



Future Solutions for Boosting Electric Cooking **in Cambodia**

MECS-ECO CHALLENGE FUND, NOVEMBER, 2021





Table of Contents

	EXECUTIVE SUMMARY	07
	GLOSSARY	011
01	INTRODUCTION	013
02	BACKGROUND	014
	2.1. Barriers to accessing to modern energy cooking solutions in Cambodia	014
	2.2. Historical Note on Gender	015
03	PROJECT GOALS AND OBJECTIVES	016
	3.1. Project Goals	016
	3.2. Specific Project Objectives	017
04	METHODOLOGY	019
	4.1. Iterative Market Test Cycles	019
	4.1.1 Research Methods	019
	4.1.2. Location	020
	4.1.3. The 5Ps Framework	022
	4.1.4. People	023
	4.1.5. Products	024
	4.1.6 Pricing	026
	4.1.7 Promotion (Marketing)	027
	4.1.8 Placement (Channels)	032
	4.2. Longitudinal Behavioural Research Methods	036
	4.1.1. Research Methods	036

Table of Contents

4.1.2. Samples	036
4.2.3. Data Collection	036
05 FINDINGS	043
5.1 Summary of adjustments during the Market Test Cycles	043
5.2 Overview of key results from Market Test Cycles	044
5.3. Results from the 5Ps analysis framework	045
5.3.1. People	046
5.3.2. Products	048
5.3.3. Promotion (Marketing)	050
5.3.4. Pricing	055
5.3.5. Placement (Channels)	058
5.4 Summary of Key Learnings	060
5.5 Learnings from Baseline-Endline Research	063
5.5.1. Previous Fuel Use	064
5.5.2. Use of Electric Cooking Devices	069
5.5.3. Transitioning to Electric Cooking	074
5.5.4. Changing Perceptions	076
5.5.5. Most Significant Changes	078
5.5.6. COVID-19 Impacts on People’s Cooking Preferences	079
5.5.7 Gender Dynamics in Cooking	080

Table of Contents

	5.6 Summary of Learnings from Longitudinal Research	081
06	ENERGY USE DATA ANALYSIS	083
	6.1. Electric Stove Data Analysis	083
	6.2. Electric Pressure Cooker Data Analysis	086
07	BOOSTING ELECTRIC COOKING IN THE FUTURE	088
08	REFERENCES	090
09	ANNEX	091
	9.1. Digital Marketing Findings	091
	9.2. Lifetime Cost Calculation	096



DRINK RESPONSIBLY
18+

TRUNG CA
GAMMA

Executive Summary

About the Project

iDE's MECS (Modern Energy Cooking Services)- ECO (Electric Cooking Outreach) project addressed two questions: How can new electric cooking products and delivery methods be effectively introduced and scaled to meet household needs and accelerate the transition to clean cooking in Cambodia? and How does electric cooking fit within people's cooking cultures and with the available electricity supply in Cambodia?

This project builds on iDE's previous research findings from the 2019 MECS- TRIID (Technology Research and Innovation for International Development) challenge fund. From iDE's TRIID Research, four emergent solution categories - introducing PAYGO (pay-as-you-go) enabled induction cookstoves, introducing other electric cooking devices, informing or modifying energy-use perceptions through smart energy meters and applying behavior change strategies to boost uptake - were incorporated into an overall marketing mix that was tested rigorously during the ECO project. iDE and Hydrologic (iDE's social enterprise subsidiary) co-designed a suitable marketing mix focusing on messages to trigger customer behavior change and promote adoption of electric cooking. The marketing mix was organized into 5Ps (People, Products, Pricing, Promotion, and Place) to understand how iteratively adjusting the marketing mix could facilitate customers' uptake of electric cooking. A set of qualitative and quantitative methods were applied to capture customer (and non customer) feedback at key stages, during purchase and longitudinally over time in order to measure changes in behaviors and perceptions on electric cooking over time.

This project was implemented in peri-urban Cambodian locations as an action research wherein actual electric cooking products were test marketed to purchasing customers through the sales and distribution chain of iDE's clean water social enterprise (Hydrologic). The guiding theory of change for the project involved targeting specific profiles of customers: the innovators, the early adopters and the early majority. These potential profiles - for a number of reasons captured in the MECS-TRIID research - are close to the threshold of

making a change in their cooking practices. This report distills, end of project learnings from the adaptive market tests and insights from the data collected to address how, why, and where the transition to clean cooking solutions is happening and suggest future strategies to accelerate the transition in Cambodia.

Iterative Market Test Cycle Findings

During the market tests, 928 people were pitched to - of which 59 (6.3%) became customers with a total of 71 products sold. These figures were lower than expected due to the impact of Covid-19 and the resultant challenges in terms of access to customers, alongside the level of effort required to build capacity in the sales team for multi-focused research projects, all of which impeded sales to an extent. Recent sales figures in the period since the end of data collection have improved significantly (18%) drawing on the learnings of the ECO project. **Findings from the market tests are organized per the 5Ps framework:**

People: From the 244 people surveyed in this study, 33% of the innovators, 24% of the early adopters and 8% of the early majority became customers. However, as the dataset is not fully representative of our non customers, only limited conclusions on interest and willingness to transition to electric cooking can be drawn. When we look at the non customers innovator profile sample, 42% (5) innovators indicated a high interest for future purchase. In the non customers early adopter sample, 44% (55) early adopters indicated a high level of interest for future purchase, and 34% (20) indicated a high interest in purchasing electric cooking products in future.

These percentages represent a positive indication for innovators and early adopters' interest in adopting electric cooking. Future pilots could retain the 5Ps utilized to reach the early adopters. A greater emphasis on transitioning early majority customers to electric cooking is required and could be achieved by further investigation of and refinements to the 5Ps.

Executive Summary

Products: Over 6 months, 71 products were sold in total including 47 Cookstoves, 14 Electric Grills, 6 EPCs, and 4 Multi Cookers. The electric cook stoves offer an aspirational fit for customers, matching peoples cooking needs at an affordable price point. Even 68% non customers indicated interest in purchasing the electric stoves in future. Challenges in understanding the functions (and buttons) of the electric pressure cooker (EPC) and multicooker devices, impacted sales but also usability for customers who did purchase the EPC. Limited functionality of the multi cooker (steaming and boiling) caused cooks to question the reason behind purchasing it.

Promotion: By far the biggest reason for not purchasing an appliance was the need to have family discussion (reported by 81% non customers); a finding which has implications for the timing of sales pitches. Sales conversions were observed to be significantly more likely at the weekend when the whole family was present (not just the cook) and able to engage in the complex decision making surrounding the purchase of a new appliance that represents a new way of cooking. Weekend sales pitches were found to facilitate family buy in and result in far quicker decisions to purchase. As a result, sales agent working hours were adjusted to ensure weekend sales - sales conversions in the 2021 sales cycle have averaged 18% (3 times more than the ECO pilots)

On the other hand, the decision to purchase is driven primarily by availability of safer cooking options made available through the project - 90% of customers highlighted safety as a factor. Ease of use (67%) and affordable installment plans (31%) were the next biggest reasons convincing customers to make the switch to electric cooking. More than health related messaging (related to smoke free cooking), safety, ease of use and time saving are the most resonant for our customers. A number of messages on aspirational lifestyle, smoke free kitchens, smart meters and energy measurement did not boost customer interest - these were removed from the sales pitch and pitched only for specific cus-

tomers per sales agents discretion.

Pricing: A number of pricing experiments such as adjustment of instalment durations, adjustments to price points, free trial promotions and up front discounts resulted in 83% of the products being sold through an alternative financing mechanism, either PAYGO or credit installments. The pricing experiments indicate the need for offering flexible finance options to customers - to enable customers to choose a plan that suits them the most. A greater consideration on alternative financing (non collateralized micro loans, longer credit periods) require further investigation. Keeping the customer financing experience in mind is an essential consideration for facilitating uptake.

Place: 31.5% of the people reached were interested in the products which provides a positive indication of the available market for modern cooking solutions adopters. Our sales agents starting from scratch required time to gain mastery over multiple components of the sales process including product understanding, sales flow, pitch execution, territory management. Our two most successful sales agents showed conversion rates of 9.8% and 8.7% and were able to close a sale every 3-5 days. There is a need for longer term piloting in order to generate confidence and mastery of the sales process, and to convert maximum customers. To trigger sales, community cooking events, live demos, and engaging customers with video content should be continued

Longitudinal Research Findings

The longitudinal behavioural study provided the most reliable form of data on customer experiences, revealing insightful findings on how e-cooking fits existing cooking practises. Most peri-urban HHs who purchased electric cooking solutions used LPG as their primary fuel, indicating that adoption of electric cooking is most likely to come from those cooking with LPG. Prior to purchasing electric cooking solutions, peri-urban HHs use LPG as the primary fuel indicating that the transition to electric cooking is happening from LPG. Wood or charcoal are common secondary fuels with HHs purchasing electric

Executive Summary

cooking appliances. However, in spite of purchasing aspirational cooking solutions, HHs display a reliance on previous cooking fuels. In particular, a consistently high number of customers continue to use LPG from initial stage to end line.

