

## ***Enhancing Energy Sector Climate Resilience in Asia***

### **Asia Clean Energy Forum (5-8 June, 2017) - Manila, Philippines**

#### **Background**

Asia is one of the fastest growing regions in the world in terms of GDP and projected energy demand. To meet this rising energy demand and other energy objectives such as improving energy access and enhancing energy security, governments across Asia are planning significant energy and infrastructure investments. At the same time, the region is particularly vulnerable to climate change impacts, motivating both climate change mitigation and adaptation efforts. For the energy sector, extreme weather events, rising temperatures, and changes to precipitation patterns pose a range of risks to energy infrastructure, supply, and demand:

- Energy infrastructure (including oil & gas infrastructure, power plants, and transmission lines) face risks of physical damage from increasing frequency and magnitude of extreme weather events, causing disruptions in the supply of electricity, oil, and gas. Coastal and off-shore infrastructure face compounded risks from sea level rise and increased flood risk. For instance in Southeast Asia it is estimated that 55 million residents will live in areas below sea level or regular flood levels by the end of the century<sup>1</sup>.
- Increasing water stresses caused by changing hydrological patterns have direct repercussions for hydropower generation, which makes up important shares of electricity generation and considerable installed capacity in certain Asian countries<sup>2</sup>. Thermal power generation - particularly coal, which notably comprises the majority of the generation mix in China and India - is also highly dependent on the availability of water for steam cooling. Rising water constraints can increase cooling costs for power plants and may require adoption of alternative cooling technologies or improved water management practices.
- Rising temperatures reduce the efficiency of electricity transmission and distribution lines, as well as that of thermal processes in power plants. Projected hotter temperatures, including more frequent and intense heat waves,<sup>3</sup> will increase cooling and energy demand during the summer months<sup>4</sup>.

Looking ahead, a growing and changing energy system characterised by increased electrification, more variable renewable energy, and other low-carbon energy technologies (e.g. CCS) may alter the nature of the climate resilience challenge in Asia, as water demand, the ability to localise and buffer supply disruptions, and risks from extreme weather events, all evolve.

While Asian countries share a vulnerability to climate change impacts, they are equipped with varying capacity to adapt or mitigate these impacts. Countries are characterised by diverse energy mixes, levels of economic development, and energy access. Yet these differences may also be strengths, if countries

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<sup>1</sup> New York Times (2014), *Flooding Risk from Climate Change, Country by Country*.

<sup>2</sup> Hydropower represents considerable installed capacity in China (304 GW), Japan (50 GW), India (45 GW), Viet Nam (15.8 GW) and Indonesia (5.3 GW). It represents important shares in electricity generation in various countries: (Myanmar (75%), Laos (97%)

<sup>3</sup> IPCC (2014), *Part B: Regional Aspects in the Fifth Assessment Report, Working Group II: Impacts, Adaptation, and Vulnerability*.

<sup>4</sup> IEA (2013), *World Energy Outlook Special Report: Redrawing the Energy-Climate Map*, OECD/IEA, Paris.

work together to support each other and strengthen the overall resilience of their energy systems with stronger coordination and integration. As such, cooperation – both intraregional and international – are key for unlocking the many challenges and opportunities that lay in the pathway to achieving greater energy access while ensuring climate resilience.

### **Climate-Energy Security Nexus: Regional Focus on Asia**

Building on past Nexus Fora, the IEA's seventh workshop will have a regional focus on Asia, to be held as a series of sessions within the Asia Clean Energy Forum in Manila, Philippines to:

- Improve understanding of the climate risks facing the energy sector in Asia and the landscape of current policies/programs addressing these risks;
- Explore the potential implications of a low-carbon transition (e.g. more variable renewables, increased electrification) on resilience;
- Share regional and international best practices in identifying, assessing, and addressing risks to enhance resilience, particularly in the areas of policy development and financing resilience-building investments;
- Identify uncertainties, challenges, and needs for data, modelling, tools, and policy;
- Identify and discuss opportunities to strengthen regional and international collaboration on resilience.

