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CASE STUDY

Asia • India

SELCO: Solar Lighting for the Poor

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Sector • Solar Power

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Executive Summary

SELCO India is a Bangalore-based social enterprise that makes solar lighting technology accessible to the economically impoverished people in India. SELCO's mission is based on a simple but powerful idea that the economic conditions of the impoverished can be improved substantially if they are made productive. One of the biggest hurdles before is their inaccessibility to clean and cost effective sources of electricity. Most of India's rural population does not have access to electricity. Instead, they are dependent on highly polluting and inefficient sources of energy such as kerosene or forest wood. Solar lights are free from pollution and provide greater illumination. However, given an average rural income of less than US\$50 per month, upfront investment in solar lighting, ranging from US\$200 to US\$500, can be expensive and seemingly unviable for the average rural household. To tide improve this situation, SELCO made sustained efforts to persuade state-owned rural banks to lend money to households so that they can make the purchase. They worked extensively with these state-owned banks, an arduous task in India, to ensure that the repayment pattern matched the cash flow that would be generated as a result of the additional income facilitated by the purchase of solar lights.

SELCO was founded in 1995 by Dr. H. Harish Hande, who did his Masters and PhD at the University of Massachusetts, Lowell, at the Centre for Sustainable Energy. Since his graduate student days, Harish firmly believed in the potential of solar energy for improving productivity of rural households. He was confident that the economically backward would be able to leverage solar technology and that it was possible to build a profitable business model even when such business met a larger social objective. However, to make it sustainable, the users of solar lights should be provided with doorstep financing and doorstep services. It would also necessitate customizing the product and associated services for specific needs of the poor.

Till date, SELCO has sold solar lighting to more than 100,000 rural homes and institutions in the Indian state of Karnataka. Employing about 170 people, SELCO services these households from 25 service centers scattered all across rural Karnataka. For its efforts, SELCO and Harish have received several awards and recognition. While SELCO has been able to establish a sustainable business model that realizes Harish's vision of bringing low cost energy solution to the economically impoverished, its challenge today is to create greater impact by scaling their business as well as creating an organization that sustains its success beyond the tenure of its founding members.



Introduction

“We set up SELCO to bust three myths – the poor people cannot afford technology, the poor people cannot maintain technology and it is not possible to run a commercial venture that fulfills a social objective”, says Dr. Harish Hande, founder and managing director of SELCO. “If you can provide doorstep financing and doorstep servicing, you can create a sustainable business model that addresses the needs of the poor.”

Dr. Harish Hande, SELCO Founder

Description of the Business Model

THE EARLY DAYS

Harish got the idea of bringing solar lighting systems to rural India when he was doing his PhD on sustainable energy at the University of Massachusetts in the USA. During a field visit to the Dominican Republic, he was surprised to find poor villagers using solar lighting and reasoned that if it was possible for the poor in the Dominican Republic to use solar lights, he should be able to bring solar lighting to rural poor in India too. In early 1993, having made up his mind to focus on solar lights as the means for rural electrification for his PhD, Harish travelled to the remote sugarcane growing village of Galgamu near Anuradhapura in North Sri Lanka with his scholarship money, carrying with him a few solar panels and his solar powered laptop. He wanted to have firsthand experience of issues and realities of villages that had no access to electricity in order to figure out how he can solve some of their problems by installing solar lights. He lived there for the next six months, understanding the linkages between poverty and energy issues till his stay came to an abrupt end because the village was stormed by an armed rebel group who took away all his solar panels.

Subsequently, Harish came back to Massachusetts and met Mr. Neville Williams, a former Greenpeace activist, who founded Solar Electric Light Fund (SELF), a non-profit organization that intended to promote solar energy in developing countries. In 1993, SELF received a grant of US\$40,000 from the US-based Rockefeller Foundation to install solar lights in 100 rural homes and Neville asked Harish to lead and implement the project in the Western Ghats region of India. Harish saw this as a great opportunity to validate his thesis about the viability of solar powered lights in rural India. Harish however was apprehensive about being dependent on grants for his endeavour and was keen to establish a commercial organization so that there was continuity in operations. He believed that the poor will be willing to pay for technology if they found it useful. Meanwhile, Harish and SELF faced insurmountable regulatory hurdles in bringing the money in the form of a grant into India. Thus, in 1994, he founded SELCO Photovoltaic Electric Private Limited as a commercial enterprise that would sell solar lights in rural India.



Harish found that solar lights were not novel in rural India. Almost every year in the month of March¹, the Indian government would install solar-powered street lights to utilize funds devoted to non-conventional energy. However, in the absence of an organization to assume ownership, very little effort was subsequently put in for proper maintenance of these lights. March was followed by the Indian summer, when abundant sunshine would often result in overcharging of the solar panels and drying of distilled water in the batteries. By the time monsoons began in July, many of the lights would stop functioning, thereby creating a perception among villagers that solar lights were fragile and unlikely to function for more than three to four months. Harish thus realized that he would have to change this negative perception about solar technology and decided to take the responsibility of maintaining some of the solar street lights in rural Karnataka² that were installed earlier to demonstrate that the technology can be made to work on a sustainable basis. He also trained some of the local villagers, typically those involved in television or cycle repair, on how to maintain these lights. In the process, he started creating a pool of technicians who could take on the responsibility of maintaining and repairing solar lights as and when SELCO would install them in future.

