

### Solar energy-based devices for the simultaneous production of fresh water and electricity

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We have developed a novel solar energy-based device that simultaneously produces clean water and electricity. In our system, polymer-modified filter paper is used as solar heat absorber. Water flows along the hydrophilic interconnected pore of the filter paper, which is then evaporated from the surface through solar heat. This creates desalinated water. At the same time, water evaporation is a promising method in generating electricity to supply power for self-powered devices. Electrical power is generated via a streaming potential mechanism. When water flows through the charged substrate, this results in a gradient of charge carriers in the substrate, and thus electrical power is generated. Through the generation of both clean water and electric power, our solar energy-based device provides a simple method that can harvest green energy.