

# **A review of the solar home system concession programme in South Africa**

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## 1. Introduction

Since the introduction of the solar home system (SHS) concession programme in 1999, the involved companies and customers have had to adapt to many changes over the years. Government introduced for example the Free Basic Electricity policy in alongside the SHS subsidy and only irregularly awarded tenders for the actual installation of SHSs; companies have split and concession areas have been renegotiated. Despite these changing conditions some companies have managed to stay in business and are still willing to install systems for new customers. The questions are: who managed to adapt to these changes, and what do the business models of the companies look like?

Rural electrification remains a challenge for government and the private sector. High connection costs, low consumption rates and high poverty rates constrain the roll-out of electricity in rural areas. The SHS concession programme was introduced with the objective to ‘speed up universal access to electricity’, and aimed to ‘attract larger, better organised private companies with their own sources of financing’ in the hope that ‘the strong financial and maintenance control characteristic of the private sector should facilitate the channelling of international development funding’. The programme was also meant to motivate the service providers to ‘adopt a delivery model that promotes a range of fuels such as gas or kerosene, in addition to SHS or mini-grid systems’ (Kotze, 2000).

Earlier research has been helpful in identifying shortcomings of the programme (for example Energy Research Centre, 2005 and Energy Research Centre, 2004) but, in order to advise policy makers, it is of particular interest to examine the survival strategies the SHS companies adopted.

## 2. Research approach and information collection methods

A survey of the SHS companies was carried out. The approach is a research methodology, which interrogates the collected data both qualitatively and quantitatively. The data were analysed both for their qualitative insight as well as their quantitative information, to provide a framework to review current business models and practices. In the survey, respondents were asked to rank the quality of earlier identified key elements of their work in the concession areas, which provides the basis for comparison between the respondents.

The survey consisted of interviews with the concession manager, guided by a questionnaire including open questions. Out of the seven concession companies, six are still operating and participated in this research. The survey which was conducted in personal conversations with the concession managers was followed up by email conversations with some of them. Only one concession company could not be met with in person and was therefore interviewed by an emailed questionnaire. Further, a semi-structured interview was conducted with the manager of the non-grid electrification programme of the Department of Energy, followed up by email correspondence. Knowledge was also shared by other experts in the field.

## 3. The current state of affairs in the different companies

There are six concession companies in the country, of which three are devoted to maintenance for the existing customers in the areas allocated to them and three are, as well as providing maintenance service, installing systems for new customers. The three maintenance-only companies have each taken over parts of the concession area the Eskom-Shell concession company was initially working in. Two of these new concession companies were not operating at the time of the research.

### 3.1 Solar Vision

#### *Operation area*

Solar Vision has been involved with the SHS program from the outset and is today servicing customers in four municipalities. Of the 11 500 installed systems, about 4 000 households have

received grid electricity meanwhile, and their systems have been removed, vandalised, stolen or sold by the households. Solar Vision says it has 6500 remaining customers at present.

#### ***Points of contact with customers***

Solar Vision runs two “solar shops” in the Venda district where LPG, improved wood stoves, paraffin, light bulbs for the SHSs and also electricity and airtime are sold. One retail shop in the Polokwane area also belongs to the company. Solar Vision has competition, particularly when it comes to selling LPG from their shop. Although selling them is not very profitable, airtime and electricity have been added to the shops’ product range with the aim of making the name Solar Vision better known.

#### ***Maintenance of existing systems***

The maintenance of the SHSs is done using cars which can drive on the often very poor road almost to all houses of the customers. Solar Vision receives about 10-15 maintenance calls per 1000 customers per day which adds up to over 1800 maintenance calls per month, although not all of these calls relate to actual technical problems. Within the first week after a problem has been reported, about 60% of the problems can be attended to and resolved. The rest can take up to 4-6 weeks, depending on the availability of spare parts. Customers either call Solar Vision directly or report technical faults to one of the technicians in the field or at the solar shops.

#### ***The team***

Solar Vision started off with six employees and is today staffed with 18 permanent staff members and has access to 5-7 contract installers and 20 representatives of the company throughout the concession area. Of the 18 staff members, 4 are female.

#### ***Collaboration with municipalities***

Solar Vision perceives the relationship between the municipalities and the company as good. The municipalities pay regularly, except in one case where the payment is currently three months overdue. The municipalities pay R40 per month per customer and the customers add R28 to this amount. In case of non-payment by customers, Solar Vision follows up on the household and usually finds that the house has received grid electricity or has damaged the system somehow without reporting it to the company. The SHS is then usually removed or the outstanding fees claimed.

#### ***Electrification***

The state’s aim to provide access to grid electricity for everybody by 2012 not only threatening the business of Solar Vision, but would make the SHS program as a whole redundant. The municipalities Solar Vision is collaborating with are hoping to reach universal access in due course.

