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## Conference abstracts

### Opening keynote presentations

#### **Transformative evaluation: State of the Environment reporting framed by the UN SDGs**

**Dr. Gillian Sparkes**

*Commissioner for Environmental Sustainability, Australia*

Dr Sparkes is pioneering the implementation of the UN Sustainable Development Goals for State of the Environment reporting for Victoria. She will discuss how and why Victoria, the fastest growing state in Australia, is transforming its environmental reporting frameworks. “We are taking the lead on applying the SDGs for environmental reporting, because implementing the SDGs makes sense”, Dr Sparkes said. It is the internationally agreed framework for sustainable development and in practical terms, framing our evaluative processes in this way, as Victoria responds to pressures such as climate change impacts and population growth, is prudent. “Standardised reporting is powerful for government agencies because when we understand and can more readily compare outcomes, we can better leverage our effort and allocate scarce resources to solve problems.” Using an SDG target-based framework and localising indicators, enables State level reporting to be scaled up to develop a national approach or localised to the regional, ecosystem or precinct level.” This is the first attempt by government at a State level in Australia, to measure the environment against the SDGs framework. In her address: ‘Transformative evaluation: State of the Environment reporting framed by the UN SDGs’, Dr Sparkes will also discuss how her independent office is moving beyond traditional methods to achieve high-quality, real-time data for decision making. This enables an assessment of synergies and trade-offs to make timely recommendations to government to improve social and environmental outcomes, support sustainable growth and achieve climate action targets. Dr Sparkes will brief delegates on a seven-stage process to “reframe and rewire the environmental evaluation system”.

#### **The status of Indonesian efforts in energy efficiency and conservation - MASKEEI’s perspective**

**Jon Respati**

*Chairman, Indonesian Energy Conservation & Efficiency Society, Indonesia*

Indonesia has made various modest efforts in energy efficiency and conservation since more than 2 decades. The efforts in energy efficiency have been facing great challenges, especially in the nineties until around 2015, for the main reason that the country’s energy usage (fuel and electricity) were heavily subsidized, that made the energy price artificially cheap, and therefore gave little or no incentive to energy efficiency efforts. More serious efforts have been made under the Energy Law of 2007 which lead to the enactment of the Government Regulation No.70/2009 on Energy Conservation. This core regulation has given some guidance to the energy users to conduct energy efficiency efforts in the Industry, Commercial Buildings and in Household sectors. Obviously, these efforts were focused on the use of electricity only, as there is no mentioning of the Transportation sector where the energy use is in liquid form. However the current Regulation have at least produced some results for the country’s strive for reducing the energy demand, particularly driven by the emergence of global energy efficiency technology available. Facing the increasingly heavy global economic competition and the increasing deficit in the energy balance sheet that lead to serious challenges to the country’s balance of payment, the country is compelled to give more attention to the demand side of the energy equation. Meanwhile, the ten years old existing regulation has been considered inadequate to drive the stakeholders conduct more efforts in energy efficiency, including the omission of the transportation sector, and therefore it needs a major revision.

MASKEEI is invited to the IEA Evaluation conference to present its perspective about the status of Indonesian efforts in energy efficiency and conservation, particularly on how the government’s intention to boost the energy efficiency and conservation efforts will find its momentum and on what the country should do to meet the challenges of reducing the energy demand while the country’s needs of energy is significantly increasing to fuel its sustainable development. The Presentation will review briefly the current status of the policy and regulations and the various efforts the country has been making to improve energy efficiency, and will further look particularly on the intended improvements in the core regulation to drive the efforts effectively faster and include all major sectors of the economy. The Presentation will also discuss the challenges the stakeholders is facing in the implementation of the expected new regulation once it is enacted, and the way forward the country should act to tap on the huge prospects and opportunities of energy efficiency and conservation for the sustainable development.

## 1.1 Bringing the Sustainable Development Goals to life: Practical lessons from the field

### Improving energetic sustainability and resilience of APEC cities through results-oriented monitoring

**Mr. Steivan Defilla**<sup>1</sup>

<sup>1</sup>*APEC Sustainable Energy Center, Tianjin University, China*

Cities already account for more than half the world population and are therefore of growing interest for sustainability. They offer a far greater variability and much smaller size than most countries, yet they show to some degree all unsustainable development trends addressed in the SDGs. Implementing integrated urban planning allows cities to be real life laboratories for sustainability policies creating new infrastructures. APEC started developing Low Carbon Model Towns (LCMT) in 2010. This process should be scaled up to include more cities and to have a measurable contribution not only to the APEC aspirational goals of improving energy intensity and increasing the share of renewable energy, but also to APEC disaster risk reduction. Since its creation in 2014, APEC Sustainable Energy Center (APSEC) started building up a network of cities that can apply results-oriented monitoring as part of the policy cycle to improve sustainability and resilience among its members. The theoretical background of this approach can be found in the report "APEC Sustainable Urban Development Report - From Models to Results" that has recently been endorsed by the APEC Energy Working Group for publication by APEC. The present paper details the concrete steps that are needed to ensure best possible sustainability and resilience development for the participating cities.

