



PRELIMINARY PROGRAM AS OF 20 MARCH 2018

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TIMETABLE 3rd INTERNATIONAL HYBRID POWER SYSTEMS WORKSHOP

TUESDAY, 8 MAY 2018		WEDNESDAY, 9 MAY 2018	
Hybrid Power Systems Workshop Day 1		Hybrid Power Systems Workshop Day 2	
08:00 – 09:00	GRAN PELINOR FOYER		
	REGISTRATION		
09:00 – 09:10	GRAN PELINOR		
	OPENING: WELCOME AND INTRODUCTION		
09:10 – 10:50	GRAN PELINOR	08:30 – 10:40	GRAN PELINOR
	SESSION 1: KEYNOTE SESSION – CANARY ISLANDS EXPERIENCE		SESSION 5A: MODELLING ISSUES
	COFFEE BREAK (20MIN) & POSTER SESSION		COFFEE BREAK (20MIN) & POSTER SESSION
11:10 – 13:00	GRAN PELINOR	11:10 – 12:50	GRAN PELINOR
	SESSION 2A: PROJECT EXPERIENCE I		SESSION 2B: SIMULATION TOOLS
	LUNCH (1H)		LUNCH (1H)
14:00 – 15:40	GRAN PELINOR	13:50 – 15:45	GRAN PELINOR
	SESSION 3A: STORAGE ISSUES		SESSION 3B: SYSTEM CONTROL ASPECTS
	COFFEE BREAK (20MIN) & POSTER SESSION		COFFEE BREAK (15MIN) & POSTER SESSION
16:00 – 18:15	GRAN PELINOR	16:00– 17:00	GRAN PELINOR
	SESSION 4A: PROJECT EXPERIENCE II		SESSION 4B: ECONOMIC ISSUES
19:30	WORKSHOP DINNER		

08:00 – 09:00 Registration

09:00 – 09:10 Welcome

09:10 – 10:50	SESSION 1 – KEYNOTE SESSION: CANARY ISLANDS EXPERIENCE
> Session Chair	Thomas Ackermann (Energynautics, Germany)
09:10 – 10:30	Presentations (20 min. each)
	<ul style="list-style-type: none"> • Towards a New Energy Model: Challenges and Solutions to Enable Large RES Penetration in the Canary Islands' Isolated Power Systems. P. Santos, F. Figueras, R. Corujo (Red Eléctrica de España (REE), Spain) (Submission-ID 48) • Gorona del Viento Wind-Hydro Power Plant – Results, Improvement Actuations and Next Steps A. Marrero Quevedo, E. J. Medina Domínguez, J. de León Izquier (Technological Institute of the Canary Islands (ITC), Spain), J. Gil Moreno, A. Castañeda Quintero (Gorona del Viento El Hierro, Spain), R. Corujo de León (Red Eléctrica de España, Spain), J. González Hernández (Universidad de Las Palmas de Gran Canaria (ULPGC), Spain) (Submission-ID 36) • The Hybrid Power Plant in El Hierro Island (Spain): Facts and Challenges from the Wind Farm Perspective N. Taveira, E. Quitmann, J. Palomares, (ENERCON, Germany), A. Marrero Quevedo (Instituto Tecnológico de Canarias, Spain), J. Gil, A. Castañeda (Gorona del Viento El Hierro, Spain) (Submission-ID 46) • STATCOM with Ultracapacitors and Batteries for Voltage and Frequency Control C. Izquierdo, B. Díaz-Guerra, P. Santos (Red Eléctrica de España, Spain), J. Villegas (GPTech, Spain), S. Marrero (University of Las Palmas de Gran Canaria, Spain) (Submission-ID 53)
10:30 – 10:50	Discussions

