



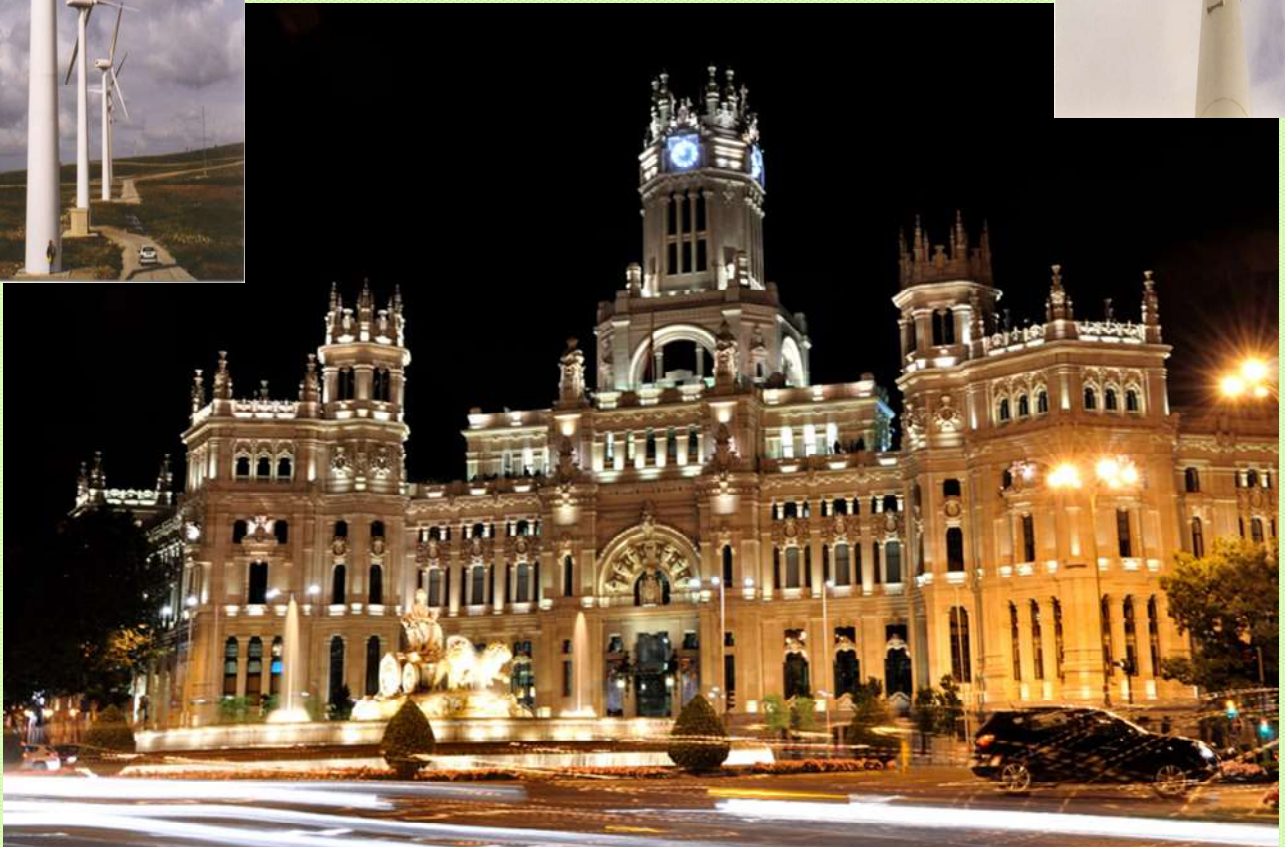
European Association  
for the Development of  
Renewable Energy,  
Environment and  
Power Quality

# ICREPO'16

INTERNATIONAL CONFERENCE ON  
RENEWABLE ENERGIES AND  
POWER QUALITY

Madrid, 4 – 6 of May 2016

## PROGRAM OF ACTIVITIES





**International Conference on Renewable Energy and Power Quality (ICREPQ'16)**  
*Universidad Pontificia de Comillas (ICAI-ICADE). Madrid (Spain)*  
May 4,5,6, 2016

**INTERNATIONAL CONFERENCE  
ON RENEWABLE ENERGY AND  
POWER QUALITY  
(ICREPQ'16)**

**PROGRAM**



## ORGANISED BY:

The International Conference on Renewable Energies and Power Quality (ICREPQ'16), will be organized by:

- European Association for the Development of Renewable Energy, Environment and Power Quality (EA4EPQ)
- University of Vigo
- Universidad Pontificia de Comillas (ICAI/ICADE)



## CONFERENCE LANGUAGE

The Conference language is English. All papers and presentations should be made in English.

## OBJECTIVES AND TOPICS

The intention of the organisers is to give an opportunity to academics, scientists, engineers, manufacturers and users from all over the world to come together in a pleasant location to discuss recent development in the areas of Renewable Energy and Power Quality.

The International Conference on Renewable Energy and Power Quality (ICREPQ'16) is structured in:

- **Plenary Sessions:** Presentations of 45 minutes in one room for all the participants
- **Special Oral Sessions and Standard Oral Sessions:** Presentations of about 15 minutes for each paper (12 minutes for the presentation and 3 minutes for questions). Simultaneously in two rooms.
- **Posters Sessions:** In 45-minute periods during the coffee breaks.

### 1. RENEWABLE ENERGY:

- Wind Energy, Small Hydro Energy, Solar Energy, Photovoltaic Energy, Ocean Energy, Geothermal, Biomass, Cogeneration,...
- Classical and special electrical generators: Theory, design, analysis, losses, efficiency, heating and cooling, vibration and noise, modelling and simulation, control strategies, protection systems, maintenance, mechanical behaviour, new methods of testing, parallel operation, transmission system, stability,...
- Power plants. Distributed generation. Fuel cells. Co-generation. Hybrid Systems. Microgrids. Smart grids. Original solutions,...
- Energy conversion, conservation and energy efficiency.
- Energy saving policy. Energy storage. Batteries....
- Energy and the environment. Ecological balance. Ecosystem,...
- Application of the renewable energy. Best practice projects.
- Legislation in the area of renewable energies.
- Biomass combustion techniques. The energy use of agricultural and forest residues. Production and the energy exploitation of bio-gas. Environment. Social importance...
- Interconnection and transport problems.



- Planning and control of the power system take into account the renewable energy. Stability. Protection...
- Economic analysis of the power system take into account the renewable energy.
- Electricity Market Structures. Regulation/des-regulation of the power market. Influence of the renewable energy.
- Models and simulation of the power systems. Models and estimation of loads. Software tools.
- Application of the communications, internet, artificial intelligence for the renewable energy.
- Security assessment and risk analysis in renewable energy.
- Electric vehicles.
- Electrical Machines & Drives, Power electronics and Control strategies for renewable energy applications.
- Monitoring and Diagnostics of electrical machines & drives, Tools for Diagnostics, Test for Predictive Maintenance in Renewable...
- Sensors and actuators for renewable energy applications.
- Renewable Energies Teaching.

## 2. POWER QUALITY:

- Electromagnetic compatibility (EMC).
- Power Quality in Transport and Distribution. FACTS
- Economic Studies of the Power Quality.
- Low-frequency conducted disturbances: Voltage deviations, voltage fluctuations/flicker, voltage dips and short interruptions, harmonics and inter-harmonics, transient over-voltages, voltage unbalance (imbalance), temporary power-frequency variations.
- Sources, effects and mitigation methods of the disturbances.
- Measurements of the power quality in networks, industrial installations and Laboratories. Equipment, procedures and measurement methods. Standards.
- Modelling and simulation of the power quality. Software tools.
- Transmission of the disturbances.
- Filtering techniques.
- Power factor compensation. Capacitor switching techniques.
- Optimization techniques.
- Communication, internet and artificial intelligence.
- Permanent monitoring techniques and online diagnosis.
- Intelligent energy delivery systems. Uninterrupted power supplies.
- Expert systems applications.
- Devices, equipment and power systems. Control centres.
- Specific problems and studies cases.
- Power quality influence in deregulated markets.
- High frequency disturbances (radiated).
- Data security and electromagnetic pulses.
- Protection against natural and intentional EMI.

## LOCAL ORGANIZING COMMITTEE

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Enrique Lobato Miguélez  
Ignacio Egido Cortés  
Fidel Fernández Bernal  
Lukas Sigrist



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Hojae Shim (Macao, China)  
Ionnides, Maria G. (Greece)  
Iwazskiewicz, J. (Poland)  
Janik, Przemyslaw (Poland)  
Jeong Se Suh (Rep. of Corea)  
Jokinen, T. (Finland)  
Jigeng Li (China)  
Jimoh, Adisa (South Africa)  
Kádár Péter (Hungary)  
Kiss, Péter (Hungary)  
Kouzou Abdellah (Argeria)  
Lee, Poh Seng (Singapore)  
Lemos Antunes, C. (Portugal)  
Levi, Emil (U.K.)  
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Machado e Moura, A. (Portugal)  
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Meyer, Jan (Germany)  
Mlangeni, Melusi (South Africa)  
Narsimhulu, Sanke (India)  
Niemenmaa, Asko (Finland)  
Nocera, Francesco (Italy)  
Oraee, Hashem (Iran)  
Ozdemir, Engin (Turkey)  
Pathan, Habit M. (India)  
Petkovska, L. (Macedonia)  
Popescu, Claudia (Romania)  
Pourmovahed, Ahmad (USA)  
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Subramanian, Chandraekaran (India)  
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Vaccaro, Alfredo (Italy)  
Valouch, V. (Czech Republic)  
Vergura, Silvano (Italy)  
Vinnikov, Dmitri (Estonia)  
Vitale, Gianpaolo (Italy)  
Xinzi Tang (China)  
Youssef Errami (Morocco)  
Zamora Belver, I (Spain)  
Zobaa Ahmed (UK)



## STEERING COMMITTEE

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## SPONSORSHIP

Sincere thanks are expressed to the organisations listed below who have given valuable support to ICREPQ'16:

- EA4EPQ
- Universidad Pontificia de Comillas (ICAI/ICADE)
- University of Vigo
- AEDIE
- CIRCUTOR



UNIVERSIDAD  
ICAI





## ICREPQ'16 PROGRAM OF ACTIVITIES

<b>Tuesday May 3, 2016</b>	
<b>17:00 – 20:00</b>	<b>Registration “ICREPQ’16 Secretariat”.</b> Registration and Documentation. It's important that all the participants seize their documentation during this day, but the ICREPQ'16 Secretariat will be open during the three days of the conference, then if you don't arrive on Tuesday 3 <sup>th</sup> you can get your documentation other day.

Room A: Sala de Conferencias

Room B: CIRCUTOR

Room C: AEDIE

<b>Wednesday May 4, 2016</b>						
<b>9:00 – 12:30</b>	<b>Registration “ICREPQ’16 Secretariat”</b>					
<b>10:45 – 11:30</b>	<b>Opening Ceremony ROOM A “Sala de Conferencias”</b>					
<b>11:30 – 12:15</b>	<b>Posters Session at ROOM C (Session P1) Coffee Break</b>	<i>Poster Session P1</i>				
		211	214	217	221	223
		224	225	226	228	230
		231	234	237	238	241
		246	248	250	256	258
		263	265	266	268	270
		443				
<b>12:15 – 13:00</b>	<b>ROOM A "Sala de Conferencias". Plenary Session PL1</b>					
	<i>PL1</i>	Prof. Gianpaolo Vitale. <i>"Energy saving by power electronics: towards a new concept of renewable source"</i>				
	EXTRA TIME FOR DISCUSSION					
<b>13:00 – 15:00</b>	<b>Welcome Lunch</b>					
<b>15:00 – 15:45</b>	<b>ROOM A "Sala de Conferencias". Plenary Session PL2</b>					
	<i>PL2</i>	Dr. Pablo Frías. <i>"Integration of renewable generation in power systems using flexibility of large industrial consumers"</i>				
	EXTRA TIME FOR DISCUSSION					
<b>15:45 – 16:30</b>	<b>Poster Session at ROOM C (Session P2) Coffee Break</b>	<i>Poster Session P2</i>				
		282	284	285	286	287
		289	292	293	297	299
		300	308	313	320	322
		323	324	327	328	341
		341	345	347	349	351
		353	356	358	404	422
<b>16:30 – 18:00</b>	<b>ROOM A</b>			<b>ROOM B</b>		
	<i>Oral Session A1</i>			<i>Oral Session B1</i>		
	203	253	254	233	249	295
	450	510		315	511	
	EXTRA TIME FOR DISCUSSION			EXTRA TIME FOR DISCUSSION		
<b>18:00-20:00</b>	<b>Welcome Civic Reception Universidad Pontificia de Comillas</b>					



Thursday May 5, 2016						
9:00 – 12:30	Registration "ICREPQ'16 Secretariat"					
	ROOM A "Sala de Conferencias" Plenary Sessions PL3 & PL4					
9:00 – 9:45	PL3	Dr. Juan Rivier. "Where are renewables leading us?"				
9:45 – 10:30	PL4	Prof. Toshihisa FUNABASHI. "Energy Saving Philosophies in the future local social energy systems".				
	EXTRA TIME FOR DISCUSSION					
10:30– 11:15	Poster Session at ROOM C (Session P3) Coffee Break	Poster Session P3				
		220	361	363	364	365
		369	370	372	377	378
		380	381	383	384	385
		388	390	392	394	396
		399	405	406	408	409
		410	411	412	505	
11:15 – 13:00	ROOM A			ROOM B		
	Oral Session A2			Oral Session B2		
	301	346	367	275	307	310
	373	454	475	357	527	540
	EXTRA TIME FOR DISCUSSION			EXTRA TIME FOR DISCUSSION		
13:00 – 15:00	Lunch					
15:00 – 16:30	ROOM A			ROOM B		
	Oral Session A3			Oral Session B3		
	240	251	309	242	368	419
	317	402		444	482	
	EXTRA TIME FOR DISCUSSION			EXTRA TIME FOR DISCUSSION		
16:30 – 17:15	Poster Session at ROOM C (Session P4) Coffee Break	Poster Session P4				
		414	415	416	420	421
		424	425	426	428	432
		433	436	437	439	440
		442	446	447	448	451
		455	458	465	468	471
		472	474	484	485	486
17:15 - 18:45	ROOM A			ROOM B		
	Oral Session A4			Oral Session B4		
	274	281	427	273	360	374
	452	470		453		
	EXTRA TIME FOR DISCUSSION			EXTRA TIME FOR DISCUSSION		
20:30	Conference Dinner (Optional) Casino de Madrid Alcalá, 15					

