



## PROGRAM AS OF 11 MARCH 2020

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

### WORKSHOP PARTNER

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### WORKSHOP AMBASSADORS

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### MEDIA PARTNER

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### ORGANIZER

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### STRATEGIC PARTNER

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## TIMETABLE 5<sup>TH</sup> INTERNATIONAL HYBRID POWER SYSTEMS WORKSHOP

TUESDAY, 19 MAY 2020				WEDNESDAY, 20 MAY 2020		
Hybrid Workshop Day 1				Hybrid Workshop Day 2		
08:00 – 09:00	FOYER					
	REGISTRATION					
09:00 – 09:20	ROOM SELVAGENS I+II					
	OPENING: Welcome and Introduction					
09:20 – 11:00	ROOM SELVAGENS I+II			09:00 – 10:40	ROOM SELVAGENS II	ROOM SELVAGENS IV
	SESSION 1: KEYNOTE SESSION				SESSION 5A: Ancillary Service Aspects / Case Studies	SESSION 5B: Micro-Grids
11:00 – 11:30 GROUP PHOTO & COFFEE BREAK				10:40 – 11:10 COFFEE BREAK & POSTER SESSION		
11:30 – 13:00	ROOM SELVAGENS II	ROOM SELVAGENS IV		11:10 – 12:50	ROOM SELVAGENS II	ROOM SELVAGENS IV
	SESSION 2A: Hybrid Power Case Studies I	SESSION 2B: Hybrid Power System Design Options			SESSION 6A: Storage and Power System Support	SESSION 6B: Hybrid Power System Technologies
13:00 – 14:00 LUNCH				12:50 – 13:50 LUNCH		
14:00 – 15:40	ROOM SELVAGENS II	ROOM SELVAGENS IV	ROOM SELVAGENS V	13:50 – 15:10	ROOM SELVAGENS II	ROOM SELVAGENS IV
	SESSION 3A: Hybrid Power Case Studies II	SESSION 3B: Storage Aspects	SESSION 3C: Forecasting		SESSION 7A: TBA	SESSION 7B: Hybrid Power Plants
15:40 – 16:00 COFFEE BREAK & POSTER SESSION				15:10 – 15:20 SHORT COFFEE BREAK		
16:00 – 18:00	ROOM SELVAGENS II	ROOM SELVAGENS IV	ROOM SELVAGENS V	15:20 – 16:30	ROOM SELVAGENS I + II	
	SESSION 4A: Hybrid Power Case Studies III	SESSION 4B: Cellular Hybrid Energy Systems	SESSION 4C: TBA		SESSION 8: CLOSING SESSION – PANEL DISCUSSION	
18:15 – 18:45	ROOM SELVAGENS I + II					
	r.e.think ENERGY DIALOGUE					
20:00	WORKSHOP DINNER			09:30	21 MAY 2020 – STUDY TRIP	

## TUESDAY, 19 MAY 2020

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**08:00 – 09:00**    **Registration**  
**09:00 – 09:20**    **Welcome Thomas Ackermann**

<b>09:20 – 11:00</b>	<b>SESSION 1 – KEYNOTE SESSION</b>
> Session Chair	Thomas Ackermann (Energynautics, Germany)
<b>09:20 – 10:40</b>	<b>Presentations (20 min. each)</b>
	<ul style="list-style-type: none"><li>• <b>Renewable Management in Madeira Region (Dispatch Center)</b> J. Cotrim (EEM [director of transmission and distribution grid, including the dispatch centre, in Autonomous Region of Madeira], Portugal)</li><li>• <b>EEM's Strategy to Maximize the Integration of Renewables in the Grid in Madeira (reversible water, batteries, synchronous compensators and grid code adaptation), with emphasis on the hydro reversible Calheta III project</b> A. Figueira (EEM [director of studies and planning department], Portugal)</li><li>• <b>Development of Specific Grid Codes to Allow Safe Increase of Renewable Generation in Islanded Power Systems</b> J. Peças Lopes, C. Moreira (FEUP &amp; INESC TEC, Portugal) (<a href="#">Submission-ID HYB20_19</a>)</li><li>• <b>TBA</b> TBA</li></ul>
<b>10:40 – 11:00</b>	<b>Discussions</b>

