

# Tools for the Smarter Grid

A BNL / ISGAN Workshop on Modeling, Simulation and More

April 14-15, 2016

Brookhaven Center South Room – Building 30

Around the world, countries are expanding their use of modeling, simulation, testing, analysis and other tools to support the development of smarter, more reliable and resilient electricity systems. During this two-day workshop, experts from New York, the rest of the United States and around the world will share perspectives, experiences and emerging best practice on these tools for the Smart Grid. Workshop presentations, questions, and discussions will be relevant to how smart grid tools can provide both baseline and “what if scenarios” that can be verified and validated in support of business and public goods cases, government and regulatory policies, and broader societal objectives.

Expected participants include engineers, programmers, regulatory experts, utility managers, technology developers and other power system stakeholders and experts. The information exchanged during this workshop will not only provide useful insights for participants, but also help inform the future agenda of the International Smart Grid Action Network (ISGAN) Annex 5: Smart Grid International Research Facility Network (SIRFN), a collaborative platform bringing together world-class smart grid research and testing facilities across Europe, North America, and Asia.

## Workshop Host

Brookhaven National Laboratory

## Co-organizer

International Smart Grid Action Network, Annex 5:  
Smart Grid International Research Facility Network

## Agenda: Thursday, April 14, 2016

### PART I: SETTING THE SCENE

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8:00 a.m.

**Arrival at BNL (45 minutes)**  
(registration; continental breakfast provided)

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8:45 a.m.

**Site Safety Briefing (15 minutes)**

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**Opening Remarks (30 minutes)**

9:00 a.m.

- Welcome Addresses
  - Stephanie Hamilton, Brookhaven National Laboratory
  - Russell Conklin, U.S. Department of Energy, Office of International Climate and Clean Energy

*Purpose and objectives of the workshop, history of BNL workshop series, critical questions for grid modernization and related tools*

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Agenda subject to change. All speakers or organizations listed below are confirmed unless noted.

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### Setting the Scene – Domestic Grid Modernization Action

- 9:30 a.m.
- Presentation (20 Minutes)
    - Gil Bindewald, U.S. Department of Energy, Office of Electricity Delivery and Energy Reliability
  - Q&A (10 minutes)

*Presentation title: "DOE Grid Modernization Initiative"*

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### Setting the Scene – Grid Modernization Initiatives Abroad (30 minutes)

- 10:00 a.m.
- Presentation (20 Minutes)
    - Russell Conklin, U.S. Department of Energy (representing ISGAN)
  - Q&A (10 minutes)

*Presentation title: "Smart Grid and Grid Modernization Abroad: Examples of Major Programs and Initiatives"*

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10:30 a.m. **Break (30 minutes)**

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## PART II: INTERNATIONAL SMART GRID RESEARCH, DEVELOPMENT AND IMPLEMENTATION – THE ROLE OF MODELING AND SIMULATION

*Modeling and simulation are critical tools for evaluating smart grid technology's contribution to policy goals, for evaluating many alternatives at low cost, and for creating insight that leads to better laboratory work, field experiments and implementation. This workshop section focuses on domestic and international experiences using such tools.*

### Potential Discussion Topics

- Strategies for using modeling and simulation tools in the face of growing grid complexity (ESS, DER, etc.)
- Real-world case studies
- Use of simulation/modeling outputs for decision making
- Emerging needs in response to shifting utility technical, business and regulatory models
- Unlocked economic benefits from using modeling and simulation tools
- Distribution / transmission system interdependencies
- Co-simulation and growing need for convergence in tool capabilities (operations, power flow, forecasting, etc.)

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### Presentation: South African Experience on Modeling and Simulation Tools (30 minutes)

- 11:00 a.m.
- Presentation (20 minutes)
    - Nick Singh, Eskom, Republic of South Africa
  - Q&A (10 minutes)

*Presentation title: "Modeling, Simulation & Prediction Tools in Grid Situational Awareness"*

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### Presentation: Domestic Experience on Modeling and Simulation Tools (30 minutes)

- 11:30 a.m.
- Presentation (20 minutes)
    - Meng Yue and Mike Jensen, Brookhaven National Laboratory
  - Q&A (10 minutes)

*Presentation title: "Using Radar in Real Time Response for Restoration of Electric Utility Systems"*

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**Presentation: International Experience Using a U.S. Modeling Tool  
(30 minutes)**

12:00 p.m.