Room A: Sala de Conferencias  
Room B: CIRCUTOR  
Room C: AEDI





Friday May 6, 2016						
9:00 – 12:30	Registration "ICREPQ'16 Secretariat"					
	ROOM A "Sala de Conferencias" Plenary Session PL3					
9:00-9:45	PL 5	Prof. José Antonio Aguado. "Off-Grid Renewable Energy Systems: Current Status and International Experiences".				
	EXTRA TIME FOR DISCUSSION					
9:45 – 10:30	Poster Session at ROOM C (Session P5) Coffee Break	Poster Session P5				
		262	355	489	490	491
		500	503	508	512	517
		520	524	526	533	534
		536	543	544	546	548
		549	554	557	559	560
		561	562	563	565	
10:30– 12:15	ROOM A			ROOM B		
	Oral Session A5			Oral Session B5		
	244	395	506	247	257	280
	521	530		311	480	
	EXTRA TIME FOR DISCUSSION			EXTRA TIME FOR DISCUSSION		
12:15– 13:00	ROOM A "Sala de Conferencias"					
	CLOSING SESSION					
	Conclusions and time for the next conference (ICREPQ'17) Awards for the three best posters					
13:00 – 15:00	Farewell Lunch					
15:00 – 20:00	Excursion for to visit the city of Toledo					

SPECIAL SESSIONS ICREPQ'16		
No.	TITLE	CHAIRMEN
1	Control and integration of wind energy systems	Mario J. Duran Martínez and Mohamed A. H. El-Sayed
2	Microgrids and Smart grids	Gevork B. Gharehpetian and Alfredo Vaccaro
3	Electric vehicles	Pere Andrada
4	Solar Technologies	Silvano Vergura and Gianpaolo Vitale
5	Applications of Multi-Level Converters and Inverters in Power Quality Improvement	P. N. Tekwani
6	Sustainable Energy Mix	Mohamed A.H. El-Sayed
7	Wind Turbines of the Future: Economics, Design & Operation	Hashem Oraee
8	Harmonics and Power Quality	András Dán and Dávid Raisz
9	Ecodesign, regulation standards and efficiency improvement of electric motors	Ramón Bargalló
10	Ocean Energy (Wave, tidal and offshore wind)	Ahmed Zobaa
11	Power Electronics for Renewable Energy Systems	Silvano Vergura and Gianpaolo Vitale
12	Net Zero Energy Building	Antonio Gagliano and Francesco Nocera
13	Economic, Financial and Social aspects of Renewable Energy Penetration	Mihail Predescu
14	Nanotechnology for Renewable Energy	Basma El Zein and Elhadj Dogheche
15	Low & High Temperature Fuel Cells	Etim Ubong



16	Power Quality and Renewable Energy	André Martinez and Shahrokh Saadate
17	Renewable energies for developing countries	Vít BRŠLICA and Alfredo Vaccaro
18	Strategic Energy Planning	Roberto Cesar Betini and Emilio Torrente Lujan
19	Model Predictive Control for Power Electronics Converters Dedicated to Renewable Energies systems	Kouzou Abdellah
20	Impacts of renewable energy for industrial development and sustainable economics	Amine Boudghene Stambouli and Samir Flazi
21	FACTS (SVC, STATCOM, UPFC, HVDC,...)	Manuel Pérez Donsión

## AUTHORS

### Oral Presentations

Each speaker of an oral presentation has an available time of 15 minutes (12 minutes for the presentation and 3 minutes for questions) and must be in the session room 10 minutes before of the beginning of the session for to test the audiovisual equipment and for to exchange opinions with the Session Chairman. We suggest that the speakers of one oral presentation prepare their material in Power Point.

### Poster Presentations

The posters must be numbered, on the up left corner, with the number of the paper and it will be put, about 15 minutes before of the beginning of the session, on the pin board that you previously can chose and it must be take off 15 minutes after of the end of the session. The author(s) must be stay near the poster during the 45 minutes of the session duration for to answer all the questions that the audience or the chairmen could formulate. The maximum available surface for each poster will be **1.000 mm x 2.000 mm** (width x high). You must select your poster size take into account this maximum available surface (Perhaps one A0 size, **841x1189** mm (width x high), could be apropiate). Put on the pin board separated sheets of the paper are not allowed.

## SESSION CHAIRMEN

On behalf of the International Scientific Committee, Steering Committee and the Organising Committee of the ICREPQ'16 and take into account their eminent position in the world of science we have selected 40 session chairmen. It is an honour for us their collaboration for to chair the sessions of ICREPQ'16 and their contribution would be greatly appreciated. We wish to express our warmest thanks.

Traditionally the Chairmen of each Session are independent in organising the Session. Nevertheless it is of special importance that the different session chairmen prepare some questions about the papers of their session in order to get a more dynamic one. Furthermore we expect of the session chairmen the following:

### Plenary sessions

Each plenary session should not exceed **45 minutes** including presentation and discussion, (35 minutes for presentation and 10 minutes for questions).

### Oral sessions

Each oral paper presentation should not exceed 15 minutes including presentation and discussion, (12 minutes for presentation and 3 minutes for questions).



## Poster sessions

The author(s) of a poster presentation must stay near the poster during the 45 minutes of the session duration and in order to get a more dynamic session it is important that along this period of time each of the chairmen of the poster sessions formulate questions to the authors and check that all is OK. The chairmen also file up a sheet with puntuations for each presented poster and then take into account these evaluations the Organizers will deliver during the Closing Session a present to the three best posters.

### Chairmen Sessions distribution

Wednesday May 4, 2016		
11:30-12:15	POSTER SESSION P1	José A. Güemes Alonso José Roberto Camacho Chiara Gandolfi Lidiya Kovernikova Jan Wenske
12:15-13:00	PLENARY SESSION PL1	Gevork B. Gharehpetian
13:00-15:00	Welcome Lunch	
15:00-15:45	PLENARY SESSION PL2	Gorazd Stumberger
15:45-16:30	POSTER SESSION P2	José Ignacio San Martín Díaz Marc Cousineau Erwin Schlemmer Leonardo Assaf Roberto San José García
16:30-18:00	ORAL SESSION A1	Berthold Bitzer
	ORAL SESSION B1	Amine Boughene Stambouli
Thursday May 5, 2016		
9:00-9:45	PLENARY SESSION PL3	Luis Rouco Rodríguez
9:45-10:30	PLENARY SESSION PL4	William Westom
10:30-11:15	POSTER SESSION P3	Pablo Eguia Jerome Wolfman José Pablo Paredes Sánchez Cees Keyer Bojan Petrovic
11:15-13:00	ORAL SESSION A2	Hortensia E. Amaris Duarte
	ORAL SESSION B2	Francesco Patania
13:00-15:00	Lunch	
15:00-16:30	ORAL SESSION A3	Aurelian Craciunescu
	ORAL SESSION B3	Mircea Ion Buzdugan
16:30-17:15	POSTER SESSION P4	Joerg Kammermann Kamel Abou Ghali Santiago Arnaltes Gómez George Sydnor Rachid Darbali Zamora
17:15-18:45	ORAL SESSION A4	Gilles C. Roy
	ORAL SESSION B4	Wolf-Gerrit Früh
Friday May 6, 2016		
9:00-9:45	PLENARY SESSION PL5	Etim Ubong
9:45-10:30	POSTER SESSION P5	Herminio Martínez García Jens Teuscher Carmen L. Barajas Forero Marta Varo Martínez Arnulfo Barroso de Vasconcelos
10:30-12:15	ORAL SESSION A5	Ahmed Zobaa
	ORAL SESSION B5	Peter Kádár
13:00-15:00	Farewell Lunch	



## ICREPQ'16 KEYNOTES

### **PL1: "Energy saving by power electronics: towards a new concept of renewable source" by Prof. Gianpaolo Vitale.**

**Summary:** In the last decades, the human role in increasing the greenhouse effects, became more apparent, anyway the global energy consumption scenario highlights that we are still using too much energy produced from fossil fuel, as a consequence CO<sub>2</sub> emissions are likely to grow further.

In this scenario the use of renewable sources (RES) appears a valid option, as a matter of fact, as for electricity production, the reduction of the combustion of fossil fuels lessens the concentration of carbon dioxide in the atmosphere, hindering the increase of the earth's average temperature. Moreover, the use of RES allows the cost of energy to be reduced, contributing to reduce poverty in underdeveloped countries and regions since solar and wind, among the sources that will have to give the highest contribution in the future, are available all around the world.

On the other hand, the growth of renewable sources market share appears relatively slow and comparable with the growth of other fossil sources in the past. This is mainly due to the daily variation of the energy produced by RES for which generated energy can range from a negligible value to a value satisfying most energy demand. Moreover, solar and wind energy must be produced where the sun or wind can ensure a good production, and this implies its transportation with power grids by either using the existing ones or installing new grids.

A considerable help can be given by storage system technologies, they can significantly push the use and growth of renewable generation As a matter of fact they can store energy in off-peaks hours and return it during peak hours. In this way a plant can be operated for a fairly constant load operation below peak demand. Even if this is a promising field in the next future, actually the global stored energy is still insufficient so that the global produced energy can be assumed as equal to the consumed energy.

In this scenario, Power electronics plays a key role through the chain of transformation from generation to storage and distribution cycle of energy. The general principle of switching power conversion, based on power semiconductor devices operated only in ON/OFF state, together to the availability on the market of faster, low losses and cheaper devices can assure high conversion efficiency with a reduced pay-back period.

This contribution summarizes the main application of power electronics converters highlighting how energy can be saved by the more efficient generation, transmission, distribution and utilization of electricity. This saved energy can be used to supply another load which is equivalent to electricity generation with null contribution to greenhouse effect as a new form of renewable source. By this concept, known as "negawatt", energy saving by power electronics can be classified as a renewable energy source and as a key technology for the reduction of carbon dioxide emissions.

## Short biography of Prof. Gianpaolo Vitale



**Prof. Gianpaolo Vitale** received his “laurea” degree in Electronic Engineering from the University of Palermo (Italy) in 1988. From 1994 to 2001 he has been a researcher and since 2002 a senior researcher of the I.S.S.I.A.- C.N.R. (Institute on Intelligent Systems for Automation belonging to National Research Council of Italy). He received the award of the national scientific qualification (“Abilitazione scientifica nazionale”) as full professor on electric energy engineering (cod. 09/E2) on 2013. He teaches “Power electronics” for the MD course on electronic engineering at the Palermo University (Italy), where he has been mentor of 9 MSc thesis, co-mentor of 12 MSc thesis, mentor of 4 PhD.

He has been “rapporteur” of 3 PhD thesis at the Université de Technologie de Belfort-Montbéliard (France) where he has been “invited professor” and responsible of 6 research grants at CNR-ISSIA.

He has been the supervisor of a research project on Electromagnetic compatibility of electric drives and of a research project on intelligent management of electric energy supplied by renewable sources. He is responsible of the research project “RITmare, Italian Research for the sea” for the unit of Palermo of ISSIA. He is senior member of IEEE (Institute of Electrical and Electronics Engineers) since 2012 and member of IEEE Vehicular Technology Society, IEEE Industrial Electronics Society and IEEE Electromagnetic Compatibility Society and he serves as reviewer for several journals and conferences. He has been Co-chair in several conferences and membership in various conferences’ boards:

He is co-editor of a book, co-author of 2 books and over 150 scientific articles, among which 35 on international ISI journals.

His current research interests are in the fields of Power Electronics, generation from renewable sources and related problems of Electromagnetic Compatibility. He is involved in the activity of scientific popularization on the energetic saving.

E-mail: gianpaolo.vitale (at) cnr.it.

## **PL2: " Integration of renewable generation in power systems using flexibility of large industrial consumers" by Dr. Pablo Frías**

**Summary:** The integration of renewable generation in Europe is still facing some challenges to manage its intermittency and, if fully integrated in the market, additional costs may limit its feasibility. On the other hand, demand side management is foreseen as a main driver to improve power system efficiency in the next future. Hence, intense electric consumers may find an opportunity to offer their flexibility to reduce their electricity bill and improve their competitiveness. Creating alternatives to use the flexibility of large industry to absorb the unbalances of intermittent renewable may result in a win-win strategy. However, the regulations in each country may make infeasible any possible business model. For instance, the rules for the balancing markets, the participation of demand response in power system services, or subsidies for renewable and electricity-intensive consumers. This plenary talk will detail

the potential benefits of merging renewable intermittency with large industry flexibility. Then, suitable business models will be presented for renewable generation and large industry. Finally, most relevant European regulations will be reviewed to identify major barriers for these business models, and some recommendations to overcome them will be presented.

### Short biography of Dr. Pablo Frías



**Dr. Pablo Frías** is assistant professor of Electrical Engineering at the Engineering School of Universidad Pontificia Comillas. He obtained the Ph.D. in Industrial Engineering from the Universidad Pontificia Comillas in 2008. Since 2009, he is Head of the Smart and Green Networks Research Group, focused on the analysis of the technical & economic and regulatory implications of the integration of renewable generation on power systems, and the implementation of smart grids. He has large experience in applied research projects in the area of renewable generation and smart grids at European level, being principal investigator on many of these projects.

He has been visiting researcher at INESC (Porto, Portugal) and Imperial College (London, UK). He is also faculty of the Department of Electrical Engineering ICAI, where since 2008 he is the Head of the Electric Machines Laboratory.

He is also responsible for two graduate courses (Electric Machines, The Challenges of Future Electricity Systems) and two post-graduate (Specialist on Power System Control, Master in Electricity Generation). His research interests are the integration of renewable generation in electrical systems, the penetration of distributed energy resources in electricity networks, and the design of electrical machines.

