

Energy Management Action Network (EMAK) Task Group

EMAK 12 Workshop Report:

“Evolution of Energy Efficiency Policies into Demand-side Energy Policies”

Held on 13 December 2023 in Paris





The Ministry of Economy, Trade and Industry and The Energy Conservation Center, Japan

March 2024

The Hub is a voluntary collaboration among 16 governments seeking to strengthen their effectiveness in deploying energy efficiency. Its Secretariat is hosted at the International Energy Agency (IEA) to foster coordination with the Agency and with other international organisations, the private sector, and other stakeholders.

The Energy Management Action Network (EMAK) is a Task Group of the Hub, established in 2009 and led by Japan. EMAK is a platform dedicated to policy information exchange to help improve energy efficiency and energy savings in industry and buildings. The goal of EMAK is to promote best practices by bringing together policy makers and energy managers to discuss solutions and develop public-private and private-private networks. To learn more about EMAK, please visit: <https://energyefficiencyhub.org/task-groups/emak/>

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List of Acronyms

ACE:	ASEAN Centre for Energy
ANRE:	Agency for Natural Resources and Energy (Japan)
ECCJ:	The Energy Conservation Center, Japan
EMAK:	Energy Management Action Network
HPCTJ:	Heat Pump and Thermal Storage Technology Center of Japan
IEA:	The International Energy Agency
METI:	Ministry of Economy, Trade and Industry (Japan)
OECD:	Organisation for Economic Co-operation and Development
TEPCO:	Tokyo Electric Power Company

Executive Summary

The Ministry of Economy, Trade and Industry of Japan (METI) and the Energy Conservation Center, Japan (ECCJ), in cooperation with the Energy Efficiency Hub Secretariat, successfully conducted the 12th workshop of the Energy Management Action Network (EMAK), a Task Group of the Energy Efficiency Hub, on 13 December 2023 at the Hilton Paris Opera in Paris, France.

The theme of the EMAK 12 workshop was “Evolution of Energy Efficiency Policies into Demand-side Energy Policies”. The dual goal of achieving decarbonisation and energy security requires a strong focus on energy demand-side policies, considering energy efficiency is the “first fuel”. The 2022 energy crisis underscored the importance of demand-side policies and solutions, to achieve carbon neutrality and energy security and to alleviate the impact of high prices on consumers and businesses. The workshop brought together policy makers and private sector leaders to address strategic approaches to electrification, fuel switching, grid flexibility, digitalisation, and disclosure of energy and climate related information.

More than 70 participants joined the workshop both in person and on line.

The workshop aimed to:

- highlight energy efficiency and demand-side policy design and implementation concerning incentives and regulation in different countries and regions;
- exchange best practices and challenges in implementing policies to promote electrification, fuel switching, grid flexibility, digitalisation, and the disclosure of energy and climate-related information;
- connect policy makers and private sector stakeholders working to foster the clean energy transitions.

During the workshop, demand-side energy policies and approaches for the industrial and buildings sectors were presented. Officials from the ASEAN Centre for Energy (ACE), Australia, Brazil, Canada, European Commission, and Japan were brought together to discuss demand-side policies.

The moderator from the ECCJ highlighted the need for bridging roles between the demand-side energy policies of each country (as discussed in Session 1) and the ways in which the private sector (represented in Sessions 2 and 3) can support their implementation using an example of the ECCJ in Japan.

Companies from France, Japan, and the United States shared their strong commitments and efforts towards carbon neutrality, with best practices and challenges including the introduction of heat pumps in the beverage sector, improvement of visibility and corporate structure for energy savings, and insulation in the industry and building sectors. Cutting-edge technologies to promote energy saving and optimised energy use were introduced, such as heat pumps and digital technologies including smart meters.

The sessions provided lively discussions, and the workshop facilitated the sharing of knowledge and experience on how to realise energy-efficiency improvements on the demand-side. Additionally, cutting-edge technologies to promote optimisation of energy utilisation were showcased. The event underscored the benefits of building a public-private network.

This report was prepared by ECCJ on behalf of METI to summarise the above outcomes and share them with more stakeholders, related organisations, and interested parties.

This report and the video recordings of the presentations will be available on the website of the Asia Energy Efficiency and Conservation Collaboration Center to ensure that the workshop outcomes are widely shared through the EMAK and Hub networks. Presentations are available on the Energy Efficiency Hub's [event page](#).



Hilton Paris Opera



Salon Baccarat

Introduction

This report provides a summary and analysis of the presentations and discussions that were conducted at the 12th Energy Management Action Network Workshop (EMAK12) held on 13 December 2023 at the Hilton Paris Opera in France. The event was organised by The Ministry of Economy, Trade and Industry of Japan (METI) and the Energy Conservation Center, Japan (ECCJ), in cooperation with the Energy Efficiency Hub Secretariat.

EMAK serves as a forum to discuss policy issues related to energy efficiency and energy management systems, to share best practices from participating countries and sectors, and to explore how to adapt such practices to the different conditions and systems prevailing in other countries. It is a Task Group under the Energy Efficiency Hub, a voluntary collaboration among 16 governments seeking to strengthen their effectiveness in deploying energy efficiency. Its secretariat is hosted at the International Energy Agency (IEA).

EMAK was originally established in 2009 as a Task Group under the International Partnership for Energy Efficiency Cooperation (IPEEC) and has been led by Japan since. It was featured in the G20 Energy Efficiency Leading Programme in 2016 as a key activity to reduce energy-intensity in the industrial sector by establishing and enhancing energy management systems and related policy and legal frameworks.

EMAK facilitates public-private exchanges on systems for improving energy efficiency in industry and buildings, and fosters the development of networks among policy makers and practitioners such as energy managers. Eleven workshops were held prior to EMAK12, all with the goal of sharing and discussing best practices in energy management and energy efficiency, including policy issues related to energy management in each country and region. The workshops held to date are as follows:

- 1st: Paris, France – January 26-27, 2010
- 2nd: Washington, USA – May 10, 2010
- 3rd: Guilin, China – November 15, 2011
- 4th: Tokyo, Japan – January 31, 2013
- 5th: Sydney, Australia – February 27, 2014
- 6th: New Delhi, India – February 25, 2015
- 7th: Moscow, Russia – November 19, 2015
- 8th: Jakarta, Indonesia – February 3, 2017
- 9th: Sao Paulo, Brazil – November 21, 2018
- 10th: Hanoi, Vietnam – December 4, 2020
- 11th: Singapore – February 9, 2023

The dual goal of achieving both decarbonisation and energy security requires a strong focus on energy efficiency policies and the development of demand-side energy policies considering energy efficiency is the “first fuel”. Governments have recognised the critical role of energy efficiency since the global environmental movement and oil crisis of the 1970s. The more recent energy crisis in 2022 underscored the importance of demand-side policies and solutions to achieve carbon neutrality and energy security and to alleviate the impact of high prices on consumers and businesses.

