

ASIA CLEAN ENERGY FORUM 2019

PARTNERING FOR IMPACT

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Deep Dive Workshop

Next-gen Utilities for a Smart Energy Future



USAID
FROM THE AMERICAN PEOPLE



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Background

Most of the economies in South and Southeast Asia region are now witnessing a paradigm shift in the power sector, which is being driven by increased viability of distributed renewable energy (RE) sources, plans for proliferation of new electricity loads like electric vehicles (EVs) and increasing consumer centricity driven by enablement of two-way power flows. Incorporating these new energy transformations not only have operational and financial implications but also require structural changes in order to sustain the transition. Nations across the region have identified distribution grid upgrades and automation as key solutions and are committing themselves in implementing these initiatives at a national-scale through both operational and structural measures.

Some of the identified and currently implemented measures across the region include:

- Large scale roll-out of Advanced Metering Infrastructure and focus on implementation of smart infrastructure
- Schemes and programs for enabling financial and operation turnaround.
- Liberalization of electricity retail markets and mechanisms for increasing private sector participation in electricity distribution
- Programs and incentives for accelerating implementation of DERs and grid-connected RE

While few of the utilities across the region have advanced in their grid modernization maturity curve, most are still in the early stages of their transition towards a clean and smart energy future and are seeking viable and innovative solutions to accelerate on this path. Therefore, in this context, planning and implementation experiences from different parts of the world (both developed and developing nations) could provide a great learning opportunity for utilities across the Asian region to develop and implement new, holistic approaches to manage the electrical grid of the future and deliver cleaner, reliable, quality and affordable electricity for all.

Objective

This DDW will provide participants, particularly those from developing countries, an opportunity to gain insights on:

- 1) Distribution reform options for ensuring sector viability in the new energy paradigm including experience sharing
- 2) Innovations and best practices for transforming utility to smart grids in areas of technology selection, business models and consumer engagement and participation schemes
- 3) Opportunities and models for scaling-up rooftop PV solutions
- 4) Power market design options and role of associated institutions

This would enable policy makers, utilities and participants to learn from the experiences of both developed and developing economies for efficient and viable operation of the power sector which is centric to customer needs. It will also foster regional cooperation, support networking and build business opportunities in the area of smart power distribution.

Agenda

8:30-9:00

Registration

9:00-9:20

Inaugural Session

- Welcome Remarks – Senior ADB Representative
- Opening Remarks – Senior USAID Representative
- Special Remarks – Senior DFID Representative
- Brief overview of USAID ‘Smart Power for Advancing Reliability and Connectivity’ (SPARC) program and showcase of economic assessment tool for enabling smart grid investments in emerging economies ¹ -(USAID Representative)

Brief Overview of DFID Power Sector Reforms (PSR) Programme and showcase of Smart Grid Readiness- Self Assessment Tool ²- (DFID Representative)

9:20-10:50

Session 1: Distribution reforms in the changing utility paradigm

Session Description: A number of initiatives related to financial turnaround schemes, strengthening of electricity network, private participation models in distribution companies, etc. are being undertaken by different countries for improving the operational and financial performance of the electricity distribution companies. However, there is a need to complement these with comprehensive structural reforms focusing on liberalizing the sector, increased private sector investments, etc. for accelerating the improvement and sustenance of the same over time.

The speakers in this session will focus on the following aspects:

¹ Tool is used for undertaking economic and financial impact of the investments of different smart grid technology use cases

² Tool helps in evaluating utility readiness to implement smart grid initiatives, and in supporting inter-se learning from each other

- Experience on structural changes including retail competition (choice to customer) and private sector participation
- Experience on financial and operational turnaround schemes implemented for power distribution companies

Moderator: Senior Representative from Rajasthan Electricity Regulatory Commission, India

Presenter(s) – people or organizations:

- Vikas Gaba, Partner, KPMG India - Context and theme setting
- Representative from the Ministry of Power, Government of India – Experience sharing on transformation schemes implemented in India (UDAY, IPDS, Saubhagya) for distribution sector turnaround
- Ofgem or Department for Business, Energy and Industrial Strategy, U.K. – Experience sharing on Great Britain electricity retail competition model
- Energy Market Authority, Singapore - Experience on Design of liberalized electricity market (1st Asian country to launch competitive market)
- TBD Representative from Philippines: Case of private sector participation in electricity distribution in Philippines

Nepal Electricity Authority (NEA): Case of financial and operational turnaround of NEA

10:50–11:00

Tea Break

11:00–12:30

Session 2: Smart infrastructure for efficiency and customer centric operation

Session Description: In order to sustain and support the structural changes in the new energy paradigm, a transition to ICT enabled smarter grid becomes critical. A smart energy system would help deliver electricity more effectively and efficiently than the systems of today by enabling real time grid visibility and control and empowering consumers with greater control and choices.

