



Quick Overview

EU	US
Welcome and Workshop Overview	
<i>Søren Dupont Kristensen, SVP System Operation, Energinet.dk and Charlie Smith, Exec. Dir., UVIG</i>	
Opening Keynote Address	
<i>Peder Ø. Andreasen, CEO, Energinet.dk and ENTSO-E President</i>	
1 Electricity Market Design, Operation and Evolution	
<i>Chair: Konrad Purchala, Director, Market Development, PSE and Chairman elect for ENTSO-E Market Committee</i>	
Keynote: Electricity Market Design – RES/ Market Tango	
<i>Martin Povh, Electricity Market Officer, ACER</i>	
Transmission Considerations for Market Operation and Efficiency from a European Point of View	Transmission Considerations for Market Operation and Efficiency from a US Point of View
<i>Klaus Thstrup, Manager, Energinet.dk</i>	<i>Bruce Rew, VP, Southwest Power Pool</i>
2. Energy Markets – Where are we and Where are we Going?	
<i>Chair: Gineke van Dijk, Senior Manager Customers & Markets, Tennet TSO B.V</i>	
Framework for Day Ahead, Intraday, and Real Time Markets and additional Considerations for Variable Generation	Current Standard Market Design Practices – Day Ahead, Interday, and Real Time Markets and Additional Considerations for Variable generation
<i>Matti Supponen, DG Energy, EU Commission</i>	<i>Erik Ela, Sr. Staff, EPRI</i>
European Intraday X-BID project	
<i>Mark Pickles, National Grid, Project Leader XBID</i>	
3. Capacity and Flexibility Markets – Incentivizing Capacity to Stay in the Market and be Flexible	
<i>Chair: Hannele Holttinen, Principal Scientist, VTT</i>	
Market Design to Provide Security of Supply	Why Are We Talking about Capacity Markets
<i>Jonathan O’Sullivan, Manager Innovation, EirGrid</i>	<i>Bethany Frew, Researcher, NREL</i>
European Sector Inquiry about Capacity Markets	Capacity Market Designs in the US
<i>Matt Wieckowski, DG Competition, EU Commission</i>	<i>Ronald Coutu, Mgr. Technology and Business Solutions, ISO-NE</i>
4. Ancillary Service (A/S) and Demand Response (DR) Markets	
<i>Chair: Elizabeth LaRose, GM, GE Energy Consulting</i>	
European Balancing markets	Demand Response (DR) Market Design considerations and Examples
<i>Kjell Arne Barmsnes, Vice President, Statnett, Convenor WG AS, ENTSO-E</i>	<i>Ronald Coutu, Manager, Technology and Business Solutions, ISO-NE</i>
European Ancillary Service and Demand Response (DR) Market Design Examples	US Ancillary Service Market Design Examples
<i>Gineke van Dijk, Senior Manager Customers & Markets, Tennet TSO B.V.</i>	<i>Dan Woodfin, Sr. Director, System Operations, ERCOT</i>
A/S, New Technologies and Digitalization	
<i>Pierre Pinson, Professor, Center for electric Power and energy, Danish Technical University</i>	
Final Keynote speaker: An International View of the Future of Markets in a Renewable Energy World	
<i>Sean Whittaker, Senior Industry Specialist - Renewable Energy, International Finance Corporation</i>	
5. Where to From Here? A Path Forward	
<i>Chair: Søren Dupont Kristensen, Senior Vice President, ENDK</i>	
Debate Between Session Chairs, Sessions 1-4	

EU/US WORKSHOP ON MARKET DESIGN AND OPERATION WITH VARIABLE RENEWABLES

May 16-17, 2017
Fredericia, Denmark

PROGRAM AGENDA

Workshop Purpose

This workshop is intended for utility, wind and solar industry, regulatory, market design and operation, university, and consulting personnel associated with the design and operation of wholesale electricity markets in EU and the US, which will experience a large share of energy from variable renewable generation. The workshop purposes are to:

- Identify fundamental principles of market design in EU and the US and operation necessary for incorporating a high share of variable renewables (wind and PV) into electricity market operation
- Identify the current state of market design in the EU and US as related to incorporating a high share of variable renewables into electricity market operation
- Identify the critical needs and a transition path for improved market design and operation with a high share of variable renewables

Audience

- TSO, RTO, ISO market design and operation personnel
- Legislative and regulatory personnel with market design responsibilities
- University, research institute and consultant market design personnel
- Electricity market stakeholders
- PV and wind plant manufacturers and developers

Tuesday, May 16

8:00 a.m. – 8:30 a.m.

Registration & Coffee

8:30 a.m. – 5:30 p.m.

Workshop

8:30 a.m. – 9:30 a.m.

Welcome and Workshop Overview

Søren Dupont Kristensen, SVP System Operation, Energinet.dk

Charlie Smith, Exec. Dir., UVIG

Opening Keynote Address: Operating Challenges in Markets with a High Share of Variable Generation

Peder Andreasen, CEO, Energinet.dk and ENTSO-E President

9:30 - 10:00 a.m.

Break

10:00 a.m. – 12:15 p.m.

1. Electricity Market Design, Operation and Evolution

Session Chair : *Konrad Purchala, Director, Market Development, PSE and Chairman elect for ENTSO-E Market Committee*

Keynote address: Electricity Market Design: the Renewables / Market Tango

Martin Povh, Electricity Market Officer, ACER 40 min

- Market design considerations: Are we there yet?
- What shortcomings do we have in existing markets?
- Influence of support schemes on market design and operation

Transmission Considerations for Market Operation and Efficiency from a European Point of View

Klaus Thostrup, Energinet.dk, 30 min

- Transmission congestion relief
- Financial and physical transmission rights
- The socio-economic benefit of reserve trading needs to be demonstrated.

Transmission Considerations for Market Operation and Efficiency from a US Point of View

Bruce Rew, VP Operations, Southwest Power Pool, 30 min

- US electric industry structure and LMP Markets
- Transmission congestion relief
- financial and physical transmission rights
- transmission seams issues

Discussion: 35 min

- Are some support schemes more friendly towards markets than others
- What are the most important changes to markets necessary to support a large share of VG
- Is there a mathematical optimization to the interconnector trading issue in Europe

- Are any of the US practices on financial transmission rights relevant to Europe

12:15 p.m. – 1:30 p.m.

Lunch

1:30 p.m. – 3:30 p.m.

2. Energy Markets – Where Are We and Where Are We Going?

Session Chair: *Gineke van Dijk, Senior Manager Customers & Markets, Tennet TSO B.V*

Current Standard Market Design Practices - Day Ahead, Hour Ahead, and Real Time Markets, and Additional Considerations for Variable Generation
Erik Ela, Sr Staff, EPRI, 30 min

Overview of Standard Elements of Energy and Balancing Market Designs - Day Ahead, Inter-day, and Real Time Markets, and Additional Considerations for Variable Generation
Matti Supponen, DG ENER, 30 min

European Intraday X-BID Project
Mark Pickles, Project Leader, National Grid, 30 min

Discussion: 30 min

- Market design: status on coupling and x-bid, next steps?
 - What are the necessary evolutionary changes to current practices to accommodate a high share of VG
 - Is it possible to develop a common continental market design for US or Europe
 - Can VG be dispatched in a competitive market

3:30 p.m. – 3:45 p.m.

Break

3:45 pm – 5:30 pm

3. Capacity and Flexibility Markets – Incentivizing Capacity to Stay in the Market and be Flexible

Session Chair: *Hannele Holttinen, Principal Scientist, VTT*

Why Are We Talking about Capacity Markets
Bethany Frew, Researcher, NREL, 20 min

- Capacity market design considerations for variable renewable resources
 - Limited capacity value of VG
 - Decreased operating hours of conventional generation with VG
- State of the capacity markets
- Towards an optimum capacity market design

Market Design to Provide Security of Supply
Jonathan O'Sullivan, Manager Innovation, EirGrid

European Sector Inquiry about Capacity Markets
Matt Wieckowski, DG Competition, EU Commission 20 min

Capacity Market Designs in the US

Ronald Coutu, Mgr., Technology and Business Solutions, ISO-NE, 20 min

Discussion, 30 min

- Evolution of capacity markets to incorporate VG considerations
- Are capacity markets the best vehicle to ensure system adequacy

5:30 p.m.

Adjourn

7:30 p.m. – 9:30 p.m.

Group Dinner

Location: Hindsgavl Castle

Wednesday, May 17

8:30 a.m. – 9:00 a.m.

Coffee

Location: Energinet.dk

9:00 a.m. – 2:30 p.m.

Workshop

9:00 a.m. – 12:30 a.m.

4. Ancillary Service (A/S) and Price Responsive Load (PRL) Markets

Session Chair: Elizabeth LaRose, GM, GE Energy Consulting

A/S European Balancing Markets

Kjell Arne Barmnes, VP, Statnett, Convenor WG Ancillary Services ENTSO-E 25 min

- Development of the European regulation – The Electricity Balancing Guideline
- The main content of the new regulation
- Timelines for implementation of the European balancing market
- Towards an integrated European balancing market - implementation activities and projects

Demand Response (DR) Market Design Considerations and Example

Ronald Coutu, Manager, Technology and Business Solutions ISO-NE, 25 min

- What are we defining as PRL, what are markets now providing, how do we encourage new products and greater participation
- Towards optimum PRL market design

European A/S and Demand Response (DR) Market Design Examples

Gineke van Dijk, Senior Manager Customers & Markets, Tennet TSO B.V., 25 min

US A/S Market Design Examples

Dan Woodfin, Sr. Director, System Operations, ERCOT, 25 min

A/S, New Technologies and Digitalization

Pierre Pinson, Professor, Center for Electric Power and Energy, Danish Technical University, 25 min

Discussion, 30 min

- Do we have the A/S and DR products we need?
- Are markets the best vehicle for obtaining A/S and DR products
- Future directions for A/S and DR markets to meet the needs of VG

Final Keynote Speaker

Sean Whittaker, Senior Industry Specialist - Renewable Energy, International Finance Corporation, 30 min

- An International View of the Future of Markets in a Renewable Energy World

10:30 a.m. – 11:00 a.m.

Break

12:30 – 1:30 p.m.

Lunch

1:30 p.m.-2.30 p.m.

5. Where To From Here? A Path Forward

Session Chair: Søren Dupont Kristensen, SVP, System Operation, Energinet.dk

Agenda for the future - A brief summary and synthesis of the discussion from the previous sessions will be followed by active discussion and debate of the ideas brought forward to attempt to point the way to a path for the future. The session will include a panel of the session chairs who will provide feedback and commentary during the discussion:

- A transition path from current markets to future markets
- Large markets or multiple regional markets
- Harmonization of continental-scale electricity markets
- What did we get right and what needs to change

Panelists: (Session Chairs)

- *Bruce Rew, VP, Southwest Power Pool*
- *Gineke van Dijk, Tennet TSO B.V*
- *Hannele Holttinen, Sr. Scientist, VTT*
- *Elizabeth LaRose, GM, GE Energy Consulting*

2:30 pm

Farewell

Søren Dupont Kristensen, SVP, Energinet.dk and Charlie Smith, Exec. Dir., UVIG

3:00-4:00 p.m.

Optional Energinet.dk Control Center Tour

Energinet.dk