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Modern energy – impact on micro-enterprise

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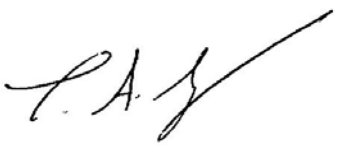
Tom Slesenger		26 March 2007

DISCLAIMER

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This project is dedicated to the people of the Mfuleni & Ngonyama communities who so graciously embraced the imposition of the research team. We hope the findings and recommendations will practically and positively impact upliftment for the poor, where it matters most.

The project team of AEA Energy & Environment (UK) and Integrated Energy Solutions (South Africa) acknowledge and appreciate the welcoming and supportive way that all those on the community side, including the local councillors, ward politicians, local police, the micro business owners and the community members at large, made their contributions to the research. It is to these people that the project team owe a huge debt of thanks for enabling the project to be completed properly.

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Executive summary

PURPOSE

This DFID research project has evolved and been refined during the last four years to now have a range of key focus areas. In essence it sets out to investigate whether prospects for poverty reduction, through employment and income generation opportunities in micro-enterprises, can be created or enhanced by the provision of modern energy services. In the context of this research, modern energy is the provision of electricity; and, a micro-enterprise is defined as very small business employing less than ten people.

The project key focus areas can be defined by the following outputs or questions, centred in the context of poor communities in developing regions of the world,:

- Does modern energy enhance micro-enterprise creation and growth?
- How does modern energy enhance the creation and growth of sustainable micro-enterprise?
- Expose the relationship between the provision of modern energy services and micro-enterprise.
- Prepare a set of guidance notes for key stakeholders that show how energisation of communities and associated interventions can maximize micro-enterprise development to in turn maximize associated poverty alleviation, benefits to beneficiary groups and economic sustainability while minimising environmental impacts.

It has been against these clear objectives that a longitudinal study over three years in South Africa, entitled 'Modern Energy: Impacts on Micro-enterprise', has been carried out by AEA Energy & Environment (UK) and Integrated Energy Solutions (Pty) Ltd., South Africa.

WHEN AND WHERE WAS THE RESEARCH CONDUCTED?

The methodology for the research was developed during 2003 including an extensive field trial of the research techniques in a poor community in South Africa and some limited field-testing in India. The final detailed specification of the methodology was completed in August 2003 and formed the basis of the phase two project approval.

A critical element of the research methodology was to survey poor communities before and after the provision of electricity (electrification). Unfortunately, due to delays in the electrification of the communities in India, the post-electrification research there had to be terminated. As a result, project resources were redirected to South Africa and this enabled an additional post-electrification survey to be conducted 24 months after electrification in November 2005. This was an additional step and not envisaged as part of the original project.

In South Africa an urban poor community, Mfuleni in Cape Town, and a rural community, Nygonama in the Eastern Cape were selected.

The pre electrification research took place late in 2003 in Mfuleni and Nygonama with post electrification research carried out twelve months later in November 2004 and then 24 months later in November 2005.

Mfuleni is a typical very poor urban settlement on the Cape Flats near Cape Town. The homes are very small

and mainly shanty dwellings. This is a formally declared township with roads, toilets and water supply provided to each housing plot to enable residents to build their own small formal houses.

Nygonama on the other hand is a typical rural area with dispersed household settlements with households traditionally living off the land although today few families support themselves from agriculture. In both communities unemployment is very high and State Old Age Pensions and Child Benefits provide the mainstay of many families income.

METHODOLOGY USED TO CONDUCT RESEARCH.

The methodology consisted of three major elements.

Quantitative

The quantitative research consisted firstly of a sweep whereby every household in the selected sample area was surveyed to ascertain whether there was a business there and the type of business. This enabled the number of micro-enterprises to be measured before electrification to establish base data and then the number and types of business 12 and 24 months after electrification. The next element of this part of the research involved an in depth interview with each of the business proprietors. High-level research personnel were involved in conducting each of these lengthy interviews with the assistance of a local interpreter. A wide range of information was gathered during these interviews including reasons for starting a business, nature of business, relevance and importance of electricity, turnover, stock, profits, people employed, level of education, business ownership, typical transactions, role of credit, extent of bad debt and the involvement of women. This information was then carefully checked and validated and input into a suite of statistical analysis tools. From this it was possible to obtain a range of key indicators and trends across the research period in trying to find answers to the various questions posed earlier.

From the interview data a number of matters were identified for more detailed investigation that were then added to the qualitative research described below.

Qualitative

The qualitative research consisted of focus group discussions, again working through interpreters as necessary, with carefully selected target audiences. Such groups consisted of various compositions of business proprietors and non-business members of the community. There were also a number of in depth one to one interviews. Using discussion groups it was possible to obtain other information and data relevant to the research subject. These included the role of micro enterprise in the lives and community affairs of local people, whether they had received any formal training or assistance in establishing their businesses, what were the barriers, how did competition play a role, how did electricity help or detract from their businesses, how did they fund their business stock and necessary appliances such as fridges, what further assistance would they value and so forth.

How they came to start their business and who owned the business were also major topics and proved invaluable in showing a high level of ladies involved.

Other methods

In addition to the research methods describe above there were also a range of other information gathering activities aimed at gathering further relevant data and to validate all information. These included discussions with the local political and tribal leaders, informal community leaders, the local police and various council, electrification and small business support officials.

A community log was also kept throughout the whole period of research to monitor other events and changing circumstances that would impact on micro-enterprises in the community. In the final survey in 2005 an indicator of employment levels was added and the non-payment of certain financial grants in the Eastern Cape was also noted.

CONCLUSIONS AND LESSONS

Did modern energy impact on micro-enterprise?

The introduction of modern energy (electricity) into two poor South Africa communities (urban and rural) has had a significant impact on the number, type and collective volume of micro-enterprise activity. Key factors impacted over the two years include:

- The number of micro-enterprises increased by 40% in urban Mfuleni and 24%in rural Ngonyama.
- Community households with an enterprise rose from 9.6% to 13.4% in Mfuleni and 13.3 to 14.5% in Ngonyama.
- Total community turnover increase by 36% in Mfuleni and 26% in Ngonyama, both well above an inflationary increase of 9%.
- Average micro-enterprise profit on the other hand showed a 9% increase in Mfuleni while in Ngonyama a reduction of 16% was found. (Exclusion of two non-electricity related closures increases the figure to 25%).
- Employment opportunity showed only marginal increase.
- The provision of electricity allows for greater micro-enterprise diversity, especially as a number were electricity dependent (this was particularly evident for some of the new business types that emerged.
- Number of enterprises using electricity in Mfuleni increased from 3 to 89% and 6% to 83% in Ngonyama.
- Enterprise owner's average perception on the role of electricity increased from 3.6 to 4.4 out of 5 in Mfuleni and from 3.1 to 4.9 out of 5 in Ngonyama.

The growth in enterprise number, increase in total turnover, greater diversity in enterprise type, electricity dependent processes, extensive use of electricity by the businesses and the higher perceived role of electricity by the enterprise owners all clearly indicate a positive impact. However, the scale of impact was found to be variable for the different business types and dependent on a host of other enablers and local conditions. The overall livelihood impact over the two years can be judged to be limited given percentage increases in number and turnover, plus the minimal employment creation.

How did modern energy impact on micro-enterprise?

A number of new businesses emerged that directly used electrical equipment. Many of these would have been unable to operate prior to electrification or would have had more difficulties operating using hand machines / tools or other power sources. These included; hairdressers, shoe repairs and TV repairs in Mfuleni, plus welders and a phone service in Ngonyama. Electric energy services included boiling water, operating electric hair trimmers, powering remote telephones and operating welding plants

Several business types were able to begin using electrical equipment where they had previously used manual equipment or where they had used appliances powered by other fuels, such as LPG or paraffin, or other sources of electricity

The availability of electric lights at the doorway and inside the home had a positive impact by enabling a number of businesses to continue working after dark. The major improvements in safety and security in Mfuleni that were achieved through the installation of street lighting enabled clientele to shop later and a number of businesses benefited from evening trade.

The availability of electricity in the communities was found to have had a negative effect on energy / paraffin sellers.

The greatest failure in terms of livelihood creation can be seen in virtual zero increase in micro-enterprises that create jobs for community members. Owner-operated enterprises were and continued to predominate with almost no individual enterprises employing people outside their immediate family.

Expose the relationship between the provision of modern energy services and micro-enterprise

Overall the arrival of electricity seemed to spark a latent or pent-up opportunity for starting a micro-enterprise.

A major trend identified in the communities was the significant number of businesses that opened and closed between the surveys. An example from Mfuleni would be following electrification 42 new business where found in the first year, yet 27 had closed, 28 more opened in the second year, yet 24 closed. :

Yet even more may have opened and closed between the survey periods. Micro-enterprises clearly play a major survival role within these communities. The provision of modern energy appears to have stimulated the formation of survivalist micro-enterprises. As electricity arrives, the opportunity to start a business increases, while a lack of knowledge, working capital etc. all stands against success. A number of micro-enterprises were short-lived, some intentionally a temporary coping strategy for specific circumstances or between employment periods, others as a consequence of failure of the business, with potential negative impact on those household if their initial investment had not been recovered. Those that survived provide a source of additional income for those households.

Modern energy, whilst instrumental in enabling micro-enterprises, cannot alone realize the full potential. There are many other factors that have equal or greater influence, for example:

- Capital outlay and technical skills

  There is a low barrier to entry for retail businesses including; the ability to start trading with relatively small amounts of stock purchased in bulk from wholesalers, require no specific technical training, a general familiarity with the household products and a perception that these businesses are easy to operate. The supply of electricity precipitated these businesses in many case through the purchase and operation of a fridge.

New entrants and increases in the numbers of enterprises were much more limited in business types where establishment, maintenance and operation required large capital outlay, specialist skills / training and dedicated premises. The need for skills and experience, and some cases large financial resources, are likely to preclude the majority of people / households in the community from starting this type of business.

- **LACK OF EXPORT MARKET**

  Little change was found in the split of the customer base between those from within and those without the community - Mfuleni 91% from within the community, and Ngonyama 87%. These figures are clear evidence of the insular nature of these businesses even in the urban setting of Mfuleni. This indicates a constrained market – turnover can only come from within the community, which is in turn financially constrained (finite number of salaries, pensions, grants etc.).

- **VULNERABILITY OF MANY MICRO-ENTERPRISES**

  In many of the start up micro-enterprise a coping strategy for poverty alleviation became clearly evident. In most cases there was a direct link between the need for entrepreneurship and family circumstances.

  The availability of money within the family to buy stock to operate the family retail business resulted in open/closure cycles. Examples were found where cash demands (such as funeral payments) were met through the sale of stock, without holding a reserve for repurchase.

  Micro-enterprises often arose from tenuous jobs, short-term labour contracts providing income for periods followed by periods with no work. During these times the breadwinners would fall back on a retail enterprise activity.

- **AVAILABILITY AND NEED TO PROVIDE CREDIT**

  The availability of, and need to provide, credit is a major factor in the long-term survival of micro-enterprises in both communities. The pressure on business owners to give credit to their customers appears to be very strong, and can become a differentiator between two businesses making a sale (they also know that credit would not be available from shops in the nearby town).

The research clearly pinpointed a number of other vital enablers for micro-enterprise to be formed and to flourish. None of the businesses interviewed either had a bank account or access to micro or small loans. Training and knowledge about how best to select a type of new business, assess the market need, understand the necessary skills and resources needed and how to start and run a small business are further vital needs together with basic financial management skills.

Most of the micro-enterprise business was various retail activities limiting real income creation for the community as a whole. There were very few manufacturing or export-orientated activities with markets outside the community thereby bringing in increased revenues and employment opportunities. To enable significant income growth it is essential to enable those economic activities that grow the overall income of the community. This can only be done with manufacturing, agricultural, service and other business activities that trade with markets external to the community.

There are thus many factors that impact on the potential of micro-enterprises as a means of lifting a community out of poverty, and on the realisation of that potential. We surmise their potential to generate additional revenue into the community will depend on local circumstances – particularly the availability of nearby latent demand and an infrastructure that will allow that demand to be exploited.

Even though in the communities studied the growth in micro-enterprise activity did not stimulate increased revenue into these communities, the observations show that micro-enterprises nevertheless have a positive role in the redistribution of cash within the community. Modern energy (in this case electrification), by stimulating micro-enterprises therefore has a positive impact on such redistribution.

Modern energy is only one enabler of micro-enterprises. We conclude there is a need to deliver all the enablers simultaneously if the potential is to be fully exploited. If this can be achieved the individual entrepreneurs would be better informed and better supported. We surmise businesses would likely be more stable, and fewer businesses would fail. There is an evident need for the modern energy provider, in this case the electricity utility to work with micro-enterprise support entities, such as change agents, field officers, training providers, and micro loan providers.

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1 Introduction

What is the relationship between modern energy services such as electricity provision and micro-enterprises in poor communities? Micro-enterprise is defined as very small business employing fewer than ten people. In many cases they are marginal undertakings supporting a proprietor and one or two other family members. Does the provision of electricity stimulate the formation and growth of micro-enterprise? If it does, how does it do it? Furthermore, what role and contribution do micro-enterprises make to the creation of sustainable economic livelihoods, and the reduction of poverty?

These and a host of other questions have concerned development agencies, energy suppliers and Governments of developing countries for many years. It was against this background that a longitudinal study over three years in South Africa , entitled 'Modern Energy: Impacts on Micro-enterprise' funded by Department of International Development (DFID), UK, has been carried out by AEA Energy Environment (UK) and Integrated Energy Solutions (Pty) Ltd (IES), South Africa to attempt to pinpoint indicative answers to these questions.

The methodology for the research was developed during 2003 including a detailed literature review and an extensive field trial of the research techniques in a poor community in South Africa and some limited field testing in India. The final detailed specification of the methodology was successfully completed in August 2003.

A critical element of the research methodology was to survey poor communities before and after the provision of electricity (electrification) to actually measure a range of defined impact areas. Careful selection of eligible communities therefore proved critical to the success of the project. An urban poor community called Mfuleni in Cape Town and a rural community called Ngonyama in the Eastern Cape were selected for this purpose in South Africa.

The pre electrification research took place late in 2003 in the South African communities with post electrification research carried out twelve months later in November 2004 and then 24 months after electrification in November 2005.

Mfuleni is a typical very poor urban settlement on the Cape Flats near Cape Town. The homes are very small and mainly shanty dwellings with a few built structures gradually appearing as the residents obtain the necessary materials to construct their own formal homes. This is a formally declared 'site and service' township with roads, toilets and water supply provided with a formal urban settlement layout. In contrast, Ngonyama in the Eastern Cape is a typical rural area with dispersed household settlements with local residents traditionally living off the land although today few families support themselves from agriculture. In both communities unemployment is very high and Government Pensions and Child Benefit Grants provide the financial mainstay of many families.

The research methodology consisted of three major elements in each community in each of the three separate field research interventions. The first was a detailed quantitative measurement of the number of micro-enterprises with a sweep through each community. This was then followed by a series of in depth interviews with actual micro-enterprise proprietors. These field research activities yielded a very large amount of standardized and carefully validated data that was then systematically studied with a suite of electronic analysis tools. The second component were a series of qualitative interviews conducted in focus group sessions and one on one interviews with a wide selection of different respondents. This information was also similarly painstakingly analysed and distilled to find reliable answers to the project questions posed earlier. The third element of the research activities can best be described as 'others' and consisted of a range of associated information gathering. These other activities included such matters as keeping a community log of all major 'external' events likely to impact on micro-enterprises and discussions with local economic development agencies.

This report provides a comprehensive description of all aspects of the project together with references to the various inception and methodological development separate reports. After a thorough description of the development of the methodology, relevant information about its implementation, there are then detailed sections dealing with site selection, community characteristics and data validation and input. Section 5 provides a detailed description of the analysis methodology of both the quantitative and qualitative analysis. The main body of the report then focuses on the results and findings in Section 6. Included in this part of the report is a detailed description of the results around micro-enterprise activity, sustainability of the various micro-enterprises, various sustainable livelihood measurement results and summary discussions about how did modern energy influence the micro-enterprises researched; and, broader issues related to the creation and growth of such enterprise in

poor communities. The report is then concluded in Section 7 with conclusions and lessons followed by Section 8 with recommendations. All of the above is supported by a wealth of detailed data, information sheets and other information that is shown in full in a comprehensive set of Appendices.

In addition to the above, technical and policy guidance briefing notes are to be prepared for the major stakeholders in energy and development such as local Governments, development agencies, energy supply bodies and socio economic development NGO's.

It is hoped that the findings of this detailed research, painstakingly conducted over a number of years, demonstrates that modern energy does have a key role to play as one of a number of vital enablers for the stimulation and growth of micro-enterprise. However the results also clearly show that micro-enterprise in poor communities is culture and context specific and that it is also a highly complex multi facetted phenomena. The predominant role of women in micro-enterprise in South Africa may not for example be replicated in other cultures.

The results of this project must therefore be firstly understood as applying to those communities in South Africa that were researched and that sweeping generalizations to other circumstances and cultures must be treated with caution.

However, where it has been possible, with a high degree of certainty to draw relevant conclusions from the results of this particular research to make general recommendations on how modern energy may perhaps, subject to any special local conditions, be deployed more effectively with other enablers to stimulate and grow sustainable micro-enterprise, this has been done.

2 Overview of methodology

The purpose of this section is to describe the methodology that was used to carry out the project. It deals with the project objectives, briefly describes how the methodology was developed before providing a summary of the methodology and some information on the implementation and some changes that occurred.

Attention is drawn to the following associated documents in which comprehensive information is provided about methodological matters, including the literature survey for reference purposes:

i. Modern Energy; Impacts on Micro-enterprises. Phase 1.
Task 2.1. Field Test on Research Methodology July 2003
ii. Modern Energy: Impacts on Micro-enterprises. Phase 1
Task 2.2. Final specification of Research Methodology. August 2003
iii. Modern Energy: Impacts on Micro-enterprises. Inception Report
August 2003

2.1 Project objectives

The project objectives, as taken from the log frame and revised log frame (Inception Report - August 2003) were as follows:

Project Goal Statement:
To support the emergence of livelihood diversification opportunities of poor people through the creation and growth of micro-enterprises after access to modern energy has been gained.

Original Purpose Statement:
To investigate whether prospects for poverty reduction through employment and/or income generation opportunities in micro-enterprise can be created or enhanced by the provision of modern energy services, i.e. ***Does modern energy enhance micro-enterprise creation and growth?***

Revised Purpose Statement:
To investigate how prospects for poverty reduction through employment and/or income generation opportunities in micro-enterprises can be created or enhanced by the provision of modern energy services, i.e. ***How does modern energy enhance micro-enterprise creation and growth?***

Project definition of 'modern energy'

For the purpose of the project the impact of grid electricity was researched in all communities. Therefore modern energy in the context of this project is defined as the provision of a new (as in South Africa) or upgraded (as planned but delayed in India) supply of reliable and affordable grid electricity to each household.

2.2 Development of methodology

Faced with a highly complex and multi variable research challenge, the Project Team devoted a significant amount of time focusing on ensuring a reliable and replicable research methodology. In addition to a comprehensive literature survey, and a systematic design process, there were several iterations with the client and stakeholders in the project. A methodological prototype was thereby created that was then thoroughly field tested in a representative poor community in South Africa before the final methodological specification was drawn up.

2.2.1 Major methodological steps

Some of the key methodological criteria that were factored into the lengthy design work are shown below:

Table 2-1 Methodological steps

	Rural Community	**Urban Community**	**Rural Communities**
Research location	**South Africa**	**South Africa**	**India**
Field Test			
	No	Yes	No
Field Survey before Electrification			
- Sweep	Yes	Yes	Yes
- Quantitative	Yes	Yes	Yes
- Qualitative (focus groups)	Yes	Yes	Yes
Field Survey 1 year after Electrification			*Post-electrification had to be abandoned: Step change in energy provision delayed beyond timescale of project*
- Sweep	Yes	Yes	*No*
- Quantitative	Yes	Yes	*No*
- Qualitative (focus groups)	Yes	Yes	*No*
Field Survey 2 years after Electrification			*Post-electrification had to be abandoned: Step change in energy provision delayed beyond timescale of project*
- Sweep	Yes	Yes	*No*
- Quantitative	Yes	Yes	*No*
- Qualitative (stakeholder interviews)	Yes	Yes	*No*

Although the development of the methodology involved some field testing in India all post electrification research had to be abandoned. These resources, in agreement with DFID and IES, were then redirected for an additional Field Survey 2 years after electrification in South Africa in an urban and rural community. All results documented and reported are therefore for South Africa only.

The project was a longitudinal study over a period of three years conducted in a standardized manner in the same carefully selected urban and rural poor communities. Information regarding the selection of sites is described separately and the availability of poor communities that were to receive electrification at a precisely defined time was a critical selection criteria.

2.2.2 Chronology of activities

The following is a brief chronological synopsis of the defining project activities undertaken during the phase of methodological development:

September to December 2002

- Mobilisation
- Inception meeting, South Africa
- Draft framework dissemination strategy

- Literature review

January/February 2003

- Debate on the focus for the project and implications for methodology, development of methodology context and framework paper.
- Consultation with DFID and DFID's advisor on project focus.
- Agreement obtained from DFID to revise the project. Modest amendments to Phase 1 programme of work.
- Development of the full methodology including questionnaires for use in the field.
- Selection of field test communities

March to July 2003

- Methodology field trial in South Africa.
- Limited field trial in India.
- Field trial reports.
- Project descriptor submitted to DFID for inclusion on KaR Web-site.
- Internal project discussions on implications of field trial and analysis methods..
- Revisions to methodology; production of revised methodology document and process. guidance in the form of an adapted field trial report.

2.2.3 Methodological development steps

The steps that were enacted during Phase 1 of the project to develop the methodology may be summarized as follows:

Step 1: Develop the methodology and research techniques to be used as a theoretical written document.

Step 2: Agree the proposed methodology document with DFID, Advisors, AEA Energy & Environment and Project Teams in South Africa and India

Step 3: Thoroughly test the methodology in a practical and representative live field situation in South Africa

Step 4: Taking lessons from the field trial refine and modify the document 'Development of Research Methodology' to produce final project methodology specification.

2.3 Methodology

2.3.1 Integrated research process context

It is important to understand that in terms of methodology, an integrated research process was created. It was a logical, comprehensive and sequentially phased approach that builds on earlier stages of field research activity within the community under investigation. Each phase of activity has to be effectively carried out to ensure a robust and replicable research methodology. In other words, subsequent phases of research rely very heavily on the earlier phases being properly completed.

Unless the community briefing is properly completed then legitimacy for subsequent interactions with the community will be in jeopardy. Unless community interviewers are properly selected, trained and monitored, then clear communications and initial data gathering from householders in the community about micro-enterprise will be compromised. Unless maps of the community are provided and the system of unique micro-enterprise location referencing is deployed accurately then the reliability of data sets will be at risk. A crucial and highly challenging activity was the in-depth micro-enterprise interviews and unless these are conducted by high level research personnel, are carefully validated and checked, then the quality of further data sets will be in question. It is then from the analysis of this micro-enterprise data that part of the subsequent qualitative research questions are framed. And so it is throughout the research methodology. Leaving out a step, failing to conduct necessary cross checks and validation routines, or failure with a host of other detailed methodological research procedures may jeopardize the accuracy and quality of the data.

2.3.2 Project Methodology – overview

The research methodology is described in detail in the separate Methodology Reports described earlier in this section. A fundamental element of the methodology was the aim to measure the impact of grid electricity provision on the formation and growth of micro-enterprises starting with a base level before electrification and then a year and then two years after electrification. The quantitative research methodology was designed to capture the 'delta' or net change in micro-enterprise activity and livelihood impact over time. In addition to simply the number and type of enterprises a range of other delta's were also measured such as financial turnover, profit, number of people employed in the business, business ownership, energy expenditures and types of energy equipment used.

The statistical analysis including verification and cross checking data was a major element of the quantitative methodology. Specific and detailed spreadsheets were designed and populated to enable this work to be done.

One of the aims of this research was to try to more fully understand the linkages between electricity and micro-enterprises. Therefore at each stage of the project, the quantitative research was combined with a range of qualitative research techniques deployed to gather 'softer' data; this centred mainly on focus group discussions. Using findings from the quantitative surveys *(the timing of which was designed to enable completion of the majority of the individual micro-enterprise owner interviews prior to the qualitative work)* and observations of the interviewers / field researchers, a set of generic questions were framed to explore key issues around energy and micro-enterprise that would enable further understanding of the quantitative data.

2.4 Implementing the methodology

This section aims to share some of the important changes and lessons that were experienced in actually carrying out the methodology in the urban and rural poor communities. Overall the methodology worked extremely well and stood up to the practical complexities encountered in the field. All the major objectives set for the methodology were achieved and satisfied. There were, however, a few minor refinements, changes and important lessons that arose and the refined methodology is described below (Table 2.2).

2.4.1 Changes to original plans for work in South Africa and India

In view of the difficulties that arose in India it was decided that it would be of value to divert available project resources to enable a further quantitative survey two years after electrification in South Africa. This enabled in 2005 additional surveys to be conducted in the urban and rural communities in South Africa in late 2005.

Table 2-2 Key steps in the refined methodology

General

1. Final selection of sites for investigation with reference to the schedule for electrification (energisation) in South Africa and India
2. Gathering of the community characteristics record and community log.
3. Preparation of the site for investigation:
   - Interaction with community leaders
   - Informing community members about the research project
   - Selection and training of researchers drawn from the community

Quantitative methodology

4. Micro-enterprise identification sweep: calls to all households, buildings and activity areas within the geographical bounds of the study to explain the project and identify micro-enterprise and business owners
5. Analyses of sweep data – targeting of the quantitative research
6. Interviews with micro-enterprise owners conducted by members of research team with assistance from community interpreters
7. Overview analysis of micro-enterprise interview data

Qualitative methodology

8. Formulation of further research questions and identification of issues arising from the micro-enterprise interview data (to be further quantified through qualitative research).
9. Prepare for qualitative research:
   - Composition of focus groups
   - Identification of one to one interviewees
   - Invitation and briefing of respondents
   - Finalise qualitative research questions, aids and so forth
10. Undertake qualitative research
    - Invite designated respondents
    - Conduct focus group meetings: Group leader and note take
    - Write up findings from focus group discussions
11. Summarise qualitative results

General

12. Undertake preliminary data analysis and data check
13. Repeat Steps 2-12 for post electrification after one year and after two years
14. Conduct full quantitative data analysis (all 3 surveys)
15. Prepare summary report on qualitative findings (all 3 surveys)
16. Conduct local ‘stakeholder’ workshop to gather further contextual data
17. Consolidate all research findings
18. Feedback to all communities
19. Prepare findings, results and final report.

2.4.2 Changes to sweep data gathering

There were a number of further refinements that were introduced for the collection of sweep data. Maps of the selected areas were deployed to produce listings of all properties with unique numbers for each. The sweep research conducted during the pre-electrification phase used small forms (see Appendix 2A) on which the information from a single household property was recorded. This included a requirement that the sweep researcher needed to identify and correctly assign the house or plot number to each sheet. This was then changed in subsequent years so that sheets were prepared that already included a listing of each separate plot number (see Appendix 2B).

Figure 2-1 Sweep data verification

Other changes to sweep data gathering centred around additional categories of information that were collected in subsequent years such as closed businesses and in the final year information about household members who were in full or part time employment.

2.4.3 Verification of sweep data

There was a detailed process of verification undertaken in the rural and urban communities researched in South Africa. This used maps of each community on which each business was marked and as the more detailed interviews with each business owner were conducted, research personnel took time to visually assess each area of the community and the households to verify the initial sweep data. This was essential to ensure that the location of each business was accurate and the type of business was also correctly recorded.

From the sweep and quantitative interviews conducted across the timeframe from the pre-electrification, Year 1 post- and then Year 2 post-electrification, it was possible to construct a very accurate picture of the business landscape – to identify those micro-enterprises that were there throughout the period, those that had closed and the new businesses that had been established.

2.4.4 Closed business form

In view of the high degree of 'churn' it became necessary in the post electrification 1 year and then in the year 2 sweep and subsequent business interviews to obtain information on closed businesses. A special form was created for this purpose (see Appendix 2C) and was used in a short interview to record that a specific business had closed and identify the key reasons for closure.

2.4.5 Micro-enterprise owner questionnaire and interviews

The project methodology called for the collection of a wide range of complex information. Even with highly sophisticated large business undertakings much of the information would have been difficult to obtain. With the research audience involved being in micro, informal, often hand to mouth business, the interviews proved a more challenging activity in practice than in theory. A specific questionnaire was designed for these interviews and was extensively refined during the pilot trial of the methodology (see Appendix 2D for the finalised quantitative survey form).