**11:00 – 11:30**    **GROUP PHOTO & COFFEE BREAK**

<b>11:30 – 13:00</b>	<b>SESSION 2A – HYBRID POWER CASE STUDIES I</b>
> Session Chair	Name Surname (Company, Country)
<b>11:30 – 12:45</b>	<b>Presentations (18 min. each)</b>
	<ul style="list-style-type: none"><li>• <b>Revealing the Potential of Hybrid Power Plants: Highlights of NREL Research and Project Experiences</b> V. Gevorgian, S. Shah, P. Koralewicz (NREL, United States) (<a href="#">Submission-ID HYB20_52</a>)</li><li>• <b>Hawaii's Innovative PPA Structure for Hybrid Solar PV and Energy Storage Projects</b> N. Miller (HickoryLedge LLC, United States) (<a href="#">Submission-ID HYB20_6</a>)</li><li>• <b>The Impact of Porto Santo's Battery on the Management of the Island's Electrical System</b> D. Vasconcelos (EEM [project manager for the project "Porto Santo's Battery"], Portugal) (<a href="#">Submission-ID HYB20_xxx</a>)</li><li>• <b>Renewables for Refugee Settlements: Sustainable Energy Access in Humanitarian Situations</b> A. Vaid, E. Taibi (IRENA, Germany) (<a href="#">Submission-ID HYB20_24</a>)</li></ul>
<b>12:45– 13:00</b>	<b>Discussions</b>

11:30 – 13:00	SESSION 2B – HYBRID POWER SYSTEM DESIGN OPTIONS
> Session Chair	Name Surname (Company, Country)
11:30 – 12:45	<b>Presentations (18 min. each)</b>
	<ul style="list-style-type: none"> <li><b>The Impact of Improving Technology on the Evolution of Hybrid Power System Design</b> P. Lilienthal (HOMER energy, United States) (Submission-ID HYB20_64)</li> <li><b>Day-ahead and Intra-day Operational Planning for Hybrid Off-grid Systems</b> L. Costa (Efacec, Portugal) (Submission-ID HYB20_31)</li> <li><b>Increasing Renewable Contributions in Island Utility Grids</b> P. Astorga, J. Glassmire, H. Bitaraf (ABB Power Grids, Spain) (Submission-ID HYB20_44)</li> <li><b>Control of Grid Connected Wind-Solar Hybrid Power Plant to Extend the Lifetime of Power Generation Units</b> M. Röpke, J. Thies, P. Singh, A. Gavrilovic (Suzlon Energy Limited, Germany) (Submission-ID HYB20_25)</li> </ul>
12:45 – 13:00	<b>Discussions</b>

**13:00 – 14:00 LUNCH BREAK**

14:00 – 15:40	SESSION 3A – HYBRID POWER CASE STUDIES II
> Session Chair	Name Surname (Company, Country)
14:00 – 15:20	<b>Presentations (20 min. each)</b>
	<ul style="list-style-type: none"> <li><b>Control Measures for Smoothing PV Power Fluctuations in Madeira Power System</b> M. H. Vasconcelos, J. A. Peças Lopes (INESC TEC University of Porto), A. Figueira (EEM - Empresa de Electricidade da Madeira, Portugal) (Submission-ID HYB20_32)</li> <li><b>Two Approaches to 100% Renewable Madeira – Market Conditions for Hybrid Power System and Smart Energy System Planning</b> H. Marcinkowski (Aalborg University, Denmark) (Submission-ID HYB20_36)</li> <li><b>Practical Experience about Self-Supplying Solar Sites</b> P. Hussinger (BayWa r.e. Solar Projects, Germany) (Submission-ID HYB20_50)</li> <li><b>Tender Processes of Hybrid Energy and Battery Storage Projects around the World – a First Attempt to Structure Reality from the View of a Project Developer</b> J. Badedo, J. Gerstner (ABO Wind, Germany), S. Heinrich (Qinous , Germany) (Submission-ID HYB20_15)</li> <li><b>Development of Multit-Megawatt Hybrid Wind Storage System in Caribbean Islands for Supporting the Renewable Energy Integration and Participating to the Electrical Grid Stability</b> T. Delaplagne, E. S. Hing (University Grenoble Alpes   CEA, France), B. Feytout, N. Seytier (Valorem, France) (Submission-ID HYB20_16)</li> </ul>
15:20 – 15:40	<b>Discussions</b>

