PHASE ONE REPORT

THE SOLAR RURAL SCHOOLS PROJECT:
SOUTH AFRICA

2006 - 2008

Zwelenqaba Senior Secondary School and two other junior schools in the Eastern Cape Province, South Africa

May 2009
**Phase One Report: The Solar Rural Schools Project**

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Scope and Aims of this Report

This report presents the results of Phase One of the Solar Rural Schools Project, a $400,000 initiative of the Solar Electric Light Fund (SELF) that was funded by the W.K. Kellogg Foundation and the J.P. Morgan Chase Foundation. In-kind support was provided by the Dell Foundation. The project consisted of installing a computer lab and satellite facilities – all electrified by solar power – at three schools in rural South Africa. The work began at the end of 2006 and was completed in 2008. The residents of marginalized communities near Mthatha (Elliotdale) in the remote Eastern Cape Province celebrated the lab’s opening on August 1, 2008.

Project Overview

Half the schools in South Africa cannot use information and communications technology (ICT) – the bridge over the digital divide – without first gaining the electric power they do not have. SELF’s Solar Rural Schools Project sought to use solar energy to install an Internet-enabled computer lab serving schools in a marginalized and impoverished rural area of South Africa. The aims of the project were and remain to bring the community into contact with the rest of the world and surrounding communities; to improve educational quality at the cluster of participating schools, thereby broadening perspectives of the students and community; and to provide an impetus for revenue generation and improved access to knowledge services for the community. Upon completion, the project should yield rewards for the community for many years to come; additionally, other communities and their authorities could see the results and seek solar solutions to their needs for electricity and ICT education resources.

The project’s first phase consisted of assessment, partnership development (e.g., with the Nelson Mandela Institute and eKhaya ICT), community relations, installation design, training, project infrastructure development, and construction. Phase Two, the usage phase, has begun and includes monitoring, maintenance, training, research, and innovation. It will run for at least three years.
We consider Phase One a success. The computers and the electricity generated by the solar installations are being used on a daily basis to improve the education and lives of 2,000 students. Not only are parents and teachers also enthused, but the project has begun to catalyze community involvement; for example, ICT training by and for the community began in November 2008. Making this impact sustainable will demonstrate electricity’s vital role – and solar’s ability to deliver it – in overcoming the poverty that afflicts the 1.7 billion people in the world that are not connected to an electrical grid.

Project and Theoretical Background

The underlying objective of the project was to provide sustainable energy to a cluster of schools in a Marginalized Rural Area (MRA) in South Africa. (MRAs refer to rural areas where poverty is endemic – i.e., where inhabitants lack the three basic human requirements of food/water, medical care, and education.1 Such areas are also characterized by a lack of infrastructure and services.) The special focus of this project was to establish a substantial computer lab connected to the Internet that would be integrated at additional schools with mobile, Internet-enabled computing facilities for use in regular classes.

SELF developed this model after successfully electrifying its first school in South Africa, the Myeka High School in Maphephethe. After Myeka received solar electricity – which initially enabled use of an overhead projector, two television sets, a VCR, a photocopier, a copy printer, and 20 computers; Internet access was added subsequently – enrollment soared by 40% and graduation rates jumped from 55% to 69%. SELF sought to build on the Myeka experience in its next education project by emphasizing Internet access from the outset and extending the benefits and use of the facilities to non-student members of the community.

1 United Nations Development Program definition of poverty.
Additional theoretical elements behind this work include:

⇒ A central component of demarginalizing MRAs is enabling residents to communicate electronically with local, national, and global networks that can provide them with access to knowledge and to the tools that help them apply it.

⇒ With regard to such electronic information and communications technology (ICT), sustained training is required to make such new knowledge available and useful.

⇒ Solar power at the schools selected will: enable computer labs that are connected to the Internet; bring education to entire communities; and introduce modern communication facilities. Students (learners) can broaden their experience and gain valuable skills, while the community at large can gain new opportunities for revenue and knowledge acquisition (e.g., adult community members can take part in programs aimed at generating revenues using the computer center after hours, and the affected community may also gain local infrastructure improvements by learning how to deal with basic problems themselves). Such labs and their user communities may prove to be models for future development in MRAs.

