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This summary report is based on the full version of the report prepared by Emerging Markets Consulting (EMC) with some additional inputs from Jason Steele and Dennis Barbian (SNV Cambodia). Any views or opinions presented in this report are solely those of the authors and do not necessarily represent those of SNV.
**Abbreviations and Acronyms**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ABS</td>
<td>Advanced Biomass Stove</td>
</tr>
<tr>
<td>ACCS</td>
<td>Advanced Clean Cooking Solutions Project</td>
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<tr>
<td>EMC</td>
<td>Emerging Markets Consulting</td>
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<tr>
<td>HH</td>
<td>Household</td>
</tr>
<tr>
<td>LPG</td>
<td>Liquefied Petroleum Gas</td>
</tr>
<tr>
<td>MFI</td>
<td>Microfinance Institution</td>
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<tr>
<td>mL</td>
<td>milliliter</td>
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<tr>
<td>NLS</td>
<td>New Lao Stove</td>
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<td>SNV</td>
<td>SNV Netherlands Development Organisation</td>
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Executive Summary
SNV Cambodia is implementing a two-year program on Advanced Biomass Stove (ABS) and renewable biomass fuel business model innovation. The principal objective of this study was to identify the target market and assess the commercial market potential for the proposed stove\(^1\)/fuel\(^2\) combination.

A mixed methodology was used, with a quantitative household survey\(^3\) and a set of qualitative focus group discussions, to ensure quantitative data could be explored in detail through focus groups. In addition secondary literature and national household statistics were used for the market segmentation.

The market was segmented based on geographic, economic and fuel type parameters into nine segments. Based on an attractiveness criteria three primary and three secondary market segments were identified during the inception phase. The survey data was then used to validate the market segments on the basis of: desired ownership; willingness to pay; ability to pay; and willingness to use financing methods. In the end, four validated primary target market segments were identified and one secondary market segment as shown below:

**Primary and secondary target market segments**

**Primary Market Segments**

1 Charcoal, top 2/3
   - Charcoal users in top 2/3 income >$194 month
   - 10.6% peri-u population
   - [98,249 people]

2 Firewood, top 2/3
   - Firewood users in top 2/3 income >$194 month
   - 14.8% peri-u population
   - [137,178 people]

3 LPG
   - LPG users
   - 60% peri-u population
   - [561,690 people]

4 Charcoal, top 2/3
   - Charcoal users in top 2/3 income >$215 month
   - 6.7% urban population
   - [38,354 people]

**Secondary Market Segment**

1 Firewood, top 1/3
   - Top 1/3 of firewood buyers who earn >$178
   - 23.1% rural population use firewood – subset buy
   - [subset of 2,557k people]

**Key findings for all market segments**

- **Desired ownership** of the ABS was high - 66% of urban and peri-urban respondents compared to less than 50% for rural respondents.
- **Price sensitivity** was high, while ABS represented 20-30% of monthly income but willingness to pay averaged from 3-11% of monthly income.

**Key findings for target market segments**

- **Total Primary Market Size** of 835,000 people (175,000 households) in the Phnom Penh metropolitan area

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1 Philips HD4012 was used as illustrative example of advanced biomass micro gasifier stove.
2 Rice Husk Pellets were used as illustrative example of renewable biomass fuel.
3 313 respondents (99% female), April 2014
- **Total Addressable Primary Market** of 64,500 ABS units ($6.45m) in the Phnom Penh metropolitan area
- **Total Secondary Market Size** of 2.56 million people ($44,000 households) in rural areas
- **Total Addressable Secondary Market** of 32,400 ABS units ($3.24m) in rural areas
- **Total Addressable Primary and Secondary Market** of 96,900 ABS units ($9.69m)
- **Open to stove change** - high, 60-80% of respondents have previously changed (change cost - $1-$8)
- **Open to new technologies** - quite high, 51% of respondents own a rice cooker (change cost - $22)

**KEY FINDINGS FOR ADVANCED BIOMASS STOVE**

- **Benefit- ‘Save fuel costs’**: perceived as most interesting benefit
- **Benefit- ‘Health’**: economics of reduced healthcare cost which was the main reason for HH saving
- **Competitive advantage** - Fuel efficiency cost savings: relative to LPG / Charcoal / Wood
- **Competitive advantage** - Safety from the risk of explosion: relative to LPG
- **Main rival products**: LPG Gas Stove, LPG 200ml, New Lao Stove
- **Main motivators for change**: time spend cooking, ease of use, savings in fuel costs
- **Barrier to adoption** – 1. Low price flexibility between $35 and $100
- **Barrier to adoption** – 2. Not having experienced product through observation & referral
- **Innovative financing** - 21% interested in MFI and 28% interested in monthly installment
- **Ownership & financing** - desire to purchase rose from 27% before - 66% after discussing financing options