Transitioning away from previous cooking fuels is a complex, non-linear process. Customers have successfully introduced electric cooking solutions in their kitchens and they do use them regularly, but the nature of the electric cooking transition is a gradual and incremental process. Pairing of fuels with electric cooking is common and is dependent on four main cooking scenarios in people's kitchens: cooking mashed food, batch cooking, fresh cooking, and quick cooking.

Other factors preventing a complete switch to using electric cooking solutions for all cooking needs include requiring specialized pots and pans, unaddressed cooking needs to cook specific dishes, increased cost of electricity during dry season, and rationing behaviors due to COVID-19.

Encouragingly, customers adding electricity to their fuel stack demonstrate that a decline or substitution of their unclean fuel usage over time does happen over time. A declining trend in both LPG and charcoal fuel usage and costs can be observed. Lockdowns and restrictions on movement due to Covid-19 are leading more people to stay at home, triggering more use of their electric cooking devices.

Regular daily use of specific electric cooking devices is observed. From initial stage to end line stage, at least 66% customers used their electric cooking device daily. Of all devices the double electric cook stove was the one most consistently used, with customers reporting ease cooking multiple dishes using it.

A positive experience early during initial use is critical to ensuring regular use. People have positive perceptions of safety and reported confidence in regularly using their products. Confidence in the affordability of the electric

cooking device increased for 8 out of the 30 customers. None of the customers felt a significant concern about the safety of the electric cooking products.

From a gender norms perspective, research highlights factors preventing more women from adopting electric cooking including a deference to elders erstwhile cooking preferences whilst living in the household, and household heads purchase decision overlooking family attitudes and perceptions towards electricity could prevent long term adoption.

For adopting families, the use of electric cooking devices does bring positive changes to the family's cooking dynamics and experience. Changes in cooks' mindsets, willingness to cook new dishes and freeing up more time to focus on childcare tasks were some positive changes identified by our customers. Households also have a positive perception of food taste, associating improved taste due to the use of electric cooking devices.

Taking Solutions to Scale

iDE's ECO project setup with intention to trigger a nascent demand for modern cooking solutions demonstrated that there is a growing number of early adopters who are making the transition to electric cooking if the main needs identified in this study (aspirations, safety, cost, reliability, and cooking culture) can be addressed.

Versatile electric cooking solutions (allowing people to cook a range of dishes) do fit with the cooking cultures and the electricity supply in Cambodia. Paired with alternative financing mechanisms (PAYGO and credit installments) and deployed through human-centered sales and strategies, electric cooking solutions can be taken to scale in the Cambodian market. Electric cooking is a trend in Cambodia and iDE and its partners developing the market system are well positioned to capitalize on the trend. Additional funding secured as a result of MECS-ECO activities will allow the project to continue market tests and sales operations until June 2022.



Glossary

iDE	International Development Enterprise
MECS	Modern Energy Cooking Services
TRIID	Technology Research and Innovation for International Development
ECO	Electric Cooking Outreach
DFID	Department for International Development
HCD	Human-Centered Design
HH	Household
LPG	Liquified Petroleum Gasoline
LMD	Last Mile Distributors
KWh	Kilowatt-hour
MTC	Market Test Cycles



01. Introduction

Modern Energy Cooking Services (MECS) is a five-year program funded by UK Aid (through the Department for International Development - DFID). It aims to break out of a “business-as-usual” cycle by investigating how to rapidly accelerate the transition from biomass to ‘clean’ cooking. During 2020-2021, the Electric Cooking Outreach (ECO) challenge fund which forms a core component of the MECS programme, provided funding to iDE. The main aim for the ECO fund was to facilitate greater uptake and understanding of opportunities for the use of efficient electric cooking appliances in low-income countries.

iDE’s ECO project addressed two questions: *How can new electric cooking products and delivery methods be effectively introduced and scaled to meet household needs and accelerate the transition to clean cooking in Cambodia?* and *How does electric cooking fit within people’s cooking cultures and with the available electricity supply in Cambodia?*

This project builds on learnings from a previous MECS challenge fund granted to iDE in 2019 - the Technology Research Innovation for International Development (TRIID) challenge fund. Under TRIID, iDE Cambodia conducted in-depth Human-Centered Design (HCD) research to establish a comprehensive understanding of key knowledge gaps, triggers and barriers preventing the adoption of modern energy cooking solutions in rural, peri-urban, and urban regions. We rapidly prototyped and tested early solutions/ interventions that showed potential (enhancing reliability, affordability and sustainability) in positioning modern cooking products and services as the next aspirational alternative.

To address the barriers preventing the adoption of modern energy cooking solutions, four electric cooking solution categories emerged from the MECS- TRIID research:

1. PAYGO enabled induction cookstoves
2. Other electric cooking devices: pressure cookers, multi cookers and barbeque grills
3. Informing or modifying energy-use perceptions through smart energy meters
4. Applying other behaviour change strategies to increase adoption of electric cooking devices

The above solution categories were incorporated into an overall marketing mix that was tested rigorously during the ECO project. The focus was on understanding how iteratively adjusting the marketing mix could facilitate customers’ uptake of electric cooking and understanding the accompanying behavioral factors impacting customers’ transition to cooking with electricity.

The project was implemented as an action research project wherein actual electric cooking products were test marketed to purchasing clients through the sales and distribution chain of iDE’s clean water social enterprise (Hydrologic). iDE and Hydrologic co-designed a suitable marketing mix and sales approach for each product, focusing on messages to trigger customer behavior change and promote adoption of electric cooking. The team deployed adaptive market test cycles, gathering evidence on the success/ lack thereof on which elements of the marketing mix (Example: which products, which behaviour change communication strategies, which price points, which channels) were most effective in facilitating electric cooking uptake.

This report distills the end of project learnings from the adaptive market tests and insights from the data collected to address how, why, and where the transition to clean cooking solutions is happening and suggest future strategies to accelerate the transition in Cambodia.

02. Background

2.1 Barriers to access to modern energy cooking solutions in Cambodia

Finding a reliable and clean source of cooking fuel in developing countries is a persistent obstacle for poor households. 80% of the rural population in Cambodia do not have access to clean cooking¹. Biomass, which is the primary cooking fuel for the majority of rural households, is available for free in rural Cambodia, and up to 20.3 hours is spent on collecting wood per week. Firewood and charcoal remain key sources of energy for household cooking and for small food businesses. Most rural Cambodians cook with wood (77%) and 6% cook with charcoal, spending approximately 1.5 hours a day on cooking². Stacking of multiple fuels is common in Cambodian households due to reasons that include reliability of the primary fuel source, accessibility, and preference. Households use on average 2.1 different fuels for cooking in their energy mix and this number increases when the households get wealthier³.

Cooking on traditional biomass stoves not only contributes to deforestation, local natural resource degradation and increased greenhouse gas emissions, but also has severe negative impacts on health through the smoke that pollutes households and the ambient air. Indoor air pollution, mostly from wood and charcoal smoke, is responsible for respiratory, heart and eye problems. A silent killer, there are 11,876 annual deaths attributable to solid fuel use in Cambodia²

LPG is a clean-burning and efficient cooking fuel and is only used by 18% of rural households as a main cooking fuel and as back up by 54%. Mainly available in urban and peri urban areas, 48% of rural households intend to switch to LPG when firewood becomes harder to collect². With wealth and urbanization, LPG use increases and wood use decreases.

Gas falls into two categories: LPG and butane. LPG typically comes in larger 5-20kg cylinder bottles, is relatively safe to use and is used mainly by urban households. Smaller butane cylinders, a different type of gas, are much more dangerous and common as a secondary fuel source for rural households. Both of these are poorly regulated in Cambodia which means a strong inhibition to people transferring from biomass across to clean modern cooking has been the perception that gas is dangerous. This widespread negative connotation towards LPG canisters/tanks is restricting adoption. Majority of incidents go unaddressed due to a lack of after sales service from distributors and this mistrust toward LPG suppliers is perpetuated through social media and word of mouth.

Apart from safety concerns, fragmented LPG value chains, with unregulated service providers, multiple middlemen and isolated retail channels drive costs up for customers. Customers want guarantees that the stoves they buy can last longer and are easy to use in the long term. After sales services for cooking products are a critical need and the lack thereof, is a key barrier to adoption with customers left with no options of repairs in case of breakdowns.

Based on research conducted by iDE and documented in the MECS-TRIID report, findings indicate that cooking with electricity is in a nascent stage in Cambodia, but has great promise. High levels of adoption of electric rice cookers - even in rural areas - points to a significant potential for a range of new electric cooking solutions to enter the market. Cooking with electricity was seen as aspirational, and a majority of households in urban centers use clean fuel mixes.

During the MECS-TRIID research study, customers identified ease and convenience as key motivations for improving their cooking experience through electricity, allowing more time for income generation and other household tasks. However, a number of barriers prevented the majority of households from adopting electric cooking technologies, including perceived taste/quality issues, perceived costs, lack of control over the consumption and lack of understanding of the technology, and a lack of access to quality, reliable solutions.

2.2 Note on Gender in Cambodia

An important influence on social norms in Cambodia is the Chbab Srey—a code of conduct governing women’s role in Khmer society, their behaviour, and their status relative to men^(4,5). (The corollary for men is the Chbab Proh). Although Cambodian women are nominally guaranteed equal rights with men, in practice—as dictated by the Chbab Srey (“You should remember to serve your husband. Don’t make him unsatisfied, you serve him regularly”)—women are of lower status in the home and community^(4,5).

