Exploring alternative energy solutions for low income households: Ga Dikgale, Polokwane

Case study for the Sustainable Energy Africa Implementing Energy Efficiency and Renewable Energy Implementation manual, 2017 (Hlengiwe Radebe, SEA, 2017)

Polokwane Municipality has an Energy and Climate Change Strategy that has identified 5 Goals that address key energy issues in the municipality. Goal 3 of the strategy says "*Reduce energy poverty by meeting the energy needs of residents with safe, clean, affordable and reliable energy services*". Thus, the municipality in partnership with Sustainable Energy Africa and University of Limpopo started to investigate an alternative energy services model approach that involves the municipality procuring energy services from small scale community based energy services enterprises to address energy poverty in the province.

Ga-Dikgale a sub-district of Polokwane was used as a case study. Ga- Dikgale was chosen as it is representative of most of the developing sub-districts of Polokwane in terms of infrastructure and development. The population live in dwellings that range from shacks (slums), mud houses, to brick houses. The majority of the population is economically disadvantaged in an area characterised by high unemployment rates, poor road infrastructure and poor service delivery.

This project started by conducting a detailed survey towards understanding household energy use and household energy service "gaps" amongst the most vulnerable households. The majority of households indicated affordability as a key challenge. Although 93% of Ga Dikgale is electrified, households run out of electricity half way through the month and revert back to using firewood and paraffin to meet their energy needs[1]. The survey was conducted by the local young women from the area.

[1] SEA and University of Limpopo, (2016). Household Energy Use and Supply Survey of Dikgale Sub District of Polokwane, http://cityenergy.org.za/uploads/resource_403.pdf

Figure 1. Community energy survey gets underway in Ga-Dikgale, December 2015; Data on household income levels indicates very high levels of poverty and related energy poverty.

This prompted an investigation into affordable alternative energy solutions that households could use along with electricity to ensure that households do not run out of electricity and revert back to dirty fuels. Five alternative energy solutions were demonstrated back to the community by the same young women who conducted the survey in the local language of the area. This was done so the community members understand how these alternatives work and also to ensure that once the households receive these alternatives they are able to use them. The alternative energy solutions were; solar cooker, hotbox, Tshisa box, solar lights and energy efficient light bulbs. While all the alternatives appealed to the community members, the hotbox was the favourite with all the community members.

Figure 2. Community workshops providing survey feedback and discussing alternative energy services take place in Ga-Dikgale, 2016.

While the project could have opted to buy hotboxes from a large corporate organisations and distributed it to the community, it was decided to empower young people in the Ga Dikgale area and create job opportunities. Thus, the same young women that had been involved in the project

from the beginning were provided training in running a business and also how to make hotboxes. The hot box production training was provided by two women from the Serapeng Cooperative, through engagement with the Gender CC and the Greenhouse Project. All the training was in the local language, and conducted by women. This training was not once off but is on-going with continuous support from SEA and the municipality.

Figure 3. Women from the Serapeng Agricultural Cooperative demonstrating hot box measuring and cutting

The young women were thus able to start a hotbox production business and they were contracted to make 500 hotboxes that will be distributed to vulnerable households of Ga Dikgale. The women have received sewing, production and business skills training. Thus far (May 2017) the young women have produced 325 hotboxes and the municipality will start distributing the hotboxes to the vulnerable households with the young women providing further demonstrations on how to use the hotbox before the households receive them.

Table 1: Anticipated annual benefits from the delivery of the first 500 hotboxes

Social	Amount	Units
Vulnerable households receiving hotboxes in Year1	500	Hotboxes
Potential households savings from use of the hotbox	73,000	ZAR
Indoor air quality and related health improvement	high	
Environmental		
Energy saved from households use of hotbox over a year	73,000	kWh
Emissions avoided from use of hotbox	65,700	KgCO2/kWh
Overharvesting of firewood avoided	medium	
Economic		

Livelihoods created for x4 women – annual value (R40,800 per woman)	163,200	ZAR
Jobs created for x1 woman – annual value	24,000	ZAR
Additional income to the area for business related services	36,000	ZAR
Note: average annual household income per household in the area	23,844	ZAR

Figure 4. Doing the final touches to hotboxes in the winter sun in Ga-Dikgale

A survey will be conducted after sometime the households have received the hotbox, to investigate if the households are using the hotboxes. If there are positive results and households are using the hotboxes, the municipality plans to adopt this project as their own funded project and include it into their own annual project. The plan is that the municipality will then continue distributing hotboxes to other communities in Polokwane.