**RECOMMENDATIONS**

- Adopt validated primary market segments as basis for market entry strategy
- Build marketing communications around the identified competitive advantages
- Develop innovative pricing plans using installments and fuel/stove bundles
- Develop detailed business plan to model price, sales, growth and profitability
- Utilize positional power of lead users for reference based marketing

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*The calculation for “Total Addressable Secondary Market” was performed by the SNV team on the basis of total population of the market segment, average household size of that market segment, percentage of households that purchase firewood (39% based on a household survey conducted by Domrei Research and Consulting Ltd. in 2013), and percentage of households showing willingness to purchase an ABS for $100.*
1. Segment Validation

The Cambodian market was segmented based on geographic, economic and fuel type parameters into nine segments\(^5\). Based on an attractiveness criteria\(^6\) three primary and three secondary market segments were identified. The survey data was then used to validate the market segments on the basis of:

- Interest in owning an ABS
- Willingness to purchase at a price of $100
- Ability to pay (ABS as a % of median monthly income)
- Willingness to use alternative financing methods for purchase

**Interest**

Interest in ABS ownership varies by geographic area. The peri-urban and urban segments, which are primarily in the Phnom Penh metropolitan area, show most interest in owning the ABS, with over 66\% of respondents (excluding LPG users) indicating interest in owning the ABS. The specific segments that showed the highest levels of interest in owning the ABS were:

1. Peri-urban Segment 1 - charcoal users in the top 2/3 income bracket (83\% interested)
2. Peri-urban Segment 2 - firewood users in the top 2/3 income bracket (75\% interested)
3. Urban Segment 1 - charcoal users in the top 2/3 income bracket (80\% interested)

The segments showing the lowest level of interest in owning the ABS were the two rural segments and the urban LPG segment, with less than 50\% interested.

**Willingness & Ability to Pay**

The respondents had a high level of price sensitivity across all market segments. When asked to freely indicate the amount willing to pay for the ABS, the respondents set this at a price representing on average between 3\%-11\% of monthly income. In absolute terms this ranges from an average willingness to pay between $14 and $50. The wealthiest segment (urban segment 1) shows the willingness to pay the highest price.

When willingness to pay was anchored to a price of $100, the strongest readiness to purchase the ABS was found in the following segments:

1. Urban Segment 1 - charcoal users in the top 2/3 income bracket (33\%)
2. Peri-urban Segment 1 - charcoal users in the top 2/3 income bracket (25.6\%)

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\(^5\) Socio-economic data and statistics sourced from the National Institute of Statistics’ socio-economic survey 2012 was used to derive a detailed understanding of income levels across three geographic areas; urban, peri-urban and rural on a nationwide scale. The micro data also provided a breakdown of the populations’ primary fuel type used for cooking. These sets of data covering income, geography and household fuel type usage were used as the criteria for market segmentation.

\(^6\) The initial target market development found that the high and low ends of the market are the least attractive segments for the ABS. The low end market users primarily collect rather than buy firewood, representing a difficult segment to sell to, as this group would not realize any of the cost savings related to the fuel efficiency of the ABS. Thus for rural firewood users and for a section of peri-urban firewood users the willingness to pay was lower than for other user segments. The high end of the market are LPG users, who have already made a large purchase to upgrade their cook stove and fuel source, to the premier fuel and cook stove on the market. The income level of users is an important consideration for affordability. The estimated retail price of approximately $100 for the ABS is a consideration for focusing on the top two thirds income groups in urban and peri-urban areas. The economies of scale for distribution and feasibility of servicing markets based on infrastructure, creates an additional bias towards the peri-urban and urban areas. Combining the income levels, with the fuel types of charcoal and purchased firewood, narrows the level of focus to the middle and upper middle range of the market, in terms of income and fuel usage. These factors provided the basis for the selection of target markets. The proposed target markets were used as the basis for designing the quantitative research sampling approach.
Peri-urban Segment 2 - firewood users in the top 2/3 income bracket (18.8%)
Peri-urban Segment 4 - LPG users all income levels (41.9%)
Rural Segment 1 - firewood users (19.2%)

In these segments the ABS price of $100 represented between 20% - 30% of the monthly income.

**FINANCING**

Overall the availability of alternative financing methods had a positive impact on the readiness to purchase the ABS at a high cost. Desire to purchase rose from 27% before - 66% after discussing financing options. Respondents generally preferred paying in installments than taking up an MFI loan.