14:00 – 15:40	SESSION 3B – STORAGE ASPECTS
> Session Chair	Name Surname (Company, Country)
14:00 – 15:20	<b>Presentations (20 min. each)</b>
	<ul style="list-style-type: none"> <li>• <b>Maximizing Renewable Generation of an Island Using a BESS</b> J. Mateus, J. Barruncho, J. Damásio, P. Aleixo, H. Jesus, J. Gouveia (Siemens, Portugal) (<a href="#">Submission-ID HYB20_27</a>)</li> <li>• <b>A Hybrid Energy Storage System Based on Batteries and Supercapacitors for the Grid Integration of Wind Power Plants</b> F. Diaz-González, C. Chillón-Antón, M. Llonch-Massachs, S. Galceran-Arellano (CITCEA-UPC, Spain) (<a href="#">Submission-ID HYB20_59</a>)</li> <li>• <b>Contribution of a Battery Energy Storage System in a Hybrid Wind/Diesel/Pumped-Storage Isolated Power System with High Wind Power Penetration.</b> D. Fernández-Muñoz, G. Martínez-Lucas, J. I. Sarasúa, J. I. Pérez-Díaz (Polytechnical University of Madrid, Spain) (<a href="#">Submission-ID HYB20_33</a>)</li> <li>• <b>Requirements Definition for the Design and Integration of Copper-Based Redox Flow Batteries on the Grid</b> C. Barbu, B. Andresen, U. Jakobsen (Aarhus University, Denmark) (<a href="#">Submission-ID HYB20_39</a>)</li> <li>• <b>Storage for BTM Applications: Focus on Solar and DG Hybridization</b> D. Sen (Customized Energy Solutions, India) (<a href="#">Submission-ID HYB20_10</a>)</li> </ul>
15:20 – 15:40	<b>Discussions</b>

14:00 – 15:40	SESSION 3C – FORECASTING
> Session Chair	Name Surname (Company, Country)
14:00 – 15:20	<b>Presentations (20 min. each)</b>
	<ul style="list-style-type: none"> <li>• <b>Recommended Practices for Optimal Selection of Short-term Renewable Power Production Forecast Solutions</b> J. Zack (AWS Truepower, United States), C. Möhrten (WEPROG, Denmark), G. Giebel (DTU, Denmark) (<a href="#">Submission-ID HYB20_7</a>)</li> <li>• <b>Development of an AI Based Load Prediction Algorithm and its Implementation into an Open Source Energy Management System</b> E. Schüftan (University Münster, Germany), N. Reiners, J. Wüllner (Fraunhofer ISE, Germany) (<a href="#">Submission-ID HYB20_35</a>)</li> <li>• <b>Control Optimization and Sizing of Energy Storage for PV Systems Using Probabilistic Forecasts</b> P. Besson, T.-P. Do, W. Mahmoud, G. Tremoy (Steadysun, France), F. Bourry (CEA-INES, France) (<a href="#">Submission-ID HYB20_41</a>)</li> <li>• <b>Presentation 4</b> TBA</li> </ul>
15:20 – 15:40	<b>Discussions</b>

**15:40 – 16:00 COFFEE BREAK & POSTER SESSION**

16:00 – 18:00	SESSION 4A – HYBRID POWER CASE STUDIES III
> Session Chair	Name Surname (Company, Country)
16:00 – 17:40	<b>Presentations (20 min. each)</b>
	<ul style="list-style-type: none"> <li>• <b>Case Study on Renewable Energy Integration in Pacific Island and Isolated Grid in Africa</b> É. Vales, J. Iria (Vergnet SA, France) (Submission-ID HYB20_9)</li> <li>• <b>From Concept to Reality – the World’s Largest Off-Grid Mining Hybrid Power System at Fekola Gold Mine</b> T. Althaus (BayWa r.e. Solar Projects, Germany) (Submission-ID HYB20_51)</li> <li>• <b>Live-demo of an ESS operating in Portugal, Graciosa</b> G. Ramzeyer (Wärtsila, Finland) (Submission-ID HYB20_49)</li> <li>• <b>MASERA Project</b> E. Hestin (Socomec, France), K. Choletais (EDF, France) (Submission-ID HYB20_13)</li> <li>• <b>First Project Experience and Case Study about our Load Management for Hybrid Energy Systems in Africa</b> M. Gast (Global Industry Management Solar Power, Germany) (Submission-ID HYB20_34)</li> </ul>
17:40 – 18:00	<b>Discussions</b>