### A holistic approach to 2030 energy transition: Linking SDG7 to the Paris Agreement

**Dr Anis Zaman**<sup>1</sup>

<sup>1</sup>*UNESCAP, Bangkok, Thailand*

The energy sector is responsible for two-thirds of greenhouse gas emissions. The success of the Paris Agreement will, therefore, largely rely on how the energy sector transitions from now to 2030. The improvement in energy efficiency help reduce emissions by reducing the use of fossil fuel for power generation, and increasing renewable energy in the fuel mix significantly reduces emissions by displacing fossil fuel for power generation. These measures together constitute the major part of Goal 7 of the Sustainable Development Goals (SDG 7) and will play a critical role in achieving emission reduction targets under the Nationally Determined Contributions (NDCs). While SDG7 describes a definite target for energy efficiency, the renewable energy target has been kept open using the term "increase substantially" leaving a doubt as to what would be a substantial increase. A logical framework with an ability to identify an appropriate share of renewable energy would be very useful for policymakers to effectively plan for 2030 energy transition. This paper discusses the roles of renewable energy and energy efficiency in achieving NDC targets and proposes a framework to identify the appropriate share of renewable energy which uses emission reduction target as the key driver. The paper also discusses the National SDG7 Tool for Energy Planning (NEXSTEP) that is being developed by the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) which is based on this framework and would be used by policymakers to plan for 2030 energy transition.

### Building capacity in the energy sector and measuring progress towards the Sustainable Development Goals

**Ms Terri Soller**<sup>1</sup>

<sup>1</sup>*Conversus Leaders, Australia, <sup>2</sup>SDG Report Card, Australia*

The U.N Sustainable Development Goals (SDGs) provide a coordinating framework for systemic action and change. As such, the SDGs present challenges and opportunities for the energy sector in understanding how energy policy and programs are experienced in the context in which they play out.

Taking a system focus prompts a need to develop the capacity for systemic leadership across the energy sector. The integrating value of SDG 17 is particularly valuable. It explores partnerships, engagement, collaboration and shared learning requiring focused attention and deliberate attempts to move beyond talk and into practice.

This presentation will explore the fundamentals of thinking and working systemically, with an understanding of how best to identify and work with multiple stakeholders and agencies to enable collaborative practice and learning. Practicing systemic leadership moves the narrative from "win-lose" where competition has been normalised, to a redefinition of collective purpose and collective impact.

The presentation will explore what is required to truly collaborate, learn and partner to enable systems transformation. By beginning to understand adaptive leadership within the energy context, we move away from the assumption that by bringing diverse actors together we will solve a problem or make progress and explores the capabilities and mindsets that we need across the system regardless of role or agency.

Evaluating the impact and quality of partnerships is critical to success. The presentation will discuss approaches and research-based tools that can be used in developing, assessing and improving partnerships and measuring progress towards the enabling aspects of the SDGs.

## **Fast checking the progress in evaluation of the SDGs - implications in energy sector evaluations**

**Dr Romeo Santos<sup>1</sup>**

<sup>1</sup>*University of the Philippines, Quezon City, Philippines*

The 'evaluation' of the SDGs is one great challenge to the global evaluation practice. This presentation will focus on the current progress in the evaluations related to the SDGs and argue on the real score in this area. It will share updates on what has been developing or achieved in organizations, such as the IOCE (International Organization for Collaboration in Evaluation), as well as countries that are likely leading in this endeavour. Further, it will infer on the implications of the current state of progress and how these reflect on evaluations of programs in the energy sector.

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## **1.2 Evaluating and assessing policies and programs for appliances**

### **Environmental impact on energy efficiency of room air conditioners in India**

**Neha Dhingra<sup>1</sup>**, Dr. Archana Walia, Pradeep Kumar Mukherjee

<sup>1</sup>*CLASP, Delhi, India*

Room Air conditioner (RAC) largely dominates the space cooling market constituting almost 40% of total cooling energy consumption in 2017-2018. Though RAC penetration in households in India is only 8% currently, rising incomes, urbanization and increasing cooling degree-days is expected to raise AC ownership to 40% in 2037-38. This would result in significant increase in power and peak load demand, environmental impact, and greenhouse gas (GHG) emissions.

Energy efficiency policies for appliances are one of the most cost-effective methods to reduce electricity consumption. India's Bureau of Energy Efficiency (BEE) initiated a labelling program for RACs in 2006 and subsequently revised the program periodically for increasing the stringency and establish the performance.

The energy efficiency of an RAC is determined on test standards under standard rated conditions. However, in real operating environment, an AC is exposed to several adverse climatic conditions such as polluted ambient and saline conditions around coastal areas, which may affect the energy performance. There is little information or data available in the public domain of the extent of potential impact due to such environmental conditions.

In a 'first of its kind' study the impact of environmental factors such as salinity, dust, and humidity on energy efficiency of an RAC was measured under simulated environmental conditions. This paper presents the methodology along with key findings and forward looking deep-dive research in assessing the impact of external environmental conditions.