Women’s low status in society has far-reaching impacts on their agency, nutritional status and their capacity to care for their children. For example, the Chbab Srey dictates that women eat only after men eat, and that women should not speak of family matters outside the home⁽⁷⁾. Although these norms are changing, women commonly lack the self-confidence and sense of self-efficacy to adopt new or different practices for the benefit of themselves or their children^(4,6).

Cambodian women do have authority over the private sphere^(4,5,6,7): Most women (86 percent) report participating in all household decision-making. Whilst allowing immense authority and control over household matters, Khmer moral code bids women to “serve and respect” their husbands^(4,5,6). So despite relatively high performance in certain facets of women’s empowerment, women’s status in Cambodian society is low and there is evidence that women see themselves as subservient to their husbands.

In Cambodia, a married couple usually establishes their own household as soon as they are able. Many women have a limited agency in decision making before marriage. Children have multiple caregivers—long-term alternate caregivers are usually grandmothers or aunts; grandmothers are primary caregivers for infants as young as 3 months.

Women carry the primary burden for reproductive labour, taking on primary responsibilities for providing child, sick, and elder care; cleaning and collection of fuel and water; and food collection and preparation. However, most women also participate in economically productive work of some sort and, at some point in their lives, will need to negotiate time spent on that work and time spent on caregiving and other domestic work.

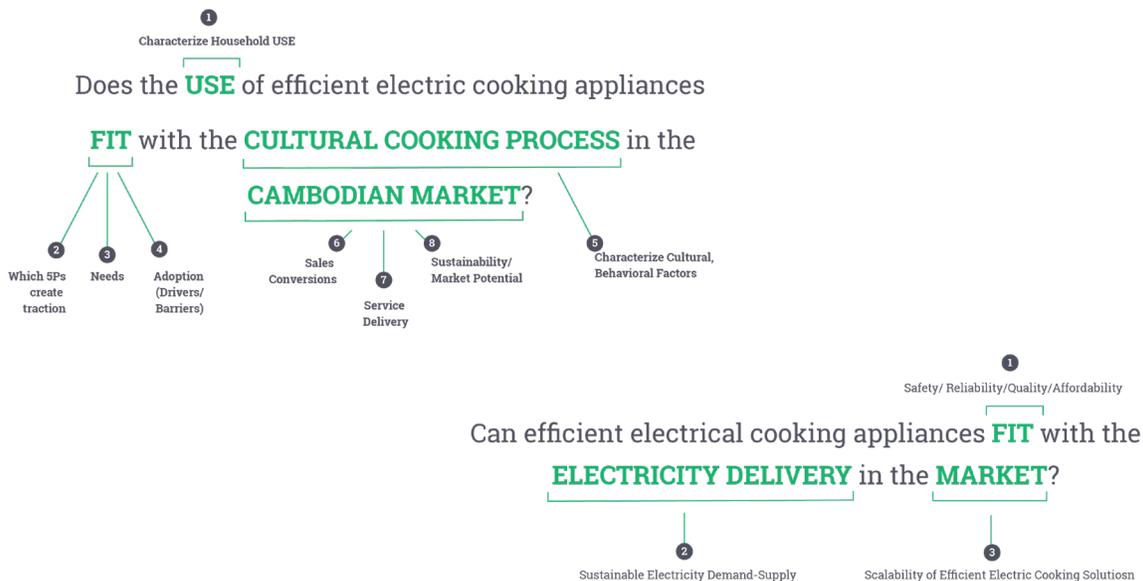
Amidst these dynamics, time saving benefits of electric cooking devices allowing for multi-tasking and engaging in productive work inside or outside the household can create a positive impact on the health and economic outcomes for women and their families. Examples in this report help explain the links between the stereotypical roles of men and women in Cambodia with household decision making inside the kitchen.

03. Project Goals

3.1 Project Goals

- Identify market-based approaches for effectively scaling up new electric cooking products in the Cambodian market
- Understand how electric cooking could fit with the cooking cultures and electricity supply compatibility in Cambodia

The project goals and objectives derive from iDE's understanding of two ECO research questions posed by MECS. Research aimed to address two overarching questions posed by the MECS programme:



The above questions aim to understand how electric cooking could fit with the cooking cultures and electricity supply compatibility in Cambodia. Deconstructing the question into individual themes (see points 1-9 and 1-3 in figure above) formed the basis for identifying thematic data to be captured, including understanding the adoption barriers, drivers, people's cooking needs, 5Ps and changes in behaviours.

iDE's interpretation of the ECO Research required further clarifications with the MECS team: iDE's definition of 'FIT' subsumed electric cooking may be compatible with Cambodian cooking culture (following insights and early testing from TRIID research), and suggested that we may now require understanding what the marketing mix combinations necessary to accelerate uptake. The MECS programme's ECO research questions definition of 'FIT' was aimed at researching cooking cultures and electricity supply compatibility to better understand various cultural and behavioural determinants that facilitate or impede the transition to electric cooking in Cambodian households (HH).

Acknowledging the value in both interpretations, modifications to research methods and tools were made during the project. A longitudinal behaviour change study was added to more directly target the ECO interpretation. This study provided valuable insights into customer behaviour which fed into the understanding of which variations of the 5Ps were most likely to be effective.

3.2 Specific Project Objectives

- Understand the cultural and behavioural factors that shape Cambodian customers transition to electric cooking
- Identify market-based approaches for effectively scaling up new electric cooking products in the Cambodian market
- Better understand and begin the process of addressing barriers for rural households to adopt electric cooking devices
- Test and iterate different 5Ps (people, products, pricing, place, promotion) marketing mix combinations that maximize electric cooking uptake

:





PHOTO: An Electric Stove Customer in Her Kitchen

04. Methodology

The team used two overarching methodologies:

- Qualitative and quantitative longitudinal behavioural research methods
- Market testing to meet our project and research goals.

The market testing involved five adaptive test cycles that were deployed over six months. Iterative adjustments to the 5Ps were made at the end of each cycle based on data analysis of successful/unsuccessful approaches.

4.1 Iterative Market Test Cycles

iDE along with the support of project partners Hydrologic and ATEC, conducted iterative market testing over six months. A sales and distribution operation was established integrating a number of internal processes tailored for the project (sales flows, performance measurement, data collection, finance and accounting). Sales activities went live on September 22, 2020 and ended on March 31, 2021. Five market test cycles were conducted, including the initial 6 weeks pilot. In each cycle, iterative adjustments to the marketing mix were made based on field sales and customer data. Data was analyzed to frame insights and recommendations for future scale up of electric cooking in Cambodia.

4.1.1. Research Methods:

1. Closing Sales Surveys: Short surveys to collect information from customers (and non-customers) on drivers of purchase (and reasons for non purchase) deployed at point of closing sales pitch

2. Delivery Survey: Short surveys to collect information on drivers to purchase, payment plans, sales experience deployed after product(s) were delivered to customers. Note: Redundancy on drivers to purchase was built in, in order to mitigate a conflict of interest in balancing sales roles with data collection tasks

3. Sales Data Logs: Reviewing sales data on people reached, paying customers, products delivered during weekly sales check-ins /end of pilot debriefs with the sales team

Data Collection Plan

Sales Data/Research was conducted at the following stages of the project:

Day 1: Closing Survey for some non-customers administered by Sales Agent at the end of the sales pitch (conversation)

Day 1: Point of payment/Delivery surveys for customers administered by Delivery Agent

4.1.2. Location Screening

From screening of 12 communes¹⁰ in 2 provinces within 40Km distance of Phnom Penh, 4 communes were finalized as target sales locations. Survey interviews were administered to understand the viability of the locations. Data collected from 8 local leaders and 15 target customers was analyzed to ensure final locations matched the following criteria:

1. Sufficient target customer profiles
2. Willingness to try electric cooking technology
3. Accessibility (within 40KM of Phnom Penh to ensure ease of service delivery)
4. Grid connected with grid stability of 12+ hours per day

Through the 4 locations, the sales team reached 2938 people over 6 months. As sales agents exhausted prospective sales territory, new locations were identified to match the above listed criteria.

