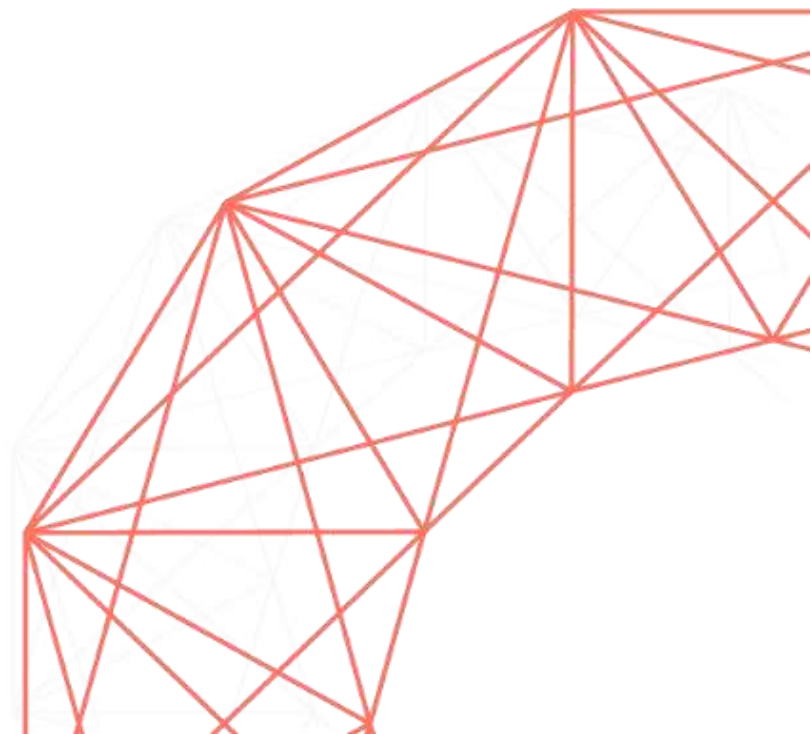


# Asian Regional Workshop on Roadmaps for Energy Efficiency Report

27 - 31 July 2015

Orchard Parade Hotel, Singapore



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## Summary of Event

The very first workshop of the Sustainable Energy Centre of Excellence was held in Singapore from the 27 - 31 July, and it focused on training Asian policy makers to develop and implement roadmaps for energy efficiency. Energy efficiency is often overlooked by many governments even though it is actually a low hanging fruit. The Asian Regional Workshop on Roadmaps for Energy Efficiency was organised by the Sustainable Energy Association of Singapore and supported by the Asian Development Bank, IE Singapore and the Sustainable Energy for All Initiative.

22 participants from 11 countries attended the 5 day workshop, and they were mostly from the energy, environment, or natural resources agencies in their respective countries (attendance list attached). There were 21 resource speakers such as from Asian Development Bank, International Partnership for Energy Efficiency Cooperation, World Bank and Copenhagen Centre on Energy Efficiency coming from all around the world sharing their knowledge and expertise with the participants. Each day focused on a different topic and covered a wide variety of topics:

- Day 1, 27 July: Introduction to Energy Efficiency and Key Partners
- Day 2, 28 July: Finance
- Day 3, 29 July: Standards
- Day 4, 30 July: Country case studies from Singapore and Japan, and Site Visit to an Energy Efficiency Building in Singapore
- Day 5, 31 July: Country Roadmap Presentations

## Outcomes of the workshop

Each country came up with a draft roadmap and on the 5<sup>th</sup> day of the workshop, presented their roadmaps to the entire group. There were many good presentations and as the participants learned from the speakers, the speakers also gained some country specific insights from the participants.

At the end of the workshop, the participants came away with some key takeaways in order for them to draft and implement an energy efficiency roadmap:

- 1) They need to build the technical capability in their country and train their people in relevant topics.
- 2) They need to set and implement EE targets, standards, labelling, building codes and policies
- 3) They need to convince their governments that energy efficiency needs to be one of the priorities in the budgeting of the country, as it is a solution to some of the major issues they need to deal with.