**VALIDATED TARGET SEGMENTS**

Based on this evaluation, the primary target market segments were identified as:

- **Charcoal, top 2/3**
  - Charcoal users in top 2/3 income >$194 month
  - 10.6% peri-u population [98,249 people]

- **Firewood, top 2/3**
  - Firewood users in top 2/3 income >$194 month
  - 14.8% peri-u population [137,178 people]

- **LPG**
  - LPG users
  - 60% peri-u population [561,690 people]

- **Charcoal, top 2/3**
  - Charcoal users in top 2/3 income >$251 month
  - 6.7% urban population [38,354 people]

These segments align to the initial market segmentation primary target markets. A fourth primary target market was identified as peri-urban LPG users. A secondary target market segment was defined as rural firewood users in the top 1/3 income group. It was deemed secondary due to the lower level of income and reluctance to access financing methods relative to the primary target segments.

The actual population numbers relating to each target segment have been extrapolated from the Cambodia socio-economic survey data and are detailed in the figure below.
The total market size of the primary target market segments is 835,000 people in the Phnom Penh metropolitan area, which based on household size and willingness to pay $100 provides an upper addressable market limit of approximately 64,500 unit sales. This would give a potential market value of $6,450,000.

The total market size of the secondary target market segment is 2.56 million people in rural areas, which based on household size, percentage of households that purchase firewood, and willingness to pay $100 provides an upper addressable market limit of 32,400 unit sales. This would give a potential market value of $3,240,000.

Together, the total addressable market limit of the primary and secondary target markets is 96,900 unit sales and potential market value of $9,600,000.

2. Target Segments Profiles

Key characteristics of identified target market segments are:

1. Peri-Urban Segment 1 - charcoal users in the top 2/3 income bracket (income >194/month)
   - Average monthly income $322
   - 83% interested in owning an ABS
   - Current primary stove: New Lao Stove (68%) & Traditional Stove (27%)
   - Current secondary stove: LPG 200ml

2. Peri-Urban Segment 2 - firewood users in the top 2/3 income bracket (income >194/month)
   - Average monthly income $490
   - 75% interested in owning an ABS
   - Current primary stove: Traditional Stove (58%) & New Lao Stove (32%)
   - Current secondary stove: LPG 200ml

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7 The calculation for “Total Addressable Secondary Market” was performed by the SNV team on the basis of total population of the market segment, average household size of that market segment, percentage of households that purchase firewood (39% based on a household survey conducted by Domrei Research and Consulting Ltd. in 2013), and percentage of households showing willingness to purchase an ABS for $100.
Peri-urban Segment 4 - LPG users all income levels
- Average monthly income $322
- 67% interested in owning an ABS
- Current primary stove: LPG 200ml (75%) & LPG Gas Stove (25%)
- Current secondary stove: Traditional Stove, New Lao Stove, LPG 200ml

Urban Segment 1 - charcoal users in the top 2/3 income bracket (income >$251/month)
- Average monthly income $677
- 80% interested in owning an ABS
- Current primary stove: Traditional Stove (67%) & New Lao Stove (25%)
- Current secondary stove: LPG 200ml & LPG Gas Stove

Rural Segment 1 - firewood users (19.2%)
- Average monthly income $459
- 48% interested in owning an ABS
- Current primary stove: Koh Thom Stove (35%), Traditional Stove (30%), New Lao Stove (17%)
- Current secondary stove: LPG 200ml

- Avg. 5 persons/HH; 2.2 income earners
- Avg. 2.4 stoves/HH
- Most frequent primary stove: Traditional Stove (43%) & New Lao Stove (32%)
- Most frequent secondary stove: LPG 200ml (62%) & LPG Gas Stove (15%)
- Boiling is most important cooking method (71%), followed by frying (23%)
- HH purchasing decision made by women in 55% of cases

3. Motivation & Barriers

3.1. Historic behaviour – cook stove changes

Change of stove type is occurring regularly, with more than half of all respondents having changed in the past. However the monetary value of change is very low.

Historic behavior relating to changing cook stoves was analyzed to provide an understanding of the type of stove changes, whether any upgrade or downgrade trends existed in cook stove changes, the cost of changes and motivations behind these changes. When reviewing the entire survey population over 50% had previously changed their cook stove. This increases from 58.3% to 83.7%, when focused on the target market segments.
The most frequent type of stove change in all target segments (except for peri-urban segment 1), is from the traditional stove to the LPG 200ml stove. This represents on average 28% of stove type changes in the target market segments. This type of change represents a departure from the standard traditional or New Lao version of a solid biomass stove, towards a new stove technology that also utilizes a new fuel.

