Science Lecture on “Innovation in Renewable Energy”

Location	DAAD Regional Office Cairo
Date	21st of November 2024
Guests	Scientists of the disciplines of Sustainability, Energy, Engineering, Climate Change and Environment. Policy makers and public administration personnel; Young scientists with interest in the field; DAAD alumni
Duration	2,5 h
Moderation and Contact Person	Ms. Miram Mahmoud (m.mahmoud@daadcairo.org)
Organiser	DAAD Regional Office Cairo German Academic Exchange Service 11 El Saleh Ayoub St. Zamalek, Cairo, Egypt URL: https://www.daad.eg

Concept Note

There are a lot of innovations that are shaping the renewable energy sector. New energy technologies are becoming increasingly popular, creating better awareness around shifting to cleaner solutions, like green energy technologies. Many industries are implementing changes and focusing on creating more sustainable solutions, from renewable energy sources, like solar and wind power to energy storage, electric vehicles, innovative heat pumps, hydrogen technologies, smart electricity grids and more alternatives for coal, oil and gas.

With the growth of artificial intelligence (AI), additive manufacturing, automation and other technologies, the transition towards a cleaner future can be easier. Many of the new energy advances help control and monitor infrastructures and improve the environment by replacing old equipment with newer solutions based on sustainable energy engineering. Thermal imagers, for example, indicate damages to solar installations caused by overheating and pressure transmitters can be used in hydrogen applications to examine the expansion force of a liquid or gaseous sample.

With technological advances, more things can be monitored and measured, creating the opportunity for the whole world to build a more sustainable environment.

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Agenda

Opening	
Greeting Words **6:00pm – 6:15pm**	Dr. Carsten Michael Walbiner Director, DAAD Regional Office Cairo Ms. Lorena Mohr Head of the Science and Protocol, German Embassy in Cairo
Keynotes	
Keynote I **6:15pm – 7:00pm**	Prof. Dr Manfred Fischedick President and Scientific Managing Director of Wuppertal Institute for Climate and Environment *"How to achieve greenhouse gas neutrality in Germany – role of renewable energies and hydrogen"*
7:00pm – 7:15pm	Q&A Session
7:15pm – 7:30pm	Break
Keynote II **7:30pm – 7:50pm**	Prof. Dr Mazen Abdel-Salam Department of Electrical Engineering Faculty of Engineering, Assiut University "*On Optimal Placement and Sizing of Wind Turbine Generators and Superconducting Magnetic Energy Storages in a Distribution System to enhance its reliability* "
7:50pm – 8:05pm	Q&A Session
Closing Remarks and Wrap-Up	DAAD Regional Office Cairo
8:10pm	Dinner and Networking

Speaker Profile

Prof. Dr Manfred Fischedick

Area of Expertise: Energy system analysis – sustainability and transformation research

Prof. Dr. Fischedick is president and scientific managing director of the Wuppertal Institute and professor at the Faculty of Economics - Schumpeter School of Business and Economics at the university of Wuppertal. He studied chemical engineering with the main focus on energy and environmental technologies at the University of Dortmund. He earned his doctorate in the field of energy technology at the University of Stuttgart analyzing the integration effects of renewable energies into the existing power plant system.

Manfred Fischedick has more than 30 years of experience in energy system analysis. He advises international institutions, the European Union, the German Federal Government and the Federal State of North Rhine-Westphalia as well as companies from a variety of industries. He is author of numerous books and articles, member of several scientific advisory boards, among others coordinating lead author of the fifth and sixth Assessment Reports of the Intergovernmental Panel on Climate Change (IPCC).

Jointly with the Wuppertal Institute, Manfred Fischedick pursues a transformative scientific approach.