The speakers in this session will discuss on their experience (challenges, learnings, benefits) in deploying smart technologies for enabling operational, financial and social benefits, including integration of new electricity loads. The discussion would also focus on potential business models for accelerating investments in smart grid technologies, considering the current constraints on resource and financial capability. Specifically, session would include experience sharing on:

- Smart grid business models and technologies – key use cases and tools for informed investments
- Digital initiatives to enhance customer experience and participation
- Serving new electric loads – Business models for smart EV Charging infrastructure (including G2V and V2G interactions)
- Frameworks for institutional strengthening and skill up-gradation in a smart energy future

Moderator: Senior ADB Representative

Presenter(s) – people or organizations:

- International Smart Grid Action Network (ISGAN) – Global smart grid technology and policy landscape and lessons learned/best practices for developing nations (could be representative from US or any other member country)
- Electric Power Research Institute (EPRI) or Southern California Edison, U.S.³– Experience sharing on planning, implementation and operationalization of Smart Infrastructure solutions including AMI implementation, EV charging, dynamic tariff, net metering, distribution automation, consumer engagement schemes, etc.
- Representative from Energy Efficiency Services Ltd (India) – Business Model and Financing Innovations for Accelerating EV charging Infrastructure for Developing Nations (also covering initiatives taken up through ADB financing)
- USAID/India - Sustained mechanisms for continuous strengthening of institutions and enabling skill upgradation for new energy future – Implementation of Smart Grid Knowledge Center
- Energy Policy and Planning Office, Ministry of Energy, Thailand - Experience sharing on design of Energy 4.0 blueprint focusing on electric vehicle, smart grid and energy storage and SPP hybrid

Smart Energy GB, U.K⁴ - Best practices in consumer engagement and participation for smart grid

12:30-13:30

Lunch Break

13:30-15:00

Session 3: Power Market Design and Role of Associated Institutes: Efficiently designed Power Markets can serve as an alternative mechanism for supporting both existing capacities and creating new pipelines of capacity. However, the current market mechanisms in most emerging economies of Asia, need to evolve beyond the reliance on just bilateral and Day-Ahead Market (DAM) for effective market operations. In this regard, Real Time Markets (RTM) and Ancillary Services (AS) can play a significant role in improving reliability and control, particularly in view of increasing share of intermittent and variable RE. However, even if the technical abilities exist to implement more advanced market designs, the current readiness of the utilities and their operating realities limit the possibilities of a rapid transition to deep markets in a short period. Hence, the operational practices and role of the utilities and associated institutes need to be re-designed/evaluated for improving efficiencies and enabling their active participation efficiencies in wholesale markets.

Session participants would thus discuss on their experience in implementing real time market design, RE forecasting and scheduling models, CFDs, Capacity Markets, balancing and ancillary services, etc. Specifically, session would include experience sharing on:

³ <https://gridwise.org/about-gridwise-alliance/> California is the leading state on grid modernization efforts in U.S. SCE is an investor owned utility which provides electric service to ~5 million consumers in California. Some of the Smart Grid measures it has introduced include ~99% AMI implementation, EV charging, dynamic tariff, consumer engagement schemes, Distribution Resource Plan, etc.

[http://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About_Us/Organization\)/Divisions/Office_of_Governmental_Affairs/Legislation/2019/CPUC%20Smart%20Grid%20Annual%20Report%202018.pdf](http://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About_Us/Organization)/Divisions/Office_of_Governmental_Affairs/Legislation/2019/CPUC%20Smart%20Grid%20Annual%20Report%202018.pdf)

⁴ <https://www.smartenergygb.org/en> Smart Energy GB is the national consumer engagement body supporting the smart meter rollout in Britain. Their objectives include: grow consumer awareness and understanding; build consumer confidence in smart meters; assist more vulnerable consumers to realize the benefits of smart meters; reach out to support small businesses, where cost-effective

