



Smart Solar Rooftops: Economically Competitive Photovoltaic Power

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Background

Solar panels, or photovoltaic panels, use photovoltaic cells to create energy. These cells create direct current through absorption of sunlight's photons by silicon, allowing electrons to be stripped from atoms. The direct current is then inverted and either stored in a battery or immediately used for energy. The current silicon-based solar cells have a limiting efficiency of about 30% for a variety of reasons. Current cells can only absorb a portion of the light the sun produces, and are inefficient due to heat loss throughout the rest of the process. Silicon is also expensive to produce, and requires protection from the elements. Photovoltaic technologies are competing with fossil fuels on the energy market, so producing high-efficiency while maintaining a low cost is a major priority for the solar industry.

Technology

A research team led by [Robert Erickson](#) at the University of Colorado Boulder has developed a new type of photovoltaic converter. The conversion technology boosts the voltage produced using a simple design that is tolerant of shading, allowing for low-cost production combined with a high-efficiency module. The technology can be used in a photovoltaic module-mounted or shingle-integrated system to produce electricity.



Advantages

When integrated into such a system, this technology has the potential to produce electricity at a price and efficiency that can compete with fossil fuels.

IP Status:

Patent pending;
available for
licensing

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Key Documents

[Low Profile Power Conversion System For Rooftop Photovoltaic Power Systems](#). PCT filed June 1, 2011; nationalized to U.S.