercises that can help capacity building of emergency response mechanisms in short-term disruptions in energy supply.
- Develop oil and gas security studies to address regional energy security challenges and threats.
- Enhance the network of energy security stakeholders in the APEC region.
- Continuously assess fossil fuel resources in the APEC region and assist economies in effectively bringing those resources sustainably to market.
- Continuously enhance the quality of APEC energy statistics to ensure more accurate analysis of APEC energy security.
- Preparation of a document titled "APEC Energy Vision Post 2020 - Discussion Paper".
- Explore the potential of hydrogen and nuclear energy for interested economies, adhering to nuclear safety, security, safeguards, and peaceful use.

## **2. Advance Clean Energy:**

- Develop the roadmap to double the share of renewables from 2010 levels in the APEC energy mix, including in power generation, by 2030.
- Undertake research to understand the systematic impact of fast deployment of variable renewable energy (VRE) on power systems and analyze the benefits and cost of enhancing power system flexibility and strengthening power grid connectivity.
- Engage in clean energy technology assessment and related activities to demonstrate the cost-effectiveness of clean energy applications.
- Facilitate the exchange of policies and best practices that seek to enable energy systems to become more sustainable through the adoption of new technologies, innovative regulatory frameworks and sustainable transport, as well as other initiatives to modernize the energy sector.
- Undertake analysis and research on clean fossil fuels, share best practices and address associated challenges.
- Facilitate development and deployment of clean fossil energy technologies that are adapted to the needs of APEC member economies, for example high-efficiency, low-emission (HELE) coal-fired power generation, green and intelligent refinery upgrading; carbon capture, utilization, and storage (CCUS) in fossil energy utilization for both power generation and industrial uses; and regional synergy on transportation fuel standards.
- Exchange best practices on enhancing the efficiency of and lowering emissions from coal-fired power plants.
- Facilitate the exchange of best policies, practices and tools in the area of clean energy financing.

## **3. Promote Energy Efficiency and Low-carbon Communities:**

- Facilitate the exchange of energy smart and low carbon policies, practices and tools among APEC member economies to promote the development of energy smart and low carbon communities across the region and to achieve progress towards the goal of reducing APEC's aggregate energy intensity by 45 percent from 2005 levels by 2035.
- Support the development and commercialization of energy efficient technologies in the areas of power generation and distribution, industry, transport, buildings and appliances.
- Strengthen the reliability, adaptability and interoperability of electric grids in the APEC region, as well as international interconnections.
- Develop the inclusion of human resource base and energy consumers within APEC member economies to improve their analytical, technical, operational, and policy capacity in the area of energy efficiency and overall energy literacy.

## **4. Enhance Energy Resiliency and Energy Access:**

- Encourage the removal of inefficient fossil fuel subsidies that promote wasteful consumption while recognizing the importance of providing those in need with essential energy services.
- Exchange best practices on integrated resource and resilience planning to prepare for natural or man-made disasters.
- Undertake research and demonstration on energy infrastructure resilience to withstand extreme weather or man-made disasters.
- Support development and, as applicable, the adoption of technologies to enable flexible operation and improve reliability of coal-fired power plants to strengthen electrical grids with greater intermittent generation.
- Undertake research and demonstration to understand the water-energy nexus, share best practices and address associated challenges.
- Accelerate best practice sharing and capacity building on the improvement of affordable, reliable and resilient energy access, as well as the quality of supply.
- Capacity building on a gender-inclusive energy workforce resilience that are capable of responding to emergency situations and swift changes in the energy market.
- Encourage the exploration of diversified and clean energy access solutions through capacity building, technical exchanges and project cooperation.

## **5. Facilitate Energy Trade and Investment:**

- Identify significant barriers to energy trade and investment in the APEC region by seeking the business community's input on priority trade and investment barriers in the energy sector.
- Conduct research to address challenges and opportunities to intra-APEC energy trade and investment.
- Promote accessibility and transparency in the formulation and administration of energy sector investment-related policies.
- Enhance consistency of policies affecting energy trade and investment across the APEC region, including supporting a diversified, flexible and integrated natural gas market in the Asia Pacific region.