Since 2012, the IEA has convened six workshops under the Forum on the Climate-Energy Security Nexus: to raise awareness about the risks faced by the energy sector from climate change and to facilitate dialogue between businesses, researchers, and policy-makers to explore and share ideas and best practices on enhancing resilience.

Further information on IEA's work on energy sector climate resilience, including workshop reports from each Nexus Forum, can be found here: <http://www.iea.org/topics/climatechange/subtopics/resilience/>.

## **DRAFT AGENDA**

### **ENHANCING ENERGY SECTOR CLIMATE RESILIENCE IN ASIA**

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ADB Headquarters, Manila, Philippines

#### ***Deep Dive Workshops (5 June)***

##### **2:00-3:30pm Creating an enabling environment to enhance climate resilience**

*In this session, speakers will discuss how enabling policy and financial environments can be established to drive resilience-building investments and business practices in the energy sector.*

- How can government policies and regulations drive businesses to build resilience, particularly alongside other objectives (decarbonisation, energy access, affordability)?
- What measures can be taken to ensure the low carbon transition, including deployment of variable renewables, promotes rather than threatens system resilience?
- What are successful models being used to finance resilience-building activities? How can momentum in driving investment for clean energy and energy efficiency be used for resilience objectives and how can we move beyond financing disaster recovery to investing in climate preparedness of assets?

<b>Moderator</b>	<b>Caroline Lee, IEA</b>
Mindanao Development Authority (MinDA)	<b>Romeo Montenegro</b> , Deputy Executive Director
Australia Energy Market Operator (AEMO)	<b>Sorrell Grogan</b> , Engineer, Operations Department
International Energy Agency (IEA)	<b>Peerapat Vithayasrichareon</b> , Energy Analyst, Systems Integration of Renewables
Asian Development Bank (ADB)	<b>Andrew Jeffries</b> , Director, Southeast Asia Energy Division

## 4:00-5:30pm Building resilient energy assets and infrastructure

*In this session, speakers will highlight best practices in building resilience into existing and new energy infrastructure, as well as the barriers that are creating challenges for asset owners, managers, and operators.*

- How are energy asset owners/managers identifying and assessing climate risks, and how do these assessments inform investment and operational decisions?
- What gaps or barriers are creating challenges in identifying and addressing climate risks to energy assets?
- What are best practices in leading power and oil and gas companies, and how can they be shared?

<b>Moderator</b>	<b>Jesus Posadas</b> , Undersecretary, Philippines Department of Energy
World Bank	<b>Vivien Foster</b> , Global Lead, Energy Economics, Markets & Institutions, Energy and Extractives Global Practice
China National Petroleum Corporation (CNPC)	<b>Shi Jing</b> , Chief Editor, Department of Corporate Presentation
Eskom	<b>Lwandle Mqadi</b> , Specialist, Climate Change and Sustainable Development: Group Risk and Sustainability (via video conference)

## Energy Futures Stream (June 7)

### 11:00-12:30 Energy Resilience at the Food-Energy-Water Nexus

*Speakers in this session will discuss the challenges and opportunities of enhancing energy sector climate resilience, through the lens of the food-energy-water nexus.*

- What are the short- and long-term climate risks to the energy sector in Asian countries, in particular at the food-energy-water nexus?
- How can changing water needs of the energy sector be better managed, particularly during the low-carbon transition?
- What are the potential synergies in pursuing clean energy and resilience, and how can both public and private financing be enhanced for projects with mitigation and adaptation co-benefits?

Moderators	<b>Caroline Lee</b> , International Energy Agency (IEA) <b>Frédéric Asseline</b> , Asian Development Bank (ADB)	
Scene-setting	<b>Paul Simons</b> , Deputy Executive Director, IEA	
	<b>Gil-Hong Kim</b> , Senior Director, concurrently Chief Sector Officer, Sustainable Development & Climate Change Department, ADB	
Presentations	International Renewable Energy Agency (IRENA)	<b>Divyam Nagdal</b> , Associate Programme Officer
	Asian Development Bank (ADB)	<b>Pradeep Perera</b> , Principal Energy Specialist
	International Hydropower Association (IHA)	<b>Bill Girling</b> , Program Director, Hydropower Development