

SolarStax® Imagine Vertical Solar Anywhere

Entry by Ronald Gdovic PhD

Background:

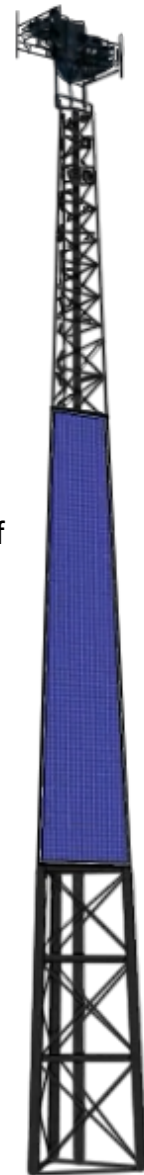
Traditionally Solar arrays have serious constraints in terms of land and roof area requirements. Most use fixed mounting facing south (in the US), which is a compromise between optimal inclinations depending on seasons and panel shadowing. Research has shown East/West configurations and vertical panels can generate more energy at certain latitudes and seasons than horizontal panels. While vertical optimized panel options can be a game changer in the solar industry as a whole, one industry stands out as direly needing a vertical renewable energy solution - wireless communications. Cell towers in aggregate consume a substantial amount of energy and have few options for adopting renewable energy. Most cell towers operate on grid but many thousands of off-grid towers operate on diesel or gas generators globally.

Our Solution and Areas We Request Assistance:

We intend to develop multi directional PV cells using smart cell technology driven by artificial intelligence. We propose to develop solar modules and balance of system components optimized for vertical installations and east/west configuration with a focus on microgrid solutions for the communications tower industry. Many external factors effect photo voltaic energy harvesting including dozens of environmental, seasonal, geospatial, and geopolitical variables. Micro inverters are a small step in the right direction but fall short of our goals.

Vertical panels have several important advantages in northern and southern latitudes as well as at the equator. They are self cleaning, do not accumulate snow, sand, or frost, run cooler than rooftop and ground mount panels, and, most importantly, vertical alignment is better suited for east/west configurations. Research on vertical panels on buildings has proven to be as efficient or more efficient than traditional rooftop arrays under certain circumstances. However, these projects are typically grid tied installations more comparing daily energy production per square foot of PV.

Distributed energy resources and microgrids of today and the future rely on battery storage to smooth renewable energy cycles. As traditional solar installation increases, problems of over generation will continue to bring grief to utilities and consumers.



Storage is part of the answer but modern battery chemistry prefers long duration and predictable charge and discharge cycles. Vertical East/West arrays make more sense in these systems.

- We are looking to other industry partners to help us achieve our goals should we be successful in winning this award. One of our industry team members is active in designing, manufacturing, installing and servicing microgrids using wind and solar at a commercial level. We will seek assistance in PV cell and module manufacturing when we reach production.

- We will look to add specialists engineers to assist in development. UL testing, compliance, and certification is another area we will need assistance.

- Structural engineering is important and we have some in house structural engineering capabilities to design towers. However, we will seek specialists in PV racking, wind and other load testing procedures, and safety procedures.

- Our team has contacts and interest from the Telco industry in the US and overseas. However, we will seek specialists with experience in the wireless communications industry and/or direct contacts in major US carriers who may want to participate in our pilot program.