## Deliverables for 2019-2023, Prioritization Implementation Schedule

Objective Performance Indicator	Activities/Deliverables	Lead Economy/ Fora	Start Date	End Date
<b>Strengthen Energy Security</b>				
Conduct oil and gas security exercises that can help capacity building of emergency response mechanisms in short-term disruptions in energy supply.	The APEC EWG and APERC will continue to carry out APEC Oil and Gas Security Exercises (OGSE) under the framework of APEC Oil and Gas Security Initiative (OGSI) in collaboration with the IEA and ASEAN. This consists of activities to improve the response to oil and gas emergency situations in the APEC region, including developing security exercise model procedures.	EWG APERC	2019	2023
Develop oil and gas security studies to address regional energy security challenges and threats.	The APEC EWG and APERC will continue to publish APEC Oil and Gas Security Studies (OGSS) under the framework of APEC Oil and Gas Security Initiative (OGSI) on 2-3 timely topics every year.	EWG APERC	2019	2023
Enhance the network of security stakeholders in the APEC region.	To this end, the APEC EWG and APERC will continue to facilitate APEC Oil and Gas Security Network (OGSN) through issuing newsletters and holding forums for policy officials in charge of energy security of APEC Member Economies.	EWG APERC	2019	2023
Continuously assess fossil fuel resources in the APEC region and assist economies in effectively bringing those resources sustainably to market.	To this end, APERC under the guidance of EWG and EGCFE will continue to publish APERC Coal, Oil and Gas Reports annually to supply necessary information to APEC member economies. The EGCFE will promote the use of gas in the Asia-Pacific region, given its potential to complement renewables in modern clean energy systems.	EWG EGCFE APERC	2019	2023
Continuously enhance the quality of APEC energy statistics to ensure more accurate analysis of APEC energy security	APERC under the guidance of EGEDA with the strong support of EWG will: <ul style="list-style-type: none"> <li>• Continue to collect energy statistics from APEC member economies and maintain the APEC energy database;</li> <li>• Advocate for more transparency in the oil and gas markets through the Joint Organisations Data Initiative (JODI);</li> <li>• Enhance capacity of member economies' energy statisticians by continuing to implement the EGEDA training program on energy statistics;</li> </ul>	EWG EGEDA APERC	2019	2023

	<ul style="list-style-type: none"> <li>• Continue to harmonize APEC energy data with other international organisations such as UNSD, IEA and IRENA;</li> <li>• Keep abreast of new developments, emerging technologies and energy products such as: hydrogen, fuel cells, electric/hybrid vehicles, district cooling, advanced biofuels and etc. and reflect the same in energy statistics to ensure more effective energy policy analyses; and</li> </ul> <p>Release timely energy analysis reports especially on tracking the APEC energy goals.</p>			
Preparation of a document titled "APEC Energy Vision Post 2020 - Discussion Paper".	The activity/deliverable is to prepare a discussion paper outlining the future energy challenges and opportunities in the APEC region in a post 2020 world. This activity will require the input and advice of our Expert Group Chairs, APERC and APSEC and Chairs of the EWG Task Forces. The purpose of this exercise to develop a clear understanding of the energy challenges facing the APEC region in a climate of an increasing need for energy security, environmental sustainability commitments, the impacts of new technologies, high levels of economic growth, urbanisation and industrialisation and the need for on-going economic growth and improved energy access outcomes. This work should be in line with the SOM-led AVG process, and will be discussed at the first EWG Meeting of 2019.	Australia	2017	2019
Explore the potential of hydrogen to regional energy security and environmental sustainability.	The EWG will continue to share information on policies and technologies that can contribute to the promotion and uptake of hydrogen in the APEC economy.	EWG	2019	2023
Explore the potential of nuclear energy for interested economies adhering to nuclear safety, security, safeguards, and peaceful use.	The EWG will continue to share policies as well as encourage status updates on the development of nuclear energy among interested economies.	EWG	2019	2023
<b>Advance Clean Energy</b>				
Develop the roadmap to double the share of renewables from 2010 levels in the APEC energy mix, including in power generation, by 2030.	EGNRET will encourage members to propose a variety of development projects to support the doubling goal. In addition, EGNRET will cooperate with APERC and EGEDA to realize the renewable energy doubling goal. Workshops on renewable energy development and	EGNRET EGEDA APERC APSEC	2019	2023