The theme of the EMAK12 was “Evolution of Energy Efficiency Policies into Demand-side Energy Policies”. This workshop brought together policy makers and private sector leaders in Paris to address strategic approaches to electrification, fuel switching, grid flexibility, digitalisation, and disclosure of energy and climate related information. Officials from the ASEAN Centre for Energy (ACE), Australia, Brazil, Canada, European Commission, and Japan, as well as companies including Oracle Energy & Water, Shiseido Co. Ltd., Electricité de France (EDF), Saint-Gobain, Ricoh Industries France, Daikin Europe N.V., Heat Pump & Thermal Storage Technology Center of Japan, and TEPCO Energy partner, came together to discuss demand-side policies.

The workshop aimed to:

- highlight energy efficiency and demand-side policy design and implementation concerning incentives and regulation in different countries and regions;
- exchange best practices and challenges in implementing policies to promote electrification, fuel switching, grid flexibility, digitalisation, and the disclosure of energy and climate-related information;
- connect policy makers and private sector stakeholders working to foster the clean energy transitions.

Remarks, presentations, and discussions can be found in the following sections.

Opening Remarks & Keynotes

Opening remarks were given by the Energy Efficiency Hub Secretariat and METI, with Japan offering an overview of EMAK and the objectives of the EMAK 12 workshop. Following remarks, the Office of Energy Efficiency and Inclusive Transitions, IEA, gave the keynote speech highlighting the importance of doubling energy efficiency by 2030.

Remarks from the Energy Efficiency Hub

Dr Jonathan Sinton, Head of Energy Efficiency Hub Secretariat, welcomed all participants to the workshop and explained that EMAK is a Task Group under the Energy Efficiency Hub led by Japan to accelerate the uptake of energy management practices globally.

He offered a brief overview of the day's agenda, noting that interventions from several countries highlighting policy frameworks would be followed by private sector presentations on actions required within that policy framework. Jonathan underscored the need to work better together in view of the urgent climate and energy targets.



Dr Jonathan Sinton

Remarks from Japan

Mr Kentaro Oe, Counsellor, Permanent Delegation of Japan to the OECD, welcomed the participants and provided an opening speech noting the following points:

(1) EMAK's objectives and efforts to date

Since the first Forum was held in Paris in 2010, 11 forums have been held around the world. He expressed his delight that today, with the support of the Energy Efficiency Hub Secretariat, the 12th EMAK Workshop is being held in Paris.

(2) Global energy situation and importance of various pathways and energy efficiency

Looking at the global energy situation, we are facing a complex challenge of simultaneously addressing climate change, ensuring energy security, and achieving economic growth. Energy efficiency, the subject covered by EMAK, is highlighted as the "first fuel" in the global energy transition towards net zero emissions in the discussions at the G7 Ministers' Meeting with presidency of Japan this year, and "energy efficiency first" needs to be recognised as a driving principle for our actions.

(3) Significance of EMAK12 and the shift from energy efficiency to demand-side decarbonisation

In alignment with the G7 Hiroshima Leaders' Communiqué in May 2023 noting "the importance of developing demand-side energy policies" in addition to energy efficiency, Mr Oe pointed out the key role of demand-side measures in combination with supply-side policies to achieve carbon neutrality.

At the recent COP28, most countries agreed to work together to "collectively double the global average annual rate of energy efficiency improvements by 2030". Mr Oe noted that the EMAK12 workshop would also contribute to increasing the global rate of energy efficiency improvement.



Mr Kentaro Oe

(4) Japan's efforts on technology and its global contributions

He concluded that EMAK12 would be a fruitful forum for all participants coming from the private and public sectors.

Keynote: The Evolution of Energy Efficiency Policies

Dr Emma Mooney, Energy Efficiency Analyst, Office of Energy Efficiency and Inclusive Transitions, IEA, provided the keynote speech.



Dr Emma Mooney

(1) Dr Mooney demonstrated that 2023 has been the hottest year on record; her presentation outlined extreme heatwaves, energy shortages, and price spikes in 2023, demonstrating urgent need to improve efficiency and conservation. She highlighted that these events placed huge strains on energy systems, with cooling demands doubling and air conditioning overload causing blackouts.

(2) Global commitments to doubling of energy efficiency gains

The IEA's call at COP28 for doubling global rate of energy efficiency improvements to over 4% yearly through 2030 is seeing strong initial level of global commitments. This target has now been adopted by over 120 countries, representing major progress.

(3) Tracking country progress on energy intensity

In examining historical data, the presentation finds nearly every country has achieved the 4% target of energy intensity improvement rate for at least two years since 2012. However, it notes only 40% of countries sustained this rate through 2022, highlighting need for policy consistency.

(4) Evolution of inclusive, flexible policies to engage sectors

Dr Mooney emphasised that energy efficiency policies must engage diverse sectors and measures, becoming more flexible and adaptive as clean energy transitions accelerate. This requires governments to transform policies to be more inclusive while continuing to electrify end-use sectors.

The Evolution of EE Policy to Support Clean Energy Transitions



- Energy Efficiency Policy is changing
 - Decarbonisation
 - Electrification
 - Flexibility
 - Engagement
- The challenge is considerable but governments have already begun the process of transforming their energy efficiency policies to address it.
- The tools, technologies and measures available today to not only help meet the challenge but to increase ambition and accelerate global progress on clean energy transitions.



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Finally, she introduced the Evolution of Energy Efficiency Policy to Support Clean Energy Transitions report which was published December 2023 by the IEA. Japan's Ministry of Economy, Trade and Industry, as part of Japan's Presidency of the G7, asked the IEA to examine the evolution of energy efficiency policy in the context of the clean energy transitions. The resulting report supported the discussions among G7 countries and provided insights and direction for the G7 energy and climate agenda.

Session 1: Demand-side energy policies and strategic approaches in each country

Ms Kristina Klimovich, Programme Officer at the Energy Efficiency Hub Secretariat, moderated the first session featuring presentations by ASEAN Centre for Energy (ACE), Australia, Brazil, the European Commission, and Japan.

This session focused on themes of digitalisation and consumer engagement.

Guiding questions included:

- Do you have examples of effective consumer engagement measures encouraging people to optimise their energy use?
- What policies have successfully supported fuel switching and demand response?
- What are some solutions to support the widespread adoption of smart meters?
- What critical challenges need to be addressed now to enable the digital transformation of energy systems?



Ms Kristina Klimovich

1. The Evolution of Energy Efficiency Policy to Support Clean Energy Transition

Mr Naoki Tosaka, Assistant Director of Energy Efficiency Division, Agency for Natural Resources and Energy (ANRE), METI, introduced the overall agenda covering new regulations through the Energy Conservation Act (the Act on Rationalising Energy Use and Shifting to Non-fossil Energy), incentives and subsidy programs aimed at energy conservation, efficiency improvements, and efforts to shift to non-fossil energy in Japan.

