

Return to Haiti - 2007

By Richard Komp

Since my first trip to Haiti in November of 2003, the Grupo Fenix from Nicaragua has been back two other times; but this was my first trip back to work with the two groups who are running cottage photovoltaic (PV) module assembly plants. This fourth Fenix trip came about rather suddenly as a result of the groups switching to the new Evergreen Solar ribbon growth PV cells. These cells are made a new way which uses far less of the expensive pure silicon than the Astropower PV cells they had been using, and are less expensive, even though they are just about as efficient; but they are very fragile and harder to handle.

One of the groups, organized by Jean Ronel Noel and Alex Georges, also had a problem with Fed-Ex badly damaging the box of 2000 Evergreen Solar cells I sent them. This group, which has started a new tiny company called **Enersa SA**, also had several customers on a waiting list that had already put down their deposits. The other group, **Movement Pasiance de Paypay** (MPP or the Paypay Peasants Movement) had also been wanting to switch to the new ribbon grown cells; so the groups got together and asked me to come and help them out.

In Port au Prince

I was in Haiti for two weeks in the joint trip, spending a week at each location. First, I worked with Enersa in their shop in a semi deserted warehouse district near the Citi de Solei in Port au Prince. The group of workers, mostly young people from the notorious Citi de Solei ghetto, quickly got the technique of sorting and cutting the damaged PV cells from the Fed-Ex boxes, and we managed to salvage far more of them than Jean Noel Ronel and Alex Georges, the managers of Enersa though was possible. The intact cells (even with small cracks) were saved to make 60 watt PV modules. We cut as many of the broken PV cells as possible exactly in half, to make 30 watt modules. The smaller pieces were saved for 15 watt and smaller modules.



Figure 1, Enersa workers sorting and cutting the broken PV cells.

I then taught them the new way of encapsulating the PV cells developed by Marco Antonio, the landmine victim who runs the Grupo Fenix cottage PV factory in northern Nicaragua. Marco and I are now coauthors, with Susan Kinne and others of a scientific paper we gave at a major international photovoltaics conference in Dresden, Germany last September. Since that time, I have been showing the other cottage PV factories the new technique (*see Solar Work on the Miskito Coast*) and the more recent developments worked out by these cottage industry groups. The Enersa group picked up the basic technique very quickly and even added their own improvements, which I will now pass on to the others.

Jean Ronel and Alex are both very creative and willing to try new ideas: The day I arrived, they showed me a new self-contained solar LED light. This light, which uses less than 1 ½ watts is bright enough to light up a whole table and has its storage battery built into its base with a plug for the input from the attached 6 watt PV module and another with adaptors to recharge different models of cell phones (which have become very popular in Haiti). The lamp puts out enough light to light up the tiny home of a poor Haitian, but the entire package will sell for only \$70. The PV module for the lamp is made from the smaller broken pieces of the Evergreen Solar cells damaged by Fed-Ex.



Figure 2. Finishing the second prototype self contained Solar LED light, using light from the previous prototype LED lamps since the electric power was down (a common occurrence in Port au Prince)

They brought the lamp to a dinner meeting we had with a couple of NGOs (Non governmental Organizations) who were interested in setting up a microloan program in Haiti to create small solar cell phone charging stations in the poorest neighborhoods. While we were eating dinner at the fancy Olefson Hotel, the electric power in Port au Prince quit (a very common occurrence there) and we used the lamp to light up the entire table to continue our meal and discussion (even before the waiters brought candles).

While in Port au Prince, I stayed with Jean Ronel's family and got to see what life is like now in the city. One afternoon we got to see Hugo Chavez's motorcade when he came on his state visit from Venezuela. There was a large, enthusiastic crowd lining the street for his arrival. Another evening we went to a Jazz festival; great music with a real Caribbean flavor. I think I was the only "Mr. blanc" there but felt very welcome.



Figure 3. At the Jazz Festival

MPP Work at the Central Highlands

After the first week, I rode to the MPP headquarters in Paypay, near the regional capital of Hinch in the Central Highlands. This is the place where Marco Antonio, Rodolfo and I had spent a month on the first Fenix visit to Haiti, showing the group how to manufacture PV modules and then using them to power solar microdrip irrigation installations. In the 3 ½ years since that visit, the main road to Hinch had gotten even worse so the 110 mile trip now took 6 hours in a “real” SUV. One reason for the slow trip was the stack of glass PV module plates we were carrying in the back, which meant we had to keep the bouncing to a minimum.

Several of the people in the original MPP workshop group were in our first workshop, or in the ones given by Carolina Barreto or Rodolfo in subsequent trips, so this trip felt like coming home. I more or less repeated the lessons I had given the Enersa group, and by noon of the first day in Paypay, part of the group was sorting and cutting the Evergreen Solar cells while the rest were soldering them into strings ready for encapsulating them onto the glass plates we had so carefully brought. We took the good half of the broken PV cells that had been trimmed up and made our first new 30 watt PV module. I taught both groups how to cut glass, so that they can custom make the PV modules in different shapes and sizes to efficiently use the broken PV cells.

