

20th 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

VIRTUAL
&
ON-SITE!

29 - 30 SEP
2021

 BERLIN
GERMANY

organized by **energynautics**

PRELIMINARY AGENDA AS OF 27 SEPTEMBER 2021

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

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ORGANIZER



TUESDAY 28 SEPTEMBER 2021		WEDNESDAY 29 SEPTEMBER 2021			THURSDAY 30 SEPTEMBER 2021				
		Wind Workshop Day 1			Wind Workshop Day 2				
		09:00 – 11:10	MOA 5			09:00 – 10:20	MOA 5	MOA 4	MOA 3
			WELCOME & SESSION 1: KEYNOTE SESSION				SESSION 5A: GRID FORMING III	SESSION 5B: POWER QUALITY ASPECTS	SESSION 5C HYBRID POWER PLANTS & MICROGRIDS
			COFFEE BREAK (20 MIN)				COFFEE BREAK (30MIN)		
		11:30 – 13:10/13:30	MOA 5	MOA 4	MOA 3	10:50 – 12:30	MOA 5	MOA 4	
			SESSION 2A: EXIT FROM COAL-FIRED GENERATION IN GERMANY – IMPACT ON TRANSMISSION ADEQUACY AND SECURITY OF SUPPLY	SESSION 2B: FORECASTING	SESSION 2C: WINDEUROPE: NEW PATHWAYS TO WIND SYSTEM INTEGRATION		SESSION 6A: GRID CODE ASPECTS	SESSION 6B: POWER SYSTEM ASPECTS I	
			LUNCH 13:10/13:30 – 14:15				LUNCH 12:30 – 13:30		
		14:15 – 15:50	MOA 5	MOA 4	MOA 3	13:30 – 15:30	MOA 5	MOA 4	MOA 3
			SESSION 3A: GRID FORMING I	SESSION 3B: RESILIENCY ISSUES	SESSION 3C: WINDNODE		SESSION 7A: GRID INTEGRATION ASPECTS	SESSION 7B: POWER SYSTEM ASPECTS II	SESSION 7C WIND POWER MODELLING
			COFFEE BREAK (20 MIN)				SHORT BREAK		
18:30 – 20:30	MOA BAR	16:10 – 18:10	MOA 5	MOA 4	MOA 3	15:35 – 16:35	MOA 5		
	NETWORKING EVENT SOLAR WS / PRE-REGISTRATION		SESSION 4A: GRID FORMING II	SESSION 4B: IEAWIND TASK 25	SESSION 4C: SECTOR COUPLING INCL. HYDROGEN		SESSION 8: CLOSING SESSION – PODIUM DISCUSSION		
		19:00	WORKSHOP DINNER						

WEDNESDAY, 29 SEPTEMBER 2021

08:00 – 09:00 On-site Registration

All times in the session tables show Central European Summer Times (CEST), the ruby stripes show the starting times of the sessions below in additional time zones.

03:00 New York | 04:00 Rio de Janeiro | 08:00 London | 12:30 New Delhi | 14:00 Jakarta | 15:00 Beijing | 16:00 Tokyo | 17:00 Sydney

09:00 – 09:15 Welcome

09:15 – 11:10 SESSION 1 – KEYNOTE SESSION

03:15 New York | 04:15 Rio de Janeiro | 08:15 London | 12:45 New Delhi | 14:15 Jakarta | 15:15 Beijing | 16:15 Tokyo | 17:15 Sydney

> Session Chair Thomas Ackermann (Energynautics, Germany)

09:15 – 10:55 Presentations (20min. each)

