Submission summary slide for Solar-Tectic LLC

Cost effective, high efficiency solar cells by Solar-Tectic LLC

90% of all solar cells made today use a silicon wafer that is not only costly due to the thickness of the wafer and therefore amount of material, but also the energy consumption involved in making it, and the large amount of material wasted when slicing the wafers (known as “kerf loss”) needed for the individual cells. The panels made from these wafers are also heavy and brittle.

Solar-Tectic’s patented technology replaces the wafer with a very thin film which requires much less energy consumption, is not confined by size, and uses much less material without any kerf loss. Less material needed due to a very thin film means the panels can be lighter and even flexible.

Proof of concept solar cells made using this silicon material, invented by the late Dr. Praveen Chaudhari (former director of Brookhaven National Laboratory) were made at NREL in 2012.

Although the quality of our silicon thin-films are very high and we can expect efficiencies to be comparable to silicon wafer panels, we nonetheless add a layer on top of the silicon film to increase the efficiency potential. This layer can be one of any number of materials, including perovskites, amorphous silicon, and CZTS all of which either have higher bandgaps than silicon or have direct bandgaps and therefore can increase the power conversion efficiency (PCE) of the overall cell. This kind of device is also known as a tandem and/or heterojunction design. We also aim to make the cell “bifacial,” by allowing light to enter in from both sides of the cell for even higher PCE potential.