GRID ALTERNATIVES

INTERNATIONAL PROGRAM

El Platanal, Nicaragua

SOLAR HOMES AND SCHOOL CASE STUDY

Potrero Platanal (locally called El Platanal) is a remote community in Nicaragua that is home to 246 people. The community is located in the San Lorenzo municipality of Boaco, a region in Nicaragua that lies east of the capital city of Managua and is known as the "Two-Story City," as it sits perched atop the hills. Its mountainous topography provides a rich environment for agriculture and cattle-ranching. The city has played an important role in Nicaragua's economy, providing "pecuaria" products (beef and dairy) to the rest of the country, as well as exporting internationally. Most community members make their living cultivating wheat, corn, and beans. Others leave their community to emigrate to Costa Rica for periods of up to 6 months to work on farms and send home remittance earnings.

GRID Alternatives became connected to El Platanal when the local director of the Ministry of Education (MINED) introduced us to community leaders who were interested in bringing solar energy to their local school. Access to El Platanal is challenging, and there was little hope the community would have grid electricity in the future since it lacks road access and the houses are sprawled far apart. After determining that El Platanal met our site selection criteria, we worked with the community in 2013 to install solar on the local school, and again in 2015 to install solar home systems to further transform the community with access to electricity.

Since the national electric grid does not extend to the community, most homes previously relied on kerosene lamps or candles to see at night. Kerosene lamps emit harmful gases, are flammable, and are expensive to use due to the cost of fuel and the time required to travel to buy the fuel from a nearby town. Some families used flashlights or lamps with batteries that must be replaced every two weeks.

Platanal has one small school with two classrooms serving

SOLAR SCHOOL SYSTEM SPECS:

Modules: Six 230W SunPower PV Modules

Inverter: One Outback GFX 1424, 24V Inverter

Charge Controller: One Midnite Classic 200 MPPT Charge Controller

Batteries: Four Trojan T-105, 6V 210Ah, Deep-cycle Lead-acid Batteries

Total Project Cost: $6,300 USD

all ages. The school was built in 2000 by the Ministry of Education and was made possible with the help of the community members, who carried cement blocks, sand, gravel, and tools by hand, in addition to supporting the manual labor during construction. There are two teachers who work at the school from Monday through Friday and teach 45 students from first through sixth grade. The school has become a gathering place for community meetings, as well as a pop-up health clinic when the Ministry of Health makes periodic visits to give vaccinations and medical check-ups. The school did not have electric power, which limited what the teachers and students could do in class and restricted the school to day-time use only.

Aside from the periodic visits from the Ministry of Health, the community does not have a health clinic where they can receive medical attention. Instead, they must walk about an hour and a half to the closest town, San Lorenzo. For more serious medical needs and emergencies, people must walk or be carried in a hammock by fellow community members on foot for 2 hours to the closest hospital in the city of Boaco. Access to healthcare is one of many challenges faced by communities in Nicaragua that are remote like El Platanal.

THE SOLAR PROJECTS

In March 2013, GRID Alternatives volunteers worked alongside community members to install a 1380 W battery-based PV system on the primary school in El Platanal, bringing lights and AC power to the school buildings. The community's commitment included helping install the solar system, hosting the volunteers, sharing responsibilities, and maintaining the system after the installation.

Two years later, GRID launched an initiative to bring solar home systems to a remote community that we had already worked in and that had proven their commitment to maintaining their system. El Platanal was the perfect example of a community who had been very engaged, who had taken initiative, and had taken great care of their school's solar system over the past two years since the installation.

GRID Alternatives was pleased to propose a solar home systems project in El Platanal to our corporate sponsor, Viridian, who helped make this next stage of rural electrification in El Platanal a reality. In March 2015, 40 families in this remote community celebrated having clean, solar energy as they turned the lights on in their homes for the first time.