This group, which had had previous experience making PV modules from the Astropower cells, caught on very quickly so I got a chance to duck out to the MPP’s solar ciber café that we had solar powered on the first trip. The satellite connection allowed me to finally get online and sort out the hundreds of e-mails waiting for me (the majority was spam, of course). In the four days I was in Paypay, we made three 60 watt modules, two 30 watt ones and a 15 watt modules from the smaller scrap cells. When I left, they were busy soldering sets of PV cells to make more 60 watt modules for the people who were waiting for their PV system. They will also expand the PV array on the cyber café.



Figure 4. Putting the liquid silicone onto a 30 watt PV module, ready to be encapsulated



Figure 5. Testing the PV cells for a 60 watt module, I am next to Chavanne Baptiste, the director of MPP

I stayed right on the MPP complex in their guesthouse and ate dinners with the rest of the group. The food was the very good traditional Haitian cuisine, which is very similar to the food in Mali, West Africa. We always had a base of some grain, usually sorghum, with a gumbo made with okra and either chicken or goat meat. MPP is working with the local peasants to improve their diet so we always had a salad and often had cooked greens to get the proper vitamins in each meal. I drank the local water, which is piped from a nearby spring and safe; but in Port au Prince, I had to drink the locally prepared bottled water sold to all those who can afford it, since the water there is badly contaminated. The hospitality I felt in Haiti was very genuine and gratifying; I was treated like a family member and got to go everywhere without feeling out of place.

However, Haiti is still a very lawless country. While I was at MPP, I heard the story of how their solar powered microdrip irrigation systems were robbed by gangs with guns. On the second Grupo Fenix trip to Haiti, Carolina Barreto had installed a large PV powered water pump to fill a storage tank from a well to irrigate several acres of farm gardens. The group had actually cemented the 1.2 KW PV array right into the roof of the storage tank, but the men with guns chipped away the mortar and took the modules. They did the same thing to a second system installed afterwards and I was told that they took the modules to the Dominican Republic to sell. However, a number of the modules couldn't be removed easily so they deliberately broke them. I went through the pile of broken modules and found that most of them still worked, but not all at full power. (Bullet holes do mess up a PV modules somewhat). I showed them how to rescue what they could and these are now being used on MPP's own buildings to charge storage batteries. The UN has a very visible presence and I am told that things are slowly changing. For instance, an international aid program is rebuilding the road from Port au Prince to Hinch so that the 6 hour SUV trip will again become a 1 ½ hour drive in a regular car.

I rode back to Port au Prince the morning of the day before my plane was to leave, so that I got to spend that afternoon visiting with the Enersa group and view the progress they had made. In the time I was away, they had put together twelve 60 watt PV modules and were assembling two more when I arrived. They had also made two 30 watt modules and several small solar cell phone chargers for the NGO project. They have developed a new variation of the encapsulation procedure, where they put a measured 400 ml of the liquid silicone on the middle of the array of PV cells and then, after laying on the glass cover, slowly add weight to force the silicone into all the cracks and behind the cells squeezing the air in front of the moving edge of the silicone. They use far more pressure than I had imagined was possible, but the uniform pressure doesn't crack any of the fragile PV cells. On the Miskito Coast, we used derelict car batteries in a similar way.



Figure 6. Laminating a 60 watt PV module, this pile of blocks and lead weights replaces the expensive laminating machine normally used in commercial PV module production.



Figure 7. The Enersa Group celebrating the finishing of the 60 watt PV modules



Figure 8. Enjoying a Sunday afternoon in Haiti at Alex's family home

The two groups are now working together to buy parts in bulk to get a better price and simplify the shipping arrangements, and are also exchanging tips and information on PV modules and systems. They don't compete with each other since they work in different parts of the country and have customers on a waiting list. These include a nice mix of both poor peasants and middle class businessmen who need the systems to power their offices and stores when the utility grid is down. One of the Enersa goals is to use the cash flow from the more affluent customers to finance the program of developing and manufacturing the small PV modules and the self-contained solar LED lanterns for the peasants.

For this trip, there was no outside NGO involved, the entire trip expenses were paid for from the sales of the PV systems the two groups are making. Of course I didn't take any pay for myself. Before I went to Haiti, I was warned that there are gangs there that kidnap rich people (which would include anybody showing up from the US) and that you would have to have to arrange for a friend to drop a plain envelope stuffed with money to get your release. The most dangerous gangs were said to live in Citi de Solei. Just before I left, somebody from Citi de Solei handed me a large plain envelope stuffed with \$100 bills to cover the travel expenses and the cost of the PV cells and other materials I brought (or had shipped earlier). Banking is still a problem in Haiti so hard cash is the normal method of doing business. The bank in Jonesport checked each bill with a special system they have to make sure they were genuine; they were. Since I got back from Haiti two weeks ago, I have already shipped a box of 1000 solar cells to an address in Miami for somebody to carry to Haiti in his luggage.

Photovoltaics is alive and doing well in Haiti.