

## Newsletter 04/17 Smart Solar Off-Grid for La Gracia

It is a good while since we last reported from the solar project in La Gracia Village, Belize.

A number of obstacles have slowed down the progress of the project unexpectedly. However, we were able to resolve the issues that were mainly of legal, organizational and financial nature such as:

“How to start operating the system within the existing legal framework?” or “How exactly will we realize the connections from the power-substations to the actual houses (last mile) since the project under REPIC-umbrella ends at the substations?”

Some of the unknowns we were able to address with the assistance of the Government of Belize, others were resolved by welcoming the British Government as a new project partner.

With their assistance, every household can now be connected to the solar system and will receive proper wiring, a breaker-box, two outlets and three light fixtures including LED light bulbs. It is particularly important to the project, that the villagers from the very beginning will use energy efficient appliances.



On April 11<sup>th</sup>, the British High Commissioner Mr. Peter Hughes OBE and his deputy Mrs. Grace Chun as well as representatives of the Energy Unit of the Belizean Government visited La Gracia to see how the project is developing.



After a period with lots of activities done behind the scenes, physical work has resumed in the village. SESB could finally connect nine households to the first two power towers. The houses will be electrified in May.



The local crew from La Gracia is currently digging the ditches for the underground wires from the sub-stations to all the houses - they are doing a fantastic job!



Amongst the first ones to receive electricity is also the Pentecoste Church. The pastor is looking forward to skip using the expensive energy from his small generator in the future.



In order to provide road safety during the Easter Holidays, the drains crossing the street were closed just in time for Good Friday.



Now the cables from the houses are getting connected with the energy dispensers of each household...



...where the villagers can activate their power supply with a personalized RFID-Card. The electricity can be purchased on a prepaid bases, that allows every household to consume power according to the respective budgets.



Mr. Thomas Flügge and Ms. Sarah Link from the German cdw-Foundation also visited the village to get an impression of what happened during the last few months. On this picture Mr. Silvan Küffer from SESB speaks with two villagers about the inside wiring of their house. Keep in mind - all of the 40 households need proper wiring before they can be connected!



On Sunday, April 24<sup>th</sup>, SESB organized another village meeting together with representatives from the Energy Unit of the Belizean Government and the villagers. The phases of electrification, facts and figures as well as power limitations were discussed.



It won't be long until the first villagers can use the energy from the La Gracia Smart Solar Off-Grid system! At the beginning of May SESB is planing to start handing over the chip cards to the first households.



For people interested in the technical aspects of the system we have created a public link, that allows you to follow the systems performance:

<https://www.sunnyportal.com/Templates/PublicPageOverview.aspx?plant=115eff94-d189-434f-858d-05e8719934ac&splang=>

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**SESB La Gracia** SESB La Gracia

- PV System Profile
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- Power Phase 1 and 2
- Battery State Of Charge
- Generator

**SESB La Gracia PV System Profile**

**Location:** La Gracia, Belize  
**Operator:** SESB - Solar Energy Solutions Belize Ltd.  
**Commissioning:** 11/7/2016

**PV system power:** 25.200 kWp  
**Annual Production:** approx. 34,020 kWh (1,350 kWh/kWp)  
**CO2 avoided:** Approx. 23.8 tons per annum

**Modules:** Renosola VirtusII-255Wp  
**Communication:** Sunny WebBox  
**Inverter:** 4 x Sunny Boy 6000TL-US-22  
 4 x Sunny Island 6048U


**Description:**

Belize is located in the southeastern part of the Yucatán peninsula, bordering on Mexico to the north and Guatemala to the west. Around 10,000 inhabitants in Belize's rural areas have no access to the electricity grid.

Within the REPIC project's framework, a stand-alone network shall be built in the La Gracia municipality, comprised of 45 households. This autonomous network is powered by a 24 kW photovoltaic system with battery storage and a back-up gas generator. The network has a modular design and uses only proven technologies. It is designed to be locally operated and maintained by the villagers, as well.

A part of this REPIC Project is to develop a resilient business model, which shall serve as a basis for the regional multiplication of such small stand-alone networks.

For this project, ZENNA is supported by SESB – Solar Energy Solutions Belize, zhaw Zürcher Hochschule für Angewandte Wissenschaften (CH), cdw Stiftungsverbund (DE), Ministry of energy (BZ), ROTARY International, Coin Invest Trust (LI), LIPPUNER EMT (CH), Trama Tecnio Ambiental (ES), HOPPECKE Batterien (DE), SMA Solar Technology (DE), Müller Azmoos AG (CH).



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ZENNA also developed the updated presentation video of the Smart Solar Off-Grid. The movie is available online on vimeo:

**vimeo** <https://vimeo.com/145614639>

ZENNA's Smart Solar Off-Grid for La Gracia Project is also displayed online on the REPIC-platform of the Swiss federal offices SECO, SDC and SFOE:

**REPIC** <http://www.repic.ch/repic-en/projects/ongoing-projects/photovoltaics/zenna-belize/>

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