- Presentation (20 minutes)
  - Marcelo Elizondo, Pacific Northwest National Laboratory
- Q&A (10 minutes)

*Presentation title: "GridLAB-D: Smart Grid Simulation and Microgrids"*

12:30 p.m.

**Lunch (30 minutes)**

**Presentation: Domestic Experience on Modeling and Simulation Tools  
(30 minutes)**

1:00 p.m.

- Presentation (20 minutes)
  - Arthur K. Barnes, Los Alamos National Laboratory
- Q&A (10 minutes)

*Presentation title: "Resilient Upgrade of Distribution Grids"*

**Presentation: The Netherlands' Experience on Modeling and  
Simulation Tools (30 minutes)**

1:30 p.m.

- Presentation (20 minutes)
  - Hans de Heer, DNV GL
- Q&A (10 minutes)

*Presentation title: "An Introduction to the 'International Test and Simulation Facility for Future Energy Systems'"*

**Presentation: EPRI's Experience on Modeling and Simulation Tools  
(30 minutes)**

2:00 p.m.

- Presentation (20 minutes)
  - Roger Dugan, Electric Power Research Institute (EPRI)
- Q&A (10 minutes)

*Presentation title: "Modeling for the Smarter Grid"*

**Presentation: Austrian Experience on Modeling and Simulation Tools  
(30 minutes)**

2:30 p.m.

- Presentation (20 minutes)
  - Serdar Kadam, Austrian Institute of Technology (AIT), Austria
- Q&A (10 minutes)

*Presentation title: "An Overview of Different Tools for Smart Grid Studies: Experiences from Several European Projects"*

3:00 p.m.

**Group Photo (15 minutes)**

3:15 p.m.

**Break (15 minutes)**

**Presentation: Domestic Experience on Modeling and Simulation Tools  
(30 minutes)**

3:30 p.m.

- Presentation (20 minutes)
  - Kevin DeGroat, ANTARES, on behalf of himself and Robert Broadwater, Electrical Distribution Design (EDD)
- Q&A (10 minutes)

*Presentation title: "In Pursuit of Reuseable, Accurate, Electric Power System Models"*

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## PART III: SMART GRID TRANSITION – OPPORTUNITIES, CHALLENGES AND ISSUES IN MANAGING CHANGE

*Electricity networks are a highly complex system of systems, with correspondingly complex decision making systems for operations and governance. Managing the transition to the fully integrated suite of technologies and practices labeled “Smart Grid” requires simultaneous attention to technology and standards development, policy and regulatory processes, program design, marketing and outreach efforts, and opportunities to capitalize on co-benefits or synergies with other sectors. Better tools are a key component but alone cannot overcome all barriers to grid modernization. This workshop section focuses on real-world experiences, lessons learned and key principles identified for managing this change, including solutions developed in other regions and markets.*

### Potential Discussion Topics

- Objectives, processes and tools for decision making
- Metrics of change; how do we assess progress?
- Unexpected challenges, barriers and roadblocks
- Real-world case studies from government/regulatory, academic and private sector perspectives.
- What workforce skillsets are needed to enable grid modernization?
- Unlocked economic benefits from using modeling and simulation tools

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### Presentation: Industry Perspective (30 minutes)

- 4:00 p.m.
- Presentation (20 minutes)
    - Ronny Sandoval, Environmental Defense Fund, representing the GridWise Alliance
  - Q&A (10 minutes)
- Presentation title: “Stimulating Discussions on the Benefits of a Smarter Grid: The 3rd Grid Modernization Index”*

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### Presentation: Utility Perspective (30 minutes)

- 4:30 p.m.
- Presentation (20 minutes)
    - Babak Enayati, National Grid
  - Q&A (10 minutes)
- Presentation title: “Smart Inverters: An Overview of the Utility Experience and IEEE 1547 Standard Version”*

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### Closing Remarks and Look-Ahead to Day 2 (10 minutes)

- 5:00 p.m.
- Look ahead to remaining presentations on the smart grid transition, presentations on opportunities for expanded use of technology and tools, presentation, site visit to BNL solar facilities, etc.*

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- 5:10 p.m. **Networking Reception – Tap Room**
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Agenda subject to change. All speakers or organizations listed below are confirmed unless noted.