Experienced personnel were required to conduct these interviews (this was validated as being required during the pilot trial). A high level of cross validation was necessary together with interpretative and deductive skills by the interviewer working through a Xhosa (and occasionally Afrikaans speaking) interpreter. Many of the notions used were unfamiliar to the respondents such as averages, seasonality, stock turnover, profits and costs. Many of the smaller businesses had their affairs intertwined with the household expenditures that further complicated matters. Very few of the businesses had bank accounts, they were all cash businesses and most of the relevant information being sought was not readily available. It was therefore necessary to interpret the various questions into elements that respondents could understand. Furthermore despite most respondents being very willing to assist the project when it came to certain financial matters they were sometimes reluctant to share openly the information. This was because they either did not know the answer in the manner this was being asked or they were unwilling to divulge it.

Despite these challenges, by deploying a broad range of investigative and validating activities such as visual inspection of stock, typical transactions, number of customers per day, conversations with customers and other investigative methods, it was possible in the majority of cases for a realistic picture for each business to emerge.

To further ensure the accuracy and reliability of data from the business owner quantitative interviews a number of data validation, cross checks and standardization routines were used. A particular area of attention was to ensure that standard units were used by each of the interviewers. To ensure that this was the case, the questionnaire includes a column on the right hand side, created after the pilot trial, for two primary purposes: firstly, to enable verification and standardisation of data and secondly to summarize the acquired information into a form suitable for data input (and subsequent analysis). Research personnel were encouraged, wherever possible, to complete the data input column as soon as possible after each interview. There were also a number of cross checks carried out between interview personnel on a regular basis to ensure consistency.

2.4.6 Qualitative information gathering

Qualitative research was also a component of the overall methodology and was used for a number of purposes within the research framework. These include; understanding the detailed characteristics of each community, to further explore and understand the results from the analysis (trends, impacts, changes etc) of the quantitative data and to gain insight into the relationships between the various indicators measured and micro-enterprise activity, and more generally on the impact of micro-enterprise on livelihoods in the community. In addition, in the year 2 post-electrification phase, meetings were held with a number of individual stakeholders with an interest in or direct involvement with electrification and / or small business activities.

Qualitative information was gathered at several points during each year of the project, primarily through focus groups and one-to-one semi-structured interviews. Various participatory techniques were used to differing degrees depending on the attendees / interviewees, and the issue / concept being discussed. From the outset, the processes used and the meeting environment were designed to encourage, facilitate and enable the micro-enterprise owners and other members of the community to feel comfortable in providing their views to the project team. The key aim of the qualitative components of the research was to gain an understanding of the issues / information from their perspective.

Examples of the topics explored in the focus groups included:

i. Purpose and value of micro-enterprise to the community.
ii. The motivators and barriers to establishing and growing micro-enterprises.
iii. The community perspectives on the value and success measure of micro-enterprises.
iv. Energy – ownership, access, affordability, contribution to micro-enterprise, appliances, costs and usage.
v. How do women micro-enterprise owners manage the requirements of both their business and their household duties?
vi. Identification of other enablers of micro-enterprise and their relationship to the provision of modern energy services.
vii. Reasons why some businesses were doing less well than their owners would like and why some businesses had closed.
viii. Extent and importance of farming as an income-generating activity (Ngonyama only).

In each community, the research assistants played a key role in delivering an extremely high level of participation from people involved in a variety of different businesses and on different scales, and from members of the community who were not micro-enterprise owners.

2.4.7 Support and co operation from communities

In both the rural and urban communities in South Africa everyone involved from the community side including the local councillors, ward politicians, the local police, the micro business proprietors and the community members at large were most welcoming and supportive of the project research. It is to all these people that the project team owe a huge debt of thanks for enabling the project to be completed properly.

3 Community characteristics & interaction

The aim of the project work was to measure the impact of electricity on the establishment and growth of small businesses in poor communities in South Africa. In addition to consideration of a number of other logistical and security issues, the final selection of communities had to be defined by a very precise match of the planned electricity switch on dates and the survey requirements of the study.

The following sections provide information on how the shortlist and final communities were selected for the fieldwork, the characteristics of each of the communities that participated in the surveys, the essential elements of community interaction and the overall time frame for the project work.

3.1 Site selection

3.1.1 Introduction

Electrification is a complex technical and logistical process and schedules can be dynamic. For any specific community or region, the installation of equipment and the switch-on dates may be delayed or brought forward.

One of the highest risks to completion of this longitudinal study as planned was that the electrification schedule would be postponed for the selected community after the project had completed its pre-electrification fieldwork (involving 6-7 weeks work including the essential initial community engagement and an elapsed time of between 2 and 3 months). Although this risk was outside the direct control of the research team, it was mitigated through frequent contact with the utility in the period immediately prior to the survey (to ensure that the team had the most accurate and up-to-date information on electrification schedules). Another key risk that was within the control of the team was that the community members and enterprise owners would not be willing to participate in the study. This was mitigated through significant time and effort being spent to fully engage with the community leaders, explain the purpose and practicalities of the project, gain their approval for working within the community. Initial and continuing engagement with the community and a high level of visibility and interaction during the fieldwork was a critical factor in gathering the resulting extensive datasets and qualitative information.

To ensure that electrification was as close to 100% assured as possible, the final selection of the communities from the shortlist of potential sites was only made immediately (a few weeks at most) prior to the pre-electrification survey.

3.1.2 Criteria for selection of the communities

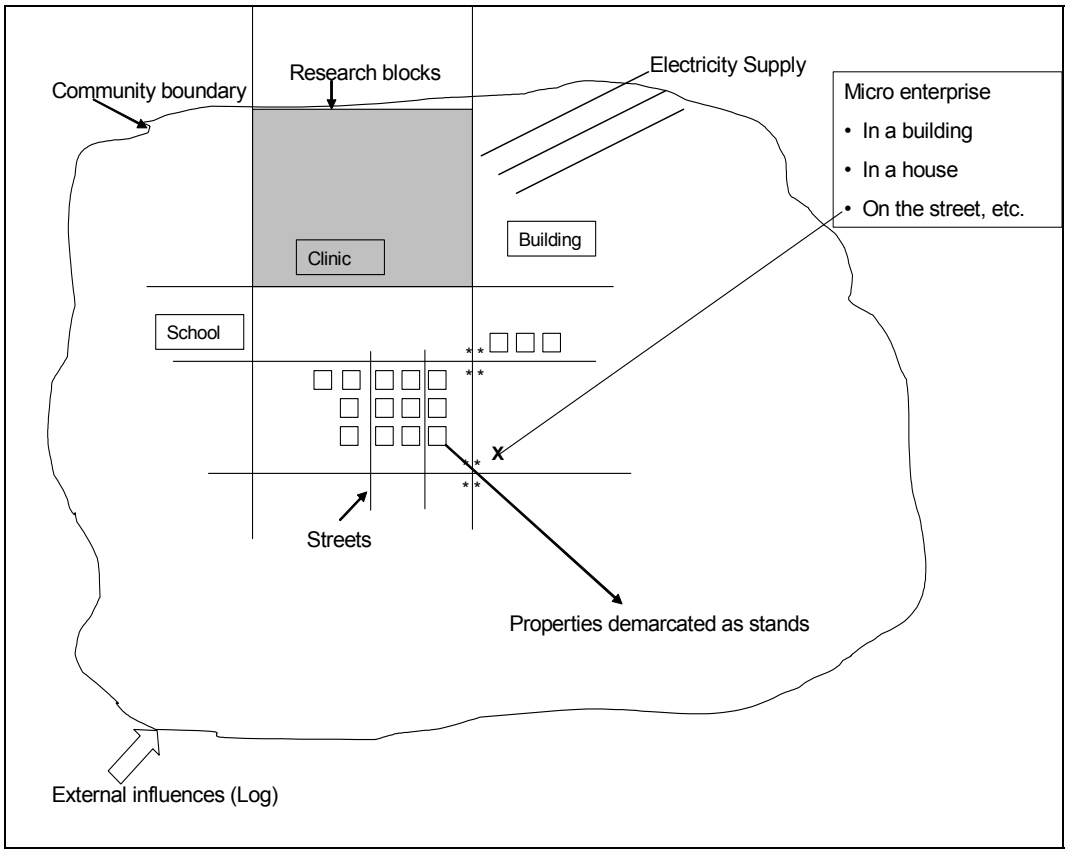
The following criteria were considered in preparing the shortlist of communities from which the final two (one urban / one rural) would be selected, based on the confirmed electrification dates:

- The communities under consideration did not have any electricity supply but they were in an area where electricity provision (grid extension) was being scheduled in a time frame that was appropriate for the project requirements.
- Electrification schedules:
  - The planned electrification would result in all households / structures in the survey area receiving electricity on the same date (and ideally this should not be an extension phase to an existing electrification since the data will be extremely complex to disentangle from what has already happened) i.e. the intervention will effect a step change on the community from an energy perspective
  - Tangible evidence of progress with the planned electrification programme e.g. infrastructural works on the ground such as poles, lines etc
  - Firmness of the planned dates for electricity switch-on
  - Confidence expressed by the electrical contractor's personnel on the ground (from actual conversations)

- A delineated community: It must be possible to clearly define the boundary of the community / survey area, and that within this area the individual households (and their associated micro-enterprises) and any specific buildings / locations of micro-enterprise activity can be identified with an existing / applied 'location' identifier
- A poor community with a permanent population i.e. a community designated by the local planning authority, and in a location that enables timely and safe physical access
- Supportive and co-operative community leaders that would give permission through the local political/community/municipal structures for our research work to take place, and where it would be possible for the research team to gain the necessary trust and legitimacy with the local community members.
- A 'living' community with some level of micro-enterprise activity prior to electrification rather than a dormitory community with the majority of the residents being employed elsewhere, and where there are permanent and / formal housing structures and infrastructure such as roads, water, schools, telephones, clinics, churches, etc.
- A sufficient number (set at > 400) individual households or residential plots in the survey to enable a large and accurate body of evidence to be built up from both the quantitative and qualitative research activities.
- Related to the above is the need to carefully "manage", together with the local leaders, the extent that the research would impact on the communities, which are often highly integrated and where outsiders attract significant attention.
- Language mix and the availability of persons from within the community for translation and research assistant duties, thereby leaving a practical legacy of experience and income in the community through the project.
- The need for a meeting room for focus groups and other stakeholder meetings
- Politically stable community that is safe and secure for the research to be conducted unhindered and without risks to the research personnel

The following diagram schematically describes the community context from a field research perspective:

Figure 3-1 Field research context



3.2 Community characteristics

Two communities were selected according to the degree of certainty of imminent electrification (which proved to be highly reliable and accurate in South Africa but, as explained earlier, delays in implementation of the electricity generation plant serving the selected rural communities in India did not enable post-electrification surveys to be undertaken within the defined timescale of the project).

The communities in South Africa were:

- Mfuleni (nr. Cape Town, Western Cape Province)
- Ngonyama (near Queenstown, Eastern Cape Province)

The characteristics of each of these communities are provided in Tables 3.1 and 3.2 below, including general photographs of the communities in Figures 3.2 and 3.3.

Table 3-1 Mfuleni community characteristics

MFULENI PHASE 5, EXTENSION 6
Location / map reference: See Appendix 1A.
Map of the community: See Appendix 1B **.**
Township age: Phase 5 started in 2002; with first occupants in Extension 6 in late 2002
Households: 538 (survey sample limited to 492 plots recorded as occupied during the pre-electrification sweep survey)
Population size (assume average of 5 person per dwelling): ~2,690
'permanent' population although some movement in and out
Languages: Xhosa, Afrikaans, English
Electrification date: 15th December 2003
Fuels used: Electricity, wood, paraffin, LPG, solar thermal drying of clothes
Community layout: Formal road layout on a grid basis, 'site and service' provision (each household plot is defined and numbered, has potable cold water through a tap at a sink, has a flush toilet and purpose built cubicle; domestic refuse collection was initiated in 2004)
Building structures: Shack structures which are self-built from materials that are either bought or collected (during 2005, the planned replacement of shacks was slowly beginning through the letting of a number of local authority contracts)
Local infrastructure & services: No schools, clinic or local services available in the immediate survey area (plots allocated for future schools, churches and formal businesses); during 2005, large primary school opened on the boundary of survey area (pre-fabricated buildings) and large secondary school in final phase of construction); municipal offices, clinic and churches located in Mfuleni Phase 1 (several miles away)
Politics: Relatively stable during the time period of the surveys although disputed local elections in 2005 gave rise to slightly increased level of tension within the community
Safety & crime: Generally calm but with a level of crime that required security measures to be in place and constant monitoring of the situation through liaison with the local police (and in 2005 a discreet police presence in the area where project researchers were working)
Accessibility: Easily accessible via main roads (and new access road completed during 2004 that ran adjacent to the research area)
Main sources of income generation: Large number of households in receipt of one or more grants (disability, child, old age pension, general low levels of employment although temporary, ad hoc and part-time jobs are common; as revealed by the study approx 12% of households are involved in micro-enterprise, with a small number of these being permanent businesses; many are a short term strategy to overcome lack of cash income or to supplement grant payment).

The following photographs illustrate the typical layout, style of housing (both original shacks and the new self / contractor built houses that each plot owner will eventually receive) and electrification infrastructure:

Figure 3-2 Mfuleni photographs

Typical electrification arrangements (taken in Nov 2003)

Standard toilet and sink arrangement provided on each plot

Shack dwellings and standard ‘site and service’ provision

Examples of new houses being built by different ‘projects’ in Mfuleni (taken in Nov 2005)

Table 3-2 Ngonyama community characteristics

NGONYAMA
Size and area:
Location / map reference: See Appendix 1A
Map of the community layout: See Appendix 1C
Township age: Community has been settled in the area for over a hundred years.
Households: 353
Population size (assume average of 5 person / dwelling) ~1765 (permanent population with historical links to the area)
Languages: Xhosa, English
Fuels used: Electricity, wood, paraffin, LPG
Electrification date: 15th December 2003
Electrification process: The community is placed on the electrification schedule by Eskom and then surveyed for household numbers and position. Following this the technical design and tender are undertaken and the major lines etc are constructed. Lastly individual households are supplied with a meter and connection, before the community is "switched on".
Community layout: Traditional lands with good sized household plots, often with several buildings; long distances between some houses and main housing areas
Building structures: Substantial traditional mud, cement block or red brick built houses and rondavels
Local infrastructure & services: Potable water is supplied through a stand pipe per 10 houses and most houses have a corrugated iron / wooden cubicle with a 'toilet' (only two houses in the community had flush toilets and only one of these was inside the house); major clinic facility located close to the community and serving a total of 5 local villages (~2500 households); nursery, primary and small secondary school located in the community; several major secondary schools in Queenstown attended by many children from the community; agricultural extension office in the community manned monthly and agricultural advisory services in Queenstown; Catholic church building in the community and a separate Christian group started during 2005
Politics: Very stable and traditional community (growing concern about an increasing level of both petty and violent crime)
Safety / crime: Very safe (no security required for the team and no problems for each research team to work remote from each other)
Accessibility: Easily accessible via main road running from Queenstown (physically divides the community in two)
Main sources of income generation: Agriculture, in some cases generating a small amount of income from the sale of surplus produce, is practiced on the majority of household plots and adjacent fields. Large number of households in receipt of one or more grants (disability, child, old age pension, or foster child. Low levels of employment amongst those living in the community however many families have one or more people working away from home (e.g. Cape Town, Johannesburg, Durban or in major local towns beyond a daily commuting distance). Our study has shown that approx 14.4% of households are permanently involved in micro-enterprise activity as a means to generate a cash income or to supplement grant payments.

The following photographs illustrate the typical layout, style of housing and electrification infrastructure in the rural community of Ngonyama:

Figure 3-3 Ngonyama photographs

Typical landscape and spacing between houses / fields

Most households build a traditional rondavel and one or more rectangular buildings

Education in the village – primary / junior school and one of the pre-schools

3.3 Interaction with the communities

A key component to effective survey and participatory work was the development of a close working relationship with the community leaders and members, based on trust respect and exchange of information.

3.3.1 Gate-keepers

It was necessary to build legitimacy for the research and the project staff, and to build relationships with specific individuals ('gate keepers') who could assist with access to and contact with the households, micro-enterprise owners and other stakeholders (both internal and external to the community. This relied heavily on the existing contacts of IES team members but also on relationships developed by them in facilitating the project in South Africa.

3.3.2 Security issues and measures

There were significant issues for the safety and security of the research team whilst working in the newly occupied area of Mfuleni. As indicated earlier, this was a new 'site and service' extension to an existing community. The families who moved into this extension had been moved from other 'illegally' occupied areas in or on the edge of other communities. Many of these areas had been or were prone to flooding. Thus, in 2003 at the time of the pre-electrification surveys, this was a new community where most people did not know their neighbours and there was some degree of tension, particularly during the hours of darkness (there was no street lighting at this time). In 2004, the situation had improved significantly as new physical infrastructure was being put in place and social networks within the community had begun to consolidate. Further improvements were also evident in 2005 however, disputed local elections had raised tensions ahead of the post-electrification (Year 2) surveys.

Following discussions during the community selection process and in the set-up phase, the project team were strongly advised to take measures to protect individual, team and vehicles security during the period of practical fieldwork. This included assigning two people from the local neighbour watch to each of the three survey teams, and restricting the presence of survey team in the community to between 9.30am and 3.30pm. Raised tensions in Sept / Oct 2005 made additional security measures necessary during the fieldwork including the need for the local police force to maintain a discreet presence in the areas where the survey teams were working.

In contrast, although violent incidents were not unknown in the rural community (Ngonyama), there was no requirement for any specific security measures in any of the 3 survey years.

3.3.3 Field research assistants & interpreters

From the outset of project design, the intention was that the fieldwork and focus groups would be undertaken by a small team of one international consultant (AEA Energy and Environment), two local consultants (IES) and a number of research assistants, interpreters and other support staff selected from the community. By necessity, due to the more difficult security conditions, the support team in the urban settlement (Mfuleni) was larger than in the rural community (Ngonyama). Initial training to enable them to undertake their specific roles in the project was complemented with more general support, advice and skills enhancement. The use of pairs of researchers (consultant or senior local researcher + community research assistant) proved to be an excellent approach whereby a natural transfer of skills and knowledge could take place.

The activities undertaken or facilitated by the community members of the fieldwork team were many and varied and included:

- Conducting the initial household 'sweep' survey
- Introductions to the micro-enterprise owners prior to interviews
- Organising micro-enterprise owners and community members for participation in the focus groups and arranging appropriate meeting rooms (including in some instances peoples' homes)
- Invaluable interpretation and translation work for quantitative interviews and prior to and during the focus groups discussions
- Visible security and neighbourhood watch (particularly in Mfuleni)

- Provision of information on any unusual occurrences prior to each days fieldwork (particular important in Mfuleni)
- Provision of more general insight into the daily life of the community as a consequence of the close working relationship that developed within the two-person fieldwork teams (especially where the same research assistants were involved in all three surveys)

Table 3-3 Numbers and type of field staff

	International / Local consultants	Community field assistants / other support
Mfuleni		
Pre-electrification (2003)	Consultants (1 UK, 2 South Africa, 1India)	Sweep researchers (6) Neighbourhood watch / security (6) Field research assistants for surveys and focus groups (3)
Year 1 Post-electrification (2004)	Consultants (1 UK, 2 South Africa) Senior local researcher (1)	Sweep researchers (6) Neighbourhood watch / security (6) Field research assistants for surveys and focus groups (3)
Year 2 Post-electrification (2005)	Consultants (1 UK, 2 South Africa) Senior local researcher (1)	Sweep researchers (6) Neighbourhood watch / security (6) Field research assistants for surveys and focus groups (3) Police officers (2; visible but discreet presence for the period of the fieldwork)
Ngonyama		
Pre-electrification (2003)	Consultants (1 UK, 1 South Africa) Senior local researcher (for community set-up, sweep survey and data input) (1)	Sweep researchers (6) Field research assistants for surveys and focus groups (2)
Year 1 Post-electrification (2004)	Consultants (1 UK, 1 South Africa) Senior local researcher (for community set-up, sweep survey and data input) (1)	Sweep researchers (6) Field research assistants for surveys and focus groups (2)
Year 2 Post-electrification (2005)	Consultants (1 UK, 1 South Africa) Senior local researcher (for community set-up, sweep survey and data input) (1)	Sweep researchers (6) Field research assistants for surveys and focus groups (2)

3.3.4 Reciprocity and Gifts

Social and economic reciprocity are strong mores in many of the poor and developing communities in South Africa, especially Xhosa communities. Community members will give their time (sometimes necessarily by prior arrangement) and will generally be very gracious in answering questions.

Courtesy, respect and patience to properly explain matters and elicit answers to questions are minimal requirements in conducting the research. In order to initiate and strengthen relationships with the community and key individuals, and where it was deemed appropriate to do so, a senior member of the research team together with one or more research assistants would always participate in discussions.

Where it is culturally acceptable to reciprocate, a small gift was presented to people who had kindly given of their time to provide assistance or contribute to the project e.g. community leaders, those being interviewed (survey) and those participating in the focus groups.

The gifts provided to the micro-enterprise owners who took part in an interview and / or one or more focus groups were specifically chosen to assist with the organisation and financial budgeting of small businesses. In the pre-electrification and first year of post-electrification interviews, the gift provided to those interviewed was a pen and a small notebook and for focus group participants was a calculator. In the final year of the work, it was decided to provide a more substantial gift to the owners who were interviewed as many of these, particularly in the rural community where there was a much more stable population, had also contributed in the previous years. A cash box was considered appropriate and generated a good deal of surprise and appreciation from the recipients.

Figure 3-4 Presentation of a cash box gift

3.3.5 Feedback to community

The relationships developed and maintained with the communities, their leaders and the wider stakeholders (e.g. the police in Mfuleni) were crucial to the effective management of the project. IES, working together with key 'gate-keepers' from and around the communities, initiated and managed the discussions to seek approval for and set up the project with each of the communities. It was fully recognised within the project design and was further reinforced by the practical experiences of the pilot trial of the methodology that continuous feedback of information from the project work is of interest and valued by the community leaders. In each year following the pre-electrification and both post-electrification surveys and focus groups, a short report was prepared that summarised the key observations and findings, together with any initial conclusions and recommendations that would assist the community leaders and other stakeholders.

Figure 3-5 Feedback to community leaders Mfuleni

Figure 3-6 Feedback to community leaders Ngonyama

In all cases, the information provided to the community leaders and members on the results of the work was presented in a way which addressed their priorities from their perspective. It also proved extremely valuable to include discussion and time for their feedback on our findings.

The major change to this approach occurred after the final year of post-electrification work when the project team extracted and fed back the maximum amount of learning to the business owners and community and actively facilitated the development of any key contacts and relationships.

4 Field work and data handling

4.1 Site Initialisation and Sweep

4.1.1 Site initialisation

Having selected the research sites according to the set of criteria related to the project objectives the next step was initialisation and community sweep to pin point the Micro-enterprises within the community. For each of the communities the following activities were undertaken:

- Local field staff were identified and recruited as part time research managers. Full project briefing and training provided. Key here was their access to and ability to deal with local community leadership structures. Training included full briefing on the nature and focus of the project and clarification on what the extent to which the project may impact on the communities and how to deal with any issues that may arise.
- Meetings held with the local political/government representatives. Particularly before the first survey effort was placed on gaining acceptance and patronage of the local leaders. In both communities this was achieved through careful explanations of what was involved and the purpose of the project and how the research would be carried out (this proved particularly important in Mfuleni).
- Community leaders assisted with the identification of suitable local community members as candidates for the sweep research. Qualifications included a matric level of education, bilingualism and availability to undertake the community research.
- From a timing perspective these activities took place around two weeks prior to the actual quantitative and qualitative research.
- Discussions also took place with the local police and community policing staff. They advised on the security situation and provided community security staff to accompany research staff doing the quantitative micro-enterprise interviews.
- It was also advised during the initialisation phase that feedback would be provided to the local councillors and other officials after the completion of the quantitative and qualitative research.
- The initialisation phase also involved obtaining site plans, local maps and preparing all the necessary research and staff briefing materials.
- The levels of remuneration for the sweep surveyors, the interpreters who assisted with the quantitative and qualitative research and the community security guards were all advised to the community leaders together with the numbers of each type of person required. These were valuable short-term employment opportunities for the local communities.

4.1.2 Sweep operation

The operation started with the sweep team training:

- Given the turn over of researchers, different in each survey, detailed training was provided to the selected sweep team before each survey (typically flip charts where used by the field managers to teach what was required)
- Demonstrations were also given on how to conduct the interview/householder engagement, the overall survey, and how to deal with different types of situation; importantly and most useful were the role-playing exercises used to coach the sweep team members.

During the sweep careful supervision of the sweep staff proved essential, including:

- Defined community areas divided into areas of around 150 households and clearly demarcated on separate maps for each survey staff member. Each sweep person was provided with a detailed list of households to be visited and blank sweep forms for each. This enabled effective checking and that no households were overlooked.

- Regular feedback sessions with the field managers were scheduled. This allowed for form checking, redirection in the event of errors, part payments for work properly completed and general support to the sweeping staff.
- Loss of researches – replacement by other person or the reallocation of additional households to the performing researchers. A number of the sweep researchers were ladies from the community and in some cases illness with their children or other family needs meant that they were suddenly unavailable to complete the sweep work. This made close supervision and support all the more necessary, both to safeguard their personal interests while also working to complete the sweep correctly and on time to enable subsequent phases of the research to proceed according to schedule.
- Spurious data – reallocation and rework by other reliable sweep staff.
- A bonus system was included for on time and accurate completion of the various sweep surveys for all sweep staff.

4.1.3 Sweep data

Upon completion, the sweep data capture and analysis was enacted, including:

- The basic data on the forms consisted of a "stand or property number", against which a yes indicted a micro-enterprise was present on the stand and a No that there was not. In addition for empty stands an "E" for empty was registered. Some additional data was gathered against the Yes properties, namely a description of the type and contact details of the owner.
- Where there was more than one business evident at a site, then an A or B was added as a property number suffix. In the case of centrally grouped businesses, such as a number of micro-enterprises at a traffic circle, the relevant ones (i.e. those that were utilising the new electricity supply within the research boundary) were captured against the owners household property number.
- Upon completion of each community sweep (both communities 3 times) the information from the sweep forms was captured in spreadsheets. A preset format was developed and issued to the data capturer with the forms.
- Sweep data was then analysed by sorting for properties that contained an enterprise versus those that did not, and by enterprise type.
- To ensure the reliability of the research sample each time, new dwellings within the area where excluded from the sample. This was made possible by capturing the second and third survey data within the same spreadsheet lines as the first. Again all the rows with an "E" – Empty were discarded for the second and third survey.
- This sorted sweep data was then printed and became an micro-enterprise roadmap for the qualitative research.

4.1.4 Sweep points of note and lessons learnt

- Usefulness of data checks by sweep supervisors
- Ongoing difficulty to explain that the project was simply a research project – in fact that the community would be receiving very little – purposefully so as not to skew the sample base and to ethically manage expectations.
- Cases where householders refused to give information – using judgement, some of these were subsequently checked again with a follow-on visit
- Forms were modified from the A5 page blocked to a simple one line table, greatly improving the efficiency of both the work of the sweeper and the management of the sweep team data management (see Appendix 2B).
- The research team found during the project women were more reliable and diligent at completing activities such as sweep surveys than men.
- The initial training and role-playing and non-invasive checking of understanding by the sweep staff proved invaluable.
- The need to genuinely work within the culture, community and especially the family constraints of employing casual female community staff who live in a different reality from that enjoyed by the project management team.

- The documentation deployed in undertaking the sweep work proved to be critical and after lessons learned from the first sweep this paperwork was streamlined and greatly improved in the following sweep phases.

4.2 Quantitative survey

Following the community sweep, detailed quantitative interviews where held with as many of the micro-enterprise owners as possible. This section sets out how the interviews where completed, what was covered, how it was managed and the data captured.

4.2.1 Interviews

- Interviewers consisted of the principle researcher plus additional selected staff from the community.
- Interviewer training, familiarisation and standardisation of nomenclature proved critical in relation to the standard questionnaire.
- Each research team was equipped with blank questionnaires and closed business forms, the sweep data and detailed maps of the survey area included numbered identifiers for each plot. The micro-enterprise owners were located and interviewed.
- Translators played an invaluable roll in all communities and especially in urban community where three languages were encountered.
- Reception by the micro-enterprise owners – amazing – such humble hospitality and the generous giving of their time.
- Difficulties with winning trust and obtaining the necessary data. This often centred around understanding, fear that the data would be used against them, fear of losing their social and child grants and that the researchers had some hidden motives. The role of the interpreters, in many cases ladies known in the community, consistently enabled these barriers to be overcome. Hence the invaluable role of the interpreters.
- Typical time was an hour per interview. It should be noted that all interviewers and interpreters showed respect for the business proprietors and that they were also running a business as well as answering questions. This often necessitated the researchers participating in the routine business activities such as welcoming customers, introducing themselves to visiting members of the community, entering the daily conversation of local people, waiting while customers were served, and so forth before being able to resume the interview.
- After requesting the permission of the proprietor the interviewers were generally able to move around in the house to look at the business equipment and to look and discuss the products being sold or produced.
- All previously known businesses were visited to establish the reasons around closure and closed business forms where completed.
- On all interview visits a small gift was given to the proprietor as a token of thanks.

