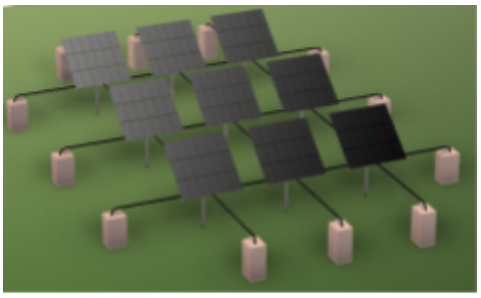
Technical Assistance Request

Sunflower: Cable-Stayed Agrivoltaics w/ Dual-axis tracking



Sunflower - Cable Stayed, dual axis, dual-use PV array

As we move to larger arrays in our demonstrations there are 5 areas of assistance we could use.

1) Labor optimization – Building at height is a known challenge. As we prepare our prototype panels and lift them into place, we will be relying on best practices for construction. We suspect that current construction best practices could be augmented by a research analysis of the task at hand.
    a. Skills needed: value stream mapping, human factors.

2) Winch/motor design optimization – As our arrays move from requiring 4 tons to 62 tons of force to adjust; alternative pulling forces may be required. Off the shelf winches are designed for short use and relatively fast pull (ft/min). Sunflower requires a large volume of low speed motors, 5ft/hr, which suggests a less powerful, highly geared solution would suffice.
    a. Mechanical engineering, electrical engineering, modelling by machine expert.

3) Alternative force discovery – As we consider other methods to reduce the wear on our motors, it may be wise to spring load elements in the array. This has not been fully explored.
    a. Mechanical engineering, material science, metal casting, automotive.

4) Custom attachments – Present rigging is available in sufficient strength and ease of use for our READY! Demo. As we move to larger arrays (9 poles to 100), custom rigging and connectors will prove beneficial for scale.
    a. Mechanical engineering, modelling, metal casting and manufacturing methods.

5) Control software – For the 3x3 demos we will be able to simulate sun tracking without advanced tracking software. We have the algorithms developed to track the sun by cable positions throughout the year. This needs to be converted to machine controls and electronics including safety functions, feedback systems, and notifications.
    a. Electrical engineering, software development, power control electronics.