# Smart devices could soon tap their owners as a battery source

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In a study published by the *Advanced Energy Materials* journal, scientists from Surrey's Advanced Technology Institute (ATI) detail an innovative solution for powering the next generation of electronic devices by using

Triboelectric Nanogenerators (TENGs). Along with human movements, TENGs can capture energy from common energy sources such as wind, wave, and machine vibration.

A TENG is an energy harvesting device that uses the contact between two or more (hybrid, organic or inorganic) materials to produce an electric current.

Researchers from the ATI have provided a step-by-step guide on how to construct the most efficient energy harvesters. The study introduces a "TENG power transfer equation" and "TENG impedance plots", tools which can help improve the design for power output of TENGs.

Professor Ravi Silva, Director of the ATI, said: "A world where energy is free and renewable is a cause that we are extremely passionate about here at the ATI (and the University of Surrey) – TENGs could play a major role in making this dream a reality. TENGs are ideal for powering wearables, internet of things devices and self-powered electronic applications. This research puts the ATI in a world leading position for designing optimized energy harvesters."

Ishara Dharmasena, Ph.D. student and lead scientist on the project, said: "I am extremely excited with this new study which redefines the way we understand energy harvesting. The new tools developed here will help researchers all over the world to exploit the true potential of triboelectric nanogenerators, and to design optimised energy harvesting units for custom applications."

**More information:** R. D. Ishara G. Dharmasena et al. Nature of Power Generation and Output Optimization Criteria for Triboelectric Nanogenerators, *Advanced Energy Materials* (2018). DOI: 10.1002/aenm.201802190

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