



# **Costa Rica Solar Workshop Project Handbook**

**Green Life Volunteers**

Puerto Jimenez, Costa Rica

Janina Schan: +506 8725-5077

E-mail: [info@glvolunteers.com](mailto:info@glvolunteers.com)

Web: [www.glvolunteers.com/solarproject/](http://www.glvolunteers.com/solarproject/)

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# 1. Project Overview – Costa Rica Solar Workshop

## I. Project History. How did the project start?

Richie Aronson (co-founder) was backpacking through Costa Rica on a spontaneous adventure searching for something different, new and exciting. After several weeks moving from hostel to hostel he found what he was looking for: Green Life Volunteers (GLV). He decided to volunteer on a secluded organic farm in the depths of the Osa Peninsula jungle.

Little did he know the farm had no power for lights, refrigeration, and other necessities (similar to many other farms, homes, and schools in the region). This greatly reduced quality of life and ability of the farmers to do their job. The profound beauty of Osa Peninsula and this short experience had a lasting impact on Richie. They later supplied power to this farm.

Janina Schan (founder of GLV) and Riche then decided that they had the ability to address this problem themselves through the creation of their own program. With a rough idea on how to make this happen they later found Keith Bonarrigo, the founder of The Green Go Solar Project, who established a Solar Power project in Baja California, Mexico. Together they created the Costa Rica Solar Power Project – A Hands on Workshop - and the rest is history.

## II. Why is our program important? Which social issues do we face? And how do we try to solve these issues?

The workshop aims at installing solar systems free of charge for chosen elementary schools and other non-profit organizations in small remote communities with no access to grid-electricity. Furthermore we also try to educate the local communities (and our international participants) about solar energy, and show them how to install, maintain, and build their own solar system.

An important aspect of the project is that we involve the local Costa Rican community in the workshop and provide knowledge and expertise to locals on solar power systems. The locals are the ones managing and running the systems later on, so they'll have to know how they work. You will help to educate the community about renewable energies and solar systems.

We are also including educational events for kids and adults throughout the workshop – usually we do a visit to our local high schools and show them how to make panels from scratch and teach them about solar energy.

## III. What is the program exactly about? What is the role of the volunteer?

As a participant in our Costa Rica Solar Workshop you will gain an understanding of the basic engineering principles of photo-voltaic power and solar panels. You will receive theory and practical lessons on how solar panels work. We will make panels from scratch in our do-it-yourself panel build workshop, and later on we will install real systems. The installs of solar systems are donations to elementary schools and other non-profit organizations in need (in varying locations throughout the Osa Peninsula).

We ask of our participants to actively take part in the theory and practical lessons, and help us with the installations of the solar system. We also include a visit to the local high school and we ask from

our participants to actively help plan the high school visit and teach high school kids about solar energy. We also include locals into our daily practical and theory classes, and we would appreciate that participants help us to teach locals about solar energy.

We provide all the materials for the workshop and have industry leading professionals teaching and leading the course to ensure the highest quality educational experience. The idea is that throughout the course the participants learn how a solar panel works, the process of proper installation, and even basic principles by making panels from scratch.

#### IV. What do you expect from the volunteers? What can the volunteers expect from you? Do the volunteers have to bring special equipment?

An ideal volunteer on this project has a passion for environmental conservation, renewable energy, and helping communities. As a participant you should be flexible, pro-active, creative, and a team-player! The workshop is held in English for our foreign participants. However, Spanish knowledge is always of advantage since you'll be speaking with locals throughout the workshop and also communicate with your host family – who may not speak English!

## 2. Mission, Objectives, and Vision of the Costa Rica Solar Workshop



We believe educating the world on clean energy such as solar technology is one of the most important objectives of our time.

This program is designed to educate participants from all over the world on solar energy alongside local community members. This dynamic will offer a truly culturally immersive experience and learning environment.

The mission of this project has two primary objectives. The first is to provide the highest quality education in solar photovoltaic technology possible. This means that all participants will leave having a solid understanding of the technology through a culturally immersive and hands on experience.

*The human centered design approach:*



The secondary objective goes hand in hand with our first stated goal, which is to significantly reduce an estimated number of 20,000 people living without power throughout the region. We hope to find ways to install more systems outside of the workshop to increase our impact. We will accomplish this as we move forward by engaging the local community through what is called a *human centered design approach*.

This means that the project is actively seeking input and engagement from the local community alongside visiting participants to continually improve the design of the course. This is done with the intent to fulfill, respect, and enhance local community needs while respecting their

culture and values. For example, the locations we choose for installations are selected very carefully to ensure it fulfills the expectations of all stakeholders involved. After all, we consider ourselves blessed to share and experience this amazing slice of earth with people who have called this region home for generations.

**The following are ongoing goals of the program that provide us with motivation and guidance as we grow:**

- 🌱 Implement solutions that fulfill the off-grid energy needs of the South Pacific region of Costa Rica, and the Osa Peninsula
- 🌱 Engage and educate as many Costa Rican locals as possible regarding solar energy
- 🌱 Every participant, regardless of their previous experience in the solar field leaves with an understanding of essential photovoltaic principles including how a solar photovoltaic systems work, how a solar panel is build (they will build a panel in the workshop), the process of proper site analysis previous to installing a system, system design and real solar system installations, alongside other basic solar energy principles
- 🌱 Provide the possibility to receive University credits for participation in our solar workshop
- 🌱 Identify ideal locations throughout the South Pacific region of Costa Rica, benefiting the most from solar power and a donation of a solar system
- 🌱 Provide basic remedial career counseling in the solar industry to participants
- 🌱 Ensure the learning environment is hands-on, engaged, and thoroughly enjoyed by everyone involved!