10:50 – 11:10 COFFEE BREAK & POSTER SESSION

11:10 – 13:00	SESSION 2A – PROJECT EXPERIENCE I
> Session Chair	Name Surname (Company, Country)
11:10 – 12:40	Presentations (18 min. each)
	<ul style="list-style-type: none"> • Dynamic study of Bonaire Power Network: Dynamic Study, Validation and Project Experience Y. Sun (DNV GL Energy, Netherlands Eindhoven University of Technology, Netherlands), W. Kuijpers (DNV GL Energy, Netherlands), E. deJong (DNV GL Energy, Netherlands Eindhoven University of Technology, Netherlands) (Submission-ID 16) • Bonaire's Wind-Diesel Hybrid Power Plant – One-Time-Only or Trend-Setting Project? M. Raila, C. Dommermuth (MAN Diesel & Turbo SE, Germany) (Submission-ID 84) • Faroe Islands – 100% Renewable Energy in the Electricity Sector by 2030? T. Nielsen (Electrical Power Company SEV, Faeroe Islands), D. McMullin, B. Lenz, D. Gamboa (ENERCON, Germany) (Submission-ID 71) • Return of Experience on Renewable Energy Integration in Islands and Remote Locations Worldwide E. Vales (Vergnet, France) (Submission-ID 23) • Renewable Energy and the Integration of Small-Scale Distributed Photovoltaic Systems into Low Voltage Networks in Seychelles S. Afif (Public Utilities Corporation, Seychelles) (Submission-ID 80)
12:40 – 13:00	Discussions

11:10 – 13:00	SESSION 2B – SIMULATION TOOLS
> Session Chair	Name Surname (Company, Country)
11:10 – 12:40	Presentations (18 min. each)
	<ul style="list-style-type: none"> • Economic Trade-offs in the Design of Hybrid Mini-/Micro-Grids P. Lilienthal (HOMER Energy, USA) (Submission-ID 79) • Sizing and Optimization of Hybrid Micro Energy Systems with micrOgridS- an Open-Source Modelling Tool S. Berendes, P. Bertheau, P. Blechinger (Reiner Lemoine Institut, Germany) (Submission-ID 62) • Simplify Frequency Stability Tool for Isolated Systems: “aDin” F. Rodríguez-Bobada, C. Izquierdo, J. Soto, R. Rivas, (Red Eléctrica de España, Spain) (Submission-ID 39) • Microgrid optimisation with the Energy Storage Integration Tool N. Francis, A. Nikolopoulou, J. van der Burgt, R. Scharrenberg (DNV GL, Netherlands) (Submission-ID 37) • A Tool for Optimal Operation and Design of Batteries and its Applications to Self-Consumption J. M. Fernández-de-Bobadilla Navarrete, L. Sigríst, E. Lobato (Universidad Pontificia Comillas, Spain), A. Gonzalez (Gas Natural Fenosa, Spain) (Submission-ID 60)
12:40 – 13:00	Discussions

13:00 – 14:00 LUNCH BREAK

14:00 – 15:40	SESSION 3A – STORAGE ISSUES
> Session Chair	Name Surname (Company, Country)
14:00 – 15:20	Presentations (20 min. each)
	<ul style="list-style-type: none"> • To Shift or not to Shift? an Energy Storage Cost-Benefit Analysis from Hawaii D. Stenclik, C. Cox, M. Richwine, S. Venkataraman (GE Energy Consulting, USA) (SUBMISSION-ID 24) • Battery Energy Storage Solution – Enhancing the Operational Flexibility of Flexible Combined Cycle Industrial Gas Turbines U. Fuchs, S. Alwers (Siemens, Germany) (Submission-ID 8) • Potential of a PCM-Based Storage Concept Combined with an Electric Heat Pump A. Benzarti, S. Roehrenbeck, W. Wellssow (University of Kaiserslautern, Germany) (Submission-ID 11) • PV-Battery Hybrid Systems to Provide Autonomous Rural Energy Supply A. Kies (Frankfurt Institute for Advanced Studies, Goethe University Frankfurt, Germany), P. B. Dabek (Wrocław University of Environmental and Life Science, Poland), J. Jurasz (AGH University of Science and Technology, Poland) (Submission-ID 68)
15:20 – 15:40	Discussions

