New vibration powered generator for wireless systems

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A generator that is 10 times more powerful than any other similar devices has been developed by engineers at the University of Southampton.

Dr Steve Beeby and his team at the University's School of Electronics & Computer Science (ECS) have developed a kinetic energy generator which generates electrical energy from the vibrations and movements present within its environment.

'This is the most successful generator of its kind and generates energy much more efficiently than any similar device of its size,' said Dr Beeby.

The generator, which is less than 1 cubic cm in size, was developed as part of the EU-funded EUR4.13 million VIBES (Vibration Energy Scavenging) project. It has been designed to power wireless sensors that monitor the condition of industrial plant and is intended to be installed within an air compressor unit supplying several laboratories within a building.

It could also be used in wireless, self-powered tyre sensors and if developed further, could even form the basis of technology for self-powered pace makers. The technology offers the potential to replace or augment batteries. The periodic replacement of batteries is not feasible for embedded applications and is highly unattractive in wireless sensor networks containing hundreds of sensor nodes.

'Vibration energy harvesting is receiving a considerable amount of interest as a means for powering wireless sensor nodes,' said Dr Beeby. 'The big advantage of wireless sensor systems is that by removing wires and batteries, there is the potential for embedding sensors in previously inaccessible locations.'

According to Dr Beeby, over the years, there has been a growing interest in the field of low power miniature sensors and wireless sensor networks, but an area that has received comparatively little attention is how to supply the required electrical power to such sensors, particularly if the sensor is completely embedded in the structure with no physical connection to the outside world. He believes that the VIBES generator could hold the solution.

A paper entitled *A micro electromagnetic generator for vibration energy harvesting* about this research has just been published on the *Journal of Micromechanics and Microengineering* website.

Dr Beeby and his team plan to exploit this application further through Perpetuum, the world-leading vibration energy-harvesting company which was formed in 2004 as a spin out from the University of Southampton.

Source: University of Southampton