

4. APEC Symposium on the Holistic Approach of Decarbonization towards carbon Neutrality

APERCC Workshop

The 62nd Meeting of APEC Energy Working Group (EWG)
17 October 2021 (EDT)

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Background and Objective

□ Background

Sharing knowledge and experience among members is important to achieve various, pragmatic and sustainable energy transitions. APERC organized the symposium as an APEC project under the auspices of Japan's Ministry of Economy, Trade and Industry (METI).

□ Objective

The symposium was held to demonstrate the importance of the holistic approach of decarbonization towards carbon neutrality. It was intended to enhance the capacity of APEC economies to pursue decarbonization towards carbon neutrality.

Summary

❑ **Date**

- Held online on August 30th and 31st, 2021

❑ **Participants**

- Including speakers and organizers, more than 180 individuals registered to participate in the symposium.

❑ **Agenda**

- Speeches, presentations and panel discussions were given by 27 experts.

Agenda

□ Agenda included:

- Potential of Decarbonization towards Carbon Neutrality in the APEC Region
- Hydrogen and ammonia
- Energy saving
- Renewable energy power
- Issues for Electricity Security: To Cope with Increasing Intermittent Renewables Power Sources
- CCUS in the APEC region
- Nuclear Energy in the APEC region
- Transition Finance including finance for LNG as a transitional fossil fuel and back-up for intermittent renewables
- Panel Discussion: How to Pursue Carbon Neutrality while Strengthening Energy Security and Resiliency in the Asia Pacific Region

Key Points (Day 1) (1/6)

- ❑ **Opening Remarks** (Dr. Kazutomo Irie, APERC)
- ❑ **Keynote Speech** (Mr. Shinichi Kihara, METI, Japan)
 - Introduced Japan's policies and activities towards carbon neutrality
- ❑ **Potential of Decarbonization towards Carbon Neutrality in the APEC Region** (Mr. Takahiko Tagami, IEEJ, Japan)
 - By technology, renewable energy has the highest potential of CO₂ emission reduction at 3.2Gt, accounting for 31.1%.
 - By economy, China has the highest potential of 4.9Gt, accounting for 47.2% of the entire APEC region.

Key Points (Day 1) (2/6)

❑ **Hydrogen and Ammonia including infrastructure issues**

(Dr. Sunita Satyapal, DOE, USA)

- The US has set goals to have a carbon pollution-free power sector by 2035 and a net-zero economy by no later than 2050. Hydrogen will play an important role in them.
- US DOE Hydrogen Program supports research, development, demonstration, and deployment (RDD&D) efforts.

(Mr. Shigeru Muraki, Clean Fuel Ammonia Association, Japan)

- Ammonia has many appealing properties:
 - it can be directly combusted without producing CO₂ emissions
 - a large commercial supply chain exists with clear cost structures
 - safety standards exist and are practiced in several industries
 - it can be effectively used to transport hydrogen using marine transportation
- Japan and other economies in northeast Asia are test-beds for developing blue and green ammonia value chains.

Key Points (Day 1) (3/6)

❑ **Energy Saving**

(Mr. Tadafumi Nishimura, Daikin Corp, Japan)

- ZEB office buildings with commercially available products and technologies: one with a newly built large size building and the other one with a small size building retrofit project.

(Mr. Steve Schiller, Lawrence Berkeley National Laboratory, USA)

- APEC Economies can take to advance efficiency and demand flexibility in gathering information and identifying opportunities, taking early actions, and establishing demand management programs for buildings and industrial facilities.

Key Points (Day 1) (4/6)

❑ Renewable Energy Power

▪ Wind power

(Mr. Ssu-yuan Hu, Industrial Technology Research Institute, Chinese Taipei)

➤ The potential for future offshore resources in APEC is significant and is expected to grow particularly in China, the US, Chinese Taipei, the Republic of Korea, Japan and Viet Nam.

• Solar power

(Ms. Charuwan Phipatana-phuttapanta, Ministry of Energy, Thailand)

➤ Thailand: published various roadmaps targeting renewable energy. The current target is a 30% share of final energy consumption by 2037

➤ Solar is supported through a feed-in tariff with different rates for different sectors

Key Points (Day 1) (5/6)

❑ **Renewable Energy Power** (continued)

- Geothermal power

(Mr. Harris, Ministry of Energy and Mineral Resources (MEMR), Indonesia)

- Indonesia has significant geothermal resources of up to 23 GW. Other economies with substantial potential include the US, the Philippines, New Zealand and Mexico.
- Challenges to geothermal development: financial risks, environmental issues accessing resources in protected areas, social issues affecting communities around plants.

