17th Wind Integration Workshop

International Workshop on Large-Scale Integration of Wind Power into Power Systems as well as on Transmission Networks for Offshore Wind Power Plants

17 - 19 October 2018

Stockholm, Sweden

PRELIMINARY PROGRAM AS OF 20 AUGUST 2018

Important: This preliminary program is subject to changes. It is strongly recommended to check back regularly.

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WEDNESDAY 17 OCTOBER 2018				THURSDAY 18 OCTOBER 2018				FRIDAY 19 OCTOBER 2018			
Wind Workshop Day 1				Wind Workshop Day 2				Wind Workshop Day 3			
				08:30 – 10:40	M1	M2	M3	08:30 – 10:40	Q1	HYLLAN	
					SESSION 3A: OFFSHORE WIND ASPECTS	SESSION 3B: ANCILLARY SERVICES I	SESSION 3C: NEDO FORECASTING PROJECTS		SESSION 7A: GRID CODE ASPECTS II	SESSION 7B: MARKET AND REGULATORY ISSUES	
					COFFEE BREAK (30MIN)				COFFEE BREAK (30MIN)		
9:00 – 14:00	FOYER			11:10 – 13:10	M1	M2	M3	11:10 – 13:10	Q1	HYLLAN	
	REGISTRATION				SESSION 4A: STORAGE ISSUES	SESSION 4B: MIGRATE PROJECT	SESSION 4C: TBA		SESSION 8A: BALANCING ISSUES	SESSION 8B: POWER QUALITY ISSUES II	
	LUNCH 13:15 – 14:00				LUNCH 13:15 – 14:15				LUNCH 13:15 – 14:15		
14:00 – 15:50	M1			14:15 – 16:10	M1	M2	M3	14:15 – 15:45	Q1	HYLLAN	
	WELCOME & SESSION 1: KEYNOTE SESSION				SESSION 5A: DISTRIBUTED GENERATION	SESSION 5B: SECTOR COUPLING	SESSION 5C: GRID CODE ASPECTS I		SESSION 9A: TBD	SESSION 9B: FORECASTING II	
	COFFEE BREAK (30MIN)				COFFEE BREAK (30 MIN)				SHORT BREAK (10 MIN)		
16:20 – 18:30	M1	M2	M3	16:40 – 18:30	M1	M2	M3	15:55 – 16:55	Q1		
	SESSION 2A: IEA TASKS 14 & 25	SESSION 2B: GRID FORMING	SESSION 2C: FORECASTING I		SESSION 6A: POWER SYSTEM STUDIES	SESSION 6B: ANCILLARY SERVICES II	SESSION 6C: POWER QUALITY ISSUES I		SESSION 10: CLOSING SESSION – PODIUM DISCUSSION		
19:00	SOLAR & WIND DINNER			18:45	POSTER RECEPTION & NETWORKING						

WEDNESDAY, 17 OCTOBER 2018

09:00 – 14:00 **Registration**

13:15 – 14:00 **Lunch**

14:00 – 14:10 **Welcome**

14:10 – 15:50	**SESSION 1 – KEYNOTE SESSION**
> Session Chair	**T. Ackermann (Energynautics, Germany)**
14:10 – 15:30	**Presentations (20 min. each)**

- **Next-Gen Generation System: The Symbiotic Relationship of Solar, Wind & Storage Hybrid Power Plants**
  Sebastian Gerhard (Director Batteries – Vattenfall, Sweden)
- **Presentation 2**
  TBA
- **Presentation 3**
  TBA
- **Presentation 4**
  TBA

15:30 – 15:50 **Discussions**

15:50 – 16:20 Coffee Break

16:20 – 18:30	**SESSION 2A – JOINT SESSION OF IEAWIND TASK 25 & PV INTEGRATION TASK 14: HIGHLIGHTS AND TRENDS FROM INTERNATIONAL COLLABORATION ON SOLAR AND WIND INTEGRATION**
> Session Chair	**TBA**
16:20 – 18:08	**Presentations (18 min each)**

- **Introduction: Summary of Wind and Solar Integration Study Results – IEA WIND Task 25 summary report briefing**
  H. Holttinen (OA Task 25, VTT, Finland)
- **Country Highlights and Trends on Solar and Wind Integration - country experts from**
  - USA (B. Mather, NREL)
  - Japan (Y. Ueda, Tokyo University of Science)
  - Germany (M. Kraiczy, Fraunhofer IEE)
- **Brief update IEA-WIND Task 25**
  H. Holttinen (OA Task 25, VTT, Finland)
- **Country presentations are planned:**
  - Denmark (A. Orths/P. Borre Eriksen – Energinet dk, Denmark),
  - Portugal (A. Estanqueiro – LNEG, Portugal)
- **IEA-PVPS Task 14**
  - Coordination between Distribution Network and Transmission Network Operation – Relevance for Solar and Wind Integration. IEA-PVPS Task 14 Report briefing: Markus Kraiczy (Fraunhofer IEE, Germany)
- **New trends in European National Grid Codes following the implementation of the RfG Network Code**
  R. Bründlinger (AIT, Austria), G. Arnold (Fraunhofer IEE, Germany)

18:08 – 18:30 **Discussion:**

16:20 – 18:30	SESSION 2B – GRID FORMING
> Session Chair	Helge Urdal (Urdal Power Solutions, United Kingdom)

16:20 – 18:08 Presentations (18 min each)

- **Introduction about the need: Essence from Europe / GB**
  H. Urdal / N.N.
- **Bottom up: How to Run 100% Converter Based Power System at Small Scale**
  M. Hirst (EON, Sweden) + (TDE MACNO, Italy)
- **Contribution at top end from wind**
  P. Brogan (Siemens Gamesa)
- **Requirements for Control Strategies of Grid Connected Converters in the Future Power System**
  H. Emanuel, R. Rosso, K. Pierros, J. Brombach (ENERCON, Germany) (Submission-ID WIW18-68)
- **Stability Assessment of a 100% Power Electronic Based Transmission System with Grid Forming Control: The Case Study of IEEE 118-Bus System**
  M. Ndreko, S. Rüberg, W. Winter (TenneT TSO, Germany) (Submission-ID WIW18-172)
- **Mixed Grid Forming and Grid Following Wind Power Plants for Black Start Operation**
  J. Martinez-Turegano, S. Añó-Villalba, S. Bernal-Perez (Universitat Politecnica de Valencia, Spain), R. Peña (Universidad de Concepcion, Chile), R. Blasco-Gimenez (Universitat Politecnica de Valencia, Spain) (Submission-ID WIW18-232)

