Device produces electricity, cleans water

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U.S. engineers have upgraded a power source that simultaneously cleans wastewater so it costs two-thirds less and produces six times more electricity.

Earlier this year, environmental engineers at Penn State University were the first to design a microbial fuel cell that generated electricity while also cleaning domestic wastewater from a settling pond of a nearby sewage treatment plant.

The upgrade not only makes the device cheaper, but also boosts electricity production, from 26 milliwatts to 146 milliwatts per square meter. The new prototype uses carbon paper that eases the work of a more expensive polymeric proton exchange membrane.

A microbial fuel device produces an electric current through bacteria that can carry electrons to the negative end of the fuel cell, then through a wire to the cell's positive end, where it then combines with protons and oxygen to form water.

The bacteria are naturally-occurring and transport electrons on the cell surface. They also produce an internal reaction that lowers the biochemical oxygen demand, cleansing the water, the engineers said.