## 27 July: Introduction to Energy Efficiency and Key Partners



(L-R): Jiwan Archarya, Senior Climate Change Specialist (Clean Energy) , Asian Development Bank; Edwin Khew, Chairman, Sustainable Energy Association of Singapore; Kow Juan Tiang, Group Director, Environment & Infrastructure Solutions Group, IE Singapore; Monika Froehler, Energy Efficiency Programme Officer, Sustainable Energy for All Initiative

To start off, participants were given an introduction to energy efficiency and management, and some of the programmes available for them if they were to embark on energy efficiency projects. The question and answer session after Dr. Sanjay Kuttan’s presentation on *Understanding the Energy Efficiency Project Lifecycle*, brought one key issue to light. Sanjay shared that monitoring is very important because checks must be made to ensure that savings are actually achieved. Putting the right monitoring systems in place, and checking the accuracy of the measuring instruments is important, otherwise real savings are hard to track. “Data doesn’t mean anything until it is information”, was one of the key takeaways.

Michael Trainor from the Asian Development Bank asked how many companies actually have energy efficiency as a KPI. Companies use ISO 9001 as a branding tool, but ISO 50001 hasn’t caught on as a branding tool. Sanjay explained that this is because ISO90001’s “seal of quality” is brought about by the consumer’s perception. Unless consumers demand a greater sense of responsibility to companies to be sustainable, companies don’t see an incentive. But this is where governments can play a part – they can declare that companies that serve in their countries must be resource or energy efficient.



Welcome Dinner sponsored by TUV SUD, and held at The Halia at the newly crowned UNESCO World Heritage Site, Singapore Botanic Gardens.

As with any project, financing is a hot topic. There are many issues in getting funding for energy efficiency, and Glen Plumbridge, Managing Director of the Sustainable Development Capital Limited (SDCL) Asia shared that it is easier to put money into renewable energy because it is easier to understand and the projects are on a larger scale. Energy efficiency projects on the other hand, are smaller in scale, and are made of moving parts that need to be put together and integrated. To deal with this, the challenge is to bring together solutions, money, technology and implementation to address the issues faced by investors and banks.

Surendra Raj Bhandari, Chief of the Nepal Electricity Authority shared that electricity is cheap in Nepal and thus it would be hard to encourage companies to become energy efficient. In cases like this, Glen shared that setting energy codes, targets, standards would help, but as it is a policy, it will take time to take effect as the industry would need to time to adopt and accept these standards. Funding is also needed to incentivize companies, and such funding can be sourced from multilateral banks, who take the investment risks off commercial banks.

Rutu Dave from The World Bank also shared case studies from the World Bank's Tool for Rapid Assessment of City Energy (TRACE). TRACE is a tool that allows cities to "assess their energy use, identify and prioritize sectors, and it suggests specific energy efficiency interventions". Many participants were interested in this presentation as they could refer to actual numbers, and this tool is already available for them to use. In the case of Bangkok that Rutu shared, the government decided to focus on building energy efficiency as 664 buildings in Bangkok were owned by the government and they could see the impact on these buildings first.

In the afternoon, the participants started their first two breakout sessions. They were broken up into groups and one or two resource speakers were paired with each group. For the first breakout session, the groups came up with the first portion of the country roadmap – whether or not it would be feasible for a roadmap in their home countries. All of the participants shared that there would be a possibility for a roadmap in their country, and they outlined the current scenario in their country and what they needed in order to proceed.



*The groups from Afghanistan (left), and the Pacific Island and Timor Leste (right) in discussion with their resource speakers.*

For the second breakout session, participants delved into further detail about financing, budget and issues faced by energy efficiency programmes. They also discussed the capacity building and procurement changes that need to be made. Many countries shared issues with getting funding from their governments – many governments do not see energy efficiency as a priority, are already using their budget on renewable energy projects, and do not allocate much budget for it as there are other pressing concerns.

## 29 July: Standards

Standards was an issue that many of the countries were interested to find out more about as they realised its importance in achieving energy efficiency. Speakers from Singapore’s government agencies; the National Environment Agency and SPRING Singapore, spoke about labelling and standards in Singapore. Many participants were keen to find out about the standards the Singapore uses and the incentives for businesses. Ram Bhaskar, Director of the Energy Efficiency and Conservation Department at the National Environment Agency shared that the labelling programme for households has saved them \$200million - \$250million a year.

In the breakout sessions, groups talked about the kind of help they needed to develop their energy efficiency roadmaps. They also set their own targets, timeline, and which parties in their country need to be involved in crafting their roadmap. Most of the participants shared that they require capacity building to train energy managers, and would need to include energy efficiency into academic syllabuses. Countries like Vietnam don’t have a strong ESCO base, and as Colombo is developing, Sri Lanka needs more consultants who can advise on energy efficiency solutions. Funding is also another issue for countries to put the energy efficiency standards and labelling into place.