Figure 5. Overview of the project process in Polokwane.

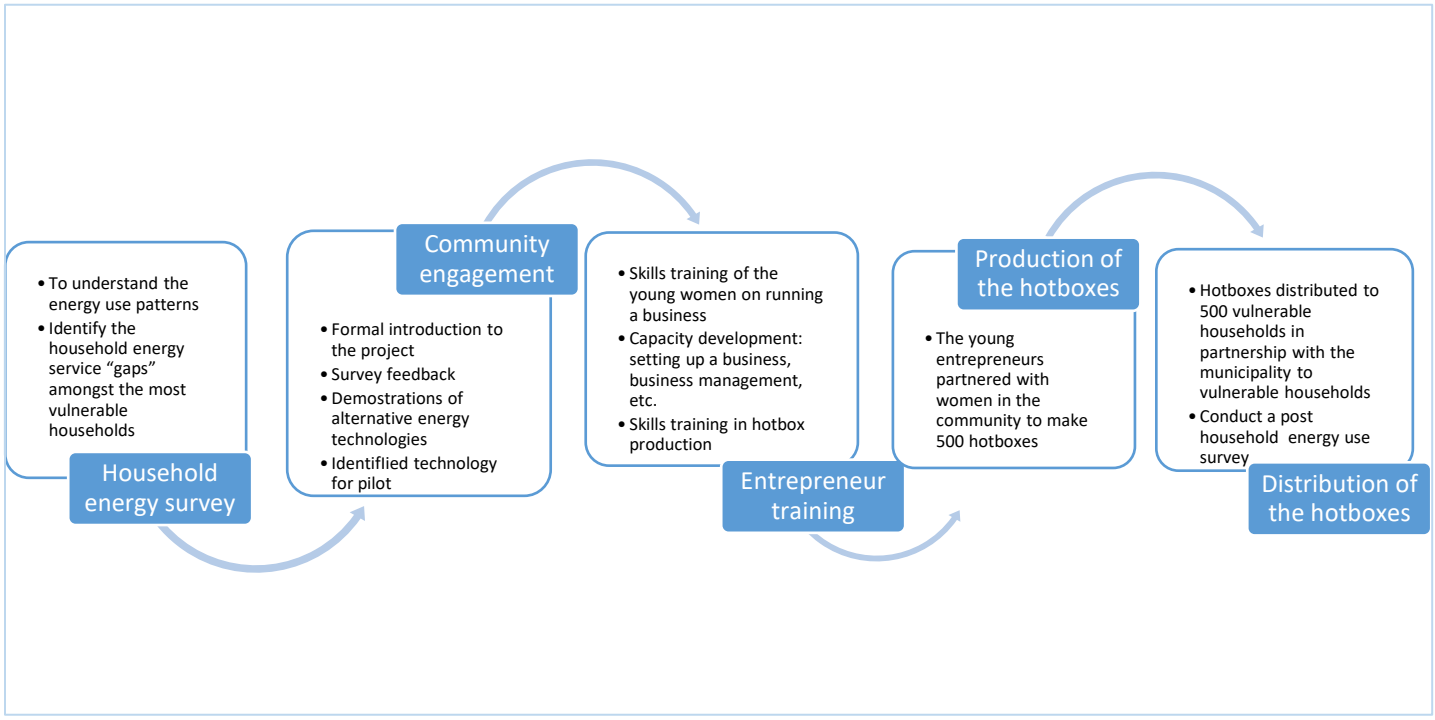

Figure 6. *"I am here at the workshop, while my samp is busy cooking at home in my hotbox!"* Energy Ambassador, Mmabatho Molapo, demonstrates the cooking of rice at a community workshop in Ga-Dikgale, May 2017.

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