



Section 1: Introduction

This report is an assessment of the overall status of the Border Green Energy Team (BGET) project. It was written for the purpose of project documentation, as well as to provide a means for organizing BGET's future efforts, with a focus on the upcoming six months. This section includes a brief overview of the "big picture" of BGET. The rest of the report is organized by project, as follows. Sections 2 and 3 address the Thai Solar Home Systems (SHS) Training Project and the Micro-Hydro Project, respectively. Section 4 discusses the proposed Refugee Camp Hybrid Project. Section 5 addresses the ongoing Refugee Camp Trainings Project, and Section 6 explains the status of the Burma Clinic Trainings Project. Section 7 outlines a plan for creating a BGET website. Finally, Section 8 addresses the overall future of the project, including long and short-term goals and the issue of sustainability of the project. In general, each section includes a short summary of past activity on the project, and also establishes plans for the upcoming six months, complete with a projected schedule for the planned work.

The overall goals of BGET were established in the BGET concept paper, written in April, 2005. For a thorough description of those goals, the interested reader is encouraged to find a copy the concept paper, either on the Internet at www.palangthai.org, or elsewhere. In order for this report to be somewhat self-contained, these goals are briefly summarized as follows:

- BGET will work to improve the sustainability of the Thai SHS program by conducting trainings in the Thai villages. These trainings are intended to help increase awareness about the warranties for the components of the solar systems, as well as to train local technicians who will be qualified to perform routine maintenance and troubleshooting of the SHS. This project is referred to henceforth as the Thai SHS Training Project.
- BGET will work to identify promising potential micro-hydro sites in Tak province, and to cooperate with villagers and, if necessary, local experts to install micro-hydro systems at these sites. This project is called the Micro-Hydro Project.
- BGET will work with refugees living in the refugee camps to provide technical training related to sustainable energy use, preferably in the context of hands-on training of skills that can be implemented in the camp. This project is referred to as the ongoing Refugee Camp Trainings Project. A related project that has only recently been proposed (as of the writing of this report), is the installation of solar arrays for use as solar-generator hybrid power systems for computer labs in each of seven refugee camps. This project is referred to henceforth as the Refugee Camp Hybrid Project.

- BGET will work with Karen medics from Burma to hold trainings at which the medics will be supplied solar systems for their clinics, and will be trained in the installation, operation, and maintenance of these systems. This project is called the Burma Clinic Trainings Project.

More generally, BGET works to increase awareness and practical knowledge regarding renewable energy applications, to promote the use of renewable energy, and to ensure that where these technologies are used, they work as effectively as possible. By attempting to ensure that peoples' experiences with renewable energy are positive, it is hoped that BGET will encourage further use of such approaches. It is the aim of BGET that its various projects build upon each other in a synergistic fashion to accomplish the above goals.

Section 2: Thai SHS Trainings Project

Review

The initial goal for this project was to complete training in each of the 11 tambons (sub-districts) within Mae Ramat and Tha Song Yang, the two ampurs (districts) in Tak province with the majority of the SH systems (together, these districts contain 9000 of the 15000 SH systems in Tak). The intended outcome of the training in a given tambon is that each moo ti within the tambon is represented in the audience, and that at the conclusion of the training at least two people from each moo ti are qualified and equipped to act as technicians for their respective moo ti thenceforth.

The intended responsibilities of these technicians include performing routine maintenance and troubleshooting on SH systems, as well as completing survey forms for all of the SH systems within their moo ti. It is the technicians' responsibility to return survey forms to the aw baw tau (government office) for their tambon. It is the aw baw tau's responsibility to use the completed surveys to fill out and submit warranty forms where applicable, and to pass the forms on to BGET, which provides BGET a means for monitoring the status of the SHS program. Because the aw baw tau is expected to play an important role in this process, another intended outcome of the trainings is the establishment of an agreement between the aw baw tau and BGET in which the aw baw tau pledges to fulfill the above role and to give the technicians the support that they need to perform their responsibilities successfully.

So far, trainings have been held in the following 8 tambons: Mae Tan, Mae Song, Mae Wa Luang, Mae La, Phra Taht, Mae Ja Rao, Tha Song Yang, and Sam Muen. It is estimated that approximately 5,700 of the systems have been surveyed. Overall, the trainings have seemed successful in that attendance has been good, and that the majority of the students have passed the practical exam at the end of the training, and have thus earned BGET's sponsorship to act as technicians in the capacity described in the previous paragraph (this sponsorship comes in the form of a toolbox and a certificate stating that the technician has successfully completed the training). However, a potentially more definitive means of measuring the success of the trainings, specifically the data for the completed surveys, is inaccessible as of the writing of this report. This is primarily because the surveys are handwritten in Thai language so that compilation of the data will require a substantial amount of time on the part of someone fluent in Thai and English (and preferably with some technical background). Another way that BGET may get feedback regarding the success of the trainings is by holding follow-up trainings in places that have already had one training. For further discussion of the plans regarding survey

data compilation and follow-up trainings, please see the “Plans and Schedule” heading in this section.