SELCO however had no access to funds, even for its working capital. Harish struggled to convince suppliers to provide him with solar lights on credit. It was around this time that Tata BP Solar³ was setting up their rural infrastructure division with the aim of developing markets for their products targeted at rural Indian customers. Harish was able to impress them with his ideas and they decided to provide him with solar lights on credit, one or two systems at a time. Mr. Thomas Pullenkav, a young manager at Tata BP, who was responsible for developing their rural infrastructure business, recalls *“I was less convinced than my organization about the viability of Harish’s plans. However, I was impressed by his dedication and conviction and realized that giving him a system or two on credit was not much of a risk for a large company like Tata BP, even if all his plans failed. Moreover, I was convinced that Harish will pay back all his dues, even from his own pocket if he failed to recover any money from his customers.”*

Thus, SELCO started operating as an organization from 1996 even though it had no finance, could not afford any office space and could employ the services of an accountant only on a part time basis. The next year was hand-to-mouth existence for SELCO – Harish continued to live and operate from his aunt’s place while Thomas moved in with Mr. Pai to save costs on rent. Meanwhile, Harish convinced Neville that it would be better to put money in SELCO as an investment, rather than depending on grants. Neville therefore registered SELCO in the

¹ March is the last month in the financial calendar of the Indian government when there is heavy pressure on government departments to exhaust their budgets, so that their budgets are not cut in the next financial year.

² In the district of Dakshin Kannada.

³ A joint venture between Tata Power Company and BP Solar, having revenue of INR 9 billion in 2008, of which INR 6 billion is earned from exports.



USA as a commercial entity in 1997 so that they could raise money from investors there. Apart from India, Neville setup various SELCO subsidiaries in other developing countries such as Vietnam, China and Sri Lanka.

Towards the end of 1996, SELCO received a conditional loan⁴ of INR 5 million from USAID through its partner the US-based nonprofit organization Winrock International. This loan enabled SELCO to hire employees, invest in printing brochures and most importantly, secure a greater number of solar lighting systems on credit. This immediately increased their stature before their suppliers. It was also the first time that Harish and Thomas got paid their salaries. Around the same time the television repair market in India nosedived and many of the technicians who had earlier worked for Harish on part time basis, joined SELCO as employees. SELCO setup its first three rural service centres, which were essential for creating a sustainable rural delivery model. Between 1999 and 2001, SELCO India received US\$750,000 from equity investors in USA and in 2003, a loan of US\$1 million from International Finance Corporation (IFC).⁵ Tables 1 through Table 4 in the Annex provide SELCO's asset and liability position and financial performance in the last five years.

NEED BASED PRODUCT AND SERVICES

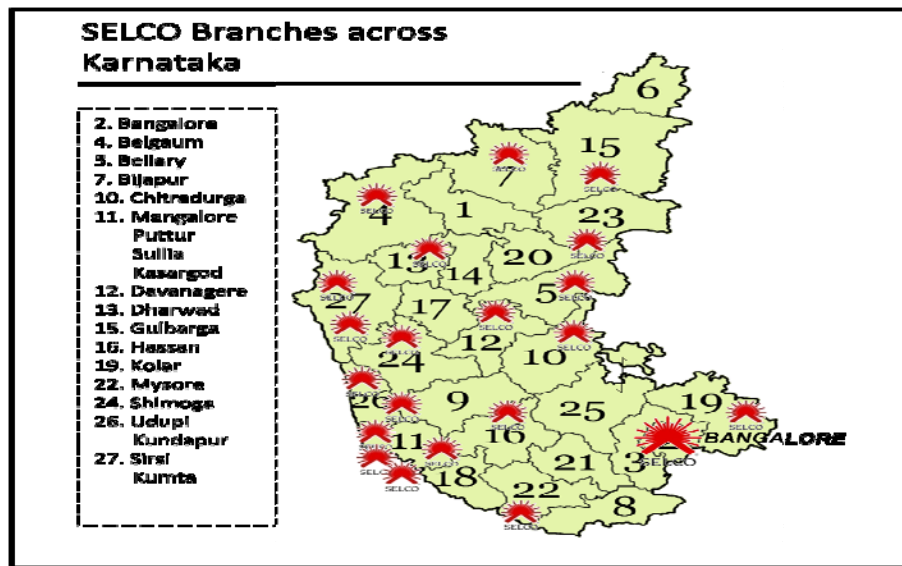
SELCO today services its customers from 25 service centres spread all across rural Karnataka. Figure 1 in the Annex and its associated note explain SELCO's organization structure and Figure 2 on the next page depicts SELCO's branch network in Karnataka that is used for sales and servicing. While solar lights per se appear to be a standardized product, lighting solutions need to be carefully configured keeping in mind the needs of the customers and their capacity to pay the loan installments. *"We could have gone in for some one-size-fits-all system, but we didn't,"* says Harish. *"When it comes to the poor, everyone wants to standardize solutions to save cost, but not us. Thus, we have a significant amount of pre-sales activity, all of which is done by the technicians because they are in the best position to understand the context as well as the solution that can meet the requirement. We do not have any marketing budget. We put all our efforts into pre sales and post sales services, which is marketing for us. All our customer service agents don the mantle of marketers when they are dealing with the customers. We encourage them to interact with the neighbors, the local community so that they have a deep understanding of the problems that the people face."*

⁴ This loan was obtained after Thomas and Harish had sent a proposal to USAID / Winrock who were evaluating projects on commercialization of renewable energy for funding. The loan was provided specifically to set up three service centres.