18:08 – 18:30 Discussions

16:20 – 18:30	SESSION 2C – FORECASTING I
> Session Chair	TBA

16:20 – 18:08 Presentations (18 min each)

- **Recommended Practices for the Implementation of Wind Power Forecasting Solutions – Part 1: Forecast Solution Selection Process**
  C. Möhrlen (WEPROG, Denmark), G. Giebel (DTU Wind Energy, Denmark), J. Lerner (Vaisala, USA), C. Collier (DNV GL, USA), J. Zack (AWS Truepower, USA) (Submission-ID WIW18-133)
- **Recommended Practices for the Implementation of Wind Power Forecasting Solutions – Part 2&3: Designing and Executing Forecasting Benchmark and Trials and Evaluation of Forecast Solutions**
  C. Möhrlen (WEPROG, Denmark), J. Lerner (Vaisala, USA), J. Browell (University of Strathclyde, United Kingdom), C. Collier (DNVGL, USA), G. Giebel (DTU Wind Energy, Denmark), J. Zack (AWS Truepower, USA), M. Westenholz (ENFOR, Denmark), J. Sharp, Justin (Submission-ID WIW18-160)
- **Evaluation of Recent Advancements in Machine Learning Methods in Very Short-term Time Series Forecasts of Wind Power Production**
  J. Zack (UL AWS Truepower, USA) (Submission-ID WIW18-184)
- **Considering Curtailments in Wind Power Forecasting**
  J. Koch, D. Jost, A. Braun, J. Dobschinski (Fraunhofer IEE, Germany) (Submission-ID WIW18-93)
- **How to Combine State-of-the-Art Multi-Scale Numerical Wind Power Forecasts and Benefits of a Human Meteorological Expertise?**
  O. Vannier, A. Ben Daoud, A. Falgon (Compagnie Nationale du Rhône, France) (Submission-ID WIW18-197)
- **Probabilistic Wind Power Forecasts using Deep Neural Networks with Discrete Target Classes**
  M. Felder, A. Kaifel, F. Sehnke, K. Ohnmeiß, L. Schröder (Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg (ZSW), Germany) (Submission-ID WIW18- 292)

18:08 – 18:30 Discussions

19:00 – 22:30 WORKSHOP DINNER WASA Museum (Bus departure 18:40)

THURSDAY, 18 OCTOBER 2018

08:30 – 10:40	SESSION 3A – OFFSHORE WIND ASPECTS
> Session Chair	TBA

08:30 – 10:18 Presentations (16 min. each)

- **Validation and Assessment of the High Definition Modular Multilevel Converter for Offshore Wind Turbines and Other Medium Voltage Applications**
  M. Smailes (Offshore Renewable Energy Catapult, United Kingdom), R. Torres-Olguin (SINTEF, Norway), C.Ng, (Offshore Renewable Energy Catapult, United Kingdom), A. Perez (Tecnalia, Spain), J. L. Dominguez (IREC, Spain) (Submission-ID WIW18-35)
- **Eigenvalue-based Stability Analysis of Sub-synchronous Oscillation in an Offshore WPP**
  L. Shuai, R. Sharma (Siemens Gamesa Renewable Energy, Denmark), S. Pirzada (Siemens Gamesa Renewable Energy, United Kingdom) (Submission-ID WIW18-148)
- **Kriegers Flak Combined Grid Solution – Principles of Voltage and Reactive Power Control for HVAC/HVDC Meshed Offshore Grids**
  V. Akhmatov (Energinet dk, Denmark), Marten (50Hertz-Transmission, Germany), R. Stornowski (50Hertz-Transmission, Germany), T. Bentzon Soerensen (Energinet dk Denmark) (Submission-ID WIW18-245)
- **A Fault Handling Current Control Strategy for Offshore Wind Power Plants with Diode Rectifier HVDC Transmission**
  C. Neumann, H.-G. Eckel (University of Rostock, Germany), S. Achenbach (Siemens, Germany) (Submission-ID WIW18-16)
- **Stability Analysis of Offshore Wind Farms with Fixed Frequency and Diode Rectifier HVDC Connection**
  C. Prignitz, H.-G. Eckel (University of Rostock, Germany), S. Achenbach (Siemens, Germany) (Submission-ID WIW18-301)
- **Concepts for the Connection of Electrical Boilers and Electrolysers to HVDC links**
  M. Ndreko (TenneT TSO, Germany), M. van der Meijden (TenneT TSO, Netherlands) (Submission-ID WIW18-258)
- **Analysis, Benchmark and Mitigation of Storm and Ramping Risks from Offshore Wind Power in Belgium**
  R. Baetens, S. De Clerq, A. Woyte, C. Guerrero (3E, Belgium) (Submission-ID WIW18-125)

10:18 – 10:40 Discussions

08:30 – 10:40	SESSION 3B – ANCILLARY SERVICES – FREQUENCY CONTROL
> Session Chair	TBA

08:30 – 10:18 Presentations (18 min. each)

- **Frequency services for Grid Support: International Experiences from On-shore and Off-shore Wind Farms**
  S. Bolik (Senvion, United Kingdom) (Submission-ID WIW18-83)
- **A Generic Control Approach to Enable the Participation of Wind Farms in Frequency Control Services**
  J. Callec, Y. Wang, G. Delille, Q. Morel (EDF R&D, France), D. Sarvary (EDF ENS, France), C. Shu (EDF EN, France) (Submission-ID WIW18-278)
- **The Impact of Inertia Emulation on Damping of Inter-Area Power Oscillations during Under-Frequency Events in the Nordic Power System**
  T. Kujansuu, A. Harjula (Fingrid Oyj, Finland), R. Ogiewa (ENERCON, Sweden), Y. Chompoobutrgool (ENERCON, Germany) (Submission-ID WIW18-5)
- **Potential for Provision of Ancillary Services by Re4newable Energy Resources in ERCOT**
  J. Matevosyan, C. Anderson (ERCOT, USA) (Submission-ID WIW18-71)
- **Pen y Cymoedd - Delivery of Enhanced Frequency Response in UK by Batteries**
  J. Persson (Vattenfall R&D, Sweden), S. Gerhard (Vattenfall, Germany) (Submission-ID WIW18-287)
- **Comparison of Different Estimation Methods for the Grid Frequency Using the Example of a System Split in the Interconnected Electrical Power System**
  H. Becker, H. Sölter, (Fraunhofer IEE, Germany), L. Hofmann (FraunhoferIEE, Germany | Leibniz University Hannover, Germany) (Submission-ID WIW18-119)