- **A TSO Strategy to Boost Decarbonisation and Development of Renewables**
O. Feix (50Hertz, Germany) (Submission-ID WIW21-xyz)
- **The Role of the Global Green Hydrogen Market in the Deployment and Integration of Solar and Wind for Net-Zero**
E. Taibi (IRENA, Germany) (Submission-ID WIW21-xyz)
- **WindNODE – Showcasing Smart Energy Systems from Northeastern Germany. Lessons learnt from East Germany's biggest energy transition consortium.**
M. Graebig (50Hertz, Germany)
- **Secure Energy Transitions in the Power Sector**
K. Everhart (IEA, France)
- **Fostering Resiliency with Good Market Design: Lessons from Texas**
P. Cramton (University of Cologne, Germany | University of Maryland, USA)

10:55 – 11:10 Discussions

11:10 – 11:30 COFFEE BREAK

11:30 – 13:30 SESSION 2A: EXIT FROM COAL-FIRED GENERATION IN GERMANY – IMPACT ON TRANSMISSION ADEQUACY AND SECURITY OF SUPPLY

05:30 New York | 06:30 Rio de Janeiro | 10:30 London | 15:00 New Delhi | 16:30 Jakarta | 17:30 Beijing | 18:30 Tokyo | 19:30 Sydney

> Session Chair Michael Jesberger (COO System- & Asset Management TransnetBW, Germany)

11:30 – 13:10 Presentations (20 min. each)

- **Key Aspects of the Legislation for the Exit from Coal-Fired Generation in Germany**
R. Pfeiffer (Amprion, Germany)
- **Coal Exit and Security of Supply: The Role of the German National Regulatory Agency (BNetzA)**
L. Neubauer (Bundesnetzagentur, Germany)
- **System-Technical Aspects during the Coal Exit: Relevance, Urgency and Conclusions for Accompanying Analyses**
H. Vennegeerts (Uni Duisburg-Essen, Germany)
- **Grid Analysis 2028 - Checkpoint of the Coal Exit Process**
F. Jahns (50Hertz, Germany) / M. König (TransnetBW, Germany)
- **Challenges for Grid Restoration in a Changing Energy System**
M. Livrozet (Amprion, Germany) / H. Woiton (TenneT TSO, Germany)

13:10– 13:30 Discussions

11:30 – 13:10	SESSION 2B: FORECASTING
05:30 New York 06:30 Rio de Janeiro 10:30 London 15:00 New Delhi 16:30 Jakarta 17:30 Beijing 18:30 Tokyo 19:30 Sydney	
> Session Chair	Leonard Hülsmann (Energynautics, Germany)
11:30 – 12:50	Presentations (20 min. each)
<ul style="list-style-type: none"> • Update on IEA Wind’s Recommended Practices for Renewable Power Forecast Solution Selection: Recommendations for Wind Facility Meteorological Measurements for Forecasting Applications J. W. Zack (UL Services Group, USA), C. Möhrten (WEPROG, Denmark), G. Giebel (DTU, Denmark) (Submission-ID WIW21-80) • Wind Power Forecasting Using LSTM Incorporating Fourier Transformation based Denoising Technique A. Kahraman (DTU University of Chinese Academy of Sciences, Denmark), G. Yang (DTU, Denmark), P. Hou (SEWPG European Innovation Center, Denmark) (Submission-ID WIW21-76) • Games and Other News from IEA Wind Task 36 Forecasting for Wind Energy G. Giebel (DTU, Denmark), W. Shaw (PNNL, USA), H. Frank (DWD, Germany), C. Draxl (NREL, USA), J. Zack (UL Services Group, USA), P. Pinson (DTU, Denmark), C. Möhrten (WEPROG, Denmark), G. Kariniotakis (MINES ParisTech, France), R. Bessa (INESC TEC, Portugal) (Submission-ID WIW21-92) • A Methodology to Improve the Predictability of Wind Energy Generation with Confirmatory Evidence from Germany K. Forbes (University College Dublin, Ireland) (Submission-ID WIW21-113) 	
12:50 – 13:10	Discussions