⁵ IFC had created Photovoltaic Market Transformation Initiative fund for India and Harish had applied seeking funds from them. This money was provided in three tranches which SELCO was supposed to pay back by 2009. The repayment date was extended after SELCO's financial restructuring in 2007.



Figure 1: SELCO Branches across Karnataka



Source: SELCO

A typical sales cycle for SELCO starts with an understanding of how much money a customer can pay as loan installments every month. A SELCO technician discuss with the customer the various costs that he incurs for providing light in his home, both in terms of out of pocket expenses as well as foregone opportunities. For example, he might be procuring INR 50 worth of kerosene every month and with the additional hours of work that SELCO lights can provide the family, he and his wife might be able to earn an additional income of INR 50 per month. Moreover, there will be non-quantifiable benefits in terms of better health, increased hours of study for the children as well as saving time that is spent in procuring kerosene or sourcing forest-wood. Adding all of these, the customer might probably be in a position to pay INR 150 per month as loan installment. This would allow him to procure a two-light system. But his need is for a minimum of four lights, one each for the kitchen, bedroom, living room and cowshed. However, a deeper understanding of his lifestyle might reveal that while he needs these four rooms to be lighted, the rooms need not be lighted simultaneously. His wife, who looks after the cows and cooks food, needs lights either in the kitchen or in the cowshed at one point of time. It is also unlikely that the family would need lights in the bedroom and in the living room at the same time. Therefore, SELCO technicians will complete the wiring in all the rooms, provide four points where the lights can be fitted, but supply only a two light system that would meet both the budget and the needs of the customer. They would ensure that the lights can be easily fixed and removed from each of the four points so that the family can carry the two lights with them from one room to the other depending on where they need them most. Sometimes, the internal structure of the house would allow fixing a light at the intersection of two rooms, ensuring that two rooms get illuminated with one light.



“It is very important that our technicians have a genuine concern for the customer,” reflects Thomas. *“Fortunately we have managed to create a team of dedicated personnel over the years, many of whom have been with us right from the inception. These were people who were earning their living by repairing televisions and bicycles – whom Harish had trained himself to be technicians for solar lights. Today, they run the service centres on their own. Even though our competitors offer them higher salaries, we have very little employee attrition, especially from our service centres. Once people understand our philosophy, they love working at SELCO, even though the task never gets easy, be it getting finance for the customers or enduring a long sales cycle.”*



(Photo credit: SELCO)

SELCO charges INR 250 as annual maintenance contract for a four-light system, which entitles the customer to two maintenance services and one emergency service on call.⁶ SELCO technicians check every solar installation twice a year to ensure that they are in proper working condition. Since the livelihoods of many customers are critically dependent on the solar lights supplied by SELCO, the technicians try to respond to every breakdown as fast as possible. This

is a challenging task, given that most of the installations are in remote areas. Today, SELCO is able to respond to 65% of these calls within 24 hours and they are constantly working on measures to improve this rate.

SELCO not only lights up homes and improves productivity, but also has been instrumental in creating several entrepreneurs in rural Karnataka. Besides the home lights, SELCO manufactures solar lamps that can be used by street vendors to sell their products during evenings. Since street vendors will not need the lights for the entire day, SELCO identified entrepreneurs who would buy the lamps from SELCO and rent them to the vendors daily. While no bank would have been willing to cater to the needs of the street vendors, the entrepreneur was able to provide both doorstep finance and doorstep service to them.

“This guy (the entrepreneur) in Hasan started with 30 lamps and put the solar charging station on the roof of his house that would charge the batteries used in these lamps. He would charge the batteries daily and rent the lamps to the vendors at 5:30 pm. Then around 9:30-

⁶ Apart from annual maintenance charges, SELCO customers incur INR 50-80 as operating cost per year to buy distilled water needed for topping the batteries.



10:00 pm, he would collect the lamps back and INR 12 per lamp that was rented out. The vendors this way would save INR 2-3 per day since they were earlier paying INR 15 to buy kerosene. Soon he purchased another 30 and then another lot of 30. Now he felt the need to purchase a tempo⁷ to carry the batteries around and reach them to the vendors and eventually employed two people, who were below him in the economic strata, to transport the batteries on his behalf. Then one day he came back to us saying that his technicians are getting fatigued lifting up so many batteries daily – it would be of help if we could make the batteries lighter. We went back to the drawing board and designed lighter batteries – it’s amazing how he made us realize a fundamental problem and led us to solve it,” recounts Harish.

