

# WORKSHOP ON CLEAN COOLING SOLUTIONS IN ASIA AND THE PACIFIC REGION

**OCT. 28, 2020**

**Jointly organised by**



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Clean cooling has emerged as a necessary modern energy service in reducing poverty gaps and inequality. Vital to health and livelihood, clean cooling has become an important element towards transiting to a low-carbon future. As global temperatures continue to rise, it has become increasingly clear that additional expansion of air condition and its associated cooling energy demand could have environmental consequences. Lack of access to cooling, in particular, poses a significant challenge for economic development.

Based on a 2020 report of Sustainable Energy for All, more than 1 billion people globally, of which 592.7 million live in Asia, are facing high risks due to lack of access to cooling for basic needs.<sup>1</sup> According to a study by the International Labour Organization (ILO), it was estimated that the global economy would suffer a productivity loss amounting to USD 2.4 trillion worth annually, due to heat stress which is the equivalent of 80 million full-time jobs.<sup>2</sup> To help ensure a clean cooling environment for all, the Asian Development Bank (ADB), Sustainable Energy Association of Singapore (SEAS) and Sustainable Energy for All (SEforALL), co-organised the Clean Cooling Workshop for professionals in the cooling industry to share knowledge, experiences, and best practices on product availability, choices, and affordability. The presentation also includes perspectives and discussions on governmental-level policies for inclusive cooling solutions, and narrowing information gaps and increasing awareness. This year, SECOE's Clean Cooling Workshop saw 39 delegates coming from over 30 private organizations and government institutions.

### Opening Remarks



**Dr. Kee-Yung Nam**, Principal Energy Economist of the Asian Development Bank (ADB), opened the workshop welcoming all attendees and speakers while thanking ADB, the Sustainable Energy Association of Singapore (SEAS), and Sustainable Energy for All (SEforALL) for organizing the event. He outlined how clean cooling solutions are vital to the health and livelihood in the different sectors of the economy, as well as ensuring a low-carbon future. Citing the 2020 Cooling Report from SEforALL, Dr. Nam shared that more than 50% of the population in Asia is facing a high risk of access to basic needs due to the lack of cleaning solutions. He further highlights how clean cooling solutions will play a key role in enabling

universal access to health through effective distribution of vaccines to millions of people during the Covid-19 pandemic.

### Session 1: Clean Cooling Situation in the Asia and Pacific Region and the Role of the Government

This session discussed the status, issues, and prospects while establishing the importance of clean cooling solutions. With developments in cooling being relatively new compared with other modern energy services such as access to electricity, the session focused on the roles government plays in ensuring access to clean cooling solutions are affordable, equitable, and timely.

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<sup>1</sup> Sustainable Energy for All. 2019. Chilling Prospects: Tracking Sustainable Cooling for All. [https://www.seforall.org/sites/default/files/2019-11/SEforALL-Chilling\\_Prospects-Infographic.pdf](https://www.seforall.org/sites/default/files/2019-11/SEforALL-Chilling_Prospects-Infographic.pdf)

<sup>2</sup> International Labour Organization. 2019. Working on a Warmer Planet: The Impact Heat Stress on Labour Productivity and Decent Work. [https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms\\_711919.pdf](https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_711919.pdf).

### **Presentation 1.1: Cold Storage Chain Development in Southeast Asia**



**Diana Connett** (Energy Specialist, Southeast Asia Department, ADB) provided an overview of global vaccine development and the enormity of the challenge, particularly in Southeast Asia. Emphasizing on how the delivery of life-saving vaccines is a multisectoral challenge, Diana outlined the need for an energy framework in planning energy needs for cold chain technologies and improvements to cold chain pricing transparency to drive cold chain development in the region. The presentation ended off with a case study of Cold Chain Planning in Indonesia, showcasing insights into the problems faced by the island nation in combating the Covid-19 outbreak, and the use of a new multisectoral approach by the Indonesian Government and the Indonesian Cold

Chain Association for Vaccine Cold Chains.

### **Session 2: Innovative Technologies for Clean Cooling Solutions**

The session discussed innovative technologies in clean cooling — for health, agriculture, perishables, livelihood — that are applicable to the developing countries of the Asia-Pacific region. Highlighting the issues and challenges in adopting these new technologies, the session further delves into the recommendations in replicating and scaling-up of access to sustainable cold chain technologies for these developing countries.