### 3. Mission, Objectives and Vision of Green Life Volunteers

Green Life Volunteers (GLV) is a small Costa Rican non-profit organization and volunteer service organization, aiming at providing affordable volunteering programs and improving the living standard of local people, as well as helping with conservation efforts in Costa Rica. GLV makes sure that every project has a positive impact on the local people, on the community, and the local animals and nature.



GLV is run by Janina Schan, the founder and manager, and dedicated Interns and volunteers. Janina founded GLV in 2012, after working already in the volunteer industry in Costa Rica for around a year. Our interns are students from Universities that need the internship to graduate, to conduct research, or they really just want to gain experience.

GLV works with “real” local non-profit projects, which are in need of actual help! Unfortunately there are many organizations around the world that create projects in Costa Rica, which are entirely run by foreigners and which make no actual difference and have no impact on the surrounding communities or environment. You’ll spend large sums of money that go directly into foreigners pockets in the USA or Europe – no income and no benefit is made to any local community member.

This is something GLV wants to avoid at all costs – our goal is to offer affordable volunteering in real projects run by local Costa Rican organizations, where your help and money actually makes a difference!

#### 4. The Green Go Solar Project

The Green Go Solar Project (GGSP) uses functional but cosmetically imperfect solar cells, which are not used in retail-grade panels and build Do-It-Yourself solar panels out of them. GGSP acquires and imports B/C grade solar cells into areas where there is either no power or extremely limited access to it. These cells are used as a vocational resource to illustrate basic electric principles critical to the design, construction, maintenance, and expansion of a larger solar system. Students test the integrity of these cells and connect them together into solar strings for a larger, pre-calculated electrical output.

#### 5. Background of Renewable Energy in Costa Rica

Costa Rica is a global leader in renewable energy. The Costa Rican electrical grid operates largely on two abundant renewable energy sources; hydropower and geothermal.

Costa Rica is blessed with an abundance of natural resources and holds a strong commitment to protecting them. As a matter of fact, Costa Rica is one of the world’s leaders in nature conservation. Costa Rica also has vast amount of fresh water resources such as springs, waterfalls, streams and rivers which are all found in abundance across the country. The country is able to benefit from many geographic advantages in that its concentration per capita of rivers, dams and volcanoes allow for high levels of renewable energy production.

The Costa Rican national park system is designed around its watersheds and natural landscapes. This abundance of natural resources and favorable rainfall levels are beneficial for generating great amounts of hydroelectric power. Costa Rica has generated 98.53 percent of its electricity from renewable sources over the past four years, using its rivers, volcanoes, wind and solar power as a source of energy. A recent statement from the Costa Rican electricity institute (ICE) indicated that 74.77 percent of renewable energy comes from hydroelectric plants using river water, 11.92 percent was geothermal, 11.08 percent came from wind power, 0.73 percent from biomass and 0.03 percent from solar power.

Estimates are that there are well over 20,000 poor rural farmers, families, and organizations (including elementary schools) without any reliable power on the outskirts of Southern Costa Rica alone. These places are too scattered and widespread to make it economically viable to connect all of them to the existing, largely renewably sourced, electrical grid in Costa Rica.

Neglected regions such as this are prevalent all throughout Central and South America—an estimated **1.6 billion** people around the world also face similar living standards. We believe providing this basic necessity is one of the most important objectives of our time.

If we can provide even a small amount of power to these areas their quality of life can be vastly improved. Through education, training, and sharing of resources we aim to spread the benefits of solar technology to this beautiful local community. This program is designed to serve this community while educating participants from all over the world.

## 6. The Costa Rica Solar Workshop Location



The Costa Rica Solar Workshop is held in Puerto Jimenez on the Osa Peninsula in Costa Rica. The Osa Peninsula boasts 2.5% of the world's biodiversity, and is the most biodiverse region in Costa Rica. The communities are still quite poor, more so than in other parts of Costa Rica. The area around Puerto Jimenez is unique and beautiful.

Puerto Jimenez has grown to be one of the largest towns on the Osa Peninsula. Located in the southern part of the Puntarenas province, this laidback town is one of the main gateways to the beautiful Corcovado National Park. The last town before one can enter the park premises; a main ranger station is situated here with many tourists using this town to stock up on supplies before they trek their way through the gorgeous and diverse wildlife that the Corcovado National Park has to offer.

Situated in the Golfo Dulce, Puerto Jimenez has a wonderful beach where one can relax while taking in the superb beauty of the Osa Peninsula. This tiny 'frontier' town has a good number of hotel and resorts, both affordable and luxurious, with many rental tour companies and travel agencies in the area from where trips around the region can be arranged. Transportation can also be organized from Puerto Jimenez, that way if you get bored you can head out to the lovely remote village of Cabo Matapalo, which is famous in the region for its awesome surf breaks.

Throughout the course, we make sure you will get some "down time" and you will be able to enjoy

what the Osa and Costa Rica have to offer. Extracurricular activities include surfing, dolphin and whale watching, hiking to a waterfall, stand-up paddling, kayaking and more.

## 6. Our Workshop Install Sites

### Where do we install our donated solar systems?




Every year we determine at least 2 – 3 communities with elementary schools, families, or non-profit organizations in need of power. There are still several schools, many families and non-profit organizations on the Osa Peninsula that have no access to grid electricity.

Throughout the last two solar power workshops, 2 schools received donated solar systems from us.

The schools were the La Balsa elementary school, and the Quebrada La Tarde elementary school.



