5. 7th Energy Efficiency Policy Workshop

APERC Workshop
The 66th Meeting of APEC Energy Working Group (EWG66)
27 November 2023 (UTC+7) – Bangkok, Thailand

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Outline

- Project background
- Main content of the 7th EEP workshop
- Post-evaluation survey
- Next steps

What is the PREE (Peer Review on Energy Efficiency) project ?

- Initiated by APEC leaders in Sydney, Australia, September 2007
- Contributes towards achieving the shared APEC energy intensity reduction goal of 45% from 2005 levels by 2035

PREE / Follow-up PREE	Energy Efficiency Policy Workshop

▪ Provide broad review and recommendations for the **volunteer host economy** on implementing their energy efficiency policies and measures.
▪ A review team will carry out the project.
 	
▪ 11 economies have hosted PREE.
  ▪ CHL, NZ, VN, THA, CT, PE, MAS, INA, PHL, BD, and MEX.
 	
▪ Follow-up PREE hosted by six economies.
  ▪ VN, PHL, THA, MAS, PE, INA.
	• Discuss critical issues in policy development, implementation, and evaluation for energy efficiency.
	• Run in conjunction with the EGEEC meeting.
	
	• The Energy Efficiency Policy (EEP) workshop has been held seven times since 2016.

What is the Energy Efficiency Policy Workshop (EEP) ?

- The Energy Efficiency Policy workshop is the successor to Cooperative Energy Efficiency Design for Sustainability (CEEDS), which was a program that ran for four phases from 2010 to 2013.
- Lead by an external expert consultancy, with input from other energy efficiency experts
- Funding for participants from 11 travel-eligible economies.
- Outcomes are published on the APEC website in a workshop report