16:00 – 17:40	SESSION 4B – CELLULAR HYBRID ENERGY SYSTEMS
> Session Chair	Wolfram H. Wellßow (University of Kaiserslautern, Germany)
16:00 – 17:20	<b>Presentations (20 min. each)</b>
	<ul style="list-style-type: none"> <li>• <b>Overview Regarding the Purpose of Cellular Energy Systems</b> (University of Kaiserslautern, Germany) (Submission-ID HYB20_23_1)</li> <li>• <b>Market Perspectives from Requirements to an Example Market Concept for a Hybrid Cellular Energy System in Germany</b> (University of Duisburg-Essen, Germany)</li> <li>• <b>Cellular Approach from its very Beginning + Findings of Studies Conducted on Cellular Energy Systems on the District Level</b> (University of Wuppertal, Germany)</li> <li>• <b>Project Report on the Investigation of a Web-of-Cells’ Ability for Local Active and Reactive Power Balancing</b> G. Hawker (University of Strathclyde/ELECTRA Web-of-Cells)</li> </ul>
17:20 – 17:40	<b>Discussions</b>

16:00 – 17:40	SESSION 4C
> Session Chair	Name Surname (Company, Country)
16:00 – 17:20	<b>Presentations (20 min. each)</b>
	<ul style="list-style-type: none"> <li>• <b>Comparison of European and Indian Grid Codes for Utility scale Hybrid Wind Power Plants</b> K. Das, A. Hansen, P. Sørensen (DTU Wind Energy, Denmark), P. Singh, A. Gavrilovic, D. K. Singh (Suzlon, Germany), S. Munuswamy, D. Kurup (National Institute of Wind Energy, India), P. Jindal (Central Electricity Authority, India) (Submission-ID HYB20_60)</li> <li>• <b>The Role of Grid Codes in Isolated Power Systems</b> P.-P. Schierhorn, N. Martensen (Energynautics, Germany) (Submission-ID HYB20_63)</li> <li>• <b>Operation of Isolated Power Systems – The Integration of Grid-Forming Inverters</b> J. Gouveia, C. Moreira, J. Peças Lopes (INESC TEC University of Porto, Portugal) (Submission-ID HYB20_22)</li> <li>• <b>Techno-Economic Aspects of Grid Forming Inverters in Small Power Systems</b> P.-P. Schierhorn, P. Gambín Belinchón, J. Guilmineau (Energynautics, Germany) (Submission-ID HYB20_62)</li> </ul>
17:20 – 17:40	<b>Discussions</b>

18:15 – 18:45 r.e.think ENERGY DIALOGUE  
> Session Chair Philipp Kunze (BayWa r.e. Solar Projects, Germany)

PANEL DISCUSSION WITH DIFFERENT STAKEHOLDERS IN HYBRID PROJECTS

**Panelists**

- TBC

**20:00 Dinner**

## WEDNESDAY, 20 MAY 2020

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09:00 – 10:40	SESSION 5A – ANCILLARY SERVICE ASPECTS / CASE STUDIES
> Session Chair	Name Surname (Company, Country)
09:00 – 10:20	<b>Presentations (20 min. each)</b>
	<ul style="list-style-type: none"><li>• <b>EASY-RES: Towards a Fully Decarbonized, Reliable and Secure Power System</b> M. Barragán-Villarejo, J. M. Mauricio, J. M. Maza-Ortega, J. L. Martínez-Ramos (University of Seville, Spain) (<a href="#">Submission-ID HYB20_26</a>)</li><li>• <b>Stability of the Hybrid Power System in Suðuroy, Faroe Islands</b> H. M. Tróndheim, T. Nielsen (The Power Company SEV, Faeroe Islands) (<a href="#">Submission-ID HYB20_54</a>)</li><li>• <b>Methodology to Elaborate a Roadmap to increase Renewable Energy share in isolated Grids. Fuerteventura case study.</b> J. Servert Del Rio, R. Valencia-Chapi (Investigación Desarrollo e innovación Energética, Spain) (<a href="#">Submission-ID HYB20_20</a>)</li><li>• <b>Integrated Control System for the Energy Supply of Isolated Communities in Cuba, Using Hybrid Systems</b> L. Arribas (CIEMAT, Spain) (<a href="#">Submission-ID HYB20_18</a>)</li></ul>
10:20 – 10:40	<b>Discussions</b>