Some developments relating to the SHS program that are especially pertinent to the SHS Trainings Project, are as follows. Using a sample of about 3,000 systems surveyed in October and November of 2005, it is estimated that at least 9% of the systems have failed within the first year. This failure rate, although somewhat lower than initial projections, suggests that there is substantial need for a project like the SHS Trainings Project, i.e. one that improves the sustainability of the SHS.

There are some promising developments. The Provincial Electricity Authority (PEA) claims that Solartron responds to all of the warranty claims that PEA files, however there are still some concerns regarding the promptness and quality of these system repairs. These concerns are based upon the fact that there is at present no official avenue by which the villagers can provide feedback regarding Solartron’s response. Some aw baw taws, including Mae Ja Rao and Mae Wa Luang, have good sustainability programs. Both aw baw taws have set up committees specifically to handle issues related to the SHS, with budgets aside by the aw baw law. Mae Ja Rao also has had a system in place for over a year for collecting a small monthly fee from Thai SHS users to pay for repairs and equipment replacement. Given the policy recently promulgated by the Ministry of Interior (MOI) that requires aw baw taws to set up committees, supported by their own budgets, to look after the systems, it seems likely that the aw baw taws will become increasingly motivated to get good sustainability programs in place. This will probably mean that BGET will be able to expect a high standard of cooperation from the aw baw taws in the future.

Future Plans

The two main outstanding goals for the Thai SHS Trainings Project are the completion of trainings in the three remaining tambons in Mae Ramat and Tha Song Yang which have not yet had trainings, and the establishment of a database for survey data. Of these goals, the trainings are considerably more urgent due to the time constraints imposed by the short expected lifetimes of the SH systems (if left un-maintained) as well as the limited warranty period. Accordingly, plans have been made to immediately complete the remaining trainings; two trainings are planned for the month of May, and the final one is planned for June. The first will be in Ka Nae Jau on May 2-4, and the other two will be in Mae U Su and Mae Teun.

Regarding the database, due to the time-intensive nature of the data entry process, the data entry portion of this task will not be undertaken until another member of the team is available to dedicate a significant amount of time to it. The team will be looking to take on an administrative assistant to help with this task as well as the Refugee Camp Hybrid Project. The immediate plan is to draft and post a job description or contract for the administrative assistant sometime in late April. Scheduling of the actual data entry for the database will wait until someone has been found for this position. In the mean time, Fredrik will work out the technical aspects of preparing the database for data entry and use.

Although BGET has had considerable success in fulfilling the ambitious goal of holding trainings in every tambon within Mae Ramat and Tha Song Yang, continuing the same approach for trainings in other districts in Tak is infeasible. This is because BGET lacks the resources to conduct such a large number of trainings, much less to finish them within a time frame that would allow them to have a significant impact. Given this limitation, one alternative is to hold a district-level training at a central location in each district, and to invite 3 or 4 people from each

tambon in the district. This would allow BGET to reach many more people through a few well-trained technicians at each tambon. In order for this approach to work well, the aw baw taws will need to take a much more active role in providing support to the SHS owners. As mentioned under the "Review" heading in this section, it is likely that BGET can expect cooperation of this sort in response to the recent MOI mandate for the aw baw taws to take responsibility for sustaining the SHS program.

Plans are now in place to test this concept by conducting district-level trainings in three districts: Mae Sot, Poep Pra, and Umphang. These trainings are tentatively scheduled for early late June/early July, September, and early October, respectively. Proposals will be drafted and sent to the district offices at the end of May or early June, and possibly earlier for the Mae Sot training (since its proposed date is considerably earlier). After these district-level trainings are completed, the district-level training concept will be evaluated, and it will be decided whether it is worthwhile to hold trainings in the remaining districts. The idea of holding district-level trainings in Mae Ramat and Tha Song Yang in order to follow up, gather feedback, and refresh peoples' memories has also been discussed. No plans have yet been made for these trainings, and they too will probably await evaluation of the three scheduled district-level trainings.

In addition to holding district-level trainings, BGET may also be able to reach a large audience with a minimal expense of resources by creating a video compact disc (VCD) recording of a SHS training. This would allow BGET to reach audiences in places that are not directly targeted by BGET trainings, and would have the added advantage that a VCD could continually serve as a reference in case people forget material covered in the training. A similar idea is to create and distribute "postcards" summarizing key information about SH system maintenance and operation. No schedule has yet been identified for the making of this VCD or the postcard, although Fredrik will be doing preliminary work on the postcard design in April or May.

