

Technical Assistance Request

Direct funding, vouchers, and technical assistance from the American-Made Solar Prize can provide valuable resources required to help the SAVD technology cross the pre-commercial gap with strong relevance to the current industry. SAVD is currently working under very limited private investment in this early stage. All of the current funding is committed to proof of principal testing, basic process optimization, scaling, and pilot line demonstration on a Al-BSF structure. The goals and justification for this current funding sources already are defined and do not address several important steps required to attract additional private funding and bridge the gap to commercial success. Without additional funding, proving relevance to the current PV industry will be severely hampered as questions will remain as to whether the SAVD process presents a viable technology and a good business opportunity. We are currently seeking other opportunities for funding, but the American-Made Prize resources will augment our other funding and provide a quicker path to commercialization of this technology.

We see the following activities as important, but currently unfunded. These are critical development areas that we can hope to fund through Prize awards and vouchers, or currently uncommitted grants and investor funding.

1. Sourcing of standard Al-BSF cells for evaluation or manufacturing of sample cells to meet our unique requirements during early stage testing. We have manufactured our own cells and purchased some samples from universities and other sources; this sourcing has proven difficult to get well characterized cells, and expensive. We could use some assistance to source basic test cells that are well characterized and inexpensive. This help may be provided by national labs, independent laboratories, or manufacturers.
2. Application of the SAVD process to alternative cell structures which could be the majority of industry cells in the near future. Cell structures such as PERC, IBC, and HJT for example are rapidly gaining acceptance as preferred commercial structures. It is important that SAVD create parallel activities that prove the viability of our process on state-of-the-art solar cells (beyond the Al-BSF structure). We have letters of commitment from several PV manufacturers and suppliers that have shown interest and will supply samples of these advanced cells for evaluation. Other manufacturers or labs could also be valuable to provide such cell samples.
3. Development of an analytical model and possible prototype testing to quantify the effect of our process on the collection of diffuse and low angle light is very important. This beneficial effect can have a major impact on the LCOE for product made using the SAVD process and quantification/proof of this effect will be critical attract customers and investors. National lab resources could be useful for this modeling and testing.
4. Further evaluation of the impact of our technology on downstream system cost savings due to both higher efficiency and low angle light collection capabilities is another area that requires work. Our process not only affects the cost of cells and modules, but will also have

a large impact on systems cost through reduction of installation labor, racking, wiring, inverters, etc. This element must be analyzed and factored into our business model. Once we have basic data on the cell performance, national labs such as NREL or our partner, Direct Gain Consulting could assist in this effort.

5. Our business model now has several paths including:
 - a. Cell manufacturing
 - b. Cell manufacturing and all downstream processes including modules and system installation/ownership
 - c. Technology licensing and support

We need to consider each of these potential directions in a business model that incorporates current industry practices, costs, and markets in order to optimize our commercialization path. Direct Gain Consulting or other Connectors might assist in this evaluation.

6. The performance of the SAVD augmented cells as they are incorporated into modules must be considered. We have done some rough analysis that indicated our cell performance will carry through to the module and our surface structures will not be adversely affected by either the EVA or module glass; however we need to further analyze this and test prototypes to verify the finished package. National labs and or manufacturers may be able to provide assistance with this.
7. We need further investment and grants for near term activities and longer term commercialization activities. We expect to use the resources provided in the American Made Prize to get introductions to potential investors and other funding sources. National labs, Direct Gain Consulting and other Connectors may be able to assist us in these funding efforts with investor introductions/screening and advise on grant sources.
8. To date, we have had minimal connections with manufacturers and laboratories with which we can form partnerships to provide unbiased testing to prove our advances and eventually prove the technology in the field. We expect to be able to improve this situation through the American Made Prize resources. Currently we do our own internal testing of references and process cells. At some point we will need independent validation of our results. Probably a national lab such as NREL could provide this for us.

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