We are also targeting non-profit organizations and families to receive our solar system donations, which may include:

- 
**Nonprofits Organizations:** Local organizations that offer an economic, social, or environmental benefit to the region whose energy needs are not being met are ideal candidates for our workshop.
- 
**Local Farms:** For a farm, access to power can significantly enhance crop quality and production. Better food means better eating and a healthier way of life for the community. We would want to target farmers with a sustainable farming approach.
- 
**Rural and Low-Income Families:** For families living without reliable electricity, life can be very difficult in so many ways we take for granted. For example, the evening hours of young students are spent crouched over a candle or kerosene lamp as they try to attend to their studies. The light is poor and unsteady, the smoke black, dirty and toxic. The open flame is a fire hazard and the fuel is costly, using up as much as 30 percent of the family's income. Ideally, these families should have a reliable source of power to operate several lights, charge a cell phone, and run a radio. If we can provide even this small amount of power their quality of life will be vastly



## 7. Solar Workshop Learning Objectives & Curriculum

### 1. Solar Power Overview

- 🌱 Brief overview on renewable energies world-wide
- 🌱 Overview of Costa Rica and Osa Peninsula renewable energies
- 🌱 Innovations in increasing access to solar power

### 2. Basics of electricity

- 🌱 Addressing the two types of electrical current
- 🌱 The relationship between volts, amps, amp-hours, watts, watt-hours
- 🌱 Perform power and energy calculations

### 3. Photovoltaic modules and the PV system

- 🌱 Understanding the history of PV technology development and the differences among various PV cell technologies
- 🌱 How a PV cell produces electricity from sunlight
- 🌱 The parts of the system and how they work together
- 🌱 Testing modules with a multimeter
- 🌱 Predicting the effects of temperature and irradiance on voltage and current values
- 🌱 The schematics of different PV system configurations such as PV direct, stand alone, grid direct, grid-tied with battery back up
- 🌱 Basics of Service Panel Connections
- 🌱 The characteristics of Series and Parallel Connections with Modules

### 4. Job site safety

- 🌱 Precautionary Measures, Procedures and Protocol for Installation

### 5. Solar site analysis and system installation

- 🌱 System sizing; basic tools and procedures
- 🌱 Implementing efficiency and optimal battery
- 🌱 Using a sun chart to determine the azimuth and altitude angles of the sun alongside the magnetic declination for a given site
- 🌱 Analyze the amount of sunlight available for a particular solar window
- 🌱 Identifying the tilt angle and orientation to provide maximum energy production for a given site
- 🌱 Evaluate site-specific criteria for mounting options; examine roof, ground, and pole mounts
- 🌱 Introduction to Grounding, Wiring, Disconnects, Overcurrent Protection, and Series Fusing

## 8. Next Project Dates and Example Itinerary

The next project dates are planned for:

January 26<sup>th</sup>, 2019 – February 9<sup>th</sup>, 2019

July 13<sup>th</sup>, 2019 – July 27<sup>th</sup>, 2019

The Costa Rica Solar Workshop arrival day in Costa Rica is generally a Saturday and you will depart on the Saturday 2 weeks later.

You'll arrive in the international airport in San Jose (SJO) on a Saturday. From there you'll take a short taxi ride to a hostel of your choice close to the airport (we will provide you with the choice of 3 different hotels).

The next day all of you will be picked up at your hotels by our private shuttle - around 8am. The first day with the group will be on Sunday, where we will travel towards Puerto Jimenez together. We will stay in a selected location on the way to Puerto Jimenez, around half way (4 hours from San Jose). The first night the entire group will travel together and stay together at a shared accommodation with dormitory type rooms. On Monday, we will continue our journey and arrive in Puerto Jimenez together that evening.

Upon arrival in Puerto Jimenez you'll be taken to your host families. Classes begin on Tuesday and end on Friday. The daily schedule is from around 9 am-11:30 am, and 2 pm – 4 pm, with a lunch break in between.

There will be some days off in the middle and end of the workshop - so that you have the chance to enjoy the Osa Peninsula: go to the beach, go for a surf, go for a horseback ride, or just hang out around town.

DAY	SCHEDULE AND ACTIVITIES
Day 1 Saturday	Arrival day. Everyone has to book international flights to arrive in SJO on this day. First night in Alajuela, a small city right next to the airport. Hotels and hostels for the first night have to be booked and paid for by participants.
Day 2 Sunday	Pick up: 8am at the hotels/ hostels in Alajuela by our private shuttle transport. Meet the group and instructors for the first time. Travel together as a group. Overnight stay as a whole group on the way towards the Osa, around 4 hours from Alajuela (half way towards the Osa Peninsula). We will stay in shared dormitory type accommodations. <b>Included in this day:</b> Transportation, lunch, dinner and accommodation. <b>Not included:</b> Breakfast.
Day 3 Monday	Onwards travel towards the Osa Peninsula. Activities together as a group. Arrival in Puerto Jimenez, Osa Peninsula, around 4-5pm. Check into your host families. Included in this day: Transportation, breakfast, lunch, dinner and accommodation at your host families.
Day 4 Tuesday	First course day. Start of theory classes with Jason Borner. Schedule: 9am – 11:30am. Lunch break. 2pm – 4pm. Afternoon: Free activities. Host family meals are typically served at: 7:30am (breakfast), 12pm (lunch) and 6pm (dinner). Included in this day: All course materials, classes, breakfast, lunch, dinner and accommodation at your host families.
Day 5 Wednesday	Second course day. Theory with Jason Borner. Schedule: 9am – 11:30am. Lunch break. 2pm – 4pm. Afternoon: Free activities. Included in this day: All course materials, classes, breakfast, lunch, dinner and accommodation at your host families.
Day 6 Thursday	Third course day. First hands-on course day (solar panel construction) with Keith Bonarrigo. Schedule: 9am – 11:30am. Lunch break. 2pm – 4pm. Afternoon: Free activities. Included in this day: All course materials, classes, breakfast, lunch, dinner and accommodation at your host families.

