

## Stakeholders have different interests: The difference between theory and practice of M&E energy interventions

### Author

**Wendy Annecke**

GVEP International Monitoring and Evaluation Manager

Cape Town, South Africa

wendya@sustainable.org.za and wendy.annecke@gvep.org

*Monitoring and evaluation (M&E) experts suggest that agreement among stakeholders on project objectives, a baseline study and a programme of consistent data collection, review and analysis are the cornerstones of good practice. This article describes an electricity to LPG intervention where few of these components were in place, and how a subsequent evaluation was implemented. Issues related to stakeholder perspectives of success and baseline information are explored. The purpose is to share the experience and highlight the mistakes made in the hope that this will contribute to developing more transparent and critical M&E procedures.*

Energy transition or fuel switching is something most energy for development practitioners are interested in, and many of our energy interventions are aimed at moving users from one fuel and appliance to another, for example from a traditional 3-stone fire to a fuel-efficient improved stove, or a switch to hydrocarbon fuels such as Liquid Petroleum Gas (LPG) or even to electricity. While methods for monitoring and evaluating the transition to improved stoves have been developed, and some studies on switching from biomass to LPG are also available, the transition observed in this report is unusual in that the objective was to switch low-income households who used electricity for cooking to instead use LPG. This was in order to reduce the use of electricity which was in short supply as any energy source may be. The principles of the transition, the pitfalls of assumptions made, the monitoring and the manner in which the socio-economic impact was evaluated are largely similar to any other energy intervention and process and will, I hope, be generally

applicable. A full version of the report is available (Annecke et al 2008).

One of the purposes of this paper is to use the electricity-to-LPG case study to highlight the differences between the theory of M&E and the application of good practice on the ground, and what happens in-between. There is space to raise only two main issues: those related to the stakeholder perspectives of success and baseline line information. Another objective is to share the experience and highlight the mistakes made, in the hope that this will contribute to developing more transparent and critical M&E procedures.

### Context

For many years Eskom, the South African electricity utility, was one of the largest and cheapest generators and suppliers of electricity in the world. But since 2000 both generation and distribution have come under severe pressure and by the end of 2005 power supply could not

keep up with demand. In Cape Town extensive electricity blackouts during February 2006 drew sharp criticism from all consumers and necessitated the development of a 90 Day Recovery Plan (Provincial Monitoring Team, 2006). This plan included aggressive energy saving measures for medium-high and low-income households, but the study is concerned only with the low-income intervention. The assumption was that household demand for heating and cooking from 6pm-9pm every evening resulted in a peak demand and put the electricity supply system at risk (Howells et al, 2005). The objective was to limit low-income households from cooking with electricity during peak times with the target of saving 50MW.

To this end an intervention was designed whereby 100,000 one or two-plate electric stoves (the type most commonly used by low-income households) would be exchanged for 100,000 LPG two-burner stoves with one full 5kg cylinder of gas and four colour-coded coupons per household (the coupons were to be redeemed when the cylinder was refilled for four consecutive months), an instruction pamphlet and individual safety demonstrations. The gas stove and all its attachments were fully subsidized by Eskom and no payment was required.

Due to the urgency of the situation, and as agreed with Eskom, within six weeks of the decision, the gas companies dispatched staff to the townships, including Khayelitsha where this evaluation study was conducted, to implement the programme's activities. The intended results chain is summarised in Table 1 (Indicators, primarily in terms of numbers of stoves exchanged and satisfactory results of the safety campaign, are not included). A sketch of how a more detailed results chain may look is available via the @HEDON link below.

In brief, almost 100,000 LPG stoves were handed out, so the hardware exchange targets were met, and LPG sales

Table 1: Intended results chain

INPUT	ACTIVITY	OUTPUT	OUTCOME	IMPACT
Funding for staff, education materials, infrastructure for collection of old stoves, disbursement of new LPGs	Intervention information campaign Organisation for taking in two- plate electric stoves (paper work/storage) Have LPG cylinders and vouchers to exchange	People arrive at venues with documents and electric stoves  People take LPG stoves home and use them	Increased awareness and use of LPG in households  Cooking time changes	LPG market created  Peak period electricity use decreased
	Train officers for education and safety demos	People shown safe use of LPG	LPG used safely and correctly	Willingness to use LPG- fear of LPG overcome

increased but peak demand remained largely unaffected. This was largely due to the way in which the project was implemented.