- Real time markets design
- RE forecasting and scheduling
- Feed-in Tariffs with Contracts for Difference⁵
- Capacity Agreements (within a capacity market)⁶
- Balancing and Ancillary Services
- Role of associated institutes

Moderator: Senior DFID Representative

Presenter(s) – people or organizations:

- Anish De, Partner, KPMG India – Context and theme setting
- Energy Market Authority, Singapore: Singapore’s experience in design of real time wholesale electricity markets (National Electricity Market of Singapore)
- Ofgem, U.K. - UK’s experience in design of wholesale energy markets
- International Energy Agency (IEA) - Best practices in new electricity market design to address the 21st century challenges of transitioning to low-carbon electricity.
- National Renewable Energy Laboratory (NREL), U.S. - Experience of U.S. on testing alternative market designs and their impact on flexibility, electricity production cost, renewable curtailment, and system balancing.

GIZ – Experience of European Union in design of power markets

Tea Break

15:00-15:30

15:30-17:00

Session 4: Utility Business Models for the Future of Rooftop PV: The rapid decline in costs of solar and wind power, energy storage and more broadly smart grid technology is set to facilitate the growth of distributed PV (DPV) solution around electricity networks. However, proliferation of distributed PV poses unique challenges to utilities, who often fear loss of revenue - which could possibly be a barrier to deployment. But despite the potential revenue impacts, DPV can provide a significant business opportunity for utilities.

The speakers in this session will discuss on their experience in deployment of innovative business models and approaches that allow utilities to participate in the rooftop PV revolution. Additionally, drawing from experiences in Thailand, Philippines and India, this session would explore the magnitude and timing of potential utility financial impacts from DPV among ASEAN countries. Specifically, session would include experience sharing on:

- Innovative Utility Business Models for the Future of Rooftop PV
- Retail electricity rates and DPV compensation mechanisms
- DPV Impacts on Utility Revenues and Rates
- Costs and benefits of distributed solar from various stakeholder perspectives

Moderator: Senior USAID Representative

Presenter(s) – people or organizations:

⁵ Long-term contracts which provide revenue certainty to investors in low-carbon generation such as renewables, nuclear etc.

⁶ Payments for reliable capacity to be available when needed, helping to ensure security of supply.

- NREL or Lawrence Berkeley National Laboratory (LBNL), U.S. - Context and Theme setting
- TBD Philippines and/or Thailand Country Representatives- DPV Impacts on Utility Revenues and Rates: Lessons from Thailand and the Philippine
- TBD U.S. Utility Representative - Utility Business Models for the Future of Rooftop PV
- TBD India Country Representative- Designing win-win low-income DPV programs in India
- TBD Thailand Country Representative - Peer-to-peer energy exchange via blockchain pilot in Bangkok, Thailand

USAID Representative - Analysis & Decision Support Tools for a Distributed Future

About the Organizers

1. **USAID** leads international development and humanitarian efforts to save lives, reduce poverty, strengthen democratic governance and help people progress beyond assistance. USAID carries out U.S. foreign policy by promoting broad-scale human progress at the same time it expands stable, free societies, creates markets and trade partners for the United States, and fosters good will abroad. USAID works in over 100 countries to:
 - Promote Global Health
 - Support Global Stability
 - Provide Humanitarian Assistance
 - Catalyze Innovation and Partnership
 - Empower Women and Girls
2. ADB in partnership with member governments, independent specialists and other financial institutions is focused on delivering projects in developing member countries that create economic and development impact. As a multilateral development finance institution, ADB provides loans; technical assistance; and grants. To achieve the vision, ADB focuses on seven operational priority areas.
 - Addressing remaining poverty and reducing inequality
 - Accelerating progress in gender equality
 - Tackling climate change, building climate and disaster resilience, and enhancing environmental sustainability
 - Making cities more livable
 - Promoting rural development and food security
 - Strengthening governance and institutional capacity
 - Fostering regional cooperation and integration
3. DFID leads the UK's work to end extreme poverty. We are tackling the global challenges of our time including poverty and disease, mass migration, insecurity and conflict. DFID's work is building a safer, healthier, more prosperous world for people in developing countries and in the UK too. DFID's priorities include:
 - Strengthening global peace, security and governance
 - Strengthening resilience and response to crisis
 - Promoting global prosperity
 - Tackling extreme poverty and helping the world's most vulnerable
 - Delivering value for money