



Optimal Solar: Request for Technical Assistance

Overview: Optimal Solar is a minority-owned, cleantech innovation firm. We are launching VIA™, a high efficiency, next-generation photovoltaic (PV) module. The solar technology concentrates solar radiation and splits it between visible and infrared and then generates electricity from the two sources of light using two separate chips.

Three areas will allow us to maintain and grow our competitive advantage: better understanding the system, its performance, and how to improve upon the design. In doing so, we have sought a relationship the National Renewable Energy Laboratory. We have began working in principle with Dr. Johney Green and his team. The work begins with understand the resiliency opportunities for our technology on the grid as well as with regards to military and space applications.

Our technology needs include review the basic science. This will include measuring and characterizing our devices and systems. We will need the tools and equipment listed on NREL's website which include:

- Analytical microscopy
- Imaging
- Interfacial analysis
- Electro-optical characterization

The result of the analysis will help us develop models and help to predict and/ or understand short and long-term performance.

In addition to understanding the basic science, it will be valuable to gauge the performance and reliability of the full system. These tests will include:

- Real-time PV and solar resource testing
- Accelerated testing and analysis
- Outdoor system and performance
- Degradation and soiling analysis.

In order for the technology to achieve bankability and future funding, the system's performance must be tested by a reputable, third party. NREL is the most trusted of sources. Further, the system's long-term ability can be tested, including its performance outdoors. Lastly, our claims on performance must be tested in light of any degradation, as well as how the system soils and its subsequent performance must be tested.

Lastly, the engineering of the system will be tested, and new manufacturing technologies will be sought to improve the efficiency in the fabrication of the

components and the overall system. Specific activities include:

- System engineering
- System integration
- Device performance
- Solar PV Model Development

The work includes designing models for technology systems like PVWatts, PVsyst, and others. It will also include review of the overall system to improve the manufacturing needs for the system.

So far, we have shown that our system has performed better than traditional solar while working at the NC Clean Energy Technology Center. The work included testing the performance of the chip with and without light splitting. The results included a relative increase in performance by 33%. Our next steps will include improving performance more by use of our infrared chip.

Given that new technologies do not have the balance sheet initially to become a Tier 1. The performance and costs of our systems must be better than what's on the market. Given for solar, over 80% of technology derive from southeast Asia, American products having strategic innovation and performance capability can compete through the resources of partners such as NREL and NC CETC.