11:30 – 13:00	SESSION 2C: WINDEUROPE SESSION: NEW PATHWAYS TO WIND SYSTEM INTEGRATION
05:30 New York 06:30 Rio de Janeiro 10:30 London 15:00 New Delhi 16:30 Jakarta 17:30 Beijing 18:30 Tokyo 19:30 Sydney	
> Session Chair	Vasiliki Klonari (WindEurope, Belgium)
11:30 – 12:30	Presentations (30 min. each)
<ul style="list-style-type: none"> • The New Simple is Complex – Why we Need More Combined Renewable Power Plants and How they Effectively Support the Grid J. Badeda (ABO Wind, Germany) • System Services by Wind Farms: Experience Overview from the Irish DS3 Programme C. Dennehy (Energia, Ireland) • Economics, Design and Operation of Wind Hybrid Projects C. Mehendale (GE Renewable Energy, USA) 	
12:30 – 13:00	Discussions

13:00/13:30 – 14:15 LUNCH BREAK

14:15 – 15:50	SESSION 3A: GRID FORMING I
08:15 New York 09:15 Rio de Janeiro 13:15 London 17:45 New Delhi 19:15 Jakarta 20:15 Beijing 21:15 Tokyo 22:15 Sydney	
> Session Chair	Jian Sun (Rensselaer Polytechnic Institute, USA)
14:15 – 15:35	Presentations (20 min. each)
<ul style="list-style-type: none"> • Necessary Development of Inverter-Based Generation with Grid Forming Capabilities in Germany H. Popella, T. Hennig, M. Kaiser, J. Massmann, L. Müller, R. Pfeiffer (Amprion GmbH, Germany) (Submission-ID WIW21-39) • Demonstration and Validation of a Conformity Testing Method for Grid Forming Storage Units in the Transmission Grid C. Petino, S. Röhr, W. Winter (TenneT TSO, Germany), U. Tröger, S. Kinzel (Mercedes-Benz Energy, Germany) (Submission-ID WIW21-38) • Grid Forming Converters in Interconnected Systems - Final Results from the Joint Research Project VerbundnetzStabil S. Rogalla (Fraunhofer ISE, Germany), A. Greulich (KACO new energy, Germany), J. Lehner (TransnetBW, Germany), H. Lens (IFK, University of Stuttgart, Germany), P. Ernst (Fraunhofer ISE, Germany), T. Schaupp (TransnetBW, Germany), R. Singer, J. Ungerland (Fraunhofer ISE, Germany), C. Schöll (IFK, University of Stuttgart, Germany), R. Denninger, A. Salman (Fraunhofer ISE, Germany) (Submission-ID WIW21-59) • Frequency Dynamics of the European System during Split Integrating Grid-Forming Capabilities M. G. Ippolito, R. Musca, G. Zizzo (University of Palermo, Italy) (Submission-ID WIW21-14) 	
15:35 – 15:50	Discussions

14:15 – 15:50	SESSION 3B: RESILIENCY ISSUES
08:15 New York 09:15 Rio de Janeiro 13:15 London 17:45 New Delhi 19:15 Jakarta 20:15 Beijing 21:15 Tokyo 22:15 Sydney	
> Session Chair	Thomas Ackermann (Energynautics, Germany)
14:15 – 15:35	Presentations (20 min. each)
<ul style="list-style-type: none"> • Shaping a More Resilient Future Energy System A. Oudalov (Hitachi ABB Power Grids, Switzerland) (Submission-ID WIW21-124) • Resilient Microgrids in the Caribbean: a Techno-Economic Analysis P. Gambín Belinchón, L. Hülsmann (Energynautics, Germany) (Submission-ID WIW21-125) • Integrated Energy Planning for Resilient Power Systems P. Vithayasrichareon (IEA, France) • Fostering Resiliency, the Importance of the Demand Side E. Bobbio (University of Cologne, Germany University of Maryland, USA) 	
15:35 – 15:50	Discussions