Day 7 Friday	Fourth course day. Second hands-on course day (solar panel construction) with Keith Bonarrigo. Schedule: 9am – 11:30am. Lunch break. 2pm – 4pm. Afternoon: Free activities. Included in this day: All course materials, classes, breakfast, lunch, dinner and accommodation at your host families.
Day 8 Saturday	FREE DAY FOR ACTIVITIES OF YOUR CHOICE Included in this day: breakfast, lunch, dinner and accommodation at your host families.
Day 9 Sunday	FREE DAY FOR ACTIVITIES OF YOUR CHOICE Included in this day: breakfast, lunch, dinner and accommodation at your host families.
Day 10 Monday	Educational day visiting high schools and elementary schools in the area and teaching them about solar panel construction and solar energy. Participants are required to help teach the kids about solar. Included in this day: All course materials, transport, classes, breakfast, lunch, dinner and accommodation at your host families.
Day 11 Tuesday	First solar system install day. Today we're installing a solar system. Start time usually around 6-7am. Day ends around 4-5pm. Overnight stay at a different lodge or hotel together as a group. Included in this day: Transport, breakfast, lunch, dinner and accommodation.
Day 12 Wednesday	Second solar system install day. Today we're installing a solar system. Start time usually around 6-7am. Day ends around 4-5pm. Overnight stay at a different lodge or hotel together as a group. Included in this day: Transport, breakfast, lunch, dinner and accommodation.
Day 13 Thursday	FREE DAY for activities of your choice. Last day in Puerto Jimenez. Last night at the host families. Included in this day: Breakfast, lunch, dinner and accommodation at your host families.
Day 14 Friday	Travel Day – today everyone leaves Puerto Jimenez. You have the choice to go by public bus for \$16 per person to San Jose. From San Jose you can either stay at a hotel of your choice in San Jose, or continue to travel to the airport town Alajuela. Buses leave at 5am and 9am. We recommend the 5am bus since it is air-conditioned and arrives early in San Jose (1-2pm) to continue your travels during the daytime. <b>Not included</b> today are: transport, breakfast, lunch, dinner and accommodation.

\*\*\*Note that we may have to move some activities/planned events around on short notice, and that this is a preliminary schedule – we reserve the right to change this schedule.

## 9. Fees of the Costa Rica Solar Workshop

The mission and goals of this program cannot be accomplished without the financial contribution of the participants, who are the lifeblood of this non-profit endeavor.

The vast majority of money collected from the participants go directly towards the solar systems we install, food and lodging accommodations, and compensation for our hard working staff.

### The costs for this project are:

The two-week course is 1800\$. You are normally asked to pay 50% upon sign up, and the other 50% of the fee around 8 weeks before project begin. We can also accept installments of 25% upon sign up, and paying the other 75% later on.

### We include in our project fees:

- ✔ Private shuttle transportation from your hostels in Alajuela (this is the town close to the San Jose airport, only 10 minutes by taxi) on Sunday morning to the project location - Puerto Jimenez (where we arrive Monday afternoon)
- ✔ 12 nights at either shared hotel/ lodging accommodations (including excursion days) or host families
- ✔ 3 meals starting from Sunday lunch at shared lodging and your host families
- ✔ The course materials and Instructor fees
- ✔ Expeditions to lodges and off-grid solar locations during the workshop
- ✔ Transportation to the installation sites throughout the workshop

#### **Not included in our costs:**

- ✔ Transport / taxi ride from the SJO San Jose International airport to the hostel/ hotel of your choice in Alajuela (short taxi ride of 5-6\$ each way)
- ✔ The first night and last night at the hostel / hotel of your choice - We will provide you hostel/ hotel options upon sign up and you make your own reservations. The costs are roughly from 20\$ per person in a dormitory type hostel.
- ✔ Food expenses on your first day (Arrival Day), first night at the hostel, and first morning at the hostel in Alajuela/ San Jose (however, most hostels include free breakfast in their overnight costs), and on your last day (Friday from around lunch time).
- ✔ Transportation costs from Puerto Jimenez BACK to San Jose/ the airport. The reason we don't include this is, that some people may decide to fly out early, stay another few days in the country and travel more. Bus travel back from Puerto Jimenez to San Jose costs \$16 one way, and a shared taxi to your hostel near the airport would be around \$10 max. Flights from Puerto Jimenez to San Jose are available from around \$80.
- ✔ Extra-curricular activities in your free time (Kayaking, surfing, horseback riding, hiking, any other free time activities)
- ✔ National and International flights
- ✔ Travel insurance
- ✔ Visa costs
- ✔ Any additional food or snacks besides the host family meals
- ✔ Other personal expenses

#### **How are the fees utilized?**

We are not getting rich of your program fee - every last cent is spend well and fairly, and assures that you'll have a great workshop experience!

**Here is an estimated breakdown of the major costs the program fee will provide (please note some of these costs are approximated and may differ in the final course):**

<b>Project Fees Total</b>	<b>\$1800</b>
Accommodation and food for our participants	\$400
Transportation costs throughout the workshop	\$200
Instructor and staff costs	\$400
Workshop materials	\$200
Solar system installation costs	\$400
Transaction & banking fees and miscellaneous costs	\$200



## 10. Instructors and Organizers

Our Costa Rica Solar Workshop, is a collaboration project involving different organizations and people. The main two organizations involved are Green Life Volunteers, founded and managed by Janina Schan and The Green Go Solar Project created and managed by Keith Bonarrigo.

### Janina Schan – Green Life Volunteers Costa Rica



Founder and Manager of Green Life Volunteers in Costa Rica, and co-founder of the Solar Power Project, Janina Schan was originally born in Germany, and decided to move to Costa Rica in 2011 to make a difference. Her background is in Environmental Studies and Biology – she has a Masters in Environmental Studies from York University, Toronto, and a Bachelor of Science from Germany.