BGET is seeking new sources of funding in order to enhance the sustainability of the team in general. For the Thai SHS Trainings Project specifically, the Thai company Solartron has been identified as a potential source of funding. Solartron is the company that installed the Thai SH systems in all of Tak province, as well as a significant portion of the systems elsewhere in Thailand. Therefore it has an interest in the success of the program that stems, if nothing else, from the fact that Solartron is responsible for satisfying warranty claims throughout Tak province. In view of this fact, BGET will ask for Solartron's support on the Thai SHS Trainings Project. It will be emphasized that support in any form, including any amount of money, or even surplus or "off-spec" equipment, would be appreciated. Chris has contacted Solartron to request a meeting, and pending its response, Salinee and Chris will attend the meeting in Bangkok on April 17th or 18th.

Finally, BGET tentatively plans to hold a press conference (date not determined). The press conference would be held in Chiang Mai, or possibly Bangkok or Mae Sot. Its purpose would be to bring the Thai SHS Program, issues pertaining thereto, and BGET's work into greater public awareness. This could be beneficial for several reasons. Firstly, it could help to motivate the higher levels of government to take responsibility for the sustainability of the SHS program. It may also open new avenues for funding for BGET's work on the project. Finally, it may be a good forum for opening communication with people who are interested in starting programs similar to the Thai SHS Trainings Project in regions beyond BGET's reach.

Section 3: Micro-Hydro Project

Review

The main goal for this project is to identify micro-hydro sites in Tak province, and to cooperate with villagers and local experts to install micro-hydro power systems at these sites.

This project started in January 2003 with the cooperation of Chris Greacen (then a PhD student) and the local organization Taipei Overseas Peace Service (TOPS), using funding from The American Women's Club of Thailand to install a 500-watt micro-hydro system at Kre Ki village, Tha Song Yang district. The power was to be used for the village school, temple and street lights. The system has a turgo turbine and a permanent magnet alternator as a generator.

In January 2004, the second micro-hydro system was implemented in E Wi Jo village, three hour walking distance from Kre Ki (unreachable by car). With additional support from another local group, Karen Network for Culture and Environment (KNCE), a 2-kilowatt micro-hydro system with the technology of crossflow turbine and synchronous generator was installed. The power provides one light in each of 40 village households. The funding for equipment and materials mainly came from TOPS. Other assistance was from organizations dedicated to helping refugees including Thai Burmese Border Consortium, the Catholic Office of Emergency Relief and Refugees, and ZOA Refugee Care.

At the beginning of 2005, the third micro-hydro system was installed in the village of Mae Sa Pau, Tha Song Yang district. It has a turgo turbine and a permanent magnet generator. The system generates 1.5 kilowatts to power lights in clinic, church, and school.

Of the three above systems, two were not functional as of the writing of this report. For the system at E Wi Jo, the problem has been identified as bad bearings in the turbine/generator, and replacement parts have been obtained. As for the system at Kre Ki, it stopped working only recently, and as of the writing of this report BGET had no further information regarding the nature of the problem [*editor's note: it was a bearing problem which the villagers fixed themselves by late April 06*]. For details about the scheduled repair and troubleshooting of the systems at E Wi Jo and Kre Ki, respectively, please refer to the "Future Plans" heading of this section.

The recent/ongoing micro-hydro project the installation of two micro-hydro systems in Mae Ramat and Tha Song Yang districts, and is funded by UNDP through KNCE as the Global Environment Facility (GEF) / Small Grant Programme. The first system was installed in Huay Kra Thing village, Mae Ra Mat district. It uses the centrifugal pump running backward as a turbine with an induction motor operating as a generator.¹ It is the first pump-as-turbine micro-hydro system in Thailand. This project was a cooperative work among many organizations including villagers, KNCE, TOPS, ZOA, Spring Street School, Village Studies Program from the US, and Engineering Study Program from Mae La Refugee camp. In addition to installing the systems, the goals for this particular project include training the villagers in environmental issues and renewable energies (solar power system and micro-hydro) and performing community outreach activities. The project duration is 18 months, and is to be completed (i.e. final report is due) by July 2007.

The system installed in Huay Kra Ting was successful in that the new technology of the pump as turbine and induction motor as generator worked as designed. Furthermore, upon installation the system proved capable of safely generating roughly 2.8 kW, which is roughly the power for which the system was designed.

Future Plans

¹ see <http://www.palangthai.org/docs/HKTmicro-hydro19Feb06.pdf>

The planned work for the Micro-Hydro Project in the immediate future falls into two categories: following up on previously installed systems, and completing work for the ongoing UNDP-funded project. Follow-ups on the first three systems (Kre Ki, E Wi Jo, and Mae Sa Pau) to install load controllers and to provide the energy management discussion or training have been planned. The proposed date is in the second week of May. For the duration of each visit, a data-logger will be set up to monitor and record voltage and current levels in the system. Furthermore, replacement bearings will be installed in the system at E Wi Jo, and troubleshooting will be performed on the system at Kre Ki in order to determine, if possible, what can be done to fix it.