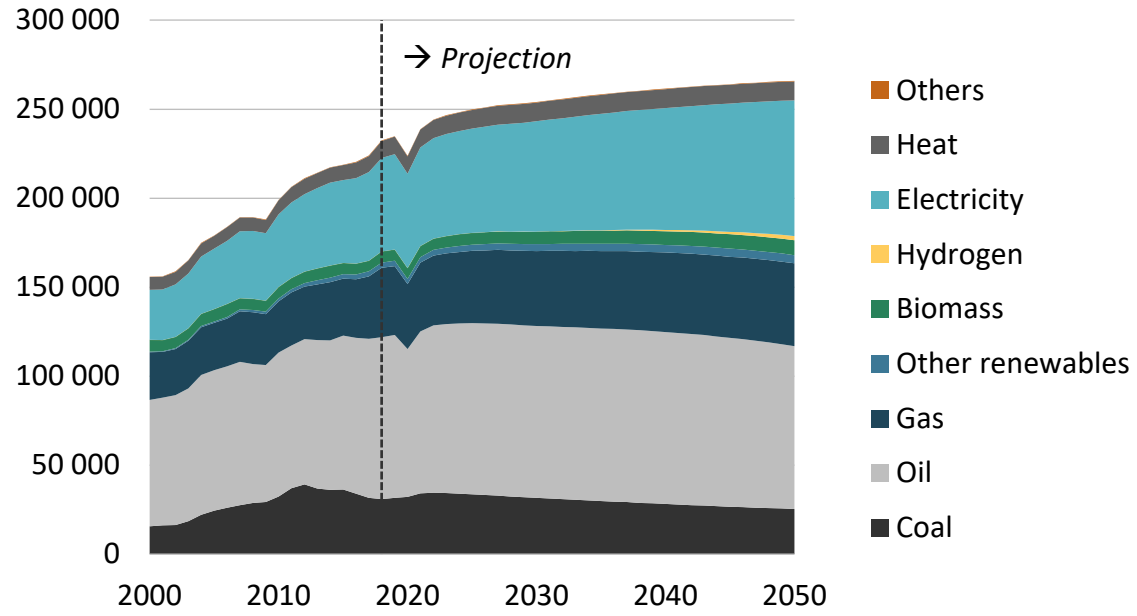
Download the PREE reports

The historical theme of the EEP workshop

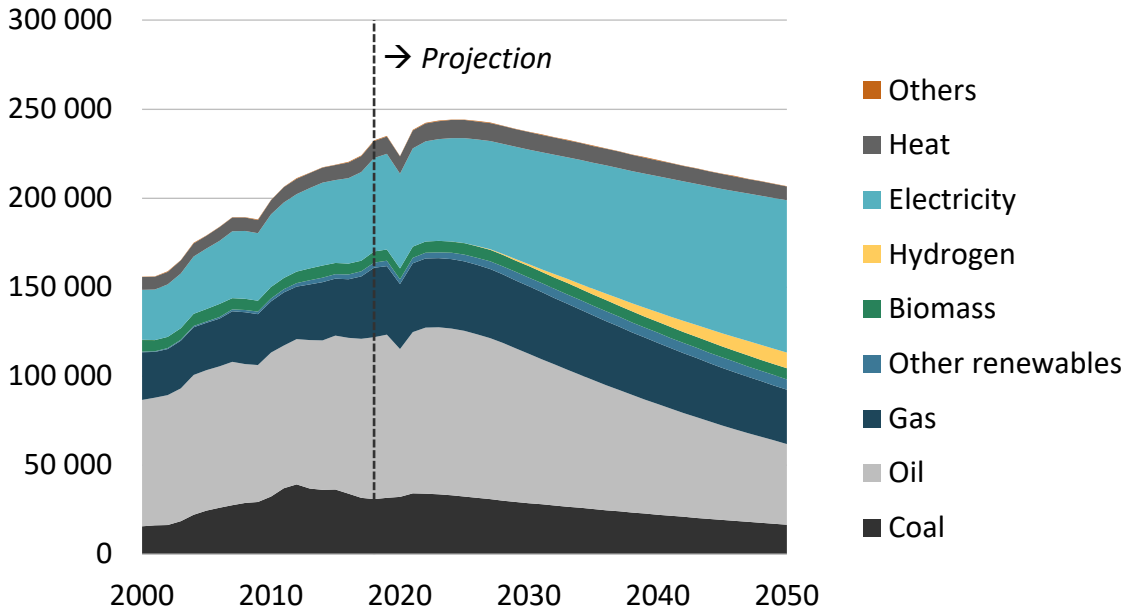
	Date	Place	Theme	Note:
1st	2016.04.12	Taichung, Chinese Taipei	Policy and Program Evaluation	Conjunction with EGEEC 47
2nd	2017.03.27	Jeju Island, Korea	Policy and Program Evaluation II	Conjunction with EGEEC 49
3rd	2018.04.10	Washington DC, USA	Conformity Assessment Approaches	Conjunction with EGEEC 51
4th	2019.03.18	Hong Kong, China	Developing Fuel Economy Regulation	Conjunction with EGEEC 53
5th	2020.11.18	Hong Kong, China (Online)	Economic Recovery through Energy Efficiency	Conjunction with EGEEC 55
6th	2022.03.29	China (Online)	Energy Efficiency Project Financing	Conjunction with EGEEC 58
7th	2023.10.16	Makati, Metro Manila, the Philippines	Electrification and Energy Efficiency	Conjunction with EGEEC 61

8th Outlook: EE and electrification contribute to energy demand reduction

Energy demand by fuel in REF (PJ)



Energy demand by fuel in CN (PJ)



- In CN, energy efficiency(EE) and electrification enable energy demand to be 22% lower in 2050 relative to REF.
- In CN, energy use peaks in 2025.

Note: Carbon Neutrality (CN) Scenario

7th Energy Efficiency Policy Workshop (Monday, 16 October 2023)

- **Theme:** Electrification and Energy Efficiency
- **Conjunction** with EGEEC 61 and EGNRENT 59 Joint Meeting
- **Participants:** 23 participants from 9 economies.
- **Experts:** 9 experts from 6 economics, including 6 female experts.

Expert	Economy	M/F
Ms. Florence Lowe-Lee	USA	F
Mr. Alexander Izhbuldin	APERC	M
Dr. Majah-Leah V. Ravago	PHL	F
Ms. Iqlima Fuqoha	INA	F
Dr. Yoon-Hee Ha	ROK	F
Ms. Yukiko Morishita	JPN	F
Mr. Vincent Barnes	USA	M
Mr. Finbar Maunsell	APERC	M
Dr. Younsung Kim	USA	F

DISCLAIMER

- The summary of each speech/presentation was not reviewed/approved by each speaker and is therefore should not be quoted.

