REPORT OVERVIEW

1. Executive Summary
2. Background & Rationale
3. Methodology
4. Baseline Summary
5. Stove Functioning
6. Stove Experience, Preference & Perceptions
7. Stove Costing and Willingness-to-Pay
8. Conclusion
EXECUTIVE SUMMARY

- On the basis of the data collected, it can be concluded that the Envirofit PCS-1 was well accepted and appreciated among Cambodian study households.

- In particular, study participants recognised and appreciated significant reductions in smoke emissions and fuel consumption, as well as less soot on pots and pans and an overall cleaner cooking experience. Significant fuel savings were independently validated by the research team.

- Respondents state their top 3 likes about the Envirofit PCS-1 as: ‘emits less smoke’, ‘cooks fast’, and ‘uses less fuel’.

- 11 out of 15 respondents prefer the Envirofit PCS-1 over their old primary stove.

- Based on the observed performance of stove, the Envirofit PCS-1 could make substantial contributions to HAP reduction and wood fuel reduction in Cambodia.

- All study participants claimed they would consider buying the Envirofit PCS-1 if the price is acceptable. Feedback from respondents suggests a price point at less than USD $30. 11 out of 15 study participants opted to forgo a cash reward for their participation in the study and instead kept the Envirofit PCS-1.

- Based on the data collected and based on in-person feedback from the field, it appears that the Envirofit PCS-1 is an advanced cookstove model that would be well accepted into Cambodian cooking culture, and there appears to be significant appetite for cookstove upgrades.

- Issues that suggest barriers to adoption (i.e. need for a more involved cooking style/increased need for stove tending that is typically required by rocket stoves but runs contrary to current Cambodian cooking behavior) is surmountable, but illustrates the need for a well-planned market introduction that places a focus on consumer education, user training and continued after-sales support.
This report summarises findings from a Consumer Acceptability and Willingness-to-Pay Study for the Envirofit PCS-1 in Cambodia.

The purpose of the study was to assess the acceptance of the Envirofit PCS-1 among Cambodian households who use predominately wood for cooking on a daily basis. It aimed to gather qualitative information relating to the appreciation of the Envirofit PCS-1 in the Cambodian cooking context.

The study was conducted over a 5-week period by SNV Netherlands Development Organisation, in partnership with Maddox-Jolie-Pitt Foundation (MJP), from August to October 2014 with 15 selected households in 2 target market segments in rural and peri-urban areas in Cambodia.

The study is part of a series of assessments to evaluate the potential for commercial introduction of Advanced Biomass Stoves in the Cambodian consumer market.
PRODUCT SPECIFICATION

- Designed by Envirofit International Social Enterprise
- High performance natural up-draft wood stove
- Efficient combustion chamber technology (incl. secondary air supply)
- Designed to reduce cooking fuel consumption, cooking time, and household air pollution
- 80% reduction in smoke & toxic emissions; 60% reduction in fuel consumption; 50% reduced cooking time
- Not yet IWA Tier rated
- Body heavy cast iron, argon welded
- Maintenance-free
- Manufactured in India
- Estimated retail price in Cambodia: USD $31-$41
CONSUMER ACCEPTABILITY TESTING METHODOLOGY

1. Selection of households from target market segments / check all stoves before they are deployed
2. Baseline survey
3. Stove Introduction (Group and Individual training)
4. One week follow-up survey / Placement of SUMS (thermal data loggers)
5. End-line Survey / Collection of SUMS / Willingness-to-pay experiment
6. Data Analysis and Reporting

Consumer Acceptability Research Questions:

- What are the desired attributes of the advanced biomass stove (ABS)?
- What are the perceived barriers and dislikes of the ABS? Are there feasible solutions to these barriers?
- Number of times and duration that ABS are used in households.
- Willingness-to-pay and does offering instalment payments influence purchase?
- Validation of expected fuel savings.
FIELD SCHEDULE

- **Week 0**
  - Household Selection, Stove preparation

- **Week 1**
  - Days 1-2: Baseline Questionnaires, Stove Introduction (group and individual)
  - Day 5: One-week Follow-up Survey and placement of SUMS

- **Week 2** [No Visits]

- **Week 3** [No Visits]