4.2.2 Survey management

- Contracting, training and management of the translators.
- Meeting up with translators at the beginning of each day, checking if the community is tranquil, safe to visit, whether it will be polite to visit today, whether there are any large funerals taking place that necessitate special respect and perhaps the postponement of research activity and so forth. This activity must never be underestimated in African cultures and outside researchers must always be sensitive to these community matters and be guided by local community members whatever the inconvenience or rescheduling of the research that may be necessary.
- Security in the urban site, Mfuleni, was a significant matter that required daily discussion and review with the local police, and frequent consultation with the community leaders and other informed persons close to the team.
- Daily updating of the sweep data, through the verification of the existence of micro-enterprises – note only micro-enterprises operating at the time of the survey were included.

At times the sweep showed a previous business as a current business. These were all corrected together with the correct classification of the business type.
- Each day a new set of micro-enterprises where targeted by the team, including those that perhaps had been away on previous days.
- This process continued until the greatest number of micro-enterprises was interviewed within the allocated time. Usually far higher percentages in each type category were achieved than the minimum required for reliable sampling.

4.2.3 Data consolidation and capture

- Cross-checks between interviewers took place on site, especially in the area of turn over and profit determination.
- Each interviewer was always responsible for undertaking the post interview processing of the forms, both calculation of values and the finalising of the data for capture. Here on each form an additional aid was a right hand column where the capture data was carefully written out according to a standard set of data ready for input.
- Once a survey was completed then the forms were handed over to the data capturer, again together with a preset spreadsheet that included the correct set of columns, widths and data types.

4.2.4 Quantitative Points of note and lessons learnt

- Value of the translators – bring local understand and context.
- Changing interview staff tended to bring different understanding, good for qualitative but not quantitative due to absolute consistence in approach needed.
- The majority of micro-enterprise proprietors had a very different perspective and understanding of business than one that may be described as the traditional European one of profit and loss, stock turnover, efficiency and so forth. The majority of these businesses were what may be described as domestic or household businesses where often the divisions between households 'budgets' and those of the business were blurred.
- Very frequently the concepts and paradigms used by researchers were very foreign to the respondents. The role of the interpreters and the need to consistently check and validate understanding between researcher and respondent was essential. It was often a very painstaking and of necessity patient interviewing process.
- Beyond the complex level of mutual understanding the appearance of white Europeans, with clip boards and files was intimidating and confusing to many in the community. Much time was spent to explain the project and reassure local residents about the reason for gathering the information.
- The external project researchers had to deploy a very high level of communication, cross cultural and interpretative skills in gently obtaining the necessary intelligence, views of respondents and visual data that surrounded them. It was not a straightforward issue of completing a questionnaire. Reference to the questionnaire shown in the Appendices will illustrate the complex task undertaken by the research interviewers. These challenges however, with the careful methodological design and pre field-testing, proved surprisingly robust in the conduct of the actual quantitative fieldwork in both the urban and rural communities.
- Plus the external project researchers had not only to understand the fundamentals of micro-enterprise but also needed a thorough understanding of the cultural mores, local politics of South Africa since independence, local service providers, African tastes, foods and interests; and, a thorough understanding of electrification and the role of energy in micro-enterprise.
- Difficulties were regularly encountered in obtaining accurate financial information about the micro-enterprises. This had to do with factors such as a lack of understanding by the proprietors themselves about this information, suspicion that the disclosure of the true information could prejudice them in some way; and, the intertwining of the business income with that of the household. However by a series of cross checks, visual validations and other deductive means methods were devised to obtain the most reliable financial information (e.g. turnover, profit, salaries and stock). Indeed, the consistency of this type of data over the duration of the three surveys proved surprisingly reliable considering the

variables being managed. From a range of cross-checking and other validations the risk of interviewer bias was also scrutinised and has hopefully been kept to a minimum.
- The ongoing involvement of the same senior research personnel over the full four year period has been absolutely essential to ensure the integrity of research, data collection and analysis. There has also been a unique and cumulative learning and acquisition of knowledge without which the project could not have been completed effectively.

4.3 Qualitative research

Qualitative research was an essential component of the overall methodology and was used for a number of purposes within the research framework. However, the primary purpose of gathering qualitative information was to enable a more in-depth understanding of the linkages between energy and micro-enterprise and to gain insight into the various factors impacting micro-enterprise activity in the two communities. These included:

- Greater understanding the impacts that had been measured (in the quantitative surveys) and observed as a consequence of the step change in modern energy provision in each of the communities.
- Identification and understanding of the linkages (if any) between modern energy and micro-enterprise establishment and growth i.e. to what extent there has been an impact and how did electricity and electrical appliances contribute to these changes, including:
  - Changes in energy use patterns, appliance acquisition and ownership, and energy costs.
  - Gathering opinions on the comparative benefits and disadvantages of different energy sources before and after electrification.
- Greater understanding of why some individual businesses closed and others opened, and whether and how particular enterprise types were affected, including:
  - Competitive impact of the coming of electricity on various businesses and reasons. (While electricity helped some it put others out of business).
  - The role of credit provision in micro-enterprise operation and the impact of none or slow repayment.
- The role and availability / local accessibility of other enablers that could promote and support small business activity
- Understanding why the majority of the micro businesses are operated by women.
- The impact and importance of micro-enterprise in the community as a whole (as seen through the eyes of non-enterprise owners who were customers of the various businesses in the community) and the relative use of these local enterprises vs use of shops, services etc in the nearby town.

Qualitative information was gathered at several points during each year of the project, primarily through focus groups and one-to-one semi-structured interviews. Various participatory techniques were used to differing degrees depending on the attendees, and the issue being discussed; these included:

- Open questions and facilitation to drill down to gain insight into particular observations or outline findings from the quantitative survey
- Time lines (e.g. to identify and explore changes that had occurred in the community such as electricity connection, establishment of services, external employment opportunities etc)
- Social maps (e.g. to locate services, facilities, businesses and households)
- Matrix ranking (e.g. working with micro-enterprise owners to explore access to assets required for their business and the importance of energy and to understand the relative importance of different micro-enterprise enablers from their perspective)

4.3.1 Focus Groups

As a prerequisite for the community-based focus groups, it was considered essential to design a process and a meeting environment that would encourage, facilitate and enable the micro-

enterprise owners and other members of the community to provide their views to the project team. The key aim was to gain insight and additional understanding into how the micro-enterprise owners themselves and members of the community view micro-enterprise, and how they perceive and rank issues associated with local businesses, energy matters, gender relations, health, empowerment, education, environmental matters and so forth.

There were a number of challenges to be overcome in order to hold these meetings and achieve the desired outcomes. This was in terms of the participation level from people involved in a variety of different businesses and on different scales, and from members of the community who were not micro-enterprise owners. These spanned all aspects of the arrangements including:

Participation of micro-enterprise owners and community members

At the end of the quantitative interview micro-enterprise owners were familiar with the aims of the project and were asked if they would be willing to participate in a focus group *(pre-electrification and year 1 post-electrification)*. Members for each group were then selected from those willing to attend and according to the subject planned for discussion (and in some cases a group also focused on a particular scale of enterprise). As a courtesy and to maximise the opportunity for full participation, consideration was also given to whether, particularly for the larger businesses, there would be any sensitivities between the micro-enterprise owners due to competition that would make them feel uneasy and less willing to discuss some of the issues in an open forum. It was also appreciated that micro-enterprise owners are busy people (with pre-existing daily timetables around trips to town, household responsibilities, opening times for supermarkets and electricity vendors, etc) and may therefore not be available for a particular session. Where possible, for those who were keen to be involved, arrangements were made to include them in any alternative session. We were also acutely aware that the majority of participants would, in reality, gain very little from their involvement in the meeting, and so endeavours were always made to include advice and information of relevance to micro-enterprise owners and the community.

A group of people where some difficulties were encountered were the community members who were not micro-enterprise owners. Although the consultants in the project team, as ‘outsiders’, were visible in each community, the only contact that the majority of households had with the project was during the sweep survey (under taken by local people that they knew and taking just few minutes per household). There was therefore a need to select non-owners at an early stage and allow time for the community researchers to explain about the project and their role in the focus group.

Lack of previous or extensive community interaction in the early stages of the pre-electrification phase meant that careful management and relationship building were required in each community *(at this time the quantitative survey period, where full days were spent on foot in the community, provided many good opportunities for making contacts and explaining about the project).*

Organisation of the focus groups

In each community, an important role played by the community researchers was to invite, remind and answer questions from the proposed participants for each meeting. This required the researchers to work in the evenings and at weekends as many micro-enterprise owners are either busy or away from their homes during the day (collecting stock or selling their products in different areas of the community). Although being paid for their time, this extra commitment by the community team was a vital contribution to the overall success of focus groups in both communities. An additional and ever present task was the need for a rapid response to finding replacements for micro-enterprise owners who were unavailable to attend at short notice. Again this very much relied on the community researchers meeting ‘alternative’ micro-enterprise owners in the evening before the meetings.

Finding and negotiating use of meeting venues

The location and style of the venue for the meetings was another consideration, and suggestions / contacts of the local team were extremely valuable in negotiating and securing approval for the use of the various rooms / buildings. The venue had to be conducive to the needs of the focus groups (environmental conditions particularly temperature, seats / benches,

a table, enough room, possibility of sticking flipchart sheets and cards to a wall or other upright support, etc). Between the two research areas, the venues for briefings and focus groups included a consulting room in the clinic, a disused school building, an agricultural research station, council meeting rooms / offices in the municipal building, community meeting hall in the library and, on several occasions, the homes of the community researchers.

Transport & logistics

Another important logistical issue, in both communities, was how to physically get the participants to and from the meeting, as most had no easy access to transport. Several of the available venues were located away from the immediate vicinity of the households and transport had to be organised to collect all participants from a pre-arranged point (a process which in itself presented a number of logistical challenges!). Solutions included using the project teams own cars and minibus, and hiring local taxis.

Conveying the issues and concepts

At the beginning of each of the focus groups it was essential to explain again the aims of the research we were conducting within the community, and how the findings would benefit communities in the future through improvements to electrification programmes (particularly in terms of energy, electricity and electrical appliances being key enablers of micro-enterprise activity).

Both the interpreters and facilitators of each of the focus groups needed to remain alert to a lack of conceptual understanding of questions and issues that were being explored. Again, the community researchers played a vital role as interpreters and needed to be well briefed, facilitated, supported and encouraged during the discussions, often to varied degrees depending on their own language skills and level of understanding. This was greatly increased where the same assistants had been involved in all or several phases of the project. Where difficulties arise with understanding and translation, it was necessary for the facilitator to intervene and immediately introduce alternative approaches to the question or to demonstrate specific concepts. Another problem area is where extensive translation slowed the discussion down to such an extent that the flow, and consequently the interest of participants, was lost. The role of facilitator (and note taker) was key to maintaining the pace of the meeting.

There were several concepts and tools used that caused particular difficulties for the participants, and in some cases the community researchers (interpreters). Firstly, the ability of the participants to contribute to the priority or preference ranking (1, 2 and 3 etc) to a group of items needs to be carefully checked. Our experience was that ranking exercises did not work particularly well and, if this is to be effectively used in a focus group, the facilitator needed to initially ‘test’ this methodology and provide the necessary level of guidance (whilst maintaining their own impartiality) to move the process forward. Secondly, difficulties were encountered with the recollection of timescales, both dates and periods of time over which events happened (within a focus groups, the recollection of historical facts by individuals was often different). Triangulation (i.e. cross-checking the same information through multiple sources) and checking of timescales was needed to ensure the information is correct.

Focused but flexible approach

It was necessary to keep each meeting focused on the issue in question yet remain flexible enough to allow new / relevant side issues to be introduced and further explored. This process happened naturally during some of the discussion and in others needed prompting by the facilitator. This was achieved by encouraging a member of the group to expand on the issue they had raised or by leading the respondent on from their answer / view to obtain further detailed information or to reach an agreement or consensus. A further area where the judgement of the facilitator is important is in knowing when to prompt for individual answers *(to capture different perspectives on an issue)* and when to initiate a group response (and collective discussion) *(more generic matters)*.

4.3.2 Stakeholder Interviews

In the final phase of the work (year 2 post-electrification), meetings were held with a number of stakeholders in each location. This provided an opportunity to present the research and its initial findings, and to obtain the views and inputs from experts and practitioners in relevant

fields – electrification, rural and urban policy development, small business promotion and support services, agriculture and employment. These meetings were semi-structured in format and designed as a 2-way exchange of information. Each began with introductions to the project team and our work, followed by a general discussion around the initial results and observations in the context of the work of the individual or organisation.

5 Analysis methodology

5.1 Quantitative analysis

From a quantitative perspective, the captured raw data from the interviews was extensively processed and is described in this section.

Two communities, each with three surveys, around 40 and 50 micro-enterprises were interviewed each time and with 90 columns of raw data generated a substantial base of information. The analysis processes contained within the Initial Field Trial Report was used as a starting point and then further refinements added. All the data (raw and processed), is contained within two spreadsheets that are issued as part of the electronic version of this report. These actual work files are called “Quantitative Analysis Mfuleni ver Report.xls” and “Quantitative Analysis Ngonyama ver Report.xls”, with only one significant alteration. All the household name and stand/property number columns have been removed or altered to ensure the questionnaire information is completely anonymous.

5.1.1 Micro-enterprise type categorisation

The first point to note is the categorisation of the micro-enterprise into a series of different types. This list was prepared, based on what was found in the communities. The following points were noted in this process:

- Many micro-enterprises have had a mix of activities hence a value judgement was made by the interviewers, as to what was the dominant type. The particular micro-enterprise was then allocated the corresponding type.
- For the general goods traders (Spaza shops) the dimension of size was added, using the monthly turn over as a basis for differentiating between three sizes.

A listing of all the types found, with a description is presented below:

Basket making (manufacturer)

Hand weaving of baskets such as shopping baskets, bread servers and other basket products. Woven by hand to standard designs.

Beadwork (manufacturer)

Hand making of small and larger mats (in Mfuleni) and necklaces, bracelets, traditional decorative items and bags (Ngonyama) from beads (plastic, glass, natural materials) of different colours.

Brick Maker (manufacturer)

Mud based bricks are formed and cured in the sun. These bricks are sold for house building purposes.

Builder (service provider)

Community member that sold his service as a builder, actually building in the community during the pre phase and excluded during the post phase as working outside the community.

Braai Meat / Take away (retailer)

Provision of cooked meat, frequently offal, from kerbside stalls on open fire. Many of these are located at busy intersections and at the traffic circle in Mfuleni.

Cash Loans (service provider)

Very small scale business operated by a single male providing small cash loans.

Clothing sellers (retailers)

These business operators, mainly women, buy clothes from off site manufacturers. Suppliers from as far away as Kwa Zulu Natal and the Eastern Cape. Products sold include clothing for children and adults and blankets.

Crèche (service provider)

Involves the care of young children while parents are away at work. Those parents running a business within the community usually tend to keep young children with them.

Fruit and vegetables (retailers)

These are dedicated fruit and vegetable vendors, and are often kerbside businesses selling to passing trade.

Grass products (manufacturer)

Cottage industry utilising traditional methods of mat, broom and other grass based products. Essentially only sold to the market within the communities.

Household linens (retailers)

These business operators, mainly women, who buy clothes from off site manufacturers. Suppliers are from as far a field as Johannesburg. Sales of the linens are to community members and surrounding communities.

Hairdresser (service provider)

Conventional hairdressing salons providing a full range of women's and men's hairdressing services. Some also retail hair products, shampoos etc.

Hardware (retailers)

Shops or front rooms of homes selling a modest range of nails, screws, tools, paint and other hardware products. They also usually carry a small stock of materials for building and maintaining shacks such as timber, waterproof sheeting and galvanized iron.

Mechanical repairs (service provider)

Small-scale car repairs and possibly tractors.

Meat seller (retailers)

These businesses sell a variety of fresh meat including chickens, low cost offal and sheep's heads. They buy the meat in small quantities either frozen or fresh and clean and prepare it. Chickens are sometimes traded live (especially in the rural community).

Medicine (retailers)

The mainstay of these businesses is the making up of various 'medicines' in quantities and then bottling and selling to end-users. Ingredients are bought off site and either mixed with water or 'boiled up' to create the final product.

Paraffin seller (retailers)

Buys paraffin in semi bulk and onward sells in small bottles or other available containers

Phone service (service provider)

This is a branded franchised outlet operating in a purpose fitted container. The business essentially consists of selling phone access and time on a number of phone booths set up in the container where customers can make phone calls. They also sell airtime for cell phones.

Photo framing (service provider)

Conventional photo framing with either fixed or assembled frames.

Sewing (manufacturer)

These businesses make garments and other household soft furnishings, Dresses, wedding gowns and clothes for special occasions are an important element of this business. Traditional costumes are made to measure.

Shabeens (retailers)

These are simple beer and entertainment establishments. They sell the branded beers, cigarettes and in some cases food. Loud music and fires in the winter add to the attraction and 'escape' from the harsher realities that surround them.

Spaza (retailers)

Nearest role model is a 'grocery shop' selling food, household detergents, matches, candles, cigarettes, cold drinks, ice cream etc. The operators buy in bulk from offsite wholesalers. Transport or access to transport a key element in the more successful Spaza's. Provision of credit is a major feature of this trade.

Shoe repairs (service provider)

Shoe and footwear repairs. Similar to traditional cobbler.

Taxi (service provider)

Taxi operators owning multiple vehicles and employing drivers. Both big and small scale operators were found.

Tractor hire (service provider)

A number of tractors are owned by community members and are rented out to perform functions such as ploughing fields and carry river sand.

Tuckshop (retailers)

These are extremely small, often secondary activities for households where a member has other work, and sell snacks and sweets mainly to local children for a few cents. Products include sweets, ice lollies, savoury snacks and cups (sometimes can or bottles) of cool drink.

TV repairs (service provide)

Repair of TV sets and radios, either working at home or in the appliance owners' home. Sale of refurbished TVs and radios.

Welder Fabricator (manufacturer)

Has a range of small engineering tools and equipment, the introduction of electricity has meant production of vehicle seats etc. has started.

Xhosa Beer seller (manufacturer)

Preparing of traditional Xhosa beer from the necessary ingredients using an open fire, and brewing it in large plastic containers on site. Customers generally bring their own containers and the brewed beer is sold from the makers home or people come to drink the beer (often brewers have a separate room set aside; snacks are often sold as well.

5.1.2 Calculation of statistical relevance and weighted averages

The first step was the calculation of the statistical relevance and the weighted averages. From the spreadsheets an example for one survey in Ngonyama is shown below.

Ngonyama Year One Post Electrification							
Enterprise numbers identified during the sweep Post Year One				Quantitative data statistics			
Enterprise type	# from sweep	% of enterprises	% of total properties	# of records	% of sweep	Statistical significance	Comments
Brickmaker	1	1.96%	0.28%	1	100.00%		
Energy seller	3	5.88%	0.85%	3	100.00%		
Fruit & Veg	1	1.96%	0.28%	1	100.00%		
Household linens	1	1.96%	0.28%	1	100.00%		
Sales Agent - Crockery	1	1.96%	0.28%	1	100.00%		
Sewing	8	15.69%	2.27%	7	87.50%		Ok
Shabeen	8	15.69%	2.27%	6	75.00%		Ok
Spaza Big	2	3.92%	0.57%	2	100.00%		
Spaza Small	8	15.69%	2.27%	5	62.50%		Ok
Taxi - big	2	3.92%	0.57%	2	100.00%		
Taxi - small	1	1.96%	0.28%	1	100.00%		
Tractor hire	3	5.88%	0.85%	3	100.00%		
Tuck shop	10	19.61%	2.83%	7	70.00%		Ok
Welder/fabricator	1	1.96%	0.28%	1	100.00%		
Xhosa beer seller	1	1.96%	0.28%	1	100.00%		
Total Enterprise	**51**	100.00%	14.45%	**42**	**82.35%**		Ok

This data has been prepared using the following steps:

1. The corrected (checked for type and active) sweep data is used to determine the number of active enterprises by type found in the community at the point in time of the survey. A sort on enterprise type then insertion of a manual count is used, as shown below:

Post Sweep data			Pre Sweep data				
Plot num	Name of Owner	Business type	Name of Owner	Business type	Entreprise Count		
						Interview management		
1	a	Brickmaker	q	Brickmaker	1	ME Types	Sweep #	Quant #
2	a	Energy seller	q	Energy seller	1	Brickmaker	1	
3	a	Energy seller	q	Energy seller	2	Energy seller	3	
4	a	Energy seller	q		3	Fruit & Veg	1	

2. Per type percentages are calculated together with an overall enterprise total; in the above example of Ngonyama Year 1 Post-electrification, the total number of enterprises i.e. the 100% is 51.
3. From the quantitative raw data, a similar sort by type and manual count was completed and the corresponding number interviewed obtained, giving the total “42”.
4. Then a statistical percentage was calculated by comparing the number of known active enterprises by type with the number interviewed.
5. A check of the statistical significance was then completed by looking in to the % surveyed by type and understanding the impact on the numbers. Any enterprise type above 60% (given the reduced impact) was deemed to be acceptable and above 75% for the total. Highlighted as green for 100% orange for acceptable and red for unacceptable. Throughout the entire study only FOUR instances where the number of interviews found to be below the desired 60%.

6. Calculation of the number of households and exclusions of those not part of the sample in the first year was completed by again sorting and separating out those properties from the sweep sample. Example of calculation of properties used shown below:

	Post	Pre
Non enterprise properties	302	311
Total properties occupied/included	353	352
Properties excluded	38	0
Empty properties or closed houses	20	50
Total properties Sweep	411	402

7. Lastly, for all utilised quantitative data e.g. turnover/month or expenditure on a fuel type, a weighted average was calculated for each enterprise type to correct for the less than 100% sample and to estimate the full impact on the community at this instance in time. The formula was simply to add all the Turnovers/month for example the energy sellers then divide by the statistical percentage.
8. Please note that the differentiation between a Tuckshop, a Spaza and a Big Spaza based on the levels of turn over was introduced only during the final analysis. This resulted in a complete rework of all the data into the above format as it affected the data from a sweep level up.

5.1.3 Business open/closed and sector analysis

Based on the numbers of enterprise in the community during each of the three surveys a table was prepared that showed whether these increased or decreased and included a sort by sector (manufacturing, retail and service). An example is shown below.

Ngonyama Business changes - opened or closed analysis

Change in business type and number (opened or closed)

Enterprise type	# from Pre Survey		# from Post Survey		# from Final Survey		Delta change Year 1	Delta change Year 2	Delta change Year 1 & 2
Brickmaker	2	5%	1	2%	1	2%	-1	0	-1
Builder	1	2%	0	0%	0	0%	-1	0	-1
Energy seller	2	5%	3	6%	1	2%	1	-2	-1
Fruit & Veg	0	0%	1	2%	2	4%	1	1	2
Grass products	1	2%	0	0%	0	0%	-1	0	-1
Household linens	2	5%	1	2%	0	0%	-1	-1	-2
Mechanical repairs	1	2%	0	0%	0	0%	-1	0	-1
Phone booth	0	0%	0	0%	1	2%	0	1	1
Sales Agent - Crockery	0	0%	1	2%	1	2%	1	0	1
Sewing	8	20%	8	16%	7	14%	0	-1	-1
Shabeen	5	12%	8	16%	6	12%	3	-2	1
Spaza Big	2	5%	2	4%	2	4%	0	0	0
Spaza Small	3	7%	8	16%	11	22%	5	3	8
Taxi - big	2	5%	2	4%	2	4%	0	0	0
Taxi - small	1	2%	1	2%	0	0%	0	-1	-1
Tractor hire	3	7%	3	6%	2	4%	0	-1	-1
Tuck shop	7	17%	10	20%	13	25%	3	3	6
Welder/fabricator	0	0%	1	2%	1	2%	1	0	1
Xhosa beer seller	1	2%	1	2%	1	2%	0	0	0
Total Enterprise	**41**	100%	**51**	100%	**51**	100%	**10**	**0**	**10**
				Change			**24%**	**0%**	**24%**

Ngonyama - Pre versus Post Electrification analysis by sector

Enterprise sector	# from Pre Survey		# from Post Survey		# from Final Survey		Delta change Year 1	Delta change Year 2	Delta change Year 1 & 2
Retail	21	51%	34	67%	36	71%	13	2	15
Manufacture and farming	11	27%	11	22%	10	20%	0	-1	-1
Service	9	22%	6	12%	5	10%	-3	-1	-4
Retail	21		34		36		62%	6%	71%
Manufacture	11		11		10		0%	-9%	-9%
Service	9		6		5		-33%	-17%	-44%
Total Enterprise	**41**		**51**		**51**		**24%**	**0%**	**24%**

In addition a matching exercise was performed on the data to determine for the sampled enterprises what was the longevity of the enterprise. This was undertaken by collating the basic database for the three surveys in each community, sorting on the common property numbers and then amalgamating those that where found in more than one survey. The results produced were in the following form:

	Open/close analysis				Profit		
	Pre	Y1	Y2	Type	Pre	Y1	Y2
1	1	1	1	Spaza Big	5995	13440	11993
2	1	1	1	Spaza Big	6844	9480	13303
3	1			Spaza Small	800		
4			1	Spaza Small			324
5			1	Spaza Small			830
6		1	1	Spaza Small		413	1415
7		1	1	Spaza Small		572	520
8			1	Spaza Small			347
9			1	Spaza Small			1059
10			1	Spaza Small			1816
11	1	1	1	Spaza Small	1500	1500	300
12		1	1	Spaza Small		1177	702
13			1	Spaza Small			1332
14	1	1	1	Spaza Small	1034	1784	1760
15		1	1	Taxi		11320	18660
16	1	1		Taxi - Big	32600	32600	
17	1			Taxi - small	275	275	

In the table it can be clearly seen whether an enterprise has existed through all three surveys, or when it started or stopped.

5.1.4 Preparation of the comparison indices

Based on the weighted averages and the basic raw data four different sets of comparison indices where calculated. This involved setting up the individual calculation for each indices for each of the three surveys and then calculation of the delta or net movement. The formula's can all be viewed in the spreadsheets behind the cells. At times the indices were based on the total weighted average and at other times they needed to be specific to the sample without a weighted average. Some variables were calculated by manual counts, such as number of micro-enterprises offering credit, given the Y/N data fields.

The type of indicators for each are shown below were:

1. *Micro-enterprise activity indicators. These measures are designed to reflect the volume and nature of enterprise activity. The activity was compared against the number of households in the community and*

Number of households per enterprise
Total ME Turnover for the community
Average enterprise turnover per community hous
Average enterprise profit per community household
Average enterprise turnover per enterprise
Average enterprise profit per enterprise
Total people employed per community household
Total people employed per enterprise
Productivity (Income/person hours)
Average Stock value
Percentage of customers internal to community
Percentage of customers external to community
Average transaction size

2. *Sustainable livelihood indicators. Here the emphasis is on what impact the micro-enterprise has on the livelihoods of the community. At times the total community households was the basis of comparison and at others the impact on the owners' household.*

Average employees income per community household
Average owners income per enterprise
Average household income per enterprise
Enterprise owners per community household
Involvement of owner family members
Community based ownership
Female enterprise ownership
Male enterprise ownership

3. *Energy equipment and usage indicators.* In the table only a selection of the equipment penetration are shown. These figures effectively track any switch in fuel usage following electrification.