09:00 – 10:40	SESSION 5B – MICRO-GRIDS
> Session Chair	Name Surname (Company, Country)
09:00 – 10:20	<b>Presentations (20 min. each)</b>
	<ul style="list-style-type: none"><li>• <b>Building up a MicroGrid in an Engineering and Production Plant</b> U. Ebach (MTU Friedrichshafen , Germany) (<a href="#">Submission-ID HYB20_61</a>)</li><li>• <b>Design and Simulation of Commercially Operating Microgrids- A Flexible Data Based Accurate Modelling Approach Considering Operational Constraints</b> I. Syed, I. Soliman, J. Smend (Enerwhere, United Arab Emirates) (<a href="#">Submission-ID HYB20_38</a>)</li><li>• <b>Fuel Consumption and Emissions Reduction through Advanced Microgrids Control System</b> P. Piclova (ComAp, Czech Republic) (<a href="#">Submission-ID HYB20_12</a>)</li><li>• <b>Comprehensive Analysis of a Complex Industrial Facility Running on Solar-Diesel-Battery Based Microgrid</b> I. Syed, J. Smend, W. Sanusi (Enerwhere Sustainable Energy, United Arab Emirates) (<a href="#">Submission-ID HYB20_37</a>)</li></ul>
10:20 – 10:40	<b>Discussions</b>

**10:40 – 11:10 COFFEE BREAK & POSTER SESSION**



11:10 – 12:50	SESSION 6A – STORAGE AND POWER SYSTEM SUPPORT
> Session Chair	Name Surname (Company, Country)
11:10 – 12:30	<b>Presentations (20 min. each)</b>
	<ul style="list-style-type: none"> <li>• <b>New Actors on Stage - Upcoming Grid Code Requirements for Storage Systems</b> B. Schowe-von Der Brelie (FGH Research Association (FGH e.V.), Germany), S. Brandt, S. M. Ali, F. Kalverkamp (FGH , Germany) (Submission-ID HYB20_30)</li> <li>• <b>Hybrid Storage System Coupled with PV Power Plant for Primary Frequency Control: A methodology for Sizing</b> A. Danese, F. Díaz González (CITCEA-UPC, Spain) (Submission-ID HYB20_8)</li> <li>• <b>Hydro Power Plant Hybridization with Battery Energy Storage System for Frequency Primary Control as Part of XFLEX Hydro European Project</b> T. Delaplagne, G. Pais, L. Vinit, M. Montaru (University Grenoble Alpes   CEA, France), J. L. Drommi (EDF-CIH., France) (Submission-ID HYB20_14)</li> <li>• <b>Back to the Future: Implementing Small Scale Solar Thermal Generation with Storage</b> H. Mackenzie (HARD software, Australia), R. Mierisch (3S Power, Australia) (Submission-ID HYB20_56)</li> </ul>
12:30 – 12:50	<b>Discussions</b>

11:10 – 12:50	SESSION 6B – HYBRID POWER SYSTEM TECHNOLOGIES
> Session Chair	Name Surname (Company, Country)
11:10 – 12:30	<b>Presentations (20 min. each)</b>
	<ul style="list-style-type: none"> <li>• <b>Floating Solar: Part of the Hybrid Toolbox, Perspective for Site Constrained Islands</b> C. Gilmour (BayWa r.e., Germany) (Submission-ID HYB20_55)</li> <li>• <b>Variable Renewable Generation and Flexible Demand</b> F. Sioshansi (Menlo Energy Economics, United States) (Submission-ID HYB20_3)</li> <li>• <b>Aggregated Flexibility through Shared Electric Vehicles in High-Density Cities</b> S. Barja-Martinez, F. Díaz-González, P. Lloret-Gallego, R. Villafila-Robles (CITCEA-UPC, Spain) (Submission-ID HYB20_4)</li> <li>• <b>Use of Palm Oil in Backup-Generator in the Miskito Community: Performance and Impact Comparison</b> J. A. Servert (Trabajos Técnicos y Científicos, Spain) (Submission-ID HYB20_29)</li> </ul>
12:30 – 12:50	<b>Discussions</b>