Even if the municipalities will not be able to deliver on their promises, Eskom’s electrification process is an issue for Solar Vision, while delays and a lack of transparency are a challenge for the planning. Solar Vision says that municipalities and Eskom are not being honest when it comes to defining dates for the electrification of newly-built houses and settlements, especially when it comes to urban settlements. The company sees the service of SHSs as a good opportunity for government to provide service to people who still have to wait years for a connection to the grid.

#### ***Future of Solar Vision***

Solar Vision considers SHS as their core business and hopes to be able to continue its work through more contracts. (Jakes Jacobs, 2010). Solar Vision has been awarded a new contract for new installations in the municipalities Mpane and Greater Sequma. Since Norwegian funding came to an end last year, the company is open to new external funders.

## **3.2 Nura**

Nura is the second company which has been active as a concession company right from the start. Nura was awarded the initial roll out for SHSs and a second ad hoc rollout of 2000 systems was made possible by their Dutch funders, Nuon, in order to prevent Nura from going bankrupt. Nura was shrinking and running out of storage room, as they had to remove many systems from customers’ houses and find storage space. In order to prevent having to invest in more storage room, Nuon financed the reinstallation of these 2000 systems to new and old customers to prevent Nura from running out of money.

***Operation area***

Nura is currently active in six municipalities in eastern Kwazulu-Natal by providing maintenance.

***Points of contact with customers***

Nura is running eight energy shops in the concession area, selling the Stovetec improved woodstove which has not been taken up very well, SHSs, LPG and the successful Ethanol fuel. As government regulates LPG, Nura's margin on LPG is low, which makes it almost unviable for them to sell it. All these products are sourced from inside South Africa, except the Stovetec woodstoves which are from China and were introduced to Nura by GTZ and Restio Energy.

Nura is preparing another shop which should be open by the end of August. Their shop in Jizana is moving into a bigger space.

***Maintenance of existing systems***

The service agreements between Nura and its customers are renewed every year and it is generally seen as difficult to keep the customers happy and the relationship with municipalities positive. Especially the poorest of their customers struggle to pay the monthly service fees for the SHS and find themselves often incurring substantial debts with Nura.

Nura installed two different SHS systems - one including a pre-payment meter which switches off in case of non-payment, the other a stand-alone system which requires manual disconnection. Nura offers two options for customers who continually fail to pay their monthly fees. Firstly, there is a chance to enter the amnesty programme whereby the payment of the amount of only one monthly fee wipes off their outstanding debts. The second option includes a two-step removal process. Customers receive first a letter noting non-payment, then monthly SMSs informing them about their outstanding balance; later the panel gets removed and if the reinstallation fees are not paid the rest of the system gets removed as well. Nura has about a 40% rate of customers who continually fail to pay their fees.

The maintenance of the SHS systems is supported by a geographic information system which helps to locate customers and in organising the logistics. The maintenance call which is longest outstanding and the houses in the immediate surrounding are serviced in one go. Nura receives about 700 maintenance calls per month, many of which might not necessarily relate to faulty systems, but rather to other problems in the houses. Customers either call Nura's cell-phone or report to the technicians in the field or in the stores. It takes about one month to solve a technical problem, depending on the availability of spare parts. Nura only started raising the customer's service fees in 2007, and in 2010 households pay R74 per month.

The maintenance team use motorbikes, allowing them to reach almost all customers without needing to walk. The usage of motorbikes is reported to challenge technicians (both female and male), as the roads are rough and many employees only recently learnt to ride a two-wheel vehicle (Dlamini, 2010).

***The team***

Nura is following a careful but constant growth path which is described by the manager as intrinsic - meaning that it has only slowly added shops (which are situated not more than 50km apart to prevent isolation of shops and ease logistics). There are currently 82 staff members, who have joined the team over time. Of these about 40% are located in Mkuze, and around 40% are female. There has been a shift in management since 2006, as Nura's management has since become located in Mkuze. The current manager, who joined the company in 2004, feels this change of location is important for the success of Nura.

***Collaboration with municipalities***

Collaboration with municipalities is also problematic for Nura. Only one municipality is currently paying the monthly subsidy in a regular manner, the other five consistently failing to pay. Customers in these municipalities have to pay the full amount of the monthly service fees.

***Electrification***

Nura finds Eskom's electrification plans are insufficiently transparent, and wishes that at least the municipalities could have a better understanding of Eskom's plans. Nura constantly tries to engage directly with Eskom, but is not satisfied with the information received. On the other hand, Nura says

it has a fair understanding of what is possible with the current grid-infrastructure, and is therefore fairly knowledgeable about what to expect in terms of electrification in the future.

