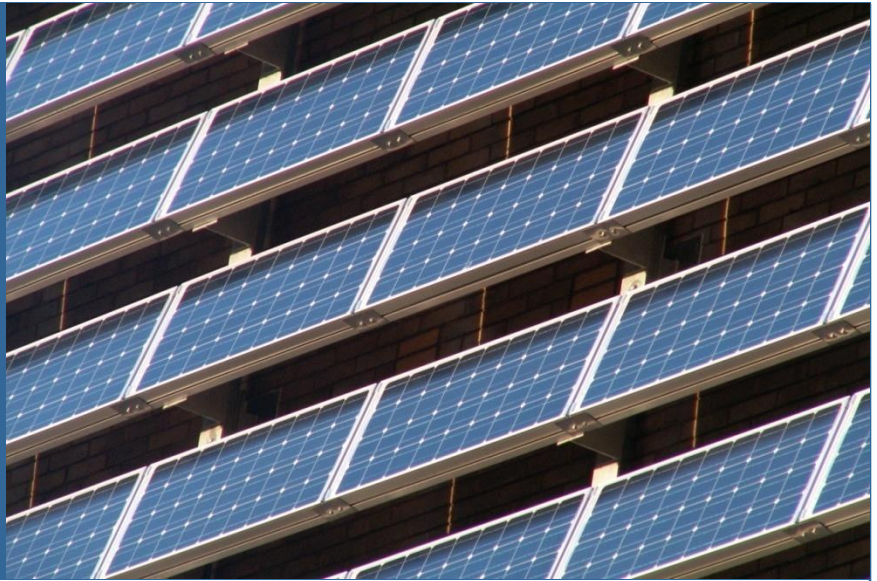
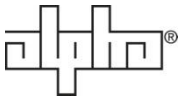


# Solar Energy Systems



**GREENSTAR**  
Engineering, P.C.



## COMPANY DESCRIPTIONS

- Greenstar Engineering, PC specializes in environmental consulting services to a wide variety of public and private clients providing investigative and remedial services.
- Alpha Energy is one of the nation's leading developers of turn-key Photovoltaic (PV) systems for commercial residential, institutional and remote (off-grid) applications.

## PROJECT GOALS

- Deploy technology to help successfully bring the treatment system SCADA system on-line to allow access to system operations from any internet access port.
- Provide the flexibility to manage the power supply through varying supply times with a solution, that was cost effective, easy-to-deploy, and able to work regardless of the available communications services.

## SOLUTION COMPONENTS

- Alpha Energy PV System SPS12-246/324G
- Data-Linc SRM6210E Ethernet Radio
- PRC1000 Programmable Relay Controller

## Customer Case Study

### Greenstar Engineering

Working closely with the cable utility, software developers and equipment suppliers, Greenstar has been able to successfully implement a highly effective internet accessible Supervisory Control and Data Acquisition (SCADA) which allows for "Real Time" monitoring and system control of a groundwater collection and treatment system located at a remote inactive hazardous waste site.

### Background

In 2000, the site, a New York State Class 2 Inactive Hazardous Waste site, was closed utilizing a landfill cap. Subsequently, in 2003, a leachate collection and treatment system was installed to control the leachate recharging to the surface. While the Java-based control system was accessible via standard dialup telephone circuit (POTS line), the connection speed was too slow to properly run the application to facilitate monitoring or system control. Adequate remote management required a higher speed connection.

In 2005, **Greenstar Engineering** was contracted to provide treatment site monitoring and maintenance. With site visits being a 700-mile round trip, remote access was a system imperative. Greenstar investigated all available communication options, including satellite, cellular, DSL, and cable. They found the most feasible option would be high-speed cable internet service from the local cable provider.

### Challenges

The primary challenge faced by Greenstar was how to get high-speed data services from the cable network out to the remote site. The treatment facility was at least ¼ mile from the nearest cable company access point. Connecting the cable demarc to the remote site meant either pursuing long-term utility pole access agreements with the local power company, or digging a ¼ mile trench from the street. Both options would be expensive and time consuming.

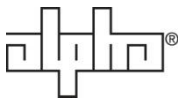
The decision was made to use a private radio link. However, with no electrical power at the cable network access point, the challenge now was to find a means to provide adequate power to operate both a Ethernet cable modem and private wireless radio on a 24/7 basis. To help meet this challenge, Greenstar turned to **Alpha Energy**.

“Simple Com Tools has enabled Greenstar to deploy an effective and reliable solution at a cost that would have never been possible without the PRC1000. By incorporating this product into the overall solution, Alpha Energy saved us several thousand dollars in both solar material and system installation costs.”

— Chip McLeod, Greenstar Engineering



Find out how the PRC1000 can help in your solar solution, contact Alpha Energy at [www.alphaenergy.com](http://www.alphaenergy.com)



Machine-To-Machine – Simplified

### The Solution

Greenstar evaluated the use of solar power capable of generating 12VDC power to run the cable modem, and the radio transmitter. They chose to deploy a solar panel solution from Alpha Energy. However, a panel capable of powering the two devices on a 24/7 basis would have been far too large and expensive for the location. Greenstar turned to Alpha Energy to help resolve the challenge.

Armed with the application requirements, Alpha Energy began designing a solar power system that would meet both the communications energy requirements and installation restrictions. Alpha designed and built a fully integrated system including the photovoltaic panels, panel mounting system, and powder-coated aluminum enclosure housing the breakers, solar controller, and batteries. Considering the electrical equipment load and solar insolation present at the customer's site, and the need for providing a smaller panel profile, Alpha chose to incorporate into the system the PRC1000 programmable relay controller from SimpleComTools.

The PRC1000 has two relay outputs which can each be programmed to allow power to flow through the relay at varying times during a 24 hour period. For Greenstar, that enabled the cable modem and wireless radio to be scheduled to be powered up 24/7 from May to September, and for just 10 hours per day from October to April. That meant Greenstar could use a far smaller solar panel than originally spec'd – saving them over \$7000 in hardware and installation costs. Alpha's choice to incorporate a PRC1000 into the total solution was key to an effective solution design and overall project success.

### Conclusion

The final solution from Alpha provided Greenstar and its customer with a reliable and cost effective solution for monitoring and operational control. Thanks in part to the PRC1000, Greenstar can now control system performance, respond to alarm conditions, ensure system reliability, and make more informed decisions. They've also eliminated unnecessary site visits, saving the client thousands of dollars per month in unnecessary costs. The solution is a great example of how Simple Com Tools makes M2M simplified.



Greenstar was able to install a 4.5' x 4.5' solar panel instead of the 9' x 10' that would have been required for 24/7 winter use.

PRC1000 controls power to both the cable modem and the wireless radio on a regularly scheduled basis.