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Agenda: Electrification and Energy Efficiency

Morning session(Part 1)
Improving Energy Efficiency in the Power Sector

Time	Content
09:30~0935	Opening Remarks
09:35~09:40	Introduction to the agenda of Part 1
09:40~11:00	**1.1** Challenges for the power sector to meet growing electricity demand with an increasing share of renewable generation
	1.2 The Role of energy efficiency in transition to cleaner energy: A developing economy perspective
	1.3 Energy efficiency technologies for power sector
	1.4 Distribution automation of power grids for energy efficiency
11:00~12:00	Discussion & Q&A

Afternoon session(Part 2)
Electrification and energy efficiency in energy sectors

Time	Content
09:35~09:40	Introduction to the agenda of Part 2
09:40~11:00	**2.1** Role of energy efficiency for large-scale electrification in industry
	2.2 Effective strategies for achieving energy efficiency buildings in existing and new construction: residential and commercial
	2.3 Potential for EV's to reduce APEC energy intensity
	2.4 Setting energy efficiency programs for local communities under the electrification trend
11:00~11:40	Discussion & Q&A
16:25~16:30	Closing Remark

Part1: Improving Energy Efficiency in the Power Sector

Current Challenges

- Intermittency and vulnerability of Variable Renewable Energy (VRE)
- Extreme weather resulted in unpredictable cooling and heating demand
- The "Cannibalization" effect of solar and wind power impacted the revenue of the utility.

Technology Solution

Demand Response

Adjust load or energy to match the **variable renewable energy**.

- Shiftable loads
- Sheddable loads.

High Efficiency Power Generator

Adopting **Cogeneration system**

- Back-press steam turbine
- Extraction-condensing steam turbine
- Gas turbine
- Combined Cycle
- Reciprocating engine

Grid-level Infrastructure

Investing in smart grid infrastructure

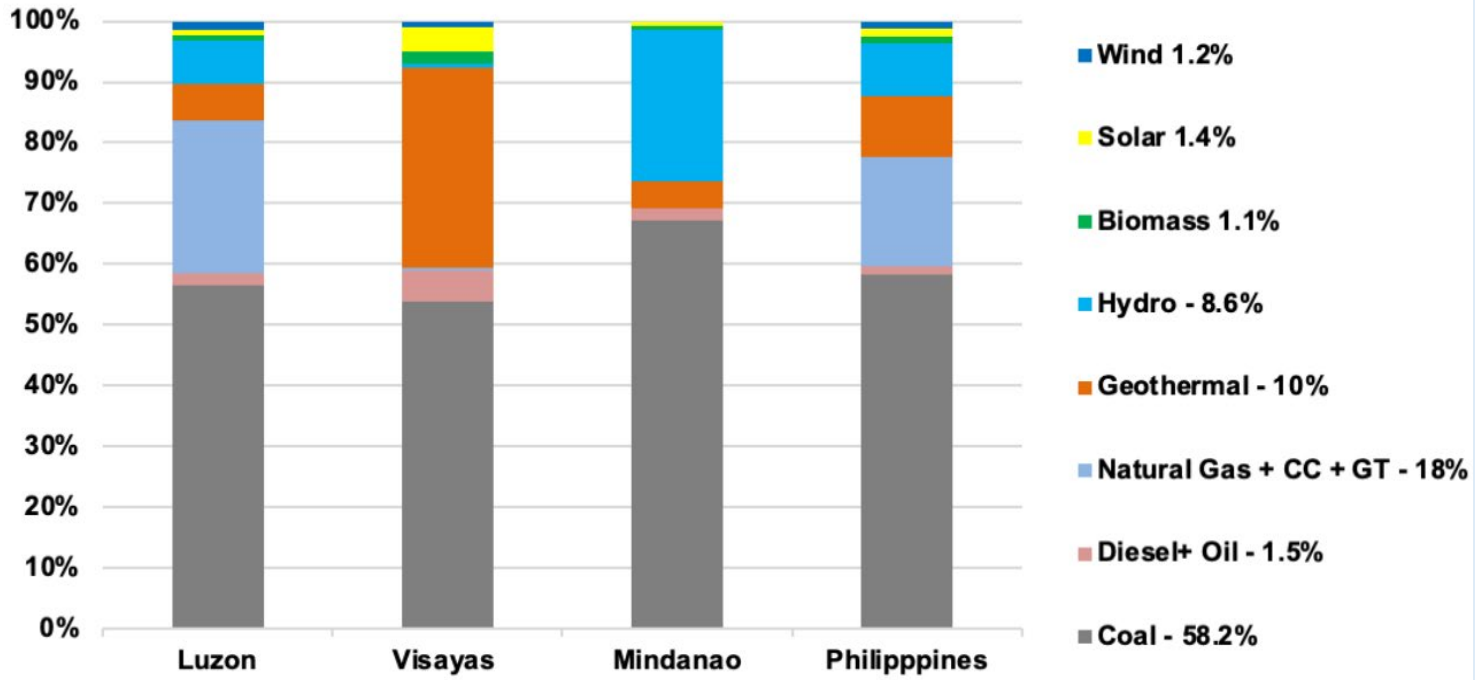
- Smart Metering & TOU
- Distributed energy supply
- Enhance system operations
- Expand the regional grid (reduce grid loss)