THE DIFFICULT TIMES

SELCO broke even for the first time in March 2001, and during the next three years steadily increased its revenues. It made a profit of US\$88,380 by the end of the financial year in March 2005. Sustained good performance enthused SELCO to plan for expanding its operations into the neighbouring states of Andhra Pradesh and Maharashtra. SELCO also decided to appoint business associates in Karnataka, since many entrepreneurs had expressed interests to become SELCO associates after witnessing SELCO’s success during the past few years. SELCO planned to move its own employees to the new markets of Andhra Pradesh and Maharashtra and decided to address the needs of Karnataka through an associate network since it had already developed the market in rural Karnataka and established the rules of running a viable business. It was around the same time that SELCO also took a decision to diversify its supplier base so that it can get cheaper alternatives, especially for solar panels. Unfortunately for SELCO this was the time when Germany started providing high subsidies to solar power. This resulted in increasing demand for solar panels of higher wattage in Germany and all major manufacturers started to cater to the German market, since there were higher margins in selling solar panels of higher wattage. Consequently, there was a shortage of solar panels in the rest of the world markets leading to a steep price rise of nearly 47%. SELCO was caught completely unaware. It did not have enough material to service its customer demands. It no longer enjoyed the comfortable relationship that it once had with Tata BP given its decision to diversify to other low-cost suppliers. Its new suppliers did not have any obligation or relationship to provide SELCO with material when the German market looked far more lucrative. Even if they had, SELCO was not in a position to pass on the price increase to its customers. Thus, SELCO’s new offices in Andhra Pradesh and Maharashtra were starved of supplies and the business associate model in Karnataka started to fumble. SELCO started making losses and in the next two years, ended up wiping almost the entire net worth of the company.

There were troubled times for SELCO in USA too. Apart from India, all its other subsidiaries had failed and shareholders wanted to cash out. Harish’s request for fresh funds was rebuffed and met with demands for retrenchment in India. Recalling those hard days, Thomas says,

⁷ A small commercial vehicle for carrying goods



“We were sitting in November (2006) with money that would last only till next March (2007). We had no option but to go into a mode of shutting down operations. I asked Harish which investor in their right frame of mind would lend money to a company like SELCO that has burnt the money received from the first set of investors? However, Harish was optimistic even in such trying circumstances. He promised us that if we can somehow make SELCO survive one more year, he will get fresh investments. I do not know why, but we all believed in what he promised – that is something only Harish can do! Our whole mindset changed, it was like rebuilding the organization. We focused on reducing costs and improving collections. We were able to stabilize operations and tide over the crisis, even before the fresh set of investments came.”

Fortunately for Harish, IFC, which had provided a US\$1 million loan to SELCO, strongly supported SELCO India and enabled Harish to raise fresh funds from a new set of socially-oriented investors such as E+Co, Lemelson and Good Energies Foundation. Meanwhile, prices of solar cells started to reduce, increasing availability. SELCO decided to postpone its expansion plans into neighbouring states and recalled its own employees to offices in Karnataka. It also realized that the associate network model, which was purely commercial in its intension, was unsuitable for an inclusive business such as selling solar lights to the poor. Most significantly, SELCO repaired its relationship with Tata BP and reverted back to its earlier philosophy of having long term relationships with one trusted supplier. The turnaround was complete when SELCO posted increased revenues and operating profits in March 2008. In retrospect, Harish feels that those difficult days helped SELCO not only refine its business model but also to have a better set of investors whose philosophy is aligned to that of SELCO. *“Howsoever in need you might be, one needs to be careful about the kind of person from whom you take money. You should always have control of the company for the sake of the mission. Never take money from someone whose mission is not aligned with yours,”* is his advice to other social entrepreneurs.

The Business and its Relationships

FINANCING SOLAR LIGHTS

For a majority of SELCO’s customers, solar lights are the most expensive equipment that they would ever purchase. Even though they might be spending equivalent amount of money in buying kerosene to meet their energy needs, making an upfront investment of an amount that was a few multiples of their monthly income was beyond their means. *“One of the best financial lessons that I learnt was from a street vendor who told me that she can afford to pay INR 10 (US 20 cents) a day, but would find it difficult to pay INR 300 (US\$6) every month! This was when I realized that to sell solar lights, the poor needs to be provided with doorstep financing that ensured that payback patterns were synchronized with their income patterns.”* However, SELCO realized that getting finance for purchase of solar lights, even from the rural banks, was difficult because home lights were not directly linked to any income generating activities.



After two and a half years of untiring effort and leveraging his family connections, Harish was finally able to convince the Chairman of Malaprabha Grameen Bank, Mr. K. M. Udupa, to sanction INR 1.5 million (US\$30,000) for financing 100 solar lights. SELCO got hold of the bank's internal notice, informing its branches about their decision to finance solar lights and went with it to other rural banks. Since Malaprabha Grameen Bank was viewed as a progressive bank in rural Karnataka, some of the other rural banks did not hesitate to emulate them, convinced that Malaprabha Bank would have done their due diligence. The fact that the internal notice did not mention the bank's upper limit of INR 1.5 million or 100 systems helped SELCO's cause. However, it was still not easy to convince the loan officers at the bank branches to sanction the loans because the banks were treading into new territory and were unfamiliar with the technology of solar lighting. Thus, for the next several months, SELCO staff had to organize field trips for the bank officials to demonstrate to them the viability of solar lights and how it can make a difference to the livelihood of the rural poor. While some of the bank officials were sympathetic to the idea and were flexible enough to sanction loans to a variety of customers –from the paddy farmer to the beedi roller to peanut farmer, others were apprehensive and reluctant. Therefore, SELCO even started tracking the transfer of sympathetic officials within the rural banking system and planned its own expansions accordingly.