	<p>conducting roadmapping will be held to exchange views and share experience.</p> <p>To support this end, the APEC EWG and APERC with EGNRET will continue to conduct APEC Peer Review on Low-Carbon Energy Policies (PRLCE), and will consider cooperation with IRENA.</p> <p>APSEC will work with LCMT-TF to explore the path for urban low-carbon energy transformation through low-carbon energy planning and the large-scale use of new energy and renewable energy.</p>	LCMT Taskforce		
Undertake research to understand the systematic impact of fast deployment of variable renewable energy (VRE) on power systems and analyze the benefits and cost of enhancing power system flexibility and strengthening power grid connectivity.	“Research on power system flexibility and energy connectivity in APEC Region areas with high variable renewable penetration”	EGNRET	2019	2023
Engage in clean energy technology assessment and related activities to demonstrate the cost-effectiveness of clean energy applications.	Training on multi-energy complementary and integrated optimization technology & renewable energy & smart grid.	APSEC	2019	2023
Facilitate the exchange of policies and best practices that seek to enable energy systems to become more sustainable through the adoption of new technologies, innovative regulatory frameworks and sustainable transport, as well as other initiatives to modernize the energy sector.	<b>EWG 15 2018A – Technological Challenges and Opportunities to Supply Flexibility to Electric Systems</b> This project intends to conduct a seminar in which expert speakers and participants will review analysis and the experience of APEC economies regarding the deployment of the latest technological tendencies aimed to improve the electric system flexibility, particularly given scenarios with high share of variable renewable energies, baseload power plants decommissioning and with changes in energy consumptions patterns due new forms of energy demands as electric mobility.	Chile EWG	Nov. 2018	2019
Facilitate the exchange of policies and best practices that seek to enable energy systems to become more sustainable through the adoption of new technologies,	<b>EWG 16 2018A – Distributed Energy Resources Regulation and Rate Design</b> The recent developments of distributed energy resources are putting the distribution system and its regulation under new challenges. Aspects like the massive adoption of distributed generation and the expected arrival of batteries and electric vehicles lead to rethinking the regulation of electricity distribution networks and the	Chile EWG	Nov. 2018	2019

