The power system of tomorrow: pathways towards large-scale integration of variable renewable energy

5 June 2017, Monday, 2.00 – 5.30 pm
6 ADB Avenue, Mandaluyong City 1550, Metro Manila, Philippines

Overview

The past few years have seen impressive growth in the global installed capacity of variable renewable energy (VRE) such as solar and wind, due to rapidly falling prices that in some cases have become competitive with traditional thermal generation. With continued cost reductions for RE technologies, increased competition among generators, and countries setting ambitious RE goals and targets – VRE penetrations will increase as a proportion of grid supplied electricity. Proper preparation is needed to address the integration challenges associated with this rapid growth of VRE to ensure reliable and cost effective operation of power systems. Successful VRE integration requires the application of adequate technical and regulatory interventions, coordination of actors, and profound market foresight.

This year’s Deep Dive Workshop will be guided by three sets of VRE integration ‘intervention areas’. We will use these ‘intervention areas’ to establish the scope of what is technically possible, and will discuss multiple pathways to achieve such changes, drawing on case studies from Asia and beyond.

- Role of the existing generation fleet
- Role of variable renewable energy
- Role of transmission system, including operations

Objectives and learning outcomes

1. Identify various options & actions for successful vRE integration;
2. Identify opportunities for stakeholder coordination;
3. Disseminate lessons learned from countries which are at various stages of vRE integration
## Schedule

**Moderation:** Christoph Menke

### Start of workshop

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| 02:00 p.m. | Welcoming address and introduction of workshop aims  
Speaker: Christoph Menke |
| 02:00 p.m. | Introduction by USAID  
Speaker: Jennifer Leisch, USAID |
| 02:05 p.m. | Renewable Integration: Experiences from International Cooperation  
Speaker: Frank Seidel, GIZ |
| 02:10 | Increasing system flexibility through market & non-market options  
Speaker: Jaquelin Cochran, NREL |
| 02:45 | The German energy transition & integration of vRE: Dispatching and evacuation of RE generation  
Speaker: Niels Ehlers, 50Hertz Transmission |
| 03:30 p.m. | Coffee-Break |
| 04:00 p.m. | Integration of variable renewables in India – The Role of Renewable Energy Management Centers  
Speaker: Kashish Bambhani, POWERGRID CORP India |
| 04:15 p.m. | Integration of variable renewables in the Philippines  
Speaker: TBC (Department of Energy, Republic of the Philippines) |

#### Start of panel discussion
Panelists: Jaquelin Cochran, NREL  
Niels Ehlers, 50Hertz Transmission  
Kashish Bambhani, POWERGRID CORP India  
Kamani Jayasekera, Ceylon Electricity Board  
PH Representative

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| 05:25 p.m. | Workshop wrap-up  
Speaker: Christoph Menke & Jennifer Leisch (USAID) |

### End of workshop

### Speakers

**Christoph Menke, Trier University of Applied Sciences**  
Prof. Dr. Christoph Menke is full professor for energy technology at the Trier University of Applied Sciences, Germany, and Distinguished Professor at the JGSEE/KMUTT, Bangkok. He worked in international organizations, like the Caribbean Development Bank, the World Bank and for the German International Cooperation (GIZ) and at the TATA Energy Research Institute in Bangalore, India. Christoph Menke is a senior energy expert for energy technologies, like solar energy and Co-Generation
and for energy policy and energy planning. His special area is energy system analysis, renewable energy system planning and energy efficiency especially in the industrial sectors. Since 2004 he is active in energy policy advisory in ASEAN countries, mainly Thailand, The Philippines, Indonesia and Vietnam. He contributed to the renewable energy plan and the recent energy efficiency plan of the Royal Government of Thailand in close cooperation with JGSEE.

**Jennifer Leisch**, *Climate Change and Clean Energy Specialist, USAID*
Jennifer Leisch is a Climate Change and Clean Energy Specialist supporting the U.S. Enhancing Capacity for Low Emission Development Strategies (EC-LEDS) initiative. She leading USAID’s Greening the Grid program, providing tools, best practices, and pilots approaches to bringing grid-connected renewable energy to scale. Prior to coming to USAID, Dr. Leisch worked in renewable energy technology R&D, focused on solar photovoltaics and fuel cells. She holds a Ph.D. in Applied Chemistry and Materials Science from the Colorado School of Mines.