*Benoit Lebot (left) and Vincent Low (right) share their experiences and insights with participants.*

With these challenges in mind, the participants outlined their goals and timelines for their energy efficiency roadmap. Countries like Cambodia, Indonesia and Vietnam for example, that already have some form of energy efficiency policies, know they need to work on strengthening their policies and set clear targets.

Others like Afghanistan, Nepal, and Bhutan need to set their priorities, understand their scope of work, gather data, and set standards.

### 30 July: Country Examples: Singapore & Japan, & Site Visit

The Building Authority of Singapore, and a Singapore ESCO, G-Energy Global Pte Limited shared building energy efficiency case studies specific to Singapore, as well as building energy efficiency standards and the Green Mark Scheme. Vincent Low, Vice President of G-Energy Global, shared actual projects that his company worked on and showed how changes in equipment saved building energy costs. Yasushi Tanaka and Yoshitaka Ushio, from The Energy Conservation Center, Japan shared case studies from Japan, and Vijay Deshpande and Ksenia Petrichenko, from the Copenhagen Centre on Energy Efficiency shared examples from the Asia-Pacific region.



*Site visit to the United World College of Southeast Asia, touring the energy management systems in the campus.*

Participants also paid a visit to an energy efficient campus in Singapore - the United World College of Southeast Asia @ Tampines. This site visit was well received by all participants and speakers who attended the site visit. Roohul Amin, Director of Public Policy Formulation at the Administrative Office of the President, Afghanistan, shared that the site visit was “extremely inspiring, very impressive that gave me great ideas to consider while we build institutes and government building(s)”. Dawa Chhoedron, Executive Engineer at the Department of Renewable Energy of Bhutan said that “it was useful to get practical knowledge on existing energy efficient practices in Singapore”.




### 31 July: Country Presentations


As the final day of the workshop, each country sent a participant to share their draft roadmaps.

Afghanistan	<ul style="list-style-type: none"> <li>• Unable to build a roadmap now, but can build a “road to the roadmap”</li> <li>• Assistance             <ul style="list-style-type: none"> <li>– Drafting/Reviewing Laws, Policies, Codes</li> </ul> </li> </ul>
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	<ul style="list-style-type: none"> <li>- Capacity building – Public and Private Finance</li> <li>- Awareness</li> </ul> <p>Ksenia from the Copenhagen Institute for Energy Efficiency highlighted a point made in the presentation that energy access in Afghanistan is more crucial than energy efficiency. She suggested that one way to tell the government about energy efficiency is that it's a part of the solution to energy access, "There's no point to increase energy access if you're going to be inefficient and waste energy and increase greenhouse gases", she said. Roohul Amin, who was giving the presentation agreed, "If we do renewable energy efficiently from the beginning we won't waste investment in the future. Our current president says we need to reduce demand".</p>
<p>Bhutan</p> 	<ul style="list-style-type: none"> <li>• Policy &amp; Legislation (clear targets, timeline, tax incentives, etc)</li> <li>• Financial Assistance in Capacity Building in private and public sector and Initial Investment/funding in EE activities (example: standards and labeling program, testing laboratory, phase out of incandescent lamps with LED, promote/ incentivize electric cookers, electric vehicles, etc)</li> <li>• Institutional Linkages</li> <li>• Awareness</li> <li>• Priority Sectors: Industry, Transport, Building, Appliance</li> </ul>
<p>Cambodia</p> 	<ul style="list-style-type: none"> <li>• Establish a sound and comprehensive database upon the energy demand of all sectors</li> <li>• Establish laws and regulations to enforce EE</li> <li>• Create public awareness for EE by publicity campaigns, educational measures, expositions and pilot projects</li> <li>• Ensure inter institutional collaboration of all stakeholders</li> <li>• Provide sufficient technical and financial support for sustainable structures of EE promotion.</li> </ul>



