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Special Session on

"Advanced Technologies Based 100% Renewable Power Generation"

Organized by

Omar H. Abdalla	Hady H. Fayek	Thomas I. Strasser	Markus Makoschitz
Helwan University	Heliopolis University	AIT Austrian Institute of Technology	
ohabdalla@ieee.org	hadyhabib@hotmail.com	thomas.i.strasser@ieee.org	Markus.Makoschitz@ait.ac.at

Call for Papers

Renewable energies in many systems are hitting significant levels and there are many promising situations and targets. The world is now generating more than 20% of its electricity from renewable energies and targeting 100% renewable power generation by 2050. Iceland is already generating 100% of its electricity from renewable energy technologies. Also Norway and Costa Rica are generating more than 95% of their electric energies from renewables. Denmark and New York state in USA are targeting 50% renewable power generation by 2030. Upper-Egypt region in Egypt is now operating with 100% renewable energies mainly hydro and photovoltaic power stations.

To face the climate change, reduction of carbon dioxide emissions is a must. To reduce or eliminate those emissions, the current share of inverter-based power systems will even further increase which leads to new technical challenges and economic disputes. Advanced technologies such as artificial intelligence, modeling, design, validation approaches, real time control and self-healing will maximize the potential of integration of renewable sources and power electronics in state-of-the-art power grids.

Topics of interest include, but are not limited to:

- Frequency control applications of low or zero inertia power systems / microgrids
- Voltage control applications of power systems with high penetration level of renewables
- Smart grid technologies based optimal operation of low inertia power systems
- Modern protection applications on grids with high share of renewables
- Artificial intelligence applications on grids with high share of renewable energies
- Challenges and opportunities of 100% renewable energy power grids
- Role of energy storage in low / zero inertia power systems / microgrids
- Advanced modelling and design of inverter based smart grids.
- Energy management systems of low inertia power systems
- Ultra-high efficient and dynamic power electronics for enhanced services in smart grids
- Integration of wide bandgap in renewables and smart grid applications

- **IES Technical Committee Sponsoring the Special Session:**
  IEEE IES TC on Smart Grids