



2022 SPECIAL TOPIC WORKSHOP: GRID-FORMING IBRS

June 6-9, 2022

The Curtis Denver – Denver, Colorado

PROGRAM AGENDA

Monday, June 6, 2022

NREL Flatirons Campus Tour (12:45 - 5:00 p.m.)

The tour will include the ARIES grid simulation facility along with basic overviews of the wind turbines, PV arrays, CoMet (blade manufacturing), structural testing, dynamometers, the controllable grid interface and integrated energy systems. There are only 20 spots available for this tour. If you are interested, please register immediately.

Also, any foreign nationals interested in attending, should contact Ryan Willis (ryan@esig.energy) by **Thursday, May 5**.

Registration for the tour closes **Friday, May 20**.

The cost per attendee is \$75.

- 12:45 p.m. - Meet in lobby of Curtis Hotel to board bus
- 1:00 p.m. - Depart Curtis Hotel for NREL Flatirons Campus
- 2:00 p.m. – Begin NREL Flatirons Campus Tour
- 4:00 p.m. – Depart NREL Flatirons Campus for Curtis Hotel
- 5:00 p.m. – Arrival at Curtis Hotel

Tuesday, June 7, 2022

8:00 a.m. – 9:00 a.m.

Registration & Breakfast

Location: Four Square Ballroom (3rd Floor)

9:00 a.m. – 12:00 p.m.

Tutorial: Grid-forming IBRs

Featured Speakers: **Deepak Ramasubramanian & Wenzong Wang**, EPRI

Location: Peek-A-Boo (2nd Floor)

[Click here to download draft Tutorial Agenda](#)

10:30 a.m. – 10:45 a.m.

Break

Location: 3rd Floor Foyer

12:00 p.m. – 1:00 p.m.

Lunch

Location: Four Square Ballroom (3rd Floor)

1:00 p.m. – 1:30 p.m.

Introduction to Workshop Agenda and Opening Remarks

Chair: **Julia Matevosyan**, Chief Engineer, ESIG

Location: Peek-A-Boo (2nd Floor)

1:30 p.m. – 3:00 p.m.

Session 1: Defining Technical Requirements and Qualification of Services

Chair: **Jeff Billo**, Director, Operations Planning, ERCOT

Location: Peek-A-Boo (2nd Floor)

GB GC0137 Update and Best Practice Guide

Tony Johnson, Technical Codes and Markets and **Dechao Kong**, Technical Specialist (HVDC & Power Electronics), National Grid ESO (UK)

HECO GFM Requirements

Andrew Isaacs, Vice President, Electranix

GFM Functional Specification in UNIFI

Deepak Ramasubramanian, Technical Leader, EPRI

Discussion – 30 minutes

3:00 p.m. – 3:15 p.m.

Break

Location: 3rd Floor Foyer

3:15 p.m. – 5:00 p.m.

Session 2: Defining Target System, Desired Performance and System Needs Studies

Chair: **Nilesh Modi**, Manager, Operational Analysis & Engineering, AEMO (Australia)

Location: Peek-A-Boo (2nd Floor)

A Structured Approach Towards 100% Renewable Energy

Chris Davies, Manager, Future Energy Systems, AEMO (Australia)

Transition to Fewer Synchronous Generators – South Australia Case Study

James Lindley, Group Manager, Systems Capability, AEMO (Australia)

Efficient Management of System Strength During the Power System Transition

Samantha Christie, Manager, System Planning, AEMO (Australia)

Discussion – 30 minutes

6:30 p.m. – 8:00 p.m.

Networking Reception

Location: Four Square Ballroom (3rd Floor)

Wednesday, June 8, 2022

8:00 a.m. – 9:00 a.m.

Breakfast

Location: Four Square Ballroom (3rd Floor)

9:00 a.m. – 10:30 a.m.

Session 3: Grid Forming Capabilities and Challenges (specifications, requirements and cost)

Chair: **Jason MacDowell**, Senior Technical Director, GE Energy Consulting

Location: Peek-A-Boo (2nd Floor)

A View from Hitachi

John Glassmire, Senior Advisor, Grid Edge Solutions, Hitachi Energy

A View from GE

Dustin Howard, Technical Director, GE Energy Consulting

A View from SMA

Daniel Duckwitz, Product Manager, Grid Services, SMA (Germany)

10:30 a.m. – 10:45 a.m.