⇒ Learners in rural communities have proved to be very open to the use of technology, as it represents to them a new and exciting future. This motivation makes students apply themselves harder (as was evident in SELF’s Myeka school electrification project), and they can also be energized further through use of educational software designed to improve their scores on examinations.

⇒ A key strategy for success is to involve the community in decision making – early and at every step of the way. Not only must community leaders and members
understand the investment and the possibilities being offered, but they need also to feel ownership (buy-in) of the direction being pursued.

-Thorough training and a sustainable follow-up and maintenance program must also be incorporated (e.g., over 3 - 5 years). This will ensure that the community is not “left alone” once the project end date is reached. Training, for example, must be organized on a continuous basis to prevent underutilization of facilities, and applications of the technology must be demonstrated until well understood by the students, educators, and community.

-Evaluation of the project will be part of the follow-up at the schools. Quantitative criteria (e.g. total power output, number of computer hours logged, and bandwidth usage) and qualitative criteria (e.g. satisfaction of participants in the project, statements by community members, etc.) will be reflected in the evaluation.

-Matching the aspirations of the projects’ funders, SELF strives in its work to be a “catalyst to meaningful, positive, and sustainable change” and “to help people help themselves through the practical application of knowledge and resources,” thereby serving “highest need neighborhoods and communities across the globe.” The Solar Rural Schools Project is a clear example of such work.

Figure 4. First ECSPIRT Training Workshop, August 14, 2008; learners working at computer tasks well after dark.

2 We refer to following case studies and analyses:
Rationale for Clustering in the Project

To expand the impact of its installations at schools, SELF chose to serve a cluster of schools rather than a single school. Its reasons were efficiency along financial/project management, technological, and sociological dimensions:

- Financially and managerially, project expenditures could go much further and better economies of scale could be realized by clustering schools. For example, groups of teachers spanning schools could be trained and the travel costs for trainers, management, and installation experts could be shared.

- Technologically, great advances have occurred since SELF’s original Myeka project, particularly with regard to Internet access. SELF believes that this technology can make a difference in the quality of education and community life in underprivileged areas. For example, relatively inexpensive wireless devices can be connected to create mesh networks that provide sharing of Internet resources with all nodes on the network. Schools on this network also can enjoy free communication between each other and use broadband services amongst each other (e.g., for live video feeds to share workshops or demonstrations occurring in the computer lab, or to share the centrally situated multimedia resource server containing more than 900 hours of curricular material). Furthermore, the mesh network enables sharing of Internet access via connectivity at any point on the network; when the planned connection to other research and governmental networks in the area occurs, those networks will also be available at the schools, thereby assisting with the overall sustainability of the project.

- Sociologically, while installing computers only at the senior school in the area would slow the "brain drain," whereby parents send their children (or often just one chosen child) to schools in urban areas at great expense, doing so would not provide younger children with early exposure to tools that can motivate them as well. By including in the project two Junior Secondary Schools that feed Zwelenqaba Senior Secondary School, we sought to extend both motivation and opportunity to a larger portion of the school-aged population. Similarly, by involving parents at more than one school and a correspondingly wider group of community leaders, the potential for uniting as well as serving more of the community also was increased.

Figure 5. Bafazi Junior Secondary School, with 1.75 kW SELF solar Installation to the Right of the School
Project Adjustments: Site Selection, Training Partners, Added Security

On the whole, the project was implemented as planned. Several modifications occurred fairly early on, however. They included:

- Finding a new location for the installations;
- Finding a new training partner; and
- Adding electrical fencing and guards for security purposes.

Change In Location

The original expectation was to work with a cluster of schools in Maputaland, a sparsely populated area in the northeast of KwaZulu Natal Province (SELF’s Myeka project occurred nearer the province’s center and the city of Durban). Initial assessments however, determined that the region was sufficiently electrified; accordingly, SELF sought an alternative location where its stand-alone power source would have greater impact. The Eastern Cape Province abuts KwaZulu Natal Province to the south, and SELF refined its search to the impoverished and non-electrified areas there. The final project site in Tafelahashi lies about 5 km south of the boundary between OR Thambo and Amathole regional municipalities.

