Researchers at Penn State announce breakthrough in microbial fuel cell development

A technological breakthrough has made it possible to use microbial fuel cells for large-scale electricity production for the first time.

Researchers at Penn State have developed a carbon fibre bottle-brush anode which provides 300 to 1,500 times more surface area than carbon paper anodes, which were previously used as standard.

This development ensures that the anode is "no longer a limiting factor in power production", according to Bruce E Logan, the Kappe professor of environmental engineering.

What's more, a new membrane-tube air cathode has been devised.

It is hoped that the combination of the two will allow microbial fuel cells to become both more efficient and more cost effective.

"With these new anodes and cathodes the design of a wastewater treatment reactor could be as simple as a large tank with the brushed and tubular cathodes inserted into the same tank," Professor Logan confirmed.

As well as producing electricity, microbial fuel cells - which use bacteria to pass electrons to the anode of a fuel cell - also act to cleanse water by consuming the organic matter naturally found in wastewater.

The Penn State team's new equipment works using bacteria already found in wastewater, dispensing with the need to introduce special bacterial strains into alien environments.

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