- **Week 4**
  - Day 25-26: End-line surveys, SUMs data collection, willingness-to-pay experiment
METHOD FOR SELECTING HOUSEHOLDS

- Households chosen from validated primary and secondary target market segments (identified as most likely adopters of Advanced Biomass Stoves through *End-User Market Assessment*1)

- Qualifiers = geographic area + income level + type of primary fuel

- 2 priority segments for Envirofit PCS-1 Study:

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

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

- Randomized household selection based on End-User Market Assessment survey data set

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1 End-User Market Assessment for Advanced Biomass Stoves – Cambodia. May 2014
METHOD TO DETERMINE STOVE ADOPTION

1. Self-reported use of stoves [Questionnaires]

2. Stove use monitoring system (SUMS)
   - SUMS record the stove temperature at selected time intervals (e.g. every five minutes); the resulting temperature profiles are analyzed to determine the frequency of “cooking events” (i.e. number of times the stoves were lit) per day.

Placement
Of SUMS iButtons on the Enviropit PCS-1
METHOD TO DETERMINE FUEL SAVINGS

1. Measuring fuel use:
   - Respondents are asked to make a pile of firewood for the amount they would typically use in a day for all cooking needs.
   - Researchers record the weight of the firewood in a data sheet. Researchers come back the following day to weigh the remainder of the fuelwood pile, thereby determining how much fuel wood was actually used.
   - This procedure is conducted for both, the baseline and intervention stove, to determine differences in fuel consumption.
SURVEY INSTRUMENTS AND DATA COLLECTION TOOLS

- Baseline Questionnaire
- One-week Follow-up Questionnaire
- End-line Questionnaire
- Willingness-to-pay method and script
- Stove introduction material (stove operation manual translated to Khmer)
- Thermal data logger (SUMs) and data sheet
- Digital weighing scales and data sheet; wood moisture meter
Preparation included ensuring that all Envirofit PCS-1 stoves are in good operating order before they are deployed into the study households.
BASELINE SUMMARY

SMART DEVELOPMENT WORKS

ACCS
Advanced Clean Cooking Solutions

SNV
Sample of 16* HHs from 2 geographic areas (8 rural & 8 peri-urban)

2 target market segments (top income bracket firewood users peri-urban and rural)

* 1 HH ended participation in the study due to illness. Baseline represents 16 HHs, One-week follow-up and Endline represent 15 HHs.
GENERAL LOCATIONS OF HOUSEHOLDS

<table>
<thead>
<tr>
<th>Area</th>
<th>Target Segment</th>
<th>Population</th>
<th>Province / District</th>
<th># of HH's / Stoves</th>
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<tbody>
<tr>
<td>Peri-urban</td>
<td>Top 2/3 of firewood buyers who earn &gt;$194</td>
<td>14.8% peri-urban population</td>
<td>Phnom Penh, Russey Keo &amp; Chroy Changva districts</td>
<td>8</td>
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<tr>
<td>Rural</td>
<td>Firewood users in top 1/3 income &gt;$178 month</td>
<td>23.1% rural population</td>
<td>Battambang, Samlout district</td>
<td>8</td>
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</tbody>
</table>
• 100% of respondents are female
• Average age of respondent is 39 (range 20-56 years)
• 15 respondents are married, 1 is widowed
• 13 out of 16 respondents have attended school
• Average highest grade attended is 6th grade (ranging from 1 to 12)
Average household size of sample is 5.5 (ranging from 3 to 11)

Average number of females in households is 2.75 (ranging from 1 to 5)

Respondents’ house types indicate middle income class
Respondent’s House
In rural Samlout district - wooden house with tin roof
Respondents in the sample represent a mix of low-, middle- and high-income earners.

Average monthly income of the sample group is approx. $300 (ranging from less than $100 to less than $1,000).

It should be noted that the average income for the 8 rural HHs is in the $100-300 bracket, while the average income for the 8 peri-urban HHs is in the $300-400 bracket.

Average monthly household expenses of the sample group are $245 (ranging from $60 to $890)
All survey households generate income from business or employment.

7 respondents save some money, 8 respondents do not save money.

Respondents mainly save for: medical treatment, children’s education, housing upgrades, consumer good purchases such as phones & motorbikes.
In 10 HHs, the male spouse is the main income earner, in 4 HHs both respondent and spouse contribute to family income equally, in 1 HH children are the main income earner, and in 1 HH the parents.

