



The SolarEdge Agri-PV Solution

Using MLPE technology to
grow energy and crop yields

The power of Agri-PV to bring farmers more control over their profitability and their energy future is being increasingly recognized across agricultural markets worldwide. Reducing operational costs, protecting crop yields and adding stable revenue streams are just some of the big benefits solar can bring to commercial farming. The expected growth of the global Agri-PV market from \$3.7B in 2022 to around \$11.14B by 2032¹ represents huge opportunities for Agri-PV stakeholders.

As with any solar project, Agri-PV installations come with their own unique set of challenges that must be fully addressed by the selected solar technology to ensure its long-term success.

¹ Source: www.precedenceresearch.com

Module Level Power Electronics (MLPE) - the smart choice for your Agri-PV projects

Using MLPE technology, SolarEdge PV systems can mitigate challenges posed by Agri-PV by maximizing crop harvest and solar energy production, ensuring site safety and increasing operational efficiency. MLPE-based SolarEdge Power Optimizers ensures that individual PV modules produce at their maximum energy level, regardless of module orientation or shade/dirt exposure. This is the key to successful Agri-PV installations as the additional energy produced is often significant to the bottom line of the project.

Main Considerations When Installing Agri-PV

As the Agri-PV market continues to grow worldwide, so have the number of publications detailing Agri-PV best practices and installation guidelines. The 'Agrisolar Best Practice Guidelines' published by SolarPower Europe in June, 2023² is one such example.

The requirements listed in these documents highlight the importance that policy makers are now giving to the following aspects of Agri-PV installations:

A: Maximization of Energy Production

To be deemed a viable alternative to traditional PV systems, Agri-PV site production should not deviate too much from that of a traditional PV system installed on the same area. Therefore, deploying an Agri-PV system designed to maximize energy output is essential.

B: Real-Time System Visibility

The ability to continuously monitor the operation of Agri-PV sites in real-time, with remote troubleshooting capabilities, is essential in ensuring optimal system performance and longevity.

C: Comprehensive Site Safety

Agri-PV site operation and maintenance relies on a safe operating environment that protects personnel and livestock at all times. Agri-PV systems deploying MLPE have been recognized by leading authorities such as SolarPower Europe and the Japanese government as the best approach to mitigating potential Agri-PV site electric shocks and fires.

Read on to learn how SolarEdge's Agri-PV solution is clearly aligned with market best practices, ensuring optimized energy and agricultural production while maintaining operational efficiencies.

² <https://www.solarpowereurope.org/insights/thematic-reports/agrisolar-best-practice-guidelines>

Why Is SolarEdge the Best Solution for Your Agri-PV Installations?

Successful Agri-PV installations must overcome several unique challenges relating to site design, system operation and maintenance, and the synergy between solar and agricultural production. Installing the right PV technology is critical.

SolarEdge's MLPE-based Agri-PV solution can help farmers and solar developers meet these challenges and fulfill the requirements of the latest international Agri-PV guidelines, creating compelling opportunities for both PV developers and farmers by ensuring the synergistic production of both energy and crops.

Typical SolarEdge Agri-PV Installation



A: Maximization of Energy Production

SolarEdge systems are designed to maximize energy output through a variety of methods:

DC-optimized topology

By connecting one Power Optimizer to every two modules in the PV array, the SolarEdge solution mitigates power losses caused by module mismatch e.g. soiling and shading. This results in maximum production from each module compared to string inverter systems - the under performance of one will not affect the rest of the system.

Unique design flexibility

By utilizing MLPE technology, SolarEdge enables better design flexibility which improves both land-use efficiency and increased coverage potential.

Innovative installation techniques

Agri-PV installations often requires innovative PV technology and unique installation techniques such as:

Installations on slopes and uneven terrains

With short tracker table size ranging from 8-24 panels, SolarEdge's PV trackers allow installation flexibility on slopes and around obstacles while preserving easy access to crops.

The short tracker allows multiple tracker angles within each row, so our smart algorithms can optimize the shading and sunlight needs of specific crops.

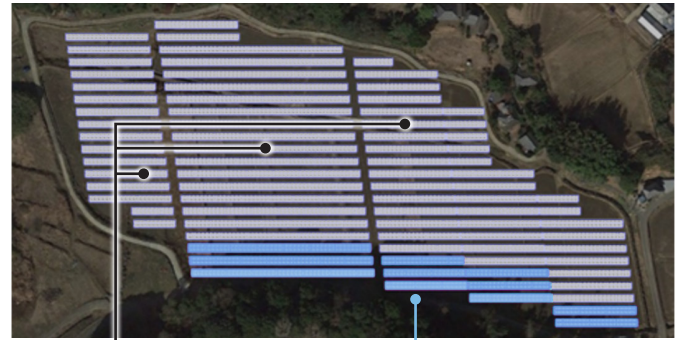
Elevated installations

SolarEdge's compact PV trackers weigh 20-40% less than standard trackers, enabling structures of up to 5m high, that use lighter piles with a lower driven depth.

