

TECHNICAL ASSISTANCE REQUEST

As outlined by NREL in a 2000 article titled, “U.S. Guidelines for the Economic Analysis of Building-Integrated Photovoltaic (BIPV) Power Systems”, there are 4 key steps needed to facilitate the development and adoption of BIPV technology.

(1) Determine and quantify all benefits for the proposed BIPV system including energy cost savings, credits from sale of power, enhanced quality/reliability, reduced construction costs, reduced CO₂ emissions, rebates, and other incentives.

(2) Characterize the relative cost of the BIPV power system using multiple vendor bids and manufacturing strategies.

(3) Specify the measurement, verification, and testing procedures to certify BIPV products to obtain objective and widely applicable metrics.

(4) Assess the economic performance of BIPV power systems to help a potential customer determine if a BIPV product makes financial sense including investment analysis, payback period, savings-to-investment ratio, and internal rate of return.

To work towards meeting these 4 objectives, we present this technical assistance request to obtain help from organizations that can help commercialize our innovation. If awarded voucher money from the Set! phase, we also estimate how we would allocate voucher funds. As a newer type of PV technology, BIPVs require many of the same tests and certifications as traditional PV, and additional testing that is specific to building materials. The National Electrical Code, International Building Code, and International Residential Code require all PV products intended to be installed on or around a building to be certified by a Nationally Recognized Testing Laboratory (NRTL).

1.) **Unique Challenge and Need** – Building-Integrated Photovoltaics Testing

Proposed Assisting Entity – Intertek

Intertek possesses the accreditations to perform testing on solar concentrator photovoltaics like the prototype we described in the narrative section. Specifically, we would ask Intertek to perform Safety Tests UL 1703 and IEC 61730, Performance Tests IEC 61215 and 61646, and BIPV product tests AC 365 and AC 07. Conveniently, an Intertek laboratory is located close by here in Florida.

Estimated Funding Required – \$10,000

2.) **Unique Challenge and Need** – Constructing a model building to demonstrate our solar window.

In effort to address objectives 1, 2, and 4 above, we would like to work with a construction company to deploy our BIPV in a building so that we can obtain data related to construction costs, energy savings from reduced cooling, challenges associated with integrating our BIPV into existing electrical systems, and strategies on how to develop a product that easy for construction workers to install.

Proposed Assisting Entity – Sanalil Construction Inc.

Estimated Funding Required – \$15,000

3.) **Unique Challenge and Need** – Automating solar window fabrication.

Proposed Assisting Entity – Advent Design Corporation

An assembly line is envisioned that perform tasks like nanoparticle synthesis, purification, and quality control followed by deposition onto windows, glass bonding, and Si PV integration. We would like to receive multiple designs and bids from automation companies for an assembly line process flow that could be developed in our 3-to-5-year time frame. In doing so, we aim to have a confident prediction in what the cost per unit would be for a scaled-up product. This will help us assess our product-market fit and provide investment scenarios that we can offer to potential customers when performing customer discovery.

Estimated Funding Required – \$40,000

4.) **Unique Challenge and Need** – Generating capital to support automated manufacturing.

Proposed Assisting Entity – Silicon Valley Robotics

We would like to work with Silicon Valley Robotics to work on marketing our innovation to qualified robotics companies and investors that would be excited at the opportunity to fund the automated manufacturing of a novel BIPV technology.

Estimated Funding Required – \$10,000