

Wind Engineering Research Trend in Malaysia

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Short Biography

Assoc. Prof. Ir. Ts. Dr AZLI ABD RAZAK has a PhD degree in (Computational Wind Engineering) from Interdisciplinary Graduate School, Kyushu University Japan, an M.Eng (Mechanical) degree from Universiti Teknologi Malaysia, Malaysia (UTM) and a B.Eng. (Hons.) Mechanical Engineering degree from Universiti Teknologi MARA (UiTM). His thesis for PhD and M.Eng based on Computational Fluid Dynamics. He joined the Universiti Teknologi MARA, Malaysia as a junior lecturer in 2001. Currently he is an Associate Professor and Head of School of Mechanical Engineering, College of Engineering UiTM Shah Alam. He has five years of industrial experience as Mechanical Head and involve in development of UiTM properties such as UiTM Teaching Hospital and Orchestra Hall UiTM. Associate Professor Ir Ts. Dr. Azli Abd Razak has been lecturing on Fluid Mechanics, Fire Precaution Engineering, Project Management, Computational Fluid Dynamic, Introduction to Engineering, Thermodynamics and Renewable Energy, which happens to be his areas of research interest (Bluff body aerodynamics and wind Engineering) and has published several technical papers in journals and conference proceedings locally and internationally. Due to his expertise and experience, he was invited to be an External Examiner for Master and PhD Thesis and review several high impact journals. With his expertise in energy and facilities management he currently invited to be a member for UiTM Energy Committee.

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Abstract

The assessment of applications, impacts, and interactions between wind in the atmospheric boundary layer and human as well as existing built structures on the earth's surface is what wind engineering is all about. Wind engineering research has gone through a number of transformations over time, depending on human needs. Furthermore, the effect of wind on structures (buildings, bridges), the wind environment (safety and comfort), pollutant dispersion, and wind energy are all fields of wind engineering. However, due to the dynamic interactions between wind and the artefacts it encounters, the fundamental study of wind continues to this day.

The majority of wind engineering research was done in developed countries like Japan, the United States, the Netherlands, and Canada. Several factors contribute to such countries' success in related fields, including strong fundamental understanding, a driving climate, adequate technology, enabling institutions, and the application of discovery in life. All of these elements are still mutually supportive. Their results have been cited as guides all over the world in order to advance understanding in the field of wind engineering.

Malaysia isn't far behind in terms of wind engineering research. Located on the equator, with average daily temperatures ranging from 24 to 38 degrees Celsius and high humidity levels of 70% to 90 %. Wind speeds are generally slow, and they are influenced by the northeast monsoon, southwest monsoon, and the two shorter monsoon transition seasons. While hurricanes, tornadoes, and strong winds do occur on occasion, the magnitude of damage and severity is much lower as compared to other countries such as Japan and the United States. Wind safety studies in Malaysia are also scarce, owing to the rarity of critical damage accidents as a result of the problem.

Wind energy research has been gaining traction in Malaysia since the 1990s, in response to the need to explore renewable energy sources in order to minimise reliance on fossil fuels. Wind energy potential studies were conducted in selected locations in East and West Malaysia for a period of ten years using wind speed data (1982-1991). According to the study's findings, regions on the east coast have the greatest wind energy capacity. However, since there are many meteorological stations near the airport, the data cannot be used to research wind energy potential due to its small size.

In addition, the first wind turbine generator was installed in 1995 on an island off Malaysia's east coast to encourage further research into wind energy. The aim of the project is to test wind hybrid systems in various parts of the island in order to support the local population. With reports of results from fieldwork involving offshore wind speed studies, wind speed studies in coastal areas, and wind energy capacity studies in the most land-based areas, the research gained further interest after 2000. The analysis of wind potential on land has gotten a lot of attention lately, thanks to a growing understanding of the value of renewable energy and government funding.