

Preface

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Selected Papers from the 11th International Conference on Deregulated Electricity Market Issues in South Eastern Europe “The Second Decade” 22-23 September 2016, Heraklion, Crete, Greece

In response to the global challenges, DEMSEE was launched as a forum for discussions on electricity market issues as well as the operation aspects of interconnected and isolated power systems in South-Eastern Europe. The purpose of this annual event, as initially stated, was to highlight the importance of research and development for the future of the electricity sector in South-Eastern Europe, in the context of the on-going electricity deregulation, and to present the efforts undertaken by the various academic and research establishments as well as the industry and the regulators in this field. Stages of the conference series have been the following: Heraklion, Greece (2006); Istanbul, Turkey (2007); Nicosia, Cyprus (2008); Belgrade, Serbia (2009); Sitia, Greece (2010); Bled, Slovenia (2011); Bucharest, Romania (2012); Cavtat, Croatia (2013); Nicosia, Cyprus (2014); Budapest, Hungary (2015) and Heraklion, Greece (2016).

Over the last 10 years DEMSEE has grown to be an important conference on a wide range of power system issues held in Central and Eastern Europe. With a broad international attendance from all over the World, DEMSEE provides an excellent networking opportunity to establish new professional relationships and/or start new projects in the region.

Market development experts and power engineers from all over the world gather to share their experience on the conference topics and academicians merge their theoretical concepts with the practical experience of industry professionals. Specialists from the region contribute by joining the discussions on specific topics related to deregulated market development and operation.

For DEMSEE 2016 in Budapest 41 papers were accepted for presentation. The conference sections covered the following topics:

- Power System Operation and Control
- Energy Markets, Economics and Legislation
- Renewable energy sources, Distributed Generation, Smart Grids
- Island's and Small Scale Power Systems

The reviewers selected 4 papers for publication in the underlying Special Issue of Periodica Polytechnica Electrical Engineering and Computer Science, which thus reflects the essence of this jubilee event.

I would like to express my gratitude for the International Scientific Committee for their selfless and dedicated contribution in ensuring the quality of the papers:

George Ashikalis	Cyprus
Gergely Balázs	Hungary
Math Bollen	Sweden
Gabriela Cretu	Austria
Ninel Cukalevski	Serbia
Dániel Divényi	Hungary
Istvan Erlich	Germany
Lothar Fickert	Austria
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Attila Györe	Hungary
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Bálint Hartmann	Hungary
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George Kallos	Greece
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Rafael Mihalic	Slovenia
Alexander Novitskiy	Germany
Nikola Obradovic	Bosnia and Herzegovina
Konstantin Papailiou	Switzerland
Igor Papic	Slovenia
Balázs Plesz	Hungary
Herwig Renner	Austria

Urban Rudez	Slovenia
Jevgeni Shklovski	Estonia
Péter Sörös	Hungary
Ádám Tamus	Hungary
Lucian Toma	Romania
Petr Toman	Czech Republic
Toomas Vaimann	Estonia
Reinier van der Veen	Netherlands
Károly Veszprémi	Hungary
Simon J. Watson	UK

I would also like to thank all Authors, who submitted their papers to the conference, thereby paving the way towards solutions of challenges ahead our energy supply systems.

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11th International Conference on Deregulated Electricity Market Issues in South Eastern Europe The Second Decade

A few decades ago electrical networks could afford to be oversized. However, in the last decade and especially nowadays power systems should operate under great complexity and stressed conditions. Increased complexity can be attributed to one or combination of the following reasons:

- Deregulation Market
- Environmental restrictions
- Load demand growth
- Increased power quality requirements
- Increased RES penetration
- Differentiation in reliability requirements of the customers
- Congestion or issues related to reinforcement of the grid.

A significant concern under these conditions is that power systems might exhibit a different case of unstable behavior, characterized by both voltage and frequency instability, transmission lines conjunctions etc. As a consequence, network robustness reliability, and stability should be a main concern for modern power system planning and operation, especially when intermittent power sources like wind and solar energy are incorporated. Additionally, while the real performance of a power system follows a non-linear behavior, as the stress conditions increase, this nonlinearity becomes more pronounced.

Generally, the vast majority of the electricity demand is produced in large centralized facilities, mainly conventional (fossil fuel and/or nuclear powered) and hydropower plants, transmitting electricity under High Voltage over long distances. These

plants have emerged mainly due to better economies of scale and fuel availability on the spot.

Currently, another network architecture approach is dispersed generation (DG). Dispersed generation, also called on-site generation, embedded/decentralized, or distributed generation, generates electrical power from many smaller and regional power plants. This reduces the amount of energy lost in transmission lines and lightens the load over the whole interconnection system. This also reduces the size of power facilities that must be constructed. Dispersed generation is composed mainly of power plants that use local energy sources. The most common in these cases is utilization of renewable energy sources, such as biomass, solar and wind energy.

Last but not least, weakly interconnected or autonomous power systems, like the ones operating in isolated areas or mostly on islands, face increased complexity related to their operation and control. In most of these systems, the real cost of electricity production is much higher than in large interconnected systems due to the high installation, operating and maintenance costs (economies of scale). Security is also a major concern, since mismatches in generation and load and/or unstable system frequency control may more frequently lead to system failures than in interconnected systems.

Although under ongoing energy policies dispersed generation and renewable energy sources further exploitation appears particularly attractive, the integration of a substantial amount of them over electrical power systems needs careful consideration, so as to maintain high degree of reliability and security of the system operation. One of the main problems identified concern operational scheduling (mainly unit commitment) due to RES forecasting uncertainties, as well as steady state and dynamic operation disorder.

Thus, international conferences as DEMSEE are very important and should further investigate, analyze and propose cases and solutions that cover the field of electric energy sector (power systems operation, control, development, planning, analysis, economics, regulation etc.) using the significant and strong experiences from various countries and environments, both from industry and academia.

The Local Organizing Committee would like to thank all authors who submitted their papers to this conference and Professor Thales M. Papazoglou, Convener of the DEMSEE conferences, for his commitment to the profession of the Electrical Engineer.

The Local Organizing Committee of DEMSEE 2016
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