10:18 – 10:40 Discussions

08:30 – 10:40	SESSION 3C – NEDO WIND GENERATION FORECASTING PROJECTS
> Session Chair	Kazuhiko Ogimoto (The University of Tokyo, Japan)
08:30 – 10:30	Presentations (15 min. each)

- **Japan's R&D Project of Ramp Forecasting Technology: Project Overview**
  T. Suga, Takahiro, N. Hayasaki (ITOCHU Techno-Solutions Corporation, Japan), K. Ogimoto (The University of Tokyo, Japan) (Submission-ID WIW18-168)
- **Japan's R&D Project of Ramp Forecasting Technology: Probabilistic Forecast Based on Dynamical and Statistical Ensemble Methods**
  D. Nohara, S. Kadokura, M. Ohba, T. Watanabe (Central Research Institute of Electric Power Industry, Japan) (Submission-ID WIW18-112)
- **Japan's R&D Project of Ramp Forecasting Technology: Deterministic Forecast with Post-processing Using Real-time Monitoring Data**
  S. Kadokura, D. Nohara, M. Ohba, A. Hashimoto, K. Nakao, Y. Hattori, T. Watanabe, H. Hirakuchi (Central Research Institute of Electric Power Industry, Japan) (Submission-ID WIW18-6)
- **Development of Ramp Forecasting Technology via a National R&D Project (in Japan): Meteorological Pattern Analysis Method**
  M. Okada, T. Ichizawa, Y. Nakamura, K. Yamaguchi, R. Kodama (Japan Weather Association, Japan), H. Kato, Y. Nagano (Nihon University, Japan), R. Ikeda, V. Q. Doan, H. Kusaka, T. Araki, I. N. Ishizaki (University of Tsukuba, Japan), N. Ogasawara (Japan Weather Association, Japan) (Submission-ID WIW18-107)
- **Japan's R&D Project of Ramp Forecasting Technology: Analog Ensemble and Extended Bias Correction Method**
  T. Araki, R. Ikeda, V. Q. Doan,N. Ishizaki, H. Kusaka (Center for Computational Sciences, University of Tsukuba, Japan) (Submission-ID WIW18-122)
- **Japan's R&D Project of Ramp Forecasting Technology: A Machine Learning Scheme for Ramp Forecast**
  Y. Fujimoto, K. Higashiyama, Y. Hayashi (Waseda University, Japan) (Submission-ID WIW18-156)
- **Japan's R&D Project of Ramp Forecasting Technology: A Forecast Integration Method**
  T. Takeuchi, Y. Hirata, S. Horai, K. Aihara (Institute of Industrial Science, the University of Tokyo, Japan) (Submission-ID WIW18-145)
- **Japan's R&D Project of Ramp Forecasting Technology: Metrics for Evaluating Ramp Forecast**
  K. Yoshida, N. Hayasaki, N. Ushigami (ITOCHU Techno-Solutions Corporation, Japan), N. Ogasawara, M. Okada, Y. Nakamura (Japan Weather Association, Japan) (Submission-ID WIW18-140)

10:30 – 10:40	Discussions

10:40 – 11:10 Coffee Break

11:10 – 13:10	SESSION 4A – STOARGE ISSUES
> Session Chair	TBA
11:10 – 12:40	Presentations (18 min. each)

- **Is Cheap Electricity Storage Essential to Build an Energy System Based on Wind and Solar Power?**
  E. Nyholm, L. Reichenberg (Chalmers University of Technology, Sweden) (Submission-ID WIW18-282)
- **Enabling 80+ Percent Share of Wind and Solar in Lithuanian Power Sector: Role of Storage Technologies**
  J. Jasiūnas, L. Söder (KTH Royal Institute of Technology, Sweden) (Submission-ID WIW18-48)
- **Understanding the Role of Short-term Energy Storage and Large Motor Loads for Active Power Controls by Wind Power**
  V. Gevorgian (NREL, USA) (Submission-ID WIW18-32)
- **Balancing by Wind and Energy Storage**
  A. Linder, A. Kosareva, B. Lenz, D. McMullin, K. Kunz (ENERCON, Germany) (Submission-ID WIW18-103)
- **Utilization of Battery Energy Storage to Assist Renewable Energy Networks**
  Y. Hu, N. Zhao, N. Schofield (University of Huddersfield, United Kingdom) (Submission-ID WIW18-204)

12:40 – 13:10	Discussions

11:10 – 13:10	SESSION 4B – PANEL DISCUSSION: THE MASSIVE INTEGRATION OF POWER ELECTRONIC DEVICES (MIGRATE) IN FUTURE POWER SYSTEMS – CHALLENGES AND SOLUTIONS
> Session Chair	Jako Kilter (Elering/TU Tallinn, Estonia)
11:10 – 12:40	Presentations (15 min. each)

- **MIGRATE Project and Future Power Systems**
  J. Kilter (Elering/Tallinn University of Technology, Estonia) (Submission-ID WIW18-329)
- **Large Disturbance Rotor Angle Stability Analysis in Power Systems with High Penetration Levels of Wind Power**
  J. Rueda Torres (TU Delft, Netherlands) (Submission-ID WIW18-330)
- **Operation of Wide-Area-Controls in Iceland**
  B. Heimisson (Landsnet, Iceland) (Submission-ID WIW18-331)
- **Experimentation Results : Grid Forming Control Interoperability Tests and Current Limitation**
  T. Prevost (RTE, France) (Submission-ID WIW18-332)
- **Relay and System Protection Challenges in Future Power Systems**
  R. Andrino Gallego (REE, Spain) (Submission-ID WIW18-333)
- **Power Quality and Grid Codes in View of Massive Integration of Power Electronic Devices**
  M. Val Escudero (Eirgrid, Ireland) (Submission-ID WIW18-334)

12:40 – 13:10	Discussions

11:10 – 13:10	SESSION 4C – TBA
> Session Chair	TBA
11:10 – 12:40	Presentations (18 min. each)

