



American-Made Solar Prize Round 4
Technical Assistance Request



Solar Battery:

A Novel Solar + Battery System in One Device

Miplus Solar Inc.

The greatest technical barrier for the MIplus Solar Team is the production of commercial-size panels for testing and validation. Commercial-size panel production requires improving our device's performance and maintaining performance levels as it is scaled to a larger size. To do this we require precise measurements, testing, and verification in a controlled environment with standard testing conditions. The National Renewable Energy Laboratory (NREL) will be a key partner and collaborator for MIplus Solar during the Set! and Go! Competition phases to advance the technology readiness level (TRL) of the MIplus Solar Battery. In particular, NREL's Energy Systems Integration Facility (ESIF) will be valuable to our team as its research aligns with our product development. ESIF specializes in the development of innovative technologies and strategies for energy generation, transport, storage, and demand-response.

We would like to request technological assistance from the following laboratories:

- **The Manufacturing Laboratory** provides core infrastructure and services for coating and deposition processes such as roller printing and drying for photovoltaic (PV) and battery technologies.
- Testing and certification (IEEE 1547 and UL 1741 standards) can be done in the **Power Systems Integration Laboratory** to measure functionality of the MIplus Solar Battery under different modes of operation: behind the meter, off-grid, or microgrid.
- The **Energy Storage Laboratory** can help us develop our value proposition and business strategy with their battery performance assessment and techno-economic model.
- **The Outdoor Test Facility (OTF)** at NREL performs diverse testing and validation for PV devices under simulated, accelerated indoor and outdoor, and standard outdoor environment. Their standard outdoor module and long-

term performance testing systems are essential to determine the stability and lifespan of the MIplus Solar Battery.

- **The Accelerated Exposure Testing Laboratory and PV Module Encapsulation Research Laboratory** offer temperature and humidity controlling chambers to test the PV devices for simulated extreme weather conditions.

For a start-up company like MIplus Solar, non-R&D technical assistance from the American Made Network is of great value and an important opportunity for successfully jumpstarting technology commercialization. In the past year, the MIplus Solar Team has participated in mentorship programs for commercialization, strategy, and market analysis supported by Cleantech San Diego, a member of the American Made Network. Through this Solar Prize Contest, the MIplus Solar Team will continue to engage and receive support from Cleantech San Diego to network with local companies, investor, and stakeholder organizations.

The highest potential risk in the development and commercialization of our proposed solar battery technology is achieving a minimal viable product. The MIplus Solar Team has a strong theoretical background and extensive experimental skills needed for the successful development of the technology, but mentorship and strategic advice are needed. We will request continued support from Cleantech San Diego, EPIC SBDC and other members of the American Made Network.

Through the opportunity for requesting technical assistance, the MIplus Solar Team will seek help with prototyping, manufacturing, testing and validation as needed for the successful development of the MIplus Solar Battery technology. We will continue to work with Cleantech San Diego and EPIC SBDC for mentorship, business development, funding opportunities, and investments.

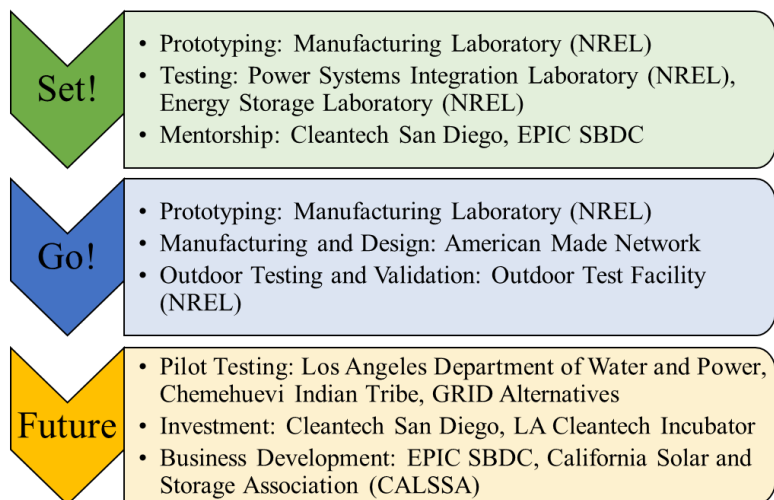


Figure 1. Schematic diagram of the technical assistance request summary.