**Main motivators for change in stove type are the time spend cooking, ease of use of the new stove and savings in fuel costs.**

The motivations given for changing stove to LPG 200ml from either New Lao or a traditional stove were the same:

- Fast cooking (45% from NLS, 50% from traditional)
- Ease of use (23% from NLS, 30% from traditional)
- No smoke (9% from NLS, 8% from traditional)

The motivations given for changing stove to New Lao from a traditional stove were:

- Strength (30%)
- Ease of use (24%)
- Cheap, use less fuel (13%)
- Cooks fast (13%)

In the context of the ABS, this shows that respondents are willing to change stove technology and fuel type, if the product has the right features, benefits. In this case, the cost of changing from the traditional stove to the LPG 200ml is approximately $7.80 and represents an incremental product upgrade in terms of price. The second most frequent stove type change is from the traditional stove to the New Lao stove. This represents an incremental upgrade in cook stove, with the same stove technology and fuel types. It does however show a willingness to upgrade based on the durability and fuel efficiencies the New Lao stove offers over traditional stoves.

### 3.2. Historic behaviour – purchasing a rice cooker

A large proportion of the respondents have adopted a rice cooker and with it a new technology. This change cost them on average $22. This price is also the most significant barrier to adoption. Drivers for adoption are ease of use and time saved when cooking.

The survey questionnaire included a section on historic behavior relating to purchasing a rice cooker. A rice cooker was chosen for the survey because it has a number of characteristics similar to an ABS. The ABS and rice cooker are both cooking related “push” products, meaning they do not fill a new consumer need.

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8 It should be noted the LPG fuel is more expensive than charcoal and firewood
but provide a new product to meet an existing need. The motivations and benefits it provides are interesting when examining the decision making process for the ABS. The rice cooker as a consumer good costing from $10-$30 more than a traditional stove also provides an interesting reference point for price related purchasing behavior. The purchasing behavior relating to past changes in cook stove types, is an important guide to understanding the decision making process through the motivations, barriers to adoptions, methods of overcoming these barriers and actual purchasing behavior.

The majority of respondents (51%) owned a rice cooker. The product benefits driving these purchases are:

- Ease of use 42%
- Saves time 32%

The change cost of purchasing a rice cooker is $22, which is higher than the cook stove upgrades discussed in the previous section. This represents the largest cooking related upgrade expenditure in the market, with the exception of the respondents who upgraded to LPG stove⁹.

The respondents who did not own a rice cooker were highly price sensitive, with over 63% indicating its cost as the most frequent barrier and 15% the cost of electricity as the second most frequent barrier to purchase. When asked how this barrier could be overcome, the top three responses were; saving (31%), receiving gift (14%) or earn more money (9%).

![Barriers to owning rice cooker](image)

![What helps to overcome barriers](image)

### 3.3. Motivations to own a new stove

*There is a substantial willingness to change the type of stove amongst the five segments. ‘Ease of use’ of current stove is the most important argument against change.*

The percentages of respondents who desired changing to a new stove are set out in the figure below:

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⁹ The cost of changing to LPG stove is $60 and only 12 respondents have made this upgrade.
Change preferences: The respondents desiring to change the type of stove aspire one of four different stoves: LPG Gas Stove, LPG 200ml gas stove, New Lao stove and Electric stove. The strongest interest overall is in the LPG Gas stove, varies however amongst segments.

1. Peri-urban charcoal users’ interest is divided amongst the four stoves to equal terms, all of them attracting roughly a quarter of respondents desiring to change.

2. Peri-urban firewood users’ favor the New Lao stove (41%). LPG 200ml and Electric stove attract a quarter of respondents, while LPG Gas stove only under 10%.

3. Peri-urban LPG users interest is divided between the large LPG Gas stove and the New Lao stove.

4. Urban charcoal users aspire to own the LPG Gas stove (60%) and the New Lao stove (40%)

5. All Rural firewood users aspire to own the LPG Gas stove.

Barriers to change: Ease of use of the current stove is the primary reason for not wanting to change stoves across all target segments. This shows a degree of inertia with respondents who use the traditional stove, New Lao stove or LPG 200ml stove.

3.4. Competitor Stove Profiles

Respondents willing to change stove type favor LPG gas stove (35.8%), New Lao stove (32.1%), 200ml LPG stove (13.2%) and electric stove (13.2%).