Change In Training Partner

Strong local partners are key to the success of all SELF projects. When we could not accept the revised proposal from our anticipated training partner, it was incumbent upon us to take the added time to identify a new partner. We were very pleased to successfully conclude, via the good offices of our primary partner, eKhaya ICT, training commitments with Rhodes University, the University of Fort Hare, LearnThings, and SchoolNet.

Additional Security

Theft of equipment is a challenge confronted at all solar installations in the developing world. In response to community concern, SELF agreed to install an electronic fence and increase the size of its security guard team and the length of its assignment.

The Project Network

SELF’s quality control standards mandate strong local partners to ensure legitimate support for and the long-term viability of its installations. Extensive contacts within the community were made, ranging from tribal structures to local school teachers, and community buy-in was widely solicited. A network of engaged partners “beyond” the local community also was created, including the government (e.g., the Department of Education, the office of the Eastern Cape Premier), the tertiary education institutions,
among these many partnership relationships, four stood out. The School Governing Body (SGB) is an organization of parents, akin to a U.S.-based Parent Teacher Association, that works closely with the teachers to help organize functions SGBs also represent the ordinary people of the community (e.g., including those who cannot speak English and whose reading and writing skills are weak) and are important for voicing and learning the community’s wider interests. The SGB’s relevance to each school’s decision-making powers is perhaps most evident by the fact that it has signatory power on the school’s bank account and may make payments. For this project, the SGB was instrumental in finding staff within the community for such labor as fencing and night watchmen; these local employment contracts were made through the SGB as hiring agency.

A second group was made up of entrepreneurs and tradespeople. These community members are employed, relatively affluent, and have access to resources that they would make available to the project. (They also have an added incentive for wanting to help create the facility and gain access to a wireless network; e.g., once computer literate they can access such electronic services as banking and commerce). Larger trading stores (e.g., the Tafalehashi Trading Store) have vehicles, buildings, and warehouses, some of which were offered to the project at very low cost for storage of construction materials and accommodation of construction workers. Alternative accommodation, for example, would have cost the project at least three times the price due both to higher rates and to travel costs between the accommodation and the site.

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3 [http://ekhayaict.com/](http://ekhayaict.com/)
Third, of course, are the authorities. The blessing of the local tribal authorities is very important for the viability of the project generally and its security in particular. Represented by Mvelile Dalikwesi, they have been involved in the project since the earliest stages. In addition, municipal and elected authorities have been represented in the project by Department of Education (DoE) officials.

A fourth group, whose participation will be enumerated in the next section, constituted the network of companies that reliably delivered goods and all equipment types to the sites – on time and entirely to specification.

The Installation

Installing the physical infrastructure, from the solar panels to all of the computer lab equipment, was the project’s most tangible achievement. The equally important organizational structures – the required supporting aspects of the project, such as training, security, and maintenance – will be addressed in the following section.

For this project, the main computer lab was established at the Zwelenqaba Senior Secondary School and satellite resources were established at the Kwantshunqe and Bafazi Junior Secondary Schools. The aim of this plan was to bring scalable computing facilities to a complete computer laboratory at the senior school and to bring five mobile computing stations each to the junior schools involved.4

The ICT Infrastructure

The power source: A total of 7.35 kW of solar power was installed. The power allocations were tailored for each school’s needs – 4.55 kW for Zwelenqaba SSS, 1.75 kW for Bafazi JSS, and 1.05 kW for Kwantshunqe JSS. The systems are in use and functioning (e.g., solar logs showed fully functioning systems 6 weeks after installation).

