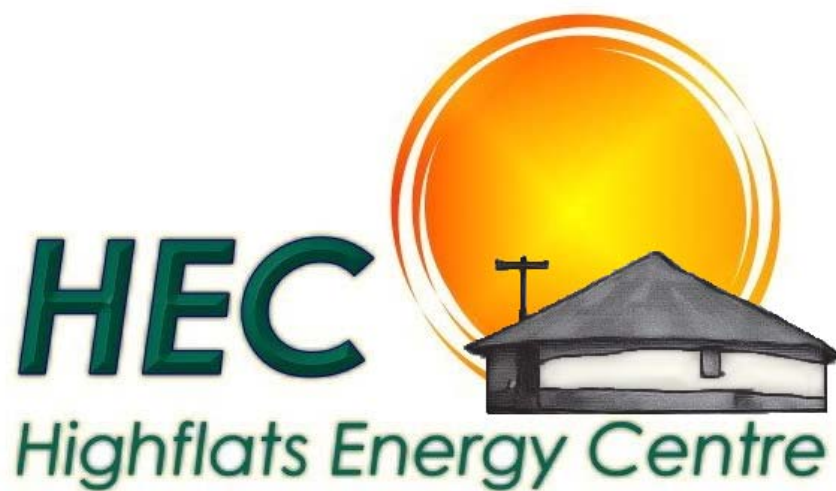


Highflats Energy Centre

APPLES Project Case Study

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1. Background

The majority of households in rural Africa are highly dependent on traditional biomass to meet their thermal energy needs, and this is unlikely to change in the foreseeable future. Although the most developed country in the region, South Africa is no exception to this situation. Years of economic and political turmoil led to energy sector instability and a need to find accessible and affordable energy supplies to previously unserved communities. The Alleviation of Poverty through the Provision of Local Energy Services (APPLES) project contributes to meeting this need.

The Energy Centre at Highflats in the province of KwaZulu Natal is the direct outcome of the APPLES project. The overall goal of the project is to find a sustainable mechanism for the effective delivery of improved local energy services to poor communities in South Africa, thereby, offering a route towards poverty alleviation and contributing to sustainable development.

To achieve this, it builds on one of the most important initiatives of the South African government with regard to overcoming barriers to a better provision of energy, which is the DME's IeC Strategy & Action plan of 2005 that aims at establishing a network of self-sustaining energy centres with the purpose of facilitating and extending access to modern energy services to the poor population. Together with the petrol companies, the DME established a number of centres based around the sale of petrol, diesel and paraffin. The main objective for the establishment and operation of an Energy Centre under the APPLES project is to demonstrate an alternative model to the current format of IeCs being rolled out by DME. The APPLES project seeks to establish an energy centre model that is self-sustaining without a petrol company as the anchor.

Although a new approach is required for the APPLES project, this must still meet the overall objectives set by DME for such energy centres. As indicated in DME's IeC

Strategy & Action Plan of 2005, the four key needs are: education, access, affordability and key partnerships. An Integrated Energy Centre is intended to be "a one-stop energy shop *owned and operated by a community cooperative and organised as a community project*. It provides energy solutions to communities, access to affordable safe and sustainable energy services and information" (DME, 2005).

The main lesson learnt from existing energy centres is that there is no "one-size-fits-all" model for energy centres in South Africa. The existing IeCs vary considerably in size, scope, membership requirements and success. The number of co-operative members varies between a few individuals to over a hundred, the membership fee from some 100 ZAR to 3000 ZAR per year and the services offered by them can include only the most commercial fuels sales (petrol & LPG) or just awareness raising. Very important elements to consider were also the unsuccessful IeCs and the reasons for their failure, which turned out to be insufficient levels of management skills and commitment from the members running the centre.

Therefore, the APPLES project team engaged in a process of identifying local conditions in an effort to develop an energy centre model most suitable for them. Important steps in this process were establishing energy related needs of the local communities, consulting with local experts on their experience with co-operatives in the area and engaging capacity building institutions to provide training necessary to overcome the lack of business management experience.

2. Area profile

The energy centre will be based in Highflats, a transport hub in the Ubuhlebezwe municipality. The municipality is part of the Sisonke district in the province of KwaZulu Natal. The geographic area of the municipality is approximately 1600 square kilometers divided into 12 wards.



Map of South Africa with Highflats

The total population of the municipality is approximately 100.000 individuals, grouped into more than 23.000 households of very different sizes. The population density of the whole municipality is extremely low, between 0 and 616 people per km², with rural areas of the Nkweletsheni valley below the 50 households/km² measure used by Eskom for future electrification.