14:15 – 15:50	SESSION 3C: WINDNODE
08:15 New York 09:15 Rio de Janeiro 13:15 London 17:45 New Delhi 19:15 Jakarta 20:15 Beijing 21:15 Tokyo 22:15 Sydney	
> Session Chair	Markus Graebig (50Hertz, Germany)
14:15 – 15:30	Presentations (25 min. each)
<ul style="list-style-type: none"> • We Can Heat the Entire North-East with Wind Power. M. Beckmann (ENERTRAG, Germany) • Sector Coupling in Action: the Potential of Power-to-Cold for the Grid Integration of Renewable Power M. Safarik (Institute of Air Handling and Refrigeration (ILK), Germany) • Cities as Wind Power Sponge – Smart Building and Power-to-Heat in the Conventional Building Envelope. S. Beucker (Borderstep Institut, Germany) 	
15:30 – 15:50	Discussions

15:50 – 16:10 COFFEE BREAK

16:10 – 18:10	SESSION 4A: GRID FORMING II
10:10 New York 11:10 Rio de Janeiro 15:10 London 19:40 New Delhi 21:10 Jakarta 22:10 Beijing 23:10 Tokyo 00:10 Sydney	
> Session Chair	Nis Martensen (Energynautics, Germany)
16:10 – 17:50	Presentations (20 min. each)
<ul style="list-style-type: none">• Analysis of the Implication of Current Limits in Grid Forming Wind Farm K. Vatta Kkuni, G. Yang (DTU, Denmark), T. Knüppel (Siemens Gamesa, Denmark) (Submission-ID WIW21-86)• Behavior of Grid Forming Converters in Different Grid Scenarios – Result of a Test Campaign on a Megawatt Scale P. Ernst, R. Singer, S. Rogalla (Fraunhofer ISE, Germany), C. Schöll, H. Lens (University of Stuttgart – IFK, Germany), A. Greulich (KACO new energy, Germany) (Submission-ID WIW21-54)• Investigation of a Wind Turbine with Grid Forming Control J. M. Cajigal Núñez, R. Mahmens (W2E Wind to Energy, Germany), S. Engelhardt (ConverterTec Deutschland, Germany), J. Struwe, P. Winter, H. Wrede (University of Applied Sciences Düsseldorf, Germany) (Submission-ID WIW21-42)• Current Limitation in Fully Grid-forming Direct Voltage Control J. Denecke, M. Maherani, H. Vennegeerts (University Duisburg-Essen, Germany) (Submission-ID WIW21-111)• An Impedance Scan Tool to Evaluate Grid Stability Impacts of Inverter-Based Resources S. Shah (NREL, USA) (Submission-ID WIW21-123)	
17:50 – 18:10	Discussions

16:10 – 18:10	SESSION 4B: DESIGN AND OPERATION OF ENERGY SYSTEMS WITH LARGE AMOUNTS OF VARIABLE GENERATION - IEAWIND TASK 25 SUMMARY
10:10 New York 11:10 Rio de Janeiro 15:10 London 19:40 New Delhi 21:10 Jakarta 22:10 Beijing 23:10 Tokyo 00:10 Sydney	
> Session Chair	Hannele Holttinen (Recognis, Finland)
16:10 – 17:50	Presentations (20 min. each)
<ul style="list-style-type: none">• Introduction: Design and Operation of Energy Systems with Large Amounts of Variable Generation H. Holttinen (OA Task 25, Recognis, Finland) (Submission-ID WIW21-71_1)• Planning Challenge: Grid Adequacy and Ensuring Long Term Reliability and Security of Supply B. Frew (NREL, USA) (Submission-ID WIW21-71_2)• Balancing Challenge: Guaranteeing Short Term System Reliability D. Flynn (UCD, Ireland) (Submission-ID WIW21-71_3)• Stability Challenge N. Cutululis (DTU, Denmark) (Submission-ID WIW21-71_4)• Market Challenges for Planning and Operations M. Korpås (NTNU, Norway) (Submission-ID WIW21-71_5)	
17:50 – 18:10	Discussions