TOU：Time of Use rate

Part1: Improving Energy Efficiency in the Power Sector

Recent Policy Development in the Philippines

- **Target: 35** percent of renewable energy in power generation by 2030, 50% by 2040.
- **Current:** 22.4 % (Geothermal 10%, Hydro 8.6%) in power generation in 2021.



Recommended Strategy

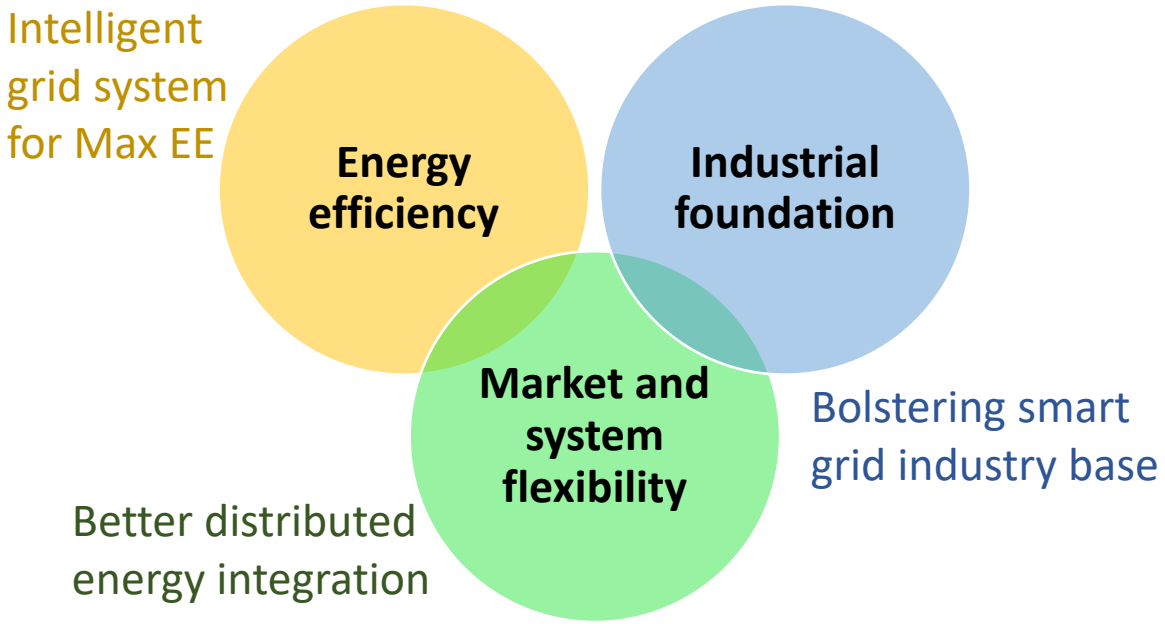
- Transform power sector (transmission) infrastructure to connect the power grid
- Develop-based structural changes
  - Access to reliable energy
  - Affordable energy

Part1: Improving Energy Efficiency in the Power Sector

Recent Policy Development in Korea

- **Flagship Plan:** Korea's Smart Grid Master Plans
- **Initiative Schedule:** 1st Phase (2012~2016), 2nd Phase (2018~2022), 3rd Phase (2023~)
- **Targe:** 18.6% share of distributed power sources in 2027

Direction for 3rd Phase Plan



Tactics for 3rd Phase Plan

1. Establishing a smart power consumption framework
2. Continuously expanding distributed energy supply
3. Enhancing power system operations
4. Expanding regional smart grid
5. Boosting smart grid industry competitiveness

Part2: Electrification and Energy Efficiency in Energy Sectors

Building

- Building electrification is the critical strategy for building decarbonization.
- Energy efficiency and demand flexibility will be needed to support electrification.