<p>Cook Islands</p> 	<ul style="list-style-type: none"> <li>• SE4All – Building</li> <li>• Accelerator/Transport/Capacity Building</li> <li>• ADB – EE for PEEP3 Institutional Strengthening</li> <li>• SPC – MEPS</li> <li>• JICA/SEAS – Training</li> </ul> <p>Benoit Lebot shared that funding for renewable energy and energy efficiency would be available from the green climate fund if a link to climate change can be made.</p>
<p>Mongolia</p> 	<ul style="list-style-type: none"> <li>• Energy Efficiency and Conservation Measures is the one of the 3 priority areas of Energy sector policy in Mongolia.</li> <li>• Establishment of Legal framework and Institutional set up are urgent matters for development of energy efficiency policy in 2015-2016.</li> <li>• Support and cooperation from international institutions, initiatives and multilateral financial organization will be crucial for development of EE in Mongolia.</li> </ul>
<p>Indonesia</p> 	<ul style="list-style-type: none"> <li>• Policy/Regulation: <ul style="list-style-type: none"> <li>○ Reducing energy subsidy for fuel and electricity</li> <li>○ Formulating appropriate EE policy and regulation</li> <li>○ Overcome the lack of EE Incentives by enhancing collaboration with development partner</li> </ul> </li> <li>• Financial: <ul style="list-style-type: none"> <li>○ Overcome the lack of EE Financing Mechanism</li> <li>○ Convince Industrial and commercial building sector to fund EE projects</li> <li>○ Convince financial institutions to fund EE projects</li> <li>○ Facilitate the ESCO to financial access</li> <li>○ Enhance consumers' purchasing ability of the technology / energy efficient equipment</li> </ul> </li> <li>• Capacity: <ul style="list-style-type: none"> <li>○ Capacity building and training for policy makers</li> <li>○ Capacity building and technical training for experts (including energy auditor)</li> <li>○ Certify energy auditor</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ Capacity building and technical training for energy managers</li> <li>○ Boosting the amount of certified energy managers and energy auditors</li> <li>● Awareness: <ul style="list-style-type: none"> <li>○ Enhance consumer's awareness to prioritize high energy efficiency appliances</li> <li>○ Enhance capacity of retailers to promote the benefits of EE Standard &amp; Label</li> <li>○ Convince the top level management to do EE</li> <li>○ Intensifying existing program for energy efficiency in schools</li> </ul> </li> </ul>
<p>Vietnam</p> 	<ul style="list-style-type: none"> <li>● Need for a long-term EE roadmap and incorporating EE plan into an energy integrated energy planning</li> <li>● Thorough assessment for EE measures for priority setting</li> <li>● Capacity building and institutional enhancement</li> <li>● Expanding regulations, standards, benchmarks in remaining sectors</li> <li>● Supports from international communities in technical assistances, knowledge sharing, funding</li> <li>● Establishing sustainable fund for EE through involvements of local bank and ESCO industry</li> </ul> <p>Dr. Ngyuen shared that “this workshop comes at a good time because we are preparing energy masterplan this year – and we may implement this masterplan in one year. We have a separate plan for coal and gas, and here in our EE side we want to include not only demand side but supply side issues. We want to speak to the government to include this EE roadmap in our energy masterplan. The content presented in this workshop is valuable for us, but we need time to look at it and set priorities on policies presented in workshop”.</p>
<p>Nepal</p> 	<ul style="list-style-type: none"> <li>● Targets achievable</li> <li>● Program Implementable</li> <li>● Expected to provide benefits and cost savings</li> <li>● Contribute towards energy conservation and environment</li> <li>● Lead to future EE programs</li> </ul>

## Sri Lanka



- Dedicated credit line for implementation of energy conservation measures in industry and buildings. (Jan. 2016 - 2020).
- Initiate actions to obtain external expertise to revise the Energy Efficient Building Code. (Jan 2016).
- Enact necessary regulations to make building codes mandatory. (May 2016 -Dec 2016).
- Establish a credit line for conversion of three wheelers to electric three wheelers. (Jan 2016 – 2020)
- Initiate a dialogue with international organizations/multilateral lending agencies to harmonize minimum energy efficiency standards. (August 2015)

When it comes to labelling schemes, the difficulty is with finding experts with the relevant capabilities. In Sri Lanka's experience, the few experts that are present are engaged in many activities. Developing and implementing standards also takes a long time. Thus Sri Lanka has suggested setting up a regional laboratory to share testing facilities, as well as standardize regional standards.

Sri Lanka received help from JAICA helped to a roadmap for the energy conservation sector. They contributed in terms of capacity building and labelling programme and sharing expertise with locals. Vijay Deshpande from the Copenhagen Institute of Energy Efficiency informed everyone that the Sustainable Energy for All Initiative has accelerators in lighting, electrical, appliances, and industry, and encouraged the participants to contact them for help.

## Timor Leste



As Timor Leste is a new country, energy efficiency initiatives can be implemented right at the beginning as new projects are developed, e.g. at the design stage of buildings or other facilities. Virgilio Guterres, General Director of Timor Leste Electricity, said "Many developed countries have problems till today. So for us we can start developing these roadmaps fresh. I can tell my government about this and the fact that we can save so much if we put in the money".