Samples

Method	Sample Size	Notes
Closing Survey	193	Closing surveys were deployed for 193 out of 928 non-customers (data was collected 2 days per pilot cycle to manage sales agent workload)
Delivery Survey	51	Delivery surveys were deployed for 51 out of 59 unique customers (customers who purchased at least one product)

TABLE: Research Sample

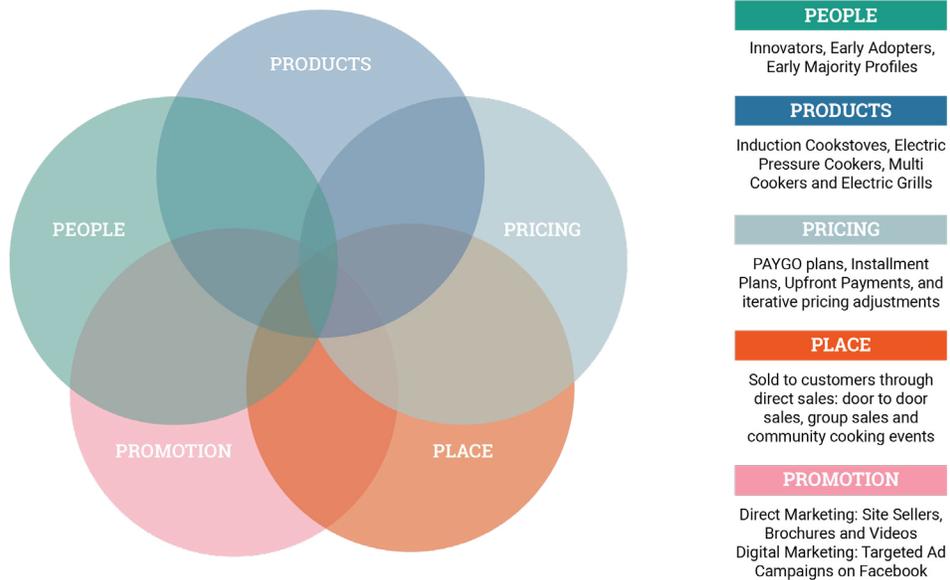
Methods	Closing Surveys	Delivery Surveys	Sales Data Logs
Timing	Day 1 (point of sale or pitch closing)	Day 1 (point of delivery /installation at HH)	Daily Sales logs updated by sales agents
Data Collector	Sales Agent	Delivery Agent	Sales/ Delivery Agents
Participant	Customers and Non Customers	Customers	Customers and Non Customers
Information collected	Products sold. Reasons to purchase (or not purchase)	Reasons to purchase, Understanding of technology,.	Daily no of people reached, No of people pitched to, No of customer customers

TABLE: Research Plan at a glance

International
Blender with Dry Mill
DR



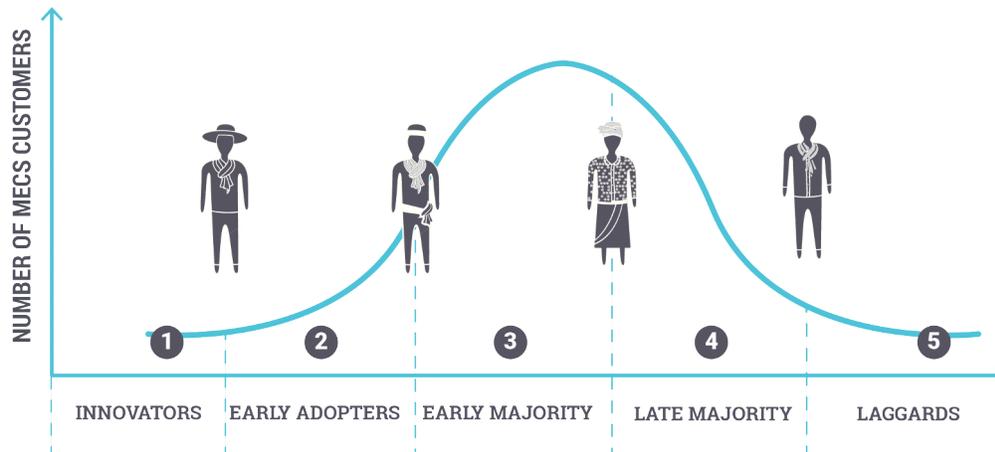
4.1.3. The 5P's Framework



Market test cycles utilized the **5 P's framework**, also known as the marketing mix from (adapted from Kotler's 4Ps of marketing) These variables (People, Products, Pricing, Promotion, and Place) were experimented with during the 6 months market test cycles.

These set of controllable and measurable variables tested iteratively helped to create an in-depth understanding of successful (and unsuccessful) approaches to better understand the uptake of electric cooking in the Cambodia market. The framework also served as a strategic tool to align internal decision making on marketing planning, pilot design and execution. Adjustments to the 5Ps were made based on following a series of process steps:

1. Allowing for a bare minimum time of 3-4 weeks before making any adjustments. This was necessary to ensure that even in absence of product sold, sufficient daily sales and customer data collected provided the required evidence based to understand approaches which required changes
2. Reviewing sales data on conversion % (number of people pitched to vs number of paying customers) monthly to address blocks for the sales agents (territory, confidence, sales process understanding etc.)
3. Reviewing customer feedback on reasons to purchase helped modify the messages and format of the sales pitch
4. Managing level of complexity for sales agents in marketing multiple products. Before starting sales of the full portfolio of products, sales agents were asked to master the sales pitch for 2 products of their choice. Experience and practice during the 6 weeks pilot increased confidence and pitch execution and helped them learn to tailor the pitch differently for other products in the following market test cycles.



FRAMEWORK: Diffusion of Adoption Framework iDE MECS-TRIID 2019

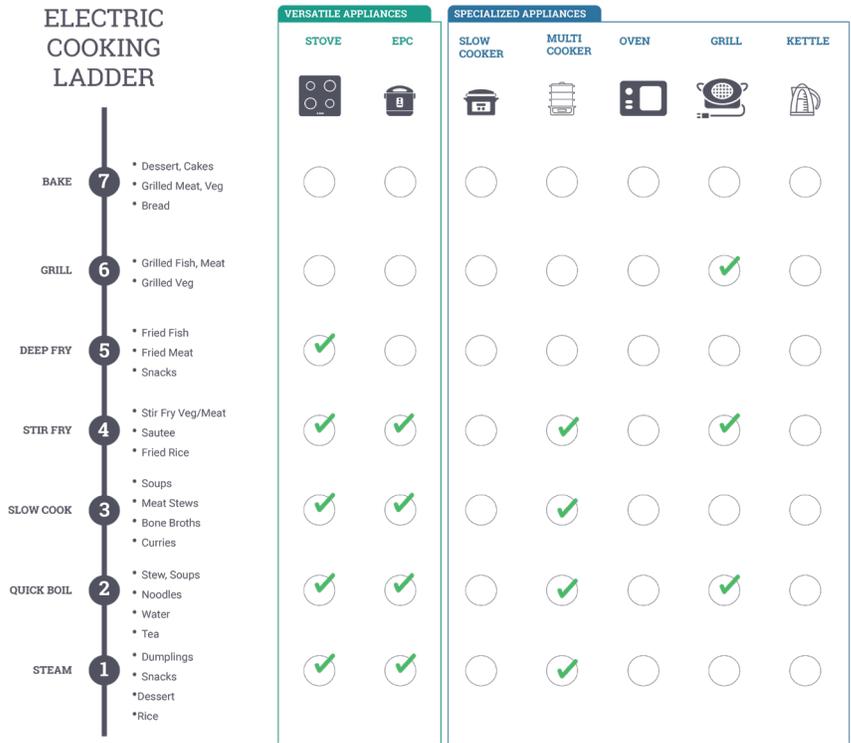
4.1.4. People

The guiding theory of change for the MECS-ECO project in Cambodia involves targeting specific profiles of customers who (for a number of reasons captured in the MECS-TRIID research, listed in Table 1) are close to the threshold of making a change in their cooking practices. The key profiles to reach were:

Innovators: Extreme cases exposed to modern cooking solutions through one-off instances. Innovators are also chefs/home cooks with a strong interest in cooking. They are willing to take risks, have high social status, have financial liquidity, are social and have closest interaction with other innovators. Examples: Chefs, Bakers, Restaurants, Business Owners, Construction companies/Hotels

Early Adopters: People positively inclined towards cooking with electricity, savvy information seeking individuals with high agency and interest towards finding new and efficient ways to cook. Examples: Skilled Migrant Workers (and their parents) Government Officials, SMEs

Early Majority: Individuals slightly above the average social status, willing to try electric cooking. Social, cultural and geographical factors (such as fear of explosions and social proofing) drive shifts in their cooking preferences and behaviours. Examples: Garment Factory Workers, Restaurants, Young/single migrant workers



FRAMEWORK: Laddering Electric Cooking Applications

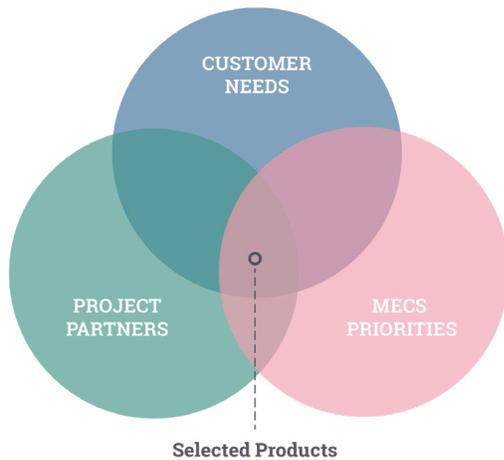
4.1.5. Products

The Ladder of Electric Cooking Framework: Synthesized as part of MECS-TRIID foundational research, the ladder of electric cooking framework guides the rationale for testing products that match with the cultural cooking process of people in Cambodia. In terms of cooking with electricity most Cambodian households are at least at step 1 of the ladder, with electric rice cookers a common part of the household cooking mix. Wide adoption of electricity for rice cooking, points to the potential to promote efficient electric cooking appliances matching peoples cooking needs.

Note: This framework does not suggest that the adoption of electric cooking solutions is expected to happen exactly in the order of cooking methods (steaming-baking) listed from step 1 to step 7. It suggests that by providing contextual solutions for each cooking method, it could be possible for customers to adopt sophisticated electric cooking applications and ladder up to multiple use cases of cooking electricity in Cambodia.