## Agenda: Friday, April 15, 2016

### PART IV: DAY TWO WELCOME

8:00 a.m.

**Arrival at BNL (45 minutes)**  
(continental breakfast provided)

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#### **Opening Remarks (15 minutes)**

8:45 a.m.

- Recap of Day One; Plan for Day Two
    - Stephanie Hamilton, Brookhaven National Laboratory
    - Russell Conklin, U.S. Department of Energy
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### PART V: SMART GRID TRANSITION – OPPORTUNITIES, CHALLENGES AND ISSUES IN MANAGING CHANGE *(continuation of part III)*

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#### **Presentation: Vendor Perspective (30 minutes)**

9:00 a.m.

- Presentation (20 minutes)
  - Larisa Dobriansky, General Microgrids
- Q&A (10 minutes)

*Presentation title: "Collaborating on 'Integrated Smart Grid Demonstrations'"*

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#### **Presentation: Municipal Perspective (30 minutes)**

9:30 a.m.

- Presentation (20 minutes)
  - Jonathan Hunsley, eThekweni Municipality, Republic of South Africa
- Q&A (10 minutes)

*Presentation title: "Journey Towards a Smart Utility: An eThekweni Electricity Perspective"*

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### PART VI: LOOKING AHEAD – OPPORTUNITIES FOR EXPANDING UNDERSTANDING AND USE OF SMART GRID TOOLS

*A forward look at modeling, simulation, testing and other key smart grid research from the perspective of domestic and international collaboration. Insights and key points will draw from the previous two days of discussion and information. This last workshop section will culminate with a discussion of potential next steps.*

#### Discussion Topics

- Are there synergies and opportunities for collaboration that cut across country and sector interests? Differences that are sector, country and region-specific?
  - What have we learned about modeling, simulation and other tools, and what are the potential applications in smart grid research, development and deployment?
  - Are we getting the most out of domestic and international collaboration and research; are we getting the most out of two-way and multilateral collaboration?
  - Are there holes in the research agenda in our different countries, in our joint research plans, for smart grid tools?
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**Presentation: Examples of Success – Smart Grids Testing under SIRFN and Related International Initiatives (30 minutes)**

- 10:00 a.m.
- Presentation (20 minutes)
    - Jay Johnson, Sandia National Laboratories
  - Q&A (10 minutes)

*Presentation title: “SIRFN Advanced DER Research and System Validation Platform”*

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10:30 a.m. **Break (30 minutes)**

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**Presentation: Examples of Success – Cooperation with Europe (30 minutes)**

- 11:00 a.m.
- Presentation (20 minutes)
    - Nick Sherman, U.S. Department of Energy, Office of European and Eurasian Affairs
  - Q&A (10 minutes)

*Presentation title: “U.S.-EU EV and Smart Grid Interoperability Centers: Harmonization of Standards, Technology and Test Procedures to Support Vehicle-Grid Integration”*

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**Presentation: Domestic, Regional Collaborative Opportunities (30 minutes)**

- 11:30 a.m.
- Presentation (20 minutes)
    - Michael Razanousky, New York State Energy Research and Development Authority (NYSERDA)
  - Q&A (10 minutes)

*Presentation title: “Opportunities for New Technologies for the New York Electric System”*

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**Synthesis Discussion: Role of Smart Grid Tools in Facilitating Change (45 minutes)**

12:00 p.m.

*A moderated exchange of views among several of the workshop speakers, and including extensive opportunity for dialogue, questions and answers with other workshop participants. The discussion will highlight the themes of the earlier presentations and delve deeper into the challenges and needs for effective tools.*

MODERATOR: Russell Conklin, U.S. Department of Energy

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**Presentation: Introduction to Onsite Solar Farm and PV Field Testing Facilities (15 minutes)**

- 12:45 p.m.
- Presentation (15 minutes)
    - Robert Lofaro, Brookhaven National Laboratory

*Presentation title: “BNL Smart Grid Test Facilities”*

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1:00 p.m. **Lunch (30 minutes)**

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1:30 p.m. **Audience Feedback (15 minutes)**

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1:45 p.m. **Closing Remarks and Path Forward (15 minutes)**

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**Guided Tour of the Onsite Solar Farm and PV Field Testing Facilities (60 minutes)**

2:00 p.m.

*Limited to first 24 people who respond.*

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3:00 p.m. **Workshop Adjourned**

*Safe travels to all!*

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