SELCO however decided to stay away from financing the customers themselves, even though, as their business grew, there were such suggestions from their investors. Both Harish and Thomas strongly believed that there would be conflict of interests if they ventured into financing. SELCO technicians develop close relations with their customers in the process of selling and maintaining their systems. They would share their meals with their customers and sometimes even sleep at night in their customers' homes because they would have missed the only bus that reached the remote village. Such emotional connections were essential for understanding the exact needs of the customer, yet were dangerous when it came to collecting money. Therefore, SELCO decided that they would work with rural banks, credit cooperatives and microfinance agencies to make necessary arrangement of credit for their customers, but will not get into financing themselves. However, as the case of Channama in the opening section describes, there are cases where SELCO steps in to provide a bridging loan if they feel that a particular community or an individual is so poor that they cannot even arrange the margin money. Even in such cases, the collection of the amount that is due to SELCO is done through the agency that provides rest of the finance to avoid any situation of conflicting interest.

RELATIONSHIPS WITH SUPPLIERS

As an organization, SELCO believes in developing long term relationships with its suppliers. A solar light comprise four key components, namely the solar photovoltaic module (solar cell/ panel), battery, charge controller, and lighting system (lamps and fans). The relative costs of these components are provided in Table 5 below for a four-light system. SELCO sources 90-



95% of its panels from Tata BP, continuing their relationship that developed even before Harish founded SELCO as an organization. While there are cheaper alternatives available, SELCO prefers Tata BP primarily for two reasons. Their products are of very good quality and despite Tata BP's stringent internal processes; they are quite flexible with SELCO in terms of schedule and batch size of orders. Moreover, having a local source of supply helps SELCO reduce inventory levels up to 25%, which is substantial given that they have to maintain inventories worth INR 15 million (US\$300,000) across their 25 service centres. SELCO purchases panels from other suppliers only in cases when Tata BP is unable to meet their demands. Likewise, batteries are purchased largely from Shakti Electronics who work closely with SELCO to customize batteries suiting the needs of SELCO lights.

Table 1: Cost Breakdown of a Four Light System

	INR	US\$
Photovoltaic Module	8,000	160
Battery	4,500	90
4 lights @ 800	3,200	64
Installation & wiring	1,300	26
Total	17,000	340

The sale price of the above system will be ~ INR 20,000 (US\$400).

SELCO sources all its other electronic items from Anand Electronics located in Mangalore, Karnataka. It is a small-scale manufacturing unit run by two entrepreneurs who have been exclusive suppliers to SELCO since 1997. SELCO felt the need for developing Anand Electronics when it realized that the technology available with Tata BP was designed for European conditions. For rural India, SELCO needed electronic components that were rugged, even if that meant making tradeoffs in technical sophistication. Anand Electronics was erstwhile involved in television repairing and was finding survival difficult in late 1990s with the advent of more reliable televisions at lower prices. SELCO convinced them to become its supplier. Being a small-scale unit, Anand Electronics does not need to pay excise duties and is able to keep its overhead costs low. Moreover, their long-term and exclusive relationship ensures that they can design and produce items to SELCO's exact specification, including experimenting with new product designs. SELCO keeps track of market prices of comparable products to ensure that they are not overpaying for the relationship or flexibility that they enjoy from their suppliers. SELCO has a high degree of transparency with all its suppliers and they are ready to back one another in case of constraints and challenges. SELCO's belief in maintaining long-term relationships with limited number of suppliers was reaffirmed during their days of financial difficulties, when their experiment of having market-oriented relationships with multiple suppliers compounded their troubles.



PARTNERSHIPS FOR INNOVATION

In 2006, SELCO was approached by SEWA Bank to be their technology partners in Project Urja⁸. Ms. Elaben Bhatt founded the Self Employed Women's Association (SEWA) in 1972 in the Indian state of Gujarat, with the objective of empowering poor women. Today, they are the largest single trade union in India with a membership of 900,000 women. SEWA Bank was established as their affiliate in 1974 to provide financial services to SEWA members. Its services include taking deposits, providing credit and insurance, as well as financial counseling. SEWA Bank initiated Project Urja for its 300,000 members to have access to reliable and affordable sources of energy. It estimated that chronic shortage of cooking fuel, reliable lighting and electric power were the key reasons why the underprivileged were unable to break the vicious cycle of illiteracy, unemployment and poverty and they chose SELCO to provide it with technological solutions to address the energy needs of their members. *“Project Urja was a dream –come- true for us,”* says Thomas. *“It immediately provided us access to a largely diverse clientele away from our home base in Karnataka. Since it was SEWA, we did not have to worry about creating the infrastructure for doorstep finance. But most importantly SEWA showed us the path to become an energy solutions company from a solar lighting company that SELCO was.”*

In the next two years, SELCO designed several solar products in consultation with SEWA. This included solar lanterns for the vegetable and fruit vendors who could use it for extending their working hours as well as using it at home, head lamps for midwives and flower pickers, solar caps for labourers and masons, and a smokeless stove for cooking. Most women in rural India do not have access to hospitals and use the services of midwives for delivery in their homes. In the absence of grid electricity, such deliveries are often done with the help of a mirror that reflected the sun's rays to the place of delivery. This improvised arrangement was of course not possible during night or on a cloudy day when the midwife would use a kerosene lamp or a candle.