50% of respondents are in charge of spending on consumer goods; 31% of respondents discuss purchase decision with their husband.

Respondents are in charge of spending on average up to $27.60 (ranging from $5 to $100)
All HHs except one own a mobile phone
- 13 HHs own a television
- 11 HHs own a motorcycle
- 9 HHs own a bicycle
- 7 HHs own a radio
- 5 HHs own a refrigerator
- 4 HHs own a rice cooker
- 3 HHs own a car
- 1 HHs owns a tuk tuk

It should be noted that asset ownership for mobile phones, TVs, and motorcycles is the same for peri-urban and rural HHs in the sample.

All other asset types are more prevalent in peri-urban sample HHs.
Respondent's House
In peri-urban Phnom Penh - wooden house with tin roof
Average # of stoves per HH = 2.4 (= total of 42 stoves in 16 sample HHs)

Average # of stoves used per meal = 1.7

Main primary stove: Traditional clay stove; New Lao Stove

Main secondary stove: LPG 200ml single burner

It is worth noting that all peri-urban HHs use a LPG 200ml single burner as a secondary stove while none of the rural HHs do
STOVE TYPE - PURCHASING BEHAVIOUR -

- Respondents purchased their most recent stove on average 20 months ago (ranging from 1 month ago to 6 years ago)
- Respondents paid an average of $4 for their primary stove
- 1 respondent bought a large LPG double burner for $110

Photo: Traditional Clay stove at study participants house in Samlout District
Respondents state the most satisfying aspects of the primary stove are:

- ‘Accommodates different cooking styles’
- ‘easy to use’
- ‘easy to light’
- ‘Accommodates different pot sizes’
- ‘Durability’

Respondents state the most dis-satisfying aspects of the primary stove are:

- ‘Smoke production’
- ‘Cleanliness of pots’
- ‘Fuel Consumption’
- ‘Appearance’
Three-Stone Fire at a study participants’ house in peri-urban Phnom Penh
**FUEL TYPES**

- **Primary & Secondary Fuels**

- **Primary Fuel of sample group:** wood (100%)
  - Main reason for using: ‘free’, ‘cheap’, ‘easy to find’

- **Secondary Fuel of sample group:** LPG (peri-urban only)
  - Main reason for using: ‘fast cooking’, ‘powerful’, ‘clean/little or no smoke’

- All peri-urban sample HHs purchase firewood.

- 7 out of 8 rural sample HHs collect wood. They spent an average of 63 mins/week for wood collection; an average of 28 mins for fuel preparation; and 15 mins to reach the collection site.

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**Primary Fuel**

- 100% Wood

**Main Reason for using Primary Fuel**

- 31% Cheap
- 25% Easy to find
- 44% Free

**Secondary Fuel**

- 44% LPG 200 ml
- 19% Charcoal

**Main Reason for using Secondary Fuel**

- 38% Fast cooking
- 13% Powerful
- 13% Clean / little or no smoke
- 6% Easy to start
Across the sample group, wood is used as fuel most frequently, several times daily.
Respondents state the most satisfying aspects of their primary fuel (wood) are:

- ‘Ease of lighting’
- ‘Cooking time’

Respondents state the most dis-satisfying aspects of their primary fuel are:

- ‘Amount of smoke’
- ‘Amount of blackness on pots and pans’
- ‘Amount of Soot and Dust in kitchen’

Respondents are somewhat dis-satisfied with the amount of fuel used
Fuel Storage at a study participants’ house in peri-urban Phnom Penh
COOKING HABITS

- Average # of stoves used per meal = 1.7
- Average # of meals cooked per day = 2.6
- Average number of dishes per meal = 2.4
- Most common cooking methods = boiling; frying; grilling; re-heating food
- Average time spent cooking for peri-urban sample HHs = 41 mins (ranging from 30 mins to 60 mins)
- Average time spent cooking for rural sample HHs = 81 mins (ranging from 40 to 105 mins)
Respondents use Traditional Clay Stove and New Lao Stove for most cooking methods.

Respondents use LPG 200ml single burner mainly to re-heat food.
6 out of 8 rural HHs and 3 out of 8 peri-urban HHs use Traditional Clay Stoves or the New Lao Stoves inside the house.

