KILONEWTON

TECHNICAL ASSISTANCE REQUEST

SOLARSPACE: Prospecting & Optimization Software

PROJECT SUMMARY: In the rapidly growing large-scale ground mount solar market, contiguous flat sites have been prevalent until recently. Challenging sites with unique civil and topographical requirements are over budget and underperforming more than ever. This is due to developers and engineering, procurement and construction companies (EPCs) failure to accurately predict issues affecting site soft costs and electricity generation. KiloNewton LLC, a solar and renewables services company, is developing an extremely efficient, unique solution using geographic information system (GIS) software in order to originate and build sites more accurately, including predicting and optimizing site soft costs, array output, plant profitability, and levelized cost of energy (LCOE).

KiloNewton's site optimization software and software as a service (SaaS), SolarSpace, will significantly improve the accuracy of predicting terrain issues that affect site soft costs and electricity production as well as quickly identify buildable areas and trade-offs between sites in terms of production variations, costs of components, and soft costs such as grading. It will also predict production losses caused by self-shading of the system due to terrain – a topic receiving close review today, currently without any software solution.

Balance of system (BoS) hardware and soft costs and generation losses can vary significantly depending on geographic variables on-site. SolarSpace will improve early planning to choose technology wisely and avoid costly areas, allowing developers and EPCs to assume the lowest range of these costs for a given region. In eliminating or reducing these problems at the start of development, costly redesigns and negotiations with local authorities having jurisdiction (AHJs) can be avoided. Additionally, developers tend to use a "shotgun" approach to site selection, choosing many sites and down-selecting through a process of individual preliminary analysis of each site. SolarSpace will enable the site down-select process to happen simultaneously for a project portfolio, saving valuable time and hours of analysis and reducing LCOE by up to 10%.

SolarSpace will enable municipalities, project developers and utilities to efficiently identify lowest cost/most efficient sites, either by searching within a large area, or selecting smaller parcels to compare. EPCs and operations and maintenance (O&M) providers can use the toolboxes to optimize sites during construction and after commissioning through terrain analyses of siting variables such as: slopes, geotechnical variation, flood conditions, complex terrain-related shading issues, racking design, and tracker parameters. Results can be used to tune production models for monitoring and increased confidence in production, resulting in better guarantees for investors.

ASSISTANCE REQUEST:

There are three main areas that we could use assistance with our software development,

1. Geographic Datasets/databases: We are looking for available datasets that can be combined in a GIS-based environment to work with our software. Though we have identified sources for most of our tools, we are always on the lookout for new sources and partnerships to bolster the confidence in the results of the tools. Of particular interest are well vetted, national datasets. We are interested in datasets in the following areas:

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Costs	Yield	Financial/Feasibility
Building Code (wind, snow, seismic, ice, etc.)	Meteorological data	PPA rates
Topography (grading vs. foundation costs), altitude	Location (latitude)	Line load costs
Proximity to grid, population centers, and roads	Irradiance	Political (national, state, local tax incentives/ depreciation)
Atmospheric corrosion	Temperature	Land use types/zoning
Soil properties	Topography (slope, aspect, curvature)	Land costs & availability
Vegetation mitigation	Bifacial technology: Soil/flora reflectivity	Endangered species/habitat
Floodplain avoidance	Module soiling	

2. Testing: We are also looking for developer, investor, EPC and O&M partners with real projects interested in site analysis services. We have been using these products already on several major utility scale sites with large developers/EPCs, however we are looking for a greater variety of types of projects and locations. If selected for the prize, we can provide some discounted services on sites, analyzing geographic design factors most important to you. We are looking for sites generally 1MW+, preferably 25MW+.

3. Validation:

    a. We are looking for investors, EPCs, or developers willing to share financial details on build costs and project performance to incorporate into validation studies of the software. Specific data would be completely proprietary, but we would need to publish high-level results of the study, and prefer a company willing to support marketing efforts as well.
    b. We are also looking for labs or analysts familiar with site financial analysis with respect to technical variables to vet the software as we complete portions of its functionality. We would prefer national/public laboratories or larger companies interested in performing case studies on sites with known financial variables.

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