#### ***Future of Nura***

SHSs are part of Nura's core business. The business is constantly growing through volume, range of products, number of employees and revenue, though less through customer growth, although that should happen now through a new contract. Nura has been awarded a new contract by the DOE for the installation of 4000 additional SHS systems. While welcoming this, Nura thinks the business could have continued surviving even without it (as has since 2006 without new installations). New customers for this roll-out will be found through community meetings, announcements in the community radio, and advertisements in the shops. The systems have to be installed in the current financial year - which is a challenge, given that the contract was only been signed in July, after which Nura immediately started tendering for the technical supply.

Nura likes to be an example for other projects and has been the subject of international studies. It is happy to share information and experiences to support other projects. Projects which fail are seriously damaging to the reputation of PV and, with PV becoming more and more viable with increasing electricity tariffs and declining technology costs, any failure should be prevented if possible. Nura's manager expects the costs of PV and grid-electricity to balance out in around 2015. Rising battery costs prolong the price reduction, associated with the technological learning curve.

### **3.3 Summer Sun Trading**

Summer Sun Trading is managed by Colin Ferrel who runs two other businesses beside Summer Sun, a car repair service and a commercial solar appliances installation company. He carries the risk for the company, while profit is meant to be shared between the management and the employees.

#### ***Operation area***

Summer Sun Trading stopped operating in February 2010. The company was initially allocated 1200 SHS customers located in five municipalities. The Hibiscus district received grid electricity and the systems were removed from the houses; Umuziwabantu used to have 240 customers, but 170 systems were removed here due to electrification as well; the municipality of Bizana has recently decided to not continue paying the subsidy for 350 of the 500 SHS customers in their area and they were consequently excluded from the company's maintenance service. From the remaining two municipalities of Flagstaff and Umzumbi the company has never received any payments.

#### ***Maintenance of existing systems***

Summer Sun Trading used to supply its customers with the SHS-specific light bulbs. The customers were meant to pay different fees depending on the municipality they belong to. Bizana's customers are meant to pay R10, Flagstaff's R13 and in Umzumbi the municipality promised to pay the full amount of R61 per customer.

#### ***The team***

The team, nine people in 2004, now consists of seven people who are currently on short time.

#### ***Collaboration with municipalities***

The collaboration with the municipalities is as mentioned before the main reason for Summer Sun Trading ceasing operations. The Bizana municipality took seven months to organise its indigent register and saw itself unable to pay while doing so. In July 2010 when the Bizana municipality finally paid they only paid for 150 out of the 500 existing customers in their area. They did not state a reason for selecting these 150 and Summer Sun Trading is therefore assuming that the 350 customers for whom payments were missing had not been accepted as indigent. From two other municipalities payment was received, with a delay of many months.

#### ***Electrification***

Before Summer Sun Trading stopped operating, the manager described Eskom as a constraint because it was communicating false information. According to him Eskom declares areas to be electrified without actually having electrified all the houses in the area. When this issue is brought to the attention of the municipalities, their reaction is in general that if Eskom declares an area as electrified, there is nothing a municipality can do.

### ***The future of Summer Sun Trading***

As Summer Sun Trading is currently not active and its staff on short time, the focus of the manager and its team is on the two other commercial businesses run by the manager.

Summer Sun Trading had been waiting for the municipalities to pay their debts and since some money had come in is now planning on sending staff into the areas to collect the fees of the customers or remove the systems if customers are unable or unwilling to pay. The systems could then be sold and installed somewhere else.

The customers often understand that Summer Sun Trading is not able to service the systems without the municipalities paying the agreed monthly fees. Some of their customers are starting to ask now for Summer Sun Trading to sell them new batteries instead of giving them out for free.

The manager of Summer Sun Trading used to manage the Eskom-Shell concession and has been involved in writing the business plan for the three maintenance companies which were meant to take on the maintenance service of Eskom-Shell's customers. This plan already showed that without additional contracts for new installations the businesses would not be able to sustain themselves for long.

## **3.4 Ilitha co-operative**

### ***Operation area***

Ilitha Co-operation Ltd is managed by Gibson Mzenzi and is one of three companies awarded the contract for maintenance of the installed SHS under the Eskom-Shell concession licence. Ilitha started negotiating with the municipalities in 2004 and is responsible for the customers in the municipalities of Matatiele, Umzimvubu and Umzimkulu. The customers in the Elundini municipality should also be maintained by Ilitha, but the municipality only agreed to subsidize 42 of the 181 customers and later reduced this to only six customers. Ilitha stopped servicing the area subsequently and the 181 customers remain un-serviced.

### ***Maintenance of existing systems***

Of the 1 852 total customers Ilitha co-operative was contracted to service, 219 houses have been electrified and 72 systems stolen, so that 1561 customers remain. The 219 electrified houses have been found with either vandalised or stolen systems; and in few cases the households are still using the SHS's as a backup.