4 respondents cook under the house, 3 of which use Traditional Clay Stoves and Three-stone fire.

4 respondents cook outside, close by the house, 3 of which use a New Lao Stove.

1 respondent uses a Traditional Clay Stove in a separate kitchen outside the house.

“Inside” defined as greater than or equal to 3 walls and a roof.
Traditional Kitchen
in a separate building close to the main house – 1 door and 1 wall semi-open.
COOKING HABITS
-CHILDREN UNDER 5-

When you are cooking, where are your children under 5?

- 7 out of 16 sample HHs have children under 5.
- All children are present in the vicinity of the kitchen or come in and out of the kitchen during cooking events.
Does your stove produce any smoke?

- 88% A lot
- 13% Some

The majority of respondents claims that their stove produces ‘a lot of smoke’.
Are you happy with the air quality in your house?
(1 being very unsatisfied & 5 being very satisfied)

- 88% Very unsatisfied
- 13% Impartial

The majority of respondents claim they are ‘very unsatisfied’ with the air quality in their house.
Are there any good things that come from the smoke of the stove?

None of the respondents thinks that there are any good things that come from the smoke of the stove.

Do you think that smoke from your stove is at all a problem?

All of the respondents think that smoke from their stove is a problem.
Respondents think that cooking with their primary stove and fuel contributes ‘a lot’ to health problems.

Respondents feel particularly strong that cooking contributes to ‘difficulty breathing’ and ‘stinging & watery eyes’
STOVE FUNCTIONING
The Envirofit PCS-1 stove was introduced in a small group setting at the MJP Field Headquarter in Battambang’s Samlout District.
All respondents received initial hands-on instruction for lighting and operating the Envirofit PCS-1.

Over the course of the study period, a small number of respondents continued to report that they found it difficult to light the stove.

This relates to learning a new method of lighting, which requires kindling of a small amount of fuel outside the stove first.

Some respondents were observed using firewood with high moisture content and were subsequently instructed to dry wood thoroughly to ease lighting.

This illustrates that cookstove interventions must sufficiently address users’ learning needs by providing initial training as well as continued after-sales support.
STOVE OPERATION

When asked how to improve the Envirofit PCS-1, respondents most often stated:
- ‘bigger stove mouth’
- ‘bigger combustion chamber’
- ‘shorter stove’

These criticisms are an indication of a cultural preference in Cambodia for stoves that can hold a large amount of fuel in order to minimise the user’s need for fuel feeding/tending so as to allow the user to do other chores while cooking.

It appears that the deliberate design of a rocket stove to save fuel - but in turn requiring a more involved cooking style and more frequent tending - is not yet fully embraced in the Cambodian cooking context.

While this did not negatively impact respondents’ overall satisfaction with the Envirofit PCS-1, it does suggest a small barrier to adoption. This can be addressed with sufficient user training and after-sales support.
Some study participants made valuable suggestions for technical improvements on the Envirofit PCS-1:

Some respondents suggested increasing the height of the grate inside the stove’s combustion chamber – ash and pieces of charred wood are difficult to remove from underneath the grate, and may clog up the air holes.

Some respondents suggested increasing the height of the base of the stove – ash drops through the air holes underneath the stove base, where it gathers and may obstruct air flow.
STOVE EXPERIENCE, PREFERENCE & PERCEPTION
All respondents self-reported use of the Envirofit PCS-1 on a daily basis, on average 2.4 times per day.

Usage slightly increased over the 4-week study period.

5 respondents discontinued use of their old primary stove.

10 respondents continued to use their old primary stove on average 1 time per day.
Placement of SUMS iButtons on the Envirofit PCS-1
STOVE USAGE
-STOVE USE MONITORING SYSTEM (SUMS)-

SUMS Introduction:

- SUMS consist of thermal data loggers, and other equipment and software used to monitor stove usage.
- Thermal data loggers were placed on all stoves a minimum of one week after the stoves were first introduced.
- The thermal data loggers were placed on the outside surface of the stove, on the backside upper-middle of the stove.
- The thermal data loggers recorded temperature readings every seven minutes.
- Cooking event algorithm: all temperatures more than 20°C above minimum are cooking times.
## STOVE USAGE

