

Scaling up Clean Energy: Early Actions to Facilitate Integration of Variable Renewable Energy into Existing Power Systems

Deep Dive Workshop, Asia Clean Energy Forum 2016
7 June, 2016, 09:00 - 17:30, ADB Headquarters, Manila



»»» Make your power system ready for a renewable energy future

The rapid growth of renewable energies, especially variable sources such as solar and wind power, can lead to significant integration challenges for existing power systems in Asia. This Deep Dive Workshop organized by NREL, GIZ, USAID, and the Clean Energy Ministerial will present and discuss actions that can be undertaken by governments and grid operators at an early stage and without excessive financial commitments to provide more operational flexibility to the power system.

»»» Get an overview on the most recent international experience

- Common myths on RE grid integration, Jaquelin Cochran, NREL
- Experiences and lessons learned from Germany, Christoph Menke, Joint Graduate School of Energy & Environment, Bangkok
- The grid integration experience in India, S.R. Narasimhan, Power System Operation Corporation (POSOCO)

»»» Learn about quick and economic ways of making power systems more flexible

- Improved forecasting
- Optimized dispatch and balancing power management
- Utilization of grid services from RE

»»» Discuss your questions with the experts

Small thematic discussion groups will give you the opportunity to bring up specific questions and discuss them with international experts.

»»» Join the discussion on the future of energy storage

Follow a panel discussion on “Energy Storage: Early Action or Remote Future?” and gain new insights into the role of energy storage for balancing variable renewable energy sources.

»»» Join for free

Registration for the Asia Clean Energy Forum (ACEF) is a prerequisite for participation in the Deep Dive Workshop. Apart from the ACEF conference fee, there are no additional costs. Please indicate your participation when registering online for ACEF at <http://www.asiacleanenergyforum.org/register/>.

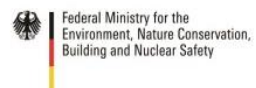
»»» Contact us

In case of any question, please contact the organizers:

- Michael Vemuri (Michael.Vemuri@giz.de)
- Jaquelin Cochran (Jaquelin.Cochran@nrel.gov)



On behalf of



of the Federal Republic of Germany

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08:30 Registration

Opening

09:00 **Welcome Remarks**

▪ **Mario Sander von Torklus**

Executive Director for Austria, Germany, Luxembourg, Turkey and the United Kingdom, **ADB**

▪ **Jerry Bisson**

Director of Technical Support, Asia Bureau, **USAID**

09:15 **Workshop objective and outline**

Michael Vemuri, **GIZ**

Session 1: Setting the Scene

09:20 **“Who Wants to Be a Millionaire? – Grid Integration Edition”, Part I**

Dr. Jennifer Leisch, **USAID**

09:25 **Confronting Myths about vRE Integration**

Dr. Jaquelin Cochran, **NREL**

09:40 **Experiences & lessons learned from Germany**

Prof. Dr.-Ing. Christoph Menke, Joint Graduate School of Energy & Environment, **KMUTT**, Bangkok

09:55 **Experiences & lessons learned from India**

Shruti M. Deorah, Advisor Renewable Energy, Central Electricity Regulatory Commission

10:10 Q&A

10:30 Coffee break

Session 2: Early Actions for the Integration of vRE

11:00 **Improved Forecasting**

Jessica Katz, **NREL**

11:30 **Optimized dispatch and balancing power management**

Frank Seidel, **GIZ**

Dr. Edwin Lerch, Head of System Dynamics, **Siemens AG**

12:00 **Utilization of grid services from RE**

Dr. Clayton Barrows, **NREL**

12:30 Lunch

Session 3: Thematic Group Discussions on Early Actions for the Integration of vRE

14:00 “Who Wants to Be a Millionaire? – Grid Integration Edition” – Part II

Dr. Jennifer Leisch, USAID

14:05 Introduction to the Thematic Group Discussions, Michael Vemuri, GIZ

Participants will join small discussion groups which will cover all three topics presented in session 2 one after the other for 25 min each. Participants can share their experiences and bring up their own country-specific questions to be answered by the respective thematic experts.

14:10 Q & A / Discussion round 1

14:40 Q & A / Discussion round 2

15:05 Q & A / Discussion round 3

15:30 Coffee break

Session 4: Energy Storage - Early Action or Remote Future?