16:10 – 18:10	SESSION 4C: SECTOR COUPLING INCL. HYDROGEN
10:10 New York 11:10 Rio de Janeiro 15:10 London 19:40 New Delhi 21:10 Jakarta 22:10 Beijing 23:10 Tokyo 00:10 Sydney	
> Session Chair	Peter-Philipp Schierhorn (Energynautics, Germany)
16:10 – 17:50	Presentations (20 min. each)
<ul style="list-style-type: none"> • Offshore Energy Hubs in Sector Coupled European Scenarios: Can Large-scale Wakes Hinder the Development? M. Koivisto, J. P. Murcia León (DTU, Denmark), J. Gea-Bermúdez (DTU, Denmark) (Submission-ID WIW21-48) • North Sea Wind Power Hub: The Pathway to Integrate more than 200 GW Offshore Wind into the North Western European Energy System L. Feenstra (Nederlandse Gasunie, Netherlands) • Impact Assessment of Smart Transmission Technologies on the Northwest Continental European Power Grid for Accelerating the Integration of Renewables R. Kuwahata (currENT, Belgium), C. Maurer, T. Kreisig, K. Lüdorf (Consentec, Germany), S. Nies, C. Kjaer (currENT, Belgium), (Submission-ID WIW21-107) • The Optimal Control of Type-4 Wind Turbines Connected to an Electric Microgrid J. Young (OptimoJoe, USA), D. Wilson (Sandia National Laboratories, USA), W. Weaver, R. Robinett III (Michigan Technological University, USA) (Submission-ID WIW21-60) • How to Use Grid Capacity from Dynamic Line Rating for Effective Integration of Renewables R. Kuwahata (Ampacimon, Belgium) (Submission-ID WIW21-116) 	
17:50 – 18:10	Discussions

19:00 **Workshop Dinner → Restaurant Ship PATIO
(to be booked separately)**

THURSDAY, 30 SEPTEMBER 2021

09:00 – 10:20	SESSION 5A: GRID FORMING III
03:00 New York 04:00 Rio de Janeiro 08:00 London 12:30 New Delhi 14:00 Jakarta 15:00 Beijing 16:00 Tokyo 17:00 Sydney	
> Session Chair	Eckehard Tröster (Energynautics, Germany)
09:00 – 10:00	Presentations (20 min. each)
<ul style="list-style-type: none">• Dynamic Behavior of Phase Shifting Transformer (PST) for Blackstart and Stable Operation of Offshore Wind Farm with Diode-Rectifier Unit HVDC link L. Cai (University of Rostock, Germany), X. Meng (SEWPG European Innovation Center, Denmark), H. Zhang, H.-G. Eckel, H. Weber (University of Rostock, Germany) (Submission-ID WIW21-15)• Real-Time PC-Based Converter for Testing Grid-Forming Control Methods in a Frequency-Variable Island Grid W. Schulze, M. Müller, M. Suriyah, T. Leibfried (Karlsruhe Institute of Technology – KIT, IEH, Germany) (Submission-ID WIW21-58)• Design- and Simulation-based Comparison of Grid-Forming Converter Control Concepts C. Schöll, H. Lens (University of Stuttgart – IFK, Germany) (Submission-ID WIW21-49)	
10:00 – 10:20	Discussions

09:00 – 10:20	SESSION 5B: POWER QUALITY ASPECTS
03:00 New York 04:00 Rio de Janeiro 08:00 London 12:30 New Delhi 14:00 Jakarta 15:00 Beijing 16:00 Tokyo 17:00 Sydney	
> Session Chair	Pablo Gambín Belinchón (Energynautics, Germany)
09:00 – 10:00	Presentations (20 min. each)
<ul style="list-style-type: none">• Methods and Results of Harmonic Simulation Assessment of a Reconstructed Meshed Transmission Grid with Distributed Harmonic Emission Sources V. Akhmatov, C. Skovgaard Hansen, T. Jakobsen (Energinet, Denmark) (Submission-ID WIW21-10)• Managing Resonances in Windfarm Collector Systems E. Larsen (eLarsen Power System Consulting, USA), J. Sun (Rensselaer Polytechnic Institute, USA) (Submission-ID WIW21-96)• Dynamic Power Flow-Based Resonance Source Location Method for the Large-Scale Power Electronics-Dominated Power Systems D. Yang (Eindhoven University of Technology, Netherlands), Y. Sun (Shell Global Solutions International, Netherlands) (Submission-ID WIW21-35)	
10:00 – 10:20	Discussions