**-STOVE USE MONITORING SYSTEM (SUMS)-**

**Envirofit Phnom Penh**

9/02/2014 12:00 AM to 9/14/2014 11:59 PM  (2675 Samples, Sample Frequency 7 minutes)

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<th>Household #</th>
<th>Days in Sample</th>
<th>Number of Cooking Days</th>
<th>Number of Cooking Events</th>
<th>Avg. Number of Cooking Events per Cooking Day</th>
<th>Avg. Number of Cooking Events per Days in Sample</th>
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## STOVE USAGE

**STOVE USE MONITORING SYSTEM (SUMS)**

**Envirofit Samlout**

9/11/2014 12:00 AM to 10/13/2014 11:59 PM (6789 Samples, Sample Frequency 7 minutes)

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</table>
Respondents found the Envirofit PCS-1 suitable for making most dishes they would usually prepare on their own stove.
Most respondents used the Envirofit PCS-1 for making most dishes they would have otherwise prepared on their old stove.

Most respondents agreed on the same cooking methods the Envirofit PCS-1 is best suited for:

- ‘Boiling Water’
- ‘Making Soup’
- ‘Frying’
- ‘Cooking Rice’

Use of the Envirofit PCS-1 for best suited types of meals remains largely unchanged from One-week follow-up to Endline survey.
COOKING METHODS

- Respondents find ‘frying’, ‘boiling water’, and ‘cooking rice’ particularly easy with the Envirofit PCS-1.
- Most respondents agree that the Envirofit PCS-1 is not suited for grilling (without additional appliances).
Respondents consistently report throughout the study period that food prepared on the Envirofit PCS-1 tastes the same or better as when cooked on their own stoves.
Cooking Speed
9 out of 15 of respondents felt that speed of cooking increased with the EnvrioFit PCS-1.
9 out of 15 respondents felt that speed of cooking with the Envirofit PCS-1 increased in comparison with their old primary stove.

This perception changed only slightly over the course of the study period.

It is worth noting that the very same respondents who initially felt cooking speed was slower later revised their opinion indicating same cooking speed.
• When asked in detail about time consumption, the majority of respondents felt that the Envirofit PCS-1 helps reduce:

  ‘Time spent cooking’

  ‘Time spent fuel gathering’

  ‘Time spent for fuel preparation’

• Approximately half (50%) of respondents felt they needed more time to start a fire on the Envirofit PCS-1 in comparison to their old stove.
13 respondents (87%) stated that the Envirofit PCS-1 is the perfect size for cooking most meals. Their opinion remained unchanged over the study period.

Only 1 respondent felt throughout the study period that the stove is too small; and 1 respondent changed opinion over the course of the study from ‘perfect size’ to ‘too small’.
Almost all respondents (93%) feel that the Envirofit PCS-1 keeps their pans and pots cleaner/free from soot.
Fuel Use

87% of respondents state that the Envriofit PCS-1 uses less fuel than their own primary stove. This has been verified by the study team.
87% of respondents state that the Envirofit PCS-1 uses less fuel than their own primary stove.
8 sample households from rural Samlout district each use an average of 3.6kg of firewood per day with their old primary stove.

These households reduced their firewood consumption to an average of 2.3 kg per day each with the Envirofit PCS-1 (reduction of 1.3kg/day on average).

If all households in Samlout district would switch to more efficient stoves such as the Envirofit PCS-1, more than 2 tonnes of wood could be saved per day.
Smoke

87% of respondents state that the amount of smoke in their kitchen is less with the Envirofit PCS-1 compared to their own stove.
The majority of respondents (87%) state that the amount of smoke in their kitchen or home is less than with their old primary stove.
73% of respondents felt that their health is better with the Envirofit PCS-1.

When asked to specify observed differences, respondents most commonly stated:

- ‘easy to breathe’
- ‘no stinging/watery eyes’
- ‘less coughing’
Personal Perceptions
Respondents experienced a sense of pride using the Envirofit PCS-1 and generally spoke very positive about it to others.
The majority of respondents agreed that the Envirofit PCS-1 made them more modern, admired by their family, and gave them a better standing in their community.
All respondents had talked to someone about the Envirofit PCS-1, mainly their neighbours and relatives.