## Combatting climate change one appliance at a time: Assessing an Appliance Labelling and Standards Programme in Six Pacific Island countries

**Ms. Linda Dethman**<sup>1</sup>, Ms. Monica Wabuke<sup>2</sup>

<sup>1</sup>Pivot Advising, Portland, United States, <sup>2</sup>The Pacific Community (SPC), Suva, Fiji Islands

Pacific Island Countries (PICs) face adverse effects from climate change, rely heavily on imported diesel fuel to generate electricity at a high cost, and have been used as “dumping grounds” for inefficient appliances. To address these issues, the Pacific Appliance Labelling and Standards Programme (PALS) worked with 10 targeted PICs since 2012 to support legislation and implementation of Minimum Energy Performance Standards and Labelling (MEPSL). This 2019 evaluation examined how PALS has contributed to four key goals that drove MEPSL efforts: political commitment; enabling legislation; effective implementation; and regional capacity. The evaluation focused on four PICs that passed and are implementing MEPSL legislation – Fiji, Samoa, Vanuatu, and Solomon Islands -- and two that have drafted legislation – Kiribati and Cook Islands. Methods included a review of program materials, a literature review, and in-person interviews with over 60 PALS stakeholders, including energy, environmental, and customs agencies, retailers, programme staff, and donors. Results show five of six PICs would not have pursued MEPSL without PALS and all say PALS support has been essential to MEPSL progress. We will examine how PALS lean approach – including gaining high-level support; providing legislative templates and legal advice; conducting targeted training for stakeholders; enabling regional feedback among PICs; building public awareness; and launching an on-line appliance permit database – helped PICs overcome hurdles and enabled their success. We will also pinpoint remaining challenges, including enforcement, knowledge transfer, and expansion to other appliances, and the resources needed to ensure the legacy of PALS endures.

## Evaluating appliance ownership and usage pattern in India

**Archana Walia**<sup>1</sup>, Neha Dhingra, Pradeep Kumar Mukherjee, Tanmay Tathagat, Piyush Varma

<sup>1</sup>CLASP, India

Residential sector in India accounted for 24% of the total electricity consumption in 2016 and is projected to rise more than eight times by 2050. This increased energy demand would primarily be driven by appliances and equipment and attributable to several factors including better access to electricity and rising disposable income. However, at present, there is limited data and understanding of residential energy end-use. As the penetration of appliances and subsequently energy use expands in Indian households, it is becoming pertinent to establish end-use baseline for formulating informed energy policies and assessing the potential impact of these policies.

A ‘first of its kind’ comprehensive pan-India residential end use survey was conducted across 5,000 urban households spanning different climate zones, socio-economic strata and demographics across the country. The objective of the study was to evaluate appliance ownership and usage patterns for urban households and develop a framework for collection and analysis of data on energy end-use in the India’s residential sector for conducting such surveys in future.

The data indicates that appliance ownership and usage is on the rise significantly. With households shifting towards nuclearisation, per capita energy use is also increasing. The results also provide good insights on variations in energy consumption across climatic zones and demographic parameters for the major appliances. This could potentially influence the formulation of customised energy policy interventions to reduce energy consumption. This data can also promote better understanding of future electricity demand, thereby enabling better planning and demand side management programs.

## Evaluating the impacts of mandatory policies and labeling program for appliances in India

**Mr Kishore Kumar PVN**, Dr Archana Walia

<sup>1</sup>*CLASP, New Delhi, India*

Household appliances are basic essentials in day to day life, important for human wellbeing and increases the productivity and comfort. Over the last decade, India has witnessed continuous growth in usage of home appliances with increase in disposable incomes, availability of innovative products and affordable pricing. The growth in consumer durable market in India has resulted in increase in the electricity demand in the residential sector by two third in the last decade.

To reduce the energy intensity of the economy, India's Bureau of Energy Efficiency (BEE) launched the standards and labeling program for residential appliances in 2006. Starting the program with four voluntary appliances and gradually expanding the policies to mandatory administration for cooling, lighting and industrial application products, the labeling program currently covers 23 products. Over the last decade or so, BEE has continuously strengthened the program to eliminate inefficient products from Indian market through mandatory policies to pull the market for efficient products and periodic revisions to increase the stringency of the energy performance standards.

Since the inception, 70% of products listed under mandatory labeling policies have resulted in cumulative electricity saving of 200 BU of the 245 BU of the overall electricity saving from the program. This paper analyses and discusses the impacts of mandatory policies and the related trends of market growth, technology improvements, market transformation and climate impacts.

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## 2.1 Bringing multiple benefits of energy efficiency to life

### Experience of evaluating energy transition policies in Europe

**Chun Xia-Bauer**<sup>1</sup>

<sup>1</sup>*The Wuppertal Institute for Climate, Environment and Energy, Germany*

This presentation will share insights of evaluation of energy transition policies based on recent evaluation projects of the Wuppertal Institute. Project examples include a recent evaluation of the Directive Governing the Promotion of Heating Optimization through Highly Efficient Pumps and Hydraulic Balancing in Germany (HZO) and an evaluation tool for multiple impacts of energy efficiency (COMBI). HZO evaluated the target achievement, effectiveness and cost-effectiveness of the program and identified technology-specific trends through market and stakeholder analysis. COMBI developed modelling approaches and visualization tool of quantifying the multiple non-energy benefits of energy efficiency. The presentation will be mainly focused on the methodology in these projects and conclude with reflections on applying these methodology.