The next step in the UNDP project is to set up a training on environmental issues, community energy management, and sustainability (as pertaining to micro-hydro systems) for Huay Kra Thing village and nearby villages. This training will take place before work on the next site starts. Then, the next step is to survey and decide on the second micro-hydro site. The proposed site is at Mor Te Ta village in Tha Song Yang district. The initial site survey took place in December 2005. The distance measured from the waterfall to the school was 800 meters and the flow measurement was 20 liters/second. The system will mainly supply the school needs including 10 lights, 2 televisions, a computer, a video compact disk player, and a satellite dish. The design and preparation will occur during rainy season (June to September) and will have Yotin and Surat (TOPS/KNCE employees) involved. The implementation will be at the beginning of 2007. The final survey for this site will be the end of April.

In addition to the above planned work, BGET is also entertaining the possibility of undertaking revenue-generating micro-hydro projects. These might include contracting installation and/or maintenance of systems for resorts, NGO's or other organizations, or possibly installing grid-tied systems. No specific plan for this type of project is in place.

Section 4: Refugee Camp Hybrid Project

Proposed Plan and Timeline

The objective for this project is to install hybrid solar/diesel systems for powering common facility computer rooms in the seven Karen refugee camps along the Thai – Burma border in which ZOA Refugee Care is implementing activities, as well as to provide training for the refugees about using renewable energy. The budget covers activities in seven refugee camps: Tham Hin, Don Yang, Nu Po, Umpiem, Mae La, Mae La Oon and Mae La Ma Luang. The funding came from UNHCR through ZOA projects. BGET is a sub-contractor to ZOA for this specific project.

Each of the seven refugee camps is already equipped with a diesel generator and a computer room with as many as nine computers. This project involves surveying, designing, purchasing, expediting, and supervising the installation of appropriate solar panels, inverters, control equipment and wiring to augment the existing system. The result will be computer room power systems that consume far less diesel fuel than currently used, in a fashion that can be expanded with further solar panels in the future. These installation projects will be combined and become part of an overall solar / renewable energy training program that BGET has initiated in the refugee camps.

The project was initially planned to be completed by the end of 2006 but BGET proposed to extend this date to May 2007 in order to allow sufficient time for the various aspects of the project (logistics planning, system implementation, and training for all seven camps) to be given

due attention and time. Final approval for the budget, which includes equipment and implementing parts, and for project duration, has not yet been given by UNHCR, although it is fully expected that this approval will be granted.

The timeline for hiring local staff and design will be before the end of May. The procurement will be done in June. The first few computer center surveys will be in April conducting by Andrew and Fredrik. BGET is looking for personnel to fill in project manager (possibly volunteer position), administrator, and local technician positions to work on this project. The first installation and training will start in July. Each installation will take up to ten days and go on every three week.

Section 5: Ongoing Refugee Camp Trainings Project

Review

There is a fairly large population of refugees from Burma living in seven refugee camps in Thailand near the Thai/Burma border. The camps have been in existence for roughly 50 years, and they are the focus of considerable aid efforts by many NGOs in the Mae Sot area. Because the refugees are restricted to the refugee camps, they are not able to fully support themselves according to their traditional way of life, and they require aid in practical matters of day-to-day subsistence (fuel for cooking, water, soap, etc.). In addition, there are many efforts underway to provide education, both vocational and general, to the refugees. The goal of these efforts is to empower the refugee community by providing its members with “hands-on” practical knowledge as well as the ability to successfully interact with the industrialized world, and perhaps even to improve the lot of their people in Burma.

BGET’s work with the Ongoing Refugee Camp Trainings Project could be considered both vocational and general education. The curriculum for the project includes the following renewable/sustainable energy technologies: hydraulic ram pumping, micro-hydro power systems, solar electricity, solar-powered water pumping, and solar cooking. In general, training activities include as much “hands-on” work as possible, although there is a group of engineering students in Mae La camp (Engineering Study Program, or ESP students) for whom more theoretical training is also appropriate. There are two main goals of the project: it is intended to enable the refugees to take advantage of renewable energy technologies to improve their quality of life within the camps, as well as to provide the skills for them to use these technologies after leaving the camps (whether back in Burma or elsewhere).

The refugee camp trainings that have already been completed are as follows. In February 2005, six students from the refugee camps came to Mae Sa Pau village to participate in a solar training for medical clinic systems and a micro-hydro system installation. In September 2005, a five-day training covering solar and micro-hydro power was held in Mae La camp for the 50 ESP students. In November 2005, six ESP students from Mae La camp (two girls and four boys), accompanied BGET on a five-day survey of Thai Solar Home Systems (see Section 2: Thai SHS Trainings Program for details about SHS surveys) for 175 systems in Mae Wa Luang village. Then in February 2006, six ESP students (two girls and four boys) came to Huay Kra Ting village for the two-week-long installation of a micro-hydro system. In March 2006, a four-day training covering solar cooking and solar electricity was held for approximately 20 students in Nu Po camp. This training was followed by a visit to Umphiem camp, in which a survey of the camp’s ailing water supply system was performed (the primary purpose of which was to assess the viability of solar powered pumping as a solution to the water supply problems). On the

whole, the refugee camp trainings that have been performed to date have been quite successful, in that they have been well attended and well received by students and all those involved in coordinating and facilitating the trainings. The students from the refugee camps have generally proven among the most enthusiastic, curious, and sharp students that BGET has had the opportunity to work with. The refugees are eager to learn about and apply new technologies; in fact, there are already several small micro-hydro systems in Nu Po camp that were installed and are being operated/maintained by the refugees.