Respondents most frequently talked about: the advantages/qualities of the stove, specifically:

- ‘Less smoke’
- ‘Easy to use’
- ‘Less fuel’
PERSONAL PERCEPTIONS

What are the most frequently asked questions others asked about the Envirofit PCS-1?

- Price
- Ease of use
- Cooking speed
- Where to buy the stove
- How to participate in this trial

Most frequently asked questions by others related mainly to:

- Price of the stove
- Ease of use
- Cooking speed
- Where to buy the stove
- How to participate in this trial
PERSONAL PERCEPTIONS

Why would someone else, like your neighbour, choose the Envirofit PCS-1?

- Respondents think that main reasons for others – like their neighbours – to buy the Envirofit PCS-1 would be:
  - Saves fuel
  - Less smoke
  - Cooks fast
  - Kitchen/pots stay cleaner

Looks nice
Can use with all kind of wood
Easy to handle and move
Not affected by wind
Well manufactured
Easy to make fire
11 out of 15 study participants prefer the Envirofit PCS-1 over their own primary stove.
STOVE PREFERENCE

At the end of the study period, 11 out of 15 respondents prefer the Envirotiff PCS-1 stove over their old primary stove.
OVERALL SATISFACTION
-LIKES & DISLIKES-

What do you like most about the Envirofit PCS-1?

- looks nice
- looks durable
- cooks fast
- less fuel
- less smoke

100% 90% 80% 70% 60% 50% 40% 30% 20% 10% 0%

• Respondents’ top 3 likes about the Envirofit PCS-1 are:
  ‘less smoke’
  ‘less fuel’
  ‘cooks fast’

• These likes remained largely unchanged over the course of the study period.
OVERALL SATISFACTION
-LIKES & DISLIKES-

What do you like **least** about the Envirofit PCS-1?

- Not all respondents were able to identify dislikes about the Envirofit PCS-1.
- When respondents mentioned dislikes, they most commonly named:
  - ‘difficult to light’
  - ‘more tending’
  - ‘stove’s mouth is too small’
- It should be noted that the dislikes ‘more tending’ and ‘small stove mouth’ refer to the same issue – the deliberate design of a rocket stove to save fuel means that users have to continually feed fuel and the small stove mouth prevents them getting around this issue.
OVERALL SATISFACTION
-LIKES & DISLIKES-

When asked how to improve the Envirofit PCS-1, respondents most often stated:

- ‘bigger stove mouth’
- ‘bigger combustion chamber’
- ‘shorter stove’

These criticisms are an indication of a cultural preference in Cambodia for stoves that can hold a large amount of fuel in order to minimise the user’s need for fuel feeding/tending so as to allow the user to do other chores while cooking.

It appears that the deliberate design of a rocket stove to save fuel - but in turn requiring a more involved cooking style and more frequent tending - is not yet fully embraced in the Cambodian cooking context.
Level of satisfaction with various characteristics of Envirofit PCS-1  
(1 = very unsatisfied; 5 = very satisfied)

- All respondents rate their satisfaction with various characteristics of the Envirofit PCS-1 as ‘satisfied’ or ‘very satisfied’.
- Characterises receiving highest marks from the sample group include: ‘durability’ ‘appearance’ ‘smoke production’ ‘fuel consumption’ ‘ease of use’
- It is worth noting that the marks for each characteristic were higher at Endline for the Envirofit PCS-1 than at Baseline for the old primary stove, except for “easy to light”.

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<tr>
<th>Characteristic</th>
<th>Baseline</th>
<th>Endline</th>
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<tr>
<td>Durability</td>
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<td>Appearance</td>
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<td>Fuel Consumption</td>
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<td>Smoke production</td>
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<td>Cleanliness of Pots and Pans</td>
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<td>Time Spent Cooking</td>
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<td>Easy to Light</td>
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<td>Easy to Use</td>
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<td>Accomodates Different Cooking Styles</td>
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<td>Accomodates Different Pot Sizes</td>
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Taking all factors into account, respondents stated that they are overall ‘satisfied’ or ‘extremely satisfied’ with the Envirofit PCS-1.
Would you consider buying an Envirofit PCS-1 if the price is acceptable?

100% Yes

How much do you think the Envirofit PCS-1 should cost?