Transportation

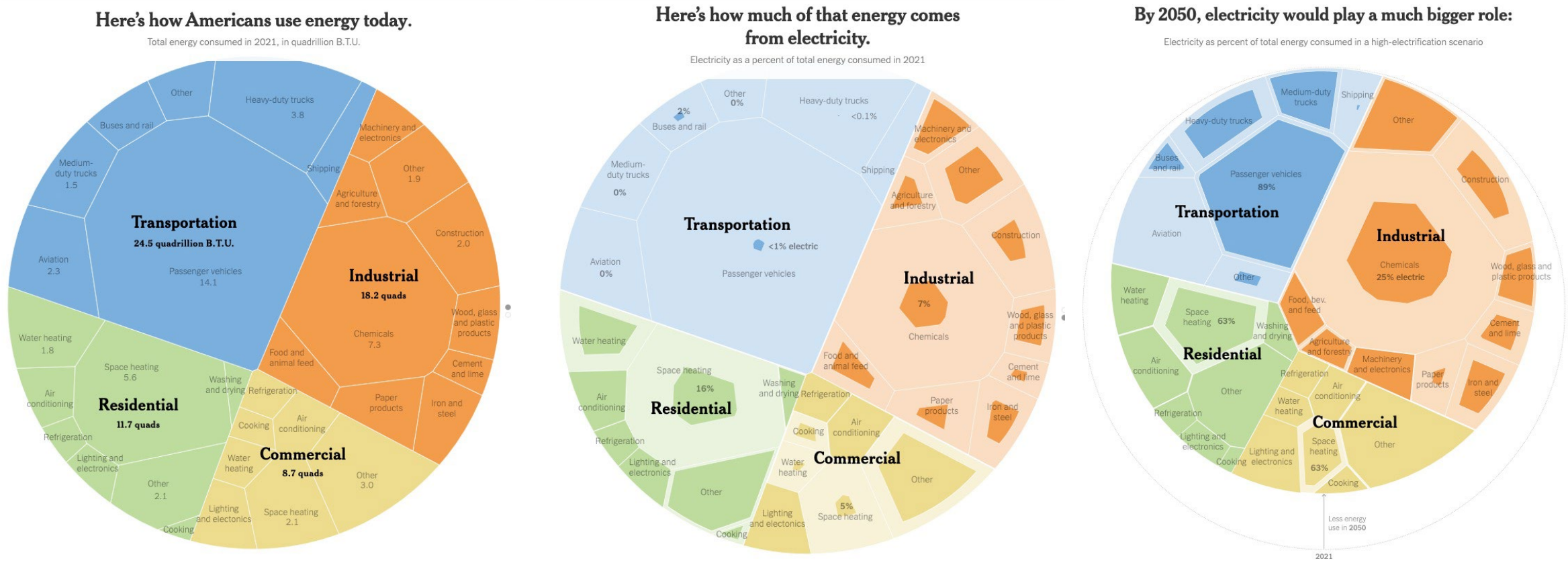
- An Efficient Electric vehicle has a more significant positive impact on energy intensity than a high-efficiency ICE vehicle.
- However, Hybrid ICE for heavy freight should be further considered due to the cost of batteries or hydrogen for fuel cell vehicles.

Industry

- The use of electrification technology in industrial processes in the Asia region is not well-defined.

Part2: Electrification and Energy Efficiency in Energy Sectors

US Electrification Trend by sector and end-use



- Building (e.g. space heating, appliances) and Transportation (e.g. vehicles, trucks) will be electric.
- Industry (Chemicals, Iron & Steel) is relatively low-electric due to challenges in cost and engineering development.

Source: The New York Times and Evolved Energy Research (2023)