Key Points (Day 1) (6/6)

❑ **Issues for Electricity Security: To Cope with Increasing Intermittent Renewables Power Sources**

(Mr. Wanhar, Ministry of Energy and Mineral Resources of Indonesia, Indonesia)

- Indonesia: Develop inter island connections like Sumatera Java, Bali Lombok. Support the ASEAN Power Grid cooperation.

(Dr. Douglas J. Arent, National Renewable Energy Laboratory, USA)

- NREL's storage futures study concludes that dramatic growth in grid energy storage is the least cost option for ensuring grid stability and reliability under all scenarios.

(Ms. Randi Kristiansen, IEA)

- The new power grid will be increasingly digital with interconnected networks and smart grids. However, digitalization comes with cybersecurity risks.

Key Points (Day 2) (1/5)

❑ **Keynote Speech** (Dr. Jennifer Wilcox, DOE, USA)

- “Climate change” has become a “climate crisis”
- Carbon capture can help advance a low cost and low carbon hydrogen economy through decarbonization of fossil-based hydrogen production

❑ **CCUS in the APEC region**

(Mr. Alex Zapantis, GCCSI, Australia)

- Blue hydrogen has significant advantages in most locations compared to green hydrogen: lower cost, space saving, and lower burden on electricity grids

(Dr. Mohammad Rachmat Sule, Institut Teknologi Bandung, Indonesia)

- There is large potential to establish regional CO₂ hubs/sinks, that Indonesia can leverage for economic growth potential

Key Points (Day 2) (2/5)

❑ **Nuclear Energy in the APEC region**

(Dr. Chae Young Lim, KAERI, Korea)

- It can be said that nuclear energy has a transitional role for decarbonization
- SMR: emerging option to contribute carbon neutrality

(Dr. Philip Andrews-Speed, National University of Singapore, Singapore)

- In ASEAN, 5 economies have research reactors and one of these has an experimental advanced reactor, but others have no active involvement in nuclear energy
- These 5 economies are cooperating with IAEA or developed economies and are assessing the option to deploy SMRs and other advanced reactors

Key Points (Day 2) (3/5)

❑ **Transition Finance including finance for LNG as a transitional fossil fuel and back-up for intermittent renewables**

(Mr. Masayuki Fujiki, MUFG Bank, Ltd.)

- Various guidelines for transition finance have been developed in the past few years
- Finance for LNG: need frameworks with global consensus

(Ms. Kazuko Sakuma, JBIC, Japan)

- Not only renewables, but gas fired thermal power generation which has a low CO2 emission on relative terms, would be indispensable for a more realistic energy transition
- LNG is an indispensable energy resource during the transition period

Key Points (Day 2) (4/5)

❑ **Panel Discussion: How to Pursue Carbon Neutrality while Strengthening Energy Security and Resiliency in the Asia Pacific Region**

- Before the panel discussions, two experts gave presentations:

(Mr. Takashi Imamura, Marubeni Corporation; ABAC Sustainability Working Group)

➤ ABAC's views regarding renewable energy

(Dr. Han Phoumin, ERIA)

➤ ERIA's study regarding decarbonization scenarios towards carbon neutrality in ASEAN

Key Points (Day 2) (5/5)

❑ **Panel Discussion: How to Pursue Carbon Neutrality while Strengthening Energy Security and Resiliency in the Asia Pacific Region** (continued)

▪ Energy security

(Dr. Han Phoumin, ERIA / Mr. Takeshi Soda, METI, Japan / Dr. Twarath Sutabutr, Ministry of Energy, Thailand / Dr. Ken Vincent, DOE, USA)

- Infrastructure, cyberattacks, extreme weather events, storage, and LNG as a transitional/backup energy