In her Master research she focused on tropical ecology and conservation and studied for 6 months in Costa Rica. The idea of the volunteer company came a little later, but she always had the desire to help out and make a difference, especially regarding conservation and development projects. After her Master research ended, she started to work in Costa Rica in the tourism and volunteer industry, and then opened up her own volunteer company Green Life Volunteers in the beginning of 2012.

The idea was to create an organization that focuses on helping the community by sending volunteers to host families, and supporting volunteer projects that actually make a difference to the community, the animals and nature surrounding them. She created a dog and cat rescue project on the Osa Peninsula (the first of it's kind in the area), and started helping many small grassroots NGOs, remote schools, and remote projects with sending them volunteers. She is involved in turtle conservation projects, a local butterfly farm, a local parrot rescue project, an environmental education program, just to name a few.

Janina lived on the Osa Peninsula for over 7 years, and has a good knowledge of the community and people. Her role in the Solar Project is to arrange all the logistics (transport, lodging, host families, course rooms, course materials etc.) and she is also the first point of contact for participants signing up for the course. She will help answer all questions during and after enrollment. She also organizes the involvement of local Costa Rican's during the workshop and chooses the schools that receive our solar system donations.

### Keith Bonarrigo – The Green Go Solar Project



Keith Bonarrigo is the founder of the Green Go Solar Project and is a certified NABCEP PV associate (associate certification number #858109285).

Keith will be a part of our workshop for almost the entire duration of the course. He's our instructor for the hands on workshop part, and he's also educating locals about system maintenance. He serves as an excellent source of knowledge regarding everything solar throughout the course. His experience of a different geographic area, that comes with different challenges, helps to bring an even broader variety of solar knowledge to the

workshop participants. Furthermore, he'll also help us to educate school kids at the local high school about solar energy.

Keith grew up and attended high school in Ipswich, Massachusetts. From there he continued moving west to Colorado for snow and later to California chasing better waves and warmer water. Keith lived and worked several years in Peru, and later on in Brazil.

Keith became interested in renewable energy and ultimately studied under/befriended Mike Nelson – life-long renewable energy advocate, designer, and legislator as well as head of the award-winning Zero Energy Technology program in Shoreline, Washington. The two began experimenting with panel designs to address/change the notable lack of power to most residents of San Juanico – Baja Sur, Mexico. Keith had been drawn to its legendary surfing reputation and it had since become a regular destination for him. Their concept and designs evolved over time, prototypes were built and then placed into the community for testing.

Keith is fluent in English, Spanish, and Brazilian Portuguese and has limited communication ability in Thai and Bulgarian. He is 44 years old and splits his time in the Northwest between Portland, Or and Baja, Mexico. He enjoys many hobbies – among them are surfing, snowboarding, skiing, skateboarding, martial arts, travel, and language.

### Jason Borner – COO and Co-Founder of Poderco Solar Costa Rica



Jason is our theory instructor during the workshop, and he also will be our solar installer for the system installs on the school buildings. You'll be working with him in the beginning and again towards the end of the course.

Jason Borner, originally born in Canada, founded Poderco SA in 1999 to service residential and commercial clients living off-grid in Costa Rica. Jason has successfully engineered and installed renewable energy systems including photovoltaic, hydroelectric, solar thermal, biomass and distributed micro grids in Costa Rica and Panama.

Jason has not only worked in the solar industry in Costa Rica for decades, he was also a pioneer in the field. Costa Rica had almost no solar power during the time Jason started Poderco. He was one of the first to bring solar power to the Osa Peninsula (where our workshop is mainly located). Jason also is one of the few installers in the country who is licensed to install on-grid solar systems. In 2010 Poderco began installing grid tied photovoltaic systems in Costa Rica, and the United States. Poderco is currently developing commercial and utility sized PV systems in Costa.

### Richie Aronson – Xero Solar L.A.



Richie is a solar energy professional from the US with an MBA in Sustainable Systems from Presidio Graduate School, which is consistently ranked as one of the top programs within the United States for social and environmental impact. After his MBA, Richie worked as an analyst in early stage start-up companies in the cleantech sector for a small group of angel investors. Richie enjoyed playing collegiate basketball in Southern California and has a lifelong passion for athletics.

Richie oversees large scale solar installs in Los Angeles with Xero solar, who is involved in cutting edge technology (like the Tesla Powerwall). Richie also

has a strong background and working knowledge in the financial aspects of solar.

Richie is the co-founder of the Solar Power Project - A Hands On Workshop, he will be on site throughout the workshop. He originally came across Green Life Volunteers and Costa Rica during a few months of traveling in the country in 2014. He actually was a volunteer at first on one of GLV's projects. Richie and Janina got along well, and shared common interests in renewable energies and environmental protection.

Richie found the Green Go Solar Project (GGSP) in an internet search shortly after returning home from his Costa Rica trip. He was researching innovative renewable programs while studying in his MBA. He found Keith Bonarrigo and emailed him, and they met in Seattle. Later on Richie came to Baja California, trained as one of the first foreign volunteers in the Green Go Solar program, and recognized it would be a great fit with the Green Life Volunteers Program.

Richie and Janina strategized how to integrate the GGSP mission with Green Life Volunteers' and the rest is history: A new project was born.