SolarWorld photovoltaics (manufactured in the USA) and Outback MX60 charge regulators were used. The batteries were manufactured locally by First National Battery and are mounted within special metal cabinets attached directly to the frame in 1 kW peak systems (as commissioned by the Department of Education since 2000). The

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4 In a baseline, unpublished study of more than 30 rural schools with computer facilities by the Nelson Mandela Institute, moving children from their junior secondary schools classrooms was found to be disruptive to their learning environment; it is preferable to integrate ICT use directly into their familiar classrooms. With senior schools however, separate computer laboratories seem to provide a better learning environment.
cabinets have heat shields to maintain acceptable operating temperatures. The added space these batteries take up necessitates increased storage capacity not available at many locations. At Zwelenqaba, a small store room was able to be converted into a battery room (another valuable factor in this school’s selection for this program).

Mounting structures were locally designed and constructed by Telecom Techniques and its subcontractors. The aims of the mounts are to avoid shading of the photovoltaic cells and to provide some additional security for the panels. The metalwork included a hinged structure which allowed assembly and testing to take place on the ground before the panels were hoisted to a height of 3 - 4 meters.

**ICT hardware:** 35 Dell Latitude laptop computers, donated by the Dell Foundation, were installed at the schools – 25 at the senior school and 5 each at the junior schools – creating a rural “wireless campus.” Free web, multimedia utilities, and viewers allow access to the server resources and Internet, and a VIKO server installed by Dabba Telecoms serves streaming video broadcasts of Math, Science, and Technology educational TV (a UNESCO program called Alex, which is about vocational training, also was installed) and gives access to a local copy of Wikipedia. Selected peripherals – printers, mice, webcams (e.g., for video conferencing on the internal network), and headphones – have been installed at the schools. Also, the quality of low-price printers was tested, and teachers and learners found the equipment to be adequate.

**ICT software:** The laptops run Windows XP and have an open source software bundle installed. Open Office and the GNU Image Manipulation Program (GIMP) allow desktop publishing. Educational software has been installed at each school, including streaming learning videos, interactive multimedia coursework, the Gutenberg library, and an encyclopedia. More than 1,000 hours of educational videos on all subjects are available, as is interactive NEPAD (New Partnership for Africa’s Development) curricula for younger children. Additional content is available via the Internet.

**ICT network:** the schools are joined by a wireless mesh network and are all able to share information through the network. Internet connectivity was initially available at the senior school and, through the mesh network, has now been extended to the junior schools. This was one of the first major computing facilities that SELF has built. For the wireless installation, the choice between Satellite Internet (VSAT) and cellular network technology (EDGE) was explored. The EDGE network was selected because its
speed connectivity was adequate compared to the VSAT (220 kbps vs. 256 kbps) and only one-third the cost, although the VSAT would be more stable.

Security: the community requested electric fencing, which was installed in a manner that is safe for children and animals. Alarms, lights, and gates add security around the installations. (Additional information about security can be found in the next section.)

The Installation Team

The decision was made to use local contractors and materials to complete the project. This assisted local businesses and will ease maintenance:

1. Saunderson Security – delivered and installed the safes required to protect equipment;
2. Hedcor – supplied good quality chairs for the lab and for classrooms;
3. Telecom Techniques – supplied the photovoltaics, installed the electrical infrastructure, and oversaw the civil engineering;
4. Dabba Telecoms – installed the wireless local area network;
5. Nelson Mandela Institute – consulted on best practices for rural school ICT project implementation; and
6. Rhodes University – consulted on best practices for rural school ICT project implementation and network tests.

Donated goods and services proved vital to the project as well:

1. Dabba Telecoms – content and VIKO server hardware;
2. Dell Foundation – 35 laptop computers;
3. eKhaya ICT the primary local partner) – a 40% discount on project management and a future software donation;
4. LearnThings – multimedia interactive content in curriculum subjects including English, Biology, Mathematics and Science; and

On-Going Organization Structures: Operations, Training, and Security

An overall network of professionals has been created through this project and is being supported. Only by having such a resource can we envision replicating this project in other communities.
Continuing Operations – the Team