The highest percentage of the respondents willing to change the type of stove expressed a desire to purchase a LPG stove or LPG 200ml. This data and the indicative price structure of the ABS, makes the LPG stove the main product competitor of the ABS. To gain a better understanding of how the ABS fits in the competitive landscape, the advantages and disadvantages of LPG stove, LPG 200ml and New Lao stove were examined across the entire survey data set.

A high percentage of the respondents willing to change the type of stove desire to purchase a LPG Gas stove or LPG 200ml. Current owners list speed and ease of cooking as principal advantages. Fear of explosion is the main disadvantage.
The advantages / benefits of the LPG Gas Stove/LPG 200ml are speed of cooking, ease of use, saving time and saving money. The largest disadvantage for the LPG stove was fear of explosion. This was backed up in all the focus group discussions where the fear of explosion was repeatedly identified as a reason to favor the ABS over LPG.

**A high percentage of the respondents willing to change the type of stove desire to purchase a New Lao Cook stove. Current owners list cost savings and the strength of fire as principal advantages. Difficulty to ignite is the main disadvantage.**

A high percentage of respondents in peri-urban segment 2 expressed a desire to purchase a New Lao stove. The advantages and disadvantages of the New Lao stove will provide a useful reference point for examining the benefits and barriers to purchasing an ABS.
3.5. ABS Benefits

Cost Savings, Health Benefits\(^{10}\) and ease of use are the strongest perceived benefits of ABS. Its high cost is the overwhelming largest barrier.

The benefits of the ABS were ranked and scored, providing aggregate benefits. The top ranked benefits across the whole market surveyed were:

- **Cost saving** 34.5%
- **Health Benefits** 17.5%
- **Easy to cook** 11.8%
- **Saves time** 9.6%
- **Cleaner house** 9.6%
- **Less smoke** 9.5%

All segments value Cost Savings highest and Health Benefits second or third. They see different other factors as further important advantages. This can be leveraged when marketing to a specific segment.

ABS Benefit importance ranking by target market segment

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\(^{10}\) additional cost savings through reduced health care costs/avoided loss of earning through illness
All primary target segments rank cost savings and health benefits as the first and second most important benefits, the secondary rural segment ranked cost saving and time savings first and second with health third.

The primary target segment focus group discussions revealed further insights on why each ABS benefit is important:

**Top Ranked Benefit #1 – Cost Savings**

*All segments value Cost Savings highest, realizable through faster cooking times and fuel efficiencies*

The top ranked benefit, based on the quantitative survey is cost savings. The focus group discussions indicated that the savings could be realized in different ways. The ABS’s ability to cook faster means less fuel is used relative to cooking with either firewood or charcoal, in addition to the inherent fuel efficiencies gained from using the ABS. This was identified in both the peri-urban segment 1 – charcoal and peri-urban segment 2 – firewood focus groups;

**Top Ranked Benefit #2 – Health benefits**

*Health benefits are the second ranked benefit, primarily because this reduced healthcare costs and lost earnings through illness*

The second ranked benefit, based on the quantitative survey is health benefits. The urban segment 1 and peri-urban segment 2 focus groups both identified health benefits as the third most important benefit after saving time and money. The specific benefits associated with improved health, such as increased longevity, avoidance of specific illnesses and quality of life were not the drivers behind the identification of health as an ABS benefit. Health was identified as a benefit because improved health means a cost saving or improved economic situation for that household, by avoiding healthcare costs and potential lost earning through ill health. Thus, the health benefit is really a cost saving benefit derived from the smoke reducing features of the ABS.

**Top Ranked Benefit #3 – Ease of use, Time savings, Safety, Durability & Style**

The third and fourth ranked benefits are ease of use and saving time. Ease of use was not highlighted in any of the focus groups, though it is likely to be partly synonymous with saving time, as the main ABS usage activities are lighting and controlling the flame, both inherently time saving activities relative to other non LPG stoves. Saving time was identified in all focus groups, with different explanations for why this was important in each. Firstly, the ability to use multiple fuels saves time having to replenish an existing fuel that runs out when an alternative may be present in the household. This was highlighted as an issue for LPG stoves, rather than traditional stoves, as LPG stoves do not have any multi-fuel capability.\(^\text{11}\) This

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\(^\text{11}\) peri-urban segment 1 – charcoal focus group
provides increased convenience, transport cost savings and time availability for other activities. Secondly, saving time was identified as important because of the competing time pressures on the person normally responsible for cooking. These competing time pressures were identified as looking after children, laundry, housework, employment, joining wedding or engagement parties and increased leisure time.