(1) Expanded reporting requirements for large enterprises

In 2022, Japan amended the Energy Conservation Act to add “Shifting to Non-fossil Energy”, requiring enterprises consuming over 1 500 kilolitres oil equivalent to report total energy usage, submit conservation plans, and shift to non-fossil energy over time. The scope expanded from initial fossil fuel focus during 1970s energy crisis.

(2) Enhancing Top-Runner efficiency standards

The successful 'Top-Runner Program' sets product efficiency targets based on best-in-class performers to drive rapid improvements over time.

(3) Strengthening energy conservation subsidies

With energy prices rising, subsidy programs aim to accelerate energy efficiency improvement, electrification and fuel switching for businesses, and insulation retrofitting and residential water heater for households. Key expansions cover heat pumps and high-efficient water heaters.

(4) Analysis of household energy use

Japanese households consume significant energy heating water due to cultural bathing habits. Policies to promote “DR-Ready” water heaters are under discussion in order to ensure grid flexibility.

(5) International policy comparisons

The presentation concluded by highlighting both the inclusion of demand-side energy policies into the G7 Communique during Japan's presidency and an interest in comparing transition support policies globally.



Mr Naoki Tosaka

2. Demand-side energy policies and strategic approach in the European Union

Dr Tudor Constantinescu, Principal Advisor to the Director General for Energy, European Commission, described demand-side energy policies and strategic approach in the European Union. The presentation outlined demand-side policies anchored in the European Green Deal and the EU strategy on energy system integration. Objectives are to increase efficiency, flexibility, and renewables to accelerate transition away from gas. The demand-side policies in the EU include the following instruments: REPowerEU, recast of EED and RED, the recast of EPBD, the Digitalisation Action Plan, and the Heat Pumps Action Plan.

(1) Relevance of demand-side flexibility and market reforms

The need for flexibility in the future energy system is expected to at least double by 2030 and triple by 2050. All flexibility solutions, including demand-side measures and storage need to be considered. The EU is looking to upgrade the market design, building on the existing Electricity Directive and Electricity Regulation. Demand response can help tackle the volatility and bring benefits to the consumers and grids. The reform of electricity market design focus on (1) enhancing non-fossil fuel sources, such as demand response and

storage, (2) enhancing the use of flexibility services by system operators, and (3) creating more opportunities for trading of renewables and flexible sources.

(2) Results and ambition in key directives

As for smart meters, the EU has a penetration rate of over 50% in 12 Member States, and the installation rate of electricity smart meters to households had reached more than 80%. The REPowerEU includes, among other measures, a goal of installation of 10 million heat pumps by 2025.



Dr Tudor Constantinescu

The recast of Energy Efficiency Directive and Renewable Energy Directive set strengthened EU-wide targets for buildings, industry, and transport. The overall target of the EED is 11.7% decrease in energy consumption, going hand in hand with the renewable energy target.

(3) Buildings sector plans and standards

The EU aims to renovate 3% of public buildings annually, reducing the total final energy consumption by 1.9% per year. The Energy Performance of Buildings Directive (EPBD) aims to achieve a fully decarbonised building stock by 2050. Measures include a gradual phase-out of stand-alone boilers powered by fossil fuels and introduce an enhanced standard for new buildings, including a more ambitious vision for buildings to be zero-emission. The EPBD further defines Minimum Energy Performance Standards, Energy Performance Certificates, National Building Renovation Plans, and renovation passports for individual buildings. The EU has a differentiated approach for non-residential (16% worst-performing buildings to be renovated by 2030 and the 26% by 2033) and residential buildings (16% by 2030 and 20-22% by 2035). A new standard is being introduced for new buildings, in line with the 2050 vision for the building stock.

(4) Digitalisation action plan

Adopted in October 2022, the plan includes 24 key actions to coordinate and accelerate the digital and sustainable transformation of the EU's energy system. This action plan will help develop a competitive market for digital energy services and digital energy infrastructure that are cyber-secure, efficient and sustainable. It supports energy system integration, participation of 'prosumers' in the energy transition, and ensures interoperability of energy data, platforms, and services.

(5) Financing and Partnerships

Hundreds of billions of euros are allocated to support the acceleration of efficiency and renewables to support consumers and businesses via mechanisms like the Cohesion Funds and Green Deal.

3. Demand-side Energy Policies and Strategic Approaches in Australia

Mr Anoop Nambiar, Distributed Energy Lead, AusNet Australia, pointed out that the rising adoption of rooftop solar presented grid management challenges. He also spoke about the proof-of-concept for consumer participation in a distributed energy market and coordination between aggregators and consumers, responding to market signals. Mr Nambiar noted the trial demonstrated technical feasibility and national scale up of the model is being considered next.



Mr Anoop Nambiar

(1) Context of increasing distributed solar generation

Australia has an already high and rising rooftop solar adoption, supplying cost-effective renewable energy but posing balancing supply and demand issues for the electricity market. Australia is the leader of per capita rooftop solar generation globally. Forecasts predict that 40% of energy will be generated from residential solar by 2050, which poses challenges for the national electricity market. Australia has a near-real time spot market where all electricity is sold. While the generation cost is dropping, the supply-demand balancing poses a challenge.

(2) Trial of market integration for distributed energy resources

Integrating distributed energy resources into the Australian electricity market is complicated as the power system and market frameworks were designed to facilitate the one-way trade and flows of electricity from large-scale generators to consumers. Project EDGE (Energy Demand and Generation Exchange) was a multi-year proof-of-concept project conducted within Victoria to demonstrate that distributed energy resources could participate in existing and future wholesale energy markets at scale. The project helped aggregators optimise how consumer-distributed energy resources (residential solar, storage, and EVs) are used.

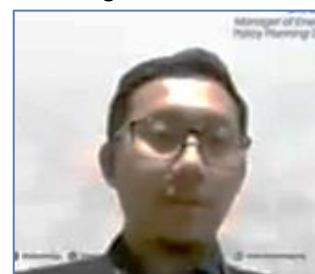
(3) Key findings and next steps

The project demonstrated an arrangement for integrating distributed energy resources at scale. Next steps involve transitioning the model nationally to leverage benefits while controlling system risks and costs.

4. Demand-side Energy Policies and Strategic Approaches in ASEAN

Dr Zulfikar Yurnaidi, Manager of Energy Modelling and Policy Planning, ASEAN Centre for Energy (ACE) talked about ASEAN regional energy efficiency efforts and targets.

Dr Zulfikar's presentation covered the ASEAN Centre for Energy's goals, initiatives, and flagship publications. The centre aims to support its member governments in achieving energy security, accessibility, affordability, and sustainability through governmental cooperation.



Dr Zulfikar Yurnaidi

(1) Regional energy efficiency targets and strategies

The ASEAN region set a target to reduce energy intensity by 32% by 2025, with a focus on industry and transport emissions reductions. Five key strategies are outlined spanning standards and labelling, private sector incentives, capacity building in priority sectors, and information dissemination.

(2) Connecting energy transition and industrial development

Dr Zulfikar expressed linking energy efficiency efforts to developing associated industries and supply chains, providing economic incentives alongside energy savings to support the transition.