We attempted to identify how much further it is possible to move customers up the ladder of electric cooking applying the 5Ps strategy. Products selected provided critical customer, behavioral and market insights to match the needs of three stakeholders

A range of efficient electric cooking appliances were selected for market testing based on order of desirability to customers (high interest to adopt), project partners priorities (assessing potential of specific technologies) and the MECS programme (research needs to capture evidence of efficient electric cooking technologies and business models).



FRAMEWORK: Products Selection Rationale

Procurement and Testing Strategy:

A survey of screening questions on product ranges, deliveries, accessories, warranties, and supplier agreements was administered with 12 popular wholesale suppliers. Data from surveys was analyzed to identify the best supplier fit offering durable, desirable, safety compliant products with standard warranties. Of the 12, two suppliers were finalized and sub-contracted for the procurement of products. Final suppliers were identified based on the procurement goals and alignment with MECSs policies on safety standards/ certifications. The final five products selected for the market tests were:

- Single and Double Magnetic Induction Cookstoves
- Electric Pressure Cookers
- Multi Cookers
- Electric Grills

The product pitch to customers was based on sales agents developing an understanding of the specific cooking challenges of the prospective customers. This was done by having a sales conversation with the customer and recommending the right electric cooking appliance to match their needs. Although this product line was kept consistent during the course of the market test cycles, not all products were made available to all of the customers pitched to. This was down to the following reasons:

Avoiding over-pitching to customers: To manage complexity and duration of the pitch, sales agents were advised to provide a maximum of 2 product options to customers

Managing the learning curve: In the first 6 week long pilot, sales agents were asked to master the sales pitch for 2 products (understanding their functions, features, buttons and specific uses) of their choice first. Experience through practice during the pilot increased confidence and pitch execution and helped them learn to tailor the pitch differently for other products in the following market test cycles. Following the pilot, the sales team developed a better understanding of the product line and pitched to customers

Replenishing Stocks: Lag time in arrival of cookstove stocks required the team to focus on marketing the other products midway through the 6 months cycles



PHOTO: Products Display Stall at a Community Cooking Event

4.1.6. Pricing

These product line was offered in the following customer financing options.:

ATEC* Single and Double Cookstoves:

- **PAYGO (pay-as-you-go):** This allowed iDE to facilitate financial contracts (on ATECs behalf) directly with customers without the need for micro-finance banks or other third party lending institutions. Customers made monthly installment payments for a set number of months until they fully owned their stove. With no added interest to be paid by the customer and no collateral taken, the PAYGO option is aimed at removing a friction point in the sales process of the electric stoves.

We tested different monthly price points and the lease durations during the project. The market tests began with monthly installments options of 15\$ and 30\$ offered for 18 months months and 9 months respectively. Feedback at the end of the pilot helped narrow the pricing and product options further to 5\$ and 10\$. The goal was to identify the price that works the best, and then remove friction in the closing steps by not overloading the customer with too many pricing options.

- **Upfront Payments:** 10% discounts were offered to customers preferring upfront payments for cookstoves, this was aimed at assessing whether incentives to reduce the price would trigger sales.

EPC, Grill, Multi cookers:

- **Upfront Payments:** For all products, 10%-15% discounts were offered to customers preferring upfront payments. We aimed to assess whether incentives to reduce the price would trigger sales

- **Installment plans:** Unlike PAYGO stoves with longer installment options, the project's ability to offer financing was constrained. A 4 months installment period was chosen based on the project staff's ability to recover the payments within the project duration. 4-month installment plans were trialed for the EPC's, Grills and Multi cookers. Monthly payments were collected through mobile money (Wing) payments.

An analysis of the finance options with respect to sales helped understand desirability of specific pricing points per product



PHOTO: Branding developed to anchor the enterprise

4.1.7. Promotion (Marketing)

Brand Identity Design: Developing a brand for the project was identified as a critical need in order to anchor all customer-facing aspects of the operations including sales and marketing, delivery, installations, payments and customer support. The brand identity was developed to provide a competitive advantage to the project - helping establish a connection with customers, building awareness and engagement, and finally ensuring purchase.

We created an authentic local brand identity aligned with the needs and aspirations of our customers. An internal branding brief was developed to provide guidance to the design team on core brand attributes to be considered including: target audience, brand values, tone of voice, motifs, color schemes and typography.

A final logo, typeface and color scheme was shortlisted from the developed variations. The final brand was then utilized on all customer-facing communication tools and materials including site sellers, posters, digital social media content, t-shirts, ID cards and stationery.

Communication Materials Design: iDE and Hydrologic attempted to ensure that customers (and non customers) not only access efficient clean cooking solutions, but develop the knowledge required to find, use, and maintain them in the long term. This requires behavioral changes that run counter to social, cultural, cooking practices.

iDE's previous experience in WASH and Nutrition recognizes that there is not a single platform or medium that can solve this challenge. However, by utilizing the principles of Human-Centered Design (HCD), the team explored making behaviors desirable, feasible and viable. We aimed to facilitate/influence positive behavior change not only through the product and service delivery offered but also through designing aspirational marketing materials and direct behavior change communication with customers.

Following brand design, the team brainstormed with Hydrologic to co-create concepts and for aspirational marketing materials aimed at promoting awareness of clean cooking and impacts of cooking with biomass fuels. The co-creation exercise included two main elements:

1. Creating an exhaustive categorization of thematic messages that could facilitate behaviour change
2. Developing the thematic messages into essential marketing materials to be use by the sales team for field sales (site sellers, posters, brochures, flyers, videos) and digital marketing (facebook pages, facebook ads)

Trained sales agents used the behaviour change messages in their pitching and product demonstration tactics to trigger interest and willingness to purchase the electric cooking appliances. Throughout the 6 months market tests, these materials were simplified, refined and validated based on feedback from sales agents on which tools and messages were more effective in triggering behaviour change. Feedback from customers was also used to refine the sales pitch and materials.

TONE OF VOICE FOR COMMUNICATION	<i>Aspirational, Clear and Direct Empathetic, Empowering, Emotional, Encouraging Positive</i>
THEMES	MESSAGES (to be tested through the market cycles)
HEALTH	<ul style="list-style-type: none"> • No smoke is healthier for you and the family • Start your "Healthy Cooking" journey • Healthy Family
CONVENIENCE	<ul style="list-style-type: none"> • An all in 1 solution • Reducing elderly effort in cooking • Even husbands can cook now for the kids
SPEED/ EFFICIENCY	<ul style="list-style-type: none"> • Save time, no need to light fire • 6 hours to transform your kitchen
SAFETY/RELIABILITY	<ul style="list-style-type: none"> • Easy to move • Try our amazing smart meters • Child Safe, no need to lock
COST	<ul style="list-style-type: none"> • Flexible Pricing Options • Save time and Save 10x more money in the long run • No more fuel costs • Modern convenient payments • Try our amazing accessories to track your usage
ASPIRATION	<ul style="list-style-type: none"> • Popular • Modern, Smart family • Good for business and good for your reputation - safe restaurant • Profitable, successful business • Innovate your cooking with our new modern products • Become a super mum
CLEAN	<ul style="list-style-type: none"> • A beautiful, smoke free kitchen • Live the ECO-Green lifestyle • Modern beautiful products for a modern beautiful house
CALLS TO ACTION (ON FACE-BOOK)	<ul style="list-style-type: none"> • Ask our executives • Find out more here -> Website • See our products in actions • Check out our products catalog • Save 10% by clicking here

TABLE: The Message Catalog





PHOTO: Snapshot of a Product Marketing Poster

The Message Catalog: The message catalog is a set of sales and marketing messages that emerged from the MECS-TRIID research identifying key triggers for customers to become interested in electric cooking and encouraging them to adopt the technology. A number of pitches /messages, nested under 8 themes were used to design direct and digital marketing materials.

These thematic messages were embedded in the sales script used by the sales agents. During the sales pitch, sales agents kept the three essential thematic messages constant (safety, health and cost saving) and depending on the time available with the customer, (group, community cooking, door to door) introduced 2-3 additional messages were emphasized to trigger customer interest. At the end of each cycle, a number of these messages were removed from the sales script based on feedback from customer data and sales agent reports.

For example: During the pilot safety, health and cost savings were messages that were kept constant. Sales agents included additional messages on aspiration, clean and convenience. Through the pilot sales agents and customer data indicated that people were not very concerned about kitchen cleanliness or building their status in the community. Messages on convenience piqued customer interest to enquire how the electric devices were more convenient than their existing fuels. This was retained as a fixed message in the future market test cycles.





PENSONIC MULTI | PMC-1301
COOKER

ต้มสุกด้วยไฟอ่อน
ต้มสุกด้วยไฟแรง

ต้มสุกด้วยไฟอ่อน
ต้มสุกด้วยไฟแรง

ต้มสุกด้วยไฟอ่อน
ต้มสุกด้วยไฟแรง

ต้มสุกด้วยไฟอ่อน
ต้มสุกด้วยไฟแรง

PHOTO: The Project Sales Team

4.1.8. Place (Channel Strategy)

The Direct Sales Strategy

The ECO projects sales strategy is derived from the Hydrologic direct-sales approach: Trained sales agents (SAs) visit communities to conduct individual or group presentations and take orders saving families the time and expense of traveling to a store to buy water filters. The direct sales approach was applied for this project to act as a bridge for last mile customers with no access to efficient electric cooking appliances.