The other important benefit that emerged in the focus groups was the safety of the ABS in relation to LPG stove types. A safety benefit was not identified in the initial listing of benefits when designing the survey questionnaire, as the fear of explosion from LPG only emerged when the competitive analysis of LPG stoves was conducted following completion of the survey questionnaire. The safety benefit that the ABS cannot explode versus LPG, which could explode, was raised in all focus groups. In the peri-urban segment 1 – charcoal focus group, two participants ranked this safety benefit as most important and another saying that she does not let her children use LPG due to fear of explosion.

Finally the durability and style of the stove were also mentioned as important in the focus groups, though neither were highlighted as key benefits, corroborating their position towards the end of the benefits ranked by the survey.

3.6. ABS Barriers to Adoption

The main barriers to adoption of the ABS are the high cost and not having been able to experience the product.

Based on the household survey results the main barriers to adoption of the ABS were ranked. The top barriers are:

1. High cost of ABS, based on the $100 price used in the survey – 67%
2. Not having experience of the product through observation and referral – 26%

It should be noted that, ‘not having experience of the product through observation and referral – 26%’ is the second biggest key barrier to adoption after high price. Marketing activities must sufficiently accommodate potential customers’ desire to ‘experience the product’ before purchasing – for instance through direct sales activities that include product demonstrations and user-based reference marketing.

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12 The mixed methodology ensured that this point was covered and examined in detail.
3.7. ABS Competitive Advantages

After reviewing the ABS benefits, benefits were examined in relation to the disadvantages of the main competing products, namely; LPG Gas Stove, LPG 200ml and New Lao stove. This analysis identified a number of potential competitive advantages the ABS has relative to competing products.

**MATCHING ABS TO COMPETITOR: LPG v ABS**

*ABS can position itself as safer and saving costs compared LPG Gas stoves.*

The LPG stove and ABS will likely compete in the same space of the market, based on the quality, price and benefits both products provide, such as; speed and ease of use benefits. The price points of both products will be in the same range and therefore competition will be based on the ability to successfully differentiate the ABS benefits from the LPG stove and leverage these competitive advantages.

The first competitive advantage is the ABS’s fuel cost saving relative to using LPG. The second competitive advantage is that the ABS does not pose any risk of explosion. The risk of explosion was identified as a significant disadvantage of the LPG stove. This was further emphasized in the focus groups. The ABS is able to provide a cook stove without any risk of explosion and thus is able to promote safety as a competitive advantage. Safety is a very explicit differentiator and importantly is related to a fundamental human need. This presents the opportunity to incorporate this into marketing messages.

If these competitive advantages can be leveraged, the large portion of the target market segments that have indicated the desire to upgrade to LPG can be targeted. These portion of the target market segments in question are; rural segment 1 (100%), urban segment 1 (60%), peri-urban segment 4 (50%) and peri-urban segment 1 (27%).
MATCHING ABS TO COMPETITOR: LPG 200ML VS. ABS

ABS can position itself as saving costs compared LPG 200ml gas stoves, saving time when cooking, being safer and being robust.

The LPG 200ml stove and ABS stove will also compete in the market place, as potential upgrade options for users of the New Lao and traditional stoves. When the motivations to own a new stove were analyzed, the barriers for existing owners of traditional and New Lao stoves to upgrading were inertia based, with ease of use and happy with the current stove the top reasons given. This may be because a cook stove is a push product, which is not inherently meeting an unmet need, but rather seeking to meet an existing need with a new enhanced product aiming to provide an improved customer experience.

The opportunity for the ABS is to provide a purchase path, either directly from New Lao, traditional stove or LPG 200ml, rather than the incremental upgrades from New Lao or traditional stove to LPG 200ml. The ABS has three competitive advantages over the LPG 200ml:

The first competitive advantage is the ABS’s fuel cost saving relative to using LPG.

The second competitive advantage is that the ABS does not pose any risk of explosion. The risk of explosion was identified as the most significant disadvantage of the LPG 200ml stove, higher than for the large canister LPG stove. This was further emphasized in the focus groups. The ABS is able to provide a cook stove without any risk of explosion and thus is able to promote safety as a competitive advantage.

The third competitive advantage is robustness. Over 21% of LPG 200ml users listed the stove breaking as a disadvantage. The ABS’s durability and its fabrication from stainless steel were both identified in the focus groups as important benefits of the ABS, providing the final competitive advantage over LPG 200ml.
MATCHING ABS TO COMPETITOR: NEW LAO STOVE VS. ABS

ABS can position itself as saving time during cooking compared to the New Lao stove, the absence of smoke and related health benefits, and cleanliness.