### PL3: " Where are renewables leading us?" by Dr. Juan Rivier

**Summary:** The development of renewable energy sources is one the pillars of the EU strategy on climate and energy. Renewables are facing regulatory changes that affect their development. This plenary session will review the current situation and its implications for the achievement of the EU targets.

### Short biography of Dr. Juan Rivier



**Juan Rivier**, Electronic Engineer and Ph.D, is with Iberdrola Renovables since 2007. He is currently the head of the Regulation Department. His responsibilities include the analysis of the regulatory frameworks of all the countries where Iberdrola Renovables is active, or planning to be active, and lobbying activities. Integration of renewables in power systems from a regulatory point of view, and prospective analysis of different technologies and markets are also within the scope of the department. Previously, he was research fellow at IIT (Comillas Pontifical University), being a consultant with experience in regulation, quality of service and renewable energies.

## PL4: "Energy Saving Philosophies in the future local social energy systems" by Prof. Toshihisa FUNABASHI

**Summary:** Smart Grid is considered as a countermeasure to serious energy challenges today, such as to maintain security, variety and reliability and to improve efficiency and cleanness of energy generation and consumption. Although, Smart Grid applications are limited to electrical energy systems in many cases at this time, philosophies of such Smart Grid should be expanded to other energy fields, such as gas or hydraulic energy. In Japan, in order to integrate more renewable energy sources to the existing electrical power systems, many activities are developed and demonstrated. And also, in some remote islands in Japan, experiment results are gathered with a viewpoint of a small model representing the whole county energy system. To consider what the future energy system should be, it might be important to have a viewpoint of local social needs, local culture and history and wisdom learned from past history of human kind in that area.

### Short biography of Prof. Toshihisa FUNABASHI



Name: Toshihisa FUNABASHI

Country: Japan

Affiliation: Nagoya University

Department: Institute of Materials and Systems for Sustainability (IMaSS) Position: Professor

Telephone: +81-52-789-2098. E-mail: [funabashi@esi.nagoya-u.ac.jp](mailto:funabashi@esi.nagoya-u.ac.jp)

**Prof. Toshihisa FUNABASHI** received the B.S. degree in electrical engineering from Nagoya University, Aichi, Japan, in 1975. He received the Doctor degree in electrical engineering from Doshisha University, Kyoto, Japan, in 2000.

In 1975, he joined Meidensha Corporation, Tokyo, Japan, where he had been engaged in research on power system analysis and also distributed generation applications in power systems.

Since April 2014, he is a professor of Nagoya University, Aichi, Japan. His current interest include power quality and stability of small power systems with renewable energy sources (RES), operation and control of power systems with large penetration of RESs, generation and transmission lines planning considering large integration of renewable energy sources and deregulated power electricity markets, and power system transients simulation for power systems fault protection and for lightning protection. He has published over 100 journal papers and over 150 international conference papers in these technical areas. Prof. Funabashi is a Chartered Engineer in the U.K, a member of IET, a senior member of IEEE and a member of IEE Japan.



## PL5: "Off-Grid Renewable Energy Systems: Current Status and International Experiences" by Prof. José A. Aguado

**Summary:** Renewable Energy deployment in off-grid systems is growing steadily in both developed and developing countries, however there are only limited data available on their scope and extent. With declining costs and increasing performance for small hydro installations, solar photovoltaics (PV) and wind turbines, as well as declining costs and technological improvements in electricity storage and control systems, off-grid renewable energy systems could become an important growth market for the future deployment of renewables.

In the short- to medium-term, the market for off-grid renewable energy systems is expected to increase through the hybridisation of existing diesel grids with wind, solar PV, biomass gasification and small hydropower, especially on islands and in rural areas. Furthermore, renewables in combination with batteries allow stand-alone operations. Finding the mix of generation and storage elements that translates into a lower cost of energy while fulfilling other constraints such as maximum initial capital or annual emissions is a complex problem that depends on many factors such as electric demand, solar and wind resource, price of fuel, available space etc.

In this talk, it is reviewed the current status of the technology, barriers for further development, main technical design challenges and some practical experiences in several South Asian countries.

### Short biography of Prof. José A. Aguado



**Prof. José Antonio Aguado.** He received his Industrial Engineering (major power systems) and PhD degrees from the University of Malaga in 1997 and 2001, respectively. He is an Associate Professor and Department Head at the Electrical Engineering Department, University of Málaga in Spain. He has authored +80 papers in journals, book chapters, and conferences. . He actively participates in scientific associations such as IEEE, where he is Vice-President of the IEEE Power and Energy Spanish Section.

He has led 35 publicly funded research and consultancy projects in the area of operation and planning of smartgrids, renewable energy, universal energy access, energy efficiency, and wireless power transfer. He also regularly serves as an energy consultant to World Bank and Asian Development Bank.





Wednesday May 4, 2016

10:45-11:30 OPENING CEREMONY

ROOM A "Sala de Conferencias"

Wednesday May 4, 2016

11:30-12:15 Poster Session P1 – Coffee Break

ROOM C "AEDIE"

Chairmen: José Antonio Güemes Alonso, José Roberto Camacho, Chiara Gandolfi, Lidiia Kovernikova, Jan Wenske

- 211 A Comparative Study between a Conventional Two-Level and a Flying Capacitor Four-level VSI for Use in Four-Wire Shunt APF Applications**  
A. F. Hanna Nohra(1,2,3), M. Fadel(2,3), H. Y. Kanaan(1)  
1. St-Joseph University, Faculty of Engineering – ESIB,Beirut . Lebanon  
2. Université de Toulouse ; INPT, UPS ; ENSEEIHT. France  
3. CNRS ; LAPLACE ; Toulouse. France
- 214 Estimation of Properties of Liquid-Vapor Mixture of Some Refrigerants at High Pressure for Solar- Photovoltaic Refrigeration**  
A. Abdallah El Hadj(1,2), M. Laidi(1,2), C. Si-Moussa(2), S. Hanini(2)  
1. Department of Chemistry, University of Blida, USDB- Algeria. Department of Electrical Engineering  
2. LBMPT, University of Medea- LBPT- Algeria
- 217 A Review on the Water and Energy Sectors in Algeria: Current, Forecasts, Scenario and Sustainability Issues**  
Amine Boudghene Stambouli, Ait Mimoune Hamiche, Samir Flazi  
Electrical and Electronics Engineering Faculty  
University of Sciences and Technology of Oran, USTO-MB. Algeria
- 221 Chemical polishing of hexagonal p-type 6H-SiC surfaces by HF/NaO<sub>2</sub> solutions**  
K. Bourenane(1), A. Keffous(2), G. Nezzal(1)  
1. Houari Boumediene University - Institute of Chemical Engineering . Algeria  
2. Development of the Silicon Technology Unit ( UDTS ) . Algeria
- 223 Study of Reactive Flow of Split-type Air Conditioners and Inverter Air Conditioners in the Consumer Units and the Public Electricity Companies**  
Marllon Welter Schlischtig(1), Gabriela Pessoa Campos(1), Arnulfo Barroso de Vasconcellos(1), Fabricio Parra Santilio(1), Teresa Irene Ribeiro de Carvalho Malheiro(2), Raul Vitor Arantes Monteiro(3)  
1. Faculty of Architecture, Engineering and Technology, UFMT –Federal University of Mato Grosso – Cuiabá/MT – Brazil



2. Federal Institution of Education, Science and Technology of Mato Grosso –IFMT Cuiabá. Brazil
3. Federal University of Uberlândia, Science and Technology of Mato Grosso –UFU Uberlândia. Brazil

**224** **Analysys of the Generation of Photovoltaic Solar Energy Connected by Electricity Energy Network using the Software Energypus**

**Gabriela Pessoa Campos(1), Iago de Moura Faria(1), Arnulfo Barroso de Vasconcellos(1), Cátia Sanchez Roboredo(1), Luciana Oliveira da Silva Lima(2), Teresa Irene Ribeiro de Carvalho Malheiro(2)**

1. Faculty of Architecture, Engineering and Technology, UFMT –Federal University of Mato Grosso – Cuiabá/MT. Brazil
2. Federal Institution of Education, Science and Technology of Mato Grosso –IFMT Cuiabá. Brazil

**225** **The influence of Nonlinearity and Reactive Flow of Electronic Loads on the bus of Consumer Units and the Concessionaire**

**Lucas de Oliveira Rosa(1), Marllon Welter Schlischtung(1), Gabriela Pessoa Campos(1), Iago de Moura Faria(1), Arnulfo Barroso de Vasconcellos(1), Teresa Irene Ribeiro de Carvalho Malheiro(2)**

1. Faculty of Architecture, Engineering and Technology, UFMT –Federal University of Mato Grosso – Cuiabá/MT – Brazil
2. Federal Institution of Education, Science and Technology of Mato Grosso IFMT. Cuiabá. Brazil

**226** **Comparative study about electric vehicle charge, individualized or station based**

**E. Ramos Iglesias, M. Pérez Donsión**

Department of Electrical Engineering. E.T.S.I.I., Vigo University. Vigo (Spain)

**228** **Study of Case for Energy Efficiency in Old Buildings**

**J.P. Fumagalli, R. C. Betini, G.M. Alves, P.C. Fritzen**

Department of Electrical Engineering, Federal Technological University of Paraná. Brazil

**230** **Cooperative Control Strategy of Multifunctional Inverters for Power Quality Enhancement in Smart Microgrid**

**C. Stevanoni, O. Deblecker, F. Vallée**

Electrical Engineering Department, Faculty of Engineering, University of Mons (UMONS). Belgium

**231** **Modeling and Simulation of an induction machine in the abc-reference frame using inversion of a matrix by partitioning**

**R. Dimitrovski, M. Luther**

Electrical Energy Systems, University of Erlangen-Nuremberg. Germany



- 234 Territorial management for an appropriate technological choice: the case of CIH and CIBiogás projects in Parana 3 River Basin, Parana, Brazil**  
**M. V. Lange(1), S. M. Andersen(1), J.C. Pasqual(2)**  
1. Environment and Development Post-Graduate Programme, in the Federal University of Parana. Sector of Agricultural Sciences - Brazil  
2. Urban Management Post-Graduate Programme, in the Pontifical Catholic University of Parana. International Hydroinformatics Centre and International Centre for Renewable Energy - Biogas -Parana. Brazil
- 237 General Analysis of Frequency Containment and Restoration Reserves of Wind Power Plants in Power Systems**  
**J. Glas, A. Semerow, M. Luther**  
Electrical Energy Systems, Friedrich-Alexander University Erlangen-Nuremberg. Germany
- 238 Surface Cleaning and Modification by High Intense UV-Irradiation for TiO<sub>2</sub> Nanoparticle Films in Dye Sensitized Solar Cells**  
**A. Kleine, U. Hilleringmann**  
Department of Electrical Engineering, University of Paderborn. Germany
- 240 Estimation of Power Grid Topology Parameters through Pilot Signals**  
**S. Neshvad, H. Margossian, J. Sachau**  
Interdisciplinary Centre for Security, Reliability and Trust (SnT), University of Luxembourg
- 241 Optimization of solar network and its generators number**  
**Fergani.S(1), Si ali.M(2), Flazi.S(3), Boudghene Stambouli.A(4)**  
1.2.3. Department of Electrical Engineering  
4. Department of Electronics,  
University of sciences and the Technology of Oran Mohamed Boudiaf
- 242 Power Quality Management of NASA's Large, Nonlinear Research Loads**  
**G. H. Sydnor, PE**  
NASA Langley Research Center. Hampton, Virginia. USA
- 246 Photovoltaic Mathematical Model for Satellite Applications**  
**Rachid Darbali-Zamora(1), Eric S. Rodriguez-Ortiz(1), Eduardo I. Ortiz-Rivera(1), Amilcar A. Rincón-Charris(2)**  
1. Department of Electrical and Computer Engineering. University of Puerto Rico  
2. Department of Mechanical Engineering, InterAmerican University of Puerto Rico



- 248 Comparative Study of Reliability and Fault Tolerance of Multi-Phase Permanent Magnet Synchronous Motors for Safety-Critical Drive Trains**  
**I. Bolvashenkov, J. Kammermann, S. Willerich, H.-G. Herzog**  
Institute of Energy Conversion Technology Technical University of Munich (TUM) Germany
- 250 Power Quality Analysis in an Industrial Electrical System by Probability Density Function**  
**G. B. Gibelli(1), M. Oleskovicz(2), J. C. M. Vieira(2)**  
1. Department of Engineering of Energy – FAEN. Federal University of Grande Dourados – UFGD. Brazil  
2. Department of Electrical and Computer Engineering. University of São Paulo – USP/EESC. Brazil
- 256 E-drive Component Tests Derived from Vehicle Master Test Cases in the SyrNemo Collaborative Research Project**  
**E. Schlemmer, H. Laussegger-Rauch**  
Hybrid and System Design. Engineering and Technology Powertrain Systems AVL LIST GMBH. Austria
- 258 Decentralised, Sustainable Energy Solutions for Remote Areas**  
**C.Facchin, A.Waterworth, W.Weston**  
Department of Engineering and Technology  
University of Huddersfield, Huddersfield. United Kingdom
- 263 Motor Current Demodulation Analysis applied with Neural Networks and Genetic Algorithms for Rotor Bar Faults Diagnosis**  
**Z.M. Taïbi(1), M. Hasni(2), O Touhami(1), R. Ibtouen(1)**  
1. LRE– ENPolytechnique d’Alger  
2. LSEI - Université des Sciences et de la Technologie H. Boumediene. Algiers
- 265 Project Implementation of the Micro Hydroelectric Roncador**  
**J. A. A. Polli , G. M. Alves, R. C. Betini, P. C. Fritzen**  
Department of Electrical Engineering  
Federal Technological University of Paraná, Curitiba. Brazil
- 266 Dynamic Behaviour of Multi-Terminal VSC-Based HVDC after a Converter Outage: DC Control Strategy**  
**F. Gonzalez-Longatt(1), S. Arnaltes(2), J.L. Rodríguez-Amenedo(2)**  
1. The Wolfson School: Electronic, Electrical and Systems Engineering  
Loughborough University. United Kingdom  
2. Universidad Carlos III de Madrid. Spain



- 268 Stochastic Modelling Applied to Prediction of Electricity Saving by using Solar Water Heating Systems for Low-Income Families**  
**B. G. Menita, J. L. Domingos, E. G. Domingues, A. J. Alves, W. P. Calixto**  
Graduate Program in Technology of Sustainable Processes  
Federal Institute of Education, Science and Technology of Goiás (IFG). Brazil
- 270 Biocarbons for Energy Conversion and Storage: DEFC<sub>s</sub> and Supercapacitors Applications**  
**A. Cuña(1,2), E. L. da Silva(2), M. R. Ortega(2), C. Radtke(3), N. Tancredi(1), S.C. Amico(4), C. Malfatti(2)**  
1. Cátedra de Fisicoquímica, DETEMA, Facultad de Química, Universidad de la República, Montevideo. Uruguay  
2. LAPEC/PPGE3M, Universidade Federal do Rio Grande do Sul, Porto Alegre/RS. Brazil  
3. Instituto de Química, Universidade Federal do Rio Grande do Sul Porto Alegre/RS. Brazil  
4. LAPOL/DEMAT, Universidade Federal do Rio Grande do Sul. Brazil
- 443 Production of synthesis gas from dry reforming of propane with carbon dioxide over ceria-promoted nickel foam catalysts**  
**J. Karuppiah(1), E. Linga Reddy(2), M.S.P. Sudhakaran(1), S.B. Lee(1)**  
1. Department of Chemical and Biological Engineering. Jeju National University, Jeju. Korea  
2. Department of Chemical Engineering, Kyungpook National University, Daegu.