THE RESULTS

• Families previously spent about $ 4.13 USD a month to light a kerosene lamp for 3 hours at night. Nowadays, families are investing that money to buy food, purchase household appliances, save funds, invest in expanding the crops they grow, purchase mobile phone credits, and start small businesses out of their homes.

• Families are now able to do activities at night that were previously not possible without access to electricity, like listening to music on the radio, keeping cell phones turned on since they have the ability to recharge them, lighting the kitchen with clean energy, and doing homework and reading with safe lighting instead of by the light of dangerous kerosene lamps that cause damage to the eyes and respiratory system over time.

• One community member, Sergio Oporta, started a small business cutting hair to earn income for his family and provide a needed service to the community.

• The Gonzales family earns their income by making cheese to sell in a nearby town. Electricity in the kitchen allows them to keep working once the sun goes down to increase production.

• A community member named Doña Fatima Oporta Solorzano started a small business making pastries. Making cake is significantly easier with an electrical mixer that she can now use in her home. Before her solar home system was installed, Doña Fatima had to do all of the mixing by hand, which meant an incredible amount of time and effort to run a very small business, considering that she was also responsible for taking care of the household. Generally speaking, Nicaraguan families live in a society with traditional gender roles, where men are the main income-earners for the family and women's responsibilities include cleaning, cooking, taking care of children, and doing the family's laundry in the creek. As an income-earner and supporter of her family, Doña Fatima shatters these traditional gender roles and serves as a positive example for her community. Doña Fatima and a group of her friends are currently taking classes on piñata-making, to expand their entrepreneurial activities and income-earning opportunities.

• Because El Platanal is a rural community, it lacks the kind of social activities and options that are available in cities or in towns with electricity. Therefore, having the option to watch TV for

access to information and for recreation is very important to community members. While not all families in El Platanal own a TV, the ones that do tend to share with neighbors. While it seems like a simple act, watching a movie together becomes a powerful way to grow and maintain good relations with other community members.

• Even with electricity in households, there is no lighting outside for walking from one house to another at night. Families have been able to replace flashlights that use alkaline batteries with a new model of rechargeable flashlights that they can be plugged in and charged using their solar electricity at home.

• Inspired by solar systems on their local school and households, community members decided they would like to bring solar to their chapel and collected funds. The chapel is an important gathering place for organizing the community, discussing issues, and socializing. Religion is very significant part of the lives of Nicaraguan people, especially in rural communities, and access to electricity in their chapel allows these important gatherings to happen in one central place at night.