Harish recollects how: *“We sat with midwives for two to three days to understand the complete delivery process. They taught us to cut the umbilical cord. People were laughing at us, but we told them that we needed to know the process well to design the energy intervention. There are usually only two women at the time of delivery – the one who is pregnant and the midwife. The midwife has a candle or a lantern, which she balances with one hand during the delivery. We therefore decided to design a solar head lamp so that both her hands are free and enough light is generated for the process.”* In the same locality, SELCO worked with flower pickers, who collected flowers from midnight till 3 a.m. in the morning. It was difficult for them to balance both the flower basket and a petromax lantern in one hand and pluck flowers with the other hand. It would slow down their efficiency. With solar head lamps, they were able to pluck double the quantity of flowers in the same time. Very often, SELCO would also appoint an entrepreneur who would rent out the solar lamps to

⁸ 'Urja' means energy in the classical Indian language of Sanskrit



the midwives and flower pickers on a daily or an hourly basis, ensuring higher usage of the lamps and greater income generation. *“Unless we work closely with them, we will not be able to identify their needs. Today, when we design a solution for a midwife, a vegetable vendor or a mason, we begin with the precept that the solution must pay for itself. It should be financed from the additional income that it generates. There is a big difference between creating a want and selling a product and identifying a need and designing a solution to fulfill it. We always want to focus on the need.”* While SELCO started primarily as a company providing home lighting solutions, Harish estimates that today for more than 20% of their customers, SELCO lights are a direct source of increased income generation through greater productivity. And their partnership with SEWA Bank provided them with a major fillip in that direction.

Women in both rural and urban India depend on the use of kerosene, Liquefied Petroleum Gas (LPG) or firewood for cooking. While LPG is expensive, both kerosene and firewood are highly polluting and inefficient sources of energy. The smoke causes cough, skin diseases and irritation to the eyes. Moreover, women typically spend an enormous amount of time sourcing kerosene or firewood, time that can be spent in income-generating activities. Therefore, with inputs from SEWA, SELCO designed a smokeless gas stove – Annapurna Stove. It is a brick and cement stove that uses minimum amount of firewood and retains essential nutrients in food. Some of the women were also trained by SEWA and SELCO so that they could construct these stoves and earn a living by selling their services.

Such experience in working with the diverse energy needs of the poor inspired Harish to set up an innovation department and an incubation laboratory as an experimental arm of SELCO. The mandate for these departments is to explore and generate new ideas that can be developed into product and services to address needs of the poor. Some of their new products include specially designed gloves for rag pickers and an energy efficient pushcart for vegetable vendors. While selling these products might not be commercially viable immediately, the innovation departments act as locus for developing a culture of innovation and experimentation that Harish wants to foster in SELCO. SELCO’s incubation centre has drawn considerable interest and attention from other organizations and institutions worldwide. Many socially-oriented enterprises, which do not have such centres of their own, have approached SELCO to do product research on their behalf. There is also a beeline of students from various Indian and international technological and management institutions who want to do their internship with the centre.

Results Created by the Business

Till date, SELCO has sold solar lighting to more than 110,000 rural homes and to 4,000 institutions such as orphanages, clinics, seminaries and schools in the Indian state of



Karnataka. An impact assessment study by World Resources Institute in 2007⁹ reported that 86% of SELCO's poor customers cited significant savings in energy costs as their primary benefit of using SELCO products, while the rest pointed to their children's education as the primary benefit. Being a non-polluting source of energy, solar lights contribute to environmental benefits as and when they replace other energy sources such as firewood and kerosene. However, this impact is yet to be quantified. Moreover, SELCO's inclusive business model has led to the creation of employment not only for its own employees but also for several rural entrepreneurs who rent out solar lights to vendors and institutions.

SELCO's business impact has been recognized by the national and international community. Harish and SELCO have been awarded the Ashden Award in 2005 and in 2007, Social Entrepreneur of the Year Award in 2007 and the Financial Times Arcelor Mittal Boldness in Business Award in 2009. Armed with investments worth US\$1.7 million¹⁰ from three social investors, namely the Good Energies Foundation, Lemelson Foundation and E+Co, SELCO is planning to light up 200,000 rural homes, covering a wider geographic area, in the next four years, which will result in greater positive social and environmental impact.

Growth Strategy and Future Outlook

Nearly 15 years after its founding, SELCO today seems to have achieved its key objective – of establishing a viable business focusing on energy needs of the poor that is inclusive in every sense of the term. However, success raises expectations and Harish and the leadership at SELCO are asked very often about their plans of scaling their business. After deep introspection and taking into consideration their failed experiment with the associate network model, Harish and Thomas have come to the conclusion that a small business model is ideally suitable for the kind of work that SELCO does. Scaling needs standardization, which is antithetical to SELCO's business philosophy where solutions are customized keeping in mind the context and realities of the end customer. Therefore, they feel their business should be replicated rather than scaled. *“It is better if we focus on developing other SELCO's suited to the context where they would operate, rather than trying to grow this SELCO,”* says Harish. Thomas agrees, *“Ideally we should create an organization that can become investment partner for entrepreneurial entities – the SELCOs' of the future. We can provide the seed capital and pass on to them our knowledge, things that we learnt the hard way. However, the new entities will have complete independence in the way they would develop their business, because their specific model needs to be suited to their context. We would like to do this in other parts of India first and thereafter, maybe, across the globe.”*