A management structure has been put in place to allow the project to “live” (i.e. grow, evolve, and improve) in the context of the community’s future development. In addition to providing or supervising the overall project management and the local maintenance arrangements for infrastructural service and support, eKhaya ICT runs the Eastern Cape Schools Participatory Internet Research and Training (ECSPRIT) project, the dedicated education and training operation. Community champions have been identified and a school computer club has been founded. Importantly for evaluation and other on-going uses and services, the project has been integrated into the Siyakhula Living Lab program, a user-centric, networked research and innovation organization in nearby Dwesa that is managed by our university partners, Rhodes and Fort Hare.5

Training

To date, eKhaya ICT has trained the teachers on the use of the network, peripherals, and other matters, and LearnThings has trained them on the use of office software and educational software. Training by eKhaya ICT has been conducted in a series of monthly workshops based on the ECSPRIT training program, while the LearnThings training took place in two workshops (in July 2008, and in November 2008). Teacher training focuses on giving the teachers sufficient confidence in using the systems so that they are able in turn to teach learners confidently and ably. For example, learning materials present on the computers assist the teachers in teaching general ICT skills such as typing, using the computer operating systems, and office software. They also demonstrate how to use curricular subject matter, online teaching aids, and reference works such as Wikipedia.

The ECSPRIT project is also implementing a sustainable training program for the entire community; when it was launched, 57 residents applied to learn how to use and apply computer technologies. Electronic services to the community also are being offered through a community-owned entrepreneurial program supported and managed by the newly formed Village Scribe Association.

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5 Living Labs follow a common methodology which leads to maximum user participation in the project, read more here: [http://en.wikipedia.org/wiki/Living_lab](http://en.wikipedia.org/wiki/Living_lab) (referenced 25th Sept 2008).
Security

The aim of the security infrastructure is to protect the vulnerable and costly equipment from theft and damage. The laptop computers and the photovoltaic panels were identified as being most at risk, the former because of their mobility and the latter due to local experience with theft (existing security was deemed sufficient for the relatively inexpensive items, such as cabling and peripherals).

For the laptops, industrial-quality safes were installed at the schools to protect them while not in use. Electronic key code authorization obviated the need for protecting and securing physical keys and eased access to the computers for authorized users. A master key is also available for the safes.

For the solar panels, a combination of planned and unplanned security measures were taken. The planned measures included:

- night lighting to illuminate the solar installations and the computer lab exterior;
- a fenced area to keep out curious children and animals;
- outdoor infrared sensors that sound an alarm and light floodlights when movement is detected; and
- attached to the panels themselves, audible alarms and flashing lights start when tampering is detected.

The primary unplanned security measure was erecting electrical fencing around the solar installations, at the suggestion of community members at one of the schools (Bafazi). The other communities supported this request and, since the budget could accommodate it and there were no technical drawbacks (i.e., an electrical fence uses very little power), electrical fences were installed at all schools – inside the primary fencing so children and passers-by would not be harmed.

Perhaps the most important aspect of the security is the community involvement, from the tribal leader’s commitment to the added jobs for nightwatchmen (noted in the next section).

Usage and Community Reaction

In preparation for the installation, students, staff and parents were all very excited and motivational levels rose. They cooperated to improve the infrastructure of the school in ways open to them, such as painting the schools and de-rusting the burglar bars in preparation for the lab. With the solar power and lab now installed, students are the most excited group. They are very glad to be able to work in the lab at any opportunity; they are happy to work on the computers until late at night and usage statistics show that the computers are used almost every day.

Fortunately, teachers are able to harness this enthusiasm, are being trained on software as well as hardware applications, and have developed corresponding lesson plans for the
students. In general, they are thankful for the improvement to the schools through the addition of the computer lab. Since the installation, teachers now feel proud of their schools and have something with which to attract the attention of the regional authorities to receive other improvements for the schools through the DoE.

Parents also are very glad that computers have come to their children’s schools. The arrival of computers has signaled that their children will have a better chance to advance themselves, and this has changed some of the parents’ behavior.

The computer lab project mobilized the school communities. The SGB, learners, and school personnel are taking steps to provide a better learning experience. This is happening at all three schools involved in the project, but most tangibly at Zwelenqaba SSS, where abandoned classrooms have been reclaimed and restored, providing the school with 4 additional classrooms.