### Beyond pure access to energy – Analysing the impact on “productive use” of small-scale energy projects

Ms Carmen Dienst<sup>1</sup>, Dr Julia Terrapon-Pfaff<sup>1</sup>, **Dr Chun Xia**<sup>1</sup>

<sup>1</sup>*The Wuppertal Institute for Climate, Environment and Energy, Germany*

Access to clean and reliable renewable energy services in the Global South is widely recognised to be a crucial factor in reducing poverty and enhancing development. One of the most notably assumed positive outcomes and co-benefits is the productive use of energy, which is expected to create value and has a positive impact on local livelihoods. However, systematic evidence of these impacts is limited. The presentation will show results that are based on the analysis of a post-evaluation of 30 globally distributed small-scale energy development projects and is interrelated to a review of existing literature. This study applies a theory-based impact evaluation approach focusing on the question “how” an intervention caused intended effects by examining the causal chain from inputs to outcomes and impacts. The applied contribution analysis approach represents a systematic and structured evaluation approach for analysing and reporting data on impacts. It includes the development of a theory of change (ToC) and gathering evidence on the same.

The results help to better understand how the supply of sustainable energy supports productive use activities, and whether these activities have the expected positive impacts. The results show that the provision of energy services alone did not automatically lead to the emergence of productive uses. The analysis indicates that certain elements, such as consideration of the whole value chain (including market potential and access) and capacity building on technical, management and business skills played a role in triggering productive uses.

## 2.2 Industrial energy efficiency

### Strategic energy management: Is a simple model enough?

**Phil Degens<sup>1</sup>**, Sarah Castor<sup>1</sup>, Erika Kociolek<sup>1</sup>

<sup>1</sup>*Energy Trust of Oregon, Portland, United States*

Energy Trust of Oregon has provided Strategic Energy Management (SEM) services to hundreds of industrial gas and electric customers over the past ten years. The types of SEM services and participating facilities have evolved over this period. One thing that has remained constant is the requirement to develop and maintain one or more energy models to monitor and track the facilities' energy consumption.

The resources that go into developing and maintaining the energy models, which often have customized specifications, baselines and savings measurement periods, can be significant and the SEM program has made a variety of changes that have focused on simplifying the model development and streamlining the data collection processes. Reducing costs associated with the model development and maintenance has become more important as the program expands SEM services to small and medium size industrial customers with smaller energy costs and savings potential.

We propose to investigate ways to further standardize and automate the SEM model development process. We will re-estimate the gas and electric consumption models for the 200+ industrial sites that have participated in the program since 2014. Both site- and fuel-specific models will be re-estimated using a standardized baseline and model specification using monthly data and a reduced set of production and weather variables. In addition, the data will be combined, and a set of cross-section time-series models will be estimated to determine if such models can provide reliable estimates of program level savings.

### What lies ahead for Singapore's industrial energy efficiency landscape? Scaling up the market with innovative solutions

**Huijun Hu**, Dr Yang Liu<sup>1</sup>

<sup>1</sup>*National University of Singapore, Singapore*

Despite the lack of significant natural resources, Singapore has grown into the third most competitive economy globally today. The strong economy is driven primarily by the industry sector which contributed to 20% of Singapore's GDP and employs a fifth of Singapore's workforce. In 2016, about two-thirds of Singapore's total final energy consumption is accounted for by the industry sector. Between 2010 and 2016, final energy consumption of the industry sector increased by 21.4%. Because of its limitation to leverage on alternative energy sources, Singapore taps on energy efficiency improvement as the key strategy to reduce emissions across all economic sectors.

Singapore leads Southeast Asia in efforts directed toward the accelerated adoption of green, resource- and energy-efficient technologies and practices across its economy. Its government, through programmes of various agencies, has designed and rolled out incentives and financing schemes to help the market scale-up the deployment of energy efficiency solutions and services, particularly in energy-intensive end-use sectors.

With some of these programmes launched as early as 2011, it now becomes imperative to understand if the programmes are indeed delivering according to their original objectives, and how these programmes can be strengthened through the remainder of their established tenures, and new financial vehicles, products or mechanisms will have to be structured and rolled out to engage the markets that are outside the reach of the existing programmes.

### Comparison of US and EU policy impacts in the manufacturing sector

**Marvin Horowitz<sup>1</sup>**

<sup>1</sup>*Demand Research LLC, United States*

In the US and the 28 EU member states, manufacturing sector electricity and natural gas consumption account for between 30 and 40 percent of final annual energy consumption, depending on the year. This sector of the US and EU economies, which consists of industries that produce durable and non-durable goods, has been the target of different public policies in each jurisdiction since the year 2000. Yet despite the policy choices, two top-down econometric studies using related methodologies find that cumulative, policy-driven energy savings over the first decade of this century is somewhat similar between the US and EU, averaging a little over 0.5 percent a year. In this presentation, the research designs, methodologies, and findings of these two studies will be described.