Break

Location: 3rd Floor Foyer

10:45 a.m. – 12:30 p.m.

Session 4: Incentivizing New Grid Services

Chair: **Mark O'Malley**, Chief Scientist, ESIG

Location: Peek-A-Boo (2nd Floor)

Capabilities and Optimal Deployment of Grid Forming Technology in Australian Market

Tony Morton, Global Technical Head – Power Systems, Vysus Group (Australia)

GB Stability Pathfinder Update

Julian Leslie, Head of Networks and Chief Engineer, National Grid ESO (UK)

EirGrid, Outcomes of DS3

Jon O'Sullivan, Head of Future Markets, EirGrid (Ireland)

Discussion – 30 minutes

12:30 p.m. – 1:30 p.m.

Lunch

Location: Four Square Ballroom (3rd Floor)

1:30 p.m. – 3:00 p.m.

Session 5: Performance Monitoring – GFM Projects and Pilots

Chair: **Vahan Gevorgian**, Chief Engineer, NREL

Location: Peek-A-Boo (2nd Floor)

EU-funded Project OS MOSE

Carmen Cardozo, Research Engineer, RTE (France)

Experience of Using Grid Forming Converters for Islanding and Black Start at Dersaloch Wind Farm

Isaac Gutierrez, Lead Electrical Engineer, ScottishPower Renewables

Practical Experiences and Lessons Learned from Connections and Planning Considerations of Grid Forming Inverters in Australia

Babak Badrzadeh, Technical Director - Power Systems, Aurecon (Australia)

Discussion – 30 minutes

3:00 p.m. – 3:15 p.m.

Break

Location: 3rd Floor Foyer

3:15 p.m. – 5:00 p.m.

Session 6: Performance Benchmarking, Modelling and Testing

Chair: **Ryan Quint**, Senior Manager, NERC

Location: Peek-A-Boo (2nd Floor)

Power System Modelling to Facilitate Uptake of IBR – Status Update
James Guest, Senior Engineer, AEMO (Australia)

Modeling Issues: User-defined vs Generic, Phasor-domain vs EMT
Alex Shattuck, Lead Electrical Engineer, Vestas

Modeling and Performance Validation of GFM IBRs, Hawaii Experience
Andrew Isaacs, Vice President, Electranix

Modeling of GFM
Deepak Ramasubramanian, Technical Leader, EPRI

Discussion – 30 minutes

Thursday, June 9, 2022

8:00 a.m. – 9:00 a.m.

Breakfast

Location: Four Square Ballroom (3rd Floor)

9:00 a.m. – 10:30 a.m.

Session 7: Research Roadmaps

Chair: **Nick Miller**, Consultant, HickoryLedge

Location: Peek-A-Boo (2nd Floor)

UNIFI Progress
Ben Kroposki, Director, Power Systems Engineering Center, NREL

RTE Research and Development Update
Thibault Prevost, Research Engineer, RTE (France)

CSIRO Research Roadmap
Behrooz Bahrani, Director of Grid Innovation Hub and Senior Lecturer, Monash University (Australia)
John Fletcher, Professor, University of New South Wales (Australia)

Discussion – 30 minutes

10:30 a.m. – 10:45 a.m.

Break

Location: 3rd Floor Foyer

10:45 a.m. – 12:30 p.m.

Session 8: Closing Panel Session – What's Next?

Chair: **Julia Matevosyan**, Chief Engineer, ESIG

Location: Peek-A-Boo (2nd Floor)

Panel discussion with a cross-section of workshop representatives to talk about gaps, needs and opportunities ahead of us.

- Are we on the way to breaking the cycle or not?
- What are the barriers that still exist?
- What do we need to do to solve the problems?

Panelists:

Jason MacDowell, Senior Technical Director, GE Energy Consulting

Mark O'Malley, Chief Scientist, ESIG

Ryan Quint, Senior Manager, NERC

Nick Miller, Consultant, HickoryLedge

Daniel Duckwitz, Product Manager, Grid Services, SMA (Germany)

Julian Leslie, Head of Networks and Chief Engineer, National Grid ESO (UK)