### **Presentation 2.1: Sustainable Energy for All's Sustainable Cooling Solutions**



**Clotilde Rossi di Schio** (Energy Efficiency Specialist, SEforALL) presented a methodical approach in identifying Sustainable Cooling Solutions, based on the assessment of cooling needs across comfort and safety, food and nutrition, and health services and infrastructure. Noting the level of risk that the rural, urban, and lower-middle-income communities face due to lack of access to efficient cooling technologies and storage, Clotilde shared how SEforALL has developed multiple approaches including protect, reduce, shift, improve, leverage, across four solution pillars; technology, services, policy, and financial, for optimizing cooling solutions.

### Presentation 2.2: Ecozen Solution for Agriculture Cold Storage



**Devendra Gupta** (Co-Founder and CEO, Ecozen Solutions) opened his presentation by introducing how Ecozen is using technology-led solutions to support the agriculture supply chain in India comprising production, management, and access to broader markets. Outlining the current value chain gaps that include food loss, Devendra showcased the effects of pre-cooling on perishables. Pre-cooled products have a longer shelf life that help farmers and producers maintain the quality of perishables and optimize income and costs. Leveraging on innovative cold storage and mobile technologies, the presentation showed how smart solutions with renewable energy can provide value to the end-to-end supply chain.

### Presentation 2.3: Enabling Sustainable Cold Chain in India and Bangladesh



**Jiten Ghelani** (CEO, Promethean Power Systems) opened his presentation by giving an overview of the food challenges faced in India as part of poor cold chain infrastructure. Highlighting how 10% of food from farms get processed in India, Jiten shared that decentralized cold chain systems can be a great enabler for rural communities in providing access to better food quality and safety, while reducing the amount of food loss. Showcasing how Promethean Systems is tapping on new products and service models including, equipment as a service and chilling as a service models, Jiten closed his presentation by showcasing how these models are bringing value to the sustainable end-to-end cold chain infrastructure in India thus transforming its food supply.

### Q&A Session for Session 2 on Innovative Technologies for Clean Cooling Solutions facilitated by Clotilde Rossi di Schio, Energy Efficiency Specialist, SEforALL

The presenters were asked to weigh in on what can be done to accelerate the deployment of clean cooling solutions. Highlighting how much of the population in developing countries do not know the benefits of cooling, **Devendra** shared that more demonstrations and awareness-building for people in multiple geographies would allow them to see the value of sustainable cooling technologies and increase their acceptance and adoption rates. He added that building these technologies and systems in volumes



can bring down their costs and make them accessible to wider audiences, while having a variety of business models can increase the cooling technologies and solutions' affordability and viability.

**Jiten** shared that having innovative technologies and business models can significantly increase adoption. Giving a firsthand account of high adoption rates of chilling as a service model by startups, small- and medium-sized enterprises, and farmer groups, Jiten shared that the main challenges facing accelerated deployment of cooling technologies are the need for sufficient demonstrations in enough areas within the supply chain for the model to be replicated as well as the financial requirements to be matched with these models.

### **Session 3: Business Models for Clean Cooling Solutions**

This session presented the available business models in clean cooling that are applicable to the developing countries of Asia and the Pacific. Discussions covered how clean cooling solutions could be financed, replicated, and scaled up; how they will be set-up, operated, and maintained; and financial commitments can be increased to facilitate access to cooling. The session highlighted the importance of collaboration among government, non-government organizations, financial intermediaries, private sector, and communities in making the provision of clean cooling more efficient and effective.

#### **Presentation 3.1: A Change in the Weather – Cooling Efficiency and the Cooling Imperative**



**James Maguire** (Partner, Sustainable Development Capital LLP) provided an overview of the Kigali Cooling Efficiency Programme and its investment strategy for cooling efficiency in Asia. Noting how 40% of the world’s energy is used in buildings, James shared that air conditioning and refrigeration are some of the biggest opportunities for greenhouse gas emission reduction and improvements in efficiency. James discussed the Cooling as a Service (“CaaS”) business model, which is ripe for implementation in the region; issues surrounding counterparty credit risk; and the need for governments and financing institutions to support credit risks to drive clean cooling solutions.