- **Wind Integration Costs – a Useful Concept that is Complicated to Estimate**
  H. Holttinen (VTT, Finland), J. C. Smith (ESIG, USA), S. Müller (IEA, France), E. Taibi (IRENA, Germany), T. K. Vrana (SINTEF, Norway), D. Fraile (Wind Europe, Belgium) (Submission-ID WIW18-241)
- **Investment Analysis on Transmission Lines using TIMES-JMRT Grid Model under a Scenario with large amount of Renewable**
  Y. Yasuda (Kyoto University, Japan), H. Hamasaki (Fujitsu Research Institute, Japan) (Submission-ID WIW18-149)
- **Usability of flexible demand and generation in the BDEW smart grid traffic light concept**
  L. Hülsmann, E. Tröster (Energynautics, Germany), U. Ohl, M. Koch (EWR Netze, Germany) (Submission-ID WIW18-327)
- **Impact of Technical Parameters and Data Quality on Wind Energy Modeling in Germany**
  D. Beulertz, A. Schnettler (RWTH Aachen Universtity, Germany) (Submission-ID WIW18-255)
- **DLR Use for Optimization of Network Design with Very Large Wind (and VRE) Penetration**
  A. Estanqueiro (LNEG, Portugal), J. P. Gentle (INL, USA), L. Söder (KTH, Sweden), P. Hilber (KTH, Sweden), K. Morozovska (KTH, Sweden), T. Kanefendt (Fraunhofer IEE, Germany), J. Duque (LNEG, Portugal) (Submission-ID WIW18-263)

12:40 – 13:10	Discussions

13:15 – 14:15 LUNCH BREAK

14:15 – 16:10	SESSION 5A – DISTRIBUTED GENERATION ASPECTS
> Session Chair	TBA

14:15 – 15:45 Presentations (18 min. each)

- **Operational Options to Integrate Decentralized Generation into Restoration Processes After Severe System Black Outs**
  H. Becker, D. Mende (Fraunhofer IEE, Germany), U. Spanel, A. Bernhart, S. Bendzko, (DUtrain, Germany), J. Brombach (I4E: Innovation for Enercon, Germany) (Submission-ID WIW18-118)
- **Key Factors for the Assessment of Short-Circuit Current Contribution of DER in Distribution Grids**
  B. Niersbach, J. Hanson (TU Darmstadt, Germany), C. Bott (Netze BW, Germany) (Submission-ID WIW18-207)
- **Transfer of the Kombikraftwerk Concept to the European and the International Level - From Transformation Studies to Operational Virtual Power Plants**
  B. Zimmermann, K. Knorr, A. Liebelt, J. Schütt (Fraunhofer IEE, Germany) (Submission-ID WIW18-22)
- **Design and Implementation of a Renewable Hybrid Power Plant Controller**
  G. A. Raducu, J. Funkquist, C. Ionita, N. Styliaras (Vattenfall R&D, Denmark) (Submission-ID WIW18-265)
- **Advanced Inertial Response Control Based on Disturbance Observer in Microgrid with Wind Power**
  J. Qi, T. Tsuji (Yokohama National University, Japan) (Submission-ID WIW18-300)

15:45 – 16:10 Discussions

14:15 – 16:10	SESSION 5B – SECTOR COUPLING AND LARGE SCALE DECARBONATION OF POWER SUPPLY
> Session Chair	TBA

14:15 – 15:45 Presentations (18 min. each)

- **Sector-Coupling Eliminates the Cost-Benefit of Transmission Expansion in a Highly Renewable European Energy Scenario**
  T. Brown, V. Hagenmeyer, J. Hörsch (KIT Karlsruhe Institute of Technology, Germany) (Submission-ID WIW18-188)
- **Sector Coupling: Renewable Gas from Offshore Wind and Offshore Electrolysers to Decarbonise Heat and Transport**
  M. Jansen, I. Staffell (Imperial College London, United Kingdom) (Submission-ID WIW18-257)
- **How to Get the Power Sector Decarbonised – a Lessons-Learned Tool for International Knowledge Exchange**
  K. Burges (RE-xpertise, Germany), F. Röser, M. Hagemann, K. Riechers, M. Moisio (NewClimate Institute, Germany) (Submission-ID WIW18-215)
- **North Sea offshore Grid development: Combined optimization of grid and generation investments towards 2050**
  M. Koivisto, J. Gea-Bermudez, P. Sørensen (DTU Wind Energy, Denmark) (Submission-ID WIW18-142)
- **Modeling the Dynamics and Control of Power Systems with High Share of Renewable Energies**
  S. Auer, T. Kittel (Potsdam Institute for Climate Impact Research (PIK), Germany) (Submission-ID WIW18-143)

15:45 – 16:10 Discussions

14:15 – 16:10	SESSION 5C: GRID CODE ASPECTS I
> Session Chair	TBA

14:15 – 15:45 Presentations (18 min. each)

- **Importance of Voltage-Dip Knowledge for Improving Fault-Ride-Through of Wind-Power Installations**
  A. Bagheri, M. Bollen (Luleå University of Technology, Sweden), M. Bongiorno (Chalmers University of Technology, Sweden) (Submission-ID WIW18-102)
- **Wind Farm Fault Ride Through – An Irish Context**
  A. McDonnell, J. Kelleher, S. Hunt, J. Whelan (ESB International, Ireland) (Submission-ID WIW18-187)
- **Analysis of HVDC and Wind Turbine Converters Response during Offshore Asymmetrical Faults**
  Ö. Göksu, N. Cutululis, P. Sørensen (DTU Wind Energy, Denmark) (Submission-ID WIW18-229)
- **Do we Need a Network Code on Cyber Security? How to Address Cyber Security Requirements in a Power System with High Penetration of Distributed Generation?**
  M. Doering, E. Haesen (Ecofys, a Navigant Company, Germany) (Submission-ID WIW18-237)
- **FRT Test System Compact for 27 MVA with Less Grid Burdens is now in Operation**
  R. Klosse (WindGuard Certification, Germany) (Submission-ID WIW18-240)

15:45 – 16:10 Discussions

16:10 – 16:40 COFFEE BREAK

16:40 – 18:30	SESSION 6A – POWER SYSTEM STUDIES
> Session Chair	TBA

16:40 – 18:28 Presentations (16 min. each)

