Solar Panel with Heatsink

Team: Cool Tech Solar

Our team have a combination of academia researchers and industry experts, from materials scientists, engineers to solar installers to tackle this challenge with our innovative solution. To get the technology success and ready for industry implementation, we have support needed from national laboratories and other American made network connectors. The details are listed as follows:

1. *Backsheet reliability test, stress test, scratch test and other backsheet test and characterizations. This includes the backsheet and solar module under repeatable, large temperature and humidity cycles, look at the materials failure rate and failure mode. Conduct relevant comparison test for a number of samples provided by cool tech solar team. The team has collaboration discussion with NREL team who have the exact experimental setup needed to conduct all these tests. The prototype samples will be produced by cool tech solar.*

2. *Material properties characterization. Our technology involves with new materials. structures, and processes we developed for implementation. At the Set! Stage, to ensure the prototype build will meet the design target, we will need additional support for rapid materials properties measurement. This including electrical and thermal properties measurement based on the materials provided, including thermal conductivity, density and electric conductivity for Nano-HS. Rapid SEM/TEM measurement are also needed. While our team have access to the equipment, some are based on shared facilities, for the short project deliverable time required in this challenge, we like to be able to have additional support in case some of the facility access will be delayed due to unexpected reason. In addition, expertise in those measurement can also reduce the time delay to obtain correct materials properties feedback.*

3. *Solar module and backsheet samples for Nano-HS development and prototype build. Since the team is still continue developing Nano-HS materials and processes. A number of samples of backsheet and solar module are still needed. For materials development, large number of tries are required. The team has connected with Heliene Inc. a local (Minnesota based) solar PV module manufacture, who is able to provide necessary component supply for the development.*

4. *Benchmark test: One of the primary goals for set stage is to achieve a full build demonstration against conventional technology. This requires a benchmark test by an independent team in addition to cool tech solar team's own test. National Laboratory can serve this purpose well. So, we can ensure the*

demonstration data collected are not being biased one way or the other. This test results will drastically speed up the industry adoption speed.

5. *Customer discovery and connections. We are looking for connectors that will help us to engage with backsheet manufacture companies, or have them contact us. Since our Nano-HS will also perform part of the function traditional backsheet have, therefore, there is an opportunity to integrate Nano-HS with the backsheet, which in turn to reduce manufacture cost of the solar panel further. As we continue our customer discovery process, we like to get more connectors contact us and introduce the relevant contacts back to us. We need power connectors and national laboratories to help introduce other industrial partners/customers, particularly for companies outside of the State of Minnesota.*