### Presentation 3.2: Business Models For Clean Cooling Solutions



Presenting on the use of Energy Performance Contracting (EPC), **Gary Hui** (Chief Operating Officer, Energenz Consulting Limited) shared the need for different business models to address concerns on capital, functional, and resourcing needs. Exemplifying the use of the EPC model based on a case study that was managed by Energenz, Gary shared how the business model helped mitigate some of the risks posed by equipment and operational performance while retaining savings for the client. Gary shared the importance of managing stakeholder expectations and highlighted several factors under consideration in fine-tuning business models over time. These include equipment operating conditions affecting consumption, degradation, fault and failure, energy costs, and change of business requirements

due to the Coronavirus Disease (COVID-19) situation, renovation, or sale.

### Q&A Session for Session 3 on Business Models for Clean Cooling Solutions facilitated by Clotilde Rossi di Schio, Energy Efficiency Specialist, SEforALL



### Workshop on Clean Cooling Solutions in Asia and the Pacific (III)

⌵ FULL SCREEN

The presenters were asked to weigh in on the specific risks and challenges that cooling finances might face in the early stages and what could be done to accelerate finance flows to clean cooling projects.

**James** shared that from a credit evaluation perspective, it is a challenge to invest right now due to the credit risks for certain cooling projects particularly in the hospitality sector due to the ongoing COVID-19 pandemic. However, he shared that by working with other cooling efficiency program stakeholders within the Kigali network, and engaging other multilateral capital providers such as the Asian Development Bank and governmental ministries, support solutions such as partial-risk sharing guarantee models can be used to mitigate the risks of potential non-payments for clean cooling

projects. He added that more aggressive marketing is needed for the future of cooling technology to drive awareness and investment into the sector.

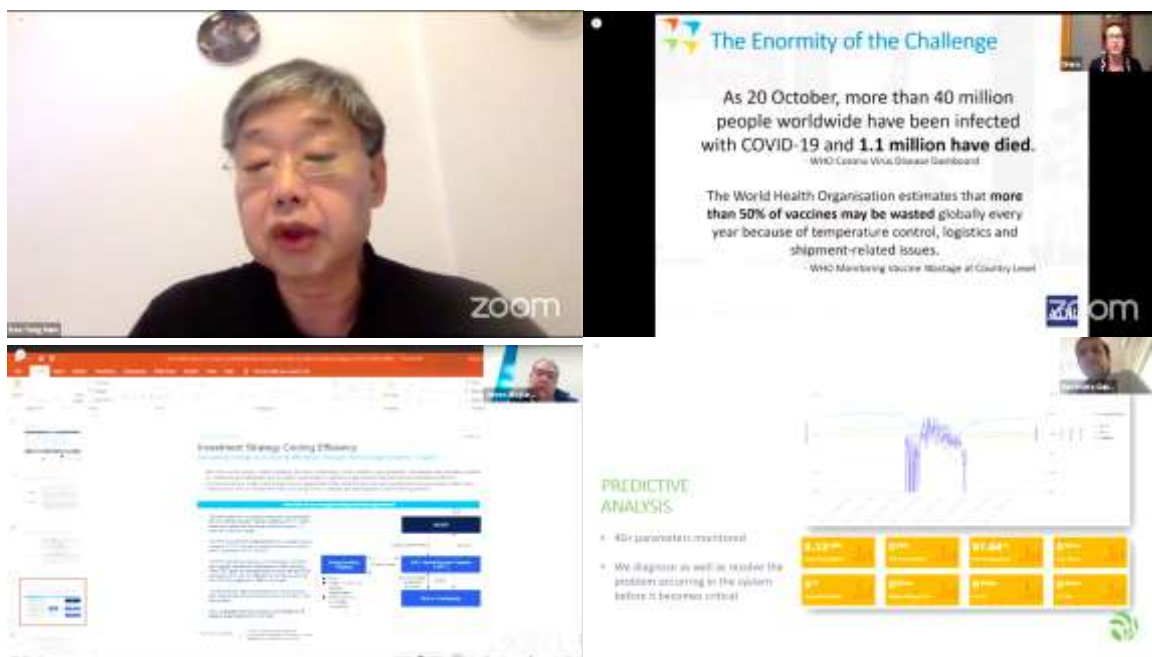
**Gary** shared that one of the obstacles faced is the differing expectations from the various stakeholders involved in the project. As such, it is important for project managers to manage expectations with various stakeholders through technical expertise and knowledge, including bringing on board representatives from the engineering, financial and sustainability side to drive clean cooling projects. He added that to accelerate financing of clean cooling projects, more successful case studies that are backed with data and knowledge have to be showcased and be disseminated to investors and financing institutions.

