# Ultra-High Efficiency Hybrid Solar Cell

Silicon based technology is technically proven and reliable and has succeeded in achieving market penetration, primarily in off-grid remote areas and in grid-connected applications where sufficient subsidies are available to offset its high cost. However, there are several inherent limitations to this technology. Silicon wafers are fragile, making processing difficult and limiting potential applications and the process also produces toxic gasses during fabrication. The process is very energy and labor intensive and manufacturing plant capitol costs are high, limiting scale-up potential. Manufacturing costs are still unacceptably high and the long term potential for significant cost reduction of the existing silicon solar cell is slight, thereby limiting the ability of this technology to deliver long term affordable energy. Finally, the efficiency of existing solar cells is still too low, making the "pay-back" period too long.

A new solar cell has been designed using flexible thin film technology that aims to reduce the costs of manufacturing, and to provide the highest possible efficiency. The novel design uses roll-to roll printing to reduce manufacturing costs, thermo-electric materials to gather electricity from heat, unique 3D nanostructures, and plasmonic structures to capture most of the solar spectrum. The use of these advanced materials in a solar cell promises to ignite a revolution in the solar cell industry with the potential to provide clean affordable energy for the whole planet.

The new solar cell is available for license from the University of Arkansas, and international rights are available.

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