(3) Buildings sector roadmap and recommendations

A recent report jointly produced with the IEA offered recommendations across seven areas to achieve sustainable near zero emission buildings by 2050. Policy, technology, and capacity building interventions were proposed for the building sector.

(4) Requests for further collaboration

In closing, Dr Zulfikar called for additional cooperation in information exchange, technology development, and financing, to support ASEAN energy efficiency efforts across end-use sectors.

5. Demand-side Energy Policies and Strategic Approaches

Ms Alexandra Maciel, National Coordinator, Ministry of Mines & Energy, Brazil, shared demand response policies and smart metering initiatives in Brazil's electricity sector.

(1) Context of digitalisation and smart grid transition in Brazil

Brazil is experiencing a growth of distributed renewable generation in the electricity sector as a transition from a unidirectional to smart grid model. This is driving a need for smarter grid management and a more customer-focused approach by utilities.

(2) Regulatory gaps around smart metering and data privacy

There are currently no clear regulations or standards established in Brazil regarding smart metering, data collection, and privacy issues. There is an opportunity develop updates to the legal framework to enable greater digitalisation.



Ms Alexandra Maciel

(3) Ongoing efforts toward standardisation

National committees are actively discussing smart grid standardisation to support digitalisation, following European Commission-designed models and European Directives.

(4) Demand response as a valuable grid flexibility option

Studies point to promising potential for demand response in Brazil as a competitive alternative to expanding generation capacity, particularly during dry seasons given the country's reliance on hydropower.

(5) Detailed study focused on quantifying demand response potential

A dedicated study was undertaken targeting major industrial sectors as well as data centres and the sanitation sector to quantify technical demand response potential. The improved methodology will enable better representation of demand response in long-term planning.

(6) Next steps to incorporate study findings into energy planning

Key next steps will involve integrating the demand response quantification methodology into national energy planning processes and updating assumed penetration scenarios to properly value the grid flexibility potential.

Discussion

After all remarks were delivered, Ms Kristina Klimovich, the moderator of this session, asked presenters about their approaches to demand-side energy policies.

- (1) Ms Alexandra Maciel from Brazil asked about other country's experiences working with energy utilities, specifically regarding setting smart meter integration into measurement procedures.

The following discussion took place among the Session 1 speakers.

- Smart meter regulations in Australia

Mr Anoop Nambiar from Australia provided an overview of smart meter rollout targets, costs, and benefits. Key details: 20-30% current national rollout of smart meters with a 2030 target of 100%, the state of Victoria has 98% consumer smart meter coverage after a USD 2 billion investment.

- EU-level smart meter support

Dr Tudor Constantinescu from the EU outlined European directives, regulations, and proposals to promote demand response and the rollout of smart meters. Goals include enabling flexibility services, evolving system operator incentives, quantified integration of renewables, and proper consumer remuneration.

- Country experiences on incentives

Japan focuses incentives on company subsidies that are not limited to smart meters. ASEAN countries highlight the need for strengthened regulatory frameworks and accelerated digitalisation to track energy usage.

- Digitalisation for unlocking demand side potential

The moderator raised digitalisation as an important enabler for demand side policies. Dr Zulfikar from ACE reinforced this point and noted the value of digitalisation for tracking energy usage and better understanding and promoting behaviours to promote energy efficiency.

- (2) The moderator asked panellists to share lessons learned and experiences in building demand response and demand side management policies. Speakers from Australia, Brazil, the European Commission, and Japan then offered their perspectives.

- EU's lessons learned

Dr Constantinescu highlighted the importance of having common EU-level targets and policies while allowing flexibility for member states to analyse demand potential by sector. He emphasised using a coordinated mix of standards, regulations, incentives, information campaigns, and financing tools tailored to countries' stages of development.

- Brazil's experience with public sector energy management

Brazil has focused implementation on improving energy management and monitoring in the public sector through ISO 50 001 certification. Better energy data enables the understanding of demand patterns and the changing of consumer behaviours.

- Japan's approaches for industry and households

Japan manages industry energy use through mandatory reporting and linking subsidies to efficiency improvements. For households, Japan promotes efficient products and relies on behaviour change interventions aimed at reducing demand.

(3) Mr Anoop Nambiar from Australia asked about other countries' highest priority for the coming 12 to 24 months.

- Perspective from the European Commission

Dr Constantinescu noted that for the next 24 months the focus would be on supporting Member States in transposing recently passed EU Directives on Energy Efficiency into national legislation. This is crucial for ensuring proper implementation of the directives afterwards.

- Perspective from ACE

Dr Zulfikar explained that the current workplan runs until 2025 and over the next two years ACE will start planning the next phase (2026-2045), while accelerating efforts to meet 2025 energy efficiency targets.

- The discussion highlighted the importance of learning from global best practices and past failures to inform future planning.

(4) Dr Constantinescu asked what steps and actions countries aim to take across sectors to meet the COP28 pledge to double the average annual rate of energy efficiency improvement.

- Brazil's plan for buildings and industry

Brazil is targeting the building and industry sectors, implementing plans for near zero energy buildings starting with public buildings then adding commercial and residential buildings. Incentive programs for energy efficiency retrofits in energy-intensive and SME industrial companies are also present.

- Southeast Asia's focus on standards and public awareness

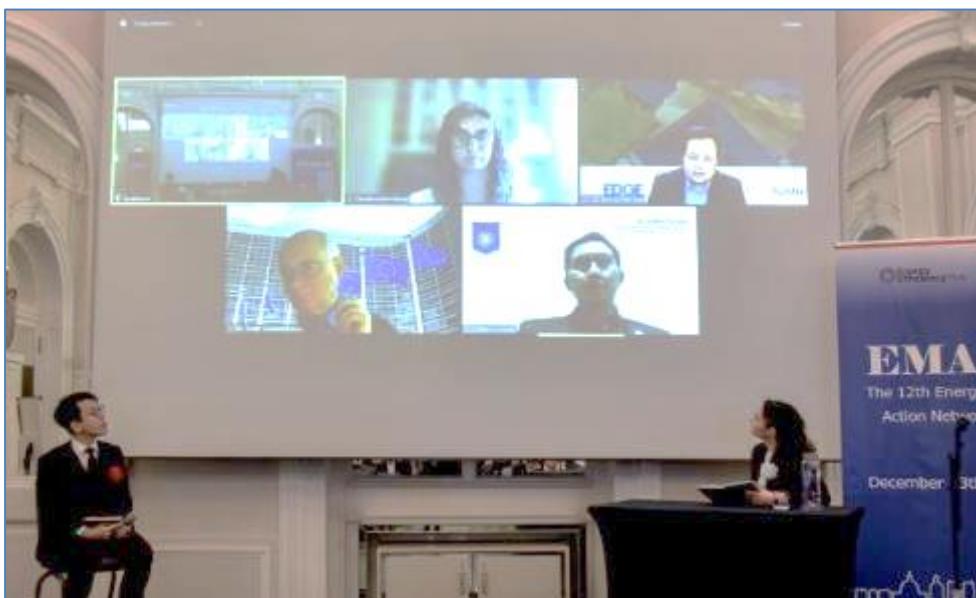
Southeast Asian countries plan to develop more efficiency standards for appliances and industry equipment. These will be complemented with efforts to foster knowledge sharing, capacity building, and public awareness campaigns given relatively low uptake of energy efficiency in industry.