Community support has been aided by the immediate, tangible features of the project. During construction, temporary jobs and local subcontracting brought money into the community as local people were employed to build fences, dig trenches, complete the carpentry, etc. The community also provided accommodation and storage facilities during construction. Once the installation was complete, three new jobs were created for night watchmen. They are funded at the going rate for three years; thereafter, the community or the DoE will need to fund the posts.

**Replication: Potential and Opportunities**

Solar Rural Schools Projects can be adapted for schools in similar situations in other parts of the country. The suitability of solar-powered, Internet-connected classrooms is very strong given the irregularity of power provided by ESKOM, South Africa’s public utility, and the partial deregulation of the local loop of communications (Electronic Communications Act Amendment 2007) that allows municipalities to create their own communication networks. This type of investment can greatly uplift other rural schools, and its future feasibility is improved by now having a tried and tested network of companies and professionals that worked on this project. (For all such work with which SELF would be involved, SELF would assume a supervisory and quality assurance role to ensure success).

Additional projects are indeed possible, beginning in the vicinity. The Eastern Cape DoE has shown great interest in replicating the project at other schools that are marginalized because of power issues, and the Nelson Mandela Institute at the...
University of Fort Hare has inquired about conducting a comparable project at three schools in the impoverished OR Tambo district.

In addition to the positive aspects of the project indicated throughout this report, there are cautionary notes as well. The first is the seemingly high upfront expense of such work. Two factors counter this concern: budget improvements will occur when such a project moves beyond pilot installations (e.g., savings are derived from repeat installations, lessons learned, economies of scale, etc.); and full life-cycle cost accounting determines more accurate price comparability. While a final evaluation is still outstanding, reports from the Siyakhula Living Lab in nearby Dwesa, which follows a similar model as far as ICTs are concerned, are very positive.

Another concern is the fact that the consumer market for solar electrical goods in South Africa is very small. Solar product consumers can experience difficulty in sourcing reliable materials and then installing and maintaining them. As more solar installations are completed these issues will fade. Additionally, creating a market with more readily available solar solutions will help reduce security concerns.

Nonetheless, at this stage, it seems that this sort of intervention is not only feasible for other schools but may act as a model for them. The Eastern Cape DoE, for example, has indicated that it is awaiting the evaluation results before assessing whether it will act on its interest in the proposed model.

Lessons Learned

Although the primary elements of a successful project were anticipated and understood – e.g., the value of local partners and the need to develop strong community networks – the amount of time it took to realize them was longer than expected. One year was required to become sufficiently networked in the community and among product and service providers, and several months were required within the community to establish trusting contacts and to explain the project focus. Actual implementation took just three months, which left very little time in the original schedule for project operation and evaluation. While this experience provides a basis for reducing the amount of time such community networking requires in the future, a certain degree of
flexibility and accommodation is necessary to build in to the design and make for a smoother schedule.

Dealing with government departments in this context took time, too. For example, a variety of possibilities for assistance by the Eastern Cape DoE and the Premier’s Office was discussed before the DoE ultimately committed to underwrite the expense of one of the security guards. In particular, the DoE is a vital part of any sustainable solution to a community project that includes schools, and its interest in this project as possible model remains encouraging. We are still in touch with DoE representatives and are hopeful that they will become actively engaged with the project in 2009 and beyond.

The pace of technological change also needs to be considered. As important as Internet access now is to such school projects, factors such as network connectivity, bandwidth, and curricular material access (e.g., new media streaming solutions can bring hundreds of hours of educational material to schools for a very low price) must also be front and center in planning considerations.