## 11. Reviews of Past Participants

These are some example reviews of past participants who joined our workshop. You can also find more reviews on our solar power project website under [www.glvolunteers.com/solarproject/](http://www.glvolunteers.com/solarproject/)

### ***Katelyn – 26 years old from the United States:***



*"I participated in the 2-week solar power workshop in June 2016. I came to the workshop with a general interest in clean energy and a desire for an immersive travel experience.*

*In addition to learning all things solar (theory, system design and maintenance, installation, and how to build a panel using cosmetically defective cells), I made chocolate from start to finish on an off-grid farm, practiced my Spanish with the locals, hiked to a waterfall in Matapalo, volunteered at a local butterfly farm, surfed, kayaked, went horseback riding, and observed an abundance of wildlife (dolphins, monkeys, toucans, scarlet macaws, and crocodiles to name a few).*

*Green Life Volunteers does an excellent job of balancing work and play. My experiences were life changing and I wish I could have stayed longer! Highly recommend."*

### ***Jake, 30 years old, from the United States:***



*"An absolutely fantastic experience. Amazingly informative on the practical aspects of solar, while at the same time extremely rewarding and helpful to the host community. I actually got to see the lights go on in a school house that had been powerless for forty years. Mixed with the project was an absolutely amazing adventure, got to experience the wonderful biodiversity of the Osa, from monkeys and dolphins to you name it, and enjoy the exciting night life, salsa dancing in the local bars and relaxing*



*with a beer on the beach. As well, the small structure of GL volunteers means that it relies highly on local businesses and all the funding goes directly into the community. Above and beyond expectations in reward and fun! Janina is the best!*

*Also, I was put in a host family on the beach with tropical scarlet macaws serenading me on my way to the workshops. Couldn't recommend enough."*

## 12. Extra-Curricular Activities

Together with your Solar Panel Workshop group you can participate in other activities around the area. There is plenty to do around the Osa Peninsula, and we will organize activities around Puerto Jimenez during your workshop time. Unfortunately, any extra-curricular activities are not covered by the workshop fee.

Activities may be surfing, paddle boarding, Corcovado National Park hikes, Bird watching, Mangrove and Sunset kayaking, Dolphin Tours, Zip lining and much more. We may set these activities up in a group or you may decide to do your own thing – but in a group we get great discounts and can offer very affordable activities.



We usually offer a couple of activities that we can do together as a group on the weekend (Saturday – Sunday) where everyone has 2 days off. We often do a dolphin/ whale watching tour together as a group, which is very well received, as well as a waterfall hike and surfing lessons.

### A list of fun activities to do around the Osa Peninsula:

- 🌿 **Kayaking:** Kayaks are for rent in Puerto Jimenez town from \$20. It's possible to go out afternoons after the course is over (around 4pm) for a sunset kayak cruise. You can hire a guide as well to take you through the Mangroves (highly recommended).
- 🌿 **Bike riding to Playa Preciosa:** Bikes are available for rent in Puerto Jimenez town from around \$10. You can take a bike and cruise around 45 minutes to a beautiful picture perfect beach with a several kilometer long beach. Perfect for an afternoon or day excursion on your own.
- 🌿 **Horseback Riding:** Horses are for rent in Puerto Jimenez town for around \$40 per horse. The guide charges another \$40 to join you and show you around.
- 🌿 **Dolphin and Whale watching tour:** Typically we organize a group dolphin and whale watching tour for the entire group (or whoever wants to join). Costs are approximately \$50 per person. The tour starts around 7:30am and goes until around 1:30pm. This tour is perfect for a whole day off (Saturday or Sunday).
- 🌿 **Tour to a Chocolate Making Farm:** There is a chocolate farm close to Puerto Jimenez. A tour typically costs around \$70 per person, includes transport and chocolate tasting! You will learn everything there is to know about chocolate making.
- 🌿 **Butterfly farm:** The butterfly farm offers night walks to see frogs, crocodiles, snakes and other night active animals. They also offer day tours around the butterfly farm and teach you about the conservation work they do.
- 🌿 **Hike to a Waterfall:** To go for a waterfall hike cost around \$20 per person for transport and a guide. They'll take you for a beautiful walk where you see lots of monkeys and animals, and arrive at a beautiful waterfall where you can go for a swim. This tour is around half a day starting from around



- 🌿 **Surfing in Matapalo:** Matapalo is one of the best surf spots around the country. Surf boards are for rent from \$20 for experienced surfers, and lessons for beginners starts at around \$55 per person. You'll get a lesson from an experienced surf instructor in small groups (around 3 people per group) and you're almost guaranteed to stand up :)
- 🌿 **Surfing in Pavones:** Pavones is one of the longest left-breaking waves in the world, and is just across the Golfo Dulce. If participants are interested, we can organize a trip to Pavones by boat to go surfing. The cost will depend on how many participants are into going, but may be around \$50 per person.
- 🌿 **Hike to Corcovado National Park:** Hikes to Corcovado National Park have to be planned a little further in advance, since park permits are limited. You need a guide to join you for this hike. Costs start from around \$140 for a day tour including transport. There is also an option to stay overnight in the park, which would be a bit more expensive (around \$250) but a once-in-a-lifetime experience. You would sleep in world famous La Sirena Ranger Station in the middle of the jungle.

## 13. General Information for Participants

### Accommodation



While you're on this project you'll either stay with the entire group in a hostel/ lodge, or stay with local host families together with other Solar Project Participants.

Usually we have the participants

split up in groups of 2 per room, and we have around 5 - 6 different host families around Puerto Jimenez. If you share a room with one of the participants, we will make sure to team up only participants of the same gender and roughly same age range. You will also always have your own bed, and just share the room and the bathroom with your fellow participant. You will also have either a private bathroom for yourselves or share a bathroom with the family.

Remember you are staying with local Costa Rican families - the accommodations are basic. You will be provided with a fan, air-conditioning is not included usually at the Costa Rican housing.

### Food

Food in Costa Rica is simple but delicious, and you will have access to a great variety of fruits, veggies, and dairy products in Costa Rica. Meals at your host family often include rice and beans; other common items include tortillas, salads, chicken, fish, pork, beef, pastas, soups, cereals, sandwiches, cheese, fruits, veggies and fresh- squeezed juices. You will help prepare meals with your host family, and you will experience a whole new way of cooking and preparing food.