- Australia's approach to efficiency and renewables

Australia aims to strengthen efficiency standards to meet the COP28 pledge, though rapid renewable energy growth, batteries, and electrification.

- Japan targeting SMEs

Japan is focusing energy efficiency support on SMEs which have lagged behind in reporting and planning, by providing expert advice and government subsidies.



Session-1 Discussion scenery

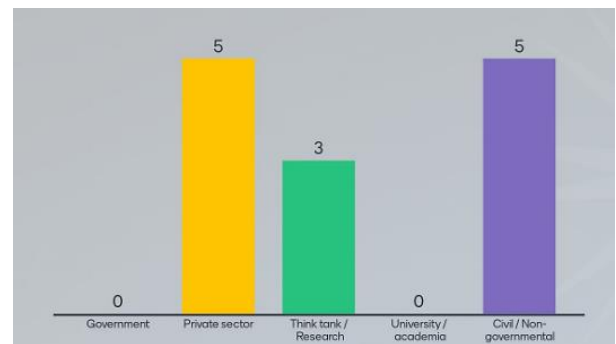
Participant engagement

A short audience engagement poll using menti.com revealed the following takeaways from the audience.

Q1: Which country are you from?



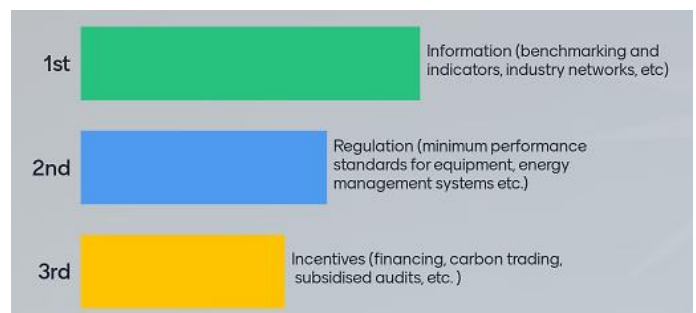
Q2: What is your affiliation?



Q3: Please rank the key catalysers to enhancing energy efficiency in buildings.



Q4: Please rank the key drivers to improve energy efficiency in industry.



Session 2: Exchanging best practices and challenges of demand-side efforts in the Industrial sector

At the beginning of Session 2, the moderator, Mr Joji Koike, Managing Director of the ECCJ, highlighted the need for bridging the gap between demand-side policy frameworks and their implementation. Mr Koike gave an example of how the ECCJ performs this bridging role in Japan.



The moderator explained the relationship between the policy-focused Session 1 and the more practical implementation-driven Sessions 2 and 3.

(1) Analysing key elements driving private sector CO2 reductions

Possible factors enabling companies to effectively cut emissions include: top-level commitment, internal coordination, collaborations between technology suppliers and users, and effective translation of policy into action. Mr Koike’s organisation provides auditing, training, awards, and consumer education to drive this change.

(2) Understanding user needs through digitisation

Trends show increased user demand for energy/emissions visualisation along with renewables integration, requiring demand optimisation. Digitalisation and precise tracking help meet these needs but require updated technological expertise.



Mr Joji Koike

(3) Summarising the session's objective

The session's overall objective was translating policy frameworks into actual private sector actions, thus energy and emissions reductions. Proposed actions aim to identify cross-cutting success factors, quantify consumer benefits from technology adoption, and gather user feedback to refine government policy.

1. “Water heat source CO2 Heat Pump” for energy-saving technology – SAKE Brewing

Mr Akihiro Watanabe, Director, International & Technical Research Department, Heat Pump & Thermal Storage Technology Center of Japan (HPTCJ), noted that the organisation has a 37-year history promoting heat pump and ice storage technologies in Japan and overseas via exhibitions, seminars, incentive schemes, and international research conferences including with IEA.

He presented introductory efforts to save energy and reduce CO2 emissions by using heat pumps in the sake production process at Hakutsuru Sake Brewery.

(1) Background on Hakutsuru sake brewery

Hakutsuru is a famous 288-year-old sake maker in Japan founded in 1743, with multiple gold medals, including a competition held in France in 2022. The new plant in Nada Uosaki has been using Mayekawa CO2 heat pumps for heating and cooling in the sake production process since 2012, including heat sterilisation and packaging.

(2) System configuration and coefficient of performance (COP) analysis

The system uses 9 CO₂ heat pumps with heating side for sterilisation and cooling side for cooling after packaging. COP charts over time show heating COP ~3.5, cooling COP ~2.5, and combined heating/cooling COP reaching 7.0. This approach cuts CO₂ emissions by 34% and costs by 24% compared to the previously used boiler/chiller method.



Mr Akihiro Watanabe

(3) Benefits and awards summary

System integration improved efficiency resulted in energy savings and lowered emissions. As a result, HPTCJ received a government award for energy efficiency in 2015. CO₂ heat pumps are effective for food/beverage factories with significant heating/cooling needs. The technology effectively contributes to carbon neutrality goals and provides high efficiency with heat recovery to reduce costs.

2. Ricoh commitment to Zero-carbon society and Circular Economy

Mr Robert Wuest, Group Manager, Recycle Business Group, Ricoh Industrie France S.A.S., presented plans to achieve the decarbonisation of its activities by 2050. Mr Wuest noted the strong involvement and engagement of the Board of Directors towards challenging ESG targets focusing on reducing environmental impact.

Ricoh's two main pillars to reduce greenhouse gas emissions are energy-saving activities and resource saving through eco-design and product reuse and material recycling.

(1) Introducing Ricoh Group and Aligning Business to ESG

Ricoh Group is a leader in office printing equipment and services with 81 000 employees, 240 companies, and USD 13 billion global revenues. The group is transforming into a digital service company, structured across five business units with a dedicated ESG committee overseeing results and setting direction.

(2) Targets and progress in GHG emissions reduction

Ricoh has set targets to reduce scope 1 and 2 GHG emissions by 63% and scope 3 by 40% by 2030, reaching net zero emissions by 2050. To date, Ricoh already cut scope 1 and 2 emissions by 45% and scope 3 by 31% while increasing renewable energy usage

by 30% as of fiscal year 2022. The company is also focusing on reducing emissions using eco-design, reused products, recycled materials, and low-carbon transportation.

(3) Innovations in eco-design and circular economy

The A3 colour printer model cut product carbon footprint 27% due to the use of recycled plastic parts, reduced packaging, and its lower energy use. Ricoh has pioneered the [Comet Circle™](#) concept for realising a circular economy in 1994 which focused on reuse, remanufacturing and recycling to eliminate waste. Goals to reduce virgin materials usage are 60% reduction by 2030 and 12% by 2050.