Most of BGET's work on the Refugee Camp Trainings Project has been made possible by ZOA, not only through their financial support, but also through support with logistical planning, coordination, and sharing of material resources and personnel.

Future Plans

At present, there are plans in place for one refugee camp training in Umphiem, and tentative plans for a training in Mae La as well (pending availability of time and resources). The subject of these trainings will be solar pumping and ram pumping. The demonstration-size ram pump that will be used for these trainings was ordered but not yet received as of the writing of this report. The possibility of getting a panel and/or DC pump as additional equipment for this training is currently being investigated (primarily by Walt), although there may not be funds available for purchasing of these items. The Umphiem training is scheduled for late June, and the Mae La training is tentatively scheduled for late August. The purpose of these trainings will be to provide general knowledge about the technology, rather than to solve the very expensive problems plaguing Umphiem's water supply system.

In addition to the above to trainings that are already planned, BGET plans to generally continue the curriculum described under the "Review" heading of this section. As has been the case in the past, the focus will continue to be on the camps nearest to Mae Sot: Mae La, Umphiem, Nu Po, and perhaps Thum Hin. This is simply because logistics for getting to these camps is considerably easier than for the further camps. BGET plans to continue working closely with ZOA on this endeavor. More concrete plans for future trainings will be made as appropriate opportunities (in terms of activities/needs in the camps, coordination with other trips to camps, and availability of money and personnel-time) arise. One avenue for facilitating future trainings that has been discussed is to hold trainings in the camps at the same time that BGET is doing work in the camp for the Refugee Camp Hybrid Project. This would require division of BGET's staff into two groups (one for the training and the other for the hybrid project work), but would allow BGET to save resources by "killing two birds with one stone".

Section 6: Burma Clinic Trainings Project

Review

On the Burma side of the border, there is a system of Karen medical clinics which treat, among others, victims of violence perpetrated by the Burmese military. Many of the clinics do not have electricity, or have only recently acquired solar systems. Through the Burma Clinic Trainings Program, BGET works to provide solar systems and the expertise to operate/maintain them to these clinics and their staff. As a matter of fact, Chris and Walt first began working together on this project, before the idea of BGET itself was conceived. The project consists of trainings during which systems are built and all practical aspects of system operation and maintenance are discussed. At the conclusion of the trainings, the systems (which consist of a

panel, charge controller, a battery, fluorescent lights, wiring and perhaps other small accessories) are packed up and brought home with the students. The students install the systems in their clinics and are responsible for upkeep of the systems thereafter. The systems are primarily used for lighting in the clinics, although some are intended to power laptop computers for minimal use as well.

The Burma Clinic Trainings Program began in April 2003, when a training was held in Mae Sot and two 60-watt systems were provided. The following year, a second training was held in April in Mae Sot, and eleven 130-watt systems were provided. In February 2005, the training was held in Mae Sa Pau village, and six systems were provided. The funding for the 2004 and 2005 trainings was provided by Green Empowerment and Knightsbridge, with additional support from a generous individual, Harvey Toub, in 2004. The training in 2005 included ESP students from Mae La camp and villagers from Mae Sa Pau. In March 2006, two four-day trainings were held in Mae Sot, the first for clinics from the northern section of Karen State, and the second for clinics located nearer to Mae Sot. During these trainings, ten complete systems were provided, as well as three partial systems for revamping existing systems at the clinics. Both trainings were attended by roughly 20 students, and were funded by Green Empowerment, Knightsbridge, and Sun Energy Power.

During the weeks leading up to the 2006 trainings, the team had the unique opportunity to receive information from first-hand surveys of seven of the clinic systems performed by a technically qualified individual. This provided valuable information pertaining to the success of the systems, factors impacting them, and resulted in several suggested improvements to BGET's methods that are likely to increase the success rate of the clinic systems in the future. The surveys resulted in the conclusion that although the systems were successful in that they were used to provide light for several years (most were still working at a basic level at least), there were also significant problems resulting from operator error.

Specifically, roughly half of the systems surveyed had broken charge controllers, and there were several instances of bypassed fuses in charge controllers, a practice that endangers the charge controllers and other equipment in the system. There were many poor practices related to battery maintenance, and one system that was crippled by low-voltage DC wiring of insufficient diameter. The systems were found to be exposed to quite harsh environments, and most of the "Burma boxes" housing the charge controllers and associated wiring were not securely fastened to anything. There were also several instances of reversed polarity wiring having destroyed a system, and a significant number of switches that had failed. All of these observed problems suggested improvements in system design, equipment procurement, and focus of training material. The improvements were put into practice as much as possible during the 2006 training, and will continue to be issues that BGET pays attention to in future work with the project.

