

Technical resources that will help move the solar development forward

These resources will help in the long term development of this solar technology

- 1) Working to optimize our custom concentrator solar cells to maximize electrical performance would be the first task. Having access to a wafer- foundry set up to make monocrystalline solar cells would accelerate progress toward the design and fabrication of more efficient mid-range solar concentrator cells. Having access to the right equipment and professionals, to do the post fabrication testing would cut down the time necessary to tune the cell design for our system. Having NREL at our disposal with its resources and experience in the field of concentrator Photovoltaic cell fabrication would save months of development processing and testing. Our concentrator cell designer, Alex Slade PhD would be able to test out new ideas to reduce the cost and time it takes to fabricate our concentrator cells. Working with a foundry that he would have confidence in to do accurate and precise fabrication steps can reduce the time and money needed to maximize the solar cell performance. Laboratory testing of our concentrator cells requires very specific expensive equipment. Having equipment available will make fabrication and testing of the different process steps much easier and faster to tune for maximum wattage from the production cells.
- 2) Another aspect of our solar collector is the relationship between the components that make up the optical path. Having access to the professionals with appropriate computer programs and powerful computers to perform a full ray-tracing of our optical components, would aid in the design process. Working with this information will reduce the time it takes to development the production system. With optical modeling we can test the tolerances of misalignment of the reflector and the receiver. This type of modeling will also show how the overall unit performance is affected by environmental -influences, like winds, rain, snow loads and ice. With computer aided ray-tracing, different construction materials and component geometries can be explored to optimize the overall system design.
- 3) Another aspect of the optics is in production tooling. Our system will need assembly tooling fixtures and clamping systems to keep the optical components aligned. Each of these surfaces, the reflector, receiver tube and cover will need to be constrained while being fastened to each other. In the beginning this tooling can be simple but in the future when production is increasing, the tooling will become more sophisticated. Setting up ray-trace models to aid the design of production tooling will keep the reflector performance optimized in production quality control. Setting up laser test equipment will also aide in the production quality control.
- 4) One critical component of our design is the pressure sensitive plastic film being used as the reflector surface. Optimizing the manufacturing of this material will ensure the production of our unit has the highest performance. We will need to explore different materials and coatings

to reduce production cost for high volume production. Having access to production groups and film designers will aide in film production.

- 5) From the sales and marketing side of the company, being able to work with outside resources will shorten the time it takes to get our collector to the market place. Having a large national name attached to this product will make the market penetration much easier. Developing different market sectors like military, federal facilities, schools and industrial customers will bring sales up to the projected levels in a shorter period of time. Using these marketing resources to help develop new markets and identify potential customers, will be needed to allow this product to make a change.