Electricity consumption per enterprise
LPG consumption per enterprise
Paraffin consumption per enterprise
Wood consumption per enterprise
Other Fuel consumption per enterprise
Average fuel cost per month
Energy importance average
% Businesses using electric equipment
Equipment penetration - LPG/paraffin Fridge/freezer
Equipment penetration - Parafin lamps
Equipment penetration - Manual sewing machine
Equipment penetration - Generator
Equipment penetration - Electric Radio/TV

4. *Other indicators. These are more general questions associated with the micro-enterprise. The intentions would be a greater understanding of the contextual situation.*

Percentage of original owners
Average educational level
Average yearly activity
Average area of premises
Percentage of businesses giving credit
Credit % of turnover
Bad debt %
Percentage of enterprise having a bank account
Adjuged percentage with growth potential

5.1.5 Data corrections

In the following three instances cross checking of the data highlighted possible inaccuracies and for these a standard data correction was applied as following:

- **Stock level**. This variable in the questionnaire was intended to be an indication of how much money the owner has invested in stock items for the business at any given point in time. With the turn over and low stock level in particularly the retail micro-enterprises the stock levels tended to be what is purchased on a regular basis e.g. if you buy groceries for the Spaza four times a month, what do you spend each time. Here one of the researchers inadvertently looked at the monthly stock purchased. A correction was made by going back to each form and with the researcher calculating the typical level e.g. dividing by four if a weekly purchase was evident.
- **Average transaction size and number of transactions per day**. During a series of data checks it was found in a around 20 instances that the correlation between enterprise turn over did not correlate with the transaction size times number per day times 30 days/month. Given the extend of effort by the researchers in getting the turnover figures as accurately as possible the decision was taken to bring a correction in to the average transaction size and number per day. Simply during the data analysis phase similar micro-enterprise were consulted and these numbers corrected to ensure the turnover was within 10% of a turnover calculated from the average transaction size and the number of transactions per day. Often in instances where the average number was less than one e.g. two sales per month problems with the data resulted.
- **Standardisation of electrical usage**. Micro-enterprise owner understanding of what the fridge for example would be consuming out of the monthly electrical costs was severely limited, leading to spurious data. This was solved by applying a set of standard usage amounts in kWh's for the different appliances. For example a fridge uses typically around 75 kWh per month representing a cost of R35.

5.2 Qualitative analysis

In total over the three phases of the work, more than 20 focus groups were completed, 12 stakeholder interviews, and numerous meetings in which feedback was given to the community leaders and micro-enterprise owners. A final workshop was held in Cape Town to discuss the preliminary findings of the work with experts in electrification and small business development and support services.

5.2.1 Focus Groups

Each focus group discussion had a leader and note taker from the research team, working together with two or more research assistants sharing the task of interpreting and translation. Flip charts, time lines and a variety of pictorial techniques were used to facilitate the full and relaxed participation of respondents in the discussions. One person (the session leader) introduced the questions and facilitated responses, while the other person took notes on the points raised and answers given during the meeting. After each focus group the 'raw' notes were written up together with initial thoughts on important findings and observations (see Appendix 5 – Notes from focus groups and stakeholder meetings). Key points around each question or issue from the series of focus groups at each time point in the project and for each community were noted.

The role of the qualitative work was to try to better understand the delta changes in a range of indicators that have been calculated from the quantitative gathered using the survey questionnaire and systematically collated and analysed in a consistent manner using the spreadsheet methodology described earlier. The comments of the focus groups assisted in providing explanations for how and why the measured changes occurred, and to answer the key questions posed for the research:

> **Whether** *(from quantitative) and* **How** *(from qualitative)* modern energy has an impact on the establishment and growth of micro-enterprise activity in poor communities.

5.2.2 Stakeholder interviews

In a similar way to the focus groups, the various stakeholder interviews were designed to enhance our understanding of the community and local characteristics, and additionally to enable the project team to place the research and its findings in the overall policy and development context in South Africa (and globally for a number of broader issues).

One or more of the project consultants were involved in each of these meetings, all of which were held in English. Notes were taken during the meeting were written up - Appendix 5.

5.2.3 Feedback to community

At various stages during the project, feedback about the research and the findings were provided to different groups from the communities. These included ward committee members, ward and local councillors, electricity company / contractor personnel, traditional and elected community leaders, the police (in Mfuleni only), the micro-enterprise owners, and our research assistants. Wherever contacts had been made with key local / regional individuals or organisations, this information was passed to the leaders and research assistants (for transfer to the micro-enterprise owners or other community groups as appropriate). [As a consequence of the stakeholder meetings, we were able to raise the profile of specific issues affecting the community or ones that had been highlighted by large numbers of the micro-enterprise owners, and in some cases make the vital first link on behalf of the community.]

The purpose of the feedback was to ensure that we effectively communicated our reasons for the research and shared our findings with those people who are in a position to bring about change based on the results and others who are ultimately beneficiaries (or affected by) of policies that may be influenced by the conclusion and recommendations.

These meetings with the community were not themselves documented however the issues identified and the results of our discussion with stakeholders are reported in the notes of those meetings plus those for the focus groups. Where further insight or information was gained at the feedback meetings, this has been incorporated into the overall Results and Findings of the project presented in Section 6.

6 Results and Findings

6.1 Introduction

In this section of the report, the quantitative results are presented to the reader, followed by a discussion on the findings. The findings are an interpretation of the results that incorporate the contextual understanding provided by the qualitative interview work - Appendix 5. The results and findings drew heavily on the quantitative summary - Appendix 3, which in turn are based on the processed quantitative data, provided separately as electronic spreadsheet files - Appendix 6.

The survey data has provided numerous quantitative measures that have been used to answer the question of *whether electrification did or did not have an impact on the establishment and growth of micro-enterprise in these rural and urban communities*.

However, the evidence gathered by the study reveals clearly that there is a richness and complexity both in the micro-enterprises and the wider community that need to be understood. In addition to the foreseen indicators that were in the original work plan, many additional impacts and key enablers of small business (other than electricity) have been identified and further investigated to understand their linkages / contribution. Thus, the qualitative component of the research underpinned the quantitative data and has been used in an attempt to explain *how electricity, and a number of other key enablers, contributed* to the changes and trends that were observed.

As a result of insight gained during the surveys and the large amount of qualitative information gathered, the study has also uncovered other findings that are highly relevant to ensuring that the impact of modern energy on income-generating activities can be maximised.

Both sets of findings have been structured under three different analysis subsets;

- The **number and type** of micro-enterprise found during each survey in the two communities.
- **Composite measurement indicators** developed during the first phase of the project.
- A detailed **by type analysis** that drilled down into the different micro-enterprise types.

6.1.1 Survey areas and household numbers

The section of the Mfuleni community (Area 5) was selected for the study as a result of the match between the City of Cape Town electrification plan and the project time lines. This area contained 538 separate household sites. Of these ***492 were occupied*** during the pre-electrification phase; the other 46 plots were excluded for the remainder of the project.

Ngonyama, a rural community, was selected and included in the study as a result of the match between the regional electrification plan and the project time lines. This village contained between 402 and 439 separate household sites (the number increased over the survey period). Of these ***353 were occupied*** during the pre electrification phase; the other sites were excluded for the remainder of the project.

6.1.2 Sweep data versus quantitative survey data

Two data sets have been prepared and used as the basis of the report.

Firstly the **sweep data**, which was checked and corrected by the researchers while in the community, is the basis of the micro-enterprise numbers.

Secondly, the quantitative interview data is used for all other fields, such as turnover, profit, appliance types etc. It is important to note that the data presented is often ***totals*** *and* ***averages*** for each business type, and as such were derived from the interviews with enterprise owners. In a number of business types (which differ from year to year, and depending on focus of the analysis) it was only possible to interview a subset of the enterprises and therefore the data obtained from interviewed enterprises has been extrapolated to generate average values for

the whole population for each business type. A statistical sampling rate of 81% was achieved in Mfuleni and 85% in Ngonyama. For these business types, the assumption was made that all enterprises comprising each business type were the same (this was considered to be a reasonable assumption for the purposes of this analysis and was based on accumulated knowledge across enterprises in the communities).

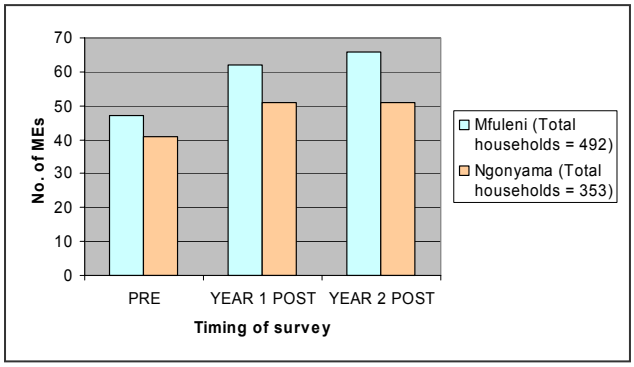
6.2 Micro-enterprise numbers

The first level of results and findings relates to an analysis of the enterprise numbers, the general change in numbers and the specific type related change over the two years following electrification.

6.2.1 Growth in micro-enterprise number

The number of households where a micro-enterprise was being operated increased significantly during the survey period in both the urban and rural community (Figure 6.1). This increase in the number of businesses was greater between the pre-electrification survey and the year 1 post-electrification survey than between the year 1 and year 2 post-electrification surveys.

Figure 6-1 No. of ME's before and after electrification



Across the whole period of the survey, there was an overall increase of 19 businesses (representing a 40% increase) in urban Mfuleni and 10 businesses (representing a 24% increase) in rural Ngonyama.

As the number of households in the two communities was different, the percentage of households containing an enterprise was also compared, to better understand whether there were any significant differences between the urban and rural contexts.

Figure 6-2 Percentage of households operating a ME before and after electrification

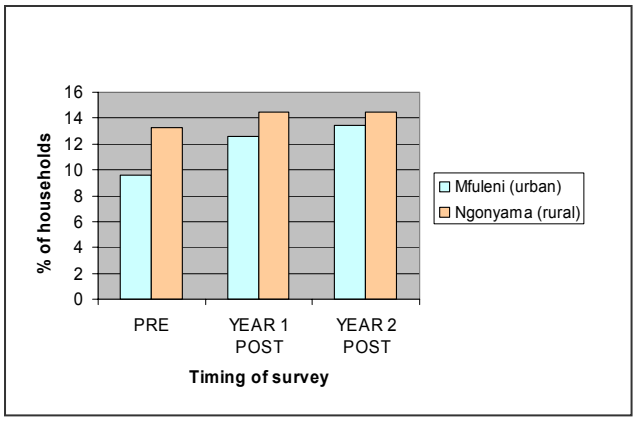


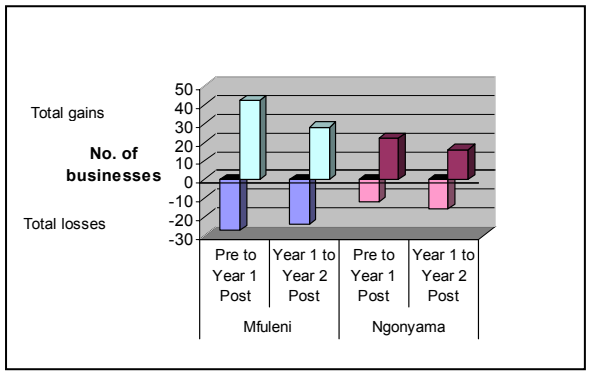
Figure 6.2 shows that the % of households operating a micro-enterprise increased after electrification but that there was a reduced urban or zero rural increase between years one and two following the arrival of electricity. The % increase in the year following electrification was greater in the rural (Ngonyama) (32%) compared to the urban (Mfuleni) (24%) community. During the following year (i.e. between one and two years following electrification) the number of micro-enterprises in the rural community remained stable and in the urban community showed a further small increase (6%).

In total over the 2 years following electrification, there was a greater % increase in the number of micro-enterprises found in the urban (40%) community compared to the rural (24%) community.

6.2.2 General micro-enterprise open/close dynamic

A significant observation that needs to be appreciated is the dynamic around the opening and closing of businesses. The above view of the total numbers of businesses found during each survey masks the general turnover of businesses. Figure 6.3 illustrates the extent of the overall changes (i.e. total gains or losses) that occurred in each of the communities over the survey periods.

Figure 6-1 Overall changes in the number of businesses



The key observations are that the overall gains in businesses were generally greater than the losses (resulting in the growth in the overall number of businesses shown in Figure 6.1) and the gains were lower and the losses higher in the period between year 1 and year 2 post-electrification compared to the previous year. This trend was observed in both the urban (Mfuleni) and rural (Ngonyama) communities, and occurred to similar extents. The exception to this was the same overall gains and losses in Ngonyama in Year 2 post-electrification leading to the stability in the number of businesses recorded (51; see Figure 6.1).

There is an even greater level of complexity within the overall gains and losses in business numbers shown in Figure 6.3 in that the net delta change for each business type can vary for different reasons. Analysis at this level of detail is provided in Section 6.2.6.

6.2.3 Changes in the sectorial profile of the businesses

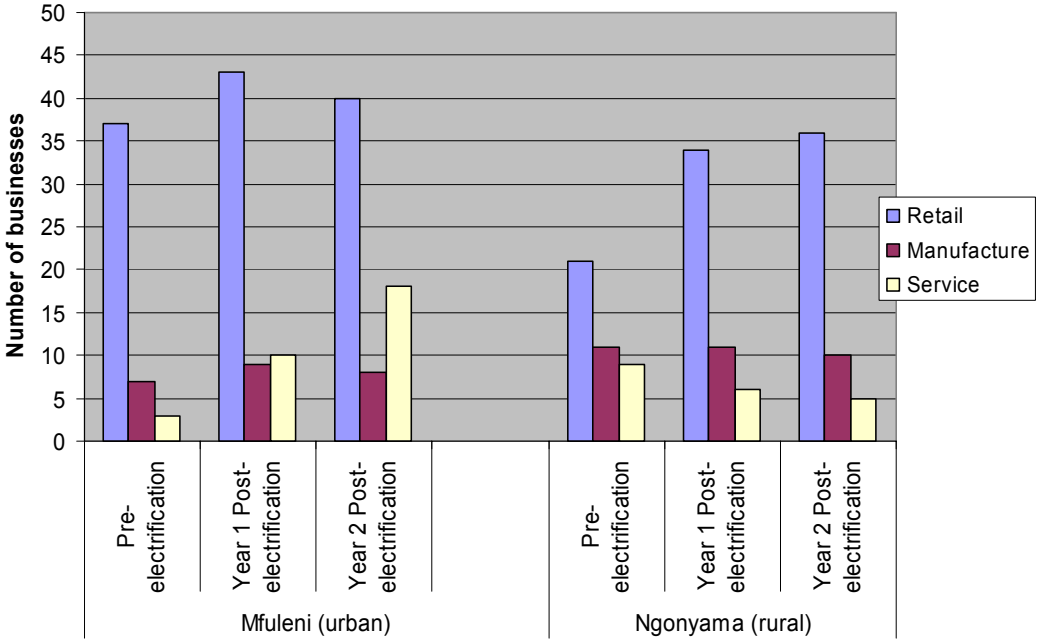
The changes and trends in the different business sectors in each community were analysed through the categorisation of each business type into **retail**, **service** or **manufacture**. This information was used to examine both the absolute numbers of businesses in each sector and the % that each sector represented within the overall business landscape. A number of these were only found in one of the communities and this is indicated in the following table; M = Mfuleni only; N = Ngonyama only.

Table 6-1 Categorisation of businesses as manufacturing, retail or services

Manufacturing	Retail	Service
• Basket making (M) • Bead work (M) • Brick maker (N) • Photo framing (M) • Sewing • Welder / fabricator (N) • Xhosa beer seller	• Clothing seller (M) • Energy (Paraffin) seller • Fruit & Vegetables • Hardware (M) • Household linens (N) • Meat seller (M) • Sales agent – crockery (N) • Shabeen • Spaza - big • Spaza - small • Tuck shop	• Braai meat (M) • Builder (N) • Cash loans (M) • Crèche (M) • Grass products (N) • Hairdresser (M) • Mechanical repairs (N) • Medicine (M) • Phone service • Shoe repair (M) • Taxi – big (N) • Taxi – small (N) • Tractor hire (N) • TV repairs (M)

Figure 6.4 illustrates the number of businesses in each sector in each community over the time period of the surveys.

Figure 6-4 Sectoral profile of businesses over time



This provides a clear indication of where growth and decline has occurred or where the number of businesses in a sector remained stable:

- Small fluctuations but relative stability in the number of businesses in the retail sector in Mfuleni was accompanied by a substantial increase (500% over two years) in the number of businesses in the service sector.
- An increase in the number of businesses in the retail sector (71% over two years) in Ngonyama together with a number of businesses in the service sector closing (and not being replaced by other service businesses) (a decrease of 44% over 2 years).
- The number of businesses classed as 'manufacturing' was essentially stable in both communities; as mentioned above, this sector was slightly more significant within the overall business profile of Ngonyama than in Mfuleni.

In Mfuleni, there is clear evidence that the establishment of new businesses in the manufacturing and service sectors diminished the initial dominance of the retail sector. In complete contrast, in Ngonyama it was the retail sector that expanded over time and businesses in the service and manufacturing sectors that closed. In relative terms the manufacturing sector played a greater role in the business profile in Ngonyama than in Mfuleni.

By the Year 2 post-electrification survey, the changes which had taken place within the three sectors had resulted in a reversal of the importance of the retail sector, with this sector dominating the overall business profile to a greater extent in Ngonyama than in Mfuleni. In contrast in the pre-electrification survey in Mfuleni, retail businesses made up almost 80% of the overall business landscape.

6.2.4 Variation in business types

Similarly this analysis provided information on which types of businesses had increased or decreased in number, any that had diversified plus the new types of businesses that had been established. The following Figures 6.5 (Mfuleni) and 6.6 (Ngonyama) provide valuable insight into the specific changes that occurred in the different business types and clearly illustrate that there was continuous fluidity of the business landscape in both communities.

There were some similarities in the business types in each community, however there were also significant differences, with a number of the businesses being context-specific:

- Urban services in Mfuleni e.g. braai meat take-away, hairdressers, shoe repairs and TV repairs.
- Rural services in Ngonyama e.g. grass products, brick maker and tractor hire.

Over the first post electrification year, the number of different business types operating in each community was stable, with a total of 15 business types being recorded (although as mentioned previously many of these were not the same type). However, in the Year 2 post-electrification survey a divergence in the number of different business types operating in the two communities was recorded; in Mfuleni there was an emergence of new businesses types in addition to others that continued to trade (with the total increasing from 15 to 20 types) whilst in Ngonyama there was a small reduction in the overall number of business types (from 15 to 14).

Figure 6-5 Enterprise number by type, Mfuleni

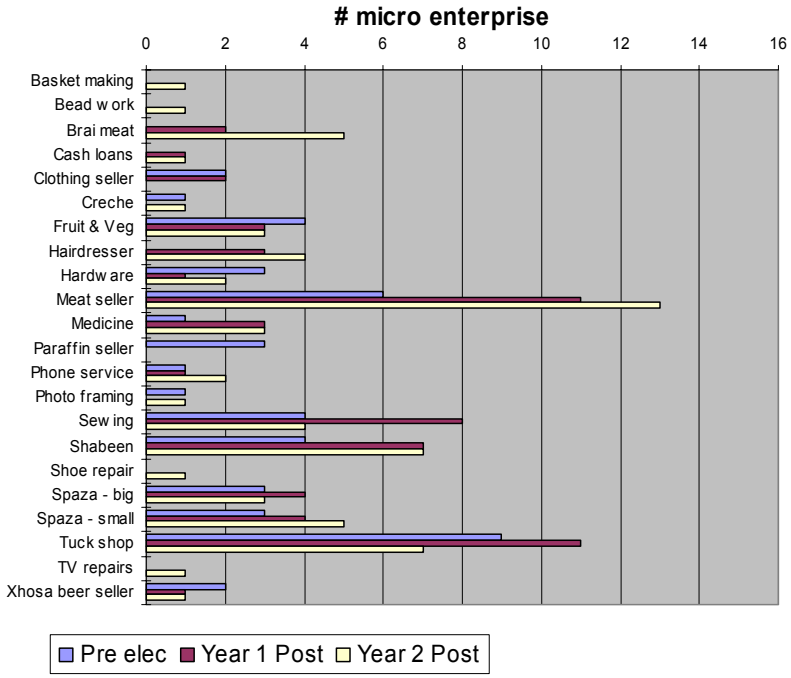
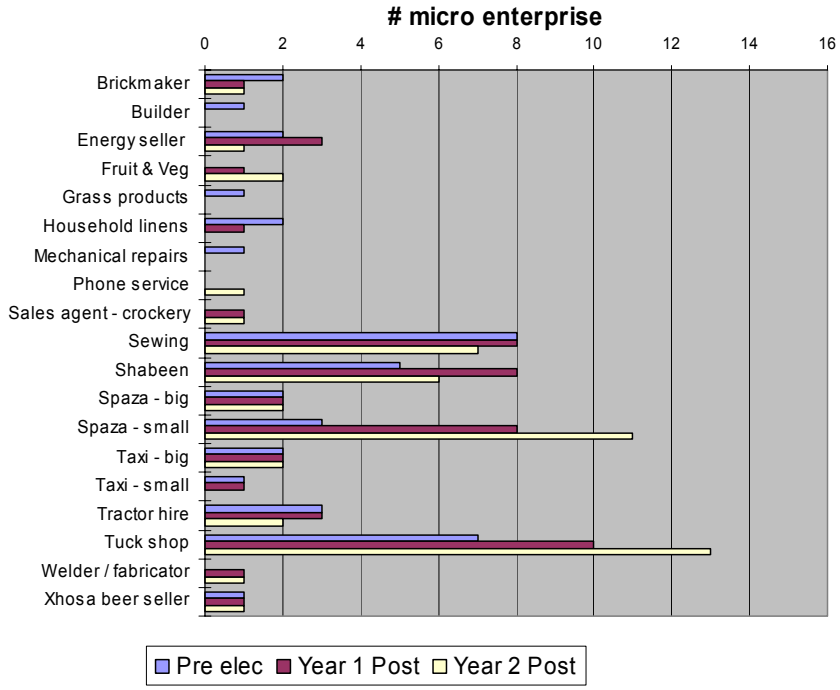


Figure 6-6 Enterprise number by type Ngonyama



6.2.5 Enterprise dominance

Comparison of the total number of micro-enterprises by type for each survey indicated a small number dominated the business landscape. The consistently dominant sector in both communities was retail and a more detailed examination of the 'top 4' enterprise types for each survey is shown in Table 6.2. Some similarity can be seen between the two communities.

Table 6-2 Top 4 business types in each survey in each community

	Pre-electrification	***Year 1 Post-electrification***	***Year 2 Post-electrification***
MFULENI (URBAN)	*Tuckshop (9)* *Meat sellers (6)* Shabeen (4) Sewing (4) Fruit & vegetable seller (4)	*Tuckshop (11)* *Meat sellers (11)* *Sewing (8)* *Shabeen (7)*	*Meat seller (13)* *Tuckshop (7)* *Shabeen (7)* Spaza – small (5) Braai meat (5)
NGONYAMA (RURAL)	*Sewing (8)* *Tuckshop (7)* *Shabeen (5)* Tractor hire (3) Spaza – small (3)	*Tuckshop (10)* *Spaza – small (8)* *Shabeen (8)* *Sewing (8)*	*Tuckshop (13)* *Spaza – small (11)* *Sewing (7)* *Shabeen (6)*

(Business types in italics were represented by the same number of enterprises)

Table 6.3 further emphasises the relative contribution of the small number of dominant business types to the overall business landscape (% of total enterprises) and to the retail sector (% of retail enterprises) in each of the communities.

Table 6-3 Dominance of a small number of business types within the total enterprises and within the retail sector in Mfuleni and Ngonyama

MFULENI	***Pre-electrification***	***Year 1 Post-electrification***	***Year 2 Post-electrification***
TOP TWO *BUSINESS TYPES Tuck shops and meat sellers* **as % of total enterprises**	*31.9%*	*35.5%*	*30.3%*
TOP TWO *BUSINESS TYPES Tuck shops and meat sellers* **as % of RETAIL enterprises**	*40.5%*	*51.2%*	*50%*
THREE *DOMINANT RETAIL BUSINESS TYPES: Tuck shops, meat sellers and shabeens* **as % of total enterprises**	*40.4%*	*46.8%*	*40.9%*
THREE *DOMINANT RETAIL BUSINESS TYPES: Tuck shops, meat sellers and shabeens* **as % of RETAIL enterprises**	*51.4%*	*67.4%*	*67.5%*

NGONYAMA	***Pre-electrification***	***Year 1 Post-electrification***	***Year 2 Post-electrification***
TOP TWO *ENTERPRISE TYPES Tuckshops and small spazas* **as % of total enterprises**	*24.4%*	*35.3%*	*47.1%*
TOP TWO *ENTERPRISE TYPES Tuckshops and small spazas* **as % of RETAIL enterprises**	*47.6%*	*52.9%*	*66.7%*
THREE *DOMINANT RETAIL BUSINESS TYPES: Tuck shops, small spazas and shabeens* **as % of total enterprises**	*29.3%*	*41.2%*	*54.9%*
THREE *DOMINANT RETAIL BUSINESS TYPES: Tuck shops, small spazas and shabeens* **as % of RETAIL enterprises**	*57.1%*	*61.8%*	*77.8%*

The 'top two' business types differ in the two communities. There is a notable absence of 'meat sellers' (enterprises selling just meat) in Ngonyama; this was in contrast to Mfuleni where this business type was consistently represented by a very high number of individual enterprises (being the largest business type in Year 2 Post-electrification) and showed the greatest expansion following the introduction of electricity. Table 6.3 clearly indicates the extent to which a small number of business types dominated both the overall business landscape and the retail sector. In Mfuleni, for example, the top two business types make up more than 30% of the total enterprise activity and grew from 40% (Pre) of the retail enterprises to 50% (Year 2 Post). In Ngonyama, there was an even narrower segmentation, with top two business types comprising ~47% (in Year 2 Post) of the total enterprise activity and ~67% of the retail enterprises.

These trends are even more strongly supported when the 'top three' business types are examined – for example in the Year 2 Post-electrification surveys, these enterprises made up 67.5% of the retail sector in Mfuleni and almost 78% in Ngonyama.

6.2.6 Changes within individual business types

The nature of the changes that occurred with regard to the number of enterprises in each business type at the different survey time points were examined in greater detail and can be classified according to the following categories:

- Numbers of enterprises in some business types that existed prior to electrification increased (over the following two years).
- New business types emerged at different times during the survey period, and there was an increase in the number of new Year 1 enterprises in some business types by Year 2.
- Numbers of some business types remained static over the survey period.
- Numbers of enterprises in some business types decreased.
- Some business types disappeared and then re-appeared.
- A small number of business types disappeared altogether.

The nature of the changes was investigated in order to better understand the contribution that electricity and electrical appliances / equipment had on the change. In some cases, other events or changes within the community was the influence and is identified.

Table 6.4 collates details of the changes that occurred within the various enterprise types and also includes, in some cases, information on the reasons why individual enterprises were faced with a significant change (down turn) in their circumstances.

