

Optimizing Education with SolarEdge

► Nairobi, Kenya

► 600 kWp



Questworks

Using the SolarEdge DC optimized inverter solution, the installation is considered to be East Africa's biggest rooftop-mounted solar site and believed to be Africa's largest rooftop solar plant.

Installation Date: June, 2014

Inverter: 30 x SolarEdge SE17kW

Power optimizers: 1200 x SolarEdge OP600-96V

Modules: 2400 x Jinko Solar 250W

Installed by: Resol.co.ke

Designed and Managed by: Questworks.co.ke

“SolarEdge’s module-level MPPT improved the energy yield of Strathmore University’s PV system by up to 20%, while its flexibility of design allowed the University to increase the overall system size by more than 50%.”

> Philip Mwangi, Engineer of Questworks and Resol

“We recommend SolarEdge technology for commercial PV installations because it offers the highest dollar per watt value. With a good design and business case in place, SolarEdge truly provides the best value for your money.”

> Timothy Kipchumba, Supply Chain of Questworks



Four years ago, Strathmore University had originally installed a small 10 kW system. Interested in increasing the size of the system for ecological and financial reasons, the University set out to expand the system to 600 kWp. Being a social pioneer as the first multi-racial college in Africa, the University also wanted to be a technology pioneer and so chose Questworks and the SolarEdge DC optimized inverter solution for its PV system. Upon completion, the installation is considered to be East Africa's biggest rooftop mounted solar installation and believed to be Africa's largest rooftop solar plant.

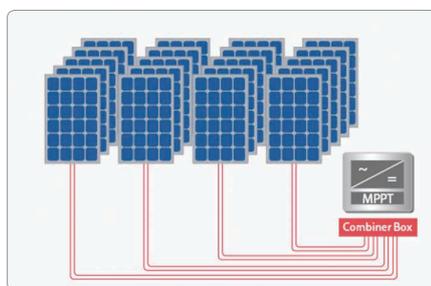
Increased Energy Yield through Module-Level MPPT

The SolarEdge DC optimized inverter solution performs per module maximum power point tracking (MPPT) and therefore allow each module to generate its own maximum possible energy. This eliminates power losses due to module mismatch and increases energy yield of the entire system. As part of the first stage of the expansion, Strathmore University decided to retrofit the original 10 kW system with the SolarEdge DC optimized inverter solution. During the pilot test, the University experienced a 20% increase in energy. This increase in energy convinced the University to optimize the entire system with SolarEdge technology.

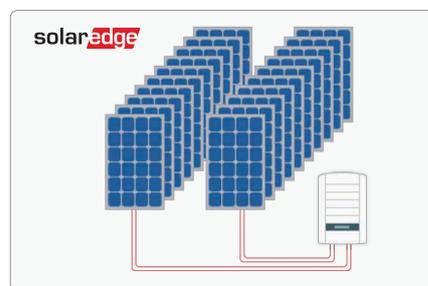
Maximum Design Flexibility

The SolarEdge DC optimized inverter solution maintains a fixed-string voltage at the inverter's input. This provides unprecedented design flexibility through significantly longer strings - up to 60 modules per string (compared to a maximum of only 24 modules per string with a typical string inverter). By being able to increase string length to 40 modules per string, SolarEdge technology provided the University with a significant reduction in BoS costs.

Longer Strings for Decreased BoS Costs



Traditional String Inverter



The SolarEdge DC optimized Inverter Solution

With multiple tilts and orientations, the University's rooftops created a significant design challenge. With a traditional string inverter, the installation would have required individual strings for different roof tilts in order to minimize energy losses. However, the SolarEdge DC optimized inverter solution, in combination with Questworks' design expertise, allows strings to be comprised of modules installed on varying roof tilts, orientations, and facets. This enabled the University to significantly decrease the amount of strings from 250 with the initial design to only 60 strings with SolarEdge as they were able to put modules of different orientations in the same string. This design flexibility decreased the inverter and switching components by approximately 50% and minimized the mounting structures and trucking.



Multiple orientations in a single string

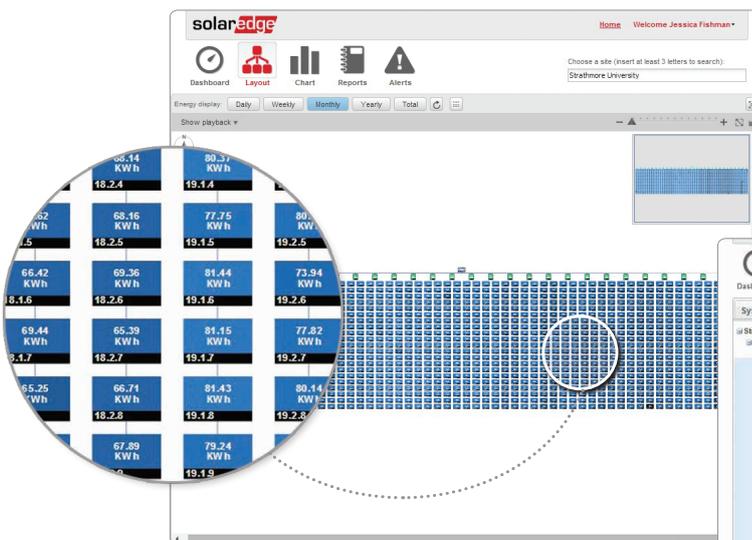
More Energy by Design

By allowing more modules on the roof, the SolarEdge DC optimized inverter solution significantly increases system capacity. If the University had used the same number of typical string inverters as current SolarEdge inverters then the system would have been limited to 900 modules - less than half of the current system.

Enhanced Maintenance

With a variety of factors impacting the bottom line of a PV system, solar asset management is essential in minimizing operation and maintenance (O&M) expenses and maximizing lifetime energy yield. By selecting the SolarEdge DC optimized inverter system with real-time remote monitoring at the module, string, and system levels, Questworks can use the SolarEdge monitoring portal as a strategic O&M tool to proactively manage its solar assets. As a management tool for optimum plant operation, the SolarEdge monitoring portal provides Strathmore University with increased system uptime and minimized downtime through a variety of features:

- Comprehensive analytics tracking and reports of energy yield, system uptime, and financial performance;
- Pinpointed and automatic alerts for immediate fault detection, accurate maintenance, and rapid response;
- Remote troubleshooting for fast and efficient resolution with minimal onsite visits.



The chart view from the SolarEdge monitoring portal shows the performance of individual modules. This graph illustrates that the power of each module is optimal and independent of other modules in the same string.

The hierarchical layout from the SolarEdge monitoring portal shows that modules in the same string have module-level MPPT. The zoom-in provides module-level energy production. This screenshot shows the monthly energy production.