<b>Wednesday May 4, 2016</b>	
<b>12:15-13:00 Plenary Session PL1</b>	<b>ROOM A "Sala de Conferencias"</b>

Chairman: **Gevork B. Gharehpetian**

**Energy saving by power electronics: towards a new concept of renewable source** by Prof. Gianpaolo Vitale.

<b>13:00-15:00</b>	<b>Welcome Lunch</b>
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**Wednesday May 4, 2016**  
**15:00-15:45 Plenary Session PL2**                      **ROOM A "Sala de Conferencias"**

Chairman: **Gorazd Stumberger**

**Integration of renewable generation in power systems using flexibility of large industrial consumers** by Dr. Pablo Frías

**Wednesday May 4, 2016**  
**15:45-16:30 Poster Session P2 – Coffee Break**                      **ROOM C "AEDIE"**

Chairmen: **José Ignacio San Martín Díaz, Marc Cousineau, Erwin Schlemmer, Leonardo Assaf, Roberto San José García**

- 282 Evaluation of Different Methods for Determining the Consumption of Electric Power in Public Lighting Installations in Latin American Countries**  
**P. Andrade, L. Assaf**  
Departamento de Luminotecnia, Luz y Visión "Ing. Herberto C. Bühler"  
Facultad de Ciencias Exactas y Tecnología, Universidad Nacional de Tucumán.  
Argentina
- 284 Comparative Analysis of Definitions for the Harmonic Emissions Levels**  
**J. Denoel, M. Petit, T.D. Le**  
Geeps, CNRS UMR 8507 – CentraleSupélec, UPSud and UPMC – Gif-sur-Yvette.  
France
- 285 Reduction of medium voltage distribution network losses through the reactive power generation in PV systems**  
**N. Srečković(1), E. Belič(1), K. Dežan(1), M. Rošer(2), M. Trbušić(1), Gorazd Štumberger(1)**  
1. University of Maribor. Faculty of Electrical Engineering and Computer Science  
Maribor, Slovenia  
2. Elektro Celje d. d., Slovenia
- 286 Optimal ESS Scheduling considering Demand Response for Electricity Charge Minimization Under Time of Use Price**  
**Kyeong-hee Cho, Seul-ki Kim, Jong-yul Kim, Eung-sang Kim, Yun-su Kim, Chang-hee Cho**  
Smart Distribution Research Center  
Korea Electrotechnology Research Institute. Korea



- 287 Real-Time Simulation of Interleaved Converters with Decentralized Control**  
**L. A. Grégoire(1), M. Cousineau(1), S.I. Seleme jr.(2), P. Ladoux(1),**  
1. LAPLACE (Laboratoire Plasma et Conversion d'Energie)  
Université de Toulouse – INPT, UPS, CNRS ENSEEIHT. France  
2. Universidade Federal de Minas Gerais. Department of Electronical Engineering  
Minas Gerais. Brasil
- 289 Selection the optimal technology for electricity generation of 5 MW using a fuzzy multi-criteria decision-making approach**  
**F.J. Cánovas-Rodríguez(1), F. Ruz-Vila(1), A Nieto-Morote(2)**  
1. Department of Electrical Engineering. E.T.S.I.I., Cartagena, Technical University of Cartagena. Spain  
2. Department of Project Management. Cartagena. Spain
- 292 Generation of Synthetic Electrical Load Profiles for Rural Communities in Developing Countries- Applied in Fiji**  
**D. Norta(1,3), S. Kopietz(1,2), S. Hien(1), S. Neshvad(3), Fiji-Team(1)**  
1. Engineers Without Borders Luxembourg  
2. Hochschule Trier. Germany  
3. Reliable Decentral Energy Systems. SnT, SystemsUniveristé. Luxembourg
- 293 Models for Fault Current Limiters based on Superconductor Materials**  
**A. Etxegarai, I. Zamora, G. Buigues, V. Valverde, E. Torres, P. Eguia**  
Department of Electrical Engineering, Faculty of Engineering of Bilbao, UPV/EHU  
Bilbao. Spain
- 297 Estimate of Sustainable Production for the Development of Biogas Systems from Animal Biomass**  
**D. H. da Silva , E. Di Mauro**  
Laboratório de Fluorescência e Ressonância Paramagnética Eletrônica (LAFLURPE) CCE, State University of Londrina, Londrina. Brazil
- 299 DC protection in modern HVDC networks: VSC-HVDC and MTDC systems**  
**G. Buigues, V. Valverde, D.M. Larruskain, P. Eguía, E. Torres**  
Department of Electrical Engineering, Faculty of Engineering of Bilbao, UPV/EHU.  
Spain



- 300 Optimal Voltage Sags Monitoring Considering Different Loading Profiles in Distribution Systems**  
T. R. Kempner(1), F. A. Mourinho(1), F. B. Bottura(1), M. Oleskovicz(1), J. C. M. Vieira(1), J. R. Lima Filho(2)  
1. Department of Electrical and Computer Engineering. University of São Paulo – São Carlos School of Engineering, Laboratório de Sistemas de Energia Elétrica.  
2. Research, Development and Energetic Efficiency Management  
Eletrobras Distribuição Piauí – EDPI. Brazil
- 308 Different LC power filter topologies - effectiveness of reducing voltage distortion**  
Chamberlin Stéphane Azebaze Mboving, Zbigniew Hanzelka, Andrzej Mondzik  
AGH University of Science and Technology, Krakow. Poland
- 313 Short-term load forecasting using an Artificial Neural Network for Battery Energy Storage System**  
Hyang-A Park, Suel-Ki Kim, Jong-yul Kim, Jin-Wook Kim, Kyeng-Hee Cho, Eung-Sang Kim  
Smart Distribution Research Center  
Korea Electrotechnology Research Institute. Korea
- 320 Implementing intelligent technical systems into smart homes by using model based systems engineering and multi-agent systems**  
J. Michael, M. Hillebrand, B. Wohlers, C. Henke, R. Dumitrescu, , M. Meyer, A. Trächtler  
Fraunhofer Project Group for Mechatronic System Design, Paderborn. Germany
- 322 Decentralized control techniques for plug-in electric vehicles in MV/LV distribution networks**  
J. García-Villalobos, I. Zamora, I. Junquera, J.I. San Martín, P. Eguía  
Department of Electrical Engineering - University of Basque Country - UPV/EHU  
Bilbao. Spain
- 323 Optimal Design and Operation of a PEMFC-based CHP System Connected to Grid**  
F.J. Asensio(1), J.I. San Martín(1), I. Zamora(2), J. García-Villalobos(2), Pablo Eguía(2)  
1. Department of Electrical Engineering  
E.U.I.T.I. of Eibar, University of the Basque Country (UPV/EHU) Eibar. Spain  
2. Department of Electrical Engineering  
E.T.S.I. of Bilbao, University of the Basque Country (UPV/EHU) Bilbao. Spain





- 324 Proposal the Use of Alternative Materials for Construction of an Alternative Low-Cost Sunlight Collecting System to Latin American Market**  
**Spacek, A. D.(1,3), Santana, M. V. F de(4,5), Mota, J. M.(1,3), Biléssimo, L. D.(1), Ando Junior, O. H.(2), Malfatti, C. F.(3)**  
1. Department of Mechanic and Automation **SATC**, Beneficent Association of Santa Catarina Coal Industry ,Criciúma-SC. Brazil  
2. Department of Renewable Energies UNILA, Federal University of Latin American Integration, Foz do Iguacu-PR. Brazil  
3. School of Engineering UFRGS, Federal University of Rio Grande do Sul, Porto Alegre-RS. Brazil  
4. Hydroelectric Power Plant. BAESA, Energética Barra Grande S/A Florianópolis-SC. Brazil  
5. Hydroelectric Power Plant . ENERCAN, Campos Novos Energia S.A. Florianópolis-SC. Brazil
- 327 Madrid biocity: biomass and bioenergy potential**  
**J. Paredes-Sánchez**  
Department of Energy, School of Mining, Energy and Materials Engineering of Oviedo. University of Oviedo. Spain
- 328 Biomass supply to a coal power plant under sustainable development conditions**  
**J. Paredes-Sánchez**  
Department of Energy, School of Mining, Energy and Materials Engineering of Oviedo. University of Oviedo. Spain
- 341 A hybrid solar panel maximum power point search method that uses light and temperature sensors in real shading conditions**  
J. Mroczka, M. Ostrowski  
Electronic and Photonic Metrology. Wroclaw University of Technology. Poland
- 342 Numerical study of the cooling capacity of several alternative liquids in zig-zag cooling system of a power transformer**  
**Agustín Santisteban, Fernando Delgado, Alfredo Ortiz, Inmaculada Fernández, Carlos J. Renedo**  
Department of Electrical and Energy Engineering  
E.T.S.I. Industriales y de Telecomunicación, Cantabria University, Santander. Spain
- 345 A Generalized Coverage Matrix Method for Power Quality Monitor Allocation Utilizing Genetic Algorithm**  
**D. P. S. Gomes(1), M. Oleskovicz(1), T. R. Kempner(1), J. R. Lima Filho(2)**  
1. Department of Electrical and Computer Engineering, University of São Paulo – Engineering School of São Carlos. Laboratory of Electrical Systems. Brazil  
2. Eletrobrás PiauÍ Distribution – EDPI. Research Management, Development and Energy Efficiency – DRRD - Teresina, PI. Brazil



- 347 Technical Feasibility of a Photovoltaic Powered Reverse Osmosis Plant Without Batteries for Brackish Water Desalination**  
**Doglasse E. Mendonça(1), P.C.M. Carvalho(1), Paulo P. Praça(1), J. Sigefredo P. Neto(1), Renata I.S. Pereira(1), J.I.C. Rocha Filho(1), D. B. Riffel(2)**  
1. Department of Electrical Engineering (DEE) Federal University of Ceará - UFC Fortaleza. Brazil  
2. Department of Mechanical Engineering, Federal University of Sergipe –UFS. Brazil
- 349 Energy Storage Applications for Distribution Grid Support: Composition of Controlling Strategies and a Standardized Model**  
**Istvan Taczi, Istvan Vokony**  
Department of Electric Power Engineering  
Budapest University of Technology and Economics, Budapest. Hungary
- 351 Potential Application of a Hybrid Renewable Energy Systems in Aquafarms of Veracruz, Mexico**  
**F.J. Gómez(1), I. Valencia(1), A. Pérez-Navarro(2)**  
1. Department of Electrical and Electronics Engineering, Instituto Tecnológico de Veracruz. Mexico  
2. Institute for Energy Engineering, Universidad Politécnica de Valencia . Spain
- 353 Development of a System for the Usability of Forest Residues For Electric Energy Production**  
**S. Baranovschi(1), A. Roque(1,2), D. Sousa(2,3), Fernão Pires(1,2)**  
1. Department of Electrical Engineering, ESTSetúbal/ Instituto Politécnico de Setúbal. Portugal  
2. INESC-ID. Lisboa. Portugal  
3. DEEC AC- Energia, Instituto Superior Técnico, Universidade de Lisboa. Portugal
- 356 Numerical Study Performance of Solar Chimney Power Plant in the Region of Constantine-Algeria**  
**Samir Djimli(1), Abla Chaker(2)**  
1. Mechanical Engineering Department, University of Jijel. Algeria  
2. Energy Physics Laboratory, Department of Physics, University of Constantine 1 Algeria
- 358 Voltage/load Control Strategy for Smart Distribution Grids with a High Penetration of Renewable Energy Sources**  
**Nour Eldeen Elsayad(1), Khaled Bashir Shaban,(1), Ahmad Massoud(1), Ramadan El-Shatshat(2)**  
1. Computer Science and Engineering Department, College of Engineering. Qatar University  
2. Department of Electrical and Computer Engineering. University of Waterloo. Canada



**404 The impact of reactive power generation in PV systems on their yearly production of electrical energy**

**Primož Sukič, Ernest Belič, Mislav Trbušić, Gorazd Štumberger**

University of Maribor, Faculty of Electrical Engineering and Computer Science.  
Slovenia

**422 Sustainability as a Paradigm of Energy Policy**

**A. Martinez, S. Valero, C. Senabr, E. Velasco**

Area of Electrical Engineering, Miguel Hernández University, Elche. Spain





Wednesday May 4, 2016  
16:30-18:00 Oral Session A1 ROOM A "Sala de Conferencias"

