# Solar-Powered Remote Microgrids

**Chocó, Colombia**

## Case Study

In the northern department of Chocó, located in western Colombia, is the Municipality of Acandi. The area is mainly jungle along the Caribbean Sea on the border with Panama. This region is located within the zones that are not tied to the country’s electrical grid due to their remote locations. The only electricity residents have access to is available for a few hours a day and is provided by diesel generators. Through its Ministry of Mines and Energy, the government of Colombia issued a mandate to expand the availability of electricity to these remote areas by building five solar hybrid installations, or microgrids. Trojan’s Industrial Line of batteries with Smart Carbon™ were selected for the project, with 288 batteries installed as energy storage for all five Microgrids.

“This project is the first of its kind in the Chocó region and allowed 431 households, including an indigenous community, to have access to clean, affordable, and reliable energy for the next 20 years,” said Ana Maria Murillo, Business Director of Tecmac Ingenieria, the project’s solar installer. “One of the greatest incentives to installing these microgrids was to reduce the use of diesel fuel.”

The key to the successful implementation of this project was to choose durable components that would last for the estimated 20-year duration of the project, as well as withstand the region’s harsh environment. The project was designed with a long-term vision to reduce the burden of increasing electricity prices for the community.

## Location

Acandia, Western Colombia, South America

## Challenge

Provide clean, reliable energy and eliminate the need for diesel-fueled generators.

## Solution

Construction of five solar hybrid microgrids using Trojan batteries with Smart Carbon™ for energy storage.

## Outcome

More than 400 households have access to reliable energy for 17+ years.

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### 300 Batteries

**Power for 400 Homes**

**Life: 17+ Years**
LOCATION

The Municipality of Acandia is located in the northern department of Chocó in western Colombia. The remote area is mainly jungle along the Caribbean Sea on the border with Panama.

CHALLENGE

The region is not tied to the country’s electrical grid and residents had access to only a few hours of unreliable, diesel-generated electricity each day. The government of Colombia decided to address this problem by building five solar hybrid microgrids, comprised of solar photovoltaic panels and batteries for energy storage.

SOLUTION

The project required batteries designed to last the 15-year duration of the project, withstand the region’s harsh conditions, and have the lowest Levelized Cost of Energy (LCOE).

Trojan’s Industrial Line of advanced lead-acid batteries with Smart Carbon were selected for energy storage for all five microgrids. Trojan’s Smart Carbon proprietary paste formula provides improved performance and life when batteries operate in Partial State of Charge (PSOC), making them ideal for solar applications.

SYSTEM SPECIFICATIONS

- Batteries: (288) Trojan SIND 04 2145*, 2,105Ah @ C100-Hr, deep-cycle, advanced lead-acid with Smart Carbon, (12) Trojan SIND 06 920**, 695Ah @ C20-Hr, deep-cycle, advanced lead-acid with Smart Carbon
- Battery Life: 17 years (per IEC 61427)
- Solar System Capacity: 191 KWp
- Battery Bank Configuration: 48V and 24V
- Solar Modules: 250W Trina Solar panels
- Inverter-chargers: Bidirectional Sunny Island inverter-chargers
- Inverters: Sunny Boy inverters
- Backup Generator: Cummins Diesel Generators
- Total Microgrid, Installed: 5
- System Integrator: Tecmac Ingenieria

*The Solar Industrial SIND 04 2145 battery was previously known as the IND29-4V battery.
**The Solar Industrial SIND 06 920 battery was previously known as the IND13-6V battery.

OUTCOME

More than 400 households in the region now have access to clean, affordable, and reliable energy for the next 17 years, vastly improving their quality of life.

PARTNER

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