September 27, 2023

American-Made Network
Solar Challenge Round 7
Washington, DC

American-Made Solar Challenge Round 7

Subject: SunnyGPT - Technical Assistance Request

Dear American-Made Solar Challenge Prize Administrator:

Please accept this Proposal as a formal request for formal assistance to enable Blockchain Power LLC to continue building "SunnyGPT", a solar-data-trained AI chatbot to support asset owners, technicians and operators to identify equipment issues and recommend actions that will quickly assist issue remediation. This will improve solar asset performance and make it easier for solar workers to do their jobs.

Our team is on a mission: to unlock solar photovoltaic (PV) data at scale to:

1. Better evaluate development and operational asset risks;
2. Improve asset performance and
3. Optimize financial outcomes for the solar industry.

As solar industry veterans responsible for a substantial portion of the assets under development and in operation in the United States, we have observed first hand that the solar industry is underperforming - and badly - in the US and around the world. Per recent industry reports from kWh Analytics and Raptor Maps, solar systems in the US have underperformed financial models for 10 years in a row and are costing asset owners more than $2.5 billion in missed annual revenue and green energy production.

The SunDAO Network currently has access to North Carolina State University AI / ML energy lab as well as Florida International University's PANDORA and GENIE advanced energy lab.

NC State University's research lab is focused on the development of transformational digital tools and technologies using physics-based and data-driven artificial intelligence (AI) approaches to enable connected, resilient, reliable, safe, and affordable energy for an equitaSincerelyible, and sustainable future. Their Office of Information Technology provides High-Performance Computing (HPC) services available to all NC State faculty members. The HPC service includes compute resources, scratch storage using high-performance parallel file systems, low latency networks, licensed system and application software, and scientific support for the use of the resources.

The Florida International University team has made available their hybrid PV pan (HPVP) facility at the FIU Engineering Center campus. This facility is equipped with the following core functionalities:

1) GE industrial-grade Advanced Energy Management System (AEMS) and Advanced Distribution Management System (ADMS) that operates 1.4 MW grid-tied PV array, 3MW-12MHr Storage, 0.5 MW Diesel generator and many other arrays, such as a 67.5 MW PV power plant,

2) Replica, data, visualization and experimental platform of 450 substations carrying more than 20GW of power to 5+ Million customers,

3) More than 15 feeders direct access, 46 PV inverters with bi-directional control located in both commercial and residential areas having at multiple EV chargers,

4) Data access from industrial level PV systems connected to transmission systems,

5) SynerGEE distribution modeling and planning software with a capability to analyze up to 30,000 nodes,

6) 5+ million customer and distribution network data gathered from state-of-the-art grid comprising several million nodes, and

7) Weather and grid reliability data, spanning over 10 years. The Center for Proactive Analytics and Data-Oriented Research on Availability Security (PANDORAS) is equipped with multicore central and general-purpose graphical processing units (GPGPUs) integrated over a secure, isolated network. These processing units host a robust data flow pipeline that streamlines data points generated at different frequencies and volumes from multiple grid-edge assets. Additionally, PANDORAS also runs in parallel to and replicates 20 GW of peak power generation with 5 million utility customers served by over 500 distribution substations that consist of feeders with different topologies (radial, mesh, and loop).

To leverage our current internal resources and partnerships described above, and to realize our solution the following types of assistance would be beneficial:

1. NREL support for: data refinement; data standardization; AI training methodology refinement; data security protocol development and data privacy best practices.
2. Access to relevant data that can be used to train and refine SunnyGPT.
3. Support with beta testing of SunnyGPT within a laboratory environment.

Sincerely,

Greg Ness

Greg S.K. Ness