14:00 – 15:40	SESSION 3B – SYSTEM CONTROL ASPECTS
> Session Chair	Name Surname (Company, Country)
14:00 – 15:20	Presentations (16 min. each)
	<ul style="list-style-type: none"> • Hybrid Utility-Scale PV-Wind-Storage Plants for Dispatchability and Reliability Services in Island Grids V. Gevorgian (NREL, USA), M. Morjaria (First Solar, USA), R. Burra (GE Global Research, USA) (Submission-ID 10) • Test Scenarios and Test Results for the Qualification of PV-Diesel Power Systems and Hybrid Controllers F. Niedermeyer, G. Arnold (Fraunhofer Institute for Energy Economics and Energy System Technology IEE, Germany) (Submission-ID 31) • Vestas Power Plant Solutions Integrating Wind, Solar PV and Energy Storage L. Petersen (Vestas Wind Systems, Denmark Department of Energy Technology, Aalborg University, Denmark), B. Hesselbæk, A. Martinez, R. M. Borsotti-Andruszkiewicz, G. C. Tarnowski (Vestas Wind Systems, Denmark) (Submission-ID 78) • Smart Renewable Hubs: Multi-Hybridization to Achieve High RE Penetration in Island Grids J. Servert, E. Cerrajero, D. Lopez, F. Comas (Investigación, Desarrollo e Innovación Energética S.L. (IDIE), Spain), A. R. Rocha, J. M. Estebaranz, R. Durán (Cobra Instalaciones y Servicios, Spain), E. Stavropoulou (Hellenic Electricity Distribution Network Operator (HEDNO), Greece), A. Dimeas (National Technical University of Athens (NTUA), Greece), A. Vaiani (Centro Elettrotecnico Sperimentale Italiano S.p.A. (CESI), Italy), E. Sánchez (Fundación TECNALIA Research & Innovation (TECNALIA), Spain) (Submission-ID 76) • Energy Management System for Islanded Microgrids Comprising PV Systems, Diesel Generators, Energy Storage Systems: Validation in a Laboratory Environment. J.-A. Vidal-Clos, M. Aragües, E. Prieto, C. Chillón, G. Vinyals, O. Gomis-Bellmunt (CITCEA-UPC, Spain) (Submission-ID 28)
15:20 – 15:40	Discussions

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

16:00 – 18:15	SESSION 4A – PROJECT EXPERIENCE II
> Session Chair	Name Surname (Company, Country)
16:00 – 17:52	Presentations (16 min. each)
	<ul style="list-style-type: none"> • Achieving an annual wind penetration of 20% on an islanded distribution network K. Pierros (ENERCON UK, United Kingdom), N. Coote (Scottish and Southern Electricity Networks, United Kingdom) (Submission-ID 44) • The Smart Energy System – How to Cost-Efficiently Implement Renewable Energy in Off-Grid Cities – in Greenland and in Tropic Islands S. Møller Thomsen, A. Dyrelund (Ramboll, Denmark) (Submission-ID 92) • Impacts of the Implementation of Hybrid Systems with High Renewable Penetration on the Operation of Thermal Units in Isolated Grids T. Althaus, P. Kunze, M. Helmy, C. Tsakiroglou (OneShore Energy, Germany) (Submission-ID 64) • Hybrid Power Systems in Indonesia P. Schierhorn, T. Ackermann (Submission-ID 102) • 12 Years of Residential PV Hybrid System Operation and Evolution in Nemiah Valley, Canada A. Swingler (University of Prince Edward Island, Canada) (Submission-ID 93) • Mini-Grids with Distributed Energy Generation and Frequency Control. Return of Experience after 6 Years of Operation of a Pilot Project in Switzerland. P. Muñoz Picos, N. Zuchuat (Studer Innotec, Switzerland) (Submission-ID 86) • Quality Control Applied to the Photovoltaic Systems of the Galapagos Islands: the Case of Baltra and Santa Cruz A. A. Eras-Almeida, M.-Á. Egado-Aguilera (Universidad Politécnica de Madrid, Spain) (Submission-ID 87)
17:52 – 18:15	Discussions

16:00 – 18:00	SESSION 4B – ECONOMIC ISSUES
> Session Chair	Name Surname (Company, Country)
16:00 – 17:40	Presentations (20 min. each)
	<ul style="list-style-type: none"> • Economic Impact on Hybrid Systems on Islands P. Kunze (OneShore, Germany) (Submission-ID 101) • Reducing Energy Costs and Environmental Impacts of Off-Grid Mines H. Bitaraf (ABB, USA) (Submission-ID 7) • Techno-Economic Analysis for a Hybrid Renewable Energy System for a Village in India A. Archana, S. Parash Ram (YMCA University of Science&Technology, India), P. G. Nikhil (National Institute of Solar Energy (NISE), India) (Submission-ID 29) • How product and Service Innovations are Leading to Disruptions of Traditional Distribution Utility Business Models: Implications for Micro-Gids and Isolated Systems F. Sioshansi (Menlo Energy Economies, USA) (Submission-ID 13) • Quality Assurance to Support the Bankability of Hybrid PV Mini-Grids and Commercial PV Battery Applications M. Vetter (Fraunhofer ISE, Germany) (Submission-ID 14)
17:40 – 18:00	Discussions