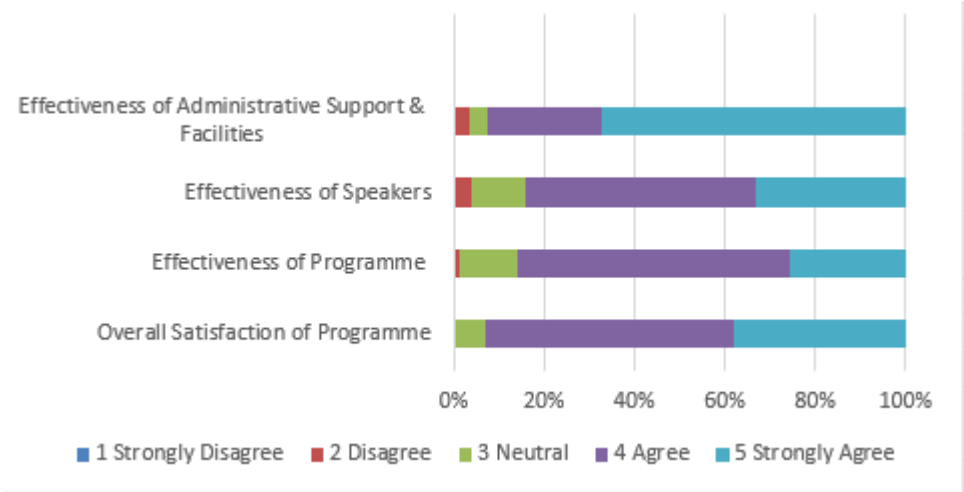
Over the last 5 years, Timor Leste has spent \$880million to build 250MW power plants, transmission lines, and 2,500km of distribution lines. Now all of their south districts are connected to grid. 11%, or 22,000

	households have solar home systems. They are advising their people who stay in rural areas to come to where water and electricity is. They provide solar systems for free for people living in remote areas, then the people pay for maintenance with assistance from the government. Electricity is free for the first 5 years, so they know that now is the time to install meters.
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Feedback & Conclusion

Many of the participants requested for help in terms of funding and capacity building, and the partners present at the workshop shared the accelerators, programmes, and initiatives available to help developing countries. Convincing governments that energy efficiency is important is not easy, but letting them know that energy efficiency is part of the solution to addressing some of the energy issues that they are facing is key.

Overall, the workshop was quite well received. Some participants shared that the structure and objectives of the workshop should be set clearly earlier and some wanted more time to work on their roadmaps. The site visit to the United World College of Southeast Asia was definitely a main highlight and the participants felt that seeing this case study in energy efficiency in person was a great experience for them.



Many look forward to future topics of the Sustainable Energy Centre of Excellence on renewable energy and Energy Access, and appreciate the training and knowledge assistance that the centre will be able to provide them.

## Country Representatives

Title	Last Name	First Name	Position	Agency/Ministry	Country
Mr.	Tereapii	Tangitamai ti	Director	Renewable Energy Development Division, Office of the Prime Minister	Cook Islands
Mr.	Daranagama	Arachchige Upali	Additional Secretary	Planning and Development, Ministry of Power and Energy	Sri Lanka
Mr.	Comester	Ronald	Deputy General Manager	Research and Development, Ceylon Electricity Board	Sri Lanka
Mr.	Pathmasiri	Ranjith	Director General	Sri Lanka Sustainable Energy Authority	Sri Lanka
Mr.	Guterres	Virgilio	General Director of Timor Leste	EDTL Lelectricodade De Timor Leste	Timor-Leste
Mr.	Batmunkh	Yeren-Ulzii	Senior Officer	Strategic Policy and Planning Department, Ministry of Energy	Mongolia
Mr.	Gundsamba	Enkhtaivan	Deputy Director	Strategic Policy and Planning Department, Ministry of Energy	Mongolia
Mr.	Khandjav	Batjargal	Director National Director	National Conservation Fund Climate Change Project Implementing Unit (INDCs/BUR/TNC), Ministry of Environment, Green Development, and Tourism	Mongolia
Mr.	Surendra	Rajbhandar i	Chief	Nepal Electric Authority -	Nepal
Mr.	Prakash Chandra	Shrestha	Director	Kathmandu Regional Office, Nepal Electric Authority	Nepal
Mr	Satchi		Chief Engineer	Planning and Coordination Dir, DRE, Department of Renewable Energy, Ministry of Economic Affairs, Thimphu, Bhutan	Bhutan
Ms.	Chhoedron	Dawa	Executive Engineer	Research and Development Division; Department of Renewable Energy, Ministry of Economic Affairs	Bhutan