One good sign for the project is the fact that the majority (all but 3 to 5 out of roughly 30) of the clinic systems in the network now have electricity, whether from BGET's project or from other sources. This would seem to suggest that the project is almost finished, but in fact, there is no question that there is almost sure to always be a need for as much new equipment as BGET can possibly supply. Reasons for this include the failure or destruction of existing systems, opening of new clinics, and new applications for solar power to improve the position of the Karen people in Burma (for more details on this last point, please refer to the "Future Plans" heading below)

Comment: "misuse of system" might give the impression that medics were using the electricity to watch World Wrestling Federation videos and that was what broke it...

Future Plans

As described under the “Review” heading of this section, this project has historically consisted of one training (or in the case of this year, pair of trainings) that takes place sometime between February and April each year. The number of systems provided has varied as a result year-to-year variations in the funds available for the project. In fact, this model (one training per year in the spring time, number of systems determined by available funding) essentially summarizes BGET’s future plans for the project. As such, there are no immediate plans for further work on the project, aside from plans to continue with another training in the spring of 2007.

However, BGET is investigating the feasibility of are several new potential applications for solar energy for the Karen people (medics and otherwise) in Burma. These applications include a solar-powered “cold chain” of small refrigeration systems for transporting and storing vaccines and medicines, solar power for communication systems for strategic use in anticipating movements by the Burmese military, and solar power for communication systems for dissemination of medical advice throughout OB/GYN clinics.

In fact, a trial run of second of these applications has already been launched as part of the 2006 trainings. During these trainings, two solar systems were provided to technicians responsible for the above-described communication systems (as well as the training to operate and maintain them). These technicians were asked to record information about system use that would enable BGET to decide about the adequacy of the system design for the application, and to pass this information back to BGET through established lines of communication. If resources allow, and the application proves to be compatible with the type of system that BGET is able to provide, then BGET will expand work further in this direction in future years.

Section 7: BGET Website

Review

The objectives of having BGET website are to gather the up-to-date information for each project for the people on the team. The audience would be anyone who is interested in our work and possible potential donors for our projects.

BGET has the existing pages on Palang Thai and Green Empowerment websites. On Palang Thai website, BGET page contains a short description of the team and projects that we have accomplished in the chronological order started in the year 2002. Each project includes links for articles, images, photo journal, reports, BGET concept paper, solar home system training manual in both Thai and English, and link to the Flickr site for different BGET photo activities. On Green Empowerment website, BGET work is mainly on Thailand page describe different ongoing projects, background of solar home systems in Thailand, and the team composition.

Future Plans

The contents of the website will comprise of eight main pages including home page, project, calendar, donate, volunteer, download, about us, contact us page, and site map. The website will be in both English and Thai.

The project page will entail each project with description, previous, recent, and planned activities, photos, and some document to download and links where applicable. The main projects are micro-hydro, Thai solar home system training, refugee camp training, hybrid camp system, and Burma clinic training. The calendar page aim to use internally and editable among

BGET but will be visible to the audiences. The donate page explains how to make a donation providing options, where the funding is substantially needed, how the funding will be used by specifying equipment and materials, the previous donor information, and the tax deductible information for the US and Canada. The following page is volunteer information comprised of the period they joined BGET, what projects they worked on, their contact information, and volunteer requirement information. The download page will consist of BGET concept paper, training manuals for each project, recent project reports, and other useful document for the audience. The about us page contains BGET mission statement, brief project descriptions, partner organization, and staff information. The contact us page includes mailing and physical addresses of BGET, office and mobile phone numbers, and email address. The final page is site map which includes the tree structure of the entire website.

The website configuration is to be simple, basically Window 98 compatible and maintainable from Mae Sot office. The donation targets specific opportunities and is strategically located throughout the website.

The draft site content is scheduled to complete by Fredrik and Chris at the end of April. Andrew proposed the website work as a donation from Day Waterbury at Azimuth Internet, web hosting service company based in the US. Azimuth would donate a editable page template to BGET and BGET will locally manage and edit the page. Azimuth will help migrating BGET page elsewhere if funds or space become available. Azimuth will also help migrating and hosting Palang Thai website. The migration set to be in May.

Section 8: Overall Future

Goals

Aside from the main BGET goals mentioned in the introduction section and the projects in general, BGET additionally plans to focus on several overall goals that do not fit well into previous sections of the report. One such goal is based upon the likelihood that BGET may someday be unable to continue work in the area (perhaps for funding reasons or others). If this happens, BGET hopes to have had a significant positive impact that continues even after BGET itself is gone. The key this happening is local capacity building via extensive training of local staff (such as TOPS interns), preferably to the extent that they become able to do similar work in the area independently. This is, to a substantial degree, accomplished by the extensive involvement of the local staff in all of BGET's various projects.

