

## **ABOUT TUTORIAL PRESENTERS.-**

**Pedro Rodriguez** received the M.Sc. and Ph.D. degrees in electrical engineering from the Technical University of Catalonia (UPC), Spain. He has been a Postdoctoral Researcher at the CPES, Virginia Tech, USA and at the Department of Energy Technology, Aalborg University (AAU), Denmark. He joined the faculty of UPC in 1990, where he became the Director of the research center on Renewable Electrical Energy Systems. He is still linked to the UPC as a part time Professor. He was also a Visiting Professor at the AAU for five years, working as a co-supervisor of the Vestas Power Program. From 2011, he is the Chief Research Scientist on Electrical Engineering and a member of the Scientific Board of Directors at Abengoa Research. He has coauthored one book and more than 150 papers in technical journals and conference proceedings. He is the holder of 9 licensed patents. His research interests include integration of distributed generation systems, smart grids, and design and control of power converters. Pedro Rodriguez is a senior member of the IEEE, a member of the administrative committee of the IEEE Industrial Electronics Society (IES), the general chair of IEEE-IES Gold and Student Activities, the vice-chair of the Sustainability and Renewable Energy Committee of the IEEE Industry Application Society and a member of the IEEE-IES Technical Committee on Renewable Energy Systems. He is an Associate Editor of the IEEE Transaction on Power Electronics.

**Remus Teodorescu** received the Dipl. Ing. degree in electrical engineering from Polytechnical University of Bucharest, Romania in 1989, and PhD. degree in power electronics from University of Galati, Romania, in 1994. In 1998, he joined Aalborg University, Institute of Energy Technology, power electronics section where he currently works as full professor

He has more than 200 papers published, 1 book – Grid Converters for PV and Wind Power Systems - ISBN: 978-0-470-05751-3, Wiley, 2011 and 5 patents. He is the co-recipient of the Technical Committee Prize Paper Awards at IEEE IAS Annual Meeting 1998, and Third-ABB Prize Paper Award at IEEE Optim 2002. He is a Fellow Member of IEEE, Associate Editor for IEEE Power Electronics Letters and chair of IEEE Danish joint IES/PELS/IAS chapter. His areas of interests are: design and control of power converters used in renewable energy systems, distributed generation mainly wind power and photovoltaics, computer simulations, digital control implementation. Remus Teodorescu is the founder and coordinator of the Green Power Laboratory at Aalborg University focusing on the development and testing of grid converters for renewable energy systems and the coordinator of the Vestas Power Program, a five year program including 10 PhD students focusing on power electronics, power systems and energy storage related to wind power plants.

**Dezso Sera** received his B.Sc. and M.Sc. degrees in Electrical Engineering from the Technical University of Cluj, Romania in 2001 and 2002, respectively.

In 2005, he graduated from the M.Sc. program at Aalborg University, Denmark, in the Department of Energy Technology (DET) and in 2008 he received his PhD degree from the same department, where he currently works as Associate Professor. Since 2009 he has

been the coordinator of the Photovoltaic Systems and Microgrids Research Programme at DET.

His research area is within photovoltaic power systems: modelling, characterisation, diagnostics and maximum power point tracking (MPPT), PV inverters and grid integration of PV power.

**Tamas Kerekes** obtained his Electrical Engineer diploma in 2002 from Technical University of Cluj, Romania, with specialization in Electric Drives and Robots. In 2005, he graduated the Master of Science program at Aalborg University, Department of Energy Technology in the field of Power Electronics and Drives. In 2009 he received his PhD degree from Aalborg University. Currently he is working as an Associate Professor at the same Department.

Since he started his PhD at the Department of Energy Technology his main interest is on PV inverter modelling, control and topologies as well as modulation techniques with focus on transformerless PV inverter systems.

## **ABOUT PRESENTERS' INSTITUTIONS.-**

**Abengoa** ([www.abengoa.es/web/en/index3.html](http://www.abengoa.es/web/en/index3.html)) is an international company that applies innovative technology solutions for sustainability in the energy and environment sectors, generating energy from the sun, producing biofuels, desalinating sea water and recycling industrial waste.

*Engineering and construction:* Engineering and construction includes our traditional engineering activities in the energy and water sectors, with more than 70 years of experience in the market. We specialize in carrying out complex turn-key projects for solar-thermal plants, solar-gas hybrid plants, conventional generation plants, biofuels plants and water infrastructures, as well as large-scale desalination plants and transmission lines, among others. Currently, Abengoa is constructing the largest worldwide solar plants based on solar-thermal technology, as well as one of the largest plants based on PV technology (<http://www.abengoasolar.com/web/en/index.html>).

*Concession-type infrastructures:* We have an extensive and young portfolio of proprietary concession assets that generate revenues that are governed by long term sales agreements with formats such as take-or-pay contracts, tariff contracts or power purchase agreements (PPAs). This activity includes the operation of electric (solar, cogeneration or wind) energy generation plants and transmission lines. These assets generate no demand risk and we focus on operating them as efficiently as possible.

*Industrial production:* The latter covers involving our businesses with a high technological component, such as biofuels, industrial waste recycling or the development of solar technology. The company holds an important leadership position in these activities in the geographical markets in which it operates.

**Aalborg University** ([www.en.aau.dk](http://www.en.aau.dk)) was inaugurated in 1974. The Department of Energy Technology is a part of the Faculties of Engineering, Science and Medicine at Aalborg University, and its research is organised in the following areas: Wind Power Systems, Fluid Power in Wind and Wave Energy, Biomass, Photovoltaic Systems and Microgrids, Modern Power Transmission Systems, Smart Grids and Active Networks, Fuel Cell and Battery Systems, Automotive and Industrial Drives, Efficient and Reliable Power Electronics, Thermoelectrics and Green Buildings. The Department has a comprehensive cooperation with industry and research institutions concerning PhD, co-financed positions, research projects, consultant work etc. Thus, the Department carries out research within all competence fields and in a number of multi-disciplinary research programmes.

The purpose of the Photovoltaic Systems and Microgrids (PVMG) programme is to carry out research and education targeted at photovoltaic power systems, including the PV generator, the grid converter and grid integration aspects. The main goal is to contribute to improved reliability and availability for PV systems, reduced cost of PV energy, as well as high penetration of PV in the electricity grid.

The PVMG programme's research areas include control strategies, advanced modelling, simulation, and hardware design for grid-connected PV inverters. Also, the group carries out modelling, characterization and diagnostics for PV arrays. Furthermore, the programme deals with issues regarding the grid integration of PV power, as well as microgrid systems.