



# New Sun Road Connects Uganda to Clean and Reliable Energy with Digi Cellular Routers

One of the largest hurdles for developing areas is the lack of reliable infrastructure—and perhaps most importantly, access to a reliable and affordable source of electricity. Without it, residents and businesses operate in a world of uncertainty and the risk of the power going out is always present.

In many remote and developing communities, the infrastructure for delivering electricity, like the standard power grid, does not exist. Today, you'll find most residents in these areas rely on diesel generators for powering machines and kerosene to provide lighting. These energy sources are costly, loud, and pollute the air. Homes and businesses are in need of a more affordable source of a power and one that will keep the environment clean.

New Sun Road is a registered California Benefit Corporation committed to implementing solutions to climate change and global energy poverty. They bring expertise in finance, engineering, economics, and conservation to partnerships with local operations in rural developing economies to design, build, and operate clean, renewable power systems.

This group of talented engineers is partnering with Ugandan green energy startup GRS Commodities to deliver reliable and clean power to the Ssesse Islands in Lake Victoria, Uganda. The goal of the pilot system is to provide affordable and reliable solar powered electricity to businesses on Kitobo Island.

## BUSINESS CHALLENGE

Although no small feat, deploying the solar power grids is likely the simplest part of the solution. Solar was the obvious choice for the power source because it is economical and relatively simple to deploy.

The primary difficulty lies in managing the energy grid and ensuring proper maintenance without having to be on-site at every location. The capability to remotely monitor the grid will enable New Sun Road to expand their service across the Ssesse Islands in a more efficient manner since each grid can be monitored from one central location. But, in remote areas, where communication options are limited, how do you remotely monitor and manage a smart solar power grid?

Without a local ISP, this can be a complex challenge, so the team decided to enable remote connectivity over the global cellular network.

In addition to communication challenges, another major difficulty New Sun Road had to overcome was finding a device capable of withstanding the high temperatures within their network hubs. The device would be residing within a NEMA enclosure in direct sunlight, so the capability to function under extremely high temperatures was a must.

## SOLUTION

New Sun Road chose the Digi® WR11 XT to enable a connection to the available 3G HSPA+ network, which would allow for remote monitoring of the grid. The Digi WR11 XT provides a reliable connection to the global 3G network while withstanding high operating temperatures of the network utility hub (seen below).

The New Sun Road team needed to ensure that they could effectively manage the grids remotely, should power go down or any other issue that could interrupt service to their customers. Using Digi Remote Manager, their operations team can easily push out new device configurations, firmware updates, and remotely diagnose and fix any issues in the network. The cloud management platform also makes it possible to monitor device temperature and alert the team if a device is starting to reach a user-defined temperature threshold as well as any other changes in device-state that they choose to actively monitor.

A unique piece to the New Sun Road solution is the custom software application developed by the company to provide real-time analytics and remote control for both the solar generation system and the end users' electricity usage. The analytics engine allows the team to anticipate problems before they happen, ensure correct maintenance, understand user needs, and continuously optimize the system.



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## RESULTS

In the summer of 2015, New Sun Road, Ugandan startup GRS Commodities, and the University of California, Berkeley CAL-RAE group began providing the first ever 24/7 metered electricity service, powered entirely by solar, on Kitobo Island.

Thirty four businesses and residential customers are now receiving power and making regular electricity payments, saving on average 50 percent of their energy costs by switching to the solar microgrid compared to diesel generators. The system is generating sufficient revenue to cover maintenance costs and recoup the capital investment proving that it's a sustainable solution.

New Sun Road solution also emphasizes the sharing of technical knowledge with local partners and communities. By training local technicians and providing students with internship opportunities, experts are available to assist on-site and young engineers develop expertise with solar system designs and communication technology.

After the successful pilot, New Sun Road is committed to extending electricity service to each of the inhabited Ssesse Islands over the next two years.



## RELATED PRODUCTS



**Digi® WR11 XT Cellular Router**- Secure 3G/4G/LTE cellular router for retail, kiosk and industrial control applications (WR11-XXXX-DE1-XB series).



**Digi Remote Manager** - A comprehensive IoT Device Monitoring Application for Secure Asset Monitoring and Control, available on desktop, tablet and mobile.