

Technical Assistance Request

Device Testing

Terascale is competent in reactor modeling, designing, construction, and operation. However, technical assistance will be necessary to help characterize fabricated devices. Terascale will have the tools to deposit the layers of a full single-junction or tandem solar stack but does not have the experience in doing device testing and modeling. A collaboration with a national lab with expertise in device testing to acquire External Quantum Efficiency (EQE), short-circuit current (J_{sc}), open-circuit voltage (V_{oc}), fill-factor (FF), and J-V curve data will be highly desired. Additional expertise in device modeling to identify performance-limiting variables will also be sought.

Industrial Reactor Design

While Terascale is familiar with small-scale, high-throughput reactor designs, it will seek consultation with industry experts to acquire industry standard know-how and best practices to make the next generation of large-area solar PV manufacturing equipment right the first time. This will include understanding what size to scale the equipment as subsequently larger and larger devices are made. Further understanding of how to cooperate with glass suppliers, such as the NSG Group, to build equipment that is easily attached to the lehr of a glass factory for truly rapid manufacturing will be desired.

Metal Oxide Electron Transport Layer (ETL)

The innovative manufacturing method is capable of depositing the metal oxide ETL, but it is not necessary to prove this at this stage. Instead, Terascale is interested in partnering with a national or university lab to deposit via atomic layer deposition (ALD) amorphous metal oxide ETL layers on fluorine-doped Sn(IV) oxide (FTO) coated glass slides. The exact material composition will be shared after the provisional patent has been filed. These substrates will be provided to Terascale to deposit the subsequent absorber, hole transport layer, and anode (for a single junction solar cell). This partnership will greatly accelerate the innovate cycle rate.

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Novel encapsulation method

Terascale is looking to develop its own novel encapsulation method to prevent the oxidation of the deposited solar cells and enable long-term device operation. This encapsulation process uses a femtosecond laser to mechanically weld two plates of glass together with the solar cell sandwiched in the middle. Terascale does not have access to a femtosecond laser, so we will look to the American-Made Network to partner with a connector to develop this part of the technology.