Economic growth through sustainable access to renewable energy solutions in rural Lesotho

Energy poverty in Lesotho remains a significant barrier to socio-economic development and the well-being of rural communities. Access to electricity is lower in rural areas at an estimated 11% (UNDP, 2017). There is a high reliance on biomass and fossil fuels and current renewable energy access levels are very low. Grid electricity infrastructure is unlikely to reach rural communities in the foreseeable future – necessitating alternatives that are sustainable and which address the energy needs of rural populations. The EU funded project, implemented by Positive Planet International (PPI) in partnership with Rural Self-Help Development Association (RSDA) contributes to the economic development of rural households in Lesotho by developing a sustainable social business within RSDA to promote and distribute energy efficient and renewable energy (EERE) products.

The project team conducted a demand side study to assess the current energy usage and needs of rural communities of Lesotho. The results of this study will inform the business model and the product selection of the RSDA social enterprise.

Methodology
Our team combined quantitative and qualitative research methodologies.

Research methodologies
Quantitative research
180 surveys conducted with residents in 10 locations in Lesotho’s five foothill districts (as shown on the map)

Qualitative research
Consisted of a multiple-layered approach that included:

• A total of 25 semi-directive interviews conducted across five districts of Lesotho with a cross-section of traders, intermediaries, end users and community members
• A total of 19 focus group discussions (FGDs) with key stakeholders, including farmers and members of households
• A series of two-day immersions in a total of two villages

Reciprocity – a consultancy firm with relevant experience in developing sustainable business models at the base of the pyramid – played a key role in designing, conducting and analysing the results of the demand side study.
Key findings

**Socio-economic and demographic indicators**

**GENDER DISTRIBUTION**

The key findings of this study may differ from the national statistics as the sample of this research included only rural communities and is limited to five districts of Lesotho.

**AGE GROUP**

There is a significant over-representation of older people.

63% of respondents older than 46 years old.

Younger adults often work in towns or in South Africa, and send money home.

**DWELLING**

Different energy needs for different structures.

73% of homesteads typically consist of 2 or 3 structures and combine ‘modern’ and ‘traditional’ dwellings (usually polatas and rontaboles).

**HOUSEHOLD MEMBERS**

Households tend to be large.

71% of respondents live in households with 5 or more members.

**EDUCATION AND SOCIAL MOBILITY**

Youngsters tend to be better educated and more socially mobile.

57% respondents have primary school education.

9% respondents have secondary education.
Community networks tend to be very entrenched and structured. More than 90% belong to at least one organisation, usually a church group or a farmers’ organisation.

People mainly rely on public transport or walking for travel. Only 2% of respondents have their own car. 98% of the respondents rely either on public transport, horses or walking.

Difficulty moving around is a constant reality. 47% of respondents travel outside the village more than once a month. People ‘travel to town’ on a regular basis (weekly and more often monthly) at high cost – both time and money.

Disposable income is very limited: 73% of the households live on less than M999 per month.

- 21% of respondents reported no personal income at all.
- 35% of respondents reported income of between 500 and 1000 Maloti per month.
- 17% of respondents reported income of up to 500 Maloti per month.
- 12% of respondents said they had a household income between 1000 and 200 Maloti per month.
- 9% of respondents had disposable income of more than 2000 Maloti per month.

Monthly household income distribution:

- 73% of households live on less than M999 per month.
- 35% of households live on between 500 and 1000 Maloti per month.
- 17% of households live on up to 500 Maloti per month.
- 12% of households live on between 1000 and 2000 Maloti per month.
- 9% of households live on more than 2000 Maloti per month.
### Income and economic activities (continued)

#### HOUSEHOLD CASH FLOW
Household cash flow is under constant pressure and requires careful budgeting and arbitrage.

Items like **transport, schooling and energy** use up most of peoples’ income.

Large once-off expenses can usually only be covered by either taking on a **loan**, or selling an asset such as a **goat, sheep or cow**.

#### FARMING
Farming dominates economic activities

- **54%** of the sample population are farmers
- **33%** are unemployed or not working

#### INCOME SOURCES

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>35%</td>
<td>Sell agricultural produce (crops, including wool)</td>
</tr>
<tr>
<td></td>
<td>Sell traditional beer</td>
</tr>
<tr>
<td></td>
<td>Sell bead work and crafts</td>
</tr>
</tbody>
</table>

A number of villagers are occasionally involved in ‘cash for work’ programmes driven by the public sector (road maintenance, and other local infrastructure projects).

Remittances are the main source of income for **13%** of households.

#### SEASONAL INCOME

Patterns vary – many people have slightly higher income during the winter and spring months (harvest time) and big expenses at the end and beginning of the year (Christmas, school supplies).

- **74%** of respondents have fluctuating monthly incomes throughout the year.

#### MOBILE MONEY

Mobile money use increases with income levels

- **39%** of respondents, M-PESA is the clear market leader with a 90% market share.