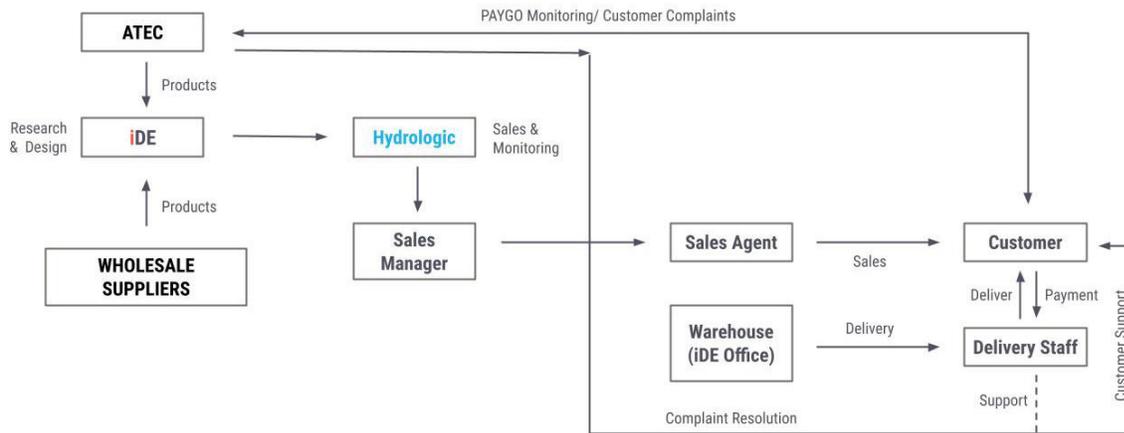
In order to avoid compromise on water filter sales due to competition between a water filter sales team and a team promoting cooking appliances in the same locations, the decision was made to form a new team following Hydrologic best practices in terms of sales operations but focused on cooking appliances. Hydrologic's expertise on applying their established business processes such as recruitment, sales curriculum development, staff training, performance measurement, and sales execution were a key enabler for the market test cycle implementation.

The sales agents hired for the project were trained in human centered sales methods to help customers weigh the cost of action versus inaction and decide if an electric cooking appliance will pay off for them. The sales presentations explain the health benefits of electric cooking and highlight the convenience and cost-saving potential of using the electric cooking appliances compared to erstwhile cooking methods. The aim was to allow people to identify the problems they are currently facing, and make connections to the impacts of these problems on their lives. Sales conversations were guided through the aid of marketing materials such as product site sellers, brochures, sample videos. At the end of the conversation, customers either purchased products or opted not to purchase

The Hydrologic sales team worked collaboratively to maximize reaching and converting customers within a given area and adapt to external factors: distances, rainy season, roads, safety, payment collections. Whilst in the field, sales agents usually coordinated with the chief of the target village to identify the profile of available customers one or two days beforehand. Territory would then be divided amongst 4 sales agents to prioritize door to door sales or group meetings with customers. Sales agents would pitch electric cooking solutions door-to-door in the village, meeting with one or two families at a time. A sales team consisting of four SAs visited covered 4-6 villages in 6 months, at times returning back to villages based on referrals or to make a subsequent pass in a village which are often better than the first time because more people are familiar with the product, having seen their neighbors use it successfully or having familiarity with the sales team.

The project's Place strategy explored understanding synergies to facilitate behaviour change across two channels: direct and digital marketing. On one hand, a small sales team of 4 sales agents and a sales manager were equipped with product-marketing materials and tasked with conducting direct sales to customers. On the other hand, Facebook campaigns were launched to reach customers, build awareness, and test marketing materials. This included:

1. Developing and operationalizing both direct sales and digital marketing for behaviour change
2. Training a team of sales agents to specialize in sales of efficient electric cooking appliances through in person interactions
3. Maximize awareness of brand and the products, reach as many customers as possible through field sales and facebook ads



PROJECT OPERATIONS: A team of professionalized sales agents conducted direct, personalized marketing to customers via individual and group meetings. These operations over the 6 months market test cycle period. 4 sales divided the territory to reach an estimated 50 people per week for 6 months.

Other additions to the direct sales strategy included:

Performance measurement processes were introduced with the Sales Manager tracking weekly Sales Agent performance, leads, and conversions; providing guidance and coaching based on the data.

Bi-weekly check ins (in-field or in office) to solve blocks for the sales team were implemented

In response to precautionary COVID restrictions were imposed in Cambodia from November 2020, which limited large gatherings. Sales Agents were briefed on **iDE's COVID protocol** to be observed in-field: wearing masks, carrying and using sanitizers, maintaining 2m distance and avoiding direct contact with the elderly

Promotional materials such as site sellers, videos and product catalogs were provided to the sales team to assist in pitch delivery. To increase efficiency, the length of the site seller was iteratively reduced and the accompanying messages shifted to videos to aid sales agents in delivering the key product messages in an engaging visual manner. Sales agents showed customers videos of the product on their smartphones

Place (Channel Strategy)

Digital Marketing Strategy

Traditionally, costs associated with direct marketing and customer acquisition are high and can be challenging to sustain in a new market or if sales volumes are low. With the rise in smartphone usage in Cambodia, customers are consuming increasingly more information through social media. According to statistics released by the Telecommunications Regulator of Cambodia (TRC), in July 2019, the number of active SIM cards in the country comfortably outnumbered the population, reaching 20.8 million. As of July 2019, the internet users – including both mobile internet and fixed internet – stand at 15.8 million, which equals about 98.5% of the population. This presented an opportunity for the project to test the potential of social media as a behavior change tool.

We created and deployed a digital outreach campaign using Facebook ads, a simple website and a call center. With a data-led strategy, the team will track performance of each audience, message, images, call scripts and conversions on a daily and weekly basis. This will involve the following steps:

1. Setting up Ads sets (customer segments): The campaign trialed ads on different audiences. Audience groups or Ad sets will be created based on age, location and interest groups (example: Recipes, Health, Beauty, Home Appliances etc.) that reflect the characteristics of our target profiles

2. Run Creative Ads: Using photos, videos and creative content writing, a number of ads on thematic messages of Health, Convenience, Speed, Lifestyle, Costs etc. were created. Over the 6 months, 5 cyclical facebook campaigns were run to obtain customer insights. In addition to testing messages, this also generated awareness of the brand – sales agents reached some customers who were aware of the brand/products through digital marketing even before their community visits.

3. A/B test messages: A/B testing (also known as split testing) is a process of showing two variants of the same Ad to different segments of website visitors at the same time and comparing which variant drives more conversions. This was done to gather rapid insight into what messages, pitches and content are most attracting customers to provide feedback, make inquiries or indicate interest in purchase.

The number of visitors on a webpage equals the number of opportunities to expand the business by acquiring new customers and building relationships by catering to existing ones. And one of the most important ways to optimize communicating with customers in digital marketing is A/B testing. Typically in A/B testing, the variant that gives higher conversions (interested customers) is the winning one, and that variant can help you optimize your site for better results. 4 thematic ads (Health, Convenience, Speed, Lifestyle, Costs) common for each Ad set were published in order to compare the performance of the ad components (content, media, call to actions) and the quality of audience.

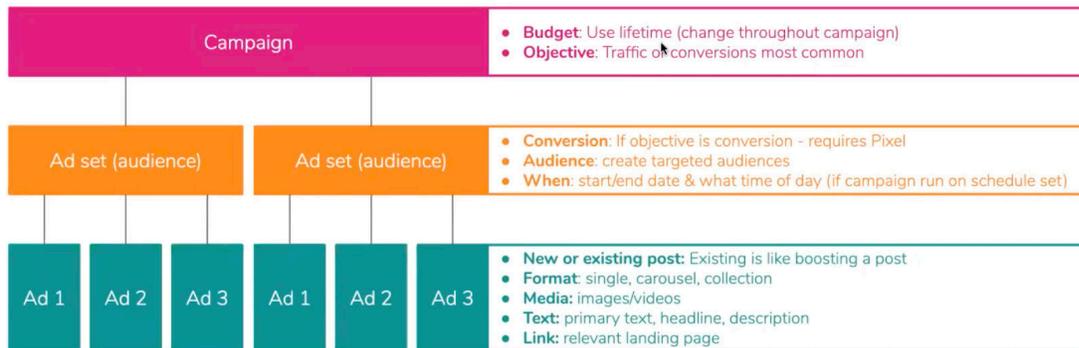


PHOTO: Structure of an Ad Campaign

4. Collect metrics and results: We identified themes and audiences that outperformed the rest. The potential of each ad was be evaluated based on an analysis of the following Facebook metrics:

- Clicks (Audience)
- Cost per Clicks (Quality of the audience)
- Engagement: Impressions, Comments, Likes
- Conversions
- Costs Per Conversions (Quality of the Ad)
- Costs per Ad

5. Iterate and Re-test: Based on the analysis we created new, adjusted versions of ads to improve upon results. After the first test, small adjustments to images and copy were be made and ads were re-run in 5 cycles to compare the quality and performance

6. Evaluate Next Steps: Key learnings were shared with the sales team in order to consider the best performing sales pitch (online) as a starting point for the direct sales operations. Refinement of direct marketing materials: Based on data analysis from A/B tests, insights helped refine the sales messages pitched to target customers. These were embedded in the direct marketing materials (site seller) used by the sales agents

For further information on the impacts of digital marketing see annex 1

4. 2 Longitudinal Behavioural Research

A set of qualitative and quantitative methods were applied to capture customer (and non customer) feedback at key stages, during purchase and longitudinally over time in order to measure changes in behaviors and perceptions on electric cooking over time.