A second question was raised where presenters were asked on what could be done to accelerate learning and replication of the broad distribution of cooling technologies.

**James** answered highlighting the importance of cold chain projects in the Kigali efficiency program and role of governments in helping to bridge the gap in providing the first mile counterparty as well as mitigating some of the risks that come with financing these projects.

### Closing Remarks

**Clotilde Rossi di Schio** concluded the event by thanking all speakers for their presentations and perspectives on the cooling industry and value chain. Giving a recap on the presentations, Clotilde shared that on the technology front, audiences were given insights into the role of cooling in the fight against COVID-19, different technologies in the cold chain, as well as the impacts of food storage systems on farmers in increasing yield and reducing waste. While on the financial front, audiences learned the importance of business models, availability of financial resources, and support from the government and non-government organizations in deploying cooling solutions.





A Real EPC Model (ESCO's CAPEX)

CAPEX: 2.3M\$  
Savings Estimated: 500k

Scenario	Annual Savings (\$)
2015	99,000
2016	100,000

Annual Savings (\$)	Client	ESCO
\$1,000	100%	0%
\$100,000 - 100,000	80%	20%
\$100,000 - 100,000	50%	50%
\$100,000 - 100,000	20%	80%



## Annex 1 – Event Programme

<b>Workshop on Clean Cooling Solutions in the Asia and Pacific Region Wednesday, October 28, 2020</b>	
2:00 PM to 2:35 PM	<ul style="list-style-type: none"> <li>● Opening Remarks by <b>Dr. Kee-Yung Nam</b>, Principal Energy Economist of the Asian Development Bank (ADB)</li> </ul> <p style="text-align: center;"><b><u>Session 1: Clean Cooling Situation in the Asia and Pacific Region and the Role of the Government</u></b></p> <ul style="list-style-type: none"> <li>● Presentation 1.1: Cold Storage Chain Development in Southeast Asia by <b>Diana G. Connett</b>, Energy Specialist, ADB</li> </ul>
2:35 PM to 3:25 PM	<p style="text-align: center;"><b><u>Session 2: Innovative Technologies for Clean Cooling Solutions</u></b></p> <ul style="list-style-type: none"> <li>● Presentation 2.1: Sustainable Energy for All's Sustainable Cooling Solutions by <b>Clotilde Rossi di Schio</b>, Energy Efficiency Specialist, SEforALL</li> <li>● Presentation 2.2: Ecozen Solution for Agriculture Cold Storage by <b>Devendra Gupta</b>, Chief Executive Officer, Ecozen</li> <li>● Presentation 2.3: Enabling Sustainable Cold Chain in India and Bangladesh by <b>Jiten Ghelani</b>, Chief Executive Officer, Promethean Power</li> <li>● Q&amp;A Session for Session 2: Innovative Technologies for Clean Cooling Solutions facilitated by <b>Clotilde Rossi di Schio</b>, Energy Efficiency Specialist, SEforALL</li> </ul>
3:25 PM to 4:05 PM	<p style="text-align: center;"><b><u>Session 3: Business Models for Clean Cooling Solutions</u></b></p> <ul style="list-style-type: none"> <li>● Presentation 3.1: Business Models for Clean Cooling Solutions by <b>James Maguire</b>, Partner, Sustainable Development Capital LLP</li> <li>● Presentation 3.2: Business Models for Clean Cooling Solutions by <b>Gary Hui</b>, Chief Operations Officer, Energenz Consulting Ltd</li> <li>● Q&amp;A Session for Session 3: Business Models for Clean Cooling Solutions facilitated by <b>Clotilde Rossi di Schio</b>, Energy Efficiency Specialist, SEforALL</li> <li>● Closing Remarks from by <b>Clotilde Rossi di Schio</b>, Energy Efficiency Specialist, SEforALL</li> </ul>