Customers can visit the reporting point, call, SMS or send 'call me' messages in order to report faulty systems. It takes Ilitha between two and four weeks to visit houses which reported problems. It receives 20-30 maintenance calls per month.

The initial service under the Eskom-Shell concession included the provision and exchange of broken lightbulbs suitable for the SHS. The maintenance contracts for Ilitha and the other two companies do not now, however, include this service. As these special 9-Watt bulbs are not available in the local shops, Ilitha sells the bulbs to its customers.

Ilitha sources its supplies from Sky Solar in Cape Town and batteries from First Election Batteries in East London.

### ***The team***

The initial team consisted of nine people 2004, of which three left and have not been replaced. The remaining team consists of the project manager, a secretary, two main technicians and two assistant technicians. The team is underutilised and two of them are only working as assistants when footwork is required. The team is well trained, according to the manager, as most of them worked for the Eskom-Shell concession before. Ilitha has access to two bakkies - which are often broken due to the bad road conditions. Technicians usually drive to a central point like a shop and walk from there with the equipment for the maintenance.

### ***Electrification***

Ilitha is working on Eskom to release more information about their future electrification plans and the DOE's involvement should help to push Eskom towards this.

### ***Collaboration with municipalities***

The three remaining municipalities where Ilitha is servicing customers are not paying the service fees regularly. After the demarcation in 2006, customers in Matatiele were split and 235 were re-allocated to Umzimvubu. Matatiele has not been paying Ilitha for one year and is currently paying irregularly for 911 of the 912 existing customers. Umzimvubu has not been paying for 14 months for their 235 customers. Only Umzimkulu is a regular payer for its 233 customers. The municipalities are all meant to pay around R48 per month per customer; with the remaining R13 to be paid by the customers.

The households, however, pay whatever they can afford when their system needs maintenance. The visiting technician collects the money on the day they are working at a system. There is no regular collecting system for the monthly fees as Ilitha feels that the households appear to not comply with monthly payments anyway. Ilitha does not switch off systems or remove them in the case of non-payment. The business model does not rely on customer payments, but on the subsidy paid to Ilitha by the municipalities.

One of the municipalities' requests Ilitha to send them the monthly maintenance reports with their invoice. This is welcomed by the company.

### ***The future of IlithaC o-operative***

The manager of Ilitha is running an accounting practice as well, and so is able to survive. Ilitha is running at a high loss and he talks of "God's influence" for his hopes that the situation will improve. Ilitha has been awarded a new contract under which they will be allocated additional areas in which they will also be allowed to install new systems in future. The areas have not been allocated yet, but it is expected that work should begin in October 2010. Ilitha hopes to add 3000 new customers to their list and hopes, too, for better collaboration with the municipalities.

"Umkomazi", an area which will never receive electricity according to Ilitha's information, is likely to be part of their area. Here 200 households are relatively close together; which should help with the collection of fees and the organisation of maintenance.

## **3.5 Kwazulu Energy Services**

### ***Operation area***

Kwazulu Energy Services (KES) is owned by TED, EDF and Calulo and managed by Vicky Basson. It operates in Mount Fletcher, Tsomo, Msinga, Maphumulo and Ndwedwe. Initially (1998) the company focused on KwaZulu Natal, and has expanded through a Tender by the Kreditbank fuer Wiederaufbau and the Department of Energy to the Eastern Cape in 2005. In total KES has installed and is servicing 10000 SHSs.

### ***Point of contact with customers***

KES runs one energy store in each area of operation, and there it sells SHSs, improved woodstoves, and LPG - which is the only product where sales are decreasing. For a new SHS customers have to pay R105 once off and subsequently the monthly maintenance fees.

### ***Maintenance of existing systems***

The total monthly costs for maintenance are R74; in some areas the customers pay the whole amount, in other areas up to half of this amount is paid for by the municipalities. The money is collected at the energy stores, as most of the households are located 2-5 kilometres from a shop. However, 21-50% of the customers permanently fail to pay the fees. In these cases, KES is open to arrangements like special individual payment schedules. In the worst case, the SHS is removed from the house.

### ***The team***

The continuously growing team consists of 66 employees for the moment (including 20 women). The staff and subcontractors are stated to all be 'local'. Installation and maintenance of SHS is seen as KES's core business.

### ***Electrification***

KES did not rate the collaboration with Eskom as they have only recently started engaging with Eskom directly, communication having previously been conducted through the municipalities.

### *Collaboration with municipalities*

KES states that they are generally satisfied with the collaboration with the municipalities.

### *The future of Kwazulu Energy Service*

The company seems to be on a constant growth path, with product volume, the number of employees and the generated revenue increasing. The manager states that the activities falling under the DOE project in the company depend on two things. On the one hand, the project needs to be implemented properly, and on the other hand a new tender for more installations needs to be prepared in time to keep the business going, because the DOE tends to need up to one year after the contract is signed to confirm the areas for implementation.