Chairman: **Berthold Bitzer**

- 203 Design of Photovoltaic Water Pumping System as an Alternative to Grid Network in Oman**  
**A. Al-Badi, H. Yousef**  
Department of Electrical and Computer Engineering. College of Engineering, Sultan Qaboos University. Oman
- 253 Thermodynamic Simulation of a Hybrid Brayton Thermosolar Plant**  
**R.P. Merchan(1), M.J. Santos(1), A. Medina(1), A. Calvo(1,2)**  
1. Department of Física Aplicada. Facultad de Ciencias - Universidad de Salamanca. Spain  
2. IUFFYM. Facultad de Ciencias, Universidad de Salamanca. Spain
- 254 NuRenew – An Advanced Hybrid Nuclear-Renewable Energy Park**  
**B. Petrovic**  
Georgia Institute of Technology , Atlanta. USA
- 450 A comparison of mechanical and ultrasonic anemometers for ampacity thermal rating in overhead lines**  
**A. Laso(1), M. Mañana(1), A. Arroyo(1), A. González(2), R. Lecuna(1)**  
1. Department of Electrical and Energy Engineering, E.T.S.I.I.T., Cantabria University, Santander. Spain  
2. Viesgo Distribución S.L. Spain
- 510 Guidelines for Publication of Voltage Quality Monitoring Results in Portugal: A Regulatory Perspective**  
**S. Faias(1,2,3), J. Esteves(1,2)**  
1. Entidade Reguladora dos Serviços Energéticos (ERSE), Lisboa. Portugal  
2. Lisbon Engineering Superior Institute (ISEL), Lisboa. Portugal  
3. INESC ID, Lisboa. Portugal

18:00-20:00

Welcome Civic Reception





Wednesday May 4, 2016

16:30-18:00 Oral Session B1

ROOM B "CIRCUTOR"

Chairman: **Amine Boubghene Stambouli**

- 233 Rural and urban transitions with biogas and biomethane in Brazil: a water-energy-food nexus analysis**  
**J.C. Pasqual(1,2,3), H. A. Bollmann(1), C. Scott(3), S. Andersen(4), M. V. Lange(4)**
1. Master's and Doctoral Program in Urban Management, Pontifical Catholic University of Paraná, Curitiba, Paraná. Brazil
  2. International Center of Renewable Energies – Biogas and International Center of Hydroinformatics, Foz do Iguaçu, Paraná. Brazil
  3. Udall Center for Studies in Public Policy/ School of Geography & Development, University of Arizona Tucson, Arizona. United States
  4. Post Graduate Programme in Environment and Development (PPGMADE), Federal University of Paraná, Curitiba, Paraná. Brazil.
- 249 Influence of HVDC P2P Links on Static Voltage Stability in Transmission Grids with High Shares of Renewable Energy**  
**F. Bennewitz, N. Hoesch, J. Hanson**  
Department of Electrical Power Supply with Integration of Renewable Energies (E5)  
Technische Universität Darmstadt. Germany
- 295 Optical high voltage breakdown prediction using thermal lensing effect in transformer oil**  
**R. Struebig, I. Glesk**  
Department of Electronic and Electrical Engineering. University of Strathclyde  
Glasgow ,Scotland, United Kingdom
- 315 Analysis of the oxygen scattering behaviour on ionomer surface in Catalyst Layer of PEFC**  
**Masataka Nakauchi(1), Takuya Mabuchi(1), Ikuya Kinefuchi(2), Hideki Takeuchi(3), Takashi Tokumasu(4)**
1. Graduate School of Engineering, Tohoku University ,Sendai, Miyagi. Japan
  2. Department of Mechanical Engineering, The University of Tokyo. Japan
  3. Department of Mechanical Engineering, National Institute of Technology, Kochi College. Japan
  4. Institute of Fluid Science, Tohoku University. Japan
- 511 Impact of Techno-economic Context on the Continuity of Supply of the European Distribution Networks**  
**N. Pereira(1), S. Faias(1,2,3), J. Esteves(1,2)**
1. Lisbon Engineering Superior Institute (ISEL), Lisboa. Portugal
  2. Entidade Reguladora dos Serviços Energéticos (ERSE), Lisboa. Portugal
  3. INESC ID, Lisboa. Portugal

18:00-20:00

Welcome Civic Reception



Thursday May 5, 2016  
9:00-9:45 Plenary Session PL3 ROOM A "Sala de Conferencias"

Chairman: **Luis Rouco Rodríguez**

**Where are renewables leading us?"** by Dr. Juan Rivier

Thursday May 5, 2016  
9:45-10:30 Plenary Session PL4 ROOM A "Sala de Conferencias"

Chairman: **Willian Westom**

**Energy Saving Philosophies in the future local social energy systems"** by Prof. Toshihisa FUNABASHI

Thursday May 5, 2016  
10:30-11:15 Poster Session P3 – Coffee Break ROOM C "AEDIE"

Chairmen: **Pablo Eguia, Jerome Wolfman, José Pablo Paredes Sánchez, Cees Keyer, Bojan Petrovic**

**220 Grid Connected PV System Using ANFIS Based MPPT Controller in Real Time**

**Muhammed Y. Worku(1), M.A. Abido(2)**

1. King Fahd University of Petroleum and Minerals. Research Institute, Center for Engineering Research, Dhahran. Saudi Arabia
2. King Fahd University of Petroleum and Minerals. Department of Electrical Engineering, Dhahran. Saudi Arabia

**361 A New Desing Methodology of a Switched Reluctance Generator Considering the Influence of the Mutual Inductances**

**Dias, R. J.(1), Reátegui, C.(1), Costa, C. S. (1), Fleury, A. (2), Andrade, D.A.(3), Cardoso, H.C.(2), Neris N.M.(2), Dos Santos, B.R.(2)**

1. Instituto Federal de Educação, Ciência e Tecnologia de Goiás. Brazil
2. Pontifícia Universidade Católica de Goiás. Brazil
3. Universidade Federal de Uberlândia. Brazil

- 363 Estimated Environments Lighting Capacity Through Sunlight**  
**Spacek, A. D.(1,3), , Santana, M. V. F de(4,5) Mota, J. M.(1,3), Biléssimo, L. D.(1), Ando Junior, O. H.(2), Freitas, G. P.(1), Pereira, T. C.(1)**
1. Department of Mechanic and Automation. **SATC**, Beneficent Association of Santa Catarina Coal Industry, Criciúma-SC. Brazil
  2. Department of Renewable Energies UNILA, Federal University of Latin American Integration, Foz do Iguaçu-PR. Brazil
  3. School of Engineering UFRGS, Federal University of Rio Grande do Sul Porto Alegre-RS. Brazil
  4. Hidroelectric Power Plant. BAESA, Energética Barra Grande S/A Florianópolis-SC. Brazil
  5. Hidroelectric Power Plant. ENERCAN, Campos Novos Energia S.A. Florianópolis-SC. Brazil
- 364 Propose of a low cost integrating sphere**  
**Freitas, G. P.(1), Santana, M. V. F. de(4,5), Neto J.M.(1,3), Spacek, A. D.(1,3), Biléssimo, L. D.(1), Ando Junior, O. H.(2), Pereira, T. C.(1)**
1. Department of Mechanic and Automation. **SATC**, Beneficent Association of Santa Catarina Coal Industry, Criciúma-SC. Brazil
  2. Department of Renewable Energies UNILA, Federal University of Latin American Integration, Foz do Iguaçu-PR. Brazil
  3. School of Engineering UFRGS, Federal University of Rio Grande do Sul Porto Alegre-RS. Brazil
  - 4 Hidroelectric Power Plant . BAESA, Energética Barra Grande S/A Florianópolis-SC. Brazil
  - 5 Hidroelectric Power Plant. ENERCAN, Campos Novos Energia S.A. Florianópolis-SC. Brazil
- 365 Impact of Green Power Distributed Generation to Voltage Profile and Protection Issues by Different Penetration Levels - A Study Developed on ATP Draw**  
**T. S. Menezes, Y. Tresso, M. V. B. Mendonça, P. H. O. Rezende, F. A. M. Moura, M. R. M. Castillo**  
Universidade Federal do Triângulo Mineiro, Electrical Engineering Department, Uberaba- Minas Gerais. Brazil
- 369 Prototype of a Reduced Scale of a Refrigeration System of Environments Controlled with Pulse Width Modulation (PWM) Using Thermoelectric Modules by Peltier Effect**  
**Maestrelli, E.(1,3), Spacek, A. D.(1,3), Mota, J. M.(1,3), Da Silva, E. A.(1), Ando Junior, O. H.(2), Malfatti, C. F.(3), Schaeffer, L.(3)**
1. Department of Automation. **SATC**, Beneficent Association of Santa Catarina Coal Industry, Criciúma-SC. Brazil
  2. Department of Renewable Energies. UNILA, Federal University of Latin American Integration, Foz do Iguaçu-PR. Brazil
  3. School of Engineering. UFRGS, Federal University of Rio Grande do Sul Porto Alegre-RS. Brazil



- 370 Radiation performance of a cavity receiver for a parabolic dish solar concentrator system**  
**O. López(1), A. Arenas(2), A. Baños(1)**  
1. Departamento de Informática y Sistemas, University of Murcia. Spain  
2. Departamento de Electromagnetismo y Electrónica, University of Murcia. Spain
- 372 Analysis of charging stations for electric vehicles in Spain**  
**F. G. Montoya , J. Martínez-Lao J. Torres-Moreno F. Manzano-Agugliaro V. Barón**  
Department of Engineering, EPS, University of Almeria. Spain
- 377 Busbar Configurations for HVDC Grids**  
**E. Torres(1), P. Eguia(1), A. Iturregi(2), O. Abarrategui(2), A. Etxegarai(1)**  
1. Department of Electrical Engineering, Faculty of Engineering of Bilbao, UPV/EHU Spain  
2. Department of Electrical Engineering, University College of Technical Mining and Civil Engineering, UPV/EHU, Bilbao. Spain
- 378 Scaling a Biodigestor Ascendant Flow for Biogas Production via Sewer and Solid Waste**  
**Silva, J. R. da(1) ,Ando Junior, O. H.(1), Spacek, A. D.(2), Mota, J. M.(2), Malfatti, C. F.(3), Furtado, A. C.(1)**  
1. Renewable Energy Engineering. UNILA, Federal University of Latin American Integration, Vila A, Foz do Iguaçu – PR. Brazil  
2. Departament of Mechanic and Automation. SATC, Beneficent Association of Santa Catarina Coal Industry, Criciúma-SC. Brazil  
3. School of Engineering. UFRGS, Federal University of Rio Grande do Sul Porto Alegre-RS. Brazil
- 380 Power Factor Corrector Design applied to an 85-kHz Wireless Charger**  
**J.M. González González, , D. Fernández-Cabrera, A. Triviño-Cabrera J. A. Aguado-Sánchez**  
Department of Electrical Engineering, Universidad de Málaga. Spain
- 381 Natural ventilation strategies for cooling purposes in the rural vernacular architecture of Cyprus**  
**D. Demosthenous(1), A. Michael(2), M. Philokyprou(2)**  
1. Department of Civil and Environmental Engineering, Faculty of Engineering, University of Cyprus  
2. Department of Architecture, Faculty of Engineering, University of Cyprus
- 383 Mathematical approach to the characterization of daily energy balance in autonomous photovoltaic solar systems**  
**F.J. Casares , M. Varo, R. López-Luque , M. Torres-Roldán, D. Muñoz-Rodríguez**  
Research Group on Physics for Renewable Energy and Resources  
University of Córdoba. Spain





- 384 Experimental regression model to predict natural lighting levels and energy savings in buildings**  
**A. Jiménez-Valle, M. Varo-Martínez, R. López-Luque**  
Research Group on Physics for Renewable Energy and Resources  
University of Córdoba. Spain
- 385 Prototype of a simplified polar heliostat suitable for integration in buildings**  
**M. Torres Roldán, M. Varo-Martínez, R. López-Luque**  
Research Group on Physics for Renewable Energy and Resources  
University of Córdoba. Spain
- 388 Localization of Harmonic Sources in Power System - Simulation and Laboratory Study**  
**Mohammad Hasanuzzaman Shawon, Szymon Barczentewicz, Andrzej Bień, Zbigniew Hanzelka**  
Department of Power Electronics and Energy Control System  
AGH University of Science and Technology, Krakow. Poland
- 390 Brazilian Automotive Market: Challenges of the Growth of Electric and Hybrid Vehicles**  
**Nilcéia Cristina dos Santos(1), Reinaldo Gomes da Silva(2), Maria Helena Bernardo Myczkowski(1)**  
1. College of Technology of Piracicaba “Deputy Roque Trevisan”  
(FATEC PIRACICABA) CEETPS, Centro Estadual de Educação Tecnológica  
Paula Souza. Brazil  
2. School of Engineering of Piracicaba (EEP) FUMEP, Municipal Foundation of  
Piracicaba. Brazil
- 392 Influence of the different Spanish climatic conditions in energy efficiency of existing dwellings**  
**A. Yolanda Fernández Ribaya, B. Antonio José Gutierrez Trashorras, C. Juan M. González Caballín, Jorge Xiberta Bernat**  
Department of Energy, Oviedo University. Spain
- 394 Study on the Potential Use of Electrochromic Materials for Solar Energy Harvest in Brazil Market**  
**Da Rosa, H. B.(1), Ando Junior, O. H.(1,2) Furtado, A. C.(2), Spacek, A. D.(1,3), Mota, J.M.(1,3), Bilessimo, L.D.(1), Malfatti, C.F.(3), Santana, M.V.F. de(4,5)**  
1. School of Engineering UFRGS, Federal University of Rio Grande do Sul  
Porto Alegre-RS. Brazil  
2. Renewable Energy Engineering. UNILA, Federal University of Latin American  
Integration, Foz do Iguaçu – PR. Brazil  
3. Department of Mechanic and Automation. SATC, Beneficent Association of  
Santa Catarina Coal Industry, Criciúma-SC. Brazil  
4. Hydroelectric Power Plant, BAESA. Brazil  
5. Hydroelectric Power Plant, ENERCAN. Brazil