SELCO has been conservative even while scaling their business in Karnataka. This is because Harish believes that pressure to scale might be subordinate to the social objective of the

⁹ “Base of Pyramid Impact Assessment”, N. M. Koppa & S Willoughby, World Resource Institute, 2007 (unpublished, obtained from SELCO archives)

¹⁰ This comprises a debt of US\$300,000 and equity worth US\$1.4 million.



organization. *“One of the obvious ways to scale,”* argues Harish *“is to put aggressive targets on the sales team. Such targets would instinctively make them chase the low hanging fruits – they will go after customers who will buy faster and who will buy larger systems. But are these the customers to whom we really want to sell to? SELCO exists to provide solar lights to the poor – the ones who can probably afford a small system and that too on credit. If one mixes the social objective with the commercial objective, it is most likely that the commercial objective will dominate. This is because it is usually easy to fulfill the commercial objective”*. Thus, the SELCO sales team and regional managers are evaluated on the quality of customers to whom they are making the sales over and above quantitative targets. It is of great satisfaction to the senior management team that over the years their average invoice value has reduced, implying that they are selling smaller systems to the poorer sections of society. Moreover, more than 90% of their customers today purchase their systems on credit.

Today, SELCO seems to be on the threshold of an inflection point. Mr. Pai, one of the founding members, has moved on to become SELCO’s exclusive dealer for manufacturing solar water heaters, targeted largely at the institutions and urban markets. Thomas is planning to go on a sabbatical towards end of 2009 and is unsure when he is going to come back. All these years, Thomas has managed the operations of SELCO and built the organization that was necessary to realize Harish’s vision. He has also ensured that when he goes on his sabbatical, SELCO is able to run smoothly. Therefore, his successors have been identified and during the past six months, Thomas has withdrawn himself from most operational matters. Harish feels that Thomas’ sabbatical is probably the ideal opportunity for him to step back from the management of the company and let the younger leaders take on their roles.

“All these years, Thomas and I have been perfect critics of one another,” recounts Harish. *“We could speak whatever came to our mind, because we knew that if it was a wild idea, the other will be forthright in telling so. With Thomas gone, there will be nobody to tell me that my ideas are wrong - therefore this will prevent me from thinking freely. After 15 years at the helm of the company, it is time we step back. We have built this company to a size of about INR 150 million (US\$3 million). There is enough opportunity in rural Karnataka itself to take SELCO to INR 400-500 million (US\$8-10 million). But we are not the right ones to do it – we need fresh ideas, fresh legs to travel up and down the country in order to motivate people - this job need a lot of that. I feel the difference now as I travel upcountry – while the older folks were far more comfortable in talking to me as peers, the younger ones treat me as their Managing Director. They are new; I am not very familiar with all of them as I used to be in the past. It is better if we now focus on building other SELCO’s rather than trying to grow this SELCO.”*



References

INTERVIEWS

- Dr. Harish Hande, Founder and Managing Director of SELCO
- Mr. Thomas Pullenkav, Vice President of SELCO
- Mrs. Revathi, Vice President and Chief Financial Officer of SELCO