## **3.6 Shine the Way**

Shine the way in the Estern Cape was reported to be no longer operating and could not be contacted. According to Summer Sun Trading and Ilitha Co-operative, the company stopped being active in the concession business due to financial problems.

## **4. Interview with Sebastian Khoza (Department of Energy)**

The role of the off-grid manager is to collaborate with Eskom and the team from DOE's grid programme in order to align the work of the off-grid programme with future national electrification plans. The double-checking of infrastructure and available funding is part of this work, allowing him to make judgements about the likelihood of Eskom's projections being realised.

### *The new contract*

The SHS programme had its last roll-out of new installations in 2006; between 2006 and 2010 political issues prevented further roll-outs. The political issues evolved partly around the tender process for a new contract. Legally, with a new contract every company would be given the opportunity to apply for the contract. Practically, however, the appointment of new companies would significantly complicate the programme as the existing customers have 20-year service agreements with the current concession companies and the new companies would have to operate in the same areas. This would confuse customers and probably municipalities as well.

When the tender process for the contract in 2010 finally went through, it turned out that the existing concession companies did not have much competition, and the tender process was won by three of the existing concession companies. Nura, Ilitha Co-operative and Solar Vision are contracted to install new systems in 2010. This current roll-out is already behind schedule due to delays in processes, and the concession companies expressed their worries about the deadline. The DOE is also interested in spending the allocated money in time, as this is expected to support the programme's argument for more funding in the following year.

### *The allocation of SHS areas*

In 2007, the DOE commissioned a study on the programme and found that the installations are very scattered due to the fact that some households were able to pay the application fees and others not. The plan to densify installations needs to include a solution to this problem – probably the abolition of application fees to registered indigent households. This, however, requires the municipalities to keep their indigent register up to date, which the DOE sees as a challenge for the municipalities.

The DOE generally has agreements with the concession companies; which have then agreements with the local municipalities. The conditions of the agreements between the DOE and the concession companies tend to be the same for each company, with only the expected output numbers differing.

The municipalities in the SHS programme remain those chosen in 1999. Initially, Eskom managed the concessioners, but now the DOE has taken this over and agreements are signed between the DOE and the concession companies directly. Eskom is meant to collaborate with the municipalities in planning the electrification roll-out. Politics in the municipalities are said to put stress on this collaboration sometimes – when, for example, a municipal manager wants village A to be electrified first (which might add costs), the electrification of village B is then delayed, and in the end the budget might not allow village B to be electrified at all during that financial plan (covering three years).

As the SHS programme is meant to be rolled out only in remote areas which will not be electrified in the near future, it faces the need to allocate new areas for the roll-out in the coming years. The off-grid manager is therefore trying to approach the South African map from the points of least likely electrification to the likely ones. 2011's local elections are a current constraint to his work, as he finds that politics influences the commitments of municipalities.

#### ***Payment by municipalities***

On the issue of the monthly payments from the municipalities to the concession companies; the DOE is not obliged to put any pressure on the municipalities, as the money is meant to be paid under the Free Basic Electricity budget out of the unconditional grant municipalities receive for Free Basic Services.

In the interview, the off-grid manager mentioned that the DOE is considering motivating the concession companies to take legal action against non-paying municipalities, as non-payment is a violation of agreements.

In Limpopo, the Energy Forum meetings are said to be very useful in keeping municipalities and their staff informed about the electrification processes in the area and also the progress in the SHS programme. Solar Vision, located in Limpopo and attending these meetings regularly, is in fact one of the two companies that does not have problems with non-payment of municipalities. Energy Forum meetings have been initiated by the DOE in all provinces and are still alive in North-West and the Free State on different levels (local government, district and province). In the Eastern Cape and KwaZulu-Natal, where such meetings are not taking place, collaboration with the municipalities is problematic for the concession companies (the exception being KES in the Eastern Cape which receives the monthly service fees for most of their installations directly from the DOE).

Additional, it was mentioned that some municipalities disagree with the DOE appointing the concession companies; they complain that they do not even know the concession company so why should they pay them?

#### ***The future of the SHS programme***

The greater goal of the SHS programme was said to be to survive and to further densify SHS installations. As funding is apparently not a problem, the simple identification of suitable areas is the major constraint to growth for the programme. The DOE is considering collaborating with the internal Energy Efficiency Unit which is working with the solar water heating (SWH) programme - the thought relates to the possibility of installing SHSs in combination with SWHs on people's roofs, but the practicalities of finding houses which both have access to piped water and are not electrified are difficult.