- **Analysis of Power System Oscillation Stability with Large Integration of Renewable Generations**
  L. Cai, H. Weber, E.-G. Eckel (Institute of Electrical Power Engineering, University of Rostock, Germany), U. Karaagac (Hong Kong Polytechnic University, Hong Kong), J. Mahseredjian (Polytechnique Montréal, Canada) (Submission-ID WIW18-150)
- **The North American Renewable Integration Study and the Interconnections Seam Study**
  G. Brinkman, A. Bloom, J. Ho, J. Novacheck (National Renewable Energy Laboratory, USA) (Submission-ID WIW18-298)
- **Dimensioning of the System Defence Plan for Over-Frequency to Ensure Frequency Stability in the ENTSO-E Continental Europe Synchronous Area**
  J. Weidner (50Hertz Transmission, Germany), T. Hennig (Amprion, Germany), G. Deiml (50Hertz Transmission, Germany) (Submission-ID WIW18-64)
- **A Machine Learning Approach to Low System Strength Grid Identification for Large Scale Power Systems**
  A. Clark (ERCOT, USA | Texas A&M University, USA), Y. Zhang, F. Huang (ERCOT, USA), L. Xie (Texas A&M University, USA) (Submission-ID WIW18-191)
- **DPSA.jl - an Open-Source library for analyzing frequency stability in power grids with high shares of renewable energy**
  T. Kittel, S. Auer, C. Horn (PIK - Potsdam Institute for Climate Impact Research, Germany) (Submission-ID WIW18-290)
- **Enhancing the Quality of Vendor-Specific Dynamic Models Representing Wind Turbine Generators and Other New Power System Components in Interconnection Studies**
  M. Borodulin (KIIP Consulting, USA) (Submission-ID WIW18-54)

18:28 – 18:30 Discussions

16:40 – 18:30	SESSION 6B – ANCILLARY SERVICES II
> Session Chair	TBA

16:40 – 18:28 Presentations (18 min. each)

- **Rethinking Ancillary Services – Provides Distributed Generation Reactive Power for Free?**
  K. Burges (RE-xpertise, Germany), M. Döring (Ecofys - Navigant, Germany) (Submission-ID WIW18-211)
- **System Services by Wind Power Plants Supporting 75% Wind Penetration in Ireland**
  M. Gilsenan, D. McMullin (ENERCON - Irish Branch, Ireland), S. Engelken (WRD, Germany) (Submission-ID WIW18-67)
- **Validation of an Experimental Test-bed System for Ancillary Services of Wind Power Plants**
  A. Kisser, L. Rezai, J. Fortmann (HTW Berlin - Universitiy of Applied Sciences, Germany) (Submission-ID WIW18-196)
- **Economic and Technical Analysis of Reactive Power Supply with Renewable Energy Power Plants**
  H. Koeppe (TU Braunschweig - elenia, Germany), R. Grab (Fraunhofer ISE, Germany), B. Engel (TU Braunschweig - elenia, Germany) (Submission-ID WIW18-285)
- **Gotland as a Microgrid – Energy Storage Systems Frequency Response in Grids with High Level of Wind Energy Penetration**
  F. Daraiseh, V. Gliniewicz, E. Lidström (Vattenfall R & D, Sweden) (Submission-ID WIW18-75)
- **Frequency Support Provision to Power Systems from HVdc-Connected Offshore Wind Power Plants**
  A. Bidadfar, O. Saborío-Romano (DTU, Denmark), E. Prieto-Araujo, O. Gomis-Bellmunt (CITCEA-UPC, Barcelona, Spain), M. Altin, Müfit, A. Cutululis, P. E. Sørensen (DTU, Denmark) (Submission-ID WIW18-81)

18:28 – 18:45 Discussions

16:40 – 18:40	SESSION 6C – POWER QUALITY ISSUES I
> Session Chair	TBA

16:40 – 18:2 Presentations (16 min. each)

- **How Large Wind Parks Contribute to Harmonic Waveform Distortion**
  D. Schwanz, M. Bollen, S. Rönnberg, A. Larsson (Luleå University of Technology, Sweden) (Submission-ID WIW18-101)
- **Method for Harmonic and TOV Connection Impact Assessment of Offshore Wind Power Plants – Part I: Harmonic distortion**
  R. de Groot, F. van Erp, K. Jansen, J. van Waes (TenneT TSO BV, Netherlands), M. Hap, L. Thielman (Tractebel Engineering, Belgium) (Submission-ID WIW18-124)
- **Method for Harmonic and TOV Connection Impact Assessment of Offshore Wind Power Plants – Part II: TOV Impact Assessment**
  K.Jansen, R. de Groot, B. van Hulst (TenneT TSO, Netherlands), K. Velitsikakis, C. Engelbrecht (DNV GL, Netherlands) (Submission-ID WIW18-129)
- **Analysis of Harmonic Resonance Stability in Power System with Renewable Generations**
  U. Karaagac (Hong Kong Polytechnic University, Hong Kong), J. Mahseredjian (Polytechnique Montréal, Canada), H.-G. Eckel, H. Weber (University of Rostock, Germany) (Submission-ID WIW18-26)
- **Case Study: Reliability of the Summation Method to Assess the Harmonic Current due to a Wind Power Plant**
  K. Redondo, J. J. Gutierrez, I. Azcarate, P. Saiz, L. A. Leturiondo (University of the Basque Country (UPV/EHU), Spain), S. Lodetti (CIRCE University of Zaragoza, Spain) (Submission-ID WIW18-116)
- **Active Filtering with Large-Scale STATCOM for the Integration of Offshore Wind Power**
  Ł. Kocewiak (Ørsted, Denmark), M. Pieschel (Siemens, Germany), K. Kabel, M. Juamperez, S. Sahukari (Ørsted, Denmark) (Submission-ID WIW18-61)
- **Analysis of Harmonic Aggregation in Wind Power Plants Based on Phase Angle Measurements and Modeling**
  T. Rasmussen (DTU, Denmark), E. Guest, L. Shuai (Siemens Gamesa Renewable Energy, Denmark), Ł. Kocewiak (Ørsted, Denmark) (Submission-ID WIW18-164)

18:32 – 18:45 Discussions

18:45 POSTER RECEPTION & NETWORKING

FRIDAY, 19 OCTOBER 2018

08:30 – 10:40	SESSION 7A – GRID CODE ASPECTS II
> Session Chair	TBA

08:30 – 10:18 Presentations (18 min. each)