## 12:50 – 13:50 LUNCH BREAK

13:50 – 15:10	SESSION 7A – TITLE
> Session Chair	Name Surname (Company, Country)
13:50 – 14:50	<b>Presentations (20 min. each)</b>
	<ul style="list-style-type: none"> <li>• <b>Isolated Power Systems Prepared for Becoming Valuable Parts of Larger Power Systems</b> P. Norgaard, P. C. Lopez (DTU, Denmark) (Submission-ID HYB20_53)</li> <li>• <b>Advanced Control using Forecast Data and Optimization Algorithm for Optimal Operation on Hybrid Power Systems “PV-Diesel-Storage”</b> T. P. Do, D. L. Ha, T. Delaplagne, S. Hing (University Grenoble Alpes, France), P. Ruvoen, T. Calvez, D. Riguet (Blue Solutions, France) (Submission-ID HYB20_40)</li> <li>• <b>Conquering Mars: A Hybrid Power Systems for a Permanent Near-Future Colony</b> D. Vázquez Pombo (DTU, Denmark) (Submission-ID HYB20_11)</li> </ul>
14:50 – 15:10	<b>Discussions</b>

13:50 – 15:10	SESSION 7B – HYBRID POWER PLANTS
> Session Chair	Name Surname (Company, Country)
13:50 – 14:50	Presentations (20 min. each)
	<ul style="list-style-type: none"> <li>• <b>One of the First Utility Scale Hybrid Plant Implementation in Europe: The Case of Haringvliet</b> G. A. Raducu, D. Pombo Vazquez (Vattenfall Vindkraft R&amp;D DK, Denmark), E. Shayesteh, J. Funkquist, N. Styliaras (Research and Development Vattenfall AB, Sweden) (Submission-ID HYB20_17)</li> <li>• <b>Hybridizing Renewables and Storage: Design and Optimization</b> G. Pontes, R. Walia, R. Khandelwal, A. Viyas (GE Renewable Energy, Brazil) (Submission-ID HYB20_43)</li> <li>• <b>Hybrid Power Plant Load Balancing</b> J. A. Méndez Pérez, B. González-Díaz, O. Novykh (University of La Laguna, Spain), I. Sviridenko (State University of Sevastopol, Russia) (Submission-ID HYB20_42)</li> </ul>
14:50 – 15:10	Discussions

**15:10 – 15:20 SHORT COFFEE BREAK**

15:20 – 16:30	SESSION 8 – CLOSING SESSION
> Session Chair	Name Surname (Company, Country)
15:20 – 16:10	Panel discussion
	<p>Topics addressed:</p> <ul style="list-style-type: none"> <li>- TBA</li> </ul> <p>Panelists:</p> <ul style="list-style-type: none"> <li>- TBA</li> </ul>
16:10 – 16:30	Discussions

## POSTER PRESENTATIONS

- **Theoretical Analysis and Mathematical Modeling of a Solar Cogeneration System in Morocco**  
S. Lachhab (Laboratory of Renewable Energies and Environment, Morocco) (Submission-ID HYB20\_5)
- **Feasibility Analysis of Hybrid Power Generation and Storage System in Riga Technical University**  
J. Zakis, L. Ribickis (Riga Technical University, Latvia) (Submission-ID HYB20\_21)
- **Overview of the Coupling between Floating PV and Hydroelectric Power Plants**  
S. Di Grazia, F. Bontempo Scavo, G. M. Tina (University of Catania, Italy) (Submission-ID HYB20\_28)
- **Techno-Economic Feasibility Analysis of Nearly-Zero Hybrid Energy System for the City of Sofia in Bulgaria**  
D. Gospodinova (Technical University Sofia, Bulgaria) (Submission-ID HYB20\_46)
- **Performance of Hybrid Grid-Connected Power System Located in Sofia, Bulgaria**  
K. Milanow (Technical University Sofia, Bulgaria) (Submission-ID HYB20\_47)