In the urban context, the off-grid programme struggles to offer ideas for non-electrified houses as the electrification policy does not allow electrification through a SHS when electricity lines are in visible distance. Also SHSs are only allowed to be installed in areas where in the next five years electricity will not be rolled out. The DOE is currently evaluating whether this latter provision could be changed to three years.

Another constraint to the successful roll-out and support of the SHS programme is the fear of municipalities that by agreeing to SHS electrification future grid-electrification would be abandoned. A collaborative meeting with Eskom, the municipalities and the DOE (one like the Limpopo Energy Forum) for the organisation of the electrification roll-out would help get everyone on the same page and explain technical and financial constraints to the municipalities and get their support for the SHS programme.

Local councillors are another crucial influence to the process of convincing people and municipalities about the SHS programme. Councillors are said to often not understand or not even be aware of the SHS programme. Again, Energy Forum meetings at different levels would address this issue. The KES concession apparently has appointed a promotion service provider who is informing councillors and presumably also potential customers about the programme. The KES concession is managed by Ms Molomo, who is the manager of renewable energy in the Department of Energy; the other concession areas fall under the responsibility of the off-grid manager. The reasons for this allocation of responsibility are unclear.

Finally, the off-grid manager reported that the Department of Energy was motivating him to find ways to provide households with stronger SHSs which could deliver enough electricity to run a

colour TV and which could even be integrated into the grid-supply once a house is electrified. Other off-grid approaches could also be integrated into the work of the off-grid team, but the only example is a failed mini-grid pilot installation somewhere in KwaZulu Natal. Apparently the maintenance and operation of the system was not well planned and education of the users was also lacking, so that the project failed (Martinot, 2001).

## **5. Summary of the challenges the programme faces**

### ***Operation areas***

The concession companies are dependent on the allocation of implementation areas by the DOE. With increasing electrification, existing customers are lost and the DOE is slow in identifying new areas and convincing municipalities to take part in the programme. As described by the off-grid manager, this process is proving difficult due to Eskom's dependency on the municipalities. The planning process of the municipalities is apparently quite susceptible to changes and the reintroduction of the SHS programme with the new contract is confronting them with additional planning problems (Khoza, 2010).

According to the DOE, work is being done on improving the collaboration between Eskom, the municipalities and the DOE in order to better integrate the off-grid and the grid programmes (Khoza, 2010).

### ***Points of contact with customers***

The three companies which have been part of the programme from the outset and have also been engaged with installing SHS, from the start established energy stores which support their business. Solar Vision, which is only operating two stores does not value the contribution as highly as do KES and Nura, which have five or six stores as an important feature of their concept.

### ***Maintenance of existing systems***

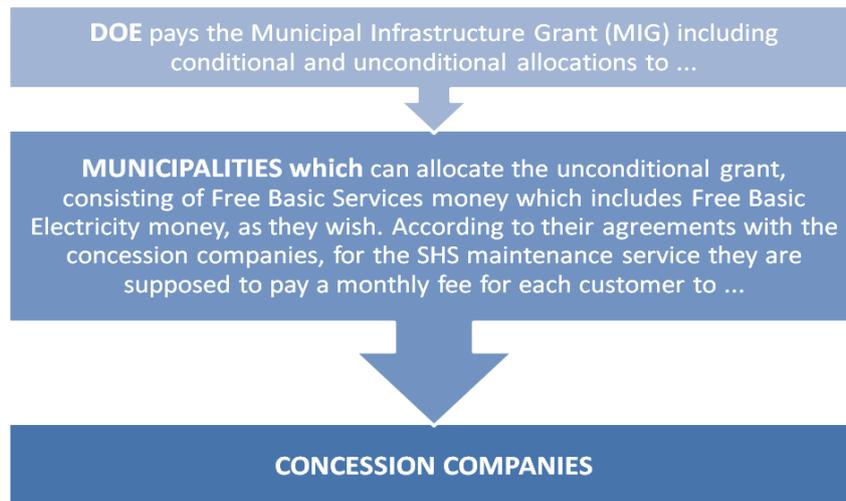
It has proven to not be possible to run a financially viable concession company by providing maintenance service alone. The three companies with a sole maintenance mandate are the ones struggling most, but one of them won an installation contract for 2010 and now has the chance to continue in business. The non-payment of the municipalities and their arguing around indigent registers are difficult as well. It seems as if the three full mandated companies find maintenance not so difficult, and they do not depend on it so much either.

### ***Electrification***

A lack of communication and honesty between Eskom, the municipalities, the DOE and the SHS companies creates a serious barrier to accessing reliable information on the extension of the national electricity grid. Especially the local councillors need to be informed about these plans in order to motivate the people in their areas accordingly. The councillors' involvement is seen as crucial for the openness of households to SHS. The priority list for electrification does not change once approved.

### ***Collaboration with municipalities***

Monthly contributions to the service fees are meant to be paid by the municipalities to the concession companies for each SHS customer in the area, as shown in Figure 1.