Emphasis was placed on capturing data on cooking behaviours, adoption factors and assessing electricity supply compatibility. This required collecting data to allow comparisons on how cooking behaviors evolve over time and to track the extent of e-cooking adoption in customers. The research questions were broken down into individual themes, and a suitable research plan described in the following section balancing marketing mix data collection data and understanding the nature of electric cooking 'FIT' was implemented.

4.2.1. Methods:

1. Initial/Midline/Endline Surveys: Phone surveys were conducted with customers at 14, 30 and 60 days after the date of purchase. Information on themes of cooking habits, energy consumption, attitudes and perceptions of cooking with electricity

2. Complementary Qualitative Research: After the initial-endline stage evaluations, qualitative research with a small sample of customers was conducted to address remaining knowledge gaps in our research. Travel restrictions imposed to manage COVID-19 transmission prevented in-field qualitative research. The research plan was adapted to conduct remote research. In-depth interviews were conducted with select customers through video calls or telephone calls.

Wherever possible, remote observations were conducted with customers by asking people to give the team a tour of their kitchens - probing questions were asked based on the observation to understand the decisions that drive people's cooking related preferences and behaviours

3. Remote Energy Use Monitoring: Data on energy consumption, peak loads and daily use patterns was collected and analyzed through wifi enabled energy meters to improve understanding of how, when and for how long customers use their electric cooking appliances

The longitudinal research also drew on the data from the delivery surveys used in the iterative market test cycle research.

TABLE: Research Sample

Method	Sample Size	Notes
Longitudinal Surveys	30	Longitudinal initial use, mid-stage and end line evaluation surveys were conducted with 30 women cooks who used the cooking device they/their family purchased
Remote Qualitative Research	25	Due to COVID lockdown restriction, remote qualitative research was conducted with 25 customers (2 men, 23 women)
Energy Use Monitoring	23	Energy use data was captured from 18 electric cookstoves, 4 EPC's and 1 Multicooker

Research and Data Collection Plan: Links to survey instruments can be found in annex

4.2.3 Data Collection Plan

Data/Research was conducted at the following stages of the project:

Day 10-14: Initial use stage evaluation surveys conducted at initial use stage by the iDE Researchers/Enumerators

Day 30-45: Follow up mid-stage evaluation surveys conducted by the iDE Researchers/Enumerators

Day 60-70: End line evaluation surveys conducted at end of data collection stage by the iDE Researchers/Enumerators

End of Market Tests: in-depth, semi structured interviews qualitative interviews conducted by the iDE Research team

Surveys designed and collated using Google Forms were administered by Sales Agents and iDE enumerators

TABLE: Behavioural Research Plan at a glance

Methods	Longitudinal Surveys	Qualitative Research	Remote Energy
Timing	Initial stage (baseline): Day 14 Mid line: Day 30 End line: Day 60	Post Endline Survey Completion	Continuous data captured through energy measurement devices
Data Collector	iDE Enumerator	iDE Researchers	iDE Researchers
Participant	Customers	Customers	Customers
Information collected	Information on themes of cooking habits, energy consumption, attitudes and perceptions of cooking with electricity	Customers current fuel use patterns, current behaviors and perceptions around electric cooking	Energy consumption, daily use patterns, peak load, unit costs

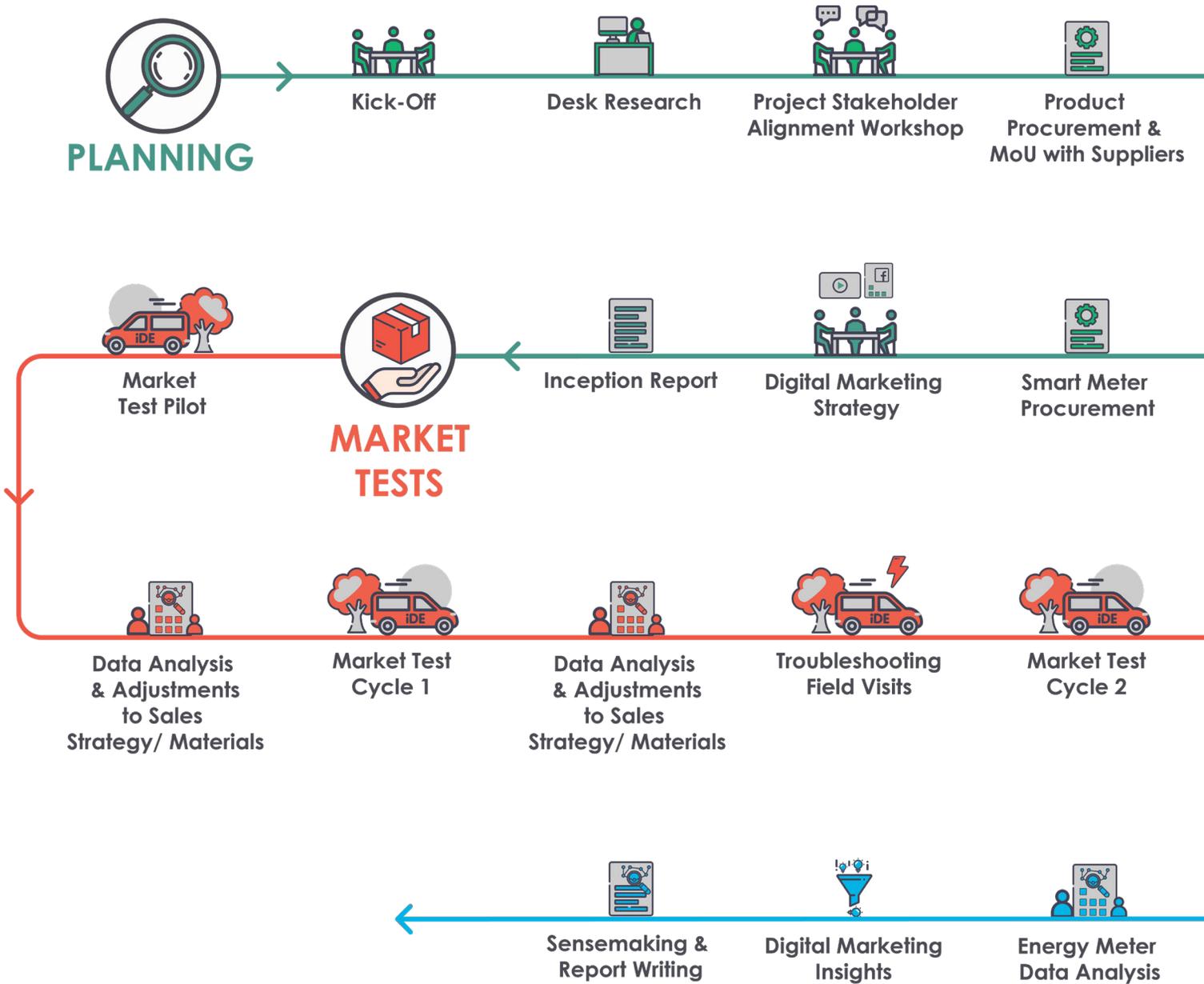
Note: Initial stage surveys are also referred to as baseline surveys in the later sections of this report



PHOTO: A Multi Cooker Customer in Her Kitchen

4.3 Limitations of the Project Methodology

1. Data captured represents the cooking related perceptions and behaviours of customers in the target locations only. The project attempted to broadly address cooking needs of cooks in the selected geographies without focusing on people living with disabilities, minorities or other communities. A future follow up study to understand cooking perceptions and behaviours of the above communities should be conducted to frame contextual understanding
2. Set up as a series of market tests, the project had a limited ability to request for customers time for feedback and data collection post sales. A number of our customers chose to opt out of the longitudinal baseline-endline data collection
3. Insights on sales data (customer and non-customer) have been inferred based on a limited data set due to changes in data collection plans midway through the first pilot. Not all the customer and non-customer information could be captured through the surveys. We represent findings with the available information, and wherever possible we try to explain the data through complementary data sources (sales agents feedback, qualitative research)
4. The limited sampling seen in the longitudinal baseline- end line data highlights a challenge of balancing deployment of iterative market tests and in-depth behavioral data collection with limited resources
5. Cooking data captured over multiple lockdown periods may not represent previous behaviours but highlights the emergence of new trends
6. COVID-19 risks prevented a larger sampling for qualitative data and community cooking events.
7. The project sales operations were adapted to manage COVID-19 risks: a broader sampling of rural and peri-urban locations for sales and research was not feasible. Due to the need for maintaining flexibility in sales and data collection, ensuring timely product deliveries and reducing logistical challenges for sales agents, peri-urban locations were prioritized



