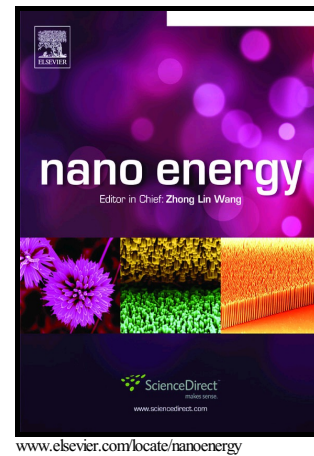


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Farms of Triboelectric Nanogenerators for Harvesting Wind Energy: A Potential Approach towards Green Energy

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Abstract

Wind energy plays an important role in new-energy market, and it has the potential to be one of the promising green electric energy sources. Thus, it is very important for scientists and researchers to develop alternative method for harvesting wind energy. Here, we introduce a farm structure consists of triboelectric nanogenerators (TENGs) for large-scale energy harvesting from natural wind. Depending on contact electrification based freestanding mode between two disks with patterns of micro-sized circular sectors, the TENG farm that works with the wind flow converts the low and high wind energy into electricity. Finally, the performance of the TENG and Darrieus turbines is compared both experimentally and theoretically, predicting the unique advantage offered by TENG at low rotation speed. Given the convincing characteristics, such as having little weight, low cost, environmentally friendly, and effortlessly connected, the TENG farm can be an effective way towards large-scale green energy harvesting from the wind.

Keywords: Triboelectrification, Wind energy, Green energy, TENG farm.

¹ A. Ahmed and I. Hassan contributed equally to this work.

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