However, BGET's success in local capacity building could be greatly enhanced via some training activities in which the members of the local staff (of BGET, TOPS, etc.) are the students rather than the teachers/helpers. In other words, this concept could be described as training put on by BGET aimed specifically at providing more advanced skills to local staff. The two main skills that have been discussed as a good focus for this type of effort are electronics/circuit theory and English language. With the aid of such skills, local people with the support from BGET could potentially set up an electronics shop for inverter repair and micro-hydro controller fabrication. This could provide an income source for BGET while advancing our general goals with regard to local capacity building.

Work on this type of "dedicated" capacity building project already begun, albeit in a somewhat informal and loosely organized fashion. Beginning in February 2006, daily English language classes were held in a "round-table discussion" style that was intended to provide roughly equal attention to any of the local staff members who were available and interested on

any given day. It was found that this method is most effective when the participating students do not differ vastly in English language skills, in which case separate classes are perhaps preferable. Furthermore, equipment for a basic circuits class (oscilloscope, adjustable power supply, breadboards, resistors, capacitors, diodes, transistors, wires, etc.) was procured and several introductory classes were held. Although the volunteer that started this work is leaving at the time of the writing of this report, the equipment is still available, and perhaps more importantly, there is a sustained, enthusiastic interest in both of these classes by many members of the local staff. Thus, there is every reason that this work should continue in the future.

Another overall goal is to extend BGET's influence in Thailand through open sourcing or national/region events including conference, training, meeting, or publications. Some efforts towards this goal are already underway.

Salinee and Chris will seek the reliable source of funding for BGET. The following topic will cover the potential source of funding for different projects. Another BGET goal is to possibly expand operation. First of all, having more volunteers (to the limit of three, not to over occupied TOPS office) will assist the team to accomplish the deadline and goals. Hiring local staffs to work on administrative and technician work will facilitate and expedite the projects. BGET proposed the budget through ZOA refugee camp hybrid project for hiring these positions. Salinee will keep the project going as long as the resources and the needs will be there. Walt will look more into the possible project expansion to the other side of Burmese border (connected to Bangladesh and India) where Assam, Shan, and Karenni people are there.

Funding and Sustainability

Most of the potential donors for BGET have the similar interest in the different projects which we are doing; therefore, we will combine the target groups of donors with the similar interest.

There both Thai and the US based organizations that their interests fall into solar home system project and micro-hydro project. The following organizations are based in the US; American Chamber of Commerce, American Women Club (funded Kre Ki micro-hydro project), Rotary, and Lions. The local companies or organizations are Solartron, JJJ (public relations firm), UNDP (GEF/Small Grant Program), ENCON (Energy Conservation Promotion Fund), other Thai corporate sponsorship and PR firms. Other potential funders specifically for Burma clinic training and refugee camp training are ZOA, Bangkok Solar, TBBC (Thai-Burmese Border Consortium), and SIDA/Diakonia.

In addition to the above sources of funding, BGET has received considerable funds from Green Empowerment (GE) for work that it had done so far. BGET plans to continue this partnership in the future, as GE and BGET share fundamental goals, and GE has the connections and presence in the US that enables it to effectively raise money from American donors.

Finally, there are several potential revenue-generating projects that BGET may be able to take on in the future. These include contract-based micro-hydro installations for paying customers, grid-tied micro-hydro systems, repair of Thai SH systems for a fee, and possibly a repair shop for inverters or other solar equipment.

BGET Member Statements:

These statements were written in response to a general query about “fun” in BGET, recognizing that as a largely volunteer effort, we will only be around as long as BGET people find it personally satisfying.

“Stephen’s take on fun with BGET:

For me, BGET is fun in two ways. First and foremost, it is fun because of the environment of working with and hanging out with a group of really fun, great people (including BGET team and TOPS people). I think the key for this to work is the laid back, casual culture of the group, as well as the people themselves. Even though there is always plenty of work to do, and everyone is usually busy, it seems to me that people on the team either don’t get stressed out, or at least they don’t let the stress stop them from joking around and playing sometimes. I think that is pretty important for the good atmosphere that makes BGET a fun place to work.

Secondly, the work is fun because it gives me the chance to learn- to explore many technical subjects (related to BGET’s work) that I have long wished to understand. Also, more generally, it is fun to meet the people in the villages and at the trainings, and it is a good feeling to think that I am doing something to help them a little.

Most of all, BGET is fun because I got to do oh so much shopping!!!!!!!!!!!!!!”

February – April 2006 Volunteer, Stephen Brink (US)

“Being a volunteer with BGET enables me to do what I’ve dreamt about for a long time, working practically with renewable energies. I really enjoy the variety of our work, the environment we work in and the dynamics of our skilled team.”

February – June 2006 Volunteer, Fredrik Bjarnegård (Sweden)

“Chris and I have been working with the BGET concept, since before BGET was started. But back then, we were primarily doing one set of clinic trainings at a time, when we could raise the funds for the systems.

