Clean energy sources are in high demand with photovoltaic energy systems viewed as increasingly competitive. While solar energy is unlimited, the ability to fully harness it is hampered by inefficient systems, along with material and manufacturing costs, which decrease its value in comparison to traditional energy sources, such as fossil fuels. This technology can be easily fabricated from any number of inexpensive materials (i.e., plastics, metals) and can be manufactured using readily available techniques (i.e., lithography, spin-coating). It consists of multiple layers of conductive materials and contains a charge-carrying channel capable of concentrating and therefore enhancing the technologies’ energy production.

**Efficiently and cost-effectively harnessing solar energy using a solid-state technology with charge-carrying channels**

A cost-effective solar panel would serve as a viable alternative to fossil fuels. This low cost technology is a fully solid-state embodiment that is highly efficient and easily manufactured. It converts solar energy into electrical energy in a way that focuses and directs the flow of charge-carriers through the use of a channel template acting as a removable pattern. This technology prevents the bidirectional flow of charge that leads to low output and decreased efficiency. The material composition, geometry of channels, and types of charge-carrier-transport materials can be varied for any application.

This technology increases efficiency and lowers costs in a way that makes the embodiment of it a viable option for any consumer.

**Lead Inventor:**

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**Applications:**

- Solar farms to produce clean energy and power for industrial and residential applications.
- Electricity generator for handheld devices and other battery powered technologies.
- Supplying power to offshore businesses with limited access to power grids.
- Improve electronics communication as semiconductor technology.

**Advantages:**

- Generates clean electricity from solar energy with increased efficiency.
- Easily customizable fabrication, due to the interchangeability of raw materials (i.e. organic molecules, polymers, metals), that preserves templated channel architecture.
- Solid-state embodiment provides for self-contained charge and improved transport of charge carriers.
- Utilizes blocking layers to prevent bi-directional flow of positive and negative charges, improving efficiency.
- Improves response time by three orders of magnitude (<1 ps) when compared with voltage changes in conventional transistors.
- Manufactured with a variety of processes that are local to the consumer (e.g. lithography, thermal firing, physical vapor deposition, self-assembly, and microcontact printing).

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