## 3.1 Innovation and the demand for evaluation

### Innovative finance for sustainable energy access: Lessons from the world's first result-based loan in the energy sector

**Ms. Architrandi Priambodo**<sup>1</sup>

<sup>1</sup>*Castlerock Consulting Pte Ltd, Singapore*

The Asian Development Bank (ADB) is supporting PLN, the Indonesian state electricity company, with the world's first result-based lending (RBL) programs in the energy sector to help realise the nation's goal in achieving sustainable universal electricity access. The loan disbursements are linked to the achievement of the program results rather than to upfront expenditures – a complete flip in the approach from traditional project lending – and uses the borrower's systems, including monitoring and evaluation (M&E), fiduciary, procurement, and environmental and social safeguards. One of RBL's core strengths is in handling large numbers of small transactions and some introduction of intangible interventions such as behavioural change. In the energy sector it is well suited to support last mile power connections and energy efficiency efforts. Since an RBL program relies almost entirely on the borrower's M&E system, highly credible independent verification of results is a necessary condition. This presentation describes the progress achieved through the financing innovation in RBL, the various results verification methods applied by an Independent Verification Agent (IVA), and the lessons learned in supporting and enhancing a power utility's system to accelerate sustainable energy access.

### Evaluating grid readiness and interventions enabling Variable Renewable Energy Grid Integration: Case of world's fastest growing economy, India

**Mr Ripu Bhanjan Singh**<sup>1</sup>, Ms. Carol Mulholland<sup>2</sup>

<sup>1</sup>*USAID Greening the Grid (GTG) Renewable Integration and Sustainable Energy (RISE) Initiative*, <sup>2</sup>*Deloitte Consulting LLP, Alexandria, U.S.A*

Rapid electricity demand growth in developing economies, such as India, puts cleaner electricity at the center of strategies for economic development and emissions reduction (WEO 2018). Sailing on the Government of India's ambitious nation-wide renewable energy capacity target of 175 GW by 2022, renewable penetration will reach significant levels in the overall Indian power mix in less than 5 years. The variability of renewable sources of energy presents a notable challenge to grid stability and reliability. Hence, the grid's ability to integrate Renewable Energy gains unprecedented importance.

USAID 'Greening the Grid (GTG)' program includes a component that supports innovative pilots in such areas as Coal Based Flexible Power Generation, Automatic Generation Control, Economic Valuation of Battery Energy Storage Systems, Regional Sharing of Reserves/Surplus Power Across States, Dynamic Reactive Power Compensation, Electric Vehicle Charging Infrastructure and Impacts on Distribution Network (New Delhi). The paper and presentation will present the methodologies GTG is using to evaluate pilot success, scalability and sustainability, as well as initial results about the first pilot to be completed, which focused on Coal-Based Flexible Power Generation. The presentation will also evaluate impacts of pilot interventions in terms of creating an evidence base and insights to aid Government of India agencies as they work to introduce regulatory norms and policy inputs to enable renewable energy's integration into power grids across India.

### The use of digital solutions to accelerate results-based financing and improve evaluation

**Mr Ingo Puhl**<sup>1</sup>

<sup>1</sup>*South Pole Group, Thailand*

The use of smart devices, Internet of Things, big data analytics greatly accelerates evaluation feedback loops and reduces the cost of data capture and processing. What are the implication of digitization on financing and evaluating the energy transformation?

# How clean energy transition with AI + Big Data Analytics impact with existing system

**Charlotte Wang**

*CEO, Equota Energy, China*

Charlotte will share how the energy industry uses Artificial Intelligence (AI) and big data to understand energy consumption profile details, uses software as service features for clients to obtain energy efficiency, critical equipment's predictive maintenance and energy load forecasting, and also assists policy makers to use that knowledge to support the clean energy transition to achieve executable and quantifiable results.

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## 4.1 Equity and access

### **Evaluation of Saubhagya (Universal Electrification) scheme of Government of India to assess the electrification and power quality status**

**Mr. Balawant Joshi**<sup>1</sup>

*<sup>1</sup>Idam Infrastructure Advisory Private Limited, Mumbai, India*

Despite the rapid developments in clean energy solutions, 1.1 billion people around the world still live without access to any form of electricity. Energy access is crucial for people to be part of national and global progress. Hence, United Nations in its Sustainable Development Goals has included affordable and clean energy access as Goal 7. Even though the Government of India had implemented several schemes in last few decades, by October 2017, India still had around 26 million households (~12%) without access to electricity. Recognizing this challenge, Central Government in October 2017 launched the Pradhan Mantri Sahaj Bijli Har Ghar Yojana (or Saubhagya). The scheme witnessed a policy transition from electrification of villages to connecting households both in both rural and urban areas by providing last mile connectivity. As per the Government data, 99.99% of households have been electrified, by March 2019 which is significant achievement. In this presentation, the author shall review electrification status through secondary data analysis and analyse quality of power received by households in rural areas. This would help policy makers in other developing countries in development of energy access policies and identifying focus areas.

### **Attaining Universal Energy Access for Social Change: Evaluating programs and policies to achieve energy transition for economic and social transformation**

**Lana Zaman**<sup>1</sup>

*<sup>1</sup>United Nations Economic and Social Commission for Asia and the Pacific, Bangkok, Thailand*

While development literature often discusses the critical importance of electricity access and clean cooking for improving economic and social wellbeing, there has been little rigorous evidence of the specific nature and magnitude of these benefits. ESCAP is currently conducting meta-analysis of rigorous impact evaluations to explore the demonstrated impacts of energy access on income, education, women's empowerment, inequality, and poverty alleviation in real-life settings. This presentation will quantify demonstrated benefits of access and will discuss what made certain access programs and policies successful – not just in terms of achieving access in a binary sense – but in terms of ensuring that access led to tangible socio-economic benefits. The presentation will further explore the demonstrated pathways through which electricity and clean cooking have led to socio-economic benefit. Based on the evidence, the presentation will provide practical guidance on what types of policies and programs effectively contribute toward achieving the energy transition in the face of growing energy demand.