- 396 Simulation of the energy efficiency auction prices in Brazil**  
**Javier L. L. Conzales(1), Rodrigo F. Calili(1), Reinaldo C. Souza(1,2) Felipe L. Coelho da Silva (2,3)**  
1. Department of Metrology, Pontifical Catholic University of Rio de Janeiro (PUC-Rio. Brasil)  
2. Department of Electrical Engineering, Pontifical Catholic University of Rio de Janeiro (PUC-Rio). Brasil  
3. Department of Mathematics, Federal Rural University of Rio de Janeiro (UFRRJ). Brasil
- 399 Potential of biogas production in an anaerobic digester solar assisted**  
**P. Quinto, H. Aguilar, R. López, A. Reyes**  
Section of Graduate Studies and Research School of Mechanical and Electrical Engineering Campus Zacatenco, National Polytechnic Institute. Mexico
- 402 Design and development of a test environment to analyze the impact of cyber attacks on the electrical distribution network**  
**Ioannis Moschos, David Lavérnia Ferrer, J. Ignasi Cairó**  
IREC, Catalonia Institute for Energy Research, Barcelona. Spain
- 405 One more interdisciplinary challenge: Incorporating Renewable Energy teaching and Research at the Postgraduate Programme in Environment and Development of the Federal University of Parana, Brazil**  
**S. M. Andersen, M. V. Lange, J.C. Pasqual**  
The Environment and Development Postgraduate Programme, in the Federal University of Parana, Sector of Agricultural Sciences, Curitiba, Parana. Brazil
- 406 Environmental behaviour of semi-open spaces in Mediterranean vernacular architecture. The case of rural traditional dwellings of Cyprus**  
**E. Malaktou, M. Philokyprou, A. Michael, A. Savvides**  
Department of Architecture, University of Cyprus
- 408 Methodology for Electrical Special Machines Project Optimization**  
**Neto, J. M.(1,2), Schaeffer, L.(2) Dias M. M.(3), Spacek, A.D.(1,2), Ando Junior, O.H.(2)**  
1. Department of Mechanic and Automation. **SATC**, Beneficent Association of Santa Catarina Coal Industry, Criciúma-SC. Brazil  
2. School of Engineering UFRGS, Federal University of Rio Grande do Sul Porto Alegre-RS. Brazil  
3. Institute of Exact Sciences and Technology, Universidade Feevale, Novo Hamburgo – RS. Brazil

- 409 Development and Implementation of a Autotransformer Fazor Controller in Zigzag ( ADZ) on ATPDraw Software 4.0**  
**M. Antonio Eduardo Ceolin(1), M. Walkyria Krysthie Arruda Gonçalves(2), M. Ronan Marcelo(3), M. Tais(2) , R. Machsuel Francisco(2) , K. Guilherme Yuji(2)**  
1. University of São Carlos (UFS). Brazil  
2. Department of Electrical Engineering, Federal University of Mato Grosso Cuiaba, MT.Brazil  
3. Electrical and Electronic Department on the IFMT. Cuiaba, MT. Brazil
- 410 The Relation Between the Wind Sector in Brazil and The Global Crisis**  
**V. R. Moraes(1), J. K. R.Santos(1), V.R. Martini(1), W.K.A.G. Martins(1), R.M. Martins(2)**  
1. Department of Electrical Engineering, Federal University of Mato Grosso Cuiaba, MT. Brazil  
2. Electrical and Electronic Department of the IFMT – Cuiaba, MT. Brazil
- 411 Loadability Improvement in Distribution Network using DG Units by Application of Biogeography Based Optimization Algorithm Considering Cable Aging Constraint**  
**Hossein Karami(1), Seyed-Alireza Ahmadi(2), Gevork B. Gharehpetian(1), Vahid Vahidi-Nasab(2)**  
1. Departement of Electrical Engineering, Amirkabir University of Technology Tehran. Iran  
2. Department of Electrical Engineering, Shahid Beheshti University, Tehran. Iran
- 412 Passive Cooling of Glazing Surfaces using Solar Chimneys**  
**A. Al Touma, K. Ghali, N. Ghaddar**  
Department of Mechanical Engineering, FEA, American University of Beirut. Lebanon
- 505 Heuristic Optimization applied on DMC and Cascade PI Controllers Tuning for Speed Control of DC Motor**  
**Douglas F. de Carvalho(1,3), Cleber A. Ganzaroli(12,3),Rafael N. H. M. Dias(1,3), Luiz A. Couto(1,3), Aylton J. Alves(1,2), Jose L. Domingos(2), Wesley P. Calixto(1,2,3)**  
1. Experimental and Technological Research and Study Group (NEXT). Brazil  
2. Federal Institute of Goiás (IFG). Brazil .  
3. Electrical, Mechanical and Computers Engineering School (EMC) Federal University of Goiás (UFG). Brazil



Thursday May 5, 2016  
11:15-13:00 Oral Session A2 ROOM A "Sala de Conferencias"

Chairman: Hortensia E. Amaris Duarte

- 301 A comparative analysis of loss current obtained by measuring circuits used in studies of degradation power cables**  
Fernando Nogueira de Lima, Antônio de Pádua Finazzi, Bismarck Castillo Carvalho, Iago de Moura Faria, Gabriela Pessoa Campos  
Federal University of Mato Grosso (UFMT), Electrical Engineering Department – Cuiabá. Brazil
- 346 Self-tuning Kalman filter and machine learning algorithms for voltage dips upstream or downstream origin detection**  
H. Shadmehr, R. Chiumeo, L. Tenti  
Ricerca sul sistema energetico RSE SpA Milano. Italy
- 367 Drawbacks of a medium sized, grid coupled Photo Voltaic Array**  
C. Keyer(1,2), I. Setiawan(2), F. Leferink(2,3)  
1. University of Applied Science Amsterdam the Netherlands  
2. Twente University. The Netherlands  
3. Thales Nederland bv. The Netherlands
- 373 Power Quality in modern lighting: comparison of LED, microLED and CFL lamps**  
F. G. Montoya, J. Castillo  
Department of Engineering, Area of Electrical Engineering, EPS.  
University of Almeria. Spain
- 454 Power Quality Enhancement by DC Distribution**  
Elizabeth Cherian(1), Bindu G.R(2), P.S. Chandramohan Nair(3)  
1. Department of Electrical Engineering, Govt. Engineering College Wayanad Kerala. India  
2. Department of Electrical Engineering, College of Engineering Trivandrum Kerala. India  
3. V K College of Engineering & Technology, Parippally, Kerala. India
- 475 Impact of a High Penetration of Electric Vehicles and Photovoltaic Inverters on Power Quality in an Urban Residential Grid Part II – Harmonic Distortion**  
S. Müller(1), J. Meyer(1), F. Möller(1), M. Naumann(1), M. Radauer(2)  
1. Department of Electrical Engineering, Technische Universität Dresden. Germany  
2. Salzburg Netz GmbH. Austria

13:00-15:00

Lunch



Thursday May 5, 2016

11:15-13:00 Oral Session B2

ROOM B "CIRCUTOR"

Chairman: **Francesco Patania**

- 275 Impact of Gearbox Oil Contamination on the Performance of the Wind Turbine Drivetrain**  
**A. Salem(1), A. Abu-Siada(2), S. Islam(2)**  
1. Department Electrical and Computer Engineering , Curtin University, Bentley. Australia  
2. Curtin University/ Electrical& Computer Engineering,Curtin University, Bentley Australia
- 307 Wind flow around a wind turbine system over hilly terrain and its environmental effects: wind tunnel tests**  
**M. Jiménez-Portaz, F.J. Bello-Millán, P. Folgueras, M. Clavero, M.A. Losada**  
Andalusian Institute for Earth System Research (IISTA)  
CEAMA - University of Granada. Spain
- 310 Multi-Objective Optimal Operation Considering Voltage Stability for Unit Commitment**  
**Masahiro Furukakoi(1), Tomonobu Senjyu(1), Toshihisa Funabashi(2)**  
1. Department of Electrical and Electronics Engineering, University of the Ryukyus. Japan  
2. Institute of Materials and Systems for Sustainability (IMaSS) NAGOYA UNIVERSITY. Japan
- 357 Reverse supply of an AC distribution feeder through a Medium Voltage DC link**  
**F. Belloni, R. Chiumeo, C. Gandolfi, D. Palladini, A. Villa**  
Ricerca sul Sistema Energetico – RSE s.p.a. Milano. Italy
- 527 Analysis of the main socio-economic impacts of wind energy in Europa**  
**Margarita Ortega(1), Pablo del Río(2), Carlos Gamarra(1), Eduardo Montero(1)**  
1. Department of Electromechanical Engineering. University of Burgos. Spain  
2. Institute for Public Policies and Goods. National Research Council of Spain
- 540 Novel conductor design to increase the thermal rating of overhead lines**  
**J.C. del-Pino-López, D. Garrido-García, P. Cruz-Romero,A. Gómez-Expósito**  
Department of Electrical Engineering  
Escuela Técnica Superior de Ingeniería, Universidad de Sevilla. Spain

13:00-15:00

Lunch

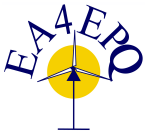


Thursday May 5, 2016  
15:00-16:30 Oral Session A3 ROOM A "Sala de Conferencias"

Chairman: Aurelian Craciunescu

- 240 Estimation of Power Grid Topology Parameters through Pilot Signals**  
**S. Neshvad, H. Margossian, J. Sachau**  
Interdisciplinary Centre for Security, Reliability and Trust (SnT), University of Luxembourg
- 251 Impact of Battery Charging of Electric Vehicles on the Power Quality in Smart Homes and Low Voltage Distribution Networks**  
**D. Batorowicz, H. Zimmer, P. Franz, J. Hanson**  
Department of Electrical Power Supply with Integration of Renewable Energies  
Technische Universität Darmstadt. Germany
- 309 Smart switchboards positioning in microgrids**  
**Alexandre Junqueira Barbosa Vianna, Reinaldo Castro Souza, Rodrigo Flora Calili**  
Electrical Engineering Departament  
Pontificia Universidade Católica do Rio De Janeiro - PUC Rio de Janeiro, RJ. Brazil
- 317 Mission Profile-Oriented Design of Battery Systems for Electric Vehicles in MATLAB/Simulink®**  
**T. Debreceni(1), G. Gy. Balázs(2), I. Varjasi(1)**  
1. Department of Automation and Applied Informatics, Budapest University of Technology and Economics, Budapest. Hungary  
2. Siemens Zrt., Budapest. Hungary
- 402 Design and development of a test environment to analyze the impact of cyber attacks on the electrical distribution network**  
**Ioannis Moschos, David Lavérvia Ferrer, J. Ignasi Cairó**  
IREC, Catalonia Institute for Energy Research, Barcelona. Spain





Thursday May 5, 2016

15:00-16:30 Oral Session B3

ROOM B "CIRCUTOR"

Chairman: **Mircea Ion Buzdugan**

- 242 Power Quality Management of NASA's Large, Nonlinear Research Loads**  
**G. H. Sydnor, PE**  
NASA Langley Research Center. Hampton, Virginia. USA
- 419 Expert System Design for Determining the Harmonic Resonance and the Capacitor Safety Level**  
**Ömer Gül, R. Tuygun Othan**  
Istanbul Technical University, Electrical Engineering Department, Istanbul Technical University, Maslak. Turkey
- 444 Study of the performance of an adiabatic cooling pad in an air cooler system**  
**J. López(1), F. Sánchez(1), I. Arocas(1), A. Viedma(1), B. Zamora(1), P. Martínez(2), M. Lucas(2), J. Ruiz(2), M. Hernández(1), A. S. Káiser(1)**  
1. Department of Thermal and Fluids Engineering. ETSII. Polytechnic University of Cartagena. Spain  
2. Department of Mechanic Engineering and Energy. Miguel Hernández University Spain
- 482 Hidden schematics of EMI filters**  
**M. Buzdugan, H. Balan**  
Technical University of Cluj-Napoca. Romania
- 368 A Power Take-Off and Control Strategy in a Test Wave Energy Converter for a Moderate Wave Climate**  
**K. L. De Koker(1), G. Crevecoeur(1), B. Meersman(1), M. Vantorre(2), L. Vandeveldel(1)**  
1. Department of Electrical Energy, Systems and Automation, Ghent University Belgium  
2. Maritime Technology Division. Ghent University. Belgium





Thursday May 5, 2016

16:30-17:15 Poster Session P4 – Coffee Break

ROOM C “AEDIE”

Chairmen: **Joerg Kammermann, Kamel Aboughali, Santiago Arnaltes Gómez, George Sydnor, Rachid Darbali Zamora**

**277 Multifunctional tunable and piezoelectric Ba<sub>1-x</sub>Ca<sub>x</sub>Ti<sub>1-y</sub>Zr<sub>y</sub>O<sub>3</sub> thin film capacitors for energy efficiency and harvesting**

**C.J.M. Daumont(1), Q. Simon(2), S. Payan(2), J.L. Longuet(3), B. Negulescu(1), M. Maglione(2), J. Wolfman(1)**

1. Laboratoire GREMAN, UMR7347 CNRS, Université François Rabelais, faculté de sciences et techniques, Tours. France.
2. Institute of Condensed Matter Chemistry of Bordeaux, ICMCB-CNRS, Université de Bordeaux. France
3. CEA, DAM, Le Ripault, F-37260 Monts. France

**414 Thermal Experimental Investigation on Air Cooled PV Panel**

**A. Crăciunescu, A. M. Croitoru, G. Colț, C. L. Popescu, M. O. Popescu**

Faculty of Electrical Engineering, University "Politehnica" of Bucharest. Romania

**415 Application of Biogeography Based Optimization Algorithm in Voltage Profile Improvement of Distribution Network by using DSTATCOM Considering Cable Aging Constraint**

**Seyed-Alireza Ahmadi(1), Hossein Karami(2), Vahid Vahidi-Nasab(1), Gevork B. Gharehpetian(2)**

1. Department of Electrical Engineering, Shahid Beheshti University, Tehra. Iran
2. Department of Electrical Engineering, Amirkabir University of Technology Tehran. Iran

**416 Single-Phase Trans-Z-Source AC-AC Converter**

**Hyunhak Shin, Minjae Joung**

Gyeongbuk Institute for Advancement of Eco-friendly Auto parts Technology (GBITECH). Korea