Table 6-4 Changes in business type profiles over time in Mfuleni and Ngonyama

a) Business types that existed prior to electrification and increased	
Mfuleni	**Ngonyama**
• The business types that showed the greatest increases in the number enterprises by the Year 1 post-electrification survey were meat sellers (+5), sewing (+4) and shabeens (+3) • Between Year 1 and Year 2 in the post-electrification phase, there was a further (but smaller) increase in the number of meat sellers (additional +2); the number of shabeens remained the same and the number of sewing businesses fell back (-4) to the level recorded in the pre-electrification survey (see below – Table d: Numbers of enterprises in some business types decreased) • Several other existing business types increased by Year 1 Post-electrification (tuck shops +2; medicines +2) • Over the whole survey period, there was also a small and positive trend in the number of small spazas (+1 in each year) (this is in contrast to the rapid growth in the number of small spazas in Ngonyama over the same period – see opposite) • A second telephone service (mobile phone based franchises operator) had been established between the Year 1 and Year 2 Post-electrification surveys	• The business types that showed the greatest increases in the number enterprises by the Year 1 post-electrification survey were shabeens (+3), tuckshops (+3), and small spazas (+5). All these business types can benefit significantly from the use of electrical equipment and appliances • Between Year 1 and Year 2 post-electrification, there was a further increase in the number of tuckshops (+3) and small spazas (+3) [there was a reduction in the number of shabeens (-2) over the same period] • By Year 1 post-electrification, (traditional) energy sellers had increased by one enterprise (to 3); these were extremely small and their owners indicated during the follow-up interviews that they were suffering as a result of the arrival of electricity, and none of these businesses were operated by the Year 2 post-electrification survey

b) New business types that emerged at different times during the survey period	
Mfuleni	**Ngonyama**
• In the Year 1 post-electrification survey, a number of new business types were recorded; these were braai (cooked) meat take-away, cash loans and hairdressers • By Year 2 post-electrification, additional braai meat (+3) and hairdressers (+1) enterprises had been established • The greatest increase in the number of these enterprises between Year 1 and Year 2 post-electrification was observed for braai (cooked) meat stands (these are generally operated from self-built stands at the road circle, a major focus within the community for transport pick-up and drop off) • In the Year 2 post-electrification survey, a number of brand new business types had also emerged; these were TV repairs, shoe repairs, bead work and basket work and were represented by one enterprise each (all require some form of training or expertise)	• In the Year 1 post-electrification survey, a number of new business types were recorded; these were welder / fabricator (1), sales agent for crockery (1), Fruit & vegetables seller (1) • In contrast to observations in Mfuleni, only one of these new business types, fruit and vegetables seller, grew between Year 1 and Year 2 • In Year 2 post-electrification, a new phone service had been established (this operates from a booth and uses electricity provided by running a long cable from the owners home nearby) • It is also interesting to note that whilst the number of welder / fabricators remained static in the Year 2 post-electrification survey, these were in fact different enterprises (i.e. the initial one had ceased trading and an unrelated business had been established by another household in the community)

c) Number of some business types remained 'static' over the survey period	
Mfuleni	**Ngonyama**
• There were **NO** business types in which the number of individual businesses remained static over the survey period	• The number of enterprises in other business types: spaza – big (2), taxi – big (2) and xhosa beer maker / seller (1) remained static; these were all represented by only one or two enterprises, many of which operated throughout the whole period i.e. same plot, same owners

d) Business types that decreased	
Mfuleni	**Ngonyama**
• Following a significant increase in the number of sewing enterprises by Year 1 post-electrification (from 4 to 8), there was a decline to the same extent between Year 1 and Year 2 post-electrification (from 8 to 4). • The overall number of hardware businesses had declined (-2) by the Year 1 post-electrification survey but had increased again (+1) in Year 2. An interesting point to note is that within this business type there were a number of different enterprises; in the pre-electrification phase, there were 3 enterprises recorded and these were selling very specific hardware items: nails; poles, towels and nails; and glass cutter & seller. In Year 1 post-electrification these 3 had closed and a new one (a carpenter) had opened and in Year 2 post-electrification, the carpenter had closed and two new businesses had been established – one selling ceiling boards and the other selling steel wool. • One of the traditional Xhosa beer maker / sellers recorded in the pre-electrification survey had closed by Year 1 post-electrification (and did not re-open).	• 2 out of the 3 energy sellers recorded in Year 1 post-electrification were no longer conducting their businesses by the Year 2 post-electrification survey, and the remaining business was extremely marginal • The number of shabeens increased from 5 to 8 in the first year following electrification however 2 of these had closed by the Year 2 post-electrification survey (i.e. operated for less than one year). • The two household linens enterprises recorded in the pre-electrification phase had both closed by the year 2 post-electrification survey, one in each of the survey years (Both for personal reasons) • In each sewing and tractor hire, one enterprise had closed between the Year 1 and Year 2 post-electrification surveys (the sewer for financial reasons and the tractor business had moved out of the community)

e) Business types that disappeared and then re-appeared	
Mfuleni	**Ngonyama**
• From the detailed data on the location of each enterprise it is possible to determine the reason for the re-appearance (in Year 2) of a specific business type (from the Pre survey) that had disappeared (in Year 1 Post); 2 possible reasons for this were that the same household had re-started the same business on the same plot or a that a different household has established this type of business on an unrelated plot (or possibly the same plot if the original owners had moved) • In Mfuleni we had examples of both of these situations: - **Crèche** - The crèche identified in the pre-electrification survey had closed by Year 1 post-electrification (due to the owner moving away from Mfuleni) and therefore no crèches were recorded. By the Year 2 post-electrification survey a new crèche had opened at a different location within the survey area. - **Photo-framing** – The owner of this enterprise (a lady trained by her husband who was too ill to undertake the photo-framing activities) recorded during the pre-electrification survey passed away and as a result no business was being operated at the Year 1 post-electrification survey. By Year 2, one of the daughters and her father, who had recovered from his illness, had re-started the enterprise from their home (i.e. same business re-started in same location)	There were **NO** examples of a business type that was present in the Pre-electrification survey, not recorded during the Year 1 Post-electrification survey and then re-appeared in the Year 2 Post-electrification survey

f) A small number of business types disappeared altogether	
Mfuleni	**Ngonyama**
The most dramatic failure in business type was the paraffin (energy) sellers; from the 3 initial enterprises recorded in the pre-electrification survey, there were no enterprises recorded in this business type in the Year 1 post-electrification surveys, and this did not change in Year 2 [this was in contrast to Ngonyama where the number of energy sellers increased from 1 to 3 in Year 1 Post-electrification but then this decreased back to a single enterprise)	• Some business types (builder, mechanical repairs and grass products) disappeared; these were all represented by a single enterprise and closed for personal reasons i.e. a move out of the community (builder), too old and frail to continue the business (grass products) and stopping this type of work (mechanical repairs)

6.2.7 Business 'churn' and life expectancy

During the analysis it became evident that a large number of individual businesses were closing and opening; the extent of this became visible during the Year 1 'sweep' survey and prompted the introduction of a 'closure' interview form that was deployed during all subsequent quantitative surveys (i.e. Year 1 and Year 2).

It was clearly evident that over the three years there was a high level of 'churn' within the business landscapes in both communities however this was much more pronounced in Mfuleni than Ngonyama as shown in tables 6.5 and 6.6.

Table 6-5 Mfuleni – Analysis of opened and closed businesses over the survey period

Mfuleni – Analysis of businesses opened and closed		
Indicator analysed	**Number of enterprises**	**%**
Open Pre-electrification	***47***	
Closed by Year 1 Post	- 27	**57.5%** (of original 47 Open Pre enterprises)
New opened at Year 1 Post	+ 42	
Closing balance Year 1 Post	***62***	*31.9% growth in business numbers compared to pre-electrification*
Closed by Year 2 Post (from original Open Pre)	- 7	Further **14.9%** (of original 47 Open Pre enterprises)
Total of original Open Pre that had Closed by Year 2	34	**72.3%** (of original 47 Open Pre enterprises)
Closed by Year 2 Post (from new Open Year 1 Post)	- 17	**40.5%** (of 42 New Opened Year 1 Post)
Closed by Year 2 Post (from total enterprises in closing balance for Year 1)	- 24	**38.7%** (of 62 businesses in the Year 1 Post closing balance)
New opened between Year 1 and Year 2 Post	+ 28	
Closing balance Year 2 Post	***66***	*24.4% growth in business numbers compared to pre-electrification* *6.5% additional growth in numbers between Yr1 and Yr2 Post-electrification*

Table 6-6 Ngonyama – Analysis of opened and closed businesses over the survey period

Ngonyama – Analysis of businesses opened and closed		
Indicator analysed	**Number of enterprises**	**%**
Open Pre-electrification	***41***	
Closed by Year 1 Post	- 12	29.3% *(of original 41 Open Pre enterprises)*
New opened at Year 1 Post	+22	
Closing balance Year 1 Post	***51***	*24.4% growth in business numbers compared to pre-electrification*
Closed by Year 2 Post (from original Open Pre)	- 6	Further 14.6% *(of original 41 Open Pre enterprises)*
Total of original Open Pre that had Closed by Year 2	18	**43.9%** (of original 47 Open Pre enterprises)
Closed by Year 2 Post (from new Open Year 1 Post)	- 10	45.5% (of 22 New Opened Year 1 Post)
Closed by Year 2 Post (from total enterprises in closing balance for Year 1)	- 16	31.4% *(of 51 businesses in the Year 1 Post closing balance)*
New opened between Year 1 and Year 2 Post	+ 16	
Closing balance Year 2 Post	***51***	*24.4% growth in business numbers compared to pre-electrification* *Zero additional growth in numbers between Yr 1 and Yr2 Post-electrification*

The data in Tables 6.5 and 6.6 clearly illustrates that large numbers of businesses opened and closed and that, in many cases, this happened in less than one year. In addition to the closure of many of the original enterprises recorded in the Pre-electrification survey, many of the new businesses identified in the Year 1 post-electrification survey had also closed by the Year 2 survey. The latter were termed 'open-close' businesses and had also been referred to as 'necessity entrepreneurs' by one of the stakeholders interviewed in the Eastern Cape.

It is interesting to note here that a small number of the enterprises recorded in one year (either pre-electrification or Year 1) were still present the following year but had grown (e.g. a tuckshop became a small spaza), diversified (e.g. energy seller became a tuckshop) or declined (e.g. big spaza became a small spaza) into a different business type. There were also several examples of the same household turning from one business type (which we can assume had not generated sufficient income) to another, often unrelated, business. The vast majority of these were retail businesses.

As the surveys only represented a snapshot in time, it is likely that a number of other enterprises opened and closed in a relatively short space of time in between each of the surveys *(indeed on some occasions, businesses that were recorded during the initial 'sweep' survey had closed by the quantitative interviews).* Further detail from the closed business interviews showed that the actual lifetime of many of enterprises was short.

Observations on the '3 year' enterprises

Despite the high 'churn' a positive observation was the number of businesses that remained active during all three surveys. Table 6.7 lists the number and type for both communities.

Table 6-7 Summary of established businesses that operated across all three surveys

Community	# enterprises operating during all surveys	Types / numbers of enterprises
MFULENI	12 out of 47 (25.5%)	*Shabeens (3)* Fruit & vegetable seller (1) Meat seller (1) Phone shop (1) Spaza – small (1) Xhosa beer seller (1) Tuckshops (2) – one of which grew to small spaza in Year 2 and other grew to shabeen in Year 1 Spaza – big (2) – one of which declined to a small spaza in Year 2
NGONYAMA	23 out of 41 (56.1%)	*Spaza – big (2)* Sewing (5) Xhosa beer seller (1) Tractor hire (2) Shabeens (5) Tuck shop (3) – 2 of which grew to small spazas in Year 1 Taxi – big (1) Spaza – small (2) Energy seller (1)

Within this group of businesses in both communities, there is a wide diversity of business types, however each of the types is only represented by a small number of individual enterprises.

Reasons for business closure

The results from the quantitative interviews and the 'closed' business forms enabled a detailed examination of the reasons why owners made, or were forced to make, a decision to stop running their micro-enterprise.

As detailed previously, at each post-electrification survey point a considerable proportion of the businesses recorded the previously year had subsequently closed. The greatest level of business loss over the two-year survey period occurred in Mfuleni where a total of 34 of the original 47 pre-electrification businesses, representing 72.3% of the original businesses recorded, had closed. In Ngonyama, the same figure was considerably less at 43.9% (i.e. 18 out of 41). This difference is born out in the difference in the age and stability of the two communities, and the more precarious nature of the urban context (shack dwelling / cash economy).

Across the various business types, a number of individual enterprises closed. This was not always for business-related / economic reasons and the follow-up during the quantitative interviews revealed that many of the businesses had closed for personal reasons; for example in Mfuleni this included the death of the owner (picture framing) and the owners moving to another area (fruit & vegetables and crèche).

6.2.8 Findings - how electricity impacted on micro-enterprise numbers

Increase in the number of enterprises in certain business types that make use of cold appliances (fridges and freezers)

In both Mfuleni and Ngonyama there was an expansion within a number of the business types (e.g. tuckshops, spazas, shabeens, meat sellers) where the enterprises are predominantly based around the energy services of cooling, cold storage and freezing. The availability of electricity enabled the cooling of soft drinks, beer, milk and juices, storage of frozen ice lollies and ice cream, and the cold storage or freezing of chicken, meat products, sausages, etc. Positive changes were also brought to enterprises where these energy services were originally provided through the use of purchased ice, diesel or petrol generated electricity and / or appliances (fridges / freezers) operating on LPG or paraffin. A key observation was that by Year 1 post-electrification many of the tuckshops recorded in the pre-electrification survey had started to sell cool drinks, cold beer and / or meat in addition to sweets, biscuits and snacks. In some cases this 'growth' resulted in a change of business type – the changes occurring in individual enterprises is discussed in more detail in Section 6.3.

By Year 2 post-electrification, the number of enterprises selling goods that required cooling or freezing had further increased e.g. meat sellers in Mfuleni; tuckshops and small spazas in Ngonyama.

Emergence of businesses that use electrical equipment

A number of new businesses emerged that directly used electrical equipment. Many of these would have been unable to operate prior to electrification or would have had more difficulties operating using hand machines / tools or other power sources. These included:

- Hairdressers in Mfuleni (uses electric kettle for heating water for washing hair and electric hairdryers, curlers and clippers for styling hair).
- Shoe repairs in Mfuleni (using electric weldling machine for applying soles to shoes and grinding / rubbing equipment for finishing shoe repairs).
- TV repairs in Mfuleni (business unlikely to be viable without significant number of TVs in the community; using electric soldering irons and electricity required for testing audio and TV equipment that has been repaired).
- Welders in Ngonyama (their owners specifically commented that electric welding is much safer and more efficient than gas welding, and that the finished weld is more robust).
- Phone service in Ngonyama (uses electricity to power the telephone hand sets and billing equipment - provides a service for people from the community to make calls as the majority of individual households do not have fixed line phones and rely on cell phones which are more expensive).

A key observation was that in most cases these new business types were only represented by a single enterprise and that many were not established until two years after electrification. The exceptions to both of these were i) the hairdressers in Mfuleni where 3 new enterprises were recorded in the Year 1 Post-electrification survey and ii) the welders in Ngonyama where two enterprises were established with the first being recorded one year after electrification). The evidence would also suggest that factors present in Mfuleni made this context more conducive for the establishment of new business types than in Ngonyama *(more new business types were established in Mfuleni and for one of these, the hairdressers, there were four separate enterprises recorded in the Year 2 post-electrification survey).*

Existing businesses benefited from using electrical equipment (or changing to using mains electricity)

Several business types were able to begin using electrical equipment where they had previously used manual equipment or where they had used appliances powered by other fuels, such as LPG or paraffin, or other sources of electricity (i.e. batteries or generators). During the quantitative interviews a number of enterprise owners indicated that the opportunity to change to electrical equipment or from their power supplies had brought considerable benefits to their business; these included:

- Medicine sellers in Mfuleni (uses electric kettles for boiling water and electric stoves for 'simmering' medicine mixtures rather than paraffin stoves for these purposes)
- Phone services in Mfuleni (the owner of the enterprise operating prior to electrification indicated that car batteries were used to power the phones and billing machine, and that he later changed to using the electricity supply on the plot).
- Shabeens in both Mfuleni and Ngonyama (in addition to the use of fridges and freezers indicated above, these enterprise owners indicated that they used hifi systems (and in some cases TVs) to play music in order to attract and entertain their customers).
- Sewing in both Mfuleni and Ngonyama (many of the owners indicated that there were important business benefits in using electric rather than hand sewing machines, and using over locking equipment – these included being able to complete garments in a shorter time and the improved quality and strength of the stitching and finished article).

Positive impact of electric light in homes on micro-enterprise operation

The availability of electric lights at the doorway of *(more relevant in Ngonyama where each house was specifically provided with an outside light as part of the electrification infrastructure)* and inside the home had a positive impact by enabling a number of businesses to continue working after dark. Comments provided by owners during the quantitative survey indicated that the following enterprises derived considerable benefit from electric light:

- Fruit and vegetable seller (owners were confident in allowing customers to come to their homes during the evening / after dark - although most limited this to the early evening only)
- Sewing, Bead work and Basket making (having good light enables sewing to continue in the evening and into the night if necessary – there were many comments that indicated that this was particularly important if orders had to be completed quickly; sewing ladies also commented that the quality of the light was much better for working than that provided by LPG or paraffin)
- Tuck shops and spazas (both small and big) (electric light enables extended opening hours as owners are more confident about allowing customers to visit their premises due to the increased security afforded by the light; in addition residents are more willing to walk around the community after dark and therefore the number of potential customers for the enterprises that stay open has been increased)
- Shabeens (premises are brighter after dark and are therefore more inviting to potential customers; the level of security for the households operating these enterprises is much higher)

In several cases owners indicated that by having electricity in the home they were able to run a long extension lead to their business premises (e.g. a small stall / container close by) which meant that this could also be lit (a benefit both in terms of visibility to customers, increased security and longer opening hours).

Positive impact of electric street lighting on micro-enterprise operation

Electric street lighting was installed in Mfuleni as part of the electrification infrastructure whereas in Ngonyama each household was given an external light above their entrance door. The low level of crime in the rural community means that having light in the immediate vicinity around household buildings is much more important (e.g. household chores can be continued, social gathering and funerals) than increased light levels in the areas between individual plots.

The major improvements in safety and security in Mfuleni that were achieved through the installation of street lighting was enthusiastically acknowledged by all residents / business owners that were interviewed. People felt more confident in walking out in the community after dark and as a result the number of available customers for shops, etc had increased. In parallel, and as a direct result of improved security, a number of owners of businesses that could benefit from evening trade indicated that they had extended the opening hours of their shops or were now willing to allow customers to visit their homes after dark (an important difference in this regard is that the safety of residents after dark in Ngonyama was much less of an issue and as such the extension to trading hours recorded for some businesses after electrification was related to the availability of light itself).

In Mfuleni, the existence of trading places in areas that were lit after dark specifically benefited a number of business types and individual enterprises. The stalls of the braai / cooked meat sellers were only located around the traffic circle at one of the main entry points into the survey area. They operated in the afternoon and early evening and although each stall used a paraffin lamp or candles after dark, the high and very bright street lights on the circle gave a generally high level of illumination and improved the level of safety and security in the immediate area.

It is possible that a number of other businesses on the circle (e.g. fruit and vegetable sellers, hairdressers, shoe repairs) also benefited from the availability of street light after dark however many of these also had their own electricity supply and used electric lights and equipment.

Possible negative effect of electricity on the viability of specific business types

The availability of electricity in the communities was considered to have had a negative effect on one particular business type originally recorded during the pre-electrification survey – energy / paraffin sellers. These were present in both communities although differing slightly in that those interviewed in Ngonyama were also selling other 'fuel' related items such as candles and small boxes of matches in addition to paraffin in small quantities (e.g. 500ml / 1 litre at a time).

There are differences in the way the market for paraffin contracted as a result of the provision of electricity to the households in the two communities. In Mfuleni, this business type had disappeared by Year 1 Post-electrification and did not re-appear in the Year 2 Post survey. This was in contrast to observations in Ngonyama where the number of energy sellers increased in Year 1 Post (3) and one of these was still operating in Year 2 Post (1), and where there were a high number of small spazas that sold paraffin in addition to other meat, groceries, etc. Many of our respondents in the quantitative survey from both communities indicated that they still regarded paraffin as their 'backup' energy source and that this was particularly useful for space heating.

The vulnerability of all of these businesses (those existing in the pre-electrification phase and new entrants) would have been significantly increased by the arrival of electricity and the fact that supplies in both communities have proved to be extremely reliable over the time period of our investigations.

6.2.9 Findings - Factors impacting micro-enterprise numbers

Retail expansion factors

The business landscape was dominated by the retail sector, through a small number of business types selling primarily food and drink items – tuck shops, meat sellers (referring to Mfuleni only, where this was the only product sold by these enterprises), braai / cooked meat sellers (again only Mfuleni), small spazas and shabeens.

Firstly, these local retailers providing a local service that enables 'convenience' shopping by members of the community and also helps customers by eliminating the time and costs of travel and transportation of goods home, coupled with the opportunity to purchase on credit. Community members will be able to obtain credit locally for purchases based on personal relationships and geographic closeness, whereas in town no credit is available. However, feedback showed that community members do not automatically use these shops and carefully consider whether it is advantageous to buy locally by comparing the price of goods in town taking into account taxi / bus fares with prices at various shops in the community.

Secondly, there is a low barrier to entry for retail businesses including; the ability to start trading with relatively small amounts of stock purchased in bulk from wholesalers (and therefore capital), no requirement for specific technical training, a general familiarity with the products (such as snacks, drinks and other groceries) and a perception (through observation of their neighbours and people in other communities) that these businesses are easy to operate. No specialised skill or equipment is required compared to the service or manufacturing businesses. Can be operated within existing household premises with household equipment e.g. fridge, drinking glasses, lounge area etc.

Economically the goods that are purchased from retailers in the community allows for one turn of the expenditure through the community (leaving the profit or mark up in the community) before reaching the wholesalers external to the community. A small number of the larger spaza shops also act as wholesalers and supply small quantities of goods for some of the tuckshops. However they have not been categorised as wholesalers since this is not their primary business.

Limited increase in business types where large capital outlay or technical skills are needed to operate an enterprise

New entrants and increases in the numbers of enterprises were much more limited in business types where establishment, maintenance and operation required large capital outlay, specialist skills / training and dedicated premises. These business types included many of the manufacturing activities (e.g. sewing, bead work, basket making, grass products, Xhosa beer making, photo framing, brick making), a number of the services (e.g. taxis - both small and big, phone services, welding, TV repairs and shoe repairs) and the larger retail enterprises (specifically the larger spazas and shabeens). The need for skills and experience, and in some cases large financial resources, are likely to preclude the majority of people / households in the community from starting this type of business.

Necessity based businesses

The high level of business 'churn' focused the analysis on the factors driving this trend. In the majority of these situations the role that micro-enterprise play as coping strategy for poverty alleviation became clearly evident. In most cases there was a direct link between the need for entrepreneurship and family circumstances.

Factors included:

- The availability of money within the family to buy stock to operate the family retail business. Examples were found where cash demands (such as funeral payments) were met through the sale of stock without holding a reserve for repurchase.
- Often tenuous job opportunities, short term labour contracts providing income for periods followed by periods with no work. During these times the breadwinners would fall back on a retail enterprise activity.

Lessons from the successful 3 year operational businesses

The long-term stability of these businesses is related more to the entrepreneurship, drive and capability of the owners rather than the business type, given the broad spectrum or the availability of electricity. In most cases these businesses welcomed the arrival of electricity, as it made the operation of the businesses easier and improved the quality of service. Plus they were capable of exploiting the new opportunities and would be more likely to seek out and acquire the relevant appliances / equipment.

The role that entrepreneurship, drive and capability of the owners play in the success or 'sustainability' of the businesses cannot be underestimated.

Community movement

Both of these communities have a regular inflow and outflow of residents with a moderate rate of household mobility; this is particularly true for Mfuleni. In most instances the micro-enterprises moved to another location with them.

Although there is no evidence of businesses being bought or sold, a number of plots in both communities have changed hands during the survey period. This was much more prevalent in Mfuleni; this was a newly established community and a number of families had moved back to their villages in the Eastern Cape selling their plots / shacks in Mfuleni

Business failure

In *Mfuleni* regarding the business closures, apart from the paraffin sellers, the main reasons for closure were not related to electricity. Reasons were more to do with family circumstances, illness and death of proprietors, people moving away and running out of working capital. There was evidence of a high level of business imitation where businesses were started to copy the business activities of neighbours in trying to boost meagre family

incomes. Many were tuckshops or were selling cool drinks and ice cream linked to a household refrigerator. With the proliferation of such activities the market became diluted and competition more fierce that further diminished the viability of these new start ups and the existing small traders hence leading to further closures. It appeared that several survivalist businesses are related to a breadwinner in the household who provides the necessary cash float to fund the business. When money is needed for other family expenditure with these being such hand to mouth activities, the business closes only to start up again later when more money is again available.

In *Ngonyama* the level of manufacturing has decreased slightly 9% and services enterprises quite significantly over the three surveys 44%. However a careful look at these closed businesses revealed that the closure was not related to the arrival of electricity, rather factors such as owners moving away from the village, movement of the business to other areas such as one of the tractor businesses, switching to other endeavours, and personal circumstances.

The increase of businesses with little competitive differential advantage was significant. Many were tuckshops or were selling cool drinks and ice cream linked to a household refrigerator. With the proliferation of such activities the market became diluted and competition more fierce that further diminished the viability of these new start ups and the existing small traders hence leading to further closures.

Other business survival enabling elements include the business skill of the proprietor, access to the local market and suppliers, reputation in the community and the ability to sustain the granting of credit especially in the retailing types of business. The degree of competition and the uniqueness of the business also play a role. It is notable that the Xhosa Beer producer and seller, the 2 large Spaza's survived across the whole research period.

6.3 Change in micro-enterprise composite indicators

The second set of findings relate to composite indicators that were developed as part of the project methodology and prepared for both communities. These included:

- Micro-enterprise activity measures.
- Sustainable livelihood measures.
- Energy and equipment measures.
- General measures.

6.3.1 Micro-enterprise activity measures

The first set of composite indicators for review is the micro-enterprise activity measures. These are shown below in tables 6.8 and 6.9. Main findings from the results are:

- The increasing number of micro-enterprise in the community corresponds with a decrease in the number of households per enterprise. In real term the numbers indicate that from every 10.5 households to every 7.5 households a business will be found. The arrival of electricity did correspond with the increase in the number of micro-enterprise.
- Following electrification there was a major 58% increase in the total micro-enterprise turnover, followed by a reduction of 14% or 36% overall. The turnover per enterprise will show an initial increase of 20% before falling 19%. From the by type analysis it was observed that more than half of the business types decreased in total turnover in the second year after electrification, indicating a general trend. The primary reason for the decrease during the second year is the higher levels of competition from surrounding areas and easier access to the main road resulting in more 'outside the community' purchasing.

Table 6-8 Mfuleni micro-enterprise activity measures

Mfuleni ME activity measures - Net Change or Delta							
#	Individual indicators	Pre Elec	Year One	Year Two	Year 1	Year 2	Year 1 & 2
1	Number of households per enterprise	10.5	7.9	7.5	-24%	-6%	-29%
2	Total ME Turnover for the community	R164,066	R259,187	R223,735	58%	-14%	36%
3	Enterprise turnover per community household	R333	R527	R455	58%	-14%	36%
4	Enterprise profit per community household	R80	R116	R122	45%	5%	53%
5	Enterprise turnover per enterprise	R3,491	R4,180	R3,390	20%	-19%	-3%
6	Enterprise profit per enterprise	R833	R919	R910	10%	-1%	9%
7	People employed per community household	0.15	0.18	0.20	21%	10%	32%
8	People employed per enterprise	1.58	1.45	1.49	-8%	3%	-6%
9	Productivity (Income/person hours)	R19	R16	R14	-16%	-13%	-27%
10	Average Stock value per enterprise	R684	R1,163	858.6	70%	-26%	26%
11	% of customers internal to community	93%	97%	91%	5%	-7%	-2%
12	% of customers external to community	7%	3%	9%	-62%	245%	32%
13	Average transaction size	R19	R46	R47	142%	2%	148%

- The profit per enterprise can be seen to increase by 10% and then decrease by 1%. From an understanding of the growing range of goods stocked and services provided the enterprises are able to improve profitability following electrification.
- Little employment is evident despite the number of enterprises increasing. Noting that the business owner has been counted as an employee (is remunerated by the business) in the per household measure. Most businesses tended to be run only by the owner with some help by a family member. Hence, the job creation possibility through the micro-enterprises is not clearly evident.
- Productivity has actually decreased as a direct result of additional hours worked, possible through more evening operations with the help of lights and the lowering turnover levels in the second year
- Little change in the split of the customer base between those from within and those without the community (91%). Clear evidence of the insular nature of these businesses even in the urban setting of Mfuleni. This has a major direct link to a constrained market – turnover can only come from within the community, which is in turn constrained.
- A significant jump in transaction size is evident between pre-electrification and year one (142%). Here the change in nature in the business types is evident.

Table 6-8 Ngonyama micro-enterprise activity measures

Ngonyama ME activity measures - Net Change or Delta							
#	Individual indicators	Pre Elec	Year One	Year Two	Year 1	Year 2	Year 1 & 2
1	Number of households per enterprise	8.6	6.9	6.9	-19%	0%	-19%
2	Total ME Turnover for the community	R259,593	R316,030	R327,601	22%	4%	26%
3	Enterprise turnover per community household	R737	R895	R928	21%	4%	26%
4	Enterprise profit per community household	R333	R340	R339	2%	0%	2%
5	Enterprise turnover per enterprise	R6,332	R6,197	R6,552	-2%	6%	3%
6	Enterprise profit per enterprise	R2,856	R2,354	R2,391	-18%	2%	-16%
7	People employed per community household	0.27	0.27	0.13	0%	-53%	-53%
8	People employed per enterprise	2.29	1.84	0.89	-20%	-52%	-61%
9	Productivity (Income/person hours)	R33	R39	R41	17%	6%	24%
10	Average Stock value	R400	R503	R695	26%	38%	74%
11	% of customers internal to community	83%	86%	87%	3%	1%	4%
12	% of customers external to community	17%	14%	13%	-14%	-7%	-20%
13	Average transaction size	R78	R81	R77	5%	-5%	-1%

- The increase in number of micro-enterprise in the first year after electrification in the community again corresponds with a decrease in the number of households per enterprise. In real term the numbers indicate that from every 8.6 households to every 6.9 households a business will be found (similar to Mfuleni 7.5). The arrival of electricity did correspond with the increase in the number of micro-enterprise.

- Following electrification there was a major 22% increase in micro-enterprise turnover, followed by a further -% or 26% overall. The turnover per enterprise will show an initial decrease of -2% before gaining 6%. These figures show the average business size remained constant, but the overall number increased resulting in overall community level increase in total turnover. It is important to note the turnover per household was more than double in rural Ngonyama.
- The profit per enterprise can be seen to initially decrease by 18% and then increase by 2%. A possible reason for the decline in profitability is the greater competition in the community which sparked a price reduction cutting into margins.
- Employment is seen to decrease in both measures over the three surveys. Overall the increase in the number of businesses has corresponded to a reduction in employment opportunity.
- Productivity has increased in the case of Ngonyama.
- The sale to customers internal to the community increased, with 87% internal to the community during the last survey. Again clear evidence of the insular nature of these businesses even in the urban setting of Mfuleni and a market constraint.
- Little change in transaction size is evident.