Phase Two (Future) Plans

Activities in Phase Two, the Usage Phase, include:

- Monitoring the power supply: A contract was signed with Alan Holder, a local technician with solid solar power knowledge, to monitor the installations weekly;
- Security of the installation: Three security guards were added to the existing contingent of two to protect the installations at the three schools from harm;
- Training: User educational activities are covered by eKhaya ICT’s ECSPiRT training program;
- Community programs: eKhaya ICT will continue assisting with the introduction of e-commerce programs in the community and linking learners with the rest of the world via secure web applications;
- Research and evaluation: The project is being integrated into the Siyakhula Living Lab, directed by project partners Rhodes University and the University of Fort Hare;
- Dissemination: The value of the lessons and results of this project will become clear only after sufficient time has passed during the Usage Phase. Sharing this news and information will be critical to making fair assessments of about the replicability or adaptability of this work (see the succeeding section for additional information about SELF’s dissemination plans, and also examine the project wiki – http://tinyurl.com/d5aoed – which is updated regularly); and
The preliminary version of a 15-minute film about the project was produced in March 2009. After final editing, the video will be shared widely, posted on SELF’s web site, and delivered to current and prospective partners and funders.

SELF is organizing the above activities in subprograms. Each subprogram is being led by a local or regional person or entity. The training and monitoring subprograms are being managed by eKhaya ICT. Community and dissemination subprograms have governmental or research funding through the participating partner universities. By participating in a research network, the dissemination subprogram is ensured in high quality scientific publications. The security subprogram is co-funded by SELF (for three years) and the DoE. Overall program direction rests with a committee composed of a member of each subprogram and the SGB.

Rhodes University and the University of Fort Hare are important partners to ensure the long-term sustainability of the project. Integrating this project with the Siyakhula Living Lab, located 30km away near Dwesa, is an ideal way both to expand the rural network footprint that the universities have established and to have the project benefit from being included in this network. Ultimately, the management of the Zwelenqaba network will be undertaken by the Siyakhula Living Lab.

**Evaluation and Dissemination**

Partner Ronald Wertlen will use the resources of Rhodes University to help evaluate this project. Various “Evaluation Indicators” will be used (e.g., for solar use, education development, economic development, and replicability), along with the assessment measures used with Living Lab projects.

Project information dissemination is occurring through eKhaya ICT’s project management and through our university partners’ ongoing research about the project. Also, since the start of the project, SELF has had an open-door policy on information concerning the project and project results. SELF feels that this will have several positive benefits: a) awareness of solar energy as a real alternative will be fueled, and b) awareness of SELF and its sponsors will increase. Additional dissemination has occurred through the eKhaya ICT wiki (see above) and website, which includes a history of the project in pictures in the photo archive, as well as a project page and a blog.

Dissemination plans include:
⇒ Release of the film about the project to leaders and organizations in international education development as well as to wider audiences via broadcasting corporations;

⇒ Project Reports, for institutional supporters and their networks, for each of the participating organizations’ own web sites and publications, and for wider dissemination (e.g., article-length pieces);

⇒ Applications for more funding for the project. The application documents will also be used for publicity (e.g., demonstrating progress and further achievements);

⇒ Exposure in scientific, university publications (e.g., at Rhodes and Fort Hare), as a result of evaluation steps and the project’s participation in the rural schools network. For example, the project has been and will be presented at conferences on ICT innovation for rural development; and

⇒ Further dissemination will occur as the project becomes a permanent part of the community and yields periodic newsworthy developments.

Financial Report

The $400,000 budget was fully met. Other than minor counteracting variances, the main noteworthy change was the in-kind donation of 35 computers from the Dell Foundation, which made it possible to strengthen the on-going security for the project.

Conclusion

SELF is excited to be developing models in which solar power is used to fight key components of energy poverty in rural communities around the world. The Solar Rural Schools Project provides the education and ICT leg that can lead or complement the health and agriculture legs that SELF is also building. Additionally, SELF is pioneering a “whole village” approach that integrates all such components.

SELF looks forward to expanding the Solar Rural Schools project to additional communities in South Africa and elsewhere throughout the developing world. We are pleased to have realized such positive preliminary results and are indebted to our partners and funders for having helped make this work possible. Energy poverty cannot be permitted to hold back one-fourth of the world’s people that do not have electricity. The Millennium Development Goals cannot be achieved, let alone pursued, without energy, and SELF is committed to finding ways to provide the needed electricity from the sun.