After I became associated with Green Empowerment, we continued this program to increase the number of clinic systems we were able to construct.

Then, in October of 2004, on a trip to Mae Sot by several members of Green Empowerment, the concept of the Border Green Energy Team came about. This was with a lot of input from Green Empowerment, along with Sam and Watit (TOPS) and Chris (Palang-Thai).

Although we set up our vision and our goals for the three areas that we felt we could concentrate on (Thai Solar Home Systems, Refugee Camps, and Burma Clinics), none of us knew whether or not our goals were realistic – especially given the logistical as well as political difficulties we knew we would be encountering. We just felt that somehow, we would be able to get past these difficulties.

We had our kick-off meetings in late August / early September of 2005, with the original team of Salinee and Andrew. It was clear then that we could not have even hoped for such a talented and dedicated team to start off with. And then, when teamed with Sam and Watit, along with Chris in Bangkok, we had a good shot at actually making this project work.

During the first six months, through communicating with all of the members of the team, it became clear that we were not only overcoming all of the obstacles, but creating new goals and achieving them. Even with the personal difficulties in her family that Salinee was confronted with during this time, she was able to keep on and maintain the momentum of the work, with Andrew chipping in with extra effort to keep things moving during this period. Together, they accomplished a tremendous amount of work.

We now have two new volunteers – Stephen and Frederick. Andrew will be leaving soon, after having stayed for more than 100% over his originally anticipated time. He might even be coming back to help out some more.

Again, with Stephen and Frederick, we could not have been more fortunate. Both come to the team with great ideas of their own, lots of energy, and a tremendous amount of experience and talent behind them to not only keep the work moving, but to inject their new ideas into the ever evolving work plan and goals.

It became clear during our management meetings this past week that we have accomplished all of our anticipated goals, and quite a bit more. The plans we all made for ourselves for the next 6 months to a year indicate that this enthusiasm is forever increasing and causing us to shoot for higher and higher standards.

The team has been able to accomplish all of this work even within the limited budget that we started with.

The challenge in the future will be to continue this level of effort, and still manage to work within available funds, while continuously being creative to find new levels of funding. After working the past month with this team, I have no doubt that they are very much up to this task.

The leadership and support that Chris has supplied to the team has been critical and will continue to be – just as the input of every member of the team is critical.

To wrap this up, I can only say that it feels really good to be a part of BGET. BGET has come very quickly from a concept and a loosely structured group – where none of us were 100% sure of where we were going - to a tightly organized team that depends less and less on people outside the group. The original goals have remained in tact – those of serving the three groups of Karen in Thailand and Burma.

I have more confidence that ever that this team will find ways to improve on the original concept (something they have already done) and continue to mold their work to suit the actual situations in Burma and Thailand.

I hope to be able to remain a resource to depend on for guidance, advice, and of course – always coming in and lending a helping hand. Although my association with and through GE is evolving, I will always find a way to continue to work with BGET, if you can put up with me.

Many thanks to all of the members of BGET who have worked so hard to make this happen!!.....and my best wishes, and encouragement, and offer of help and continued to support to keep things going.”

Walt Ratterman

“BGET is not so much a project as a lifestyle. Born of the minds, beliefs, and work ethics of Chris Greacen, Walt Ratterman, and project partners, BGET has hectically explored work and life on the border since its September inception. Need, inequality, and atrocity certainly flow in intractable confused rivers here; but resource, hope, dedication, patience, love, and skill abound as well. BGET proudly counts itself part of this abundance.

On a personal level, every day has seen small victories alongside major fuck ups. This I expected. What I didn't expect was the immediate and continued friendship and excitement with which the project has been greeted in Mae Sod and the province at large. BGET is not just a good idea. BGET makes a very real difference in people's lives here on the border. Our working relationships thus far prove that we are not the only ones to recognize this.

BGET's aims are equality, sustainability, responsibility, and justice. BGET's tools are renewable energy, smiles, education, laughs, long work hours, whiskey, innovation, local cooperation, wise guidance, love, and volunteers. I am one such volunteer and as such, the past 7 months has been a wonderfully unmatched experience. I am proud to have been a formative part of BGET. Thank you BGET.”

Andrew Pascale, 2005-2006 BGET Volunteer (US)

BGET works for several key reasons: (a) the need for our work is clear and present; (b) we've had generous help – especially from volunteers who have repeatedly gone beyond the call of duty to make it happen; (c) the work and the people are fun.

Focusing on part (c) -- it has been a pleasure to be part of this team. My work in Bangkok on policy issues, analysis, and BGET logistics/planning mostly ties me to a desk, often connecting to others only through phone or email. My monthly stint in remote villages working with a team of energized folks on real practical challenging hands-on stuff, sleeping under starry skies, drinking hot instant coffee on cold jungle mornings, mucking around in streams... recharges my soul. Thanks!

Chris Greacen, BGET regular