6.3.2 Sustainable livelihood activity measures

The second set of composite indicators for review is the sustainable livelihood measures. These are shown below in tables 6.10 and 6.11. Main findings from the results are discussed below the tables.

Table 6-9 Mfuleni livelihood activity measures

Mfuleni Sustainable Livelihood activity measures - Net Change or Delta							
#	Individual indicators	Pre Elec	Year One	Year Two	Year 1	Year 2	Year 1 & 2
1	Employees income per community household	R6	R7	R2	7%	-74%	-72%
2	Owners income per enterprise	R729	R888	R857	22%	-4%	17%
3	Owners household income per enterprise	R834	R919	R910	10%	-1%	9%
4	Enterprise owners per community household	9%	11%	13%	28%	13%	45%
5	Involvement of owner family members	29%	21%	33%	-26%	56%	15%
6	Community based ownership	94%	91%	96%	-3%	6%	3%
7	Female enterprise ownership	77%	84%	72%	8%	-14%	-7%
8	Male enterprise ownership	23%	16%	28%	-29%	75%	24%

- Employment of staff by the community micro-enterprises is very small with the owner and perhaps family members receiving most benefit of any benefit from profit. The average per household of between R7 and R2 is virtually negligible. Minimal employment was created outside the business owner and their immediate family.
- Owners income, while increasing in total value, due to an increasing number of micro-enterprises, nevertheless was constrained within a range of R729 to R888 per month.
- The number of micro-enterprise owners per community household rose from 5 to 13% over the three surveys.
- Female ownership dominated throughout, with a further growth in the first year, before falling back to below the pre electrification level. Immediately after electrification the substantial increase of retailers led to higher female ownership, but this then receded as many of these failed given the limited market.

Table 6-10 Ngonyama livelihood activity measures

Ngonyama ME activity measures - Net Change or Delta							
#	Individual indicators	Pre Elec	Year One	Year Two	Year 1	Year 2	Year 1 & 2
1	Average employees income per community household	R26	R27	R30	1%	12%	13%
2	Average owners income per enterprise	R2,856	R2,354	R2,391	-18%	2%	-16%
3	Average owners household income per enterprise	R3,154	R2,525	R2,734	-20%	8%	-13%
4	Enterprise owners per community household	11%	14%	14%	26%	0%	26%
5	Involvement of owner family members	37%	35%	33%	-4%	-6%	-9%
6	Community based ownership	100%	100%	100%	0%	0%	0%
7	Female enterprise ownership	67%	71%	78%	7%	9%	16%
8	Male enterprise ownership	33%	29%	23%	-14%	-21%	-33%

- Employment of staff by the community micro-enterprises is higher than Mfuleni but remains small with the owner and perhaps family members receiving most financial benefit. The average per household grew from R26/month to R30/month showing a small growth. A small number of staff do benefit from micro –enterprise in the community.
- Average owner's income decreased by 16% but increase across the community, due to an increasing number of micro-enterprises. A comparison with the Mfuleni figures shows average owners income in Ngonyama as 2.8 times higher!
- The number of micro-enterprise owners per community household rose from 11 to 14% over the three surveys.
- Female ownership again dominated throughout, with a further growth in the levels after electrification (up from 67% to 78%). Interestingly, similar levels to Mfuleni.
- No significant increase following electrification is evident, rather extraneous factors have halved the average levels.
- Female enterprise ownership continued to increase, most likely due to the spare time retail focus
- Male ownership showed a steady decrease following electrification, from 33% to 23%.

6.3.3 Energy and equipment measures

The third set of composite indicators for review is the energy and equipment measures. These are shown below in tables 6.12 and 6.13. Main findings from the results are discussed below the tables.

Table 6-12 Mfuleni energy and equipment measures

Net Change or Delta							
#	Individual indicators	Pre Elec	Year One	Year Two	Year 1	Year 2	Year 1 & 2
1	Electricity consumption per enterprise	R0.00	R39.98	R40.39	na	1%	na
2	LPG consumption per enterprise	R15.45	R0.00	R0.00	-100%	na	-100%
3	Paraffin consumption per enterprise	R21.08	R5.31	R10.20	-75%	92%	-52%
4	Wood consumption per enterprise	R3.06	R11.45	R10.20	274%	-11%	233%
5	Ice consumption per enterprise	R60.82	R0.00	R0.00	-100%	na	-100%
6	Average fuel cost per enterprise	R101.54	R56.82	R52.01	-44%	-8%	-49%
7	Energy importance average	3.6	4.3	4.4	18%	2%	21%
8	% Businesses using electric equipment	3%	93%	89%	2779%	-4%	2674%

Appliance penetration	Pre elec	Year One	Year Two
Equipment penetration - Refrigerator/freezer "coolbox" use ice - Manually calculated totals	8	0	0
Equipment penetration - Parafin lamps - Manually calculated totals	23	0	0
Equipment penetration - Candles - Manually calculated totals	1	0	0
Equipment penetration - LPG Fridge/Freezer - Manually calculated totals	3	0	0
Equipment penetration - Paraffin cooker - Manually calculated totals	4	0	0
Equipment penetration - Radio/ juke box/hifi (battery) - Manually calculated totals	2	0	0
Equipment penetration - Electric Refrigerator/freezer - Manually calculated totals	0	46	46
Equipment penetration - Electric lights - Manually calculated totals	0	43	34
Equipment penetration - Manual sewing machine - Manually calculated totals	3	2	1
Equipment penetration - Electric sewing machine - Manually calculated totals	0	6	4
Equipment penetration - Wood braai - Manually calculated totals	3	3	5
Equipment penetration - Electric Hairdryers, clippers, tongs - Manually calculated totals	0	3	4
Equipment penetration - Radio/juke box/hifi - Manually calculated totals	0	5	6
Equipment penetration - Electric Kettle - Manually calculated totals	0	4	3
Equipment penetration - Electric Jigsaw/grinder - Manually calculated totals	0	1	2
Equipment penetration - Electric Stove/microwave oven - Manually calculated totals	0	2	4
Equipment penetration - Generator driven Electric lights - Manually calculated totals	2	0	0
Equipment penetration - Generator driven Refrigerator/freezer - Manually calculated totals	5	0	0
Equipment penetration - Generator driven HiFi - Manually calculated totals	1	0	0

- The most notable measure was that 93% of the businesses after the first year were using electricity and that this had declined marginally to year 2 to 89%. This is largely because of the increase in braai meat sellers who traditionally use wood.
- While the monthly cost of electricity naturally increased the average fuel/energy costs per month declined to half. Significant decline in inferior, unsafe and dangerous paraffin.. LP Gas usage and ice usage was made redundant by the introduction of electric refrigerators after electrification.
- There had been a steady increase in the importance of energy to the micro-enterprise owners, from 3.6 to 4.4 out of 5.
- Electric lighting showed a significant increase from 25 paraffin lamps to 34 electric lights, with a corresponding benefit to the micro-enterprises. Plus fridges increase from 11 to 46.

Table 6-13 Ngonyama energy and equipment measures

Net Change or Delta							
#	Individual indicators	Pre Elec	Year One	Year Two	Year 1	Year 2	Year 1 & 2
1	Electricity consumption per enterprise	R0.00	R22.90	R45.51	na	99%	na
2	LPG consumption per enterprise	R24.13	R6.29	R0.85	-74%	-87%	-96%
3	Paraffin consumption per enterprise	R4.85	R1.90	R2.56	-61%	35%	-47%
4	Wood consumption per enterprise	R2.22	R19.05	R9.87	757%	-48%	344%
5	Other Fuel consumption per enterprise	R16.13	R0.95	R0.64	-94%	-33%	-96%
6	Average fuel cost per enterprise	R47.93	R51.09	R59.44	7%	16%	24%
7	Energy importance average	3.1	4.3	4.9	40%	15%	61%
8	% Businesses using electric equipment	6%	67%	83%	1100%	24%	1385%

Appliance penetration	Pre elec	Year One	Year Two
Equipment penetration - LPG/paraffin Fridge/freezer - Manually calculated totals	10	2	2
Equipment penetration - Parafin lamps - Manually calculated totals	11	0	0
Equipment penetration - Electric Fridge/freezer - Manually calculated totals	0	15	28
Equipment penetration - Electric lights - Manually calculated totals	0	30	46
Equipment penetration - Manual sewing machine - Manually calculated totals	8	4	2
Equipment penetration - Electric sewing machine - Manually calculated totals	0	5	8
Equipment penetration - Electric Radio/TV - Manually calculated totals	1	4	6
Equipment penetration - Drill/welder/grinder - Manually calculated totals	0	3	3
Equipment penetration - Generator - Manually calculated totals	2	0	0

- Percentages of businesses using electric equipment went up from 6% to 67% and on to 83% - substantial electricity conversion. There was greater reliance on electricity by the micro-enterprises from post electrification year 1 to year 2. From the qualitative research it can be deduced that this was due to owners still saving up for new electrical equipment or the conversion of non electric appliances such as manual sewing machines.
- Fuel costs increased over the period, primarily due to an increase in electricity usage for fridges, lighting and so forth. Plus an initial low usage of energy in micro-enterprises before electrification.
- The ranking of the importance of energy by respondents increased over each of the three surveys, 3.1 to 4.3 then 4.9 out of 5.Thus, the business proprietors themselves perceived energy to be of increasing importance. The coming of electricity and the practical impact this had on the various businesses is the singular factor that occurred during the life of the survey to impact such perceptions.
- Electric lighting showed a significant increase from 11 paraffin lamps to 46 electric lights, with a corresponding beneficial to the micro-enterprises. Plus fridges increase from 11 to 28.

6.3.4 Other Activity Measures

The last set of composite indicators for review is a number of general measures. These are shown below in tables 6.14 and 6.15. Main findings from the results are discussed below the tables.

Table 6-14 Mfuleni other measures

Mfuleni other activity measures - Net Change or Delta							
#	Calculated indicator	Pre Elec	Year One	Year Two	Year 1	Year 2	Year 1 & 2
1	Percentage of original owners	100%	100%	100%	0%	0%	0%
2	Average educational level	6	8	7	32%	-7%	24%
3	Average yearly activity	81%	77%	63%	-5%	-17%	-21%
4	Average area of premises meters sqd	13	10	10	-26%	5%	-22%
5	Percentage of businesses giving credit	81%	80%	81%	0%	0%	0%
6	Credit % of turnover	35%	24%	59%	-31%	143%	67%
7	Bad debt %	10%	8%	12%	-27%	62%	19%
8	% of enterprise having a bank account	26%	13%	12%	-52%	-2%	-52%
9	Adjuged percentage with growth potential	87%	91%	88%	5%	-4%	1%

- No enterprises were sold or purchased.
- Small change in average educational level.
- Credit was given by a major portion 80% of the businesses. Plus the % of turnover sold on credit increased substantially from year 1 to year 2 from 24% of turnover to 59%. Bad debts had also risen from 8 to 12% in the same period.
- Number of businesses utilising a bank account decreased from 26 to 12%.

Table 6-15 Ngonyama other measures

Ngonyama other activity measures - Net Change or Delta							
#	Calculated indicator	Pre Elec	Year One	Year Two	Year 1	Year 2	Year 1 & 2
1	percentage of original owners	100%	100%	100%	0%	0%	0%
2	Average educational level	6.1	6.6	6.7	7%	2%	9%
3	Average yearly activity	75%	77%	75%	3%	-3%	0%
4	Average area of premises	17.7	19.7	20.1	11%	2%	14%
5	Percentage of businesses giving credit	67%	79%	77%	18%	-2%	15%
6	Credit % of turnover	27%	24%	23%	-11%	-4%	-15%
7	Bad debt %	8%	6%	4%	-29%	-34%	-53%
8	Percentage of enterprise having a bank account	19%	31%	33%	59%	8%	71%

- No enterprises were sold or purchased.
- Small change in average educational level.
- Credit was given by an increasing number of the businesses, up to 77%. Plus the % of turnover sold on credit decreased marginally to 23% from 27%. Bad debts had decreased from 8 to 4% in the same period.
- Number of businesses utilising a bank account increased from 19 to 33%.

6.4 Analysis by business type

In the previous section, the results and findings that were presented examined the changes that took place within the overall micro-enterprise population using a wide range of indicators. These included turnover, profit, productivity, ownership, energy use, equipment use, employment, sales internal versus external to the community, and many others.

A more detailed analysis of key economic and energy / equipment use indicators was undertaken at the individual business type level in order to better understand the changes that

occurred over the survey period and how the different business types responded to the provision of electricity.

Throughout, the reader is reminded that the figures were all collected at three points in time – essentially snapshots of micro-enterprise activity over the two year period (pre-electrification, year 1 post-electrification and year 2 post-electrification).

6.4.1 Turnover and profit

The economic status of individual households in both Mfuleni and Ngonyama is dependent to differing extents on a number of different income sources. These usually include one of more of the following: formal employment, informal / casual employment, micro-enterprise activity, welfare grants (e.g. pension, child support, foster parenting, disability and others) and pension (occupational, old age or both). In this section, data on turnover and profitability (generation of a surplus) for each of the business types is examined.

Total turnover by business type

Figure 6.7 presents the **total** relative monthly turnover for each of the business types in Mfuleni and Ngonyama at the three survey time points. There are clear overall differences between the changes that occurred in the two communities.

Figure 6-7a Total Monthly Turnover by Business Type - Mfuleni

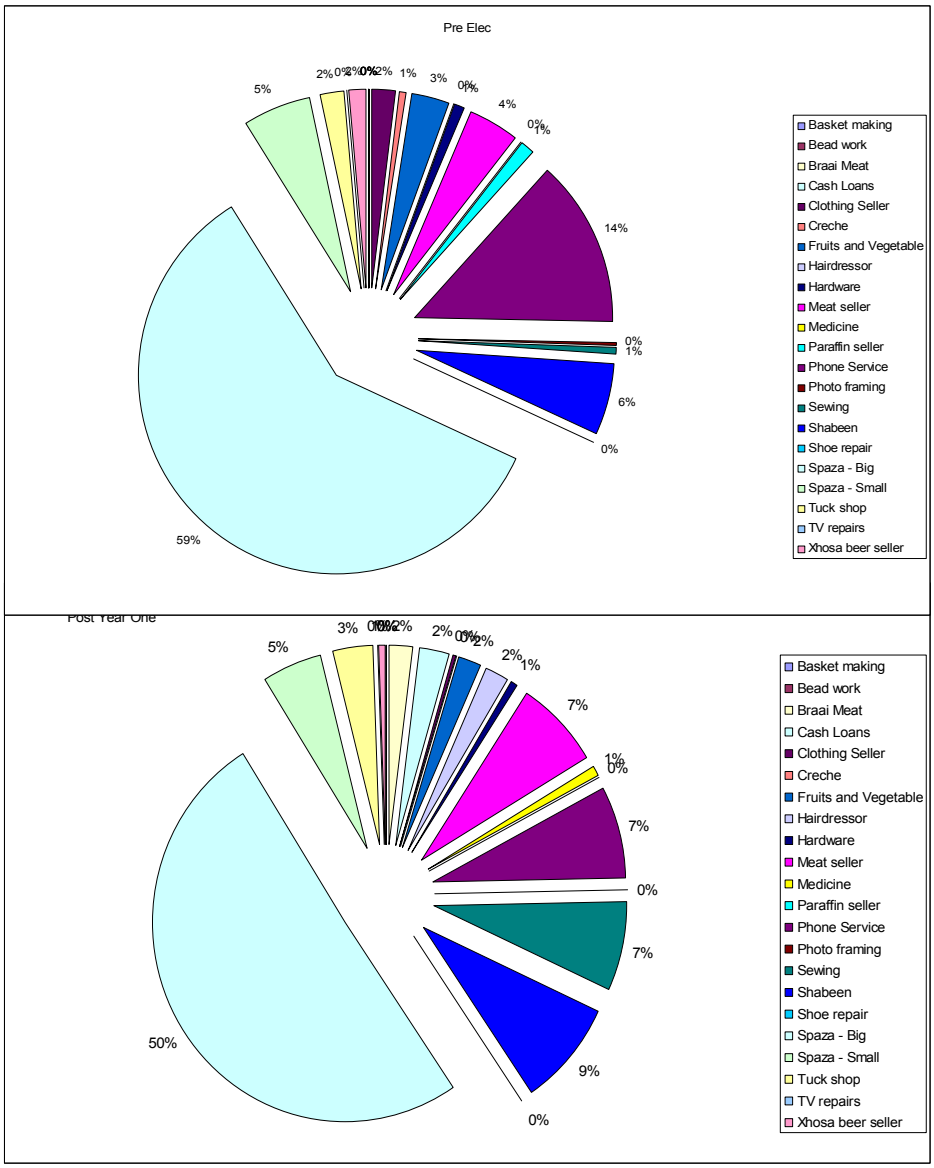
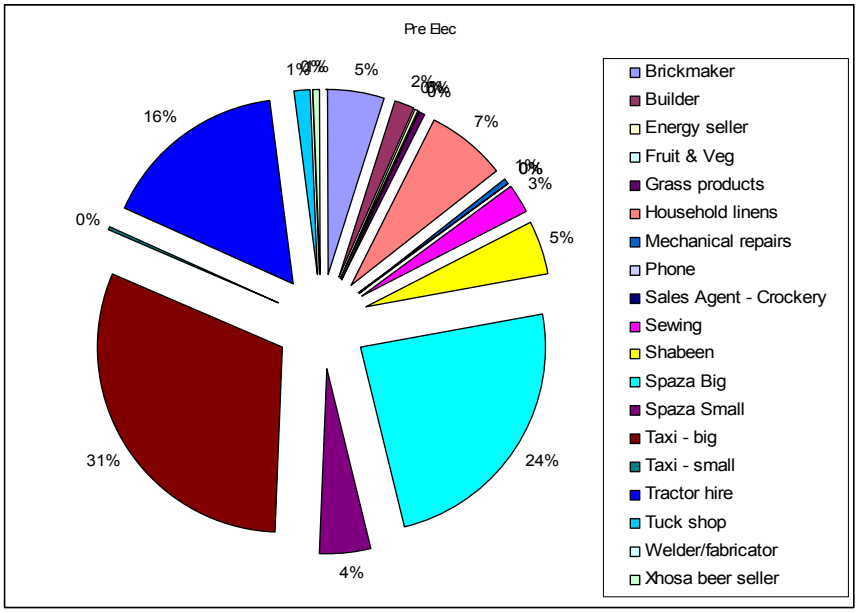
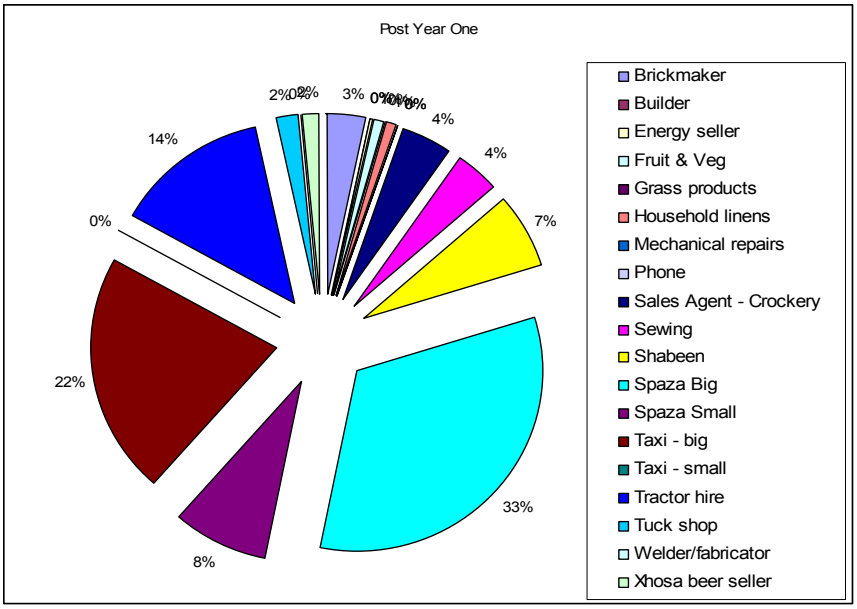
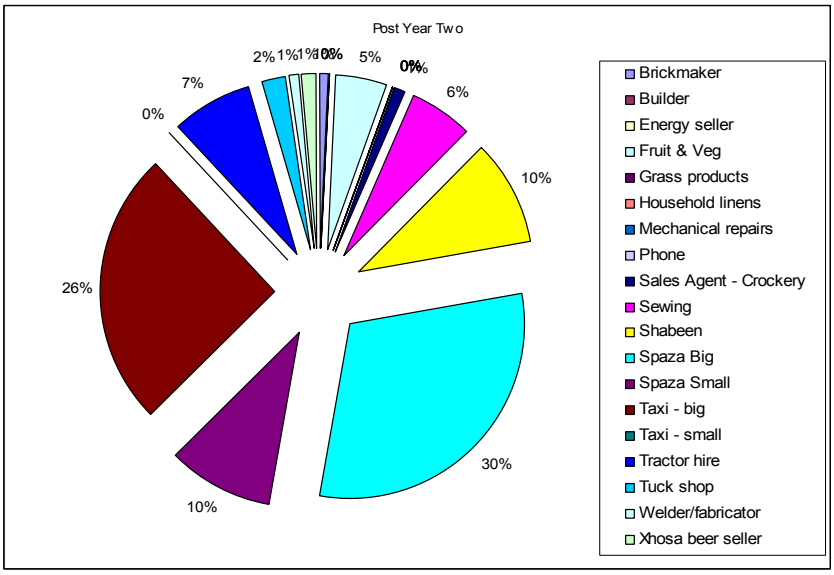


Figure 6-7b Total Monthly Turnover by Business Type - Ngonyama







In Mfuleni a major proportion of the total turnover pre-electrification was associated with one business type; Spaza – Big (59%) with the second highest contributor being considerably less - Phone service (14%). None of the remaining business types had more than a 6% share of the total turnover, confirming the predominance of retail business types – Shabeen (6%); Spaza – small (5%) and Meat sellers (4%).

Following electrification, the share of the total turnover changed with more business types having a greater share of the total. Lowering the dominance by the Spaza - Big type and this change was accompanied by a growth in total turnover for the Spaza – Small and other similar retail enterprises.

In Ngonyama, the dominance of a small number of business types is still evident, however there is no one business type associated with the majority of the turnover (as in Mfuleni in the first two survey years). The proportion of the total turnover achieved by Taxi – big (22 – 31%) and Spaza – big (24 – 33%) remains relatively stable over the three years. The total turnover of some business types decreased as a result of closure of one or more enterprises (e.g. Tractor hire, Households linens, Brickmaker) whilst a number of others increased (Spaza – small, Shabeen, Fruit & Vegetables and Sewing). [For this specific reason, the total turnover / profit of each business type in monetary terms (Rands) has not been examined, only % share of turnover and profit between the various business types]

The dominance of the retail sector in both communities in terms of numbers of individual enterprises has been previously discussed (Sections 6.2). The data presented in Figure 6.7 indicates that this also extends to the value of the sales (turnover) in that the majority of those business types that maintained or increased their contribution to total turnover were retail.

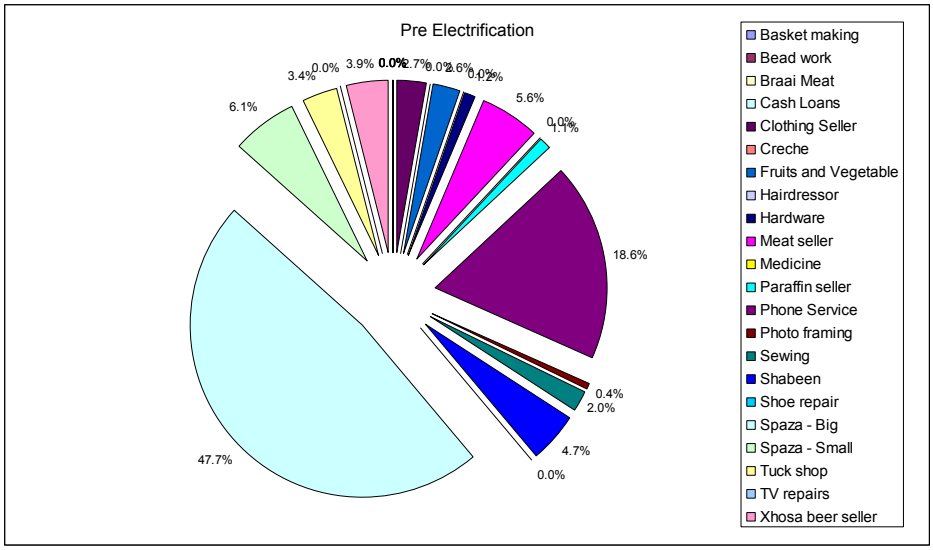
Total profit by business type

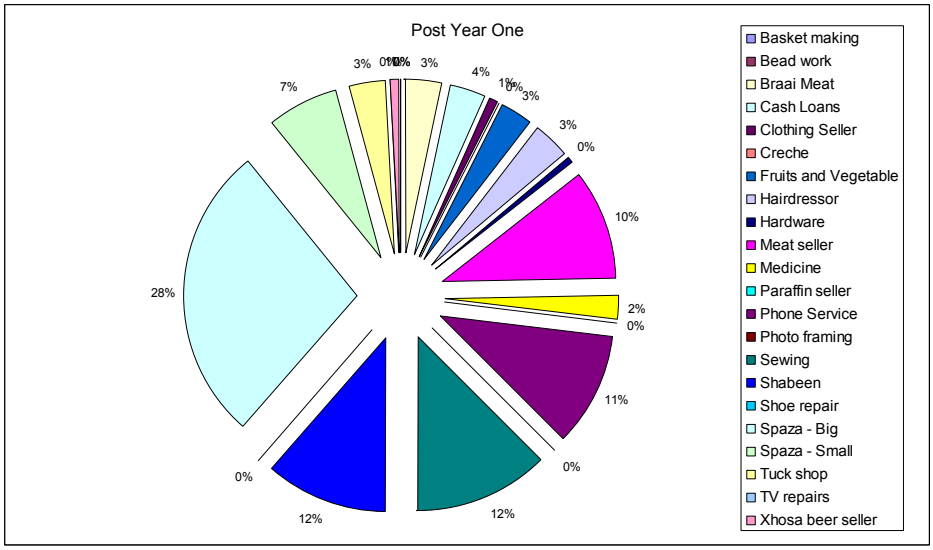
The % share of total monthly profit was used to examine the amount of surplus *(that can be used for household expenses, business stock, etc)* generated, the extent to which this is divided amongst the various business types, and the changes that occurred over time (Figure 6.8).

In Mfuleni, in the pre-electrification phase the majority of profit (~67%) was created by just two business types (Spaza – Big and Phone service). However the emergence of a number of new business types and the loss of other profitable businesses (in particular one large spaza and a number of sewing enterprises) resulted, by Post Year 2, in a much more even spread of the total profit amongst the wide range of business types.

In Ngonyama, there was a similar situation, with the vast majority of the profit again being created by a minority of business types; these were Taxi – big, Spaza – Big and Tractor hire; in the pre-electrification phase these accounted for 66% of the total average monthly profit, in Post Year 1 for 62% and in Post Year 2 for 66%). Within the remainder of the business types, the changes that can be seen in the % share of total profit in Post Year 1 and Year 2 were brought about by the loss of a profitable business type; Household linens by Post Year 1 and Sales agent – crockery by Post Year 2.