Mr.	Tashi	Dorji	Project Engineer	Project Implementation Unit, ADB, TT, Thimphu Thromde, MOWHS	Bhutan
Mr.	Sovanna	Toch	Director	Ministry of Mines and Energy	Cambodia
Mr.	Harris	Muhammad Yahya	Director	New Energy and Renewable Energy, Ministry of Energy and Mineral Resources	Indonesia
Mr	Hoang	Viet Dung	Energy Expert	Energy Efficiency and Conservation Office	Vietnam
Dr	Nguyễn Ngọc Hưng		Institute of Energy	Ministry of Industry and Trade	Vietnam
Mr	Roohul	Amin	Director	Public Policy Formulation, Deputy Policy & Strategic Planning, Administrative Office of the President, Islamic Republic of Afghanistan	Islamic Republic of Afghanistan
Mr	Mirwais	Attaie	Director Billing and Collection	Da Afghanistan Breshna Sherkat, Islamic Republic of Afghanistan	Islamic Republic of Afghanistan
Mr	Mazharuddin	Amanpoor	Energy Efficiency Manager, EPD	Ministry of Energy and Water, Islamic Republic of Afghanistan	Islamic Republic of Afghanistan
Ms	Makereta	Lomaloma		Secretariat of The Pacific Community	Fiji

**List of ADB**

<b>Title</b>	<b>Last Name</b>	<b>First Name</b>	<b>Position</b>	<b>Agency/Ministry</b>	<b>Country</b>
Mr.	Kohlhase	Jude	Infrastructure Specialist	Pacific Sub regional Office, Pacific Department, ADB	Fiji
Mr.	Trainor	Michael	Energy Specialist	Energy and Resources Division, Pacific Department, ADB	Philippines
Mr.	Tareen	Adnan	Energy Specialist	Energy Division, Central and West Asia Department, ADB	Philippines
Ms.	Seiler	Annika	Finance Specialist (Energy)	Energy Division, East Asia Department, ADB	Philippines
Ms.	Cowlin	Shannon	Energy Specialist	Energy Division, South Asia Department (India Resident Mission), ADB	India
Mr.	Enomoto	Kazuhiro	Energy Specialist	Energy Division, South Asia Department, ADB	Philippines
Ms.	Wanniachchi	Aruna	Senior Energy Specialist	Energy Division, South East Asia Department, ADB	Philippines
Mr.	Acharya	Jiwan	Senior Climate Change Specialist (Clean Energy)	Sector Advisory Service Division, Sustainable Development and Climate Change Department, ADB	Philippines
Ms.	Tolentino	Ana Maria	Access to Energy Consultant	Sector Advisory Service Division, Sustainable Development and Climate Change Department, ADB	Philippines

## List of Resource Speakers

Title	Last Name	First Name	Agency	Country
Ms	Malavika Jain	Bambawale	Accenture	Singapore
Ms	Mengmeng	Cui	Accenture	Singapore
Mr	Ablaza	Alexander	Blue Sky Energy Corporation	Philippines
Mr	Towell	Benjamin	Building and Construction Authority	Singapore
Mr	Vinod	Kesava	Climate Resources Exchange (2014) Pte Ltd	Singapore
Mr	Deshpande	Vijay	Copenhagen Centre on Energy Efficiency	Denmark
Mr	Ksenia	Petrichenko	Copenhagen Centre on Energy Efficiency	Denmark
Dr	Sanjay	Kuttan	DNV GL - Energy	Singapore
MS	Rutu	Dave	Energy Sector Management Assistance Program (ESMAP), World Bank	USA
Mr	Low	Vincent	G-Energy Global Pte Ltd	Singapore
Mr	Chee	Jin Bek	International Copper Alliance	Singapore
Mr	Benoit	Lebot	National Renewable Energy Laboratory & International Partnership for Energy Efficiency Cooperation	France
Mr	Low	Jason	SPRING Singapore	Singapore
Mr	Glen	Plumbridge	Sustainable Development Capital LLP	Singapore
Ms	Monika	Froehler	Sustainable Energy for All Initiative	Austria
Mr	Yasushi	Tanaka	The Energy Conservation Center	Japan
Mr	Yoshitaka	Ushio	The Energy Conservative Center	Japan
Prof	Toh	Kok Chuan	Nanyang Technological University	Singapore