The education profile is typical of underdeveloped regions. Among working-age adults, one-fifth had no formal education at all and twice as many had some Primary schooling as their highest educational achievement. Roughly one-third had some Secondary schooling but only three percent complete Secondary schooling (matriculated) or tertiary education.

Low education levels imply low incomes with the average GDP per household in the municipality in 2006 at just below 20 000 ZAR/year; although according to the 2001 census, over 8 000 households had no official source of income and another 10 000 had less than 10 000 ZAR/year. Poor rural households are heavily reliant on income grants and transfers from government and employed relatives in the cities.

Transport is one of the biggest problems in the area, as roads are scarce and typically made of gravel. Few people have access to a car and for the majority that doesn't, carrying fuel supplies is an exceedingly costly or straining activity.

The most common cooking fuel by far is wood (used in open fire inside huts), which was used by more than half of the households within the municipality, followed by electricity, paraffin and gas. The use of wood is not surprising since it is often, though decreasingly so, easily available, cheap with few existing alternatives.



Traditional way of cooking on open fire

The current supply of energy products in the area is monopolistic, restricted and very inefficient. Paraffin sold in bulk at pumps and represents a significant health hazard especially for children, who often mistake it for cold drinks and ingest it. There is no continuous and organized supply of solar systems. Any energy product passes through several middle men before reaching the consumer, adding to the high final price.

3. Energy needs assessment

To ensure that solutions provided by the energy centre are really the most adequate ones and reflect the true needs of the community, a participatory needs assessment was carried out in 2007 which involved identifying and prioritizing energy related needs of the community through a series of workshops, interviews and community meetings. The following energy needs were identified:

Domestic activities	Current use
• Cooking	Wood, paraffin, gas
• Boiling water	Paraffin, wood
• Water Collection	Walks to river with bucket
• Radio/TV	Batteries, SHS
• Ironing	Coal, wood
• Vacuuming	Broom

Community services	Current use
• Computers – writing minutes of community meetings	By hand
• Schools – feeding scheme (cooking), computers, overhead projector, copies, faxes	Wood, gas (cooking), teacher writes on black board for learners to copy notes
• Skills development centres	Too far and expensive to travel
• Baking – bread, catering	Wood (in iron pot)
• Transportation	Taxibus prices too high and infrequent
• ICT services listed– faxing, emailing, printing, internet access, typing, photocopying	Only available in town
• Community meetings – microphones, posters	Posters are written up, loudhailers
Small businesses	Current use
• Welding – gates, burglar bars, car exhausts	Blow lamp
• Carpentry	Hand held saw
• Spaza shops – lighting and refrigeration	Paraffin, gas
• Hair salon – tongs, hair clippers, hairdryers	Scissors for cutting, towels for drying, curlers (more time consuming)
• Sewing	Hand driven sewing machine
• Motor mechanics – welding, spray painting	Blow lamp, hand pump (affects quality)
• Cutting grass (along the roads)	Hand shears

Based on the result of this process a list of products and services required from an energy centre was created:

- Energy efficient lights for 220V
- Battery sales (including car batteries)
- Gel fuel stoves and gel
- Paraffin in safety bottles
- Coal
- Computer centre
- Solar cookers
- Energy appliances
- Paraffin and gas heaters
- Skills development, training
- Battery charging (cell and car)
- Cell phone air time
- Candles
- Solar power sales and installation
- LPG
- Tokens for pre paid electricity
- Public telephone facilities
- Sale of wood and charcoal
- Sale of gas
- Communal TV/ radio facilities
- Wood stoves

Based on the current use patterns and the desired changes, the APPLES team engaged in a series of negotiations with suppliers of the products and services the energy centre will offer. Several of the desired products have already been made available at the energy centre at competitive prices. The aim is to introduce the rest as soon as the initial cash-flow constraints are overcome.

4. Structure and governance

The Highflats centre is owned and run as a co-operative of local men and women that have been able to identify the challenge and the opportunity of improving the energy situation in their communities. The energy co-operative in charge of the Highflats Energy Centre started as a group of 8 people, which quickly expanded as has now a membership of 13.

To help the co-op after the termination of the APPLES project, an Advisory Board has been chosen comprising experienced and respectful individuals from the municipality. Their function is primarily the provision of advisory service, aiming to ensure even-handedness and transparency.