- **Wind Farm Grid Code Compliance Testing: Different Approaches, Biggest Hurdles and the Foreseeable Future**
  T. Rösner, J. Fleischhauer, M. Fernandez (Nordex Energy, Germany) (Submission-ID WIW18-96)
- **Validating Wind Turbine EMT Model Used for Phase to Earth Fault UVRT Simulation from Field Measurements and Fulfilling Grid Connection Requirements**
  P. Ghimire, F. Martin, R. Sharma, I. Szczesny (Siemens Gamesa Renewable Energy, Denmark) (Submission-ID WIW18-195)
- **Validation Criteria and Appropriate Level of Detail for EMT Models in the Scope of System Studies and Grid Code Requirements**
  M. Laubrock, W. Belkacemi (Nordex Energy GmbH, Germany) (Submission-ID WIW18-62)
- **Grid Code Development for Wind Power Integration in China and Electrical Simulation Model Validation**
  L. Shuai (Siemens Gamesa Renewable Energy, Denmark), Y. Chi (China Electric Power Research Institute, China), F. Martin (Siemens Gamesa Renewable Energy, Denmark), J. Shi, Z. Zhu (Shanghai Electric Wind Power Group, China), H. Tang (China Electric Power (Submission-ID WIW18-153)
- **Grid Code Certification in Germany – A Recipe for Europe?**
  C. Scheefer, C. Lütke-Lengerich (FGH Certification Body, Germany) (Submission-ID WIW18-87)
- **Comparison of Impedance Characteristics of Multi-Megawatt Grid Simulator with LVRT-Container During LVRT Test**
  S. Azarian, T. Jersch (Fraunhofer IWES, Germany) (Submission-ID WIW18-216)

10:18 – 10:40 Discussions

08:30 – 10:40	SESSION 7B – MARKET AND REGULATORY ISSUES
> Session Chair	TBA

08:30 – 10:18 Presentations (18 min. each)

- **Wind Generation in Adequacy Calculations and Capacity Markets in Different Power System Control Zones**
  L. Söder (KTH Royal Institute of Technology, Sweden), A. Estanqueiro (LNEG, Portugal), D. Flynn (University College Dublin, Ireland), B.-M. Hodge (NREL, USA), J. Kiviluoma (VTT, Finland), T. K. Vrana (SINTEF, Norway), E. Neau (EDF, France), N. A. Cutululis (DTU, Denmark), D. Pudjianto, G. Strbac (Imperial College London, United Kingdom) (Submission-ID WIW18-63)
- **A Dispatch Methodology to Secure Power System Inertia in Future Power Systems**
  H. Thiesen, C. Jauch (Flensburg University of Applied Sciences - Wind Energy Technology Institute, Germany) (Submission-ID WIW18-146)
- **Negative Market Prices and Market Premium Support Schemes – Impacts on Wind Integration in the German Electricity Market**
  M. Klobasa, M. Haendel, L. Pfluger (Fraunhofer ISI, Germany) (Submission-ID WIW18-220)
- **Experiences in the NEM: Practical Considerations for the Successful Integration of Utility-Scale Renewable Storage Solutions**
  H. Mackenzie, J. Dyson (Dispatch Solutions, Australia) (Submission-ID WIW18-105)
- **Grid Investment Needs for Renewable Capacity Integration – A Different Approach**
  H. Milheiras (1- ERSE - Entidade Reguladora dos Serviços Energéticos, Portugal) (Submission-ID WIW18-307)
- **Comparison of Connection Policies for the Planning of Generation Integration into a Distribution Network**
  A. Chabrol, J. Wallace, C. Molloy (ESB Networks, Ireland) (Submission-ID WIW18-27)

10:18 – 10:40 Discussions

10:40 – 11:10 Coffee Break

11:10 – 13:10	SESSION 8A: BALANCING ISSUES
> Session Chair	TBA
11:10 – 12:40	Presentations (18 min. each)

- **Balancing Challenges for Future North Sea Offshore Network**
  K. Das, J. G. Bermudez, M. J. Koivisto, P. E. Sørensen (DTU Wind Energy, Denmark) (Submission-ID WIW18-217)
- **Future Flexibility Valuation in Power Systems with High Penetration of Variable Generation**
  M. F. J. Ronde, M. Duvoort (DNV GL, Netherlands) (Submission-ID WIW18-304)
- **Finding the Limits to System Flexibility**
  E. Lannoye (EPRI International, Ireland), A. Tuohy, E. Ela, Q. Wang (EPRI, USA) (Submission-ID WIW18-219)
- **Ancillary Services and its Role in Grid Balancing in India**
  S. Bhagat (Ministry of New and Renewable Energy, Government of India, India) (Submission-ID WIW18-138)
- **Frequency Regulation of Power System in Japan with Large-Scale Integration of Renewables by using Electrolyzers**
  T. Tsuji, J. Qi (Yokohama National University, Japan) (Submission-ID WIW18-309)

12:40 – 13:10 Discussions

11:10 – 13:10	SESSION 8B – POWER QUALITY ISSUES II
> Session Chair	TBA
11:10 – 12:40	Presentations (18 min. each)

- **Analysis of the Flicker Estimation at PCC of a Wind Power Plant**
  K. Redondo, I. Azcarate, J. J. Gutierrez, L. A. Leturiondo, P. Saiz (University of the Basque Country (UPV/EHU), Spain) (Submission-ID WIW18-166)
- **Application of the Impedance Based Method to an Offshore Wind Power Plant**
  L. Beloqui Larumbe, Z. Qin, P. Bauer (Delft University of Technology, Netherlands) (Submission-ID WIW18-198)
- **Methods to Aggregate Turbine and Network Impedance for Wind Farm System Resonance Analysis**
  H. Wang (China Electric Power Research Institute, China), C. Buchhagen, M. Greve (TenneT, Germany), J. Sun (Rensselaer Polytechnic Institute, USA) (Submission-ID WIW18-177)
- **An Impedance-Based Active Filter for Type-IV Wind Turbines**
  E. Guest (Siemens Gamesa Renewable Energy, Denmark | DTU, Denmark), T. Rasmussen (DTU, Denmark), K. Jensen (Siemens Gamesa Renewable Energy, Denmark) (Submission-ID WIW18-20)
- **Demonstration of Low Voltage IGBT-Based Active Power Factor Correction on Medium Voltage**
  D. Liljengren (Comsys, Sweden) (Submission-ID WIW18-10)

12:40 – 13:10 Discussions

13:15 – 14:15 LUNCH BREAK

14:15– 15:45	SESSION 9A – TBA
> Session Chair	TBA

14:15 – 15:35 Presentations (18 min. each)