## 4.2 Energy program and policy evaluation capacity building in Asia Pacific: Report from the field

**Dr. Edward Vine<sup>1</sup>, Ms. Nina Campbell<sup>2</sup>, Mr Romeo Santos<sup>3</sup>, Mr. Boonrod Yaowapruet<sup>4</sup>, Ms. Rislina Sitompul<sup>5</sup>**

<sup>1</sup>LBNL, Berkeley, United States, <sup>2</sup>Energy Efficiency and Conservation Authority (EECA), New Zealand, <sup>3</sup>University of the Philippines, Philippines, <sup>4</sup>Creagy, Nonthaburi, Thailand, <sup>5</sup>Indonesian Institute of Sciences, West Java Province, Indonesia

Evaluation capacity building (ECB) involves the design and implementation of teaching, training, technical assistance and online/virtual network groups and learning strategies to help individuals, groups and organizations learn about what constitutes effective, useful and professional evaluation practice. The ultimate goal of ECB is sustainable evaluation practice – where members continually ask questions that matter, collect, analyze, and interpret data; and use evaluation findings for decision-making and action, policy advocacy.

In this panel, five Energy Evaluation Asia Pacific (EEAP) Ambassadors discuss energy program and policy evaluation capacity building activities in their countries – past, present and future:

1. What is being done in their country to promote and support evaluation (for policy makers as well as for evaluation professionals)?
2. What energy programs and policies have been evaluated, or are planned to be evaluated?
3. What are the gaps, challenges and opportunities that exist at the moment?
4. What is being planned regarding evaluation capacity building?

The target audience is evaluators, program managers and policymakers. Most of the discussion will focus on future directions:

1. What is the role of government and the private sector in deciding on future directions?
2. What is the role of evaluators in working and supporting countries (especially government) for the future?
3. Should evaluators be certified?

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## 5.1 Unleashing the transformative potential of the SDGs a Panel Discussion

This panel discussion will focus on the progress of the Sustainable Development Goals (SDGs), the barriers that are emerging, and practical action on how to unlock these barriers. The four panellists have been brought together from different vantage points and perspectives:

Ed. Vine argues that the SDGs open up a completely new world of evaluation and challenges. Thinking beyond silos; instead connecting and interrelating interventions, examining integration, alignment and coherence across sectoral specializations.

As Commissioner, Gillian Sparkes reports and advises government on the environment. She is pioneering the implementation of the UN SDGs into environmental reporting for Victoria and is leading reforms in environmental monitoring, evaluation, assessment and reporting,

Terri Soller works to reimagine current thinking and approaches to building leadership capabilities, by creating spaces for collective, systemic and collaborative learning. Her expertise lies in building the capacity of whole systems (teams, organisations, sectors and communities) to adapt to new challenges and opportunities and face new realities.

Lana Zaman is an energy professional with over a decade of experience in energy, sustainability, and economic analysis. Lana is currently an Associate Economic Affairs Officer to the Energy Division of the United Nations Economic and Social Commission for Asia and the Pacific, a division committed to ensuring access to affordable, reliable, sustainable, and modern energy for all in Asia and the Pacific.

Michael Reid has worked in a number of capacities in relation to the SDGs over the last few years and has recently co-authored a paper published in Sustainability Science on *Assessing national progress and priorities for the Sustainable Development Goals (SDGs): experience from Australia*.

## 6.1 Development in focus: Renewable energy and evaluation

### Measuring Compliance with Corporate Commitments to Purchase Renewable Energy

**Mr. John Bruce Wells**<sup>1</sup>

<sup>1</sup>*USAID Vietnam Low Emission Energy Program, Viet Nam*

Direct Power Purchase Agreements (DPPAs) are bilateral agreements between electricity generators and power consumers for the delivery of power and the hedging of power prices. DPPAs have become popular worldwide as large corporations with well-known brands seek to meet global sustainability commitments and secure long-term power price certainty.

The US Agency for International Development (USAID) Vietnam Low Emission Energy Program (V-LEEP) is designing a pilot program that will allow the Government of Vietnam (GVN) to test the use of DPPAs. To meet GVN's objectives, which includes ensuring that corporate electricity buyers can successfully meet their sustainability commitments, V-LEEP recently examined global renewable energy (RE) purchasing initiatives (e.g., RE100, Carbon Disclosure Project, and the United Nations Alliance on Sustainable Fashion) to assess their reporting criteria and determine the elements of power market systems that would enable a determination of corporate compliance. V-LEEP's report describes and assesses various environmental attributes, reporting and tracking registries, and procurement options through which companies measure and report their progress in meeting these commitments. V-LEEP's work also reviews the legal and institutional experience in various jurisdictions for tracking generation and consumption of RE to meet the reporting criteria and identifies the required elements within a country's power market system.

