

An Electrical Power Generator and A Self-powered System including such Power Generator

Energy & Environment

Manufacturing

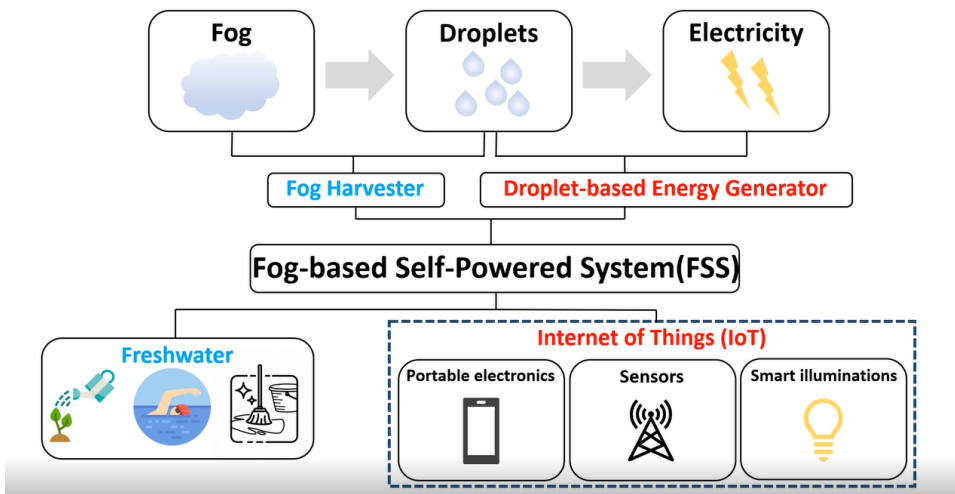
Buildings and Construction Technology

Consumer Electronics

Electricity and Power Electronics

Energy Conservation/Generation/Management/Storage (Battery)

Conceptional framework of fog-based self-powered system (FSS)



Opportunity

Atmospheric moisture, including fog, vapour, aerosol, and cloud have roughly accounted for 10% of the world freshwater. Especially in coastal regions like Hong Kong, the annual mean relative humidity is as high as 80%. In striking contrast to universal large-scale energy harvesting, such as solar, wind, thermal, and hydropower, ambient moisture as an abundant source has seldom been applied in energy generation. Almost all the existing fog harvesting systems are designed for freshwater collection only.

Technology

The present technology relates to a novel system of harvesting energy and freshwater from high-humidity air via the 3D printed Fog-based Self-powered System (FSS), which consists the components of a fog harvesting mesh with bioinspired material, a droplet distributor, a newly developed high-power density droplet-based generator (DEG), and a water reservoir. Different configurations of the integrated system are developed to meet the optimal aerodynamic properties and compact requirements to be applied in various scenarios. By ingeniously integrating these components, the portable FSS as an eco-friendly battery may not only charge small electronic products but also sustainably supply freshwater in remote areas.

Remarks

Inventions Geneva Evaluation Days (IGED) 2022 - Gold Medal with Congratulations of the Jury

IP Status

Patent filed



Technology Readiness Level (TRL) ?

4

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Develop Concept

Proof Concept

Funding

Build Value

Advantages

- Made by 3D printing to suit for different configuration in various scenarios
- Utilized ambient moisture to generate electricity and harvest freshwater concurrently
- Low cost of maintenance and operation
- Long lifetime, easy assembling, and flexible scale

Applications

- Generating electricity from the sustainable source of ambient moisture in remote area
- Harvesting freshwater from atmospheric moisture