**Figure 1: Finance stream in the SHS programme**

Collaboration with the municipalities is for almost all of the concession companies a major challenge. The reasons for Shine the Way dropping out of the business are not known, but Summer Sun Trading had to stop operating due to the permanent failure of the municipalities to pay the monthly maintenance fees. Ilitha Co-operative and Nura complain about irregular payments as well. Only Solar Vision and KES are receiving regular payments from almost all of the involved municipalities. In the Limpopo case, Solar Vision and the DOE state that the regular Energy Forum meetings are key to the satisfying collaboration between the concession company and the municipalities. KES says its general satisfaction with the collaboration with the municipalities is the result of meetings with the financial and the municipal managers, and community workshops.

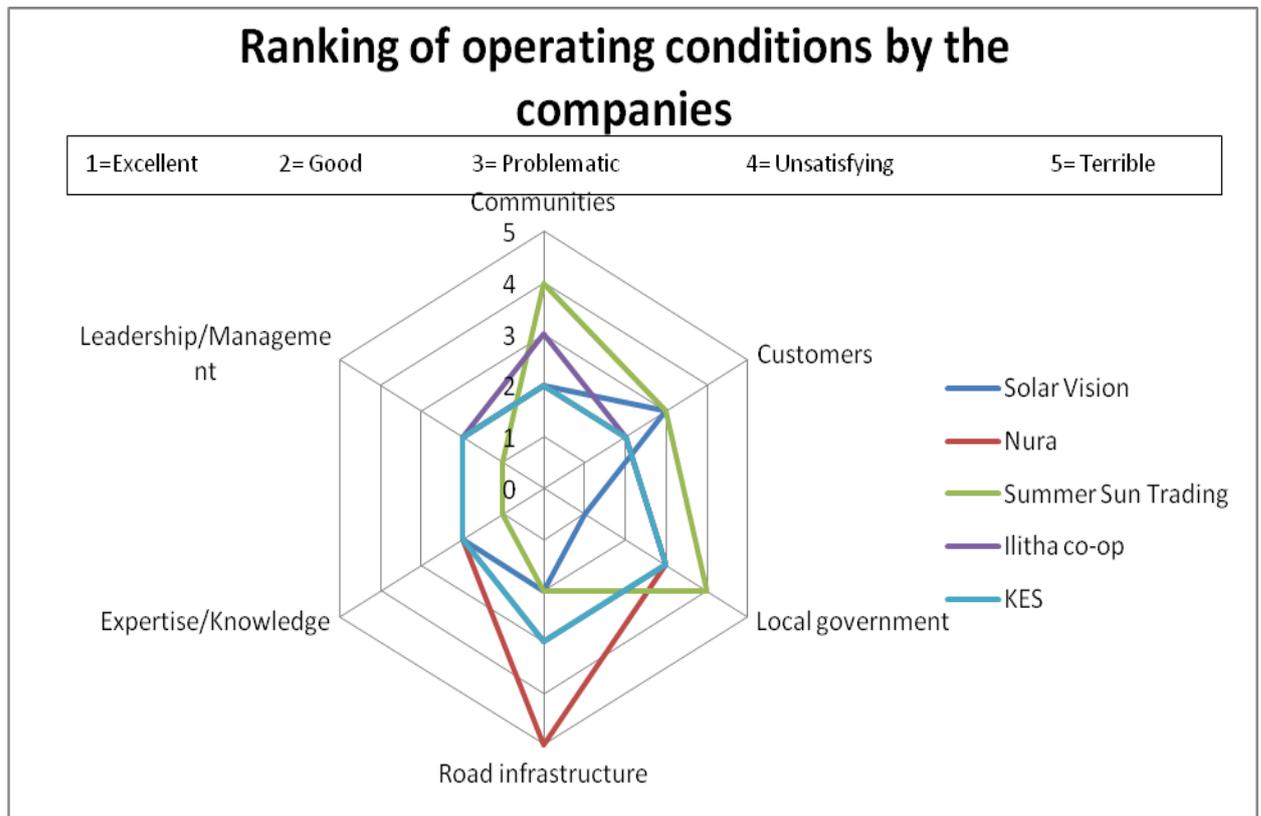
Summer Sun Trading expressed great concern about the risk of Ilitha not succeeding with the new contract if the conditions remain the same. Both companies identified the municipal managers as key figures who need to be convinced of the programme each time there is a change in personnel in the municipalities. Without the personal buy-in of the manager, Ilitha reckons that even signed contracts are meaningless, as payments will simply not come through. This reflects the general lack of awareness about solar technology and the SHS programme in particular. From the local councillors to the municipal manager, the programme needs to be better known. Summer Sun Trading is therefore requesting the DOE to play a bigger role and also to apply pressure on non-paying municipalities.

