



TECHNICAL ASSISTANCE REQUEST

AMERICAN MADE CHALLENGE SET! CONTEST

I. Validating Core Technology Claims

Uplift would like to work with the National Renewable Energy Laboratory (NREL) and/or Sandia National Laboratory to conduct an initial validation of core technology claims. Validation would involve placing multiple Uplift-Inside modules in a location or locations where it can operate for a pre-determined period and be monitored. Parameters to be investigated include output voltage; temperatures inside the module; and power output of the module. This testing should also validate the shade-mitigation by imposing partial shade on a subset of the modules's cell strings and comparing power output with wholly unshaded samples.

II. Validating Rapid Shutdown Compliance

Uplift is looking for a partner to run the SunSpec testing to affirm Rapid Shutdown signal demodulation, interpretation, and response.

III. Validating Data Communication Capabilities for Cloud Sensing

Uplift would like to place Uplift-Inside modules at NREL and one or two other locations to act as cloud sensors. Ideally the modules will communicate to the Sensing, Measurement, and Forecasting Group at NREL for further work with its Physics-Based Smart Persistence Model for Intra-Hour Solar Forecasting (PSPI). The group would advise Uplift on raw data and edge-processed data packets that could be used to determine cloud albedo and cloud movement vectors, and needed speed of data delivery for 5- and 15-minute irradiance and energy forecasting. Tests would verify data as a useful foundation for discerning albedo and motion; data accuracy; and whether speed of delivery can be sufficient.

IV. Validation of Partial Shade Mitigation Value Proposition

Uplift has learned through customer discovery that installers avoid array layouts and module placement where shadows and obstructions affect power output, and that could mean foregoing modules. This problem is more acute for residential, roof-top installs. Uplift is interested in technical validation as to the power output of an Uplift-Inside module under deliberate

partial-shade conditions as compared to other modules without DC optimization or with module-level power electronics available on the market today. Uplift is also interested in data discovery, from solar module installers and users in the field, as to the quantitative value of modules producing power in partial shade conditions comparable to nearby, unshaded modules. Additional quantification of interest is the potential reduction in installer training and time as a result of lower sensitivity of array layouts to partial shade.

V. Manufacturers of Specialized Form Factors or Energy Storage

Uplift is looking for additional partners with bifacial or unique module form factors that have difficulty integrating external DC optimizers. It is also interested in energy storage or DC appliances that could benefit from module-integrated Pay-As-You-Go management capability, or anti-theft protection embedded in the battery or device. Uplift would evaluate integration of its device into the form factor to meet power optimization, shade mitigation, Rapid Shutdown compliance, and voltage control needs not met by the module-level power electronics currently on the market.