**420 A Cost-effective Microcontroller based Sensor for Dual Axis Solar Tracking**

**Sameer Meshram, Sharad Valvi, Nilesh Raykar**

Department of Mechanical Engineering, Sardar Patel College of Engineering, University of Mumbai. India

**421 Consideration on the effects of DERs in the PLC communication channel**

**J.I. Cairo, Jordi Pegueroles, Fernando Martín, Maite Hormigo**

IREC, Catalonia Institute for Energy Research, Barcelona. Spain





- 424 An experience of distant consumers power supply by means of the renewables given specific conditions**  
**Andrew V. Pazderin, Vladislav O. Samoylenko, Stanislav A. Eroshenko**  
Department of Automated Electrical Systems, Ural Federal University.  
Russian Federation
- 425 Flicker Propagation in Power Networks with Hybrid and Parallel Overhead Transmission Lines**  
**A. Novitskiy, I. Konotop, D. Westermann**  
Department of Power Systems, Faculty of Electrical Engineering and Information Technology, Ilmenau University of Technology. Germany
- 426 Flux switching alternators for small wind generation**  
**P. Andrada(1), F. Martínez(2)**  
1. GAECE, DEE, EPSEV, UPC Barcelona Tech. Spain  
2. Escuela de Ingeniería Minera e Industrial, Universidad de Castilla la Mancha. Spain
- 428 Influence of Manufacturing Tolerances on PMSM Torque Ripple**  
**P. M. García(1,3), P. Fernández(2,4), J. A. Güemes(1,4), V. Moreno(1,3), A. M. Iraolagoitia(1,4), J. Molina(1,3)**  
1. Department of Electrical Engineering, University of the Basque Country (UPV/EHU). Spain  
2. Department of Electronic Technology, University of the Basque Country (UPV/EHU). Spain  
3. E.U.P., Donostia-San Sebastián. Spain  
4. E.U.I.T.I., Bilbao. Spain
- 432 Research into harmonic power in the high- voltage networks**  
**L. I. Kovernikova**  
The Siberia Branch of the Russian Academy of Sciences  
Energy Systems Institute –Irkutsk. Russia
- 433 Determining the Source of Dips Using Data of One Monitor in the MV Network**  
**L.E. Weldemariam, V. Cuk, J.F.G. Cobben**  
Department of Electrical Engineering, Eindhoven University of Technology. The Netherlands
- 436 Power Quality Analysis for a PV Plant in Uruguay**  
**D.Giacosa(1), D.Betancur(1), L.Lussich(2), G.Abal(2), L.Valevici(2), A. Pardo(2)**  
1. Engineer of Planning and Distribution Studies. UTE. Montevideo. Uruguay  
2. Distribution Power Quality Studies. UTE. Montevideo. Uruguay



- 437 Optimising the use of a battery in a wind-diesel-battery hybrid island grid using power prediction and day-ahead optimisation**  
**W.G. Früh**  
Institute of Mechanical, Process and Energy Engineering, School of Engineering and Physical Sciences, Heriot-Watt University, Edinburgh . United Kingdom
- 439 Assessment of the temperature distribution into a transformer through tensile index**  
**C. Fernández, F. Ortiz, C. Olmo, J. Carcedo, A. Ortiz**  
Department of Electrical Engineering, E.T.S.I.I. y T., Cantabria University, Santander. Spain
- 440 Contribution to the knowledge of a microgrid. Smart Campus**  
**D. Quiroga Alonso, M. Pérez Donsión**  
Department of Electrical Engineering. E.T.S.I.I., Vigo University. Spain
- 442 Analysis and Implementation of a Switched Reluctance Generator in Connection with the Three-Phase Power Grid and Proposal of an Anti-Islanding Strategy**  
**M. A. A. Freitas(1), G. P. Viajante(1), D. A. Andrade(2), J. A. Santos Jr(1), V. R. Bernardeli(1), L. G. W. Silva(1), E.N. Chaves(1), C.X. Rocha**  
1. Federal Institute of Education, Science and Technology of Goiás  
Energy Systems Research Center (Núcleo de Pesquisas em Sistemas de Energia - NuPSE). Brazil  
2. Electric Drives Laboratory, Federal University of Uberlândia. Brazil
- 446 A Study of the Induction Motor/ASD Immunity in the Presence of Voltage Sags**  
**Juan Carlos Gómez(1), Medhat M. Morcos(2)**  
1. Electrical Power System Protection Institute, Rio Cuarto National University. Argentina.  
2. Electrical and Computing Engineering Department, Kansas State University Manhattan, Kansas.USA.
- 447 New Application Rules for Fuses in Low and Medium Voltage Grids having Distributed Generation**  
**Juan Carlos Gómez, Daniel Humberto Tourn**  
Electrical Power System Protection Institute, Rio Cuarto National University. Argentina
- 448 Energy Efficiency and Distributed Generation: Case Study**  
**A. F. Ferreira(1,2), J. L. Domingos(1), T. P. Sousa(2), M. L. S. Miguel(2), P. H. Franco(2), E. G. Domingues(1), A. J. Alves(1), W. P. Calixto (1)**  
1. Federal Institute of Education, Science and Technology of Goiás (IFG) Goiânia-GO. Brasil  
2. CELG Distribution- Goiás. Brazil



- 451 Development of an Experimental Platform to Drive the Switched Reluctance Machine**  
R. Fidelis(1), G. Viajante(1), D. Alves(1), F. Mendonça(1), D. Andrade(2), O. Souto(1), L. Wezs(1), L. Coutinho(2)  
1. Federal Institute of Education, Science and Technology Goiás, NUPSE Goiás. Brazil  
2. Electric Drives Laboratory, Federal University of Uberlândia. Brazil
- 465 Comparison of Fuzzy and Neuro-Fuzzy Controllers for Maximum Power Point Tracking of Photovoltaic Modules**  
Jemaa Aymen(1), Zarrad Ons(1), Aurelian Crăciunescu(2), Mihai Popescu(2)  
1. L'École Nationale d'Ingénieurs de Monastir, Université de Monastir. Tunisia  
2. Electrical Engineering Faculty, University Politehnica of Bucharest. Romania
- 468 Suggestion of design method in horizontal spiral coil type ground heat exchangers**  
Min-Jun Kim(1), Seung-Rae Lee(1), Seok Yoon(2), Jun-Seo Jeon(1), Min-Seop Kim(1)  
1. Department of Civil and Environmental Engineering, KAIST. Republic of Korea  
2. Radioactive Waste Disposal Division, KAERI. Republic of Korea
- 471 Comparative analysis of exhaust gas from a vehicle running in road cycle with ethanol and compressed natural gas (CNG)**  
Raphael Araújo de Holanda, Gil Colona Laranja, Cleiton Rubens Formiga Barbosa Junior, Francisco de Assis Oliveira Fontes, Cleiton Rubens Formiga Barbosa  
Department of Mechanical Engineering. Federal University of Rio Grande do Norte, Natal. Brazil
- 472 Investment Risk Analysis in the Use of Landfill Biogas for Electricity Generation**  
Alessandro Nunes Costa, Giordani Pacífico Medeiros, Wesley Calixto Pacheco, Aylton José Alves, Daywes Pinheiro Neto, Elder Geraldo Domingues  
Nucleus of Experimental and Technological Studies (NEXt)  
Federal Institute of Goiás (IFG). Brazil
- 474 Impact of a High Penetration of Electric Vehicles and Photovoltaic Inverters on Power Quality in an Urban Residential Grid Part I – Unbalance**  
F. Möller(1), J. Meyer(1), M. Radauer(2)  
1. Department of Electrical Engineering, Technische Universität Dresden. Germany  
2. Salzburg Netz GmbH. Austria

- 484 The classification of low-voltage grids with the scenario methodology**  
**J. Teuscher, W.Schufft**  
Department of Electrical Energy and High voltage Technology  
Technische Universität Chemnitz. Germany
- 485 Operation Strategy for Hydrogen Production by Water Electrolysis Powered by Solar Photovoltaic Energy**  
**E. Amores, J. Rodríguez, J. Oviedo**  
Centro Nacional del Hidrógeno (CNH2) Ciudad Real. Spain
- 486 Impact of PV/Wind/Diesel Hybrid System on the Distribution Networks – Fault Currents**  
**Sara N. Afifi, Mohamed K. Darwish**  
Department of Electronic and Computer Engineering, Brunel University London.  
United Kingdom





Thursday May 5, 2016  
17:15-18:45 Oral Session A4 ROOM A "Sala de Conferencias"

Chairman: **Guilles C. Roy**

- 274 Variable structure strategy to avoid torque control saturation of a wind turbine in the presence of faults**  
**C. Tutivén, Y. Vidal, L. Acho, J. Rodellar**  
Universitat Politècnica de Catalunya  
Applied Mathematics-III (MA-3) Department, Barcelona. Spain
- 281 Sensorless control for active damping of torsional vibrations in wind turbine drivetrains with doubly-fed induction generator**  
**Jan Wenske(1), Ulrich Beckert(2)**  
1. Fraunhofer Institute for Wind Energy und Energy System Technology IWES  
Bremerhaven. Germany  
2. Institute for Electrical Engineering, TU Bergakademie Freiberg. Germany
- 427 Super-twisting controllers for wind turbines**  
**C. Tutivén, Y. Vidal, L. Acho, J. Rodellar**  
Universitat Politècnica de Catalunya, Applied Mathematics-III (MA-3) Department,  
CoDALab, Barcelona. Spain
- 452 Differences using measured and calculated solar radiation in order to estimate the temperature of the conductor in overhead lines**  
**R. Domingo(1), A. González(2), M. Mañana(1), A. Arroyo(1), M.A. Cavia(1), C. del Olmo(2)**  
1. Department of Electrical and Energy Engineering, University of Cantabria  
Santander .Spain  
2. Viesgo Distribución, S.L. Spain
- 470 A comparison of different methodologies for rating definition in overhead lines**  
**R. Martínez(1), A. Arroyo(1), M. Mañana(1), P. Bernardo(1), R. Mínguez(2), R. Garrote(2)**  
1. Department of Electrical and Energy Engineering. E.T.S.I.I.T., Cantabria  
University, Santander. Spain  
2. Viesgo Distribución S.L. Spain

20:30-23:30

Conference Dinner (Optional)



Thursday May 5, 2016

17:15-18:45 Oral Session B4

ROOM B "CIRCUTOR"

Chairman: Wolf-Gerrit Frü

**273 Design Procedures and Analysis for Single-Phase Variable Reluctance Motors**

**A. C. F. Mamede, J. R. Camacho, D.A. Andrade**

School of Electrical Engineering. Universidade Federal de Uberlândia (UFU) – Uberlândia. Brazil

**360 Impact of climate change in urban meteorology and energy demand**

**San José R.(1), Pérez J.L.(1), González, R.M.(3)., Pecci J.(2), Garzón A.(2), Palacios M.(2), Pérez L.(1)**

1. Environmental Software and Modelling Group  
Computer Science School, Technical University of Madrid (UPM). Spain
2. Indra S.A Madrid. Spain
3. Department of Geophysics and Meteorology, Faculty of Physics, Complutense University of Madrid (UCM). Spain

**374 A Case Study of Determining Energy Efficiency in Squirrel Cage Induction Motor According to IEC 60034-2-1:2014 Standard**

**G. Kaan Esen(1), E. Özdemir(2)**

1. Turkish Standards Institute, Electrotechnical Laboratory, Kocaeli. Turkey
2. Kocaeli University, Department of Energy Systems Engineering, Faculty of Technology, Kocaeli. Turkey

**453 Chair Fans as Energy Efficient Strategy to Aid Localized Ventilation**

**Carine Habchi, Kamel Ghali, Nesreen Ghaddar**

Department of Mechanical Engineering, American University of Beirut. Lebanon

20:30-23:30

Conference Dinner (Optional)





Friday May 6, 2016

9:00-9:45 Plenary Session PL5

ROOM A "Sala de Conferencias"

Chairman: **Etim Ubong**

## **Off-Grid Renewable Energy Systems: Current Status and International Experiences** by Prof. José A. Aguado

Friday May 6, 2016

9:45-10:30 Poster Session P5 – Coffee Break

ROOM C "AEDIE"

Chairmen: **Herminio Martínez García, Jens teucher, Carmen L. Barajas Forero, Marta Varo Martínez, Arnulfo Barroso de Vasconcelos**

### **262 Influence of the battery model in the optimisation of stand-alone renewable systems**

**I.R. Cristóbal-Monreal(1), R. Dufo-López(2), J. M. Yusta-Loyo(2)**

1. Centro Universitario de la Defensa. Academia General Militar. Zaragoza. Spain
2. Electrical Engineering Department, University of Zaragoza. Spain

### **355 Net zero emissions for a seminar room in the University of Balearic Islands**

**A. Moià-Pol(1), Beatriz Rosselló-Batle(1), C. Carmona(2), B. Alorda(2)**

1. Department of Physics-Mechanical Engineer Area- Engineering Group of Energy Management
  2. Department of Physics – Architectonic construction and building engineering group
- Balearic Island's University (U.I.B.). Palma de Mallorca (Spain)

### **489 Utilization of Battery Energy Systems (BESS) in Smart Grid: A Review**

**I. Atteya(1), N. Fahmi(1), D. Strickland(1) H. Ashour(2)**

1. Department of Electrical Engineering , Aston University , Birmingham. UK
3. Arab Academy for Sciences and Technology and Martine Transport, Department of Electrical Engineering, Alexandria. Egypt

### **490 Solar Nanoantennas energy based characterization**

**C. Di Garbo(1), P. Livreri(1), G. Vitale(2)**

1. Dipartimento di Energia, ingegneria dell'Informazione, e modelli Matematici, Università di Palermo, Viale delle Scienze, Ed.9, 90128 Palermo. Italy
2. Istituto di Studi sui Sistemi Intelligenti per l'Automazione (ISSIA), Consiglio Nazionale delle Ricerche (CNR), Palermo. Italy