Remember that the Costa Rican diet may differ from our western diets. Vegan and vegetarian diets are not very well known in Costa Rica, but families will prepare vegan and vegetarian meals for you in the way that they can. However, there are certain items that they may not be able to prepare or buy for you because special vegan items can be expensive (as they're imported, such as tofu, vegan cheese, etc.). If you are vegan and need those special items, we ask participants to be flexible and purchase additional food items themselves, and ask the family to prepare those for meals (gluten free pasta, hummus, tofu or vegan cheese).

It is important to let us know about any dietary needs in advance so the family is notified and they can prepare accordingly.

Usually breakfast will be served around 7:30am, lunch around 12:30pm, and dinner around 6pm every day. Sometimes this schedule may vary depending on course activities and excursions.

### Laundry/cleaning

You will have access to a place where you can wash your own laundry and most families have a washing machine (only some have dryers). Some families might offer to do your laundry for an additional fee (if you want). It is culturally unacceptable for women to wash other women's underwear so if you arrange to have your laundry done, please separate your underwear and wash them yourself.

### Telephone/internet access

In Puerto Jimenez Internet and Phone Signal is readily available. Most host families and hotels offer wifi. You also may purchase your own cellphone sim-card for an unlocked phone. That way you can use a prepaid card and also use internet/WiFi if you have a smartphone. The sim cards are very cheaply available – it costs around 2000 Colones and you can buy it almost at any small Kiosk (Pulperia) in Puerto Jimenez or San Jose.

### Weather and Clothing

It usually rains at least once each day during the rainy season (May-November) even if it is just for 10-30 minutes. Puerto Jimenez is right at the ocean and the rainforest is not far – rain is pretty common during your project time. Daytime temperatures range from the mid 70's (Fahrenheit) when overcast and low-90's when the sun is out. The weather can change very quickly, storms can develop and rain may fall even though it was just sunny five minutes ago. However, it is mostly sunny all throughout the morning. So installing solar panels and outdoor work will mainly be happening in the morning hours.

Humidity is very high and cotton clothes should be avoided because they never dry completely. During the summer months the humidity is a lot lower, the skies are clear and blue with a nice breeze, however at times it may be a bit dusty since the roads are gravel. We recommend quick-dry clothes and light breathable fabric. You will need some sandals for light day work, and stronger hiking boots or gum boots for working at the farm. Check our Packing List at the end of this document for more details.

### Spending money

There are two banks located in the center of Puerto Jimenez – they both have ATMs and access to

US\$ and Colones. You should not have to spend too much money while you are on the project, since the project fee covers your accommodation and meals, but we recommend you bring some money for your own personal items, snacks, drinks, or anything else you may want to buy.

There is really no need for you to change money into Colones before you come to Costa Rica. Once you are in Costa Rica, and pay with your dollars, you will usually receive change back in Colones. You can take money from the ATMs with your credit card or debit card, so you do not need to carry a lot of cash with you. Please contact your bank and clear your card for international usage. Some banks have restrictions as to the amount of cash you can withdraw in a day. Find out what those limits are prior to departing. You should bring enough cash to carry you for at least the first week until you have a chance to go to an ATM (sometimes you have to try a few ATMs before you get money). If you are bringing US Dollars you have to make sure that the bills are in good conditions, otherwise the bank would not accept them. You will need your passport (not a photocopy) in order to exchange dollars.

Most places in Costa Rica would not take fifty or hundred dollar bills (with the exception of some hotels). If you carry fifties and hundreds, you will have to go to the bank to exchange them.

## Rules and Guidelines

The workshop instructors and coordinators expect you to attend the program regularly, be on time, and behave consistently in ways that reflect well upon Green Life Volunteers and the other participants. You are expected to dress according to local norms while in public and to treat people with kindness and respect appropriate to their age and social standing.

The same goes for your host family. In addition, Green Life Volunteers insist that volunteers avoid any contact with drugs and any culturally inappropriate activities relating to alcohol, especially in your host family homes. Remember that some of these families have children and their culture is rather conservative and religious. In cases that a volunteer repeatedly behaved in ways that contradict the codes and conducts, we reserve the right to remove volunteers from a program.

We view the experience of the participants as a commitment that includes a willingness to overcome challenges of all kinds. In cases where participant are experiencing difficulties, we strongly encourage creative, collaborative solutions that allow the participant commitments to be completed. At the same time, we respect the ability and freedom of our participants to use their own judgments and we understand that participant's work only functions well when the participants retain the will to work fully and energetically.

Green Life Volunteers expects participants to respect the areas in which you are working as well as your project leaders, members of your host families, members of the community and other participants.

In case you are experiences troubles or conflicts, we rather know sooner than later if there is anything that is not working for you and we want to make you as comfortable as possible. Having said that, we cannot stress enough that flexibility and being positive and open-minded will go a long way in ensuring an enjoyable participant experience.

Remember that you are in a Spanish speaking country. It is up to you to accommodate the new language and not impose your language on the locals. We always recommend to volunteers and participants that the more Spanish they speak, the better their experience will be. If you do not speak any Spanish or if you are a beginner, you have a perfect opportunity to improve your language skills while you are on your project and in your host family. On most of our projects the project

coordinators and host families speak very little to no English. Ask us for options to take Spanish Classes before your volunteer stay – we offer very affordable and a great Spanish school program.

