Technical Assistance Request

ABSTRACT

We need automated snow removal for solar.

Solar panels are not designed for snow and ice conditions, yet snowfall impacts the reliability of solar power and cost of maintenance.

NREL data shows the affected areas of the United States risk PV losses of 2-16% annually. Northern Minnesota (where our team is located) expects to lose 10-16% PV energy production annually. In one extreme case, a site in Northern Alaska is estimated to have annual snow PV losses reaching almost 40%.

We have developed a solution that uses standard solar panel manufacturing techniques to create a solar panel that is optimized to reduce losses from snow and ice. The unique combination of features will make testing key to ensuring success in the field.

REQUESTS

Patent Expertise

We need help identifying and pursuing intellectual property protection. Our solar panel design combines several unique features to handle snow and ice.

Market Insights

We will need to conduct a thorough market study. While we know this problem is prevalent in the industry and has been studied extensively, we are unsure what customers in residential, commercial or utility scale would pay to incorporate this technology into their arrays. This information will help direct the product strategy to be able to hit a certain target price point in comparison to traditional panels.

UL Certificate Experience

We will need UL and CE certifications for our markets, and we will need guidance from someone who can counsel us through the process and standards requirements. Our snow solar panel will also need independent testing to be certified before it can be installed in a pilot program as part of the Go! goal.

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Testing Partners

The solar panel design is going to include insulation to aid in the efficiency of the nanoparticle heater. As a result, the panel may respond differently than conventional solar panels in other conditions. To rapidly iterate our design we will be looking for a partner located in a warmer climate or facility with a test chamber that will be able to accurately characterize the performance of the panel in high heat and humid conditions. Due to the unique configuration of the panel we will be testing all aspects of the design.

Technical Modeling

We will be looking for laboratories to help us model the loads and stresses incurred from various weather conditions our product will endure and comparable benchmark product data. With this additional data, we can accurately model our solar panel design and understand performance expectations.

Prototyping Components

In the prototype, we plan to use bent sheet metal to create the rear frame of our panel which we can produce in house or contract out with a small manufacturer. We will eventually have manufactured a custom die for aluminum extrusion that will allow us to interface with existing racking systems. We need a manufacturing partner for short run custom aluminum extrusions.

To offer assistance, please reach out:

VAGNER

KARL WAGNER: *Product & Development*
(218) 390-1867, karl@solarmuseum.org, linkedin.com/in/wagnerkarl

DANIELLE RHODES: *Business & Marketing*
(218) 216-7078, danielle@solarmuseum.org, linkedin.com/in/qwirk

OUR PARTNERS:

HELIENE | minnesota power | STEP heat | ecolibrium3 LOCAL ENERGY MATTERS | POWERHOUSE