09:00 – 10:20	SESSION 5C: HYBRID POWER PLANTS & MIRCOWGRIDS
03:00 New York 04:00 Rio de Janeiro 08:00 London 12:30 New Delhi 14:00 Jakarta 15:00 Beijing 16:00 Tokyo 17:00 Sydney	
> Session Chair	Peter-Philipp Schierhorn (Energynautics, Germany)
09:00 – 10:00	Presentations (20 min. each)
<ul style="list-style-type: none">• Interfacing Energy Management with Supervisory Control for Hybrid Power Plants Q. Long, R. Zhu, K. Das, P. E. Sørensen (DTU, Denmark) (Submission-ID WIW21-112)• Low Voltage Onboard DC Micro-grid for Electric Ship: A Detailed Simulation with Design Configuration R. H. Shakil, Z. Lidan, G. Yao (Shanghai Jiao Tong University, China) (Submission-ID WIW21-57)• The Latest Development in Synchronous Wind Turbine Technology: How the LVS System Can Deliver Low Cost, Broad-Band Variable Turbine Speed and Type 5 Grid Connection G. Henderson (SyncWind Power Ltd, New Zealand) (Submission-ID WIW21-119)	
10:00 – 10:20	Discussions

10:20 – 10:50 COFFEE BREAK

10:50 – 12:30	SESSION 6A: GRID CODE ASPECTS
04:50 New York 05:50 Rio de Janeiro 09:50 London 14:20 New Delhi 15:50 Jakarta 16:50 Beijing 17:50 Tokyo 18:50 Sydney	
> Session Chair	Nis Martensen (Energynautics, Germany)
10:50 – 12:10	Presentations (20 min. each)
<ul style="list-style-type: none">• RfG Implementation in Europe – The Whole Picture B. Schowe-von der Brelie (FGH Research Association e.V., Germany), S. M. Ali, Y. Ayadi, E. Makki (FGH GmbH, Germany) (Submission-ID WIW21-52)• Demystifying Grid Compliance – from Grid Code Towards Wind Turbine Capability and Their Testing P. Ghimire, F. Martin (Siemens Gamesa Renewable Energy, Denmark), S. Azarian (Siemens Gamesa Renewable Energy, Germany) (Submission-ID WIW21-45)• Under Voltage Ride through Testing on System Level Based Test Benches – Differences in the Testing Procedure A. Frehn, A. Monti (RWTH Aachen, Germany) (Submission-ID WIW21-118)• Technical Limitations of Generic Wind Power Plants Electrical Simulation Models, used in Power System Dynamic Studies for Grid Code Compliance M. A. Cova Acosta, P. Gupta, H. Abildgaard, A. Shattuck, T. Drljevic-Nielsen, U. D. Árnadóttir (Vestas Wind Systems, Denmark) (Submission-ID WIW21-72)	
12:10 – 12:30	Discussions