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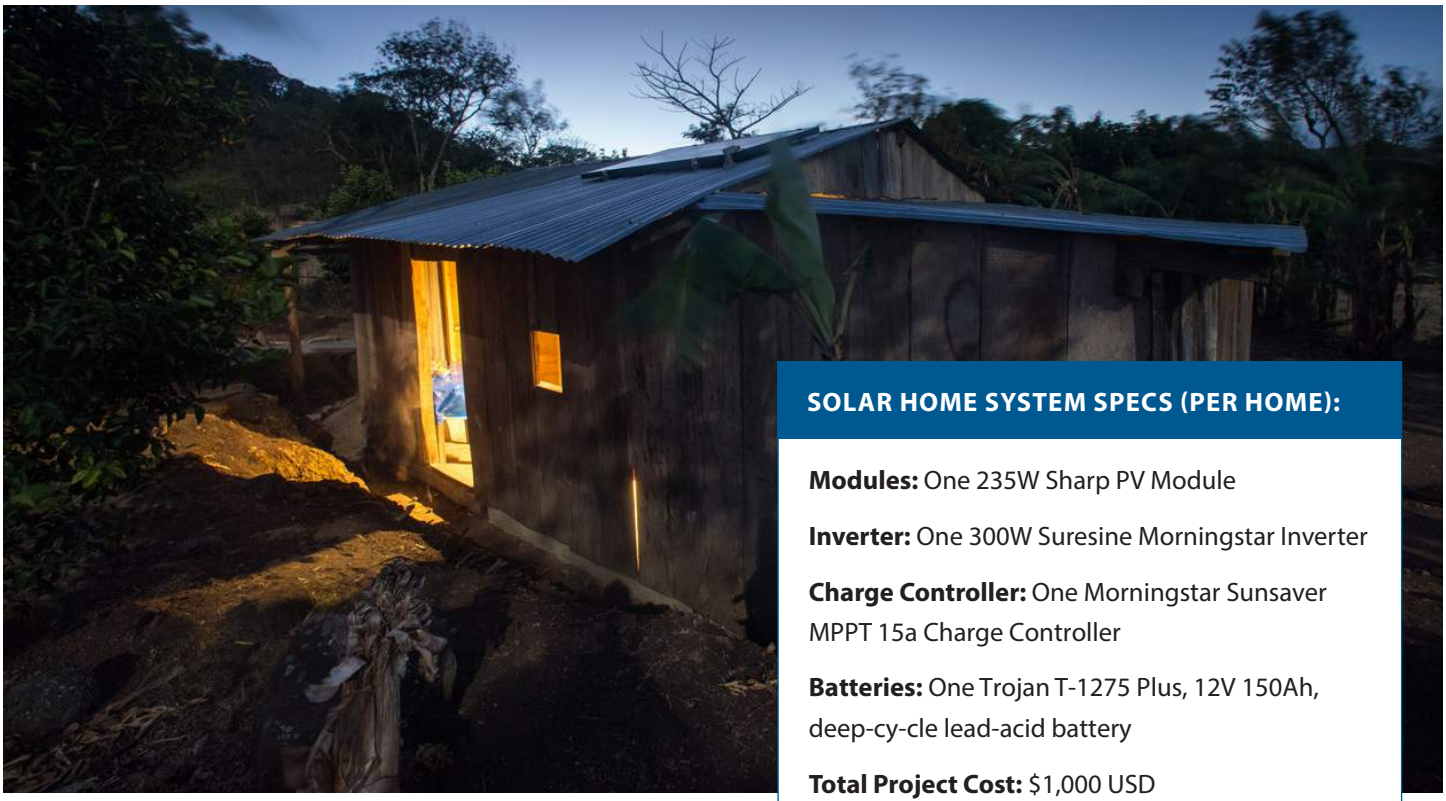

SOLAR HOME SYSTEM SPECS (PER HOME):

Modules: One 235W Sharp PV Module

Inverter: One 300W Suresine Morningstar Inverter

Charge Controller: One Morningstar Sunsaver MPPT 15a Charge Controller

Batteries: One Trojan T-1275 Plus, 12V 150Ah, deep-cy-cle lead-acid battery

Total Project Cost: $1,000 USD

LOOKING FORWARD

GRID continues to visit El Platanal twice a year, at a minimum, to maintain a strong relationship with the community, gather feedback, ensure the solar home systems continue to operate and serve families long-term, and ensure community members are part of our growing solar network in Nicaragua. Representatives from El Platanal are invited each year to attend our Annual Solar Conference, where they gather with representatives from other communities where GRID has installed solar projects to learn more about solar energy and to share experiences with others.

In every community GRID works with, an Energy Committee is formed, consisting of trusted leaders and active members of the community. We train the Energy Committee and local residents before, during, and after the installation, monitor the community's use of the system over time, and stay in touch to ensure the system is working properly. El Platanal has a very strong and organized Energy Committee formed by Angel Oporta (President), Francisco Reyes (Vice President), Ninfa Flores (Secretary and school teacher), Jose Ariel Somoza (Fiscal), and Sergio Oporta (Vocal).

The committee's president, Angel Oporta, has been an active leader organizing the community and serving as its representative when working with the office of the Mayor or with NGOs. Angel has encouraged community members to participate in meetings and spearhead community improvement projects.

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