### ***The future of the concession companies***

The concession companies, regardless of whether they benefited from the last installation contract in 2006, expressed the need for more frequent contracts. Between 2006 and 2010, the DOE has not subsidised additional SHSs due to political issues which are described in more detail in the interview with Sebastian Khoza. Previous research reckons that “these delays have damaged the programme, and adversely affected its potential beneficiaries. Lengthy periods of uncertainty about whether or not the programme would go ahead have done little for investor confidence. Lost opportunities and associated opportunity costs for customers must also have been substantial” (Gostner, 2005). The new contract is based on an 80/20 principle which implies that the costs are to 80% covered by the subsidy and the remaining 20% are the responsibility of the concession company.

The concession companies were asked to judge/rank their interaction with communities, customers and local government. They were asked for the quality of infrastructure in form of roads, quality of expertise and knowledge and of leadership and management in their team. The graph below indicates that the interaction with communities is ranked from good, through problematic to unsatisfying, with Solar Vision, KES and Nura being most in favour of the communities they work

with and Summer Sun Trading the least. The satisfaction with the interaction with customers differs only little between the companies, good and problematic are the two almost equally chosen categories. The interaction with local government, however, reflects the findings in this report very clearly. Solar Vision is the only company judging this interaction as excellent; the other companies chose problematic and unsatisfying. The road quality differs a lot between the concession areas with Nura calling the conditions terrible, KES and Ilitha finding them problematic and Sun Trading and Solar Vision enjoying good roads. The quality of leadership/management and expertise and knowledge was ranked by all companies that answered the question as good.



**Figure 2: Ranking of business influencing factors**

## 6. Recommendations resulting from the findings

- a) Attend to the customers without access to maintenance services for their SHS since Summer Sun Trading and Shine the Way stopped operating.
- b) Revive Energy Forum meetings in KZN and the Eastern Cape and consider Forum suggestions regarding suitable areas for SHS roll-outs.
- c) Investigate cell phones as a possible option for collecting monthly service fees from households.
- d) Consider the inclusion of smaller SHS systems and other solar household appliances like solar lanterns to diversify the product range and potentially increase the number of customers, as this would reduce maintenance fees and poorer households could participate as well.
- e) Investigate funding opportunities through the Free Basic Alternative Energy Policy/Budget.
- f) Create momentum for the inclusion of SHS electrification into the Universal Access Plan for 2012/2013.
- g) Identify an appropriate agent/agency to control the programme and have the competence to sanction stakeholders in case of non-compliance with guidelines.

## 7. The findings in the international context

The World Bank/GEF report from 2001 identified certain elements of SHS projects being eminent in projects all over the world. Some of these appear also in the South African projects. Projects here should also be designed to overcome a) a lack of established markets; b) the unwillingness of utilities to provide off-grid electricity services; c) high first-cost and affordability issues; d) lack of consumer financing; and e) uncertain or unrealistic grid expansion plans. The reality, however, shows that up to now none of these barriers has been overcome.

As in China where the ESCO model failed because an appropriate authority to regulate the concessions could not be found (World Bank, GEF, 2001), the regulation of the SHS programme in South Africa is a major concern. To date, the DOE as the managing agent of the programme has not been able to ensure payments through the municipalities to the concession companies nor has a way been found to effectively integrate the SHS programme into the national electrification plans. It seems as if Eskom is still to learn what in Sri Lanka has apparently succeeded, the integration of SHS into rural electrification planning. This needs to be improved in South Africa, and the issue around unrealistic political promises also calls for greater attention when it comes to electrification. "Lessons from early experience suggest that concession tariff-setting, bidding and regulation present numerous challenges and require substantial time and resources. Projects must recognize the link between rural electric-grid extension and solar home system demand; customers' perceptions of future rural electric grid extensions, whether based upon concrete government plans or merely unrealistic political promises, can limit demand for solar home systems. Thus clear, open and realistic rural electrification policies can help create and/or stabilize market demand" (Martinot, 2001).

None of the South African concession companies has been able to establish a cost-effective way of collecting the monthly service fees from the households. In Sri Lanka, a company which initially worked under a concession scheme had to give up, as the costs to collect the monthly fees in the scarcely populated rural areas simply were too high (Martinot, 2001).

"The key elements of a sustainable rural PV market include customer satisfaction, affordability, dealer profitability, and effective supply and service chains" (Martinot, 2001). The World Bank and GEF document the success of firms with rural experience and distribution infrastructure, and in line with these KES and Nura are the strongest companies in South Africa. They both have a number of stores and collect the monthly fees with certain stringency.

It can be concluded that South Africa's experiences with the SHS concession programme are very similar to those elsewhere in the world; this suggests the potential for a more detailed comparison in future research.

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