

## **TECHNICAL ASSISTANCE REQUEST (2 pages, including images, will be made public)**

Provide a two-page description of the unique challenges and needs a national lab, private facility, and/or member of the American-Made Network could potentially help you resolve. The Prize Administrator will make this request broadly available so members of the American-Made Network can understand your needs and assist you through the voucher program or otherwise.

Through the course of the competition there are two main challenges that can be solved by members of the American-Made Network. Since the main goal of our work is to use our sustainable metal ink to metallize perovskite solar cells, and to compare that to performance of a perovskite solar cell with commercial pastes, we are left with two main barriers that members of the American-Made Network can help with:

First, we need state-of-the-art process controlled perovskite solar cells without front metallization for our experiments. Second, we need to compare the efficiency of our perovskite solar cells with sustainable metal ink metallizations and perovskite cells with screen printed silver metallization. This will need to be done before, during, and after measurements. In order to present the development of our technology to potential investors and customers we need an official certification of cell efficiency, as well as standard reliability testing.

The best group to collaborate with for state-of-the-art solar cells, solar cell efficiency verifications, and reliability testing is the National Renewable Energy Laboratory (NREL). In order to properly gauge our progress and comparison versus the standard perovskite solar cells, we would greatly benefit from collaboration with NREL.

**From:** Berry, Joseph Joe.Berry@nrel.gov  
**Subject:** Re: American Made Solar Prize  
**Date:** December 9, 2019 at 11:28 PM  
**To:** Mariana Bertoni bertoni@asu.edu

JB

Dear Prof. Bertoni:

If your team's entry to Round 3 of the American Made Solar Prize, entitled "Sustainable Metals for Next Generation Solar Cells" is selected for the Ready contest our NREL team would be happy to contribute samples for evaluating your printing process and ink chemistry on our state-of-the-art perovskite cells.

Best regards  
-joe

p.s. sorry for the delay!

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