**Jaquelin Cochran**, *Senior Energy Analyst, NREL*
Jaquelin Cochran is a Senior Energy Analyst with the National Renewable Energy Laboratory. Dr. Cochran analyzes policies and market designs that create an enabling framework for emerging energy technologies (renewable energy, demand response, distributed generation), with a focus on best practices for grid integration of renewable electricity. Prior to NREL, Dr. Cochran was an Assistant Professor of Natural Resource Management with KIMEP University in Almaty, Kazakhstan. She also served as a Peace Corps Volunteer for two years with the Polish Foundation for Energy Efficiency (FEWE) in Krakow. She holds a Ph.D. and M.A. from the Energy & Resources Group at the University of California at Berkeley.

**Frank Seidel**, *Energy Advisor, GIZ*
Frank Seidel is a renewable energy advisor and planning officer at Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). He structures and advises bilateral energy projects. Within his work he focuses on renewable energy policy and strategy, with an emphasis on identifying and mainstreaming methods for the least-cost integration of variable renewable energies in power systems of emerging and developing economies. Mr Seidel holds degrees in economics and energy policy from the University of Bayreuth (GER) and Sussex University (UK).

**Niels Ehlers**, *Head of Concepts and System Strategy at 50Hertz Transmission*
Dr. Niels Ehlers is heading the Concepts and System Strategy team at 50Hertz Transmission GmbH, one of four transmission system operators in Germany. The team is involved in national and European working groups regarding the evolution of the European electricity market (balancing, energy and capacity markets) and the adoption of market rules to
accommodate for large shares of intermittent and decentralized generation. Prior to joining 50Hertz, Dr. Ehlers worked as a researcher at the department for energy systems at TU Berlin. Dr. Ehlers holds a master degree of electrical engineering at RWTH Aachen university.

**Kashish Bhambhani**, Chief Manager at POWERGRID CORP India

Mr. Kashish Bhambhani, an Electrical Engineer by profession, is having total 19 years of extensive experience of Indian Power sector. He started his career in 1998 and currently working with Power Grid Corporation for past 17 years. He has extensive experience in the area of integrated Transmission System Planning and its development. His core expertise includes Power system modelling & Simulations. He was associated in evolution of a large no. of transmission projects implemented by POWERGRID in India including High Capacity Transmission Corridors, Green Energy Corridors and major HVDC projects.

About the Organizations

The **Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)** provides services worldwide in the field of international cooperation for sustainable development. GIZ has over 50 years of experience in a wide variety of areas, including economic development and employment, energy and the environment, and peace and security. The diverse expertise of our federal enterprise is in demand around the globe, with the German Government, European Union institutions, the United Nations and governments of other countries all benefiting from our services. The German Federal Ministry for Economic Cooperation and Development (BMZ) is our main commissioning party, but we also work with the private sector, fostering successful interaction between development policy and foreign trade.

**USAID** is the lead U.S. Government agency that works to end extreme global poverty and enable resilient, democratic societies to realize their potential. USAID’s climate work safeguards this mission and puts countries on a path to pursue clean energy growth and resilient, low-carbon development. Countries around the world are feeling the effects of climate change, from more intense heat waves, droughts, floods and storms to slower-moving changes like ocean acidification. USAID is sharing world-class climate knowledge, data and tools to ensure countries can predict, prepare for and adapt to change. USAID also helps countries lay the foundations for sustainable growth powered by clean energy and healthy landscapes.

The U.S. Department of Energy’s **National Renewable Energy Laboratory (NREL)** focuses on creative answers to today’s energy challenges. From breakthroughs in fundamental science to new clean technologies to integrated energy systems that power our lives, NREL researchers are transforming the way the nation and the world use energy. NREL analysis informs policy and investment decisions as energy-efficient and renewable energy technologies advance from concept to commercial application to market penetration. With objective, technology-neutral analysis, NREL aims to increase the understanding of energy policies, markets, resources,
technologies, and infrastructure and connections between these and economic, environmental, and security priorities.

**Contact**

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