The founding members of the energy co-operative, May 2008

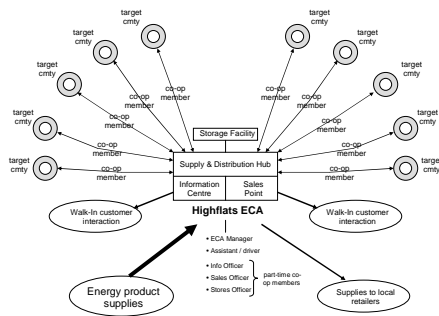
The aim of the APPLES project is to achieve the most efficient way of delivery to both Highflats residents and surrounding rural communities. This objective will be best served by the “hub & spokes” model.

The Highflats energy centre will have a threefold function:

1. It will serve as the **main distribution point** for all products offered by the centre and the co-op members. The products suppliers will deliver their supplies to the HEC where they will be stored until individual co-op members collect the goods for further distribution.
2. It will have a **sales point** – a retail outlet for direct sales to Highflats shoppers. It is important for the energy centre to provide this activity at Highflats as well not only because of local resi-

dents but also because many residents of more remote areas will come to Highflats at least once a month or a fortnight to collect their pensions and do their shopping.

3. It will house an **information centre** – the non-income generating activity of the centre is aimed at raising awareness of the various energy options available to meet the local population’s energy needs and about their benefits and dangers. It will also be the place where capacity building will take place, where demonstrations can be held and other social activities aimed at improving the energy situation of local residents.



5. The Energy Centre

The Highflats Energy Centre is housed in an abandoned social club building standing right next to the Multi Purpose Community Centre construction site. The building consists of the manager’s office, the retail outlet and the information centre and the storage site for the stock of energy products.



The building housing the Highflats Energy Centre

Based on the wishes of the community and a market assessment, the following products that have been identified as the most suitable for business start-up and have been negotiated at favourable terms with suppliers:

1. airtime & prepaid electricity
2. solar cellphone chargers
3. solar home systems (LED & 12V)
4. gelfuel & stoves & lamps
5. leisure batteries
6. energy efficient lights
7. paraffin
8. safe paraffin stoves and heaters
9. LP Gas
10. LP Gas stoves
11. candles
12. ultra efficient wood/charcoal stoves

More products and services are expected to be made available at the centre after the initial period of establishment, such as solar water pumps, solar battery chargers etc. The energy centre will also install solar home systems and carry out the necessary maintenance.

Local NGOs and research institutions have provided a significant amount of information material on safe and efficient energy use for households and small business that are available at the information part of the centre. The HEC also has TV and video facilities for use in workshops and other awareness and capacity building events.



Information material on display at the HEC

6. Capacity building and entrepreneurial opportunities

Two main areas of capacity building were identified as necessary to improve the energy situation of the communities in and around Highflats: awareness on energy issues, including benefits and dangers of different types of fuels and a business approach to improving the energy situation.

In the course of the APPLES project, several events were held during which energy issues were raised as a concern. During the needs assessment, the co-operative preformation workshop and the opening of the centre the most pressing problems relating to current energy use patterns were raised in an effort to create more awareness both within the community and the local leadership. In partnership with the Paraffin Safety Association of South Africa (PASASA), paraffin use, one of the biggest domestic health hazards for children in South Africa, will be continuously addressed by showing video material and holding workshops at the HEC.

To better understand the different types of fuels and how best they can be used, the co-op members have already received training from some of the suppliers of the products on sale at the HEC and more are expected to be arranged.



Demonstration of gel fuel stoves and lamps for the co-op members

At the same time, any long-term solution must be self-sustaining by providing income to its enactors. To achieve a successful business operation of the HEC and the

co-op members, APPLES has partnered with a local provider of training services who has arranged for a tailor-made training course in basic business skills and co-operative management for the co-op members.

Finally, as a result of having a better selection of modern and affordable energy products and services available, several opportunities for small businesses have arisen, which have been presented to the community at the workshop for entrepreneurs. Some of the business opportunities identified so far include:

- the sale and installation of solar PV systems and appliances,
- sewing machine center,
- cell phone charging
- organic vegetable garden centre for sale and education,
- lease solar water pumping systems,
- solar drying of herbs and vegetables,
- lighting for chicken farming.

Due to its developmental focus, in the first phase of operation the energy centre is likely to need some form of external support, both financial and supervisory, to enable it to expand its range of products and services and the customer base. This support has been secured by winning a grant from South Africa's National Development Agency in the beginning of 2009, which will provide the necessary funding to expand the energy centre operation as well as act as a steward of the centre and the co-operative. In the long run, however, this venture has significant potential to become the main driver for improving the energy situation of the local communities and even provide support for small local enterprises. If the concept proves successful, it could be replicated in other locations in South Africa and beyond.