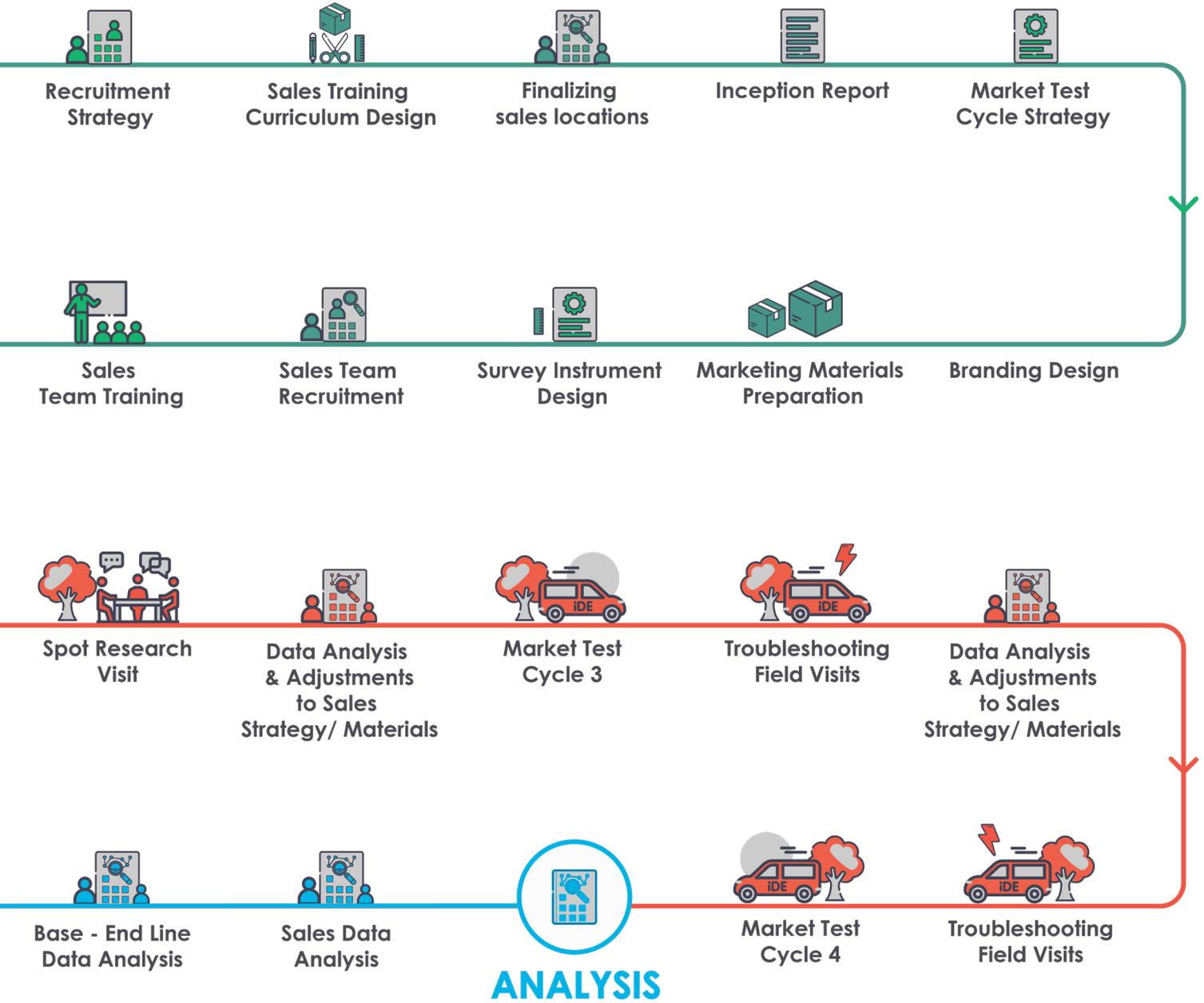


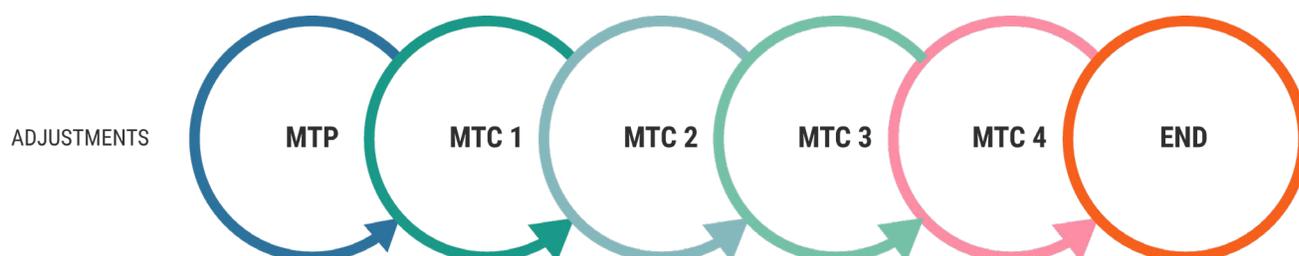
PHOTO: End to end project journey



05. Findings

5.1 Key learnings from the iterative market test cycles

This section reviews key results from the market cycles and the impacts of iterative changes made to the 5Ps over the 6 months market cycle period. Specific changes to the 5Ps are summarised in table 5.1 below and key statistics from the sales and outreach activities are summarized in table 5.2



5Ps	Market Test Pilot Adjustments	Market Test Cycle 1 Adjustments	Market Test Cycle 2 Adjustments	Market Test Cycle 3 Adjustments	Market Test Cycle 4
People	Innovators, Early Adopters, Early Majority				
Products	Replenishing inventory of Electric Stoves and Grills	Same day delivery and installation protocol	<ul style="list-style-type: none"> • Staff retraining on EPC and Multicookers • W-fi enabled energy meters installation 	Replenished cookstove inventory	
Pricing	<ul style="list-style-type: none"> • Retaining installments. • Mobile payments collection process 		<ul style="list-style-type: none"> • Adjustments to cookstove price points • Free trials for cookstoves • Offering EPC Discounts 		
Promotion	<ul style="list-style-type: none"> • Improving sales pitch • Improving customer pitch experience using video 	Adjustments to site sellers	Designing Cooking Show event and related promotional material	Community Cooking Shows	
Place	<ul style="list-style-type: none"> • Retraining sales agents • Sales tactics/Sales execution changes 	Test Facebook Ad campaign	Facebook Ad campaigns	Promoting the event on Facebook live to attract online customers	
Other	Customer complaints mechanism	COVID-19 Response protocols	Field observations and spot checks		Sales Team Feedback

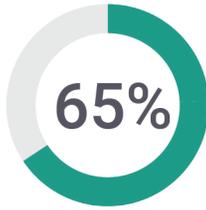
TABLE 5.1: Summary of adjustments during the market test cycles

5.2 Results from the market test cycles

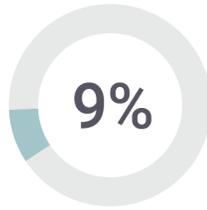
SALES

71

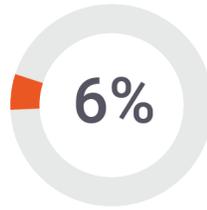
E-COOKING PRODUCTS SOLD



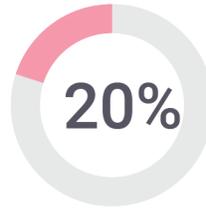
COOKSTOVES



EPC



MULTICOOKER



GRILL

55% PAYGO
28% INSTALLMENTS
17% UP FRONT

PRICING OPTIONS PREFERRED

DIRECT MARKETING



2,938

PEOPLE REACHED DOOR TO DOOR



129

PEOPLE REACHED THROUGH COMMUNITY COOKING



928

CUSTOMER SALES PITCHES



6.35%

SALES CONVERSIONS

DIGITAL MARKETING



403,928

PEOPLE REACHED FACEBOOK ADS



2.20%

ENGAGEMENT (LIKES, SHARES, COMMENTS)



149

DIRECT CONVERSATIONS

GENDER DATA



100%

WOMEN RECEIVING SALES PITCH (928 SALES PITCHES)



90%

% WOMEN PURCHASE DECISION MAKING (SOLE OR JOINT DECISION)



86%

% PRODUCTS PURCHASED BY WOMEN COOKS

5.3 Results Overview from 6 months market tests

Note: Customer and non-customer feedback was collected by deploying 193 point of sale surveys and 51 delivery surveys. The data set utilized in this section may not completely represent the total sample of people the sales team reached. This is due to challenges in proper data collection, COVID-19, and changes in research plan mid way through the first pilot.

We represent findings based on the available information and wherever possible we have attempted to explain additional learnings through complementary data sources (sales agents feedback and qualitative research) This section distills key results from the 6 months market test cycles which incorporated various adjustments and refinements to the 5Ps framework.



05. Findings

5.3.1. People

As per the project's Theory of Change, market tests reached the innovators, early adopters and early majority. In this section, we review the profiles of purchasing customers, understanding and inferring from customer (and non customer) feedback captured at point of sale (or no sale) and understand people's motivations to adopt (or not adopt)

928 people were pitched to - of which 59 became customers (6.3%) with a total of 71 products sold. Of the 928 people pitched to, 244 were surveyed and as part of this process classified