innovative regulatory frameworks and sustainable transport, as well as other initiatives to modernize the energy sector.	way it is paid. Therefore, it is necessary to have a deep understanding of the complexity of the changes related to these challenges. This project will conduct a seminar bringing together actors and experts to explore these topics and new regulation trends.			
Facilitate the exchange of policies and best practices that seek to enable energy systems to become more sustainable through the adoption of new technologies, innovative regulatory frameworks and sustainable transport, as well as other initiatives to modernize the energy sector.	<b>EWG Energy Policy Dialogue</b> , focused on sharing best practices and insights related to the issues of innovation, sustainable transport and modern regulatory frameworks.	Chile EWG APERC	2018	2019
Undertake analysis and research on clean fossil fuel, share best practices and address associated challenges.	Research on clean and efficient coal-fired power generation technology in the APEC Region to promote industrial-academic-research cooperation, advanced technical experience exchange and project achievement. Realize sharing of ultra-low emission coal-fired power generation and innovative energy saving technologies in APEC region.	APSEC	2019	2023
Facilitate development and deployment of clean fossil energy technologies that are adapted to the needs of APEC Member Economies, for example HELE coal-fired power generation, green and intelligent refinery upgrading, and CCUS in fossil fuel utilization.	The EGCFE plans to promote the recognition of CCUS as a technology-enabled and strategically important solution to environmental issues. Specifically in the near-term, the EGCFE plans to hold an APEC Regional Workshop on Coal Plant Efficiency to share information on technologies and best practices that increase existing power plants' efficiency and reduce their emissions, including the possibility to retrofit with CCUS. The EGCFE also plans to organize Exchange and Training on Clean Coal Technology and Clean Energy Policy to promote the application of clean coal technologies and to facilitate capacity-building in energy policy management in interested APEC economies. The EGCFE also plans to hold an APEC Green and Intelligent Refinery Workshop, sharing the best practice information on the clean and efficient development of refinery industry.	EGCFE	2019	2023
Exchange best practices on enhancing the efficiency and lowering emissions of coal-fired power plants.	The EGCFE will complete a Peer Review on Efficient Power project to facilitate expert reviews of current coal power generation practices in two APEC developing economies. The EGCFE also plans to conduct Best Coal Power and Cogeneration Plant Case Studies to highlight	EGCFE	2018	2023

	recent global advances towards the overall efficiency goals of 50% for electricity generation and even higher for cogeneration, and to identify management best practices that assure optimum and reliable performance.			
Facilitate the exchange of best policies, practices and tools in the area of clean energy financing.	<p>The EGCFE will complete a Peer Review on Efficient Power project to facilitate expert reviews of current coal power generation practices in two APEC developing economies. The EGCFE also plans to conduct Best Coal Power and Cogeneration Plant Case Studies to highlight recent global advances towards the overall efficiency goals of 50% for electricity generation and even higher for cogeneration, and to identify management best practices that assure optimum and reliable performance.</p> <p>Deepen research on demonstration project of multi-energy complementary and integrated optimization for ‘clean coal-fired power generation and renewable energy’, analyze policy environment, institutional mechanisms and business models, and summarize the prospects for transfer and promotion of related technologies</p>	EGCFE APSEC	2018	2023
<b>Promote Energy Efficiency and Low-carbon Communities</b>				
Facilitate the exchange of energy smart and low carbon policies, practices and tools among APEC Member Economies to promote the development of energy smart and low carbon communities across the region and to achieve progress towards the goal of reducing APEC’s aggregate energy intensity by 45 percent from 2005 levels by 2035.	<p>The LCMT Task force will oversee the completion of three LCMT case studies in three APEC volunteer towns in 2019 and also in 2020, and consider how to further disseminate the LCMT concept in the APEC region.</p> <p>The APEC EWG and APERC with EGEEC will continue to conduct the APEC Peer Review on Energy Efficiency (PREE) including follow-up reviews, and hold Energy Efficiency Policy Workshops.</p> <p>They will undertake the low-carbon energy planning method and advanced energy technology system research for APEC urban sustainable development.</p> <p>They will deepen research on clean and efficient coal-fired power generation technologies and renewable energy technologies based on the concept of ‘Internet plus’ smart energy (energy Internet), to enhance the intelligent degree of clean energy technology projects.</p> <p>The EWG will explore opportunities to share experience and best practices and exchange views among APEC economies on energy smart and low energy intensity communities.</p>	EWG LCMT Taskforce EGNRET EGEEC APSEC	2019	2023

