Thee Solar Company - Thee Inverter Box

American-Made Solar Prize Round 7 Ready! Contest Submission

Thee Inverter Box® (patent & trademark pending)

Technical Assistance Request

We are developing a DC-to-AC electronic inverter system for residential and commercial applications. We would like for our customers to monitor the output of each solar panel. Basically, we would like to emulate the Enphase® Enlighten, plus add additional parameters.

- The key parameters that are monitored include:
  - Notify users whether there's a problem with any equipment or wiring.
  - If the fault is from a solar array, it will identify which panel is experiencing trouble.
  - Daily solar system performance updates include:
    - How much power was created on that particular day.
    - Daily energy data displays the maximum power used for the day.
    - Weather conditions.
  - Preserves a record of solar array power generation in 15-minute increments throughout the day from the time of installation.
  - Real-time data on any given day of its lifespan.
  - Shows the most profitable time the system is running.

- An added feature we would like to include would be:
  - Provide total energy management of residence or commercial property.
  - This means Solar Panel Monitoring system will have the ability to turn on / turn off appliances during the day and at sun set that will allow the solar system to operate on island mode without any or at least greatly reduced battery capacity.

We Request Technical Assistance from our national labs:
We need a Technical Viability Analysis conducted on our **Thee Inverter Box** that will show:
1. How well can **Thee Inverter Box** be scaled?
2. Demonstrate the ease of Installation of **Thee Inverter Box** on an Unoccupied Test Home.
3. Determine how novel is the idea.
4. The Multiple Benefits of our product –
   a. Can Thee Inverter Box operate for 25 years?
   b. How efficient is Thee Inverter Box at achieving MPPT, achieving a high power factor, and converting DC from the solar panels into AC?

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Technical Assistance from our National Labs
Conduct a Market Characterization of the product
Conduct a Construction Cost Estimation
Conduct a Building and Electrical Code Compliance analysis
Benchtop Demonstration that will Emulated Load Test Bed and General Bench Testing
Conduct a Field/Lab Demonstration in an Unoccupied Test Home
Conduct Testing and Analysis with Software Modeling for Assessing the Impacts of the product
Provide Technical Viability Analysis on the speed, scaling, ease of installation, and novelty of the Product
Conduct load profiles. Perform durability and endurance testing.