- 491 Solar energy: a source for water disinfection in Colombia**  
**Carmen Leonor Barajas Forero**  
Department of Hydraulic, Fluids and Thermal Sciences  
Francisco de Paula Santander University, Cucuta. Colombia
- 500 Background harmonic distortion measurement at power networks with wind farms**  
**R. Vazquez(1), M.A.Muñoz(1), M. Alonso(1), H. Amaris(1), C. Alvarez(2)**  
1. Department of Electrical Engineering, University Carlos III of Madrid. Spain  
2. Energy to Quality E2Q. Madrid. Spain
- 503 Optimal network reconfiguration for congestion management optimization in active distribution networks**  
**M. Alonso(1), H.Amaris(1), B. Rojas(1), Davide Della Giustina(2), A. Dedè(2), Zaid Al-Jassim(3)**  
1. Universidad Carlos III de Madrid, Department. Electrical Engineering. Spain  
2. A2A Reti Elettiche, Lombardia. Italy  
3. Dansk Energi (Danish Energy Association), Copenhagen. Denmark
- 508 Utilising a cluster-based power optimisation used in micro grids**  
**B. Born, J. Teuscher, W. Schufft**  
Department of Electrical Energy and High voltage Technology  
Technische Universität Chemnitz. Germany
- 512 Thermal and energy production optimization in microgrids with Model Predictive Control**  
**S. Raimondi Cominesi(1), A. Del Corno(2), E. Corsetti(2), G. A. Guagliardi(2), C. Sandron(2), R. Scattolini(1)**  
1. Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano.  
2. Ricerca per il Sistema Energetico italiano, RSE S.p.A. Italy
- 517 Management of Sources and Loads in a Smart Grid**  
**S.A. Tadjer(1), I. Habi(1), M. El Ganaoui(2), S. Angel(2)**  
1. Laboratory Electrification of Industrial Enterprises. University M' Hamed Bougara  
Algeria  
2. University of Lorraine. LERMAB & GREEN. France
- 520 Integration of Solar Energy Resource into Agro-Energy Cooperative Districts: A Case Study based on Solar Powered Irrigation Pumps**  
**A. Rubio-Aliaga(1), A. Molina-García(1), J.M. Sánchez-Lozano(2), M.S. García-Cascales(3)**  
1. Department of Electrical Engineering  
3. Department of Electronics, Computer Architecture and Project Engineering  
Universidad Politécnica de Cartagena. Spain  
2. Centro Universitario de la Defensa de San Javier, Academia General del Aire,  
Universidad Politécnica de Cartagena, Murcia. Spain





- 524 Analysis on Stability in Control of Active Power Filter in Electric Grid with Megawatt DFIG Wind Farm Connected**  
**Nguyen Gia Minh Thao(1), Kenko Uchida(1), Kentaro Kofuji(2), Toru Jintsugawa(2), Chikashi Nakazawa(2)**  
1. Department of Electrical Engineering and Bioscience, School of Advanced Science and Engineering, Waseda University, Tokyo. Japan  
2. Power System Analysis Section, Energy Solution Development Department Fuji Electric Co., Japan
- 526 Innovative planning synergies between manufacturing processes and microgrids**  
**Carlos Gamarra(1), Margarita Ortega(1), Eduardo Montero(1), J.M. Guerrero(2)**  
1. Department of Electromechanical Engineering, University of Burgos. EPS.Spain  
2. Department of Energy Technology, Aalborg University. Denmark
- 533 Solar Energy Systems Course for Energy Engineering Students in the Context of the European Higher Education Area (EHEA)**  
**Herminio Martínez-García(1), Jordi Cosp-Vilella(1), J. Luís Durán-Moyano(2)**  
1. Department of Electronics Engineering  
2. Department of Automatic Control  
Barcelona College of Industrial Engineering (EUETIB)  
Technical University of Catalonia (UPC). BarcelonaTech. Spain
- 534 Comparative Aspects in Control Strategies for Hybrid DC/DC Converters**  
**Herminio Martínez-García, Jordi Cosp-Vilella**  
Barcelona College of Industrial Engineering (EUETIB)  
Department of Electronics Engineering, Technical University of Catalonia (UPC).  
BarcelonaTech. Spain
- 536 Dynamic model of a solar powered absorption refrigeration system**  
**A. Gómez-Moreno, J.M. Palomar-Carnicero, F. Cruz-Peragón**  
Department of Mechanical and Mining Engineering , E.P.S. of Jaén.  
University of Jaén. Spain
- 543 Application of generalized non-active power theory for parallel hybrid compensation of periodic and non-periodic disturbances**  
**Martin Cernan, Zdeněk Muller, Jan Švec, Josef Tlustý, Viktor Valouch**  
Department of Electrical Power Engineering. Faculty of Electrical Engineering, CTU  
in Prague. Czech Republic



- 544 Analysis of Cell to Cell Voltage Variations in a 4-cell and 25- Cell Low Temperature PEM Stacks**  
**Etim U Ubong(1), Kishore Asokan(1), Uwem U. Ubong(2), Ini U. Ubong(3)**  
1. Center for Fuel Cell Systems Research & Powertrain Integrations  
Kettering University. USA  
2. Department of Chemistry. Akwa Ibom State University. Nigeria  
3. Institute of Pollution Studies. Rivers State University of Science and Tech.  
Port Harcourt, Rivers State. Nigeria
- 546 Daily Global Solar Radiation estimation for Gran Canaria Island using Artificial Neural Networks**  
**L. Mazorra Aguiar (1), P. Lauret (2), F. Díaz(1), A. Ortigón(3)**  
1. Department of Electrical Engineering. University of Las Palmas de Gran Canaria  
Spain  
2. Laboratoire PIMENT from the University of La Réunion. France  
3. Instituto Tecnológico de Canarias (ITC), Canary Islands. Spain
- 548 New Urban Vertical Axis Wind Turbine Design**  
**F. Frunzulica(1,2), A. Dumitrache(2), A. M. Cismilianu(3)**  
1. Department of Aerospace Engineering. Politehnica University of Bucharest  
Romania  
2. "Gh. Mihoc – C. Iacob" Institute of Mathematical Statistics and Applied  
Mathematics, Bucharest. Romania  
3. NCAS - National Institute for Aerospace Research "Elie Carafoli", Bucharest.  
Romania
- 549 Harvesting the wind energy through an actively controlled pitch-plunge flapping wing**  
**F. Frunzulica(1,2), A. Dumitrache(2), M. Stoia(1), I. Predoiu(1), B. Suatean(1)**  
1. Department of Aerospace Engineering. Politehnica, University of Bucharest  
Romania  
2. "Gh. Mihoc – C. Iacob" Institute of Mathematical Statistics and Applied  
Mathematics, Bucharest. Romania
- 554 Analysis of Power Generation and Transmission from Very Large-Scale Photovoltaic Systems in Algeria**  
**S. Flazi(1), A. Boudghene Stambouli(2), M. Bouzid(1)**  
1. Department of Electrical Engineering,  
2. Department of Electronics  
Electrical and Electronics Engineering Faculty. University of Sciences and  
Technology of Oran Mohamed Boudiaf (USTO-MB). Algeria
- 557 Estimating the age of power transformers using the concentration of furans in dielectric oil**  
**F. Ortiz, C. Fernández, A. Santisteban, F. Delgado, A. Ortiz**  
Depart. of Electrical Engineering. E.T.S.I.I., Cantabria University, Santander. Spain



- 559 Energy Household Forecast with ANN for Demand Response and Demand Side Management**  
**Filipe Rodrigues(1,2), Carlos Carneira(3), J.M.F.Calado(1,3), R. Melício(3,4)**  
1. Instituto Superior de Engenharia de Lisboa, Instituto Politécnico de Lisboa  
Departamento de Engenharia Mecânica. Portugal  
2. MIT Portugal, Porto Salvo. Portugal  
3. IDMEC/LAETA, Instituto Superior Técnico, Universidade de Lisboa. Portugal  
4. Departamento de Física, Escola de Ciências e Tecnologia, Universidade de Évora. Portugal
- 560 Electromagnetic Interference from a Wireless Power Transfer System: Experimental Results**  
**Elena N. Baikova(1,4), Stanimir S. Valtchev(1), R. Melício(2,3), Vítor M. Pires(3)**  
1..FCT, Universidade NOVA, Lisbon, Portugal  
2. IDMEC/LAETA, Instituto Superior Técnico, Universidade de Lisboa, Lisbon. Portugal  
3. Departamento de Física, Escola de Ciências e Tecnologia, Universidade de Évora. Portugal  
4. Escola Superior de Tecnologia, Instituto Politécnico de Setúbal, Portugal
- 561 Vanadium Redox Flow Battery Storage System Linked to the Electric Grid**  
**B.N. Arribas(2), R. Melício(1,2), J.G. Teixeira(3), V.M.F. Mendes(2,4)**  
1. IDMEC/LAETA, Instituto Superior Técnico, Universidade de Lisboa, Portugal  
2. Departamento de Física, Escola de Ciências e Tecnologia, Universidade de Évora, Portugal  
3. HERCULES Laboratório, Departamento de Química, Escola de Ciências e Tecnologia, Universidade de Évora, Portugal  
4. Instituto Superior de Engenharia de Lisboa. Portugal
- 562 Traffic Lights Control Prototype Using Wireless Technologies**  
**J. Cunha(1), C. Carneira(2), R. Melício(2,3)**  
1. Instituto Superior Técnico, Universidade de Lisboa. Portugal  
2. IDMEC/LAETA, Instituto Superior Técnico. Portugal  
3. Departamento de Física, Escola de Ciências e Tecnologia, Universidade de Évora, Portugal
- 563 Wireless Energy Transfer with Three-Phase Magnetic Field System: Experimental Results**  
**L.F. Romba(1), Stanimir S. Valtchev(1), R. Melício(2,3)**  
1. FCT, Universidade NOVA, Lisbon. Portugal  
2. IDMEC/LAETA, Instituto Superior Técnico, Universidade de Lisboa. Portugal  
3. Departamento de Física, Escola de Ciências e Tecnologia, Universidade de Évora. Portugal



**565 Real Time Simulation of HVDC and VSC-HVDC models: Application to Algerian – Spanish Power System Interconnection**

**M.Khiat(1), L. Ghomri(1)**

1. ENPO/SCAMRE. BP EL M'Naouer-Oran-Algeria

**Friday May 6, 2016**

**10:30-12:15 Oral Session A5**

**ROOM A “Sala de Conferencias”**

Chairman: **Ahmed Zobaa**

**244 Risk mitigation of performance ratio guarantees in commercial photovoltaic systems**

**H.A. Basson, J.H.C. Pretorius**

Faculty of Engineering and the Built Environment.

University of Johannesburg , Auckland Park. South Africa

**395 PVT-Biomass-Battery systems optimized with evolutionary algorithms for small and highly shaded environments**

**J. A. Fernández Fernández(1), P. González-Rodelas(2), E. Alameda-Hernández(1)**

1. Department of Civil Engineering. E.T.S.I.C.C.P., Granada University. Spain

2. Department of Applied Mathematics. E.T.S.I.C.C.P., Granada University. Spain

**506 Model-based analysis of the viability of concentrating solar power plants**

**Martin János Mayer**

Department of Energy Engineering, Budapest University of Technology and Economics. Hungary

**521 Techniques of CCHP as a right way to apply the 2<sup>nd</sup> Law of Thermodynamic: Case study (Part Two)**

**Francesco Patania(1), Antonio Gagliano(2), Francesco Nocera(1), Agrifoglio Antonio(2)**

1. Department of Industrial Engineering (DII). Catania University. Italy

2. Independent Researcher

**530 Behaviour of small scale dispersed PV generation**

**Péter Kádár**

Óbuda University. Department of Power Systems, Alternative Energy Sources Knowledge Centre. Budapest. Hungary

**12:15-13:00**

**Closing Session**

**13:00-15:00**

**Farewell Lunch**

**15:00-20:00**

**Cultural Excursion to Toledo**



Friday May 6, 2016  
10:30-12:15 Oral Session B5 ROOM B "CIRCUTOR"

Chairman: Péter Kádár

- 247 Security issues in cloud-based Smart Grid applications**  
**Berthold Bitzer, Enyew Gebretsadik**  
South Westphalia University of Applied Sciences  
Department of Automation Technologies. Germany
- 257 Supervision of Community Based Microgrids: an Economic Model Predictive Control approach**  
**Francesco Tedesco(1), Lubna Mariam(2), Malabika Basu(2), Alessandro Casavola (1), Michael F. Conlon(2)**  
1. University of Calabria, DIMES. Italy  
2. Dublin Institute of Technology,SEEE. Ireland
- 280 Optimal Compensation of Harmonic Propagation in a Multi-Bus Microgrid**  
**E. Skjong(1,3,4), J. A. Suul(2,5), M. Molinas(1) T.A. Johansen(1,3)**  
1. Department of Engineering Cybernetics  
2. Department of Electric Power Engineering  
Norwegian University of Science and Technology, Trondheim. Norway  
3. Centre for Autonomous Marine Operations and Systems, Trondheim. Norway  
4. Ulstein Power & Control AS, Ålesund. Norway  
5. SINTEF Energy Research, Trondheim. Norway
- 311 Voltage stability improvement of power system using a shunt capacitor**  
**Masahiro Furukakoi(1), Tomonobu Senjyu(1), Toshihisa Funabashi( 2)**  
1. Department of Electrical and Electronics Engineering University of the Ryukyus.  
Japan  
2. Institute of Materials and Systems for Sustainability (IMaSS) NAGOYA UNIVERSITY. Japan
- 480 Proposal of an applicable ZVT Quadratic Boost Converter Topology in Renewable Energies**  
**Mikael N. Oliveira(1), Diego F. Rodrigues(2), L. R. Barbosa(1)**  
1. Department of Electrical Engineering, State University of Londrina. Brazil  
2. City Hall of Cambé . Brazil

12:15-13:00	Closing Session
13:00-15:00	Farewell Lunch
15:00-20:00	Cultural Excursion to Toledo



**International Conference on Renewable Energy and Power Quality (ICREPQ'16)**  
*Universidad Pontificia de Comillas (ICAI-ICADE). Madrid (Spain)*  
**May 4,5,6, 2016**