Takeaways

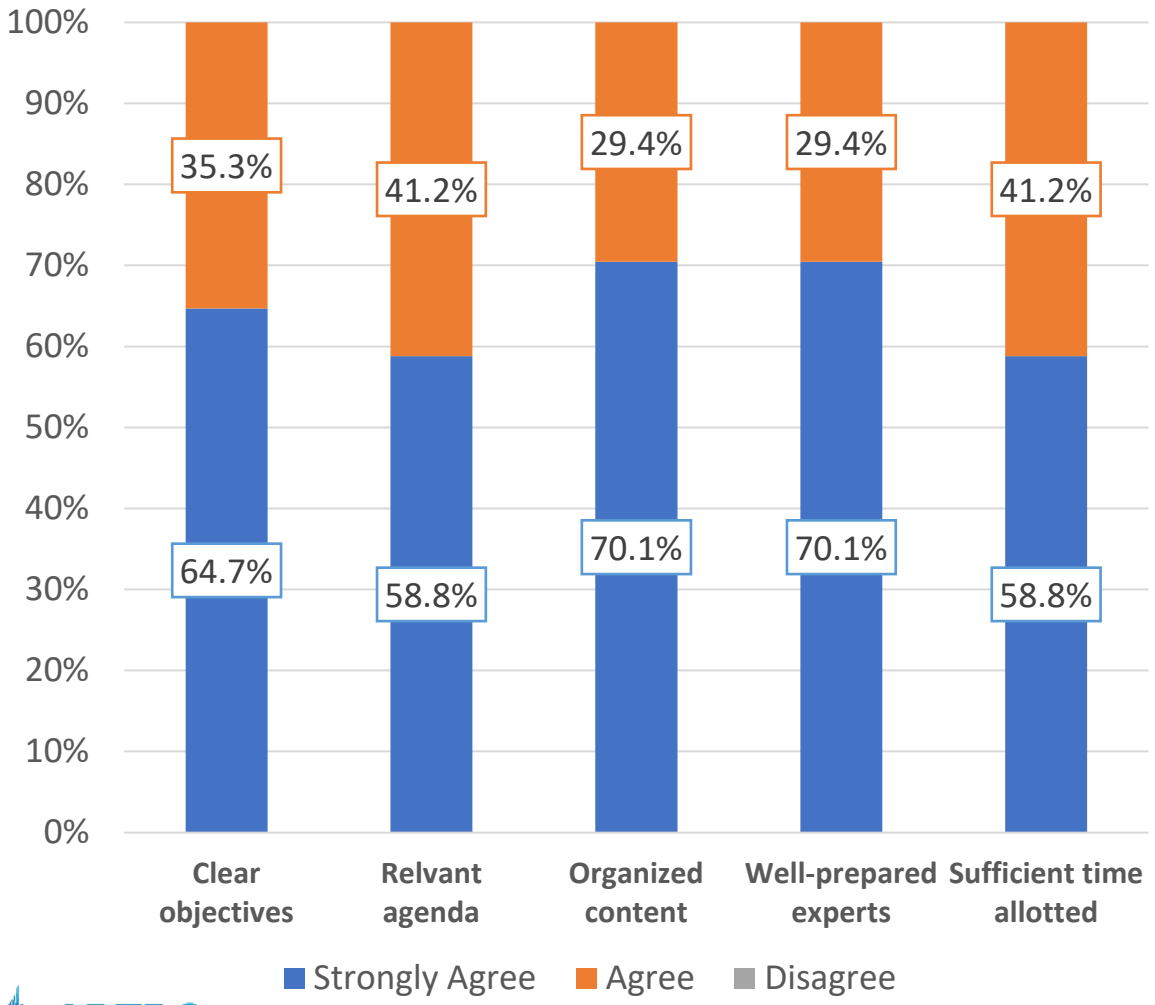
- The primary concerns on energy efficiency vary between advanced economies and emerging economies
  - **Advanced economies:** Rebound effect (increased energy usage due to reduced cost EE measures)
  - **Emerging economies:** Expanding energy services and increasing welfare

- Building and transportation sectors are relatively highly electrified for the coming years; industrial processes in the industry are still unclear due to higher energy costs but have a higher technical potential for electrification.

- Enhanced digitalization in power networks (smart grid) could speed up energy efficiency and demand flexibility. However, customer engagement is vital to fulfilling energy saving through smart grids.
  - Consumer information & feedback system
  - Energy diagnostics for homes and small and medium buildings.

Post Evaluation Survey

Most participants strongly agree with the great workshop arrangement.



What new skills and knowledge did you gain ?

- The significance of the building sector and EV in the future of electrification in the context of electricity load.
- Gender-based discussion in energy efficiency practices and policies
- Understanding the recent developments in the selected economies

What needs to be done next by APEC?

- Continue to organize this sort of program to bring expert knowledge so that delegates can apply acquired skills to their research
- It is good to have experts with engineering backgrounds as participants in future events

Next steps

- The EEP Workshop Summary Report will summarize the proceedings of the workshop and provide an in-depth analysis of the discussions and will be uploaded on the APEC and APERC website after EWG's approval.

- The 8th EEP will be in conjunction with an EGEE&C 63 meeting in the second half of 2024, a full-day in-person.

- The topic of EEP will be determined in consultation with EGEE&C.

Asia-Pacific
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APERC
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Thank you.

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