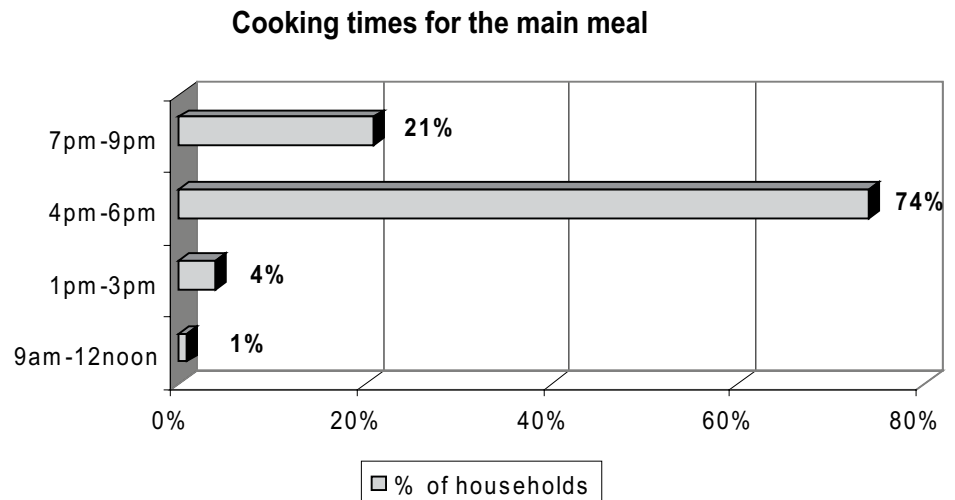
## Stakeholder objectives

Monitoring and Evaluation (M&E) methodologies suggest that one of the first steps in setting up a monitoring system is to clarify that the objectives of each of the stakeholders are clearly defined in order to measure the degree of impact and success. In doing this it became clear that the key stakeholders in this exchange programme had different interests in the results. Eskom wanted to assess whether such an intervention would lead to sufficient reduction in peak demand to make their substantial contribution and support (both financial and infrastructural) worthwhile. The Liquid Petroleum Gas Safety Association of South Africa (LPGSASA) got involved in order to find out whether such a large scale intervention would create the impetus for a market for LPG in Khayelitsha, and the Department of Minerals and Energy was concerned about how 'the community' would accept the exchange programme as a solution to electricity shortages. The intended beneficiaries were not consulted prior to the implementation, so no-one knew what their expectations or objectives were. All stakeholders were interviewed during the impact study and while the different objectives were not mutually exclusive, having a common understanding of each stakeholder's indicator of success would have assisted in more cordial relations, the sharing of information and a more sustainable solution for each.

## A baseline study

Another critical component of M&E methodologies is a baseline study to provide status quo information from which to measure the extent of change. There was no baseline study conducted except that the utility knew the peak demand for Cape Town (but did not appear to disaggregate for Khayelitsha at this stage). The evaluators used the load information for different areas to determine peak demand from Khayelitsha, and researched the number of electricity users both in the specific and general area.

Statistics South Africa (StatsSA) collects regular but limited primary data on household energy use. Their statistics over ten years show an overall increase in using electricity for cooking, so that in 2006 88.9% of all households in the Western Cape used electricity for cooking (StatsSA, 2007). Finally the perceptions and memory of participants in the focus



groups and the respondents to the questionnaire were probed as to past and current cooking times and changes that had taken place.

Eskom was correct to assume that over 80% of connected low-income households in Khayelitsha used electricity for cooking, but what they did not verify was cooking times. The demand analysis and impact study showed that the majority of low-income households cooked their main meal of the day between 4pm and 6pm when they had electricity (See Fig. 1). The system peak demand time is between 6pm and 9pm. Thus cooking is largely complete in low-income households before middle and high income households start consuming energy for their evening use. Checking this assumption may have led to re-designing the intervention.

## Issues arising

Not having accurate baseline knowledge about cooking times was the first mistake that could have been avoided. Then, once the programme was running, extraneous factors intervened which made it less than viable. One unforeseeable factor occurred two months into the intervention, in July 2006, when it became evident that availability and pricing of LPG would threaten the sustainability of the programme. Internationally the price of crude oil began to skyrocket and, as LPG prices subsequently rose, cooking with gas became more expensive than cooking with electricity. It soon became apparent that LPG would be unaffordable without a long term subsidy which had not been part of the design.

In addition planned and unplanned shutdowns of refineries around the country caused a shortage of LPG (arguably foreseeable). This meant that those households that had handed

**Figure 1** Cooking times for the main meal in low-income households

in their electric stoves could not take advantage of the electricity supply when it came back on stream, and could not get LPG because the supply had run out. These households were thus stranded with no energy services. Many resorted to kerosene or wood use.