- **Synchronous Condensers Applications in Transmission Network with Power Electronics Based Devices**
  A. Atallah (Siemens, Germany) (Submission-ID WIW18-135)
- **Sliding Mode Control of Back-to-Back Converter**
  H. Schulte (HTW Berlin - University of Applied Sciences Berlin, Germany) (Submission-ID WIW18-202)
- **Requirements for Power-Electronic Inertia to Avoid Black-Outs in Emergency Islanding Conditions**
  D. Duckwitz (Fraunhofer IEEE, Germany) (Submission-ID WIW18-259)
- **A New Method of Grid Control of a Wind Turbine**
  L. Rezai, N. Klaes, J. Fortmann, M. Engel (Hochschule für Technik und Wirtschaft (HTW) Berlin, Germany) (Submission-ID WIW18-199)
- **Operational Experience of Type 3 WPP in a Weak Power System Region with Two Type 2 Wind Power Plants and 2 Synchronous Condensers**
  A. Abdellaoui, M. Asmine (Hydro-Québec (TransÉnergie), Canada) (Submission-ID WIW18-316)

15:35 – 15:45 Discussions

14:15– 15:45	SESSION 9B – FORECASTING II
> Session Chair	TBA

14:15 – 15:30 Presentations (20 min. each)

- **Understanding Uncertainty: the Difficult Move from a Deterministic to a Probabilistic World**
  C. Möhrlen (WEPROG, Germany), R. Bessa (INESC TEC, Germany), C. Draxl (NREL, Germany), B.-M. Hodge (NREL, Germany), G. Giebel (DTU Wind Energy, Germany), A. Tuohy (EPRI, USA) (Submission-ID WIW18-155)
- **Probabilistic Wind Power Forecasting Using Deep Learning**
  S. Haglund El Gaidi, M. Chiru (Greenlytics, Sweden) (Submission-ID WIW18-302)
- **Short Term Forecasting of Wind Turbine Production whith Machine Learning Methods: Direct Approach and Integrated Approach.**
  M. Dione (Engie Green France-CREST (ENSAE ParisTech), France), E. Matzner-Lober (CREST (ENSAE ParisTech), France), P. Alexandre (Engie Green France, France) (Submission-ID WIW18-11)
- **Overcoming the Arising Challenges of Wind Energy Forecasting with Machine Learning Models**
  S. Vogt, A. Braun, J. Dobschinski, D. Jost, J. Koch (Fraunhofer IEE, Germany) (Submission-ID WIW18-190)

15:30 – 15:45 Discussions

15:45 – 15:55 SHORT BREAK

15:55 – 16:55	SESSION 10 – CLOSING SESSION
> Session Chair	
15:55 – 16:15	Presentation
	• **Panel Discussion** TBA
16:15 – 16:55	Discussions

POSTER PRESENTATIONS

- **Modeling the Arrangement of Turbines for Onshore Wind Power Plants Under Varying Wind Conditions**
  M. Celeska, K. Najdenkoski, V. Dimchev, V. Stoilkov (Ss. Cyril and Methodius University in Skopje, Macedonia), L. Fickert, R. Schuerhuber (TU Graz, Austria) (Submission-ID WIW18-4)
- **Passive Houses as Power and Heat Storage in the Smart Grid**
  A. Bretzke , R. Höfer (Univ. of appl. Sc. Biberach VDI, Germany) (Submission-ID WIW18-13)
- **The Effect of Large Scale Renewable Projects Integration into Jordanian Power System in 2025**
  A. Abu Dyak, A. Harb (NEPCO National Electric Power Company, Jordan) (Submission-ID WIW18-21)
- **Modelling of Large Size Electrolyzer for Electrical Grid Stability Studies in Real Time Digital Simulation**
  P.K.S. Ayivor, J.L. Rueda Torres (Delft University of Technology, Netherlands), M.A.M.M. van der Meijden (Delft University of Technology, Netherlands | TenneT TSO, Netherlands) (Submission-ID WIW18-37)
- **Global Geospatial Optimization of the Locations of Wind Farms and the Configuration of Transmission Networks**
  K. Iwamura, R. Kobayashi, K. Nishiyama, Y. Nakanishi (Waseda University, Japan) (Submission-ID WIW18-40)
- **Accounting for Wind Gusts in Stability and Fault Ride-Through Capability Assessments for a Wind Power Plant in Wind Generation Interconnection Studies**
  M. Borodulin (KIIP Consulting, USA) (Submission-ID WIW18-52)
- **Modeling and Simulation of Wind Power Plant Dynamics in Power System Planning Studies: Lessons to Learn from the 2016 South Australian Blackout**
  M. Borodulin (KIIP Consulting, USA) (Submission-ID WIW18-56)
- **Experiences of State Forecasting Using Wind Generation Forecast in Real, Smart Distribution Grids**
  F. Paulat, K. Korotkiewicz, M. Ludwig, M. Zdrallek (Bergische Univesität Wuppertal, Germany) (Submission-ID WIW18-65)
- **Contribution of Increased Wind Generation to Dry Year Risk Management in New Zealand**
  L. Schwartfeger, A. Wood (University of Canterbury, Christchurch, New Zealand), G. Bickers (Transpower New Zealand, New Zealand) (Submission-ID WIW18-74)
- **Environmental Friendly High-Voltage Switchgear for an Emerging Renewable Energy Market**
  C. Buetuener (Siemens, Germany) (Submission-ID WIW18-78)
- **Inertia Contribution and Optimal Grid Utilization with Wind Turbines**
  C. Jauch, A. Gloe (Flensburg University of Applied Sciences, Germany) (Submission-ID WIW18-80)
- **Control Solutions for Blackstart Capability and Islanding Operation of Offshore Wind Power Plants**
  A. Jain, Anubhav, N. A. Cutululis (DTU, Denmark) (Submission-ID WIW18-97)
- **Steady-state characteristics of substation-free wind power plant composed of series-connected wind turbine generators and current-source thyristor inverter**
  S. Nishikata, F. Tatsuta (Tokyo Denki University, Japan) (Submission-ID WIW18-106)

- **Unconventional High-voltage Ride-Through Technical Retrofitting Scheme for Certain Imported Old Generating Units of the Northeast China Power Grid**
  Q. Lv (Columbia University, USA), H. P. Zhang, G. H. Shao, J. Q. Liu, S. B. Du (Northeast Power Dispatching Center of SGCC, China) (Submission-ID WIW18-109)

- **Reducing Maintenance Costs of Offshore HVDC Energy Export System through Optimized Maintenance**
  J. F. Unnewehr, A. Weidlich (University of Freiburg INATECH, Germany), H.-P. Waldl, T. Pahlke, (Overspeed, Germany), I. Herráez, (Hochschule Emden/Leer, Germany) (Submission-ID SIW-121)