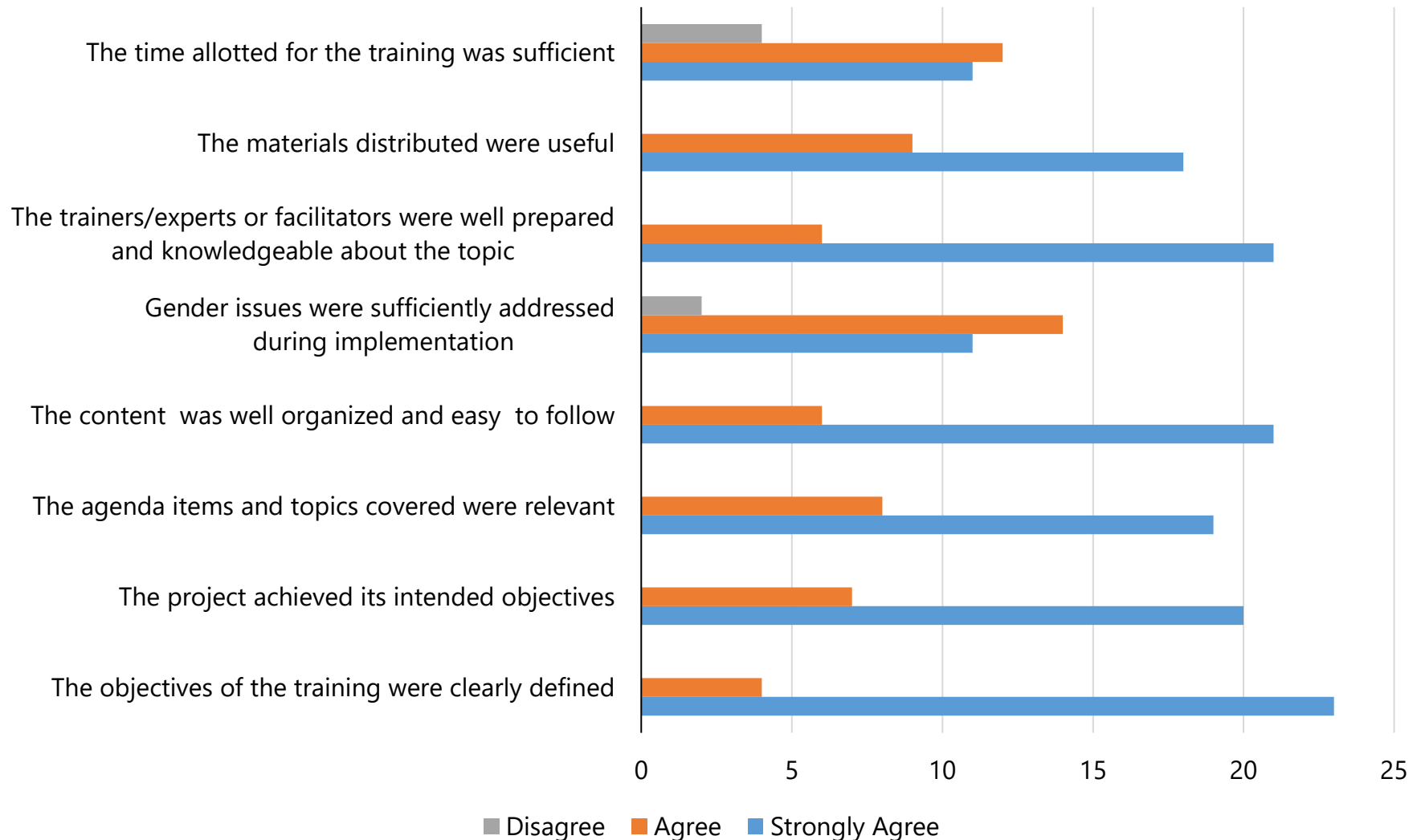
• Energy Resiliency

(Mr. Takashi Imamura, Marubeni Corporation; ABAC Sustainability Working Group / Mr. Hiroshi Hasegawa, METI, Japan / Mr. Alexander Lopez, Department of Energy, The Philippines / Mr. Dan Ton, DOE, USA)

- Energy resiliency and carbon neutrality need to be balanced (Mr. Imamura)
- To promote energy resiliency enhancement : developing sustainable financing and insurance mechanisms, conducting impact and vulnerability assessment of old and new energy systems and infrastructure, and sharing knowledge and experience. (Mr. Lopez)

❑ **Closing Remarks** (Dr. Kazutomo Irie, APERC)

Evaluation





Thank you for your kind attention.

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