Support the development and commercialization of energy efficient technologies in the areas of power generation and distribution, industry, transport, buildings and appliances.	APSEC will carry out training on the Low-Carbon Energy Plan and Technology, Low-Carbon Energy Transition and Implementation Roadmap.	APSEC	2019	2023
<b>Enhance Energy Resiliency and Energy Access</b>				
Undertake research and demonstration on energy infrastructure resilience to withstand extreme weather or man-made disasters.	<b>APEC Energy Resilience Smart Grid Workshop.</b> Under the US-Philippines co-chaired APEC Energy Resiliency Task Force (ERTF), this project will support the design and implementation of a workshop on smart grid technologies to enhance energy resilience with APEC partners. The workshop will highlight smart grid technologies, and share tools, techniques, and best practices from U.S. and other APEC member economy's grid modernization efforts.	USA EWG ERTF	Nov. 2018	Nov. 2019
Support the development and, as applicable, the adoption of technologies that enable flexible operation and improve reliability for coal-fired power plants to strengthen future electrical grids with greater intermittent generation.	The EFCFE will explore opportunities to facilitate information exchange and best practice sharing among APEC economies on coal power plant flexible operation and reliability improvement	EFCFE	2019	2023
Undertake research and demonstration to understand the water-energy nexus, share best practices and address associated challenges.	<b>EWG 13 2018A - Workshop on Integrated Energy-Water Planning and Policy Formulation.</b> Building upon EWG 03 2014S, this project supports a three-day workshop focusing on capacity-building and training on integrated planning for connected energy-water systems. The workshop will help participants identify risks posed by the energy-water nexus across sectors as well as formulate adaptive measures to address emerging risks and enhance resiliency	USA EWG ERTF	Nov. 2018	Nov. 2019
Accelerate best practice sharing and capacity building on the improvement of affordable, reliable and resilient energy access.	<b>EWG 02 2018S- Ethanol's Role in APEC Energy Access.</b> The project supports a workshop focused on the important role that increased ethanol use holds for improving energy access in member economies and in supporting environmental and human health benefits. The goal of the workshop is to further the dialogue around the expanded use of ethanol as member economies seek to improve energy access and to meet APEC's ambitious 2030 goals of doubling the share of renewables in their energy mix.	USA EWG ERTF	June 2018	Nov. 2019

Accelerate best practice sharing and capacity building on the improvement of affordable, reliable and resilient energy access, as well as the quality of supply.	<b>EWG 17 2018A – Lessons Learned from Promotion Mechanisms Focused on Boosting Energy Solutions in Remote Areas</b> This project will conduct a workshop focused on identifying and learning from international experience on promotion mechanisms that have allowed economies to increase the penetration of energy solutions in isolated or rural locations.	Chile EWG	2019	2019
Capacity building on a gender-inclusive energy workforce resilience that are capable of responding to emergency situations and swift changes in the energy market.	The EWG will continue to work on women’s participation issues by creating a platform where stakeholders from public and private sectors from both energy and gender background can exchange expertise to identify potential areas that energy policies can be improved with a refined gender perspective, and increasing knowledge of women’s participation potential in each sub sector within energy field. The EWG will also seek dialogues and collaboration with the APEC Policy Partnership on Women and the Economy (PPWE) on women’s empowerment in energy field for greater synergy among APEC.	EWG PPWE	Jan 2019	Dec 2019
<b>Facilitate Energy Trade and Investment</b>				
Conduct research to address challenges and opportunities to intra-APEC energy trade and investment.	<b>EWG 05 2018A – Aligning Conformity Assessment Efforts for Energy Efficiency Regulations of Motors in the APEC and ASEAN Regions.</b> This project expands a 2008 project conducted by China on motor efficiency and aims to inform the regulatory and policy environments within APEC and ASEAN of the benefits of harmonization of standards and conformity assessment approaches to facilitate trade of energy efficient electric motors and accelerate progress toward energy intensity reduction in the region.	USA EWG EGEEC	June 2018	Nov. 2019
Supporting a diversified, flexible and integrated natural gas market in the Asia Pacific region and promoting regional synergy of transportation fuel standards.	The EWG will continue to share best practices and policy initiative related to reducing the uncertainty and risk associated with the development of markets and to support LNG trade, and identify and address barriers to LNG trade and development, support in building necessary infrastructure, and create a favorable and competitive fiscal environment to attract investment and LNG market development projects.	EWG EGCFE	2019	2023