Figure 6-8a Total monthly profit by Business Type - Mfuleni





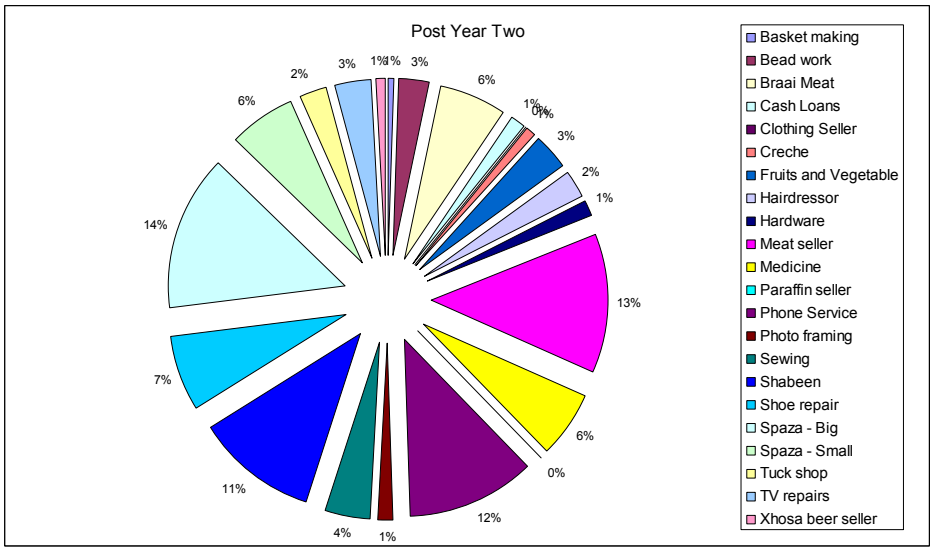
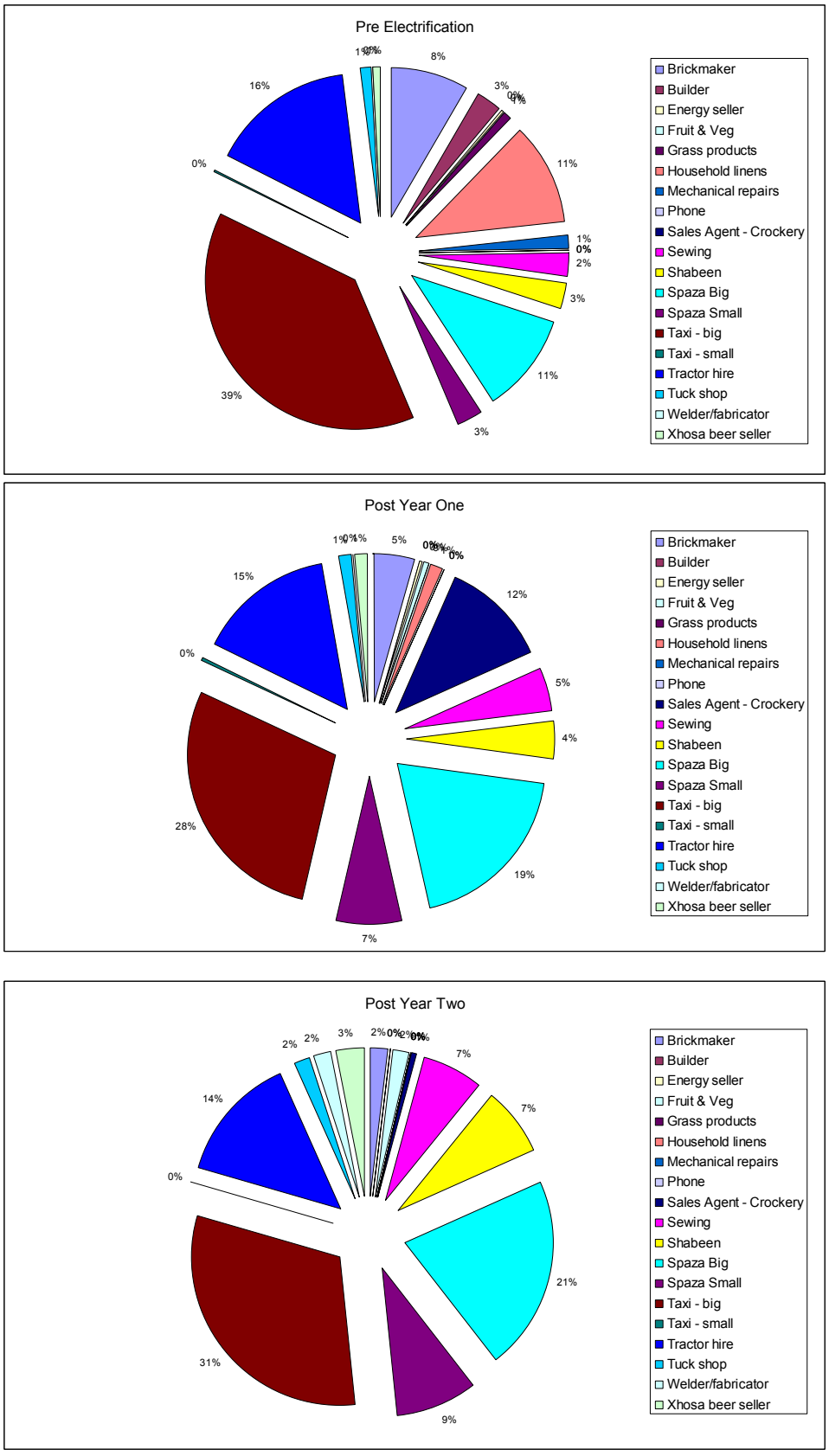


Figure 6-8b Total monthly profit by Business Type - Ngonyama



Referring back to Figure 6.5 and 6.6 (number of enterprises in each business type), it can be seen that there are only a small number of individual enterprises amongst those business types that create the majority of the total monthly profit. It is clear therefore that the majority of income generation accrues to and directly benefits a very small number of individual enterprises and households. The research has also revealed however that even where only small amounts of surplus (profit) are generated through enterprise activities, this can significantly increase the overall household income.

6.4.2 Averages by enterprise type

The ***average*** data (monthly turnover / monthly profit) enables an overview of the scale (turnover) of typical enterprise activities in each of the business types in the two communities, and provides an indication of the extent to which the associated households were able to generate an economic surplus ('profit').

This data has been used to draw findings from across the whole population of business types and not to examine in detail any changes that may have occurred within the individual business types. The main reason that the latter is not appropriate here is due to the inherent difficulty of obtaining accurate data on turnover and profit from informal enterprises (who do not keep records and where business and household expenditure cannot be disaggregated) and where, in some cases, the addition or loss of a single enterprise has a disproportionate influence on the average for that business type (this is further exaggerated by the small sample sizes that existed for many of the business types).

Total turnover by business type

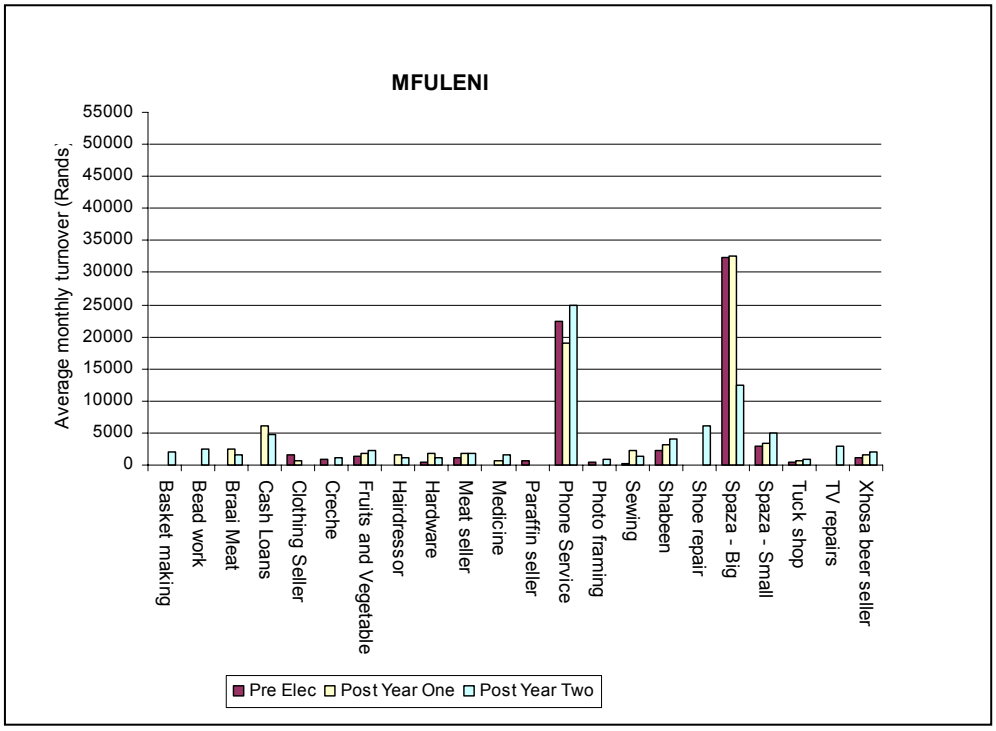
Figures 6.9 a and b clearly indicate that the majority of businesses in both of the communities have an average monthly turnover of less than R 2,500, and in many cases monthly turnover is considerably less than this figure.

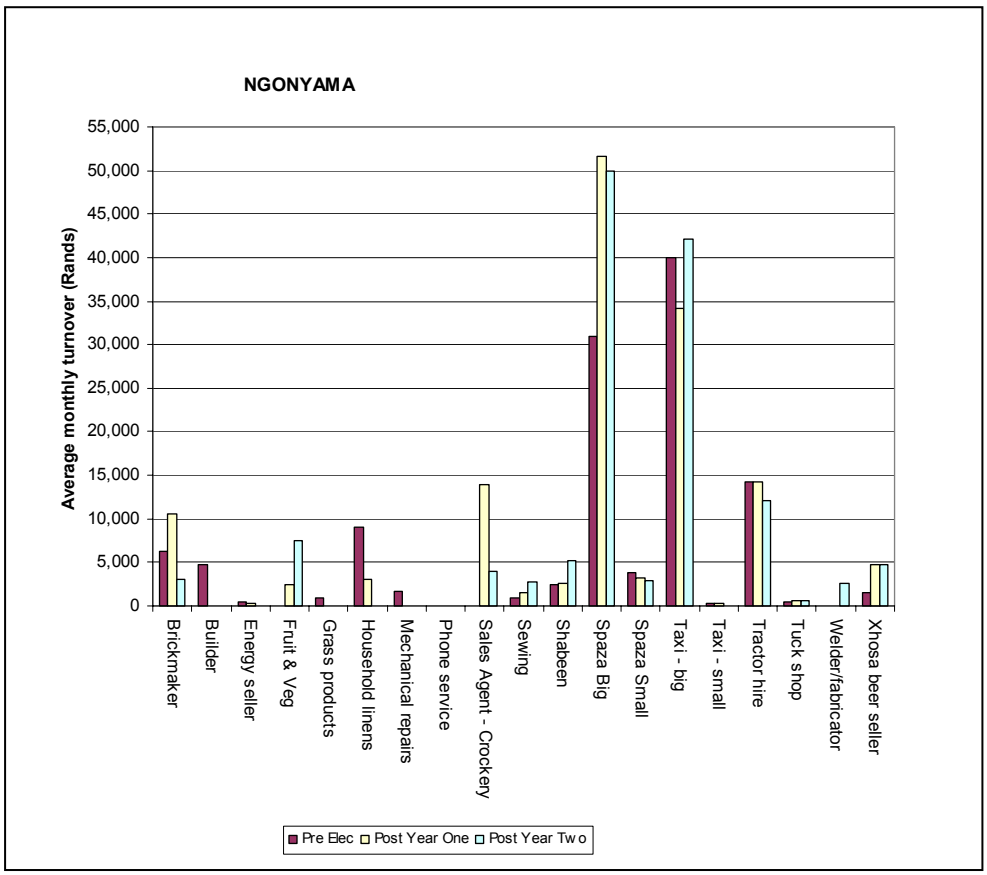
In Mfuleni (Figure 6.xxa), there were two business types that had average monthly turnovers in all three years that were considerably higher than all other types; these were the Phone service (~R 20,000 / month - all three years) and Spaza – big (>R 30,000 / month - first two years). The ***average*** monthly turnover in latter business type showed a marked decrease in Post Year 2, and which was explained by the closure of one of the two largest spazas in the sample area. It is also likely that growing competition from increasing numbers of enterprises focusing on the sale of food and drink products (e.g. meat sellers, small spazas, tuck shops and fruit & vegetable) may also have contributed to falling average monthly turnover.

The majority of all other business types in Mfuleni had an average monthly turnover of less than R 2,500. The exceptions were: Spaza – small (all three years), Braai meat (Post Year 1 only), Cash loans (Post Year 1 and Year 2), Shabeen (Post Year 1 and Year 2), Shoe repairs (Post Year 2 only) and TV repairs (Post Year 2 only).

Figure 6-9 Changes in Average Monthly Turnover by Business Type

(note: Y axis scale is the same on both graphs)





As previously seen in Figure 6.9, the overall average monthly turnover in all three years was considerably higher in Ngonyama than in Mfuleni. Figure 6.9 also clearly shows that in Ngonyama a much larger number of the business types had an average monthly turnover greater than R 2,500 and in many cases this exceeded R 5,000. The following business types had an average monthly turnover of > 5000R: Brickmaker (pre-electrification and Year 1 Post), Fruit & Vegetable Seller (Year 2 Post only), Household Linens (pre-electrification), Sales agent – crockery (Year 1 Post only), Shabeen (Post Year 2 only), Spaza – big (all three years), Taxi – big (all three years), and Tractor hire (all three years). Similar to the situation observed in Mfuleni, there were two business types where the average monthly turnover far exceeded that of all others – these were Spaza – big for which the average monthly sales were approximately R 50,000 in the two years following electrification and Taxi – big with average monthly turnover of R 35,000 – 40,000. A further business, Tractor – hire, also had comparatively high monthly turnover.

This evidence suggests that, on average, those enterprises that are operating in Ngonyama (rural) have a higher turnover compared to similar ones in Mfuleni (urban). The availability of cheap transport means that enterprises in the urban community have to compete directly with the larger shops, supermarkets and other service businesses in the vicinity (and also in Cape Town). Comparatively the costs of transport were found to be higher for residents in the rural community; the nearest town was approximately 20km away, return taxi fares in Post Year 2 were R22 (with additional charges of R 3-5 / package being transported) and around 30 minutes of travel time is required each way. It is likely that residents in the rural community used their local enterprises more frequently due to the time and cost constraints of travelling into town.

Total profit by business type

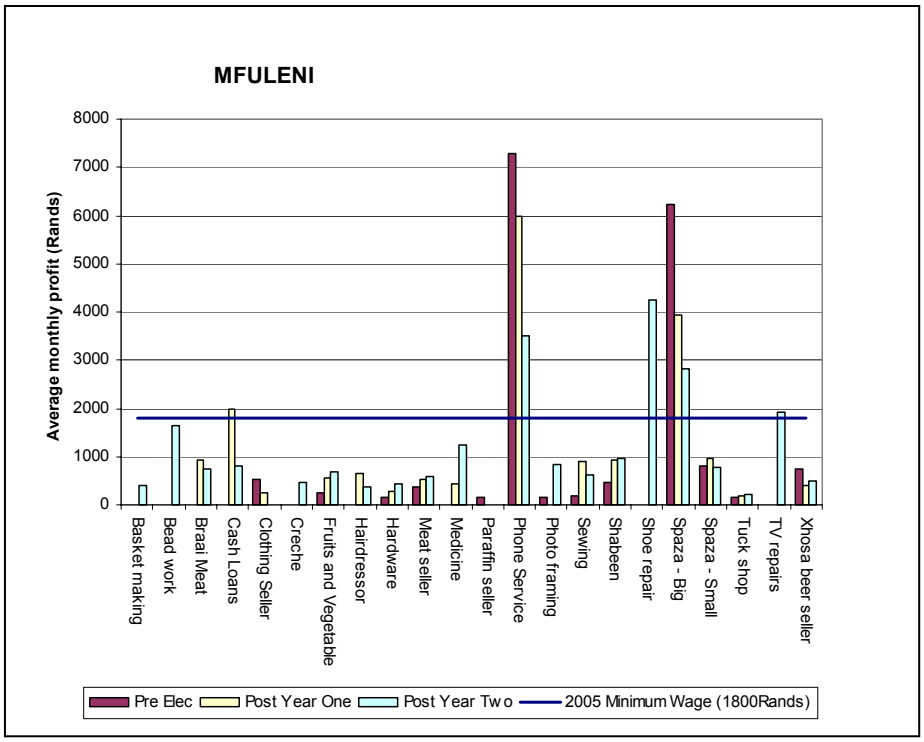
Average monthly profit is the disposable income generated from micro-enterprise activity. Only a minority of households running a business (equally applicable to large and micro activities) relied solely on this for their income generation. For most this is only one element of an overall mix of income streams; other sources given by respondents included old age / occupational pensions, child support, informal jobs, and formal employment (both within their household and through other family members who sent back part of their wages). For many of those running a micro-enterprise, the latter two sources were however never or only rarely available.

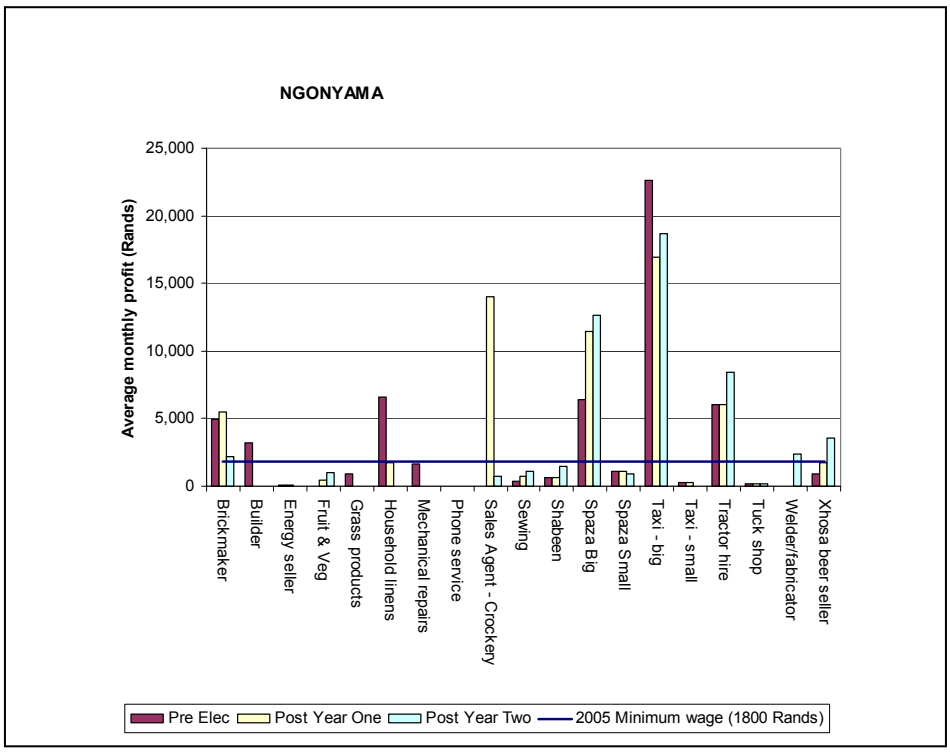
Figure 6.10 shows the Average Monthly Profit for each of the business types in Mfuleni and Ngonyama, and compares this to a typical wage – R 1,800 / month - for jobs in the wholesale & retail, manufacturing and hospitality sectors in South Africa in 2004 / 2005 (various references at http://www.info.gov.za/gazette). For information and comparison, more specific figures for minimum wages in various jobs are provided below[1]).

[1] Minimum wages in South Africa vary accordingly to the job being undertaken, and for some sector are governed by a Labour Law that set minimum wage levels for a range of jobs. The following minimum wages applied for each of the three years of the study (all figures are monthly salaries):
2003 – security guard (rural) R 426; cashiers R 789; domestic workers (urban) R 862; retail assistant manager (urban) R 1357; local government employees R 1900; shop manager (urban) R 2900
2004 – farm workers R 800;
2005 – local government employees R 2600; farm workers (urban) R 950; farm workers (rural) R 872

Figure 6-10 Changes in Average Monthly Profit by Business Type

(note: Y axis scales is larger on Ngonyama graph)





It is important to note that the scales of the two graphs presented in Figure 6.10 are different – the Y axis for Ngonyama being 3 times that of Mfuleni – this is due to the presence of several enterprises that recorded comparatively high average monthly profits. Indeed several of the business types in Ngonyama had average monthly profits that greatly exceeded the maximum that was recorded in Mfuleni. Table 6.16 indicates that these business types had broadly similar average net profit margins in all years in both communities.

In Mfuleni (Figure 6.10 upper) there are only three business types that generated average monthly profits well above 1800R; these were Phone Service (all three years), Shoe repairs (only present in Year 2 Post) and Spaza – Big (all three years). Three other businesses (TV repairs, cash loans and bead work) generated profits that were close to the typical wage level; two of these are service businesses and one is classed as manufacturing and therefore the main inputs are the skills / time of the owner *(and in the case of the beadwork of her daughter and other assistants)*.

It is also clear that the average profit generated by the two business types that were operating in all three survey's periods had decreased considerably for 'Spaza – Big', this was caused by the closure of one of the largest enterprises in the community *(decreasing the average 'size' of enterprises in this type)* however, for the phone service, even though only one enterprise *(the original one)* out of two was interviewed, the detailed raw data indicates that costs have risen and in addition the profit margin was likely to have been further eroded through competition from the new phone service.

A comparison of both sets of data clearly illustrates that more business types in Ngonyama *(9)* had average monthly profits exceeding 1800R than in Mfuleni *(3)*. This is in line with the previous observation that the average monthly turnover overall, and of several business types comprising the largest enterprises, was considerably higher in Ngonyama than in Mfuleni.

Whilst acknowledging the difficulties in collecting accurate data from informal enterprises, these results clearly highlight that the majority of business types (and therefore individual enterprises) generate an average monthly profit that is below 1800R, and particularly in Mfuleni this figure was below 1000R for the majority business types.

Average net profit as a percentage of turnover

An examination of average net profit margin provides a useful measure of the extent to which a surplus can be generated relative to the sales that are made (and is related to both the type of products being sold and acceptable selling price – based on the ability of customers to pay and the level of competition). Comparison of several business types that were present in both communities and that comprised enterprises that were very similar in nature i.e. Spaza – big, Spaza – small and Tuckshop revealed that profit margins were very similar**.** Where discrepancies were observed across the three survey years this could be explained by the closure / opening of one or more enterprises.

The exception to this was in Mfuleni in Post Yr 1 where this was considerably reduced – referring back to Figure 6.6 reveals that the number of large spazas had increased from 3 to 4 in this year and is therefore likely to have resulted in reduced selling prices as a result of increased competition (the number dropped back to 3 again in Post Yr 2 with the closure of one of the largest shops).

Table 6-16 Average net profit margins in all years in both communities.

	MFULENI			NGONYAMA		
BUSINESS TYPE	Pre	Post Yr 1	Post Yr 2	Pre	Post Yr 1	Post Yr 2
Spaza – big						
Average monthly turnover (Rands)	32333	32638	12490	30938	51703	49922
Average monthly profit (Rands)	6233	3943	2813	6,420	11,460	12,648
Average net profit margin (%)	**19.3**	**12.1**	**22.5**	**20.8**	**22.2**	**25.3**
Spaza – small						
Average monthly turnover (Rands)	2993	3295	5034	3873	3284	2868
Average monthly profit (Rands)	801	953	760	1111	1089	946
Average net profit margin (%)	**26.8**	**28.9**	**15.1**	**28.7**	**33.2**	**33.0**
Tuck shop						
Average monthly turnover (Rands)	350	761	841	500	596	577
Average monthly profit (Rands)	150	176	215	172	148	141
Average net profit margin (%)	**42.9**	**23.1**	**25.6**	**34.4**	**24.8**	**24.4**

6.4.3 Energy and appliance use

Micro-enterprise covers a wide range of activities and as such the need for and nature of energy services (and therefore the appliances) that will be required will also vary amongst the different business types and between individual enterprises (depending on their financial circumstances and to ability to access assets).

Figure 6.11 highlights that, in the pre-electrification phase, paraffin was being used by a much higher number of enterprises in Mfuleni (18) compared to Ngonyama (5) and that the popularity of other energy sources was different in the two communities. A range of energy sources was being used by the enterprises in both communities, and for a wide variety of energy services:

- Paraffin used mainly for lighting which enabled work, such as sewing, to continue after dark, shops to extend their opening hours or to illuminate road side stalls in unlit areas (only seen in Mfuleni) but in some cases to power fridges and freezers.
- Bottled LPG used for lighting and to power fridges and freezers (which were often dual power with the option of running on either LPG or electricity
- Ice for cooling (meat, soft drinks, beer etc) and maintaining frozen foods for short periods.
- Wood for drying / cooking of meat and offal.
- Car batteries to enable use of various electric appliances (e.g. TVs, radio, hifi in Shabeens) and lights.
- Candles for lighting of work areas at home or on a road side stall.

- Generator (petrol or diesel) used to provide an electricity supply as an alternative to grid connection for lighting, fridges and freezers, and entertainment equipment.

For the majority of enterprises using paraffin, LPG, ice and candles these energy sources were purchased in small amounts from either spazas in the community or from shops in the nearby town. A small number of enterprises, that had greater financial resources and access to transport, were able to purchase paraffin in bulk (20 litres or more) or larger bottles of LPG from local wholesale suppliers. Wood was either collected at no financial cost from nearby trees or as scrap / offcuts, or was purchased. Car batteries and generators (driven by petrol or diesel) were used by a small number of enterprises to power electrical equipment and appliances prior to availability of grid-connected electricity. These enterprises were observed to be amongst the largest in each community and were being operated by households with considerable financial resources.

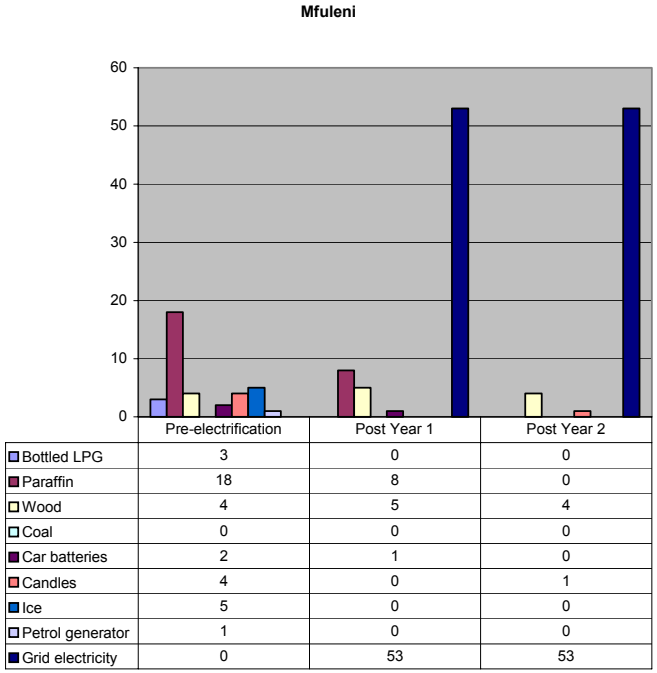
A number of enterprises were making use of several energy types whilst others did not use any energy for their business activities. In Mfuleni, there were meat sellers who bought fresh meat and had to sell everything in one day as they did not own a fridge or freezer, a fruit and vegetable seller that did not refrigerate any of their produce or operate after dark, and tuck shop and hardware enterprises that also did not operate after dark. In Ngonyama in the pre-electrification phase there are a large number of enterprises that did not use any energy including brickmaking, builder, grass products, sewing where a hand-operated machine was used, and tuckshops. None of these enterprises continued to work after dark and as a result did not use energy for lighting. Fuel for vehicles was excluded from the research and therefore the taxi businesses (both big and small) were also considered to have no requirement for the energy sources examined in Figure 6.11.

In Post Year 1, the use of paraffin continued in Mfuleni to a much greater extent than in Ngonyama

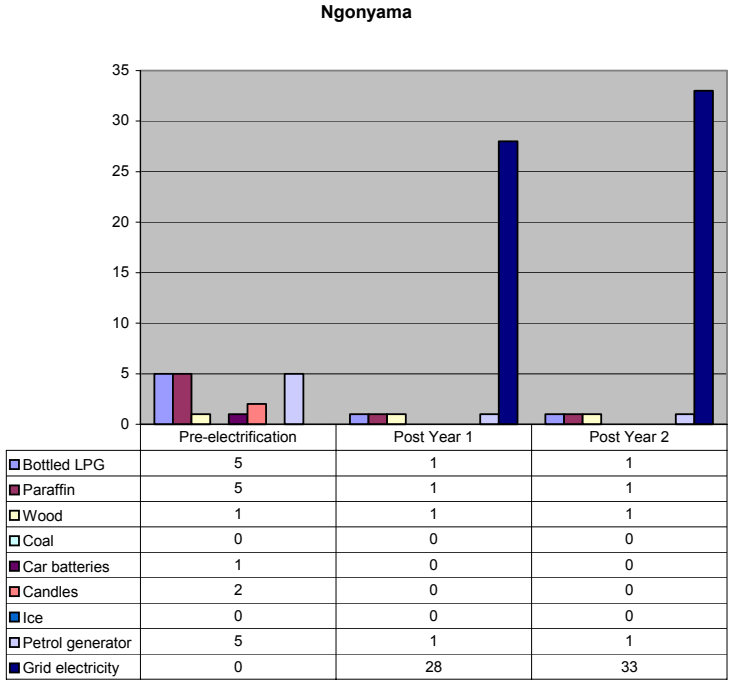
In both communities, the greatest prevalence of multiple energy sources being used by the micro-enterprise owners was in the pre-electrification phase, and it is clear that these had been either immediately (Ngonyama) or gradually (Mfuleni) replaced with electricity. There was one exception, wood, which continued to be used by two specific enterprises those activities were focused around traditional cooking methods; these were for Xhosa beer making (Mfuleni and Ngonyama) and the cooking of meat / offal on an open fire (braai) (Mfuleni only).