### Evaluation of solar rooftop policies in India and preparation of a solar rooftop risk assessment framework for multi-family housing

**Ms. Sonia Shukla**<sup>1</sup>

<sup>1</sup>*Idam Infrastructure Advisory Private Limited, Mumbai, India*

National Solar Mission has provided a boost to the clean energy expansion in India. A total solar generation capacity of approx. 30 GW has been installed as on 31 March 2019. Ground mounted holds the majority share of ~26 GW, while the growth in rooftop solar has been dismal with ~3.4 GW capacity. Commercial and Industrial (C&I) consumers dominate the market for rooftop solar with 70% (2.4 GW) share of total installed capacity. Urban Residential sector, generally organised as high rise multi-family housing, offers a significant potential for rooftop solar owing to higher telescopic tariff, better paying capacity, decreased cost of solar system and awareness level of consumers. However, it has largely been neglected. Evaluation of rooftop solar policies across major states show lack of promotional incentives and access to finance as major barrier for adoption of rooftop solar in multi-family housing sector besides others. Limited information on the performance records of projects and limited knowledge of rooftop technology deters lenders to extend debt to these projects. Consequently, most of the rooftop solar capacity in multi-family housing is based on CAPEX model, where the consumer invests the capital required for installation of the system, limiting the adoption of solar technology. This work proposes to review the existing solar rooftop policies in India and develop a risk assessment framework for multi-family housing sector. It shall provide recommendations for policy makers and lenders to develop appropriate frameworks for promotion of rooftop solar and increasing availability of finance to eligible projects respectively.

### Enabling Local Renewable Energy Development: The Case of the Rizal Wind Farm (Philippines)

**Ms. Margery Bautista**<sup>1,2</sup>

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The findings of the case study proved that active participation through partnership with the private sector in governance was important to pursue local renewable energy (RE) development. It presented milestones that the private developer faced and how it addressed the problems it encountered particularly on social acceptability requirement, financial, technology transfer, and administrative challenges particularly mitigating measures to counter community impact of the project. Moreover, the Local Government Unit (LGU) support was crucial. A symbiotic relationship among the major actors were present but it was observed that active private sector participation, local engagement and local government support were indeed necessary alongside with institutional networks as imperative strategies to enable local RE development. Thus, the case showed the lessons learned and best practices of the private developer and LGUs in Rizal Wind Farm (Philippines). Asia pacific countries, private developers and local governments aspiring to implement RE projects shall benefit from the case experience.

## 6.2 Evaluation capacity building

### Creating an evaluation community in Asia: what's happened in the last two years?

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For the last several years, Energy Evaluation Asia Pacific (EEAP) has taken a leadership role in expanding the practice of, and capacity for, objective evaluation in the energy efficiency, renewable energy and energy-related (such as water and transportation) program and policy arena. In addition to creating a new website (energy-evaluation.org), it holds conferences, workshops and webinars to foster the development of self-sustaining evaluation communities in the countries in the Asia Pacific region. In addition to an organizing committee, EEAP has recruited 35 Evaluation Ambassadors from 24 countries in this region for communication purposes, so that an evaluation community will be developed. Furthermore, EEAP is working with non-energy evaluation organizations in this region as well as with several key international organizations.

This presentation will describe the capacity building activities conducted in the last two years since the first EEAP Conference in October 2017:

- EEAP activities: including new website, Evaluation Ambassadors, webinar.
- EEAP partner activities: including International Energy Agency's evaluation training in Asia Pacific, an evaluation panel at Asia Clean Energy Forum (organized by the Asia Development Bank), and ongoing efforts by the Asia Pacific Economic Cooperation's Energy Working Group, and the Independent Evaluation Group of the World Bank
- Ongoing evaluation projects in selected countries in Asia Pacific

The presentation will conclude by identifying potential future ideas and activities for EEAP and other organizations in continuing the development of an evaluation community in Asia.

### Evolving energy efficiency programs to focus on CO2 reduction: Implications for program evaluation

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The challenge of addressing climate change by reducing greenhouse gas (GHG) emissions is immense and requires economy-wide approaches to achieve meaningful outcomes. While policies mandating emissions reductions are an important tool, new programs are also needed to support families and organizations reduce their carbon footprint. Importantly, program oversight – including program evaluation – must be structured in a way that does not prevent meaningful action.

Energy efficiency, along with the effective grid-level integration of distributed renewable resources, provides significant reductions in GHG emissions. With this objective in mind, Southern California Edison is running the Clean Energy Optimization Pilot, a new program design concept aimed at supporting participants in achieving GHG emissions reductions in the ways that make the most sense for these customers and limit the requirements placed upon participants.

The authors believe that this program design provides a model for innovative programs that are primarily focused on GHG reductions through energy efficiency. This paper will provide an overview of the program design, as well as the evaluation design which combines a developmental process evaluation with meter-based quantitative analysis specifically designed to address emissions reductions at campus levels. The quantitative analysis introduces a novel approach to meter-based measurement for groups of buildings that segments end-use building types (residences, offices, laboratories, etc.) to increase energy-use predictability and the interpretability of results obtained. The Evaluation Plan also includes an embedded Process Evaluation to assess whether the customer participants' experience in the Pilot was simplified and easier to navigate than traditional program offerings.

## Updating Energy Efficiency Evaluation to Ensure Continued Socio-Environmental Relevance

**Dr. Rafael Friedmann<sup>1</sup>**

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Making energy efficiency again the core of social sustainability and climate change mitigation requires significant changes to current evaluation beliefs, practices, and policies. Changes needed to align evaluation with today's context and needs are covered.