The ABS will not directly compete with the New Lao stove, which will still remain the most likely incremental product upgrade path for traditional stove users. However, the users who have already upgraded to New Lao and are considering a further upgrade may move directly to the ABS. The ABS does have competitive advantages over the New Lao stove, though when viewed in the context of LPG stove and LPG 200ml in the market, none of these are true competitive advantages in the overall market, as the LPG stoves also have these advantages over the New Lao stove. These advantages should only be utilized in marketing messages, for campaigns that are specifically tailored to the demographics of the customers using traditional stove types.
**Savings Related to ABS Benefits**

70% of respondents put part of their income as savings aside. The major reason is healthcare, which is equally a perceived major benefit of the ABS.

The survey asked respondents who saved money, why they saved money. The largest reason for saving across all market segments was to pay for healthcare (41%), with education (14%) and ceremonies (9%) trailing as second and third reasons.

This provided an interesting reference point against the ABS benefits of cost saving benefit and health benefit. Thus, the reality of healthcare costs as a major reason for saving and household expense provides an opportunity to promote the financial efficiencies the ABS provides via fuel cost saving and improved health, leading to reduced health care costs.

### 3.8. ABS Fuel Savings

The monthly expenditure on existing fuels was examined and the potential annual savings that would accrue from using the ABS calculated. The calculations were based on the fuel usage and efficiency assumptions provided by SNV\(^\text{13}\) that assume based on fuel efficiency, an average monthly fuel cost of $6 for the ABS. This fuel could either be an innovative new fuel, such as rice husk or sawdust pellets, or an existing fuel source, due to the SNV model pricing charcoal and a new fuel source at the same price. It should be noted that if cost savings can be realized with innovative fuel production and these savings are passed on to the customer in the form of lower prices, this could present opportunities for cross subsidization of the ABS, enabling market based price competitiveness, through bundled fuel and stove installment plans.

\(^{13}\) The model assumes average daily usage of charcoal of 1.3kg at a price of 1500 Riel per kg. The ABS realization of 60% fuel efficiency over traditional stove types gives an average monthly expenditure of $6 per month on fuel. Note these initial assumptions are subject to further sensitivity analysis.
Charcoal users can make the largest savings by using ABS. For firewood and LPG users fuel expenditure savings are negligible as are savings in transport costs for all segments.

The most significant savings were for the peri-urban and urban charcoal users. Based on the ABS estimate price of $100 the fuel saving for urban charcoal users would pay for the ABS in less than ten months, while the fuel saving for peri-urban charcoal users would pay for the stove in just over one year. The savings for LPG are less significant at $21. However, as LPG is the main competing product for potential ABS customers, it would be worth exploring exact level of fuel efficiencies the ABS offers relative to the different sizes of LPG canister. The negligible and zero saving for the peri-urban and rural firewood segments is indicative of the fact that most firewood is still collected in both areas, and purchased firewood is lower cost than charcoal and LPG.

**REPLACEMENT RATE OF FUEL**

The existing purchasing patterns of fuel were analyzed for each target market segment. The pattern of behavior differs for each fuel type and illustrates that any new fuel introduction to the market should be cognizant of this when designing a channel strategy. The time to buy or collect fuel was low for all segments, with rural firewood spending the highest amount of time, 2.5 hours per month. Thus, there is no need to further consider the opportunity cost of fuel collection time, as a potential factor in the financial and market analysis of the ABS pricing and promotion approaches.
3.9. Affordability & Financing

The survey questionnaire asked; what was the willingness to buy the ABS, based on a price of $100 and a fuel saving over one year of $100 (bearing a close approximation to the actual fuel saving for peri-urban and urban charcoal users). There was a 27% positive response across the entire data set.

The preferred methods of payment were saving (69%) and using available money (25%). This was referenced against the method of payment for purchasing a similar priced cook stove, namely the LPG stove. The methods of payment were the same but with the percentages roughly reversed, with 67% using available money and 29% saving.

The preferred method of payment shows little variance across all target market segments.
FINANCING – MICROFINANCE OPTION

The overall willingness to take a micro finance loan to pay for the ABS was low, with similar levels of interest across all target market segments. Based on the example used in the survey questionnaire, that offered different repayment terms on a monthly 2.75% interest rate $100 loan, the majority of respondents in all segments chose either the shortest payment term of 6 months or the longest payment term of 18 months. Those who chose the lowest payment term were indicating a willingness to pay a higher monthly amount but with a lower overall cost of financing, while those who chose the longest payment term favored a lower monthly repayment but with higher overall financing costs. The 79% of respondents who indicated they did not want to take out a micro finance loan gave two main reasons. The first reason was fear of not being able to pay back the loan (49%) and the second reason was that they did not want to have debt (27%).