### Important rules that you should be aware of are

- 🌱 Drinking is permitted ONLY while NOT on duty. Keep in mind that alcohol can negatively affect a participant's performance at the project and you will be doing tasks that may be dangerous to do when under the influence of alcohol. Drinking after hours is left to your discretion but be sensitive to the drinking habits of your host family. It is unacceptable to show up at your host family home intoxicated and sloppy!
- 🌱 Participants are permitted to smoke cigarettes but not inside the project's buildings or your host homes. You will have to agree on a place for you to smoke cigarettes where it does not molest anyone.
- 🌱 Please respect the facilities and the environment.
- 🌱 Conserve water and electricity as it is expensive and you do not want to burden your host family.
- 🌱 Respect the culture of the local community and ask for permission if you want to do things in their home that they don't normally do. Use common sense and treat people and their home with respect.
- 🌱 Be aware of mosquitoes, scorpions, spiders and other insects. Keep your bed clean and your bag zipped. Use your mosquitoes net if you brought one.
- 🌱 Always clean your feet from sand before you enter the house and specially the shower.
- 🌱 Since you're right on the beach, drains can easily clog due to sand being tracked to showers and drains.
- 🌱 Due to the heat and humidity, it is recommended that all volunteers shower and use deodorant every day. Personal hygiene is a must in this type of climate. Please do not put yourself in the situation that you have to be told to practice personal hygiene. The families are usually very polite, and they would feel terrible to have to tell you that you "smell". Please be considerate!
- 🌱 Normally, toilet paper is deposited in baskets right next to the toilet. Do not flush toilet paper after using the bathroom! Again, drains in these rural areas and especially on the beach can clog easily and do not have the power to deal with toilet paper, female slips or tampons! Always throw those items in the bin next to the toilet.
- 🌱 If you use, abuse or even come in contact with drugs, drug users, drug pushers or anyone remotely connected with drugs illegal or otherwise (other than for medical reasons), your placement will be terminated immediately, your visa will be withdrawn, and you will be deported from the country with no compensation. Never bring drugs into the project or host families (other than prescription drugs). There are no exceptions to this rule, regardless of the reasons. Please accept that while you're working on your project you don't consume illegal drugs.

### Safety and Precautions

Tourists are sometimes targets for pickpockets and thieves. The Osa Peninsula is a very safe place but places like San Jose are not as safe. Please do not put yourself in a dangerous situation. Be cautious and use common sense. As a general rule, participants should not go off alone at nights, especially in large cities like San Jose. Puerto Jimenez is a very safe town, but even there we recommend to go out at night (!) with groups of 2 – 3 people.

In general, the best way to store valuables is not to bring them with you if you go out but to leave them with your host family. Make sure whatever valuable you bring are in your bag and that you



keep your bag close to you at all times. Money belts are a good investment before you travel to Costa Rica. Make sure if you get one that it is big enough that you can also fit your passport in it.

If you travel on public buses please always stay close to your bag, or bring your valuables with you when you go to the bathroom. Don't even leave your valuables alone for a few minutes – it has happened to many volunteers and participants before that they lost items on the bus.

### Tips:

- ✦ Travel in pairs if you can (one can stay with the bags, the other goes to the bathroom).
- ✦ Use caution in unfamiliar locations.
- ✦ Be very careful when traveling in San Jose.
- ✦ You're a target for thieves. Keep your valuables in a safe place. Always keep an eye on your bag. Never leave your bag unattended when you go to the beach.
- ✦ Photocopy your passport and important documents. Don't carry your original passport on you.
- ✦ Carry your money and passport (or copy) inside a money belt on your body. It is the safest place.
- ✦ Avoid flashy dresses. Never wear expensive jewelry, etc. while traveling. Do not carry all your credit cards and all cash with you. If there isn't a safety box where you are, use a money belt or make several trips to the bank.
- ✦ In a lot of areas in Costa Rica swimming can be dangerous because of rip tides. Please inquire FIRST before swimming at a deserted beach. Don't go swimming alone, have someone watch you at the beach.

### Medical facilities

The closest medical facility is a clinic on the Osa Peninsula in Puerto Jimenez. The doctors in Costa Rica are well educated, often speak English, and are able to take care of most of your medical needs. In case of a more serious medical situation, there is a bigger hospital in Golfito, where patients can be transferred, or if a more serious situation occurs, participants can fly to San Jose.

### Recommended packing list

- ✦ Passport and passport photocopy
- ✦ Your own Towel
- ✦ Camera and batteries (you can find batteries here but they're more expensive)
- ✦ Notebook and pen
- ✦ Headlamp or Torch (we do have power outages and it gets dark at night – streets are not well lit)
- ✦ Personal medical first aid (Or medication you may need – it is remote in your location and you may not be able to buy what you need, so bring it from your home country).
- ✦ Clothing for a warm tropical climate, preferably non-cotton, that you are not worried about ruining or getting dirty. Quick-dry clothing is best. Bring some long-sleeved pants and shirts, as they protect well from mosquitos!
- ✦ Sturdy shoes and tennis shoes for working (hands-on workshop) and hiking
- ✦ Waterproof sunscreen
- ✦ Sunglasses
- ✦ Mosquito repellent
- ✦ IF you wish: Mosquito nets for your beds. The host families do not generally provide these.
- ✦ Sandals and comfortable walking shoes (that dry fast)
- ✦ Lightweight disposable rain poncho

- 🌱 Sweater for colder rainy weather and when in San Jose
- 🌱 Swimwear
- 🌱 Water proof & secure bag for documents
- 🌱 Money belt (for extra security)
- 🌱 ADAPTER for electrical outlets: Outlets are 120 Volts and general USA plugs. However a lot of outlets do not have the third larger grounding prong in the middle, only 2 prongs.
- 🌱 Forms of entertainment: books, games, music, guitar, paints, surfing equipment, etc.
- 🌱 Positive attitude 😊

**Thank you and we are looking forward to working with you!**

**Your Costa Rica Solar Workshop Team**

