



“OUR SOLUTION WITH TROJAN BATTERY BACKUP, HAS CONSIDERABLY REDUCED THE HIGH OPEX AND CO₂ EMISSIONS PREVIOUSLY PRODUCED AT THESE SITES. THESE SAVINGS SHOULD RESULT IN THE SYSTEM'S ROI IN LESS THAN FOUR YEARS.”

George Matthews, TeamSustain

Solar Powered Telecom India, Nicaragua, and Peru

Reliable wireless communication is something people around the globe demand from their services 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. 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 enable tower companies to more efficiently utilize their capital for other core business objectives.

Trojan's broad line of deep-cycle 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. Trojan's flooded and AGM battery technologies are repeatedly selected to power various remote telecom networks located around the world. Consistent power and reliability provided by Trojan's deep-cycle batteries ensures that data and voice communications connectivity is available to customers 24/7.

With Trojan Battery, customers can achieve:

- Lowest Total Cost of Ownership (TCO) due to long cycle life and round-trip efficiency
- Reduced Levelized 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)

India – American Tower Co. and Quanta TowerGen Base Transceiver Stations (BTS)



India – Base Transceiver Stations (BTS)

While AGM has traditionally been the battery technology of choice by many telecom companies due to low maintenance requirements, high quality deep-cycle, flooded batteries are beginning to gain in popularity in areas where maintenance can be performed, and low cost and widespread availability are determining factors. For the telecom market in India, Trojan's project integrator, TeamSustain, has developed a unique climate-controlled battery enclosure to house a Trojan flooded battery bank for American Tower Co. The enclosure protects the flooded batteries from the elements and provides easy access for routine maintenance such as battery watering.

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

To ensure reliable transmission of critical system data, TeamSustain 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.

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, as well as a communication bus incorporated inside the combiner box to transfer the collected data to the remote servers.

"To maintain the up time, they had to heavily depend on the diesel generators 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 sites. These savings should result in the system's ROI in less than four years."

*The L16RE-B battery has transitioned to the Solar Premium SPRE 06 415 battery.

For more information:

Trojan Battery Company
www.trojanbattery.com

TeamSustain Ltd.
www.teamsustain.com



Nicaragua – Claro Base Transceiver Stations (BTS)



Nicaragua – Base Transceiver Stations (BTS)

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.

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

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.

Annual training seminars are provided by ECAMI for 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.)

*The L16-P battery has transitioned to the Solar Signature SSIG 06 475 battery.

Not only does the new RE system 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.

For more information:

Trojan Battery Company
www.trojanbattery.com

Ecami S.A.
www.ecami.com.ni/



Peru – Gilat Satellite Networks Ltd.

Telecom VSAT networks



Peru – VSAT telecom 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 communications networks featuring Gilat Satellite Networks Ltd.’s Very Small Aperture Terminals (VSAT).

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

By bringing telecom VSAT networks to rural areas of the country, local residents 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 VSAT 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.

For more information:

Trojan Battery Company
www.trojanbattery.com

CIME Comercial S.A.
www.cime.com.pe



Trojan batteries are available worldwide.

We offer outstanding technical support, provided by full-time application engineers.

call 800.423.6569 or + 1.562.236.3000 or visit www.trojanbattery.com

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