10:50 – 12:30	SESSION 6B: POWER SYSTEM ASPECTS I
04:50 New York 05:50 Rio de Janeiro 09:50 London 14:20 New Delhi 15:50 Jakarta 16:50 Beijing 17:50 Tokyo 18:50 Sydney	
> Session Chair	Thomas Ackermann (Energynautics, Germany)
10:50 – 12:10	Presentations (20 min. each)
<ul style="list-style-type: none">• Transmission Planning for 100% Clean Electricity D. Lew (ESIG, USA), J. Bakke (Midcontinent Independent System Operator, USA), A. Bloom (NextEra Analytics, USA), P. Brown (MIT Energy Initiative, USA), J. Caspary (Grid Strategies, USA), C. Clack (Vibrant Clean Energy, USA), N. Miller (HickoryLedge, USA), A. Orths (Energinet, Denmark), A. Silverstein (Alison Silverstein Consulting, USA), J. Simonelli (Flashover, USA), R. Zavadil (Enernex, USA) (Submission-ID WIW21-16)• The Levelized Cost of Headache P.-P. Schierhorn (Energynautics, Germany)• Addressing Power Oscillations Damping Requirements for Wind Power Plants L. Petersen, P. H. Nielsen, G. C. Tarnowski, T. Lund (Vestas Wind Systems, Denmark) (Submission-ID WIW21-32)• Experiences on Studies for Subsynchronous Oscillation Risks of Wind Power Plants Connected in the Vicinity of Finnish Series Compensated Network O.-P. Janhunen, R. Korhonen, L. Linnaamaa, A. Kuusela, T. Rauhala (Fingrid, Finland) (Submission-ID WIW21-127)	
12:10 – 12:30	Discussions

12:30 – 13:30 LUNCH BREAK

13:30 – 15:10	SESSION 7A: GRID INTEGRATION ASPECTS
07:30 New York 08:30 Rio de Janeiro 12:30 London 17:00 New Delhi 18:30 Jakarta 19:30 Beijing 20:30 Tokyo 21:3 Sydney	
> Session Chair	Leonard Hülsmann (Energynautics, Germany)
13:30 – 14:50	Presentations (20 min. each)
	<ul style="list-style-type: none"> • Advanced Operation Control in Wind Plants using Active Wake Control Methods and Artificial Intelligence – State of Research and Concept of the Project “SmartWind” P. Krajinski, K. Günther, C. Sourkounis (Ruhr University Bochum, Germany) (Submission-ID WIW21-75) • Experimental Testing of a Wind Power Plant with IEC 61400-27 Models for Voltage Regulation Service in Italy R. Musca, G. Zizzo (University of Palermo, Italy), V. Cascio (Green Energy Management Services, Italy), E. Festuccia (Siemens Gamesa Renewable Energy, Italy) (Submission-ID WIW21-47) • DC Bus Collection of Type-4 Wind Turbine Farms with Phasing Control to Minimize Energy Storage W. W. Weaver (Michigan Technological University, USA), D. G. Wilson (Sandia National Laboratories, USA), R. D. Robinett III (Michigan Technological University, USA), J. Young (OptimoJoe, USA) (Submission-ID WIW21-46) • Development of an AC/DC Impedance Matrix Measurement Toolbox for MTDC system H. Wu, X. Wang (Aalborg University, Denmark), Y. Liao (KTH Royal Institute of Technology, Sweden), M. Ndreko, R. Dimitrovski, W. Winter (TenneT TSO, Germany) (Submission-ID WIW21-17)
14:50 – 15:10	Discussions