50% $16-$30

50% $11-$15

0% $5-$10

• 100% of respondents would consider buying an Envirofit PCS-1 if the price is acceptable.
• Respondents expected to pay an average retail price of USD $14 for the Envirofit PCS-1 (ranging from USD $4.5 to USD $30)
• 2 out of 15 respondents were willing to pay $30, 5 respondents were willing to pay $20, and 8 respondents were willing to pay $10.
• None of the respondents claimed they were willing to pay more than $30.
• 7 respondents claim they would be the person who would make the decision to purchase the stove, others would discuss with spouse or family.
• It is worth noting that the Baseline found that respondents who could make decisions to purchase consumer goods could only do so independently at an average price of $27.60.
PAYMENT OPTIONS

Where would you get the money to purchase a new stove?

- 5 respondents would aim to pay the stove in full at once.
- 10 respondents state they would be more comfortable making the purchase if they can pay for the stove in instalments.
- 8 respondents would pay for the stove in more than 2 instalments, at an average rate of $3.10 per month (ranging from $1 to $5).
- 7 respondents state that if they were to buy the stove, they would use their existing savings.
- The remainder would obtain the money through small business or farming activities.
Willingness-to-Pay Experiments

- All 8 respondents from the rural segment were given the choice to keep the provided sample stove (owning it free of charge as reward for their participation in the study) or to sell the stove back to SNV for USD $25 cash on the spot.

  6 out of 8 rural respondents opted to forgo the cash reward and instead kept the Envirofit PCS-1.

- All 7 respondents from the peri-urban segment were given the choice to keep the provided sample stove (owning it free of charge as reward for their participation in the study) or to sell the stove back to SNV for USD $30 cash on the spot.

  5 out of 7 peri-urban respondents opted to forgo the cash reward and instead kept the Envirofit PCS-1.
CONCLUSION

- On the basis of the data collected, it can be concluded that the Envirofit PCS-1 was well accepted and appreciated among Cambodian study households.
- In particular, study participants recognised and appreciated significant reductions in smoke emissions and fuel consumption, as well as less soot on pots and pans and an overall cleaner cooking experience. Significant fuel savings were independently validated by the research team.
- Respondents state their top 3 likes about the Envirofit PCS-1 as: ‘emits less smoke’, ‘cooks fast’, and ‘uses less fuel’.
- 11 out of 15 respondents prefer the Envirofit PCS-1 over their old primary stove.
- All study participants claimed they would consider buying the Envirofit PCS-1 if the price is acceptable. Feedback from respondents suggests a price point at less than USD $30. 11 out of 15 study participants opted to forgo a cash reward for their participation in the study and instead kept the Envirofit PCS-1.
- Based on the data collected and based on in-person feedback from the field, it appears that the Envirofit PCS-1 is an advanced cookstove model that would be well accepted into Cambodian cooking culture, and there appears to be significant appetite for cookstove upgrades.
- Based on the observed performance of stove, the Envirofit PCS-1 could make substantial contributions to HAP reduction and wood fuel reduction in Cambodia.
- Issues that suggest barriers to adoption (i.e. need for a more involved cooking style/increased need for stove tending that is typically required by rocket stoves but runs contrary to current Cambodian cooking behavior) is surmountable, but illustrates the need for a well-planned market introduction that places a focus on consumer education, user training and continued after-sales support.
WAY FORWARD

• At the time of writing, SNV Cambodia is in the advanced planning stages for a commercial pilot project.

• The pilot will test fundamentals of a sustainable business model for an advanced biomass stove supply chain in Cambodia.

• The project engages established private sector last-mile distribution networks for base-of-pyramid products.

• Studies conducted by SNV indicate substantial potential for the commercial introduction of the Envirofit PCS-1 in Cambodia.

Photo: Cambodian sales agents from a local last-mile distribution company learn to operate the Envirofit PCS-1
CONSUMER ACCEPTABILITY TESTING SERVICES

- SNV Cambodia offers Consumer Acceptability Testing services to stove suppliers wishing to enter the Cambodian market.
- SNV Cambodia can introduce and assess the acceptance of just stoves or stoves in combination with new fuels.
- All research staff (local and international) have been trained and have applied these research methods on multiple occasions in Cambodia.

Contact us to request further information.
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