Mobile money use is much more common among farmers who are members of farmer groups, at **56%**.

#### ENERGY PURCHASES

Cash still dominates energy purchases, but non-cash channels are making inroads.

- **72%** of energy purchases are made in cash.

52% of respondents use formal payment channels to make general purchases: either using a bank account, transfers through a retail chain store or mobile money.
Energy sources and energy usage

There is a clear distinction between households using only ‘free’ sources of energy (for instance animal dung, wood, maize cobs and shrubs) and households spending some of their income on energy (“paid energy” such as paraffin, candles, gas, solar energy, coal and charcoal).

Wood and paraffin remain the dominant sources of energy:

- 69% of respondents use wood or plants as the main source of energy for cooking
- 72% of respondents use paraffin as the main source of energy for lighting
- 79% use wood as the main source of energy for heating

Penetration of paid energy sources in households:

- Paraffin is used by 90% of respondents
- Batteries are used by 60% of households
- Candles are used by 50% of households

Only 22% of respondents use gas

- 92% of respondents pay for lighting
- only 34% of respondents paid for energy sources for cooking
- and 18% for heating

The key opportunities for commercial energy sales are:

- lighting,
- charging and
- entertainment (radio and TV)

Household spending patterns on energy

Respondents spend 70% more on energy in winter than in summer: the total average monthly household expense in our sample on energy (all sources combined) is M159.

However, that average varies significantly according to the season: in winter, average spend rises to M194, dropping to M165 in midseason and M114 in summer.

Higher household income levels are clearly correlated with more spending on ‘paid’ energy sources such as paraffin, gas and solar energy.

- Paraffin users tend to spend the most: their monthly spend is an average of M162 throughout the year
- Candle users spend an average monthly amount of M62 per household
- Households that regularly charge cellphones report spending M52 per month on average
Analysis of findings

**OPPORTUNITIES**

Paying consumers are open to using several alternatives to fulfill their energy needs. There is disposable income and most households already spend some money on energy, especially lighting and charging phones.

There is a high and growing penetration of formal payment channels, especially mobile money.

There is significant familiarity with and awareness of EERE products including solar lights and clean cookstoves and their health benefits.

There is a growing level of mobile phone penetration and significant demand for phone charging.

**OBSTACLES**

Low income levels, greatly influence energy usage: behaviours are dictated by availability of cash flow rather than needs.

High income seasonality.

There is a relatively high lack of trust due to questionable quality and poor maintenance of existing solar devices and some cookstoves: after-sales service and maintenance will be a key driver in promoting EERE devices.

Fear that adopting EERE products may cause people to lose the chance of ever being connected to the grid.
Lessons learned

PRODUCT RANGE
• Primarily focus on energy needs currently fulfilled by paid sources: lighting and charging and alternatives to candles/paraffin
• Products should offer a financial return on investment as a money saver and/or money generator

PRICING AND PAYMENT CHANNELS
• Affordability is a critical factor
• People are prepared to pay for quality, but they need to trust the products and will require a warranty
• Selling on credit is not likely to work, given high default rates and widespread indebtedness
• Pay-As-You-Go models need to be explored and tested
• While M-PESA and Ecocash’s footprints and market share are growing fast, there is a degree of skepticism about the reliability (and practicality) of mobile phone payments. Younger people tend to be more positive and confident about the possibility of EERE devices being paid for by M-PESA

PLACE AND PROMOTION
• Price: we will need to offer value for money and payment facilities (including PAYGO solutions)
• Distribution: our products should ideally “come to” the customer, as 60% of people who purchase energy do so near to where they live. This means that the reseller model is probably an ideal channel to promote EERE products: door-to-door sales and through public gatherings

• Payment channels
° Cash needs to remain an option for customers as it is still the most widely accepted and available means of payment
° Mobile money is an opportunity: with 39% penetration and 55% amongst respondents spending more than M150 a month on energy sources
° Migrant workers and remittances constitute a significant opportunity, not only to buy on behalf of their relatives, but also to spread awareness
### Lessons learned (continued)

#### RESEARCH METHODOLOGY

<table>
<thead>
<tr>
<th>What worked well</th>
<th>What was challenging</th>
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<tbody>
<tr>
<td>Multiple insights were obtained from participants</td>
<td>Occasionally had too many FGD participants</td>
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<tr>
<td>High-quality quantitative data was extracted from the pre-FGD surveys, enabling us to enrich our insights through comparisons with the UNDP energy study</td>
<td>Pre-FGD questionnaires had to be revised and adapted</td>
</tr>
<tr>
<td>Gained a better understanding of specific needs and expectations of the market</td>
<td>Ensuring the interlocutors were representative of the general population</td>
</tr>
<tr>
<td>Record-keeping and organisation of FGDs and pre-FGDs worked well</td>
<td>Managing expectations of participants</td>
</tr>
<tr>
<td>Great note-taking and record-keeping</td>
<td>Ensuring the representativity of our samples</td>
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</tbody>
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