

# **2nd International Meeting on Wind Turbine Noise 2007**

**(WTN 2007)**

**Lyon, France  
20 – 21 September 2007**

**ISBN: 978-1-62276-390-0**

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at the address below.

INCE/Europe  
Riverside House  
4 Oakland Vale  
New Brighton, Merseyside CH45 1LQ, UK

Phone: +44 (0)151 638 0181  
Fax: +44 (0)151 639 5212

[inceeurope@cmrl.demon.co.uk](mailto:inceeurope@cmrl.demon.co.uk)

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# Wind Turbine Noise 2007

## Welcome to the CDROM of the Proceedings of Wind Turbine Noise

Held in Lyon, 20/21 September 2007

The Conference was organized by  
Dr Geoff Leventhall  
On behalf of INCE/Europe



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## **Theoretical analysis of wind turbine used to power a stand-alone solar desalination unit in selected coastal areas of Egypt**

**Zeinab Sayed Abdel-Rehim**

Mechanical Engineering Department, National Research Center ,  
Dokki, Giza , Egypt  
e-mail: [zabdelrehim@yahoo.com](mailto:zabdelrehim@yahoo.com)

Theoretical analysis of wind turbine used to power a stand-alone solar desalination unit in selected coastal areas of Egypt is presented in this work. The selected coastal areas are; Mersa Matruh and Sidi-Barrani on the Mediterranean Sea coast and Hurghada and Abu Rudies on the Red Sea coast. In these areas, the fresh water shortage is significant problem and the wind energy is usually high that used in renewable energy applications. The available wind data of the selected areas are collected from meteorological station along these coastal areas of Egypt . The wind data are analyzed in a form useful for wind turbine characteristics and wind energy computation. The annual mean wind speeds are 5.3, 5.0, 6.3 and 4.8 m/s for Mersa Matruh, Sidi-Barrani, Hurghada, and Abu Rudies, respectively. The proposed solar desalination system is considered as conventional solar still and simple system of breaking the boundary layer of the basin water surface to enhance the performance of the solar desalination system. This simple system is helical shaft that installed near to the basin water surface. The helical shaft is running with slow speed by using small motor. This motor powered by the considered wind energy. This study aimed at evaluating of the mean wind speed for the selected areas to determine the characteristics of the suitable wind turbine and compute the amount of captured wind energy to power the proposed solar desalination system. Analytical assessment is presented to determine the power available from the wind stream. The analytical assessment reveals that the coastal areas of Egypt offer sufficient wind energy for economic utilization of requirement of energy in these communities. The results show that Mersa Matruh and Hurghada have the highest amount of wind energy, power and distillate water productivity due to the climatic district.

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## **Long range sound transmission over the sea with application to wind turbine noise**

**Mats Åbom and Mathieu Boué**

The Marcus Wallenberg Laboratory (MWL)  
KTH, SE-100 44 Stockholm, SWEDEN  
[matsabom@kth.se](mailto:matsabom@kth.se)

The classical theory of spherical wave spreading is not valid at large distances from a sound source due to atmospheric refraction caused by wind and temperature gradients. For large distances (> 1 km) in the down wind direction a cylindrical type of wave spreading can be expected. Over areas with soft ground conditions, e.g., grass land, the ground damping will restore a behavior close to a free field spherical spreading. This is also the approximation used in most national recommendations for estimating noise emission from wind turbines. However in Sweden there is a special recommendation for sea based wind turbines, which use cylindrical wave spreading for distances larger than 200 m. This model is based on a few old measurements and in order to better validate the model new and better data is needed. This paper presents a measurement procedure for long-range (5-15 km) outdoor sound propagation over the sea. Using the procedure measurements have been performed