19:30 Dinner

WEDNESDAY, 9 MAY 2018

08:30 – 10:40	SESSION 5A – MODELLING ISSUES
> Session Chair	Name Surname (Company, Country)
08:30 – 10:18	Presentations (18 min. each)
	<ul style="list-style-type: none">• Mathematical Models for Scheduling Hybrid Wind-Diesel Generators B. Singh (Sandia National Labs, USA), D. Morton (Northwestern University, USA), S. Santoso (University of Texas at Austin, USA) (Submission-ID 74)• Modeling the Dynamics and Control of Power Systems with High Share of Renewable Energies S. Auer (Potsdam Institute for Climate Impact Research (PIK), Germany Humboldt University Berlin, Germany), F. Hellmann, T. Kittel, C. Horn (Potsdam Institute for Climate Impact Research (PIK), Germany), J. Kurths (Potsdam Institute for Climate Impact Research (PIK), Germany Humboldt University Berlin, Germany Institute of Applied Physics, Russian Academy of Science, Germany) (Submission-ID 55)• Assessment of Control Strategies Performance in Islanded PV-Diesel System: Simulation and Experimental Test T. P. Do, G. A. Koucoi, F. Bourry (National Institute of Solar Energy (INES), French Alternative Energies Atomic Energy Commission, France), X. Le Pivert (SteadySun, France 2 SteadySun, France) (Submission-ID 57)• Modelling of a Large Number of Electric Vehicles (EVs) in the All-Island Ireland Energy System V. Duboviks, S. Pedder (GE Energy Consulting, GE Power, United Kingdom) (Submission-ID 5)• Contrastive Techno-Economic Analysis and Design Optimization of Safe, Reliable, User-Friendly, Simply Designed and Economically Feasible Off-Grid Hybrid Renewable Energy System within the Context of Local Electrical Energy Scenarios M. M. Elkadragy (Karlsruhe Institute of Technology (KIT), Germany) (Submission-ID 12)• Modeling Retrofitting Options for Hybrid Power System to Maximize Penetration of Variable Renewable Electricity M. Knopp (Technical University of Braunschweig, Germany) (Submission-ID 99)
10:18 – 10:40	Discussions

08:30 – 10:40	SESSION 5B – SYSTEM DESIGN ASPECTS I
> Session Chair	Name Surname (Company, Country)
08:30 – 10:18	Presentations (18 min. each)
	<ul style="list-style-type: none">• Ensuring Reliable Power for Commercial and Industrial (C&I) Sites H. Bitaraf (ABB, USA) (Submission-ID 6)• Bottom-up Restoration of Distribution Grids with Large Amounts of PV Systems D. Lafferte, A. Klingmann (University of Kassel, Germany), M. Braun (University of Kassel, Germany Fraunhofer Institute for Energy Economics and Energy System Technology IEE, Germany) (Submission-ID 50)• Load Management for Hybrid Energy Systems M. Gast (PHOENIX CONTACT Electronics, Germany) (Submission-ID 45)• Case Studies Regarding the System Configuration of Wind Integrated Hybrid Power Plants for Off-Grid Systems L. Petersen (Aalborg University, Denmark Vestas Wind Systems, Denmark), F. Iov (Aalborg University, Denmark), G. Tarnowski, C. E. Carrejo Gonzales (Vestas Wind Systems, Aarhus, Denmark) (Submission-ID 35)• Feasibility of Solar PV Integration in to the Grid Connected Telecom Base Stations and The Ultimate Challenge K. Wijesinghe (edotco Services Lanka Limited, Sri Lanka) (Submission-ID 18)• EnerKite - Airborne Wind Energy and Storage systems for Off-grid and Mobile End-uses A. Bormann, J. Beland, M. Kompen, M. Ranneberg, A. Candade (EnerKite GmbH, Germany) (Submission-ID 94)
10:18 – 10:40	Discussions

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

11:10 – 12:50	SESSION 6A – TBD
> Session Chair	Name Surname (Company, Country)
11:10 – 12:30	Presentations (16 min. each)