16:00 The role of energy storage for vRE integration

- Dr. Rahul Walawalkar, Executive Director, Indian Energy Storage Alliance & Vice Chair, Global Energy Storage Alliance
- Rao Konidena, Principal Advisor, Policy Studies, Midcontinent Independent System Operator (MISO)

16:40 Panel discussion: Energy Storage: Early Action or Remote Future?

Facilitator: Prof. Dr.-Ing. Christoph Menke, Joint Graduate School of Energy & Environment, KMUTT, Bangkok

17:10 “Who Wants to Be a Millionaire? – Grid Integration Edition”, Part III

Dr. Jennifer Leisch, USAID

17:15 Summary of the day

Dr. Jaquelin Cochran, NREL

17:20 Closing Remarks

- Dr. Bernd-Markus Liss, Director & Principal Advisor, Climate Program Philippines, GIZ
- Dr. Jennifer Leisch, Climate Change Mitigation Specialist, USAID Office of Global Climate Change

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Contact: Michael Vemuri, Michael.Vemuri@giz.de
Jaquelin Cochran, Jaquelin.Cochran@nrel.gov



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Tuesday June 6, 9:00AM - 5:30PM

Organizers: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), US Agency for International Development (USAID), National Renewable Energy Laboratory (NREL) and Clean Energy Solutions Center

Contact: [Michael Vemuri](#) (GIZ) and [Jaquelin Cochran](#) (NREL)

The rapid growth of renewable energies, especially variable sources such as solar and wind power, can lead to significant integration challenges for existing power systems in Asia. This Deep Dive Workshop organized by NREL, GIZ, USAID, and the Clean Energy Ministerial will present and discuss actions that can be undertaken by governments and grid operators at an early stage and without excessive financial commitments to provide more operational flexibility to the power system. The workshop will cover topics such as improved forecasting, optimized dispatch and balancing power management, and the utilization of grid services from RE. The role of energy storage in future power systems will also be explored.

Speakers

DR. CLAYTON BARROWS, ELECTRIC SYSTEM MODELER, NREL



Dr. Clayton Barrows is a member of the Energy Forecasting and Modeling Group at the National Renewable Energy Laboratory. His research focuses on improving the technical and economic efficiency of electrical systems through advanced computation and analysis. During Dr. Barrow's Ph.D. program, he interned at Los Alamos National Lab where he developed new algorithms to solve the optimal topology control problem. At NREL, Clayton focuses on electric system planning and operations models. He is a core developer of the RPM capacity expansion model, and he has designed and implemented a time domain partitioning method to parallelize production cost model simulations. Additionally, Clayton serves as a special detailee to the Federal Energy Regulatory Commission, where he leads analysis of electricity market data. He received his B.S. in Electrical Engineering from the University of Wyoming and his Ph.D. in Energy and Mineral Engineering from The Pennsylvania State University.

DR. JAQUELIN COCHRAN, SENIOR ENERGY ANALYST, NREL



Dr. Jaquelin Cochran is a Senior Energy Analyst with the National Renewable Energy Laboratory, where she analyzes system operations, policies and market designs that create an enabling framework for emerging energy technologies (renewable energy, demand response, distributed generation). Dr. Cochran has published on many topics related to integration of renewable electricity, including policy best practices, coal cycling, RE curtailment, variability analysis, integration studies, system flexibility and market designs. She holds a Ph.D. and M.A. from the Energy & Resources Group at the University of California at Berkeley.

JESSICA KATZ, ENERGY ANALYST, NREL



Jessica Katz is an analyst at the U.S. National Renewable Energy Laboratory (NREL) in Golden, Colorado. Her work focuses on coordinating and implementing technical assistance in support of the U.S. government's Enhancing Capacity for Low Emission Development Strategies program, which works with partner countries to accelerate sustainable economic growth while minimizing greenhouse gas (GHG) emissions trajectories. In this role, she has developed tools and trainings related to clean energy development topics such as renewable energy resource assessment and the integration of large-scale renewable energy systems to the grid. Jessica holds a BSE in civil and environmental engineering from Arizona State

University.