(4) Circular economy initiatives at Ricoh

Ricoh's factory in France employs 600 people and boasts a revenue of USD 182 million from thermal paper and circular economy activities. The factory cut 61 tonnes CO₂ via heat recovery installation, and 20% of electricity comes from green sources. Ricoh is continuously modelling product carbon footprints. The company has expertise in repair, renewal, and re-manufacturing. Additionally, products parts are being reused since 1996, a practice that is now expanding to non-Ricoh partners.



Mr Robert Wuest

3. Thorough Energy Conservation Reform for Realisation of Carbon Neutrality in Cosmetics Manufacturing Facility

Mr Tomoya Onuki, Facility Management Group, Manufacturing Department, Kakegawa Factory, Shiseido, Co. Ltd., presented energy conservation activities at the factory, which was awarded the Energy Conservation Grand Prize of Japan in 2022.

Mr Onuki introduced the Shiseido Kakegawa factory and provided an overview of Shiseido's global structure, output, and workforce. The company's mission is "beauty innovations for a better world", and its strategic priority is to reduce environmental footprint.

(1) Shiseido's aggressive carbon neutrality goals

Shiseido aims to achieve scope 1 and 2 carbon neutrality by 2026. Additionally, Shiseido aims to reduce scope 1 and 2 CO₂ by 46.2% by 2030.

(2) New organisational structures and visibility

The Kakegawa factory has long-standing energy conservation awareness activities. Since 2018, energy consumption has been increasing alongside with production volume. In order to increase the uptake of energy conservation activities, more than 430 electricity meters were installed with data freely available for analysis. An organisational structure was put in place to facilitate consistent and hands-on energy conservation, involving the quality assurance personnel.

(3) Past successes and sustained activities

Data-driven improvements implemented at the Kakegawa factory optimised equipment operations thus reducing waste by 80%. Additionally, capital investments in equipment renewal have shown significant energy savings and a reduction of 188 tonnes of CO₂ a year. Such case studies focused on automation and cost-effective capital investments are shared with other Shiseido companies.

(4) Ongoing Efforts

In order to sustain the energy-saving activities in factories, the secretariat team offered support in preparation of energy conservation proposals and reports. Moreover, efficiency of the production line and the product manufacturing method were reviewed to seek additional energy savings. Monthly production plans were standardised based on the solar power generation predictions to further reduce energy consumption.



Mr Tomoya Onuki

Lastly, the reduction of high air conditioning loads was made possible due to the introduction of newly developed breathable uniforms. This allowed temperatures to increase by 3°C. Mr Onuki noted three principles that promote energy conservation internally: (1) do not criticise or blame, (2) share appreciation to bolster self-esteem, and (3) put yourself in other colleagues' shoes.

Overall, energy management systems became standard in recent years; however, data reporting can still be improved and turned into useful accessible suggestions.

4. Exchanging best practices and challenges of demand-side efforts in the industrial sector

Ms Céline Carré, Head of Public Affairs, Saint-Gobain, introduced Saint-Gobain and its sustainability commitments.

(1) Introducing TIPCHECK programme

Technical Insulation Performance Check (TIPCHECK) is an energy audit programme for industrial facilities that aims to save energy and reduce CO₂ emissions through insulation. The TIPCHECK Programme was developed by the European Industrial Insulation Foundation (EiiF). The TIPCHECK programme offers training courses for engineers and auditors to train them to evaluate technical insulation systems in industrial facilities. It has delivered average savings of 200 000 – 400 000 MWh/year for clients over 10 years, reducing costs by approximately EUR 7 million annually with 1–2-year paybacks, simultaneously avoiding 1 million tonnes of CO₂.

(2) Standardised assessment process

The TIPCHECK is a standardised energy auditing tool designed in line with existing protocols, such as EN 16247 and ISO 50 002. EiiF develops standards like the TIPCHECK, which are relatively non-intrusive.

(3) Accelerating Building renovation with policy

The recast European Energy Performance of Buildings Directive and Building Renovation Passports can help drive deeper upgrades by improving coordination. However, government subsidies often target single measures instead of focusing on the overall building renovation. Additionally, consumers often lack awareness and tools to undertake building renovation.

(4) Gaps in Energy Efficiency First principle

There are loopholes in applying the Energy Efficiency First principle. For instance, installing heat pumps without upgrading building envelope is sub-optimal. Additionally, better grid integration is needed to take advantage of the demand reduction potential.



Ms Céline Carré

(5) Key takeaways

The following actions would help accelerate building renovation:

- Better implementation of the Energy Efficiency First principle;
- Increased support for implementation of energy efficiency solutions in the industry sector;
- Awareness of and emphasis on systemic benefits of energy efficiency; and
- Deepened interaction between demand reduction in the residential sector and renewable heat solutions in industry.

Discussion

After all presentations were delivered, Mr Joji Koike, noted the following key points brought up during the session: organisational approaches, targets-setting, renewable energy adoption, digitalisation, circular economy, collaboration with suppliers, policy guidance needs, etc. Common themes included strong climate commitments and systematic policy approaches.

(1) Q&A and discussion with HTPCJ (Best practice of Hakutsuru case)

Dialogue examined how Hakutsuru overcame cost hurdles in adopting expensive but efficient heat pumps. Hakutsuru focused on substantial emissions reductions and communicated longer-term cost savings to convince its management to undertake the project.

(2) Q&A and discussion with Ricoh Industries France

Discussions covered how Ricoh fosters internal alignment on ESG goals across its sites and handles scope 3 indirect emissions. The prioritisation of circular economy models to enable local production, reuse, and recycling are together lowering transport-related impacts.

(3) Q&A and discussion with Shiseido

Exchanges detail how Shiseido gets buy-in from its internal teams to pursue energy efficiency amid concerns over quality risks. Clear risk quantification and risk mitigation planning have helped convince management and production staff to pursue efficiency measures and practices.

(4) Q&A and discussion with Saint-Gobain

Saint-Gobain has held consultations with building owners on various energy efficiency topics, including Building Renovation Passports. Voluntary energy rating labels serve as a feasibility test for future wider regulatory adoption. The EU-funded projects can offer valuable insights; the outcomes from projects can be shared more widely.

Session 3: Exchanging best available technologies and challenges of demand-side efforts in large enterprises, SMEs, and consumer sectors

Mr Joji Koike, Managing Director of ECCJ, moderated session 3 and introduced the presenters.

1: Trends and examples of demand-side strategies in Canada

Ms Valerie Bennett, Manager of the External Partnership Team, Office of Energy Efficiency, Canada, focused on energy efficiency programs. Ms Bennett noted that Canada has one of the world's cleanest electricity systems but is still relying partially on fossil fuels.