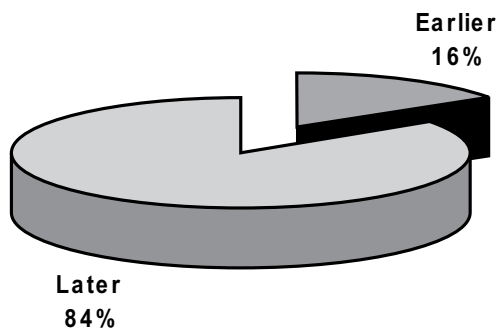
## Monitoring conditions and accommodating change

One of the purposes of monitoring is to track the progress of a project and if necessary decide how to change it so that errors are not continued or multiplied. Following this practice, the changes in extraneous conditions were observed, and accordingly adaptations were made in the implementation. About half way through Phase 1 it was decided that two-plate electric stoves still had to be brought to the exchange point but owners were allowed to take them home so that they could use LPG or electricity as it was available.

## Impact of the programme

One evaluation was conducted immediately after the implementation and one a year later. Standard data collection methods were used including interviews with key stakeholders in the utility, government, the LPG industry, sellers of LPG in the townships, participating and non-participating households and small and micro-enterprises (SMEs). The latter three groups also participated in focus group discussions and 282 households and SMEs completed a questionnaire (Annecke et al 2008). Only the issues raised above, the key assumption about cooking times and stakeholders' expectations are addressed here.

### Change in cooking times with LPG use



**Figure 2** Change in cooking time with a switch from electricity to LPG use

#### Cooking times

It was important to track cooking times since this is the most energy intensive activity in low-income households and we wanted to see if these had changed with the introduction of LPG. The switch to LPG precipitated a later start to cooking times for 84% of the households surveyed (Fig. 2), the reason they gave was because cooking by gas is quicker. If households revert to electricity but maintain the habit of cooking later, this will mean that the LPG intervention will have had an unintended and adverse effect on the peak demand by nudging all households into cooking with electricity at the peak demand times between 6-9pm.

Each of the stakeholders had a different perspective of the success of the project.

#### Customers' perspective

The idea of exchanging a two-plate electric stove for a new gas cylinder and a two-burner stove caught the imagination of the people of Khayelitsha. No-one wanted to miss out on the idea of something 'for free'. Most people (91% of the respondents) received the correct information and understood exactly what was involved. Queues formed early in the mornings at exchange venues. There was disorder in the ranks as people pushed and shoved to get stoves, security guards and the police were called in to manage scuffles. Those unable to join the queues tried to find other ways of getting a gas stove. Respondents strongly criticized the LPG suppliers for arriving at the venues late in the mornings and not having enough stoves and vouchers for everybody. They

suggested a fairer model for distribution and continued subsidies. From the perspective of those who received LPG stoves and could afford to go on using them, this intervention was a success.

#### Utility's perspective

Only minor savings were made during peak time because the cooking peak with electricity in Khayelitsha occurred earlier than anticipated. This could have been determined from load studies or a quick baseline study. On the other hand the energy efficiency messages were successful, with 81% of respondents consciously attempting to save electricity through reducing the amount of water boiled, turning off appliances and using fewer lights for shorter periods of time. The utility was disappointed in the results and in the unreliable supply and rising price of LPG. They withdrew from the programme after Phase 1 (nearly 100,000 LPG stoves had been handed out).

#### LPGSASA's perspective

The intervention was successful in creating a market for gas where there had been practically none. Stockists were trained and inroads into the market were made. A year later 89% of households who had received LPG were still using them, albeit irregularly. The LPG companies did not put any money into continuing the programme, but have maintained stockists in the township. It remains to be seen whether, with the rising prices of LPG and electricity, the poor are able to continue to use modern fuels.

#### DME's perspective

The large scale LPG exchange programme in the Western Cape highlighted the need for the regulation of the gas price or at least agreements for the pricing or subsidy for low-income households, as

well as agreements on cheaper cylinders to be concluded and decisions about infrastructure for importing gas to be made. These are policy decisions that urgently need to be addressed.

The success of this intervention depends very much on the perspective of the stakeholder; where one stands in the hierarchy of power and decision making. The study highlighted the need to conduct a baseline study, the need for constant monitoring and adaptation especially of unintended consequences, and how evaluations can produce policy recommendations with regard to pricing and availability.

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#### Profile of the author

Wendy Annecke has a special interest in gender issues, low-cost electrification, renewable energy and biofuels. She has worked in Africa, India and Latin America in energy research, policy development and planning, specialising in participatory methodologies and qualitative research design. Wendy lives in Cape Town, South Africa and works as GVEP International's Monitoring and Evaluation specialist.

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