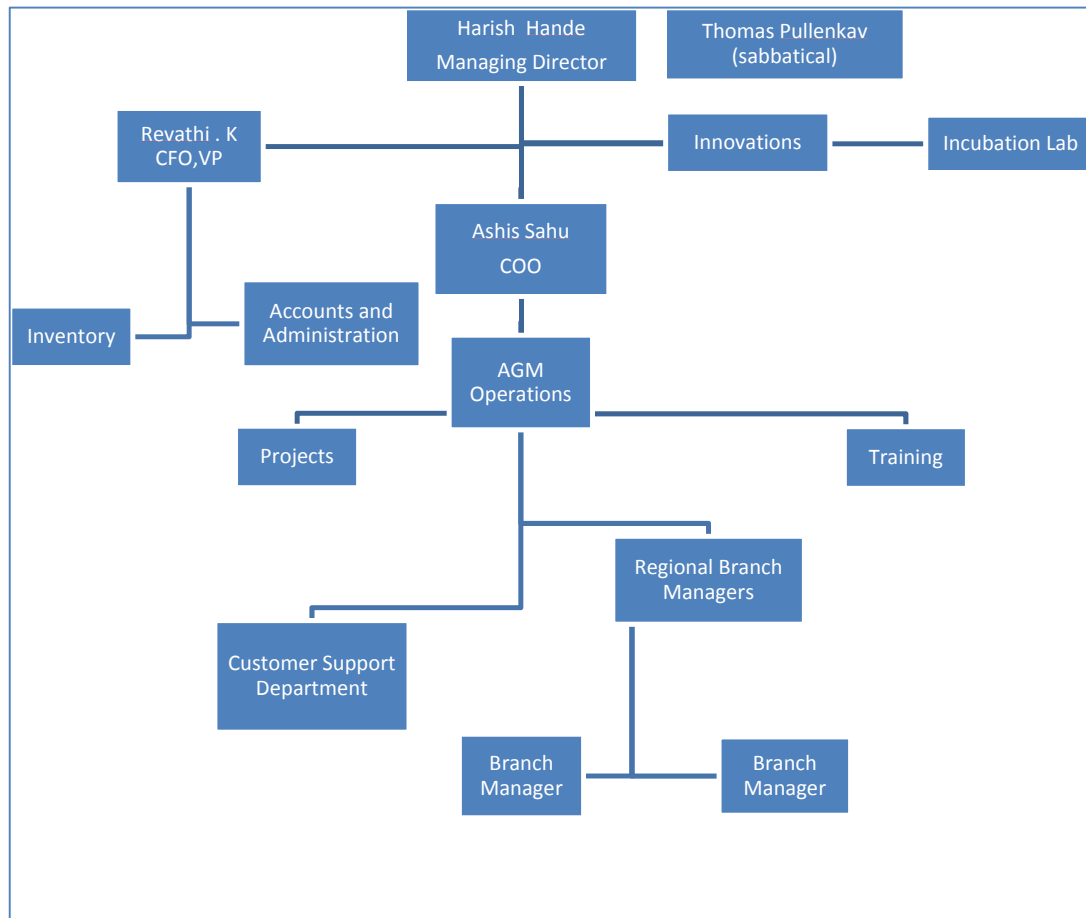
PUBLICATIONS

- World Resource Institute, “Base of Pyramid Impact Assessment”, N. M. Koppa & S Willoughby, 2007



Annexes

Figure 1: SELCO's Organization Structure at Corporate Office



NOTE ON SELCO'S ORGANIZATION:

SELCO operates through a network of 25 Energy Service Centres (ESC), 23 of which are located in Karnataka and one each in Gujarat and Kerala. Three to four of such ESC's report to Regional Branch Offices (RBO). All RBO's report to SELCO's corporate office in Bangalore. An ESC is typically headed by a manager and has one sales executive, two customer support executives and one office accountant or administrator, who all report to the ESC manager as well as to their functional heads. The ESC is the basic building block of SELCO's rural operations. Each ESC has a service territory in which it markets, sells installs and services SELCO's energy services. The RBO's provide operational and management support to the ESC's within their region and act as a contact point between SELCO's



corporate office and the ESC's. The corporate office provides all accounting and managerial oversight and is responsible for overall management of SELCO operations. The corporate office also has the innovation department (described in the case) and projects department that is typically involved in selling solar lights to institutions. SELCO currently has about 150 employees in various roles and responsibilities as follows:

Managers at corporate head office and RBO's:	15
Managers at ESC's and sales executives:	45
Customer support executives:	55
Office administrators / accountants:	35

Table 1: SELCO's Profit & Loss Account (all figures in INR Million)

	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09
Revenue	130	66	63	78	120
Material Cost#	86	43	42	53	77
SG&A	8	4	4	5	8
General Admin Costs	32	29	36	28	32
Financing Costs	2	3	4	2	0.5
Profit / Loss	3.15	-12.3	-23.13	-8.39	1.36

includes Market Awareness creation programs, Demos, Interest Subsidy costs, Sales Commission etc.



Table 2 : SELCO's List of Shareholders as of 31/03/2009

SHAREHOLDERS	No. of Equity Shares (Face Value Re. 1)	Paid up Share Capital in INR Million	% of Shareholding
SOLAR ELECTRIC LIGHT COMPANY, USA	4,140,448	4.14	7%
E+Co., USA	9,774,243	9.77	16%
LEMELSON FOUNDATION, USA	14,000,000	14.00	23%
GOODENERGIES FOUNDATION, SWITZERLAND	34,000,000	34.00	55%
Mr. HARISH HANDE, MANAGING DIRECTOR	253,859	0.25	0.41%
Mr. K.M. UDUPA, DIRECTOR	20,000	0.02	0.03%
	62,188,550	62.19	100%

Table 3: SELCO's Balance Sheet (INR Million)

Parameters	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09
Fixed Assets	3.5	3.35	1.95	1.53	1.43
Current Assets & Investments	103.7	91.84	63.39	55.03	122.29
Current Liabilities	37.57	23.11	19.19	20.27	31.25
Secured & Unsecured Loans	30.8	45.88	45.86	44.62	18.22
Share Capital	45.94	45.94	45.94	4.59	62.19
Reserves (Net of Accumulated losses)	-7.11	-19.74	-45.65	-12.92	12.06



Table 4: SELCO's Secured Loans (External Commercial Borrowings) as on 31st March 2009 (Figures in US\$)

Lender	Total Loan Amount	Loan Aailed	Outstanding as of 31/03/2009
IFC	1,000,000	1,000,000	435,000
Lemelson Foundation	250,000	125,000	125,000

Table 5: Salary Range of SELCO employees (INR per month)

Employee Type	Salary Range
Technicians	3,500 – 8,000
Sales Executives	5,000 – 12,000
Branch Managers	10,000 – 20,000
Senior Mangers	15,000 – 30,000
Regional Managers	25,000 – 40,000



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The information presented in this case study has been reviewed by the company to ensure its accuracy. The views expressed in the case study are the ones of the author and do not necessarily reflect those of the UN, UNDP or their Member States.

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