Brief about the Presentation:
Title: *"How to achieve greenhouse gas neutrality in Germany – role of renewable energies and hydrogen"*
The presentation outlines the main challenges for the transformation of the energy system in Germany. Following the climate protection law, which was implemented in 2019, the country aims for greenhouse gas neutral by 2045 latest. In the presentation various transformation pathways are shown and discussed which technologies are needed to achieve the climate protection goals, which (new) infrastructures are needed as solid ground for the transformation and how the different strategy elements could be combined properly. A specific focus will be on the role of renewable energies and hydrogen to fulfill the outlined goals. The presentation will end with reflecting on the various technological, economic, cultural, institutional, political and social challenges that have to be overcome, but also highlights the manifold chances associated with the transformation. Lastly, the need for more international cooperation will be stressed.

Prof. Dr Mazen Abdel-Salam

Area of Expertise:

Electrical Power Engineering, with a focus on power systems, renewable energy integration, and advanced control technologies, supported by extensive global academic and research experience.

Department of Electrical Engineering
Faculty of Engineering
Assiut University, Assiut, Egypt

was born in Egypt. In 1973, he joined the faculty of Electrical Engineering at Assiut University, Egypt as an Assistant Professor, and became an Associate Professor, and a Professor in October 1977 and January 1982. During the academic years 1977-1979, he was an Alexander-Von-Humboldt Fellow at the Technical University of Munich, Germany, and University of Liverpool, England. In September 1979, he began work as a Researcher with General Electric Company, Pittsfield, MA, USA. During the academic years 1982-1984, he was a Professor at the University of Jordan, Amman. During the academic years 1984-1986, he was a Professor at Michigan Technological University (MTU), Houghton, MI, USA. From 1990 to 1994, he was a Professor at King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia. From August to December 2006, he was a Professor at Toyohashi University of Technology (TUT), Toyohashi, Japan. He had obtained research fellowships of two-three months at world-wide known universities during the period 1984-1999 at Miliary Technical University of Hamburg in Germany, University of Leeds in UK, Kaiserslautern University in Germany, MTU in USA, TUT in Japan, Technical University of Hamburg in Germany, and University of Manchester, Manchester, U.K. in 2000, 2004 and 2005. He has been elected Fellow of IEEE, Institute of Electrical and Electronics Engineers, in 1992, New York, USA, Fellow of IEE (currently IET), Institution of Engineering and Technology, in 1992, London, U. K. and Alexander-von-Humboldt Fellow in 1977, Bonn, Germany, Fellow of IOP, Institute of Physics in 2002, Bristol, U.K., and Fellow of JSPS, Japanese Society for Promotion of Science, Tokyo, Japan in 1996. His research interests cover areas of High-Voltage Engineering, Field Computations, Electrical Measurement, Electrical Power Systems, and Renewable Energy

This career trajectory highlights a diverse background, marked by significant international collaborations and substantial contributions to research.

Brief about the presentation:
Title: "*On Optimal Placement and Sizing of Wind Turbine Generators and Superconducting Magnetic Energy Storages in a Distribution System to enhance its reliability* "

High penetration of intermittent wind-turbine generation (WTG) into electric distribution system along with large variations of load demand introduce many problems to the system such as high-power losses, voltage sag, and low voltage stability. To mitigate such problems, the distribution system is supported by superconducting magnetic energy storages (SMESs). Optimal placement and sizing of WTGs and SMESs in a distribution system using multi-objective-function are determined along with checking the reliability indices. The weighted-sum multi-objective function is formulated for simultaneous minimization of energy-loss and voltage-deviation as well as enhancement of voltage-stability as indices characterizing the distribution system performance. The weight factors are no longer assumed or left open to the preferences of the decision maker. They are computed while optimizing the indices of the objective function. The proposed method for optimal placement and sizing of WTGs and SMESs is tested and validated on the standard IEEE 33-bus distribution system with time-varying voltage-dependent load models including residential, industrial, commercial, and mixed loads as well as variable wind-speed. The numerical results and simulations imply that the combination of WTGs and SMESs can successfully achieve the goals of the formulated objective function.