To power remote telecom towers in rural and oftentimes rugged areas such as on mountaintops, desert regions or other isolated areas, battery-based renewable energy systems are now being established to deliver consistent power to these telecom network systems.

Solar, wind and hybrid systems with battery backup for energy storage are the most cost-effective and reliable solutions available for remote communication devices such as microwave, cellular base stations, repeaters, VSATs and two-way radio networks. With Trojan batteries serving as the energy storage component, telecom providers can offer turnkey solar-powered tower solutions, reducing the overall cost of power consumption and enabling tower companies to utilise their capital more efficiently for other core business objectives.

Trojan’s broad line, of deep-cycle flooded and AGM batteries, has been selected as the energy storage solution for a variety of telecom projects around the globe from some of the world’s top telecom network and equipment providers including American Tower Co., Quanta TowerGen, Claro and Gilat Satellite Networks. The consistent power and reliability provided by Trojan’s deep-cycle batteries, data and voice communications means connectivity is available to customers 24/7.

Trojan Battery customers can achieve:
- Lowest Total Cost of Ownership (TCO) due to long cycle life and round-trip efficiency
- Reduced Levelised Cost of Energy (LCOE) over the life time of the system
- Enhanced battery performance with Smart Carbon™ technology to address Partial State of Charge applications (PSOC)

To address the issue of PSOC, Trojan’s engineering team has done extensive research on various types of battery technologies. Based on more than five years of R&D, the team developed Smart Carbon™, a proprietary formula of carbon additives designed to enhance life and performance of Trojan’s Industrial and Premium batteries when operating in PSOC. Trojan Battery is the first manufacturer to introduce a carbon additive to deep-cycle flooded batteries for renewable energy applications.

Reliable wireless communication is something people around the globe demand from their service providers. With many telecom network sites located in remote areas where no grid access is possible, or access to the grid is unreliable, alternative power sources are making inroads. Here’s how Trojan is leading the way…
Trojan Battery Remote Telecom
Customer Applications

India – American Tower Co. and Quanta TowerGen

Base Transceiver Stations (BTS)
Solar Battery Backup System
specifications:

- Batteries: (24) Trojan L16RE-B deep-cycle flooded batteries, Premium Line
- Battery Bank: 48V 1021 Ah
- Installed Solar Capacity -- Phase 1: Five sites with 6.6 kWp, and five sites with 5.88 kWp
- Charge Controller: OutBack

A key component of the project is the use of Trojan’s Smart Carbon™ batteries to address Partial State of Charge (PSOC), a common issue in solar off-grid applications that has not been addressed by battery manufacturers until today. Trojan’s project integrator, Team Sustain, developed a unique climate-controlled cabinet to house the battery bank that allows for passive cooling, decreasing the site temperature

“To maintain system up time, these customers previously had to depend on diesel generators for power, which incurred a high OPEX”

George Matthews, Team Sustain
for the batteries without drawing power from the system or batteries. The climate-controlled battery enclosure also features a battery water reservoir and tubing with mechanical automatic floats for easy watering; sensors to monitor temperature, voltage and current; and a communication bus incorporated inside the combiner box to transfer the collected data to the remote servers.

To ensure reliable transmission of critical system data, Team Sustain developed the Green Energy & Energy Management System (GeEMS), a remote monitoring software program which enables customers to quickly and easily monitor the operation and health of the entire telecom site including the batteries which power it. The software connects to the system’s controllers and wireless telemetry to manage the battery bank. The battery bank’s state of charge (SOC) is monitored by the software, with key information transmitted and stored on off-site servers for later data evaluation.

“To maintain system up time, these customers previously had to depend on diesel generators for power, which incurred a high OPEX,” said George Matthews, president of TeamSustain. “TeamSustain telecom customers require a reliable solar-based system with a properly sized battery bank to power remote telecom sites. Our solution, with Trojan battery backup, has considerably reduced the high OPEX and CO₂ emissions previously produced at these locations. These savings are expected to result in the system achieving its ROI in less than four years.”

