

Illuminating the Solar Superhighway of Brazil

Morningstar Charge Controller Selected for Largest Solar Lighting Project in Brazil

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Summary

- Largest solar highway illumination project in Brazil
- Project will light 73 KM of highway along the Arco Metropolitano
- Morningstar’s TriStar MPPT-45 critical component of self-contained energy storage system

Situation



The Arco Metropolitano is a 145 KM arch of highway in the state of Rio de Janeiro stretching from the port city of Itaguaí to Duque de Caxias, a commercial and manufacturing center that boasts one of Brazil's largest oil refineries. The arch skirts the booming metropolis of Rio de Janeiro city, providing a vital connection to the five major highways that crisscross the state.

One of the most strategic highway projects in Brazil, the Arco Metropolitano diverts commercial traffic out of the congested roads of Rio de Janeiro city, while serving as a lifeline to the less developed regions of rural Rio de Janeiro state. Commercial trucks transporting goods throughout the state have reduced transportation time by half, and development along the highway has brought economic growth to regions previously cut off from the city center.



Project

Hazardous weather conditions and high crime made driving on the highway at night difficult and dangerous. To keep the highway open, the government needed a reliable lighting solution that would provide round-the-clock illumination on the most trafficked and dangerous stretches.

In response, the state government of Rio de Janeiro facilitated the largest solar highway project ever attempted in Brazil, and one of the largest in the world, a project locals called the Solar Superhighway.

The project called for more than 4,300 free-standing streetlights to be installed along a 73 KM stretch of the highway connecting to Itaguaí, a critical port entry.

Solution

Japanese electronics firm Kyocera Solar, Inc partnered with a Brazilian engineering company Soter to develop and install a street lighting system capable of producing 2.8 GWh of solar energy per year without burdening the already fragile local energy grid.

The solution, a Kyocera streetlight kit, creates a stand-alone streetlight independent of the local grid, or other supplementary energy sources. To accomplish this, the system depends on a lead battery system connected to a charge controller, capable of storing up to three days worth of energy. The Morningstar TriStar MPPT-45 serves as a critical component for this single-source energy solution.

Each streetlight kit, capable of producing more than 2.8 GWh of solar energy per year, consists of:

- Morningstar TriStar MPPT-45
- Four 240 Ah/12 Vcc batteries
- 150 W LED lamp
- Three solar modules
- One photocell
- One pole with mounting structures

To operate, the batteries are connected to the TriStar MPPT-45 and store solar energy during the day. Once the photocell detects that light levels have fallen and LED lamps are needed, the lights automatically switch on. The system is capable of storing enough energy to power a streetlight for up to three days without sunlight.

“The success of high-profile projects such as this one will position Brazil as a global leader in solar and renewable energy. With so much depending on this project, we need components with exceptional quality and reliability. Morningstar products are best in class and the MPPT-45 was the clear choice when choosing a charge controller for this project,” said **Sergio Beninca, President of Kyocera Solar Brazil.**