RAO KONIDENA, Principal Advisor, Policy Studies at Midcontinent Independent System Operator (MISO)



Rao began his work with MISO in the areas of resource adequacy and transmission planning. He and his team developed demand side and clean technology options as alternatives to generation in the 20 year long term transmission expansion planning process. Rao is currently involved in the development of a comprehensive approach towards implementing state and federal policy objectives around increased penetration of energy storage and renewables. Rao has an Executive MBA from Carlson School of Management, University of MN with a minor in International Business and MSEE (Master of Science in Electrical Engineering) from University of Texas at Arlington. Rao is a Board member of Finnish American Chamber of Commerce - Minnesota and volunteers at City of Roseville, MN on the Finance Commission.

PROF. CHRISTOPH MENKE

Professor for Energy Technology, Trier University of Applied Science, Germany

Visiting Professor and International Advisor, Joint Graduate School of Energy and Environment (JGSEE), Bangkok, Thailand



Prof. Dr.-Ing. Christoph Menke is since 19 years a full professor for energy technology at the Trier University of Applied Science, Germany and as well since 11 years a visiting professor and international advisor at the Joint Graduate School of Energy and Environment (JGSEE) in Bangkok, Thailand.

He worked successfully in many international organizations, like The World Bank, the Caribbean Development Bank and for the German International Cooperation (GIZ). In addition he worked several years at the TATA Energy Research Institute in Bangalore, India and at the JGSEE/KMUTT in Bangkok, Thailand and senior energy expert and as senior energy policy advisor.

Christoph Menke is a senior energy expert for energy technologies, like solar energy and Co-Generation and a senior advisor for energy policy and energy planning. His special area is energy system analysis, renewable energy system planning and energy efficiency project design especially for industrial sectors. Since many years he is involved in the integration of variable renewable energies into the grid and in off-grid systems and the transformation of the energy markets.

Since 2000 he is active in energy policy activities in ASEAN countries, mainly Thailand, The Philippines, Indonesia and Vietnam. He is a senior energy policy advisor to GIZ in the Philippines to assist in the implementation of renewable energy law and energy efficiency policy.

DR. RAHUL WALAWALKAR

President & MD, Customized Energy Solutions India Pvt. Ltd.

Vice President, Emerging Technologies, Customized Energy Solutions Ltd.

Executive Director, India Energy Storage Alliance & Vice Chair, Global Energy Storage Alliance



Rahul is President and Managing Director of Customized Energy Solutions India Pvt. Ltd. Rahul leads the Emerging Technologies practice for Customized Energy Solutions globally with focus on energy storage, renewables, demand response and smart grid technologies as well as international markets. Rahul has been involved in evaluating economics of emerging technologies in deregulated electricity markets since 2004. His activities have covered complete range of smart grid, demand response, microgrid and energy storage technologies.

Rahul is founder and Executive Director for India Energy Storage Alliance (IESA). He served as member of the Board of Directors of Electricity Storage Association (ESA) during 2009-15 and was elected as Secretary in 2013. He is Vice Chair for Global Energy Storage Alliance (GESA) since 2014.

DR. EDWIN N. LERCH



Edwin N. Lerch (1953) received his Dipl.-Eng. degree from the University of Wuppertal/Germany in 1979, where he also completed his PhD in 1984. Since 1985 he is a member of the systems planning department PTI at Siemens. He is working in the areas of power system stability, dynamics of multimachine systems, control, optimization and identification problems in electrical power systems. Since 1994 he is head of the system dynamic department of Siemens PTI.

SHRUTI MAHAJAN DEORAH



Shruti Deorah is currently Advisor- Renewable Energy at Central Electricity Regulatory Commission (CERC), India. She leads regulatory work for sustainable development of renewable power in the country, including regulations on grid integration of renewable sources. In 2014, Shruti was a visiting scholar at Goldman School of Public Policy, UC Berkeley, and a consultant at Lawrence Berkeley National Lab. Prior to this, she worked at Observer Research Foundation Mumbai, where her research focused on Solar mini-grids for

rural electrification. Earlier, Shruti led Clean Transport and Energy-efficient Lighting programs for the Clinton Climate Initiative in India. She has a B.Tech and M.Tech in Electrical Engineering from IIT Bombay.

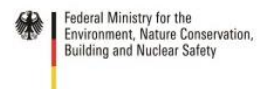
FRANK SEIDEL



Frank Seidel is a renewable energy advisor with the sector project “Technology Cooperation in the Energy Sector” at Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). 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 and Sussex University.



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