Mfuleni – paraffin and LPG usage for micro-enterprise activity declined to zero. However, there still was a level of paraffin use in Post Year 1 which was not the case for LPG. The likely explanations for this are the greater familiarity with and ease of access to paraffin from other enterprises / households in the community (particular when electricity runs out and it is not possible to travel to buy more prepaid units). By Post Year 2, the availability of a secure and reliable electricity supply had completely eliminated the use of other fuels for micro-enterprise activity. It is interesting to note that for many business types the usage of electricity decreased between Post Year 1 and Year 2. From the quantitative interviews and qualitative research it was clear that prior to the arrival of electricity many enterprise owners (and indeed other community members) believed that using electricity would considerably reduce their overall fuel costs. Whilst in general this was a fair assumption, it is likely that during the first year following electrification, the consumption of electricity and the associated costs were in a trial phase for most enterprises / households and that once the real costs for their particular requirements were known, it is possible that some level of energy saving had been introduced (e.g. it was noted that some owners switched off fridges and freezers at night when they were not being opened).

Figure 6-11 Numbers of enterprises using various energy sources pre- and post-electrification (Note: different scales in graphs)



	Pre-electrification	Post Year 1	Post Year 2
Bottled LPG	3	0	0
Paraffin	18	8	0
Wood	4	5	4
Coal	0	0	0
Car batteries	2	1	0
Candles	4	0	1
Ice	5	0	0
Petrol generator	1	0	0
Grid electricity	0	53	53



	Pre-electrification	Post Year 1	Post Year 2
Bottled LPG	5	1	1
Paraffin	5	1	1
Wood	1	1	1
Coal	0	0	0
Car batteries	1	0	0
Candles	2	0	0
Ice	0	0	0
Petrol generator	5	1	1
Grid electricity	0	28	33

	MFULENI			NGONYAMA		
	Pre-electrification	**Post Year 1**	**Post Year 2**	**Pre-electrification**	**Post Year 1**	**Post Year 2**
% of enterprises interviewed that were using grid-connected electricity	0%	94.6%	93%	0%	66.7%	82.8%

Lastly, the following two graphs give an indication of which are the most energy intensive industries. It can be seen that the traditional beer brewers and big and small spaza's are the predominant users of energy.

Figure 6-12 Mfuleni energy usage by enterprise type

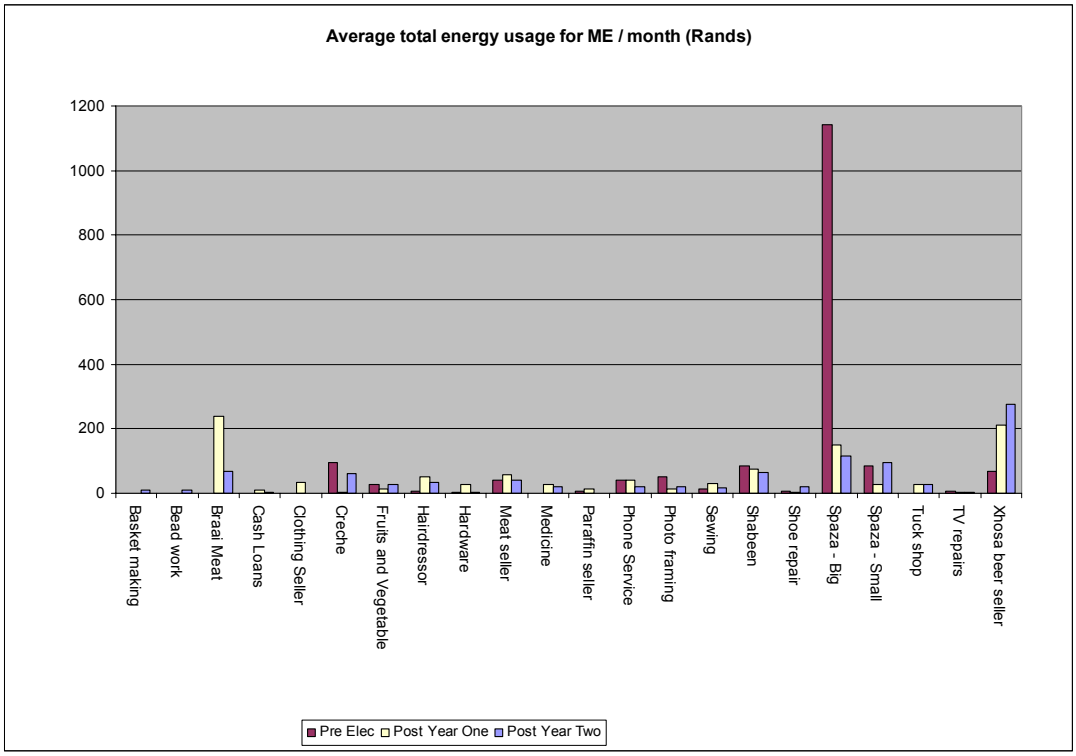
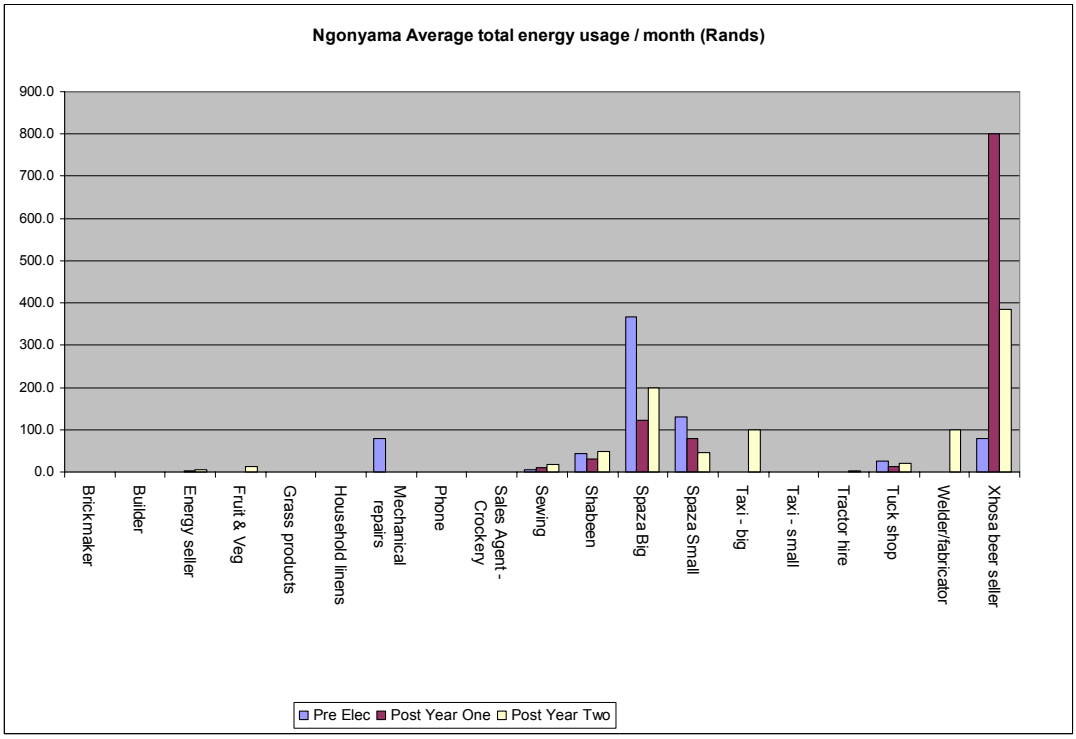


Figure 6-13 Ngonyama energy usage by enterprise type



7 Conclusions and Lessons

This section of the report draws together a series of conclusions and lessons developed from the project findings and these are presented below against the key questions that the research set out to investigate.

7.1 Did modern energy impact micro-enterprise

This longitudinal study, conducted through three separate surveys, one prior to electrification then one and two years after electrification, has accurately measured the volume and nature of micro-enterprise activity at these three instances in the two South African communities. In answer to the question “Does modern energy enhance micro-enterprise creation and growth?” the following conclusions can be drawn.

Growth in micro-enterprise numbers

Across the whole period of the survey, there was an overall increase of 19 businesses (representing a 40% increase) in urban Mfuleni and 10 businesses (representing a 24% increase) in rural Ngonyama. The percentage increase in the first year following electrification was greater in the rural Ngonyama (32%) compared to the urban (Mfuleni) (24%) community. During the second year the number of micro-enterprises in the rural community remained stable and in the urban community showed a further small increase (6%).

The total percentage increase in the number of micro-enterprises found in the urban (40%) and rural (24%) communities indicates a *strong growth impact through the provision of modern energy*.

This conclusion was confirmed by a micro-enterprise being found in every 10.5 households before electrification 8.6 after in Mfuleni and 7.5 then 6.9 in Ngonyama. Plus, the proportion of micro-enterprise owners per community household rose from 9.6% to 13.4% in Mfuleni and 13.3% to 14.5% in Ngonyama.

Growth in total micro-enterprise turnover and profit

In *Mfuleni there was an overall increase of 36% in the total enterprise turnover and 26% in Ngonyama*, both well above an inflationary increase of 9%. Interestingly in both communities the average turnover per enterprise remained constant, indicating the average micro-enterprise size on a turnover basis was constant and the increased turnover was the result of an increase in number.

Average micro-enterprise profit on the other hand showed a 9% increase in Mfuleni while in Ngonyama a reduction of 16% was found. (Note this reduction can be attributed to the closure of a linen sales agent and brick making businesses and is not related to the introduction of electricity. If they are excluded there is an overall increase of 25%)

Owners income in Mfuleni increased in total value by 17%, whereas owners in Ngonyama decreased by 16%, for the same reason. A comparison with the Mfuleni figures though shows the average owners income in Ngonyama as 2.8 times higher (R910 and R2391 respectively).

Growth in employment

Employment of staff by the community micro-enterprise is very small with the owner and perhaps family members receiving most benefit of any benefit from profit. The average per household of between R7 and R2 in Mfuleni is virtually negligible and R26/month to R30/month in Ngonyama not much better. The increase in *employment opportunity for community members was not found*, rather most businesses tended to be run only by the owner with some help from a family member.

Changes in the sectorial profile of the businesses

In urban Mfuleni, there were small changes in the number of retail and manufacturing businesses, whereas the service sector experienced a substantial increase, 500% over two

years. In Ngonyama, the retail sector was dominant, 71% over two years, the manufacturing stable and the service sector experiencing a decrease of 44% over the 2 years.

Given the variation in the changes, between the rural and urban communities, *the type related growth is a result of other factors* such as the market opportunities, the skills of entrepreneurs and situational factors.

Growth in business diversity

Over the two years the types of businesses found in Ngonyama remained constant with only the loss of paraffin/energy sellers. However, in urban Mfuleni there was significant increase in year two increasing from 15 to 20 different types. This indicates that *the provision of electricity allows for greater micro-enterprise diversity*, especially as a number were electricity dependent.

Growth in enterprises utilising cold appliances (fridges and freezers)

In both Mfuleni and Ngonyama there was a rapid expansion (growth in number or improvement in existing) within a number of the business types (e.g. tuckshops, spazas, shabeens, meat sellers) where the enterprises are predominantly based around the energy services of cooling, cold storage and freezing. The role of electricity to power fridges and freezers is seen in the growth in number utilised from 11 to 46 in Mfuleni and 11 to 28 in Ngonyama

Male versus female ownership

Female enterprise ownership in Mfuleni remained around 75% and in Ngonyama increased from 67 to78% in Ngonyama. The higher increase in Ngonyama is primarily linked to the greater growth of retail enterprises, small spaza's and tuckshops, with both having a predominantly female ownership.

Growth in enterprise use of electrical equipment

In Mfuleni the number of enterprises using electricity increased from 3 to 89% and 6% to 83% in Ngonyama. There was a corresponding reduction in the purchase of other fuels and increase in purchase of electricity.

Enterprise owner's average perception on the role of electricity in their businesses also increased significantly from 3.6 to 4.4 out of 5 in Mfuleni and from 3.1 to 4.9 out of 5 in Ngonyama.

Did modern energy enhance micro-enterprise - conclusion

The introduction of modern energy (electricity) into two poor South Africa communities (urban and rural) has had a significant impact on the number, type and collective volume of micro-enterprise activity. Key factors impacted over the two years include:

- *The number of micro-enterprises increased by 40% in urban Mfuleni and 24%in rural Ngonyama.*
- *Community households with an enterprise rose from 5 to 13% in Mfuleni and 11 to 14% in Ngonyama.*
- *Total community turnover increase by 36% in Mfuleni and 26% in Ngonyama, both well above an inflationary increase of 9%.*
- *Average micro-enterprise profit on the other hand showed a 9% increase in Mfuleni while in Ngonyama a reduction of 16% was found. (Exclusion of two non electricity related closures increases the figure to 25%).*
- *Employment opportunity showed only marginal increase.*
- *The provision of electricity allows for greater micro-enterprise diversity, especially as a number were electricity dependent (this was particularly evident for some of the new business types that emerged.*
- *Number of enterprises using electricity in Mfuleni increased from 3 to 89% and 6% to 83% in Ngonyama.*
- *Enterprise owner's average perception on the role of electricity increased from 3.6 to 4.4 out of 5 in Mfuleni and from 3.1 to 4.9 out of 5 in Ngonyama.*

The growth in enterprise number, increase in total turnover, greater diversity in enterprise type, electricity dependent processes, extensive use of electricity by the businesses and the higher perceived role of electricity by the enterprise owners all clearly indicate a positive impact. However, the scale of impact was found to be variable for the different business types and dependent on a host of other enablers and local conditions. The overall livelihood impact over the two years can be judged to be limited given percentage increases in number and turnover, plus the minimal employment creation.

7.2 How did modern energy impact micro-enterprise

Having established that modern energy did impact on micro-enterprise development, the question of "how did it" is now addressed.

Emergence of businesses that use electrical equipment

A number of *new businesses emerged that directly used electrical equipment*. Many of these would have been unable to operate prior to electrification or would have had more difficulties operating using hand machines / tools or other power sources. These included; hairdressers, shoe repairs and TV repairs in Mfuleni, plus welders and a phone service in Ngonyama. Electric energy services included boiling water, operating electric hair trimmers, powering remote telephones and operating welding plants

A key observation was that in most cases these new business types were only represented by a single enterprise and that many were not established until two years after electrification. The evidence would also suggest that factors present in urban Mfuleni made this context more conducive for the establishment of new business types than in Ngonyama.

Existing businesses switched to electrical processes

Several business types were able to begin using electrical equipment where they had previously used manual equipment or where they had used appliances powered by other fuels, such as LPG or paraffin, or other sources of electricity (i.e. batteries or generators). *During the quantitative interviews a number of enterprise owners indicated that the opportunity to change to electrical equipment or from their power supplies had brought considerable benefits to their business*; these included; medicine sellers, phone services shabeens and sewing. Electric services included boiling water easily, powering phone systems, keeping drinks cold and operating electric sewing machines.

Positive impact of electric light on micro-enterprise operation

The availability of electric lights at the doorway and inside the home had a positive impact by *enabling a number of businesses to continue working after dark*. Comments provided by owners during the quantitative survey indicated that the following enterprises derived considerable benefit from electric light; fruit and vegetable seller, sewing, bead work and basket, tuck shops and spazas (both small and big) and shabeens.

Positive impact of electric street lighting on micro-enterprise operation

Electric street lighting was installed in Mfuleni as part of the electrification infrastructure whereas in Ngonyama each household was given an external light above their entrance door.

The major improvements in safety and security in Mfuleni that were achieved through the installation of street lighting *enabled clientele to shop later and a number of businesses benefited from evening trade* . In Mfuleni, the existence of trading places in areas that were lit after dark specifically benefited the stalls of the braai / cooked meat sellers. It is possible that a number of other businesses on the circle (e.g. fruit and vegetable sellers, hairdressers, shoe repairs) also benefited from the availability of street light after dark however many of these also had their own electricity supply and used electric lights and equipment.

Negative impact of electricity on the viability of a specific business type

The availability of electricity in the communities was found to have had a negative effect on energy / paraffin sellers. These were present in both communities and experienced a direct decline following the provision of electricity. Also households may be drawn into possible

over-traded situations in some of the retail business types as owners replicate use of fridges / perceived income generating activities.

"Churn" or the open/close dynamic versus sustainable enterprises

A major trend identified in the communities was the significant number of businesses that opened and closed between the surveys. Just the difference between the surveys shows:

	Mfuleni		Ngonyama	
	Pre to Year 1 Post	Year 1 to Year 2 Post	Pre to Year 1 Post	Year 1 to Year 2 Post
Closed	-27	-24	-12	-16
Open	42	28	22	16

Yet even more may have opened and closed between the survey periods. This is a strong indication of how micro-enterprise plays a major survival role in the communities. Plus as electricity arrives, the opportunity to start a business increases, while a lack of knowledge, working capital etc. all stands against success.

In contrast to these figures are the numbers of businesses that survived throughout all three surveys (i.e. original pre-electrification enterprises that were still active at the Year 2 Post-electrification survey). In Mfuleni 12 (26%) and Ngonyama 23 (56%) were found and across all enterprise types. This *strongly indicates other reasons for success* such as entrepreneurial skill, capital, drive, perhaps geographic position, training and experience.

Provision of modern energy, such as electricity, *without other micro-enterprise enablers will not lead to major upliftment*.

Business failure or closure

Apart from the paraffin sellers, the main reasons for closure were not related to electricity or even business-related. The follow-up quantitative interviews revealed that many of the businesses had closed for personal reasons, such as family circumstances, illness and death of proprietors, people moving away and running out of working capital. Plus with the proliferation of types such as tuckshops the market became diluted and competition more fierce, this further diminished the viability of these new start ups and the existing small traders hence leading to further closures. It appeared that several survivalist businesses are related to a breadwinner in the household who provides the necessary cash float to fund the business. When money is needed for other family expenditure with these being such hand to mouth activities, the business closes only to start up again later when more money is again available.

In Ngonyama, where the services enterprises reduced significantly (44%), the closure was not related to the arrival of electricity, rather factors such as owners moving away form the village, movement of the business to other areas such as one of the tractor businesses, switching to other endeavours, and personal circumstances.

Again other business enabling elements include the business skill of the proprietor, access to the local market and suppliers, reputation in the community and the ability to sustain the granting of credit especially in the retailing types of business and even stability within the family.

Overall the arrival of electricity seemed to spark a latent or pent up opportunity for starting micro-enterprise. However, *the delivery of a single (though key) enabler without the presence of other micro-enterprise enablers appears to have limited the benefit of sustainable enterprises to the community*.

How did modern energy impact micro-enterprise – conclusions

Micro-enterprises clearly play a major survival role within these communities. The provision of modern energy appears to have stimulated the formation of survivalist micro-enterprises. A number were short-lived, some intentionally a temporary coping strategy for specific circumstances or between employment periods, others as a consequence of failure of the business, with potential negative impact on those household if their initial investment had not been recovered. Those that survived provide a source of additional income for those households.

Many micro-enterprise owners reported considerable benefits to their businesses from the provision of electricity, including convenience, efficiency, amenity, increased choice, longer working hours and improved safety and security.

The greatest failure in terms of livelihood creation can be seen in virtual zero increase in micro-enterprises that create jobs for community members. Owner-operated enterprises were and continued to predominate with almost no individual enterprises employing people outside their immediate family.

Modern energy, whilst instrumental in enabling micro-enterprises, cannot alone realize the full potential. There are many other factors that have equal or greater influence.

7.3 Other factors related to micro-enterprise

Dominance of retail business numbers

The top three businesses in both communities, from a number perspective, were tuckshops, small spazas and shabeens. By the final surveys, these 'top three' business types made up 67.5% of the retail sector in Mfuleni and almost 78% in Ngonyama.

Retail expansion factors

The business landscape was dominated by the retail sector, through a small number of business types selling primarily food and drink items – tuck shops, meat sellers, braai / cooked meat sellers, small spazas and shabeens. These local retailers provided a local service that enabled 'convenience' shopping by members of the community and a source of credit purchases.

There is a low barrier to entry for retail businesses including; the ability to start trading with relatively small amounts of stock purchased in bulk from wholesalers, require no specific technical training, a general familiarity with the household products and a perception that these businesses are easy to operate. The supply of electricity precipitated these businesses in many case through the purchase and operation of a fridge.

Economically the goods that are purchased from retailers in the community allows for one turn of the expenditure through the community (leaving the profit or mark up in the community) before reaching the wholesalers external to the community. A small number of the larger spaza shops also act as wholesalers and supply small quantities of goods for some of the tuckshops. However they have not been categorised as wholesalers since this is not their primary business.

Limited business types needing a large capital outlay or technical skills

New entrants and increases in the numbers of enterprises were much more limited in business types where establishment, maintenance and operation required large capital outlay, specialist skills / training and dedicated premises. These business types included many of the manufacturing activities (e.g. sewing, bead work, basket making, grass products, Xhosa beer making, photo framing, brick making), a number of the services (e.g. taxis - both small and big, phone services, welding, TV repairs and shoe repairs) and the larger retail enterprises (specifically the larger spazas and shabeens). The need for skills and experience, and some cases large financial resources, are likely to preclude the majority of people / households in the community from starting this type of business.

Lack of export market

Little change was found in the split of the customer base between those from within and those without the community, Mfuleni 91% and Ngonyama 87%. These figures are clear evidence of the insular nature of these businesses even in the urban setting of Mfuleni. This indicates a constrained market – turnover can only come from within the community, which is in turn financially constrained (finite number of salaries, pensions, grants etc.).

Exporting of goods and services remained significantly limited, thereby restraining the economic pool from which to drive economic growth within the communities. This is also related to the limited numbers of manufacturing and service enterprises – the retail business types unlikely to sell goods outside the community.

Vulnerability of many micro-enterprises

In many of the start up micro-enterprise a coping strategy for poverty alleviation became clearly evident. In most cases there was a direct link between the need for entrepreneurship and family circumstances.

The availability of money within the family to buy stock to operate the family retail business resulted in open/closure cycles. Examples were found where cash demands (such as funeral payments) were met through the sale of stock, without holding a reserve for repurchase.

Often tenuous job opportunity, short term labour contracts providing income for periods followed by periods with no work. During these times the breadwinners would fall back on a retail enterprise activity.

The majority of micro-enterprises operate at a very small scale

A key feature of a large proportion of the individual enterprises is their scale of operation i.e. they are trading very small, locally affordable quantities that are being bought by customers on an 'as needs' basis.

Availability and need to provide credit

The availability of, and need to provide, credit is a major factor in the long-term survival of micro-enterprises in both communities. In all of the sectors, most of the businesses are run on a very personal basis where the owner knows the majority of their customers circumstances and credit record. The pressure on business owners to give credit to their customers appears to be very strong, and can become a differentiator between two businesses making a sale (they also know that credit would not be available from shops in the nearby town).

Very little evidence of plot-specific businesses

There is very little indication that a particular plot is important for a specific business type. In Mfuleni, the majority of households did not have any input into the decision regarding the plots that they were allocated and in Ngonyama many of the plots are transferred to community / family members through traditional processes administered by the leaders. Therefore, in both cases, households could not tailor their location for a particular business type. Mfuleni was also a newly established community and as such the majority of businesses were developed after re-location (although a small number of households had historically operated the same or similar business in another location). There were a small number of businesses in both communities that had made a specific decision to establish a structure (e.g. self-built stall, container, caravan, or similar) in a particular location in order to take advantage of 'passing trade'. Examples include: Fruit & vegetable & braai meat stalls at the busy circle in Mfuleni, and the telephone booth and fruit & vegetable stall at the taxi stopping point in Ngonyama.

Identified micro enterprise enablers

The research clearly pinpointed a number of other vital enablers for micro-enterprise to be formed and to flourish. These are *capital* both to buy equipment and stock; and to ensure proper working capital. None of the businesses interviewed either had a bank account or access to micro or small loans. *Training and knowledge* about how best to select a type of new business, assess the market need, understand the necessary skills and resources needed and how to start and run a small business are further vital needs together with basic financial management skills. *Access to markets beyond the community* was also identified as a major constraint together with a lack of essential marketing skills. Most of the micro-enterprise business was various retail activities limiting real income creation for the community as a whole. There were very few *manufacturing* or export orientated activities with

markets outside the community thereby bringing in increased revenues and employment opportunities.

There was however a high level of *entrepreneurial* drive, out of necessity, and this needs to be further developed, channelled and supported. Entrepreneurial skills and how these may be inculcated and acquired. Mentorship and practical 'on the job' training has an important role to play.

Franchised business where much of the start up risk is reduced, the business format is packaged and comprehensive training, start up and ongoing support is provided can also play a positive role with suitable types of micro-enterprise's for poor communities.

To enable significant income growth it is essential to enable those economic activities that grow the overall income of the community. This can only be done with manufacturing, agricultural, service and other business activities that trade with markets external to the community.

Other factors related to micro enterprise – conclusions

There are many factors that impact on the potential of micro-enterprises as a means of lifting a community out of poverty, and on the realisation of that potential. We surmise their potential to generate additional revenue into the community will depend on local circumstances – particularly the availability of nearby latent demand and an infrastructure that will allow that demand to be exploited. Even though in the communities studied the growth in micro-enterprise activity did not stimulate increased revenue into these communities, the observations show that micro-enterprises nevertheless have a positive role in the redistribution of cash within the community. Modern energy (in this case electrification), by stimulating micro-enterprises therefore has a positive impact on such redistribution.

Modern energy is only one enabler of micro-enterprises. We conclude there is a need to deliver all the enablers simultaneously if the potential is to be fully exploited. If this can be achieved the individual entrepreneurs would be better informed and better supported. We surmise businesses would likely be more stable, and fewer businesses would fail. There is an evident need for the modern energy provider, in this case the electricity utility to work with micro-enterprise support entities, such as change agents, field officers, training providers, and micro loan providers.

8 Recommendations

The recommendations that can be made following the completion of this project focus on three areas; continued analysis and learning from the data, application of the findings to the delivery of modern energy to those without and future research areas.

Ongoing use of the data

Upon completion of the project, the report and the data gathered over the three surveys will be placed in the public domain. It should be noted that the immediate project team members, in terms of their analytical skills are not professional economists or micro-enterprise development experts, rather energy practitioners. This has been necessary given the project focus on the modern energy delivery impact. However, much of the detailed data provided in this report may well be of significant interest to experts in these other fields. It is for this reason that much of the raw data and the various analysis routines employed in the project are provided in such detail in this report. It is hoped that others with the necessary expertise may also add further findings and conclusions should they wish to study the data.

Application of the conclusions and lessons

The entire project was conducted within two South African communities, which raises the question "how generically applicable are the findings?". Importantly the two communities can be judged to be significantly different in nature, with examples being; different social structures, lifestyles, partially different population groupings and access to services. Thus during the analysis a comparison was continuously made between the two communities. This ensured only generic findings related to the delivery of modern energy were concluded.

There are clearly a number of simple, cost effective and practical measures that can be implemented immediately by key stakeholders to maximize micro-enterprise development in relation to modern energy supply programmes to poor communities across the world. Factors include:

- *Electricity Utility* appreciation that modern energy, particularly electricity, when delivered releases a latent drive/energy within the community for the establishment of micro-enterprise. However, unless the delivery is undertaken jointly with other enablers the overall impact will be constrained.
- For *organisations* (NGO's, local government departments etc.) involved with the support and development of micro-enterprise to understand and appreciate the role that modern energy plays as a critical enabler.
- *Policy makers* need to appreciate the linkages and ensure the integration of delivery is reflected in policy.
- As in all matters of this nature, unless the message is constantly raised no progress will be made. Here the role of "*change agents"* at both a community and policy level is needed to bring the different players together as they very often do not have the drive or purpose to work with others.

In support of the application of the conclusions and lessons guidance notes have been prepared for government/policy makers, electricity utilities and micro-enterprise support agencies.

Future research and work

In answer to the question "what further research is required?" the following points are made:

- With regards to the fundamental question of does electricity positively impact on micro-enterprise development, no further research is recommended.
- Application research needs to become the focus, where the actual implementation of the lessons from this report are tested, further enhanced and communicated.
- On-going facilitation through the work of "change agents" is needed, through the constant promotion of micro-enterprise development needs in these communities to the utilities and support organisations with a view to integration of delivery activities.