Nicaragua – Claro

Base Transceiver Stations (BTS)

Solar Battery Backup System specifications:
- Batteries: (56) Trojan L16-P, deep-cycle flooded batteries, Signature Line
- Solar modules: Kyocera KD215
- Installed Solar Capacity: 6.5KW
- Inverter: Xantrex XW
- Charge Controller: Xantex XW MPPT
- Racking: Combination of ground and roof mount installation

Trojan distributor ECAMI S.A. installed an off-grid, solar power system with energy storage featuring Trojan flooded batteries to support a base transceiver station also referred to as the radio base station (RBS) used to operate Claro’s telecom towers. Claro is the region’s primary provider of mobile telephone, Internet and satellite television services to both residential and business customers.

The renewable energy system produces between 70 to 100 percent of the energy needed to operate the telecom towers in order to meet customer demand. Converting the telecom installation to solar power with battery backup enabled Claro to move away from using diesel generators to power these sites. Not only does the new renewable energy save the company more than $6,700 annually in operating costs by removing the expense of purchasing diesel fuel, it also eliminates noxious emissions previously produced by the generators.
Annual training seminars are provided by ECAMI with Claro staff to address updates on maintenance practices for the system’s cables, solar modules, battery bank, and electronic components (i.e. inverters, solar charge controllers, AGS, etc.)

Peru – Gilat Satellite Networks Ltd.

Telecom VSAT networks

Solar Battery Backup System specifications:
- Batteries: (2) Trojan deep-cycle 24-AGM batteries
- Solar modules: SolarWorld 85W PV modules
- Installed Solar Capacity: 35 sites, 255W
- Inverter: Victron Phoenix 12V inverter
- Charge Controller: Steca charge controller
- Racking: Mounted to tower

Trojan distributor CIME Comercial S.A. is making inroads on bridging the “digital divide” in Peru by providing battery backup systems to local telecom companies. In 2010, the government of Peru launched the initiative “FITEL 10” to establish communications in rural areas and, in turn, encourage social and economic development. The initiative includes building and repairing broadband satellite communication networks featuring Gilat Satellite Networks Ltd.’s Very Small Aperture Terminals (VSAT).

By bringing telecom VSAT networks to rural areas of the country, local residents now have access to reliable cell phone coverage. Trojan Battery distributor, CIME Comercial S.A., was brought on board to design a standalone photovoltaic (PV) battery-based, solar-powered solution for the local telecom VSAT network, owned and operated by Gilat.

CIME designed a battery-based, solar-powered system for 35 off-grid rural telecom networks for Gilat, with each supported by two Trojan deep-cycle, 24-AGM batteries connected in parallel. Using a standalone PV energy solution was ideal due to the ease of installation and the reliability of Trojan’s deep-cycle valve regulated lead acid (VRLA) AGM batteries.

The energy stored in the Trojan batteries enable the VSATs to operate 24/7, which is critical to telecom operations. Trojan’s AGM batteries were selected based on the project’s required amp-hour capacity, physical size, availability, price and required cycle life. Trojan’s line of deep-cycle AGM batteries are ideal for telecom applications that are powered by renewable energy systems, because they are designed for daily cycling and include robust thick plates that extend the batteries’ life. Trojan’s AGM batteries also are low temperature tolerant and have a low internal resistance for higher discharge current and higher charging efficiency, key factors for operating in Peru’s various climates.

www.Trojanbattery.com

About Trojan Battery Co., LLC

Trojan Battery Company is the world’s leading manufacturer of deep-cycle batteries, offering a complete portfolio of technologically-advanced deep-cycle flooded, AGM and gel batteries that provide maximum long-lasting performance to meet the requirements of today’s advancing renewable energy systems. Trojan Battery, founded in 1925, is ISO 9001:2008 certified with U.S.-based operations in California and Georgia. For more information, visit www.trojanbattery.com