## Annex 2 – Attendance Overview

Groups	First name	Last name	Job title	Company	Country
Speaker	Kee-Yung	Nam	Principal Energy Economist	Asian Development Bank	Philippines
Speaker	Kavita	Gandhi	Executive Director	Sustainable Energy Association of Singapore (SEAS)	Singapore
Speaker	Gary	Hui	Chief Operations Officer	Energenz Consulting Ltd	Hong Kong
Speaker	Jiten	Ghelani	CEO	Promethean Power	India
Speaker	Diana	G. Connett	Energy Specialist	Asian Development Bank	Vienna
Speaker	Hu	Min	Executive President, Institute of Finance and Sustainability, and Director, IFS' Energy and Climate Center	Institute of Finance and Sustainability, and IFS' Energy and Climate Center	China
Speaker	Clotilde Rossi	di Schio	Energy Efficiency Specialist	Sustainable Energy for All	Vienna
Speaker	Devendra	Gupta	Chief Executive Officer	Ecozen	India
Speaker	James	A. Maguire	Partner	Sustainable Development Capital LLP	Hong Kong
Speaker	Adrien	HUMBERT	Program Manager	ENGIE Lab Singapore PTE LTD	Singapore
Delegate	Bayarmaa	Amarjargal	Young Professional, South East Asia Department	Asian Development Bank	Philippines
Delegate	Hueh chuah	Ong	Project Manager	Nanyang Technological University	Singapore
Delegate	Vincent	Phang Cheh Sine	Heads of BD	G8 Subsea Pte Ltd	Singapore
Delegate	David	Brunt	CEO	YINSON RENEWABLES SINGAPORE	Singapore
Delegate	Vincent	OR	Deputy Director	Energy Market Authority	Singapore
Delegate	Celine	Paton	Senior financial analyst	Solar Energy Research Institute of Singapore	Singapore
Delegate	Wee Khiang	Toh	Director	National Energy Transformation Office, EMA	Singapore
Delegate	Ingo	Puhl	MD, South East Asia	South Pole	Thailand
Delegate	Alexandre	Maravel	Managing Director	DEIF	Singapore
Delegate	Mikael	Melin	Senior Specialist	SEforALL	Vienna
Delegate	Fely	Arriola	Access to Energy Expert (Consultant)	Asian Development Bank	Philippines
Delegate	Denise	Encarnacion		Asian Development Bank	Philippines
Delegate	Fritzie	Vergel	Sustainable Energy Consultant	Asian Development Bank	Philippines

Delegate	Grace	Yeneza	Consultant	Asian Development Bank	Philippines
Delegate	Walter	Marin	CEO	Plug The Sun	Hong Kong
Delegate	Michael	Trainor	Energy Specialist	Asian Development Bank	Philippines
Delegate	Lia	Roslan	Consultant	NIL	United Kingdom
Delegate	Ed	Brown	Research Director, MECS	Loughborough University	United Kingdom
Delegate	Thomas	McMahon	Chief Executive Officer	AirCarbon Pte. Ltd.	Singapore
Delegate	Brendan	Lim	Consultant	NIL	Singapore
Delegate	Anne	Kania	Executive VP	Floating Island International	United States
Delegate	Atsumasa	Sakai	Senior Energy Specialist	Asian Development Bank	Philippines
Delegate	Yan	Wang	Cluster Director	Solar Energy Research Institute of Singapore	Singapore
Delegate	Kok Ann	Tan	Director	Ameqa Precess Management Pte Ltd	Singapore
Delegate	Philipp	Schmaelzle	Managing Engineer	X	United States
Delegate	Hiroyuki	Okada	Consultant	Deloitte Tohmatsu Consulting LLC	Singapore
Delegate	Cheng Guan	Tan	Head, Renewables & Environment Businesses	Sembcorp Industries	Singapore
Delegate	Arifeen	Wahed	Senior Research Fellow	SERIS	Singapore
Delegate	Ana Maria	Tolentino	Sustainable Energy Policy and Institutional Expert (Consultant)	Asian Development Bank	Philippines
Delegate	Maria Dona	Aliboso	Operations Analyst	Asian Development Bank	Philippines
Delegate	Lyndree	Malang	Energy Economist (Consultant)	Asian Development Bank	Philippines
Delegate	Nicholas	Ng	Project Manager	Energetix Pte Ltd	Singapore