It is imperative to align energy efficiency efforts to social sustainability and climate change mitigation. This requires a transcendental review of core beliefs shaping current energy efficiency evaluation that are no longer aligned with today's relatively mature energy efficiency market; where more data availability and analytics open new opportunities for programs and evaluation; and where more competitive, renewable supply options exist that efficiency needs to integrate with.

This work critiques core beliefs that constrain the development of more effective and relevant, energy efficiency efforts. Assessing program specific impacts and/or determining "net" savings in today's context are questioned. Can evaluation instead enable energy efficiency to co-exist with the design and implementation of broader efforts that foster socio-environmental sustainability?

Policy and programmatic evaluation changes that result in relevant, cost effective, and more interesting energy efficiency for society are discussed. These changes will maximize the value of energy efficiency for goals such as mitigating climate change, resolving constrained electric grid areas, flattening the "duck curve", enhancing local economies, or others.

The paper will enable those involved in policy design, regulation oversight, design and implementation, and/or evaluation/research to get more value from evaluations. It will help address mostly self-imposed constraints and enable us instead to maximize the benefits we get from energy efficiency efforts.

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## 7.1 Program Evaluation of International Financing Institutions: Increasing the impact of development organizations in the energy sector

**Mr Alfredo Baño Leal**

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International Financing Institutions (IFIs) play an important role in the development of the energy sector of the Asia Pacific region, not only because of the large financial support, but also because of their influence in policy and sector reform.

Interventions in the energy sector account for a large portion of total IFIs financial commitments. In many low-income countries, IFIs are the largest source of financing in energy infrastructures.

Evaluating the impact and results of energy sector interventions funded by IFIs are of paramount importance to governments of developing countries that rely significantly on concessional finance and technical assistance, as it is in the interest of borrowing countries to maximize the socioeconomic returns of such investments.

Further, after the Paris Agreement on 2015, countries need to work towards achieving the national determined contributions (NDCs) targets for mitigating global warming. Monitoring and evaluating the impact on climate change mitigation of IFI-financed projects is necessary to keep each country's efforts on track.

The session will bring together a panel of experts from government, IFIs and bilateral development organizations to discuss how IFIs monitor and evaluate energy operations, and what could be improved to maximize their impact from a number of perspectives, including climate change mitigation, energy security, energy equity, economic development, etc.

## Closing keynote presentations

### **Using evaluation to secure support: The experience of the GEF replenishment**

**Juha Uitto**

*Director of the Independent Evaluation Office (IEO), Global Environment Facility (GEF), USA*

In the Global Environment Facility (GEF), a major source of public funding on the environment to developing countries, evaluation is fundamental to the replenishment process. As GEF financing mostly takes the form of grants, the fund needs to be replenished on a four-year cycle. Every replenishment negotiation is preceded by a comprehensive evaluation that informs the development of new programming directions and policy agenda for the next replenishment cycle. The comprehensive evaluation conducted by the Independent Evaluation Office (IEO) is seen by the GEF donors as one of the key inputs to determining the size and direction of the next GEF funding period. The latest comprehensive evaluation was completed in December 2017. It provided confidence to the funders that the GEF was achieving results in improving the trajectory of the global environment. It also provided concrete lessons about what works and the determinants of GEF's performance, as well as the efficiency of its institutional arrangements.

One of the areas that the comprehensive evaluation looked at in detail pertained to the GEF climate change focal area focusing on the promotion of innovation, technology transfer, and supportive policies and strategies. It found that the greatest progress has been made within the energy efficiency portfolio where projects more frequently achieved direct greenhouse gas reductions and led to market change as compared with projects focused on renewable energy and sustainable transportation. These findings based on project and portfolio level analyses contributed directly to the further refinement of GEF strategies in the area.

A number of factors contributed to the use and influence of the evaluation. A fundamental factor pertains to the institutional arrangements whereby the IEO is an autonomous internal unit reporting directly to the GEF governing Council. This status provides IEO the independence to strategically set its own evaluation agenda and conduct the evaluations without interference. A related factor is the technical competence and credibility of IEO evaluations. When it comes to evaluation utility, timeliness is a key factor. The IEO in consultation with the Council decided to feed in results from the component evaluations as they became available, thus ensuring that evaluation findings could be incorporated into the replenishment proceedings in real time. Finally, the involvement of key stakeholders and decision-makers at critical junctures of the evaluation process contributed to buy-in. The findings and conclusions of the comprehensive evaluation were widely disseminated to broad stakeholder groups.

### **Subsidies to coal and their impact on renewables expansion**

**Lucky Lontoh**

*International Institute for Sustainable Development, Indonesia*

Renewable energy is advancing in Indonesia, and the government plans to support the rapid expansion of a wide variety of sources of renewable energy over the next decade. However, the growth in renewable energy may be limited as politicians and ordinary Indonesians do not wish to see further increases in electricity prices, making it difficult for them to make the necessary investments in renewables without larger subsidies. But the government does not wish to increase its subsidies. In this presentation, Mr. Lontoh will discuss this situation in Indonesia and identify the opportunities where renewables are the cheapest option and where barriers to deployment of competitive projects need to be removed.