The focus groups also indicated a low level of interest in micro financing for the ABS, with fear of not being able to pay back, not wanting to have debt and fear that the micro finance scheme is too complicated listed as the main reasons. The respondents indicated the decision making power to take out a micro finance loan would not rest solely with them.

FINANCING – FUEL/STOVE INSTALMENTS OPTION

An alternative method of financing was designed for the survey questionnaire to test whether a fuel / stove combination would be attractive to potential ABS customers. This financing method offered payment for the stove and delivery of a month’s worth of new fuel, by a single monthly installment. The installments did not have an interest rate, though they did vary according to the length of payment term, with the highest monthly installment amount payable over the shortest period of time and the lowest installment amount payable over the longest period of time. It was also explained that when the installments finished the ABS would be fully owned and the option to continue purchasing the new fuel would exist.

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14 EMC’s organizational experience in the MFI sector indicated this was a typical monthly interest rate.
15 The rice husk pellets were used as an example of a new fuel when explaining the scheme.
16 The monthly fuel in the scheme was 18kg based on SNV usage assumptions.
There was interest in the scheme in peri-urban segments 1 & 2 and urban segment 1. Overall respondents interested to pay for the ABS with installments prefer the 24 month pay-back scheme. Thus, making the ABS financially accessible is the strongest reason for choosing installments and not wanting debts the strongest reason against.

The focus groups examined the scheme in more detail, though it was clear that the exact structure of the scheme was not well understood by the participants. The only aspect that was commented on was the fuel delivery aspect, which was viewed as a benefit to avoid the cost and inconvenience of travelling to buy fuel. The complexity of any innovative fuel and stove price bundle can present a barrier if the proposition is not properly understood.

4. Conclusion

The challenge when introducing the ABS into the market is to encourage change from an existing cook stove to the ABS despite the barrier presented by the ABS price. To enable this stove upgrade, two important areas must be addressed. Firstly, the ABS product benefits must deliver a competitive advantage over the products competing in the stove upgrade space. Secondly, the products pricing must be managed creatively.

The primary benefits of the ABS across all segments were in order of importance, savings on fuel costs and health benefits, which are valued about half the importance as saving on fuels. Although these are ABS’ two most important benefits, they were not observable for the respondents. Success of ABS will be dependent on turning these perceived benefits into observable benefits.

A number of secondary benefits were also discovered, these varied by segment. Peri-urban charcoal users, top 2/3 income bracket ranked cleanliness for the cook as the third benefit. Peri-urban firewood users in the top 2/3 income bracket ranked ease of cooking and absence of smoke as important secondary benefits. Peri-urban LPG users ranked ease of cooking and saving time as secondary benefits most attractive to the segment. Urban charcoal users in top 2/3 income bracket value ranked ease of cooking and saving time as most important secondary benefits. For Rural firewood users in the top 1/3 income bracket value, the most important secondary benefits are health benefits and the cleanliness of the house.

The key ABS competitive advantages are;
- Fuel efficiency cost savings relative to LPG / Charcoal / Firewood
- Safety from the risk of explosion (LPG)

The health benefits\(^{17}\) offered by the ABS, relative to traditional stove types, provides cost saving on the cost of healthcare that were deemed of high importance by the target market. These benefits should be considered as the most important selling points when developing marketing messages.

5. Recommendations

- Adopt the validated primary target markets as the basis for a market entry strategy.
- Build a marketing communications plan around the ABS competitive advantages of fuel cost saving (addressing the price challenge), safety (addressing basic human need for safety) and other key benefits such as improved health that will reduce health related costs.
- Develop creative pricing plans that offer installments as a payment plan. The installments should not have an interest rate build into the price. This is a subsidy of the financing cost, though if the financing funds are provided by a development agency the normal financing cost of capital is negligible allowing this to be passed through to the customer in this way.
- Develop creative pricing plans built around fuel and stove bundles. This presents the opportunity to cross subsidize the price of the stove via the fuel. The fuel may have a lower cost structure than existing fuels, which could be directly passed through to the bundle, and or via the fuel efficiencies leading to a lower overall fuel requirement and cost.
- Enhance understanding of the primary target market segments through product trials and additional semi-structured interviews to test defined product propositions.
- Develop detailed business plan to understand how pricing plans are affected by operational and market driven sensitivities.
- Adopt a promotion plan that utilizes lead users in positions of responsibility and authority within target communities as the basis for facilitating community and reference based marketing.

\(^{17}\) Health benefits are not classified as a competitive advantage, as these benefits can also be provided by alternative cook stove products fuelled by either LPG or electricity.