



Housing and Building
National Research Center



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“Green Smart Sustainable Building between Present & Future”
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Ministry of Housing, Utilities
and Urban Communities



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Lecture Title: Future of Wind Energy – Chances & Challenges

Abstract :

The main energy production is usually covered by fossil fuels such as coal, natural gas and crude oils. The excessive use of these fossil fuels however leads to a significant increase in greenhouse gasses in the atmosphere, which over time lead to severe changes in the earth's climate. **Wind Energy** as a renewable and nearly carbon neutral energy sources are well suited to aid in covering the world's energy demand without any bad effect to the climate change. In the last years, installation of wind farms has increased significantly and this trend is expected to continue. Large amounts of electric power coming from wind energy can be produced from wind farms.

Dimensioning the **WEPs support structure** has to meet the following fundamental goals: safety, cost-effectiveness and sustainability. Usually this is an iterative process and requires a very efficient simulation and design package. Reaching these goals all kinds of environmental loading and their impact on the wind plant with special interest on the support structure should be considered. Based on the research results, the behavior of the foundation elements for WEPs can be predicted in a suitable manner to optimize the design procedure and maintain the sustainability of these structures.

Field of Experience:

Dr. Khalid Abdel-Rahman finished his Bachelor study with “Excellent” at the Faculty of Civil Engineering - “Ain-Shams University” – Cairo – **EGYPT**. Afterwards he went to Germany at “University of Hannover”, where he got a master degree with overall grade “Excellent” in “Geotechnique and Infrastructure Engineering”. His PhD study under the excellent supervision of “Prof. Achim Hettler” at University of Dortmund - Germany was completed (grade = 1,0) with innovative results related to the “Numerical Investigation of Scale Effect by Earth Pressure Problems”. After getting his Ph.D., he joined the team at Institute for Geotechnical Engineering at “Leibniz University of Hannover” as **Senior Lecturer** then he was nominated by the head of the department “Prof. Martin Achmus” to be his “**Deputy Head**”. During his academic career, he published with the team in his department “Institute for Geotechnical Engineering (IGtH) more than 90 publications mainly in the Numerical Modeling of Foundations Systems for Wind Energy Plants (Onshore & Offshore). Last but not least, winning “Outstanding Paper Award” from the international journal “**Computers and Geotechnics**” in **2016**.

In 2016, he had the honor to be one of 27 Egyptian Scientists who took part in the first Conference in Hurghada (By its Scientists, **EGYPT Can**) and later on in **2018** in Luxor, Egypt.