- **Sky-imager forecasting for improved management of a hybrid photovoltaic-diesel system**
A. Braun, O. Liandrat, E. Buessler, L.-E. Boudreault, S. Cros, N. Schmutz (Reuniwatt SAS, France) ([Submission-ID 49](#))
- **Evaluation of the Impact of Intra-Day Distributed PV and Wind Generation Forecasts on Decision-making in the Operations of an Island Grid System**
J. Zack (AWS Truepower, USA), R. Kaneshiro, L. Dangelmaier (Hawaii Electric Light Company, USA) ([Submission-ID 56](#))
- **Short term Prediction of Wind Turbine Production with Data Mining Methods: Direct Approach and Integrated Approach.**
E. Matzner-Lober (CREST ENSAE Paris Tech, France), P. Alexandre (ENGIE Green FRANCE, France) ([Submission-ID 19](#))
- **Potential for Interconnection of Isolated Power Systems with ENTSO-E Network - Example of Cyprus Power System and Baltic States**
A. Vovk (ENTSO-E, Belgium), G. Christofi (TSO Cyprus, Cyprus) ([Submission-ID 97](#))
- **Interaction analysis in Islanded Power Systems with HVDC Interconnections**
C. Collados-Rodriguez, E. Prieto-Araujo, M. Cheah-Mane, R. Ferrer-San-Jose, O. Gomis-Bellmunt (CITCEA-UPC, Spain), S. Sanz, C. Longas, A. Cordon, L. Coronado (REE, Spain) ([Submission-ID 58](#))

12:30 – 12:50 **Discussions**

11:10 – 12:50 **SESSION 6B – SYSTEM DESIGN ASPECTS II**

> **Session Chair** **Name Surname (Company, Country)**

11:10 – 12:30 **Presentations (16 min. each)**

- **Progressive Reduction of Fossil Fuel in the Honduran Bay Islands to Strengthen Sustainable Tourism**
C. Jacome (Regional Energy Specialist - Interamerican Development Bank, Honduras) ([Submission-ID 81](#))
- **Smart Community Microgrid with Decentralized Energy Management and Dynamic Power Exchange**
D. Gomez, D. Hardy (Smart Hydro Power, Germany | Technical University Munich (TUM), Germany), K. Kolmsee (Smart Hydro Power, Germany | Alliance of Rural Electrification (ARE), Belgium) ([Submission-ID 42](#))
- **Renewable Park Controller**
N. Styliaras, C. Ionita, G. A. Raducu, J. Funkquist (Vattenfall AB, Sweden) ([Submission-ID 30](#))
- **Grid stabilization of Rural Distribution Networks by Embedded Renewable Generation**
N. Fischer, S. Nowaczyk, J. Gerstner, J. Ruebenach (ABO Wind AG, Germany) ([Submission-ID 88](#))

12:30 – 12:50 **Discussions**

12:50 – 13:50 **LUNCH BREAK**

13:50 – 15:45	SESSION 7A – STABILITY ISSUES
> Session Chair	Name Surname (Company, Country)
13:50 – 15:26	Presentations (16 min. each)
	<ul style="list-style-type: none"> • Stability Challenges & Solutions for Power Systems Operating Close to 100% Penetration of Power Electronic Interfaced Power Sources H. Urdal (Urdal Power Solutions Ltd, United Kingdom) (Submission-ID 96) • The need of synchronous inertia in autonomous power systems with increasing shares of renewables P. Beires, C. Moreira, J. Peças Lopes (INESC TEC - Institute for Systems and Computer Engineering, Technology and Science, Portugal Faculdade de Engenharia da Universidade do Porto (FEUP), Portugal) (Submission-ID 27) • ENTSOE – System Needs 2040 – Frequency Stability Challenges ENTSOE-Drafting Team Planning Standards (DTPS), D. Powell (ENTSO-E, Belgium) (Submission-ID 100) • Adaptive Droop Control for Frequency Regulation in Microgrid with Renewables and Electric Vehicles J. Qi, T. Tsuji (Yokohama National University, Japan) (Submission-ID 70) • Energy Storage for Frequency Control in High Photovoltaic Power Grids S. You, Y. Liu, M. Gonzalez, X. Zhang (University of Tennessee, Knoxville, USA), J. Tan, Y. Zhang (National Renewable Energy Laboratory, USA), Y. Liu (University of Tennessee, Knoxville, USA Oak Ridge National Laboratory, USA) (Submission-ID 9) • Li-ion Batteries for Providing Virtual Inertia L. Beushausen, R. Bengler, J. Gollenstede, F. Deblon, N. Orasov (Technical University of Clausthal - TU Clausthal, Germany) (Submission-ID 59)
15:26 – 15:45	Discussions