13:30 – 15:30	SESSION 7B: POWER SYSTEM ASPECTS II
07:30 New York 08:30 Rio de Janeiro 12:30 London 17:00 New Delhi 18:30 Jakarta 19:30 Beijing 20:30 Tokyo 21:3 Sydney	
> Session Chair	Peter-Philipp Schierhorn (Energynautics, Germany)
13:30 – 15:10	Presentations (20 min. each)
	<ul style="list-style-type: none"> • Study on the Impact of Fault Current Injection in a Wind Power Plant Using EMT-type Tool G. Torresan, H. Saad (RTE, France), V. Gomes (Enercon, Germany), P. Gartmann (Wobben Research and Development, Germany) (Submission-ID WIW21-84) • Nonlinear Stability Analysis of a Reduced-Order Wind Turbine VSC-grid model Operating in Weak Grid Conditions S. Ghosh, G. Yang (DTU, Denmark), M. K. B. Dowlatabadi, Ł. Kocewiak (Ørsted, Denmark) (Submission-ID WIW21-74) • Instability Mitigation Methods in Modern Converter-based Power Systems L. Kocewiak, J. B. Kwon (Ørsted, Denmark), C. Buchhagen (TenneT, Germany), X. Wang (Aalborg University, Denmark), M. Larsson (Hitachi ABB Power Grids, Switzerland), R. Blasco-Giménez (Universidad Politecnica de Valencia, Spain), Y. Sun (Shell Global, Netherlands) (Submission-ID WIW21-114) • Evaluating the Performance of a Wind Generator in Providing Droop Control During Grid Frequency Increases – An Independent Analysis E. Rebello, M. Rodgers (Wind Energy Institute of Canada, Canada), M. Fischer (Enercon Canada, Canada), D. Stanford (Nova Scotia Power, Canada) (Submission-ID WIW21-99) • Frequency Regulation by the Distributed Hydrogen Storage Power Plant (HSPP) N. Ahmed, H. Weber (University of Rostock, Germany) (Submission-ID WIW21-87)
15:10 – 15:30	Discussions

13:30 – 15:30	SESSION 7C: WIND POWER MODELLING
07:30 New York 08:30 Rio de Janeiro 12:30 London 17:00 New Delhi 18:30 Jakarta 19:30 Beijing 20:30 Tokyo 21:3 Sydney	
> Session Chair	Eckehard Tröster (Energynautics, Germany)
13:30 – 15:10	Presentations (20 min. each)
•	Wind Power Plant Modelling Benchmark of RMS vs EMT Simulation Models for the Electric Reliability Council Of Texas (ERCOT) Market M. A. Cova Acosta , B. M. Magalhães Soares, H. Abildgaard, D. Rodrigues Parrini, A. Shattuck, I. Cristiano Da Costa, T. D. R. da Rosa (Vestas Wind Systems, Denmark) (Submission-ID WIW21-81)
•	FRT Field Test Beyond the Standard Locking to Vector Jump, Saturation Effects or Fast Transients. R. Klosse (EESYST Energie Elektrische Systemtechnik GmbH, Germany) (Submission-ID WIW21-31)
•	Evaluating the Optimal Portfolio of VRE Capacity to be Integrated into the Power System: A Case Study of Zambia L. F. Habostad , H. Farahmand (Norwegian University of Science and Technology, Norway), T. Haugstenrød (Multiconsult, Norway) (Submission-ID WIW21-115)
•	Advancing the Methodology of Contingency Selection and Analysis in Stability Studies for Power Systems with High Wind Penetration M. Y. Borodulin (KIIP Consulting, USA) (Submission-ID WIW21-8)
•	Short-Circuit Analysis of Wind Power Plants Considering Converter Limitations J. Song , M. Cheah-Mane, E. Prieto-Araujo, O. Gomis-Bellmunt (Polytechnical University of Catalonia – UPC, Spain) (Submission-ID WIW21-128)
15:10 – 15:30	Discussions

15:10/15:30 – 15:35 SHORT BREAK

15:35 – 16:35	SESSION 8 – CLOSING SESSION – PANEL DISCUSSION
09:35 New York 10:35 Rio de Janeiro 14:35 London 19:05 New Delhi 20:35 Jakarta 21:35 Beijing 22:35 Tokyo 23:35 Sydney	
> Session Chair	Eckehard Tröster (Energynautics, Germany)
15:35– 16:25	
The Future Role of Combined Wind Power & Hydrogen	
Input for Discussion	
Jochen Bard (Fraunhofer IEE, Germany) – TBC	
Panelists:	
-	Torsten Lund (Vestas Wind Systems, Denmark)
-	Luuk Feenstra (Nederlandse Gasunie, Netherlands)
-	Emanuele Taibi (IRENA, Germany)
16:25 – 16:35	Closure by Thomas Ackermann