Sites utilizing bifacial and vertically installed panels

SolarEdge's DC optimized technology can overcome the unique challenges faced by installations using bifacial or vertical panels, vertical installations, through panel mismatch mitigation, advanced safety and design flexibility.

Due to the uneven light distribution on the rear side of the bifacial panels, mismatch loss can reach more than 10%. This is even more noticeable in vertical installations, where mismatch can reach up to 30%³. SolarEdge MLPE topology helps mitigate these mismatch losses for higher energy yields.



Traditional system

More modules with SolarEdge flexible design



Elevated structure using SolarEdge PV trackers



Vertical installation powered by SolarEdge

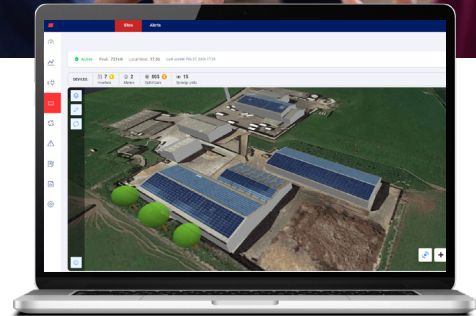
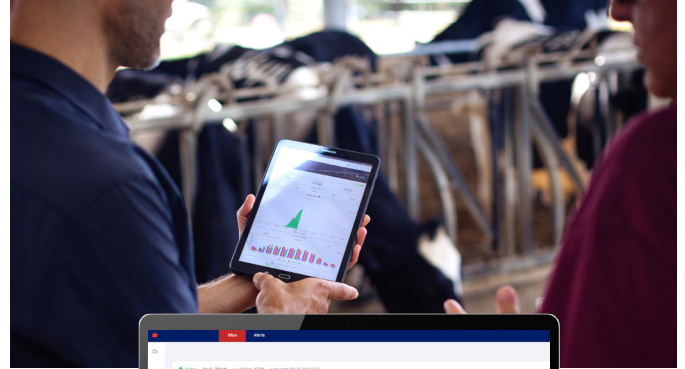
³ Based on SolarEdge Monitoring Platform data taken from rooftop vertical installations

B: Real-Time System Visibility

Using the SolarEdge ONE energy optimization platform, the SolarEdge Agri-PV solution provides real-time, centralized control of PV installations for increased profitability, flexibility and predictability.

It is responsible for managing site energy production, consolidating comprehensive internal and external agronomic-related data to make intelligent decisions that balance the need to optimize crop yield as well as energy production.

SolarEdge ONE conducts real-time monitoring of the site's production and consumption allowing pinpointed detection of system issues. This includes a live alerts system that ensures quick response to critical issues. Using remote troubleshooting tools that minimize on-site visits, SolarEdge ONE can reduce interference with agricultural activity by solar maintenance crews.



Track system performance using SolarEdge ONE

C: Comprehensive Site Safety

SolarEdge's approach to PV safety is based on a holistic solution that addresses various safety requirements, from the installation stage and throughout the system lifetime.

We have developed built-in safety features, such as SafeDC™, that meet the most up-to-date PV safety regulations and insurance requirements, ensuring maximum protection of people, property and livestock. Further boosting our safety credentials, SolarPower Europe recommends MLPE technology in Agri-PV systems to reduce the risk of electric shocks and fires.

Built-in SafeDC™

Designed to automatically drop DC voltage to touch-safe 1V DC. This enables a safer environment for installation, maintenance work and emergency teams during fire events.

The Bottom Line

SolarEdge's field-proven, innovative PV + tracker technology helps farmers and solar developers successfully address all requirements of the Agri-PV market.

About SolarEdge

SolarEdge Technologies is a global leader in renewable energy technology that applies world-class engineering and innovation to provide solar PV solutions for the residential, commercial and utility segments. SolarEdge brings an optimized approach to generating, storing, managing and consuming energy. The company develops and produces PV inverters and Power Optimizers, energy management and optimization solutions, energy storage and grid services. SolarEdge's DC-optimized technology is installed in millions of homes in over 140 countries, and more than 50% of Fortune 100 companies have SolarEdge technology on their rooftops. SolarEdge is accelerating the transition towards distributed, sustainable energy networks which will optimize energy everywhere.