(1) Energy efficiency program jurisdictions

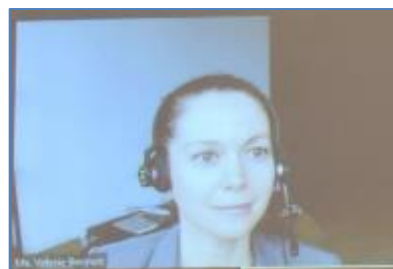
In Canada, the federal, provincial, and territorial governments share responsibilities related to energy use and efficiency. This poses coordination challenges despite federal efforts to work on codes, performance standards, and funding programs.

(2) Diverse business landscapes

Canada has many small businesses across multiple sectors with varying abilities to reduce peak energy use. The economy is also energy intensive due to production, processing, and transportation.

(3) Current federal emissions reduction efforts

The federal government recently released a plan targeting 40% emissions reduction by 2030, including building retrofits and equipment standards. New funding programs also support industrial decarbonisation, building codes advancement, and other projects.



Ms Valerie Bennett

(4) Existing provincial demand response programs

Provinces also have demand-side efforts focused on efficiency and equipment installations, but a limited number of peak demand mitigation programs. Ontario's large consumer demand response initiative successfully reduced demand peaks and costs.

(5) Technology's role in unlocking flexible demand

Digitalisation and automation can help large companies better manage energy use and distributed resources to participate in electricity markets. Smaller firms can also leverage smart technologies and aggregators to jointly benefit from demand response.

2: Contribution with heat pump technology in the decarbonisation and energy security for Europe

Ms Saki Nakaoka, Supervisor, Environment Research Centre, Daikin Europe N.V., focused on heat pumps, explaining different types such as air-to-water and air-to-air, their growing adoption for heating, and efficiency improvements enabled by technologies like inverters.

(1) Introduction

Ms Nakaoka provided background on Daikin Europe, including its 50-year history, business footprint across Europe/Middle East/Africa, manufacturing sites, core technologies in heat pumps and refrigeration, product portfolio, and environmental vision for 2050.

(2) Heat pump technology and market

The presentation detailed heat pump types like air-to-water and air-to-air, their growing use for heating in Europe, efficiency gains from inverter technology, and European energy regulations promoting adoption of efficient heating products.

(3) Heat pumps for decarbonisation

Ms Nakaoka outlined the carbon reduction potential of switching from fossil fuel heating to heat pumps, European regulations like Eco-Design speeding this transition, and the need to balance efficiency requirements across different heating system types.

(4) Daikin initiatives

Examples were provided of Daikin projects to improve energy efficiency, including heat recovery systems for retailers, apartment heating solutions, residential demand response, and R&D investments in a new Europe/Middle East/Africa R&D centre.

(5) Importance of communication

The presentation concluded by emphasising the future potential of heat pumps for decarbonisation, energy security, and the critical role of stakeholder communication in supporting adoption of new efficient technologies.



Ms Saki Nakaoka

3: Workshop for the Energy Management Action Network Applying technology to demand-side policy

Mr Ian Ferguson, Global Solutions Architect, Oracle Energy and Water – Opower, introduced Opower's demand-side management approach using data analytics and behavioural science. Mr Ferguson highlighted the benefits of using software with technology-focused solutions, proposing to instead apply software to the abundant data utilities retain about customers.

(1) Challenges reaching less engaged customers

The majority of utility demand-side management programs reach the most engaged customers. New technology makes it possible to better understand customers and drive permanent changes in energy usage across wider groups, including less digitally engaged limited-income renters.

(2) Personalised communication tools and strategies

Opower has developed various tools to analyse utility data and then communicate personalised insights to individual customers in ways that can impact their behaviour during brief moments of engagement. This allows the tailoring of outreach on energy usage, bills, and programs to specific customer segments.



Mr Ian Ferguson

(6) Four-part formula to change energy usage

The formula involves: large utility data sets, analytics platforms to process data, behavioural science to trigger engagement, and measurable program designs to test effectiveness. Opower has refined this approach through over a decade of experience working with over 175 utilities globally.

(7) Global results and cross-cultural applicability

Opower has robust measurable results demonstrating ability to permanently change habits and increase program adoption across 12 countries. Initial concerns about cultural differences in Japan proved unfounded, confirming behavioural triggers work internationally.

(8) Policy recommendations

Governments can enable the technology through aligning utility incentives, requiring measurement, supporting digitalisation and scalability via opt-out programs. Japan provided positive examples of policy and regulations driving success.

4: Demand-Side Technologies of Electric Power Company

Dr Masanobu Sasaki, Senior Manager, TEPCO Energy Partner, Inc., described the activities of Tokyo Electric Power Company (TEPCO), the largest electricity company in Japan, to reduce carbon emissions and expand renewable energy which is demand-side technologies of Electric Power Company.

(1) Introducing TEPCO and its decarbonisation targets

TEPCO is the largest electricity company in Japan with USD 55 billion in revenue. Their 2030 target is 50% carbon emissions reduction across the supply chain. TEPCO was restructured into holding, grid, retail, and renewable energy companies after the Fukushima disaster.



Dr Masanobu Sasaki

(2) Industrial electrification and heat pumps

Switching industrial fossil fuel processes like painting to electricity via heat pumps improves efficiency and reduces emissions. There are plans to redevelop TEPCO's headquarters to implement solar power generation and storage.

(3) Balancing renewables via virtual power plants

As renewable energy use increases, virtual power plants need to aggregate demand response from building systems to stabilise the grid. Adding demand response capabilities to heat pumps is a cost-effective approach.

5: Decarbonisation of industry

Mr Clément Gachot, Électricité de France (EDF), noted that decarbonisation of industrial heat is a priority to reach carbon neutrality.

(1) Introducing EDF and decarbonisation

EDF is a French utility company operating across Europe focused on building a net zero energy future. Industrial emissions account for 35% of France's target to reduce emissions 55% by 2030 globally. Waste heat is 42% of French industry's energy consumption, representing a major decarbonisation opportunity.

(2) Assessing decarbonisation technologies

In France, there are two main decarbonisation levers: heat recovery and fossil fuel substitution. Technical solutions include heat pumps (20% waste heat recovery potential), mechanical vapor recompression, electric boilers (60+ TWh market), and electric furnaces (80+ TWh market). However, the deployment of these technologies is happening too slowly.

(3) Workforce and innovation constraints

Additional skilled workforce is needed to facilitate the installation of heat pumps and other relevant technologies. A case study of a 17-year innovation cycle for transcritical heat pump demo shows time required to develop solutions.



Mr Clément Gachot

(4) Role of policy, subsidies, and partnerships

Additional subsidies supporting operational costs are needed to incentivise high temperature heat pumps. More value is placed on waste heat recovery in efficiency metrics would optimise solutions. Public-private partnerships can de-risk technology and assist development.

Discussion

Mr Joji Koike, the moderator of session 3, briefly summarised all presentations.

The discussion highlighted common challenges including high up-front costs, electricity vs. gas pricing, and difficulties getting buy-in from SMEs. There was general agreement on the key role of policy alignment, capacity building, data usage, and end-user engagement.

(1) Key takeaways and common themes

The moderator summarised key themes, noting the role of policy frameworks in addressing the barriers to energy efficiency acceleration. Additionally, the need to engage less advanced end-users and further utilise energy data was noted as well as the necessity to integrate innovative technologies.

(2) Q&A and discussion on heat pumps

Panellists discussed heat pump adoption challenges including high up-front costs and ongoing operating costs, given different electricity vs. gas pricing. Solutions explored involved subsidies, carbon pricing, working with manufacturers on specifications, and waste heat utilisation.

(3) Discussion on demand response and grid integration

The expansion of renewable energy penetration and electrification led to an increased need for demand response and end-user load adjustments across regions. While the optimal energy mix varies among countries, panellists emphasised the crucial role of policy alignment between national and sub-national governments.

Closing Remarks and Networking Dinner

Dr Emma Mooney, Energy Efficiency Analyst, Office of Energy Efficiency and Inclusive Transitions, IEA, and Mr Haruto Shinoda, Assistant Director, International Affairs Office, ANRE, METI, Japan, provided closing remarks for the workshop.

Dr Emma Mooney noted that today's workshop highlighted inspirational examples as well as demonstrated the scale of the challenge to double the rate of global energy efficiency improvement. Efficiency must remain central in decarbonisation efforts as the world transitions to electrification, otherwise much higher infrastructure investment will be needed to deliver low-carbon energy.



Dr Emma Mooney

The energy transition must put people at the centre. To reflect this, the name of the IEA's energy efficiency division has changed to the Office of the Energy Efficiency and Inclusive Transitions.

Dr Mooney closed her remark by thanking METI for leading the EMAK Task Group, the Energy Conservation Center Japan for organising the workshop, and the Energy Efficiency Hub for their collaboration and contributions.

Final remarks were made by Mr Haruto Shinoda from METI, the host of this workshop, who started by thanking workshop speakers, participants, chairs, and online audience for a fruitful discussion. He noted many countries and companies have set ambitious energy efficiency improvement targets, including the global goal of doubling efficiency gains by 2030, as agreed at the COP28 Climate Summit.



Mr Haruto Shinoda

Achieving these targets requires effective practical actions and coordination between the public and private sectors to ensure policy objectives align with industry's knowledge and capabilities.

Cooperation between countries is also vital to bring together energy efficiency technologies and expertise to enable the transition to carbon neutrality and a circular economy.

He noted that Japan will continue hosting workshops to promote energy efficiency under the umbrella of the Energy Efficiency Hub.

He concluded by thanking all participants for their contributions to this successful workshop.

Analysis of Workshop Themes

Approximately 70 people attended EMAK12 workshop in person and online. Networking took place during meeting breaks and the reception.



Figure 1. Participant Affiliations

Appendix 1: Agenda

Agenda	
09:00	Registration
Opening Remarks & Keynote	
09:30	Introduction from Dr Jonathan Sinton, Head of Energy Efficiency Hub Secretariat
09:35	Remarks from Ms Penny Sirault, Chair of Energy Efficiency Hub, Australia
09:40	Remarks from Mr Kentaro Oe, Counsellor, Permanent Delegation of Japan to the OECD, Japan
09:45	Keynote from Dr Emma Mooney, Energy Efficiency Analyst, Office of Energy Efficiency and Inclusive Transitions, IEA
09:55	Photo Session
10:00	Networking Coffee break
Session 1: Demand-side energy policies and strategic approaches in each country	
Chaired by Ms Kristina Klimovich, Programme Officer, Energy Efficiency Hub	
10:30-11:10	Remarks from Mr Naoki Tosaka, Assistant Director, ANRE, METI, Japan
	Remarks from Mr Anoop Nambiar, Distributed Energy Lead, AusNet
	Remarks from Dr Tudor Constantinescu, Principal Advisor to The Director General for Energy, European Commission
	Remarks from Dr Zulfikar Yurnaidi, Manager of Energy Modelling and Policy Planning (MPP), ASEAN Centre for Energy (ACE)
	Remarks from Ms Alexandra Maciel, National Coordinator, Ministry of Mines & Energy, Brazil
11:10	Discussion
11:40	Lunch
13:30	Participant engagement
Session 2: Exchanging best practices and challenges of demand-side efforts in the industrial sector	

Chaired by Mr Joji Koike, Managing Director, Energy Conservation Center Japan	
13:40	Presentation from Chair
14:00-15:20	<p>“Water Heat source CO2 Heat Pump” For energy saving technology-SAKE Brewing-</p> <p>Mr Akihiro Watanabe, Director, International & Technical Research Department, Heat Pump & Thermal Storage Technology Center of Japan</p>
	<p>Ricoh's commitment to Zero-carbon society and Circular Economy</p> <p>Mr Robert Wuest, General Manager, Reuse and Recycle Business Group, Ricoh Industrie France SAS</p>
	<p>Thorough Energy Conservation Reform for Realisation of Carbon Neutrality in Cosmetics Manufacturing Factory</p> <p>Mr Tomoya Onuki, Facility Management Group, Manufacturing Department, Kakegawa Factory, Shiseido, Co. Ltd.</p>
	<p>Presentation from Ms Céline Carré, Head of Public Affairs, Saint-Gobain</p>
15:20	Discussion
15:35	Networking Coffee break
Session 3: Exchanging best available technologies and challenges of demand-side efforts in large enterprises, SMEs, and consumer sectors	
Chaired by Mr Joji Koike, Managing Director, Energy Conservation Center Japan	
16: 05-17:45	<p>Trends and examples of demand-side strategies in Canada</p> <p>Ms Valerie Bennett, Manager of the External Partnership Team, Office of Energy Efficiency, Canada</p>
	<p>Contribution with heat pump technology in the decarbonisation and energy security for Europe</p> <p>Ms Saki Nakaoka, Supervisor, Environment Research Centre, Daikin Europe N.V.</p>
	<p>Workshop for the Energy Management Action Network Applying technology to demand-side policy</p> <p>Mr Ian Ferguson, Global Solutions Architect, Oracle Software</p>
	<p>Demand-Side Technologies of Electric Power Company</p>

	Dr Masanobu Sasaki, Senior Manager, TEPCO Energy Partner, Inc.
	Decarbonisation of industry Mr Clément Gachot, Électricité de France (EDF)
17:45	Discussion
Closing	
18:15	Closing Remarks from Dr Emma Mooney, Energy Efficiency Analyst, Office of Energy Efficiency and Inclusive Transitions, IEA
18:20	Closing Remarks from Mr Haruto Shinoda, Assistant Director, ANRE, METI, Japan
	END of Workshop
18:30-20:00	Networking Reception

Appendix 2: Photos from the Workshop

Venue signage

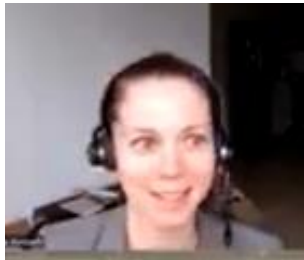


Audience



Speakers and moderators





Networking break



Networking lunch



Reception and networking