13:50 – 15:45	SESSION 7B – MICRO GRID DESIGN ASPECTS
> Session Chair	Name Surname (Company, Country)
13:50 – 15:26	Presentations (16 min. each)
	<ul style="list-style-type: none"> • Framework Design for Smart Micro-Grids N. Martensen (Energynautics, Germany), S. Al-Agtash (German Jordanian University, Amman, Jordan), B. Azzopardi (Malta College of Arts, Science and Technology (MCAST), Malta), A. Tsolakis (Information Technologies Institute, Greece), A. Önen (Abdullah Gul University, Kayseri, Turkey), J. L. Martinez-Ramos (Universidad de Sevilla, Spain), M. Khat (ENP d'ORAN, Algeria), L. Hadjidemetriou (University of Cyprus, Cyprus), D. Masendorf (Energynautics, Germany), N. Fragale (GeoSYS Ltd, Malta), N. Borg, (Electronic Systems Design Ltd, Malta), D. Tzovaras (Information Technologies Institute, Greece) (Submission-ID 47) • Design of a Low Voltage DC Microgrid Based on Renewable Energy to be Applied in Communities where Grid Connection is not Available E. Prieto-Araujo, E. Iraola, R. Padrós-Valls (CITCEA-UPC, Spain), H. Kirchhoff (SOLshare Ltd., Bangladesh), O. Gomis-Bellmunt (CITCEA-UPC, Spain) (Submission-ID 63) • Results for a MV-Hybrid-Microgrid Test campaign in the MW-Range M. Bader, R. Singer, C. Siedle (Fraunhofer ISE, Germany) (Submission-ID 61) • Design and Control of the Microgrid D. Panic (E.ON Energidistribution, Sweden) (Submission-ID 98) • Development of 600V Industrial DC Microgrid for Highly Automated Manufacturing Applications: Factory and Laboratory infrastructure experience. A. Senfelds, A. Avotins, L. Ribickis (Riga Technical University, Latvia) (Submission-ID 52) • Revisiting Edison: Residential DC Nanogrids A. Pinhel (Maelstom Engenharia e Inovação, Brazil) (Submission-ID 38)
15:26 – 15:45	Discussions

15:45 – 16:00 COFFEE BREAK & POSTER SESSION

16:00 – 17:00	SESSION 8 – CLOSING SESSION
> Session Chair	Name Surname (Company, Country)
16:00 – 17:00	Panel discussion
<p>Topics addressed:</p> <ul style="list-style-type: none"> - TBA <p>Panelists:</p> <ul style="list-style-type: none"> - TBA 	

POSTER PRESENTATIONS

- **Local Energy Autarky with Decentralized Smart Grid Systems using EV Charging Management**
R. Uhlig, M. Stötzel, M. Zdrallek (University of Wuppertal, Germany) ([Submission-ID 26](#))
- **Measurement-based Methods for Model Reduction of Large Power Systems**
X. Zhang (University of Tennessee, USA), Y. Xue (Oak Ridge National Laboratory, USA)
S. You (University of Tennessee, USA), Y. Liu (University of Tennessee, USA | Oak Ridge National Laboratory, USA)
([Submission-ID 32](#))
- **Characterization Methods for the State of Charge Estimation of Lithium-ion Batteries**
F. Conte (DITEN, Università degli Studi di Genova, Italy), S. Grillo (DEIB, Politecnico di Milano, Italy), S. Massucco, M. Saviozzi,
F. Silvestro (DITEN, Università degli Studi di Genova, Italy) ([Submission-ID 34](#))
- **Model-Based Virtual Heat Meters for a Wide Area Village with Application to a Clean Heat-on-Demand Solution**
C. Barbu, B. Andreasen (Aarhus University, Denmark) ([Submission-ID 51](#))
- **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., M.A.M.M.van der Meijden (Delft
University of Technology, Netherlands | TenneT TSO B.V, Netherlands) ([Submission-ID 54](#))
- **Unified Gas and Electricity Distribution Grid Control**
B. Dahlmann (Bergische Universität Wuppertal, Germany), J. Huettenrauch (DBI Gas- und Umwelttechnik GmbH, Germany)
([Submission-ID 65](#))
- **Smoothing Effect of the Power Fluctuation in Large Scale Mega Solar and Wind Turbine Hybrid Power Plant**
K. Yaguchi, Y. Murakami (Toshiba Corp., Japan), K. Yabui, Y. Kamata (Toshiba Energy Systems & Solutions Corp., Japan)
([Submission-ID 82](#))
- **Observation Study from a Small Business and Small Family Operation – Utilizing Hydro Power to Energize Entire Operation**
D. Smith (Customer, USA) ([Submission-ID 83](#))
- **Building Energy Supply with Hydrogen**
N. Klüber, J. Schumann (TU Bergakademie Freiberg, Germany) ([Submission-ID 91](#))
- **Promoting Renewable Energies in Tourism: An actor-based SWOT-Analysis**
L. Müller (HTWG, Germany) ([Submission-ID 103](#))