- **Lyapunov-Based Control for Grid Side Inverters of Wind Turbine Systems**
  A. Schöley (University of Rostock, Germany) (Submission-ID WIW18-134)

- **Meteorological Categorization of Wind Power Ramp Events - Case Study of Three Areas of Japan**
  M. Okada, K. Yamaguchi, R. Kodama, N. Ogasawara (Japan Weather Association, Japan), K. Ogimoto (University of Tokyo, Japan) (Submission-ID WIW18-136)

- **Onshore Grid Frequency Control Using DC Capacitor in Full-Scale Converter for Offshore Wind Generator and Adjustable Speed Motor for Offshore Plant Connected by Multi-Terminal HVDC**
  H. Matsuda, Y. Ota, Yutaka, T. Nakajima (Tokyo City University, Japan) (Submission-ID WIW18-144)

- **Assessment of a Potential Hybrid System Between Offshore Wind and Tidal Park**
  C. Merkai (Vattenfall, Sweden | KTH Royal Institute of Technology, Sweden), L. Pérez Andrés, Holmberg (Vattenfall, Sweden) (Submission-ID WIW18-151)

- **On-line Markov Chain Based Thermal Risk Estimation for Offshore Wind Farm Cables**
  M. A. Hernandez Colin, J. Pilgrim (University of Southampton, United Kingdom) (Submission-ID WIW18-163)

- **A Framework to Endogenize the Capacity Credit of Wind Power in a Large-Scale Electricity Market Model**
  J. Peter, J. Wagner (University of Cologne, Germany) (Submission-ID WIW18-178)

- **Energy Control of Modular Multilevel Converter in MTDC Grids for Wind Power Integration**
  K. Shinoda, Ramachandran, A. Benchaib (SuperGrid Institute, France), J. Dai (SuperGrid Institute, France | CentraleSupélec, France), B. François (Centrale Lille, France | L2EP, France), S. Bacha (SuperGrid Institute, France | Université Grenoble F. Alpes (Submission-ID WIW18-179)

- **Experimental Results of a Wind Farm Scheduling Method Considering State-of-Charge Transition for an Electricity Market with the Compressed Air Energy Storage System**
  M. Ito, A. Kikuchi, Y. Fujimoto, M. Mitsuoka, H. Ishii, Hideo, Y. Hayashi (Waseda University, Japan) (Submission-ID WIW18-181)

- **Dynamic Line Rating in Western Danish Transmission System: a Case Study**
  N. Viafora, J. Holbøll (Technical University of Denmark (DTU), Denmark), R. Aabye Olsen, A. Steen Kristensen (Energinet, Denmark) (Submission-ID WIW18-189)

- **Investigation of Transient Energy Storage Sources for Support of Future Electrical Power Systems**
  Y. Hu, L. O. Shobayo, N. Zhao, N. Schofield (University of Huddersfield, United Kingdom) (Submission-ID WIW18-201)

- **Smart Energy Network Demonstrator - SEND**
  N. Schofield (University of Huddersfield, United Kingdom) (Submission-ID WIW18-209)

- **Wind Power Generation power plant for the CSIR Pretoria Campus**
  S. Simelane (Programme Manager, South Africa) (Submission-ID SIW-213)

- **Voltage Support Provision as an Ancillary Service from Wind Turbines Installed in Distribution Networks**
  S. Namayantavana (KTH Royal Institute of Technology, Sweden), A. Bidadfar (DTU, Denmark) (Submission-ID WIW18-221)

- **The Importance of the Test and Resource Centre for Small Wind Turbines for the Achievement of the Renewable Energy Goals – How Can a Testing Facility Increase People's Confidence in Small Wind Turbines?**
  T. Brink (Nordic Folkecenter for Renewable Energy, Denmark) (Submission-ID WIW18-228)

- **Variable Renewable Energy Integration Study and Policy Proposal in Japan by Using Demand-Supply Analysis and Grid Stability Analysis**
  S. Ichimura (Renewable Energy Institute, Japan) (Submission-ID WIW18-230)

- **Novel Control Scheme to Enhance Frequency Response of Wind Farms Augmented With Energy Storage Systems**
  S. M. Mousavi Agah, D. McNamara (Renewable Power Generation LTD, Ireland) (Submission-ID WIW18-238)

- **Challenges with the design of cost effective series DC collection network for sea-based wind-farm**
  M. Kharezy (Rise Research Institutes of Sweden, Sweden), T. Thiringer (Chalmers University of Technology, Sweden) (Submission-ID WIW18-246)
- **A Correction Method to Improve the Quality of the Wind Forecast – A Case Study for Wangjiangping Station**
  Y. Shen (China Meteorological Administration, China) (Submission-ID WIW18-256)
- **Operational Planning Strategies of Wind-Powered Electric Vehicle Charging Stations for Charging Demand Dispersion**
  Y. Lee (Sangmyung University, Korea, Republic of (South)), Y. Cho (Daegu Catholic University, Korea, Republic of (South)), J. Hur (Sangmyung University, Korea, Republic of (South)) (Submission-ID WIW18-269)
- **A Study on Future Power System Database Construction According to the Renewable Energy Expansion of Korean Electric Power System**
  S. Park, J. Han, H. Kwon, Y. Cho (Daegu Catholic University, Republic of South Korea), J. Hur (Sangmyung University, Republic of South Korea), H. Kim (Korea Electric Power Corporation, Republic of South Korea) (Submission-ID WIW18-280)
- **Reactive Power Management of a Large Scale Wind Power Cluster in Northern Sweden**
  I. Leisse (E.ON Energy Networks, Sweden) (Submission-ID WIW18-284)
- **Calibration of Wind Turbine Power Curve through Data Mining**
  Z. Qi, P. Guo (Inner Mongolia University, China, China), S. You, J. Wang, Y. Zong (DTU, Denmark) (Submission-ID WIW18-286)
- **Quasi-Monte Carlo Based Probabilistic Power Flow Calculations in Power System Considering the Correlations between Renewable Energy Sources**
  T. Takao (Yokohama National University, Japan) (Submission-ID WIW18-306)
- **Maximum Likelihood Wind Field State Estimator with LIDAR Measurements for Wind Farm Control**
  B. Uzunoglu (Uppsala University, Sweden) (Submission-ID WIW18-311)
- **Review of European Grid Codes for Wind Farms and Their Implications for Wind Power Curtailments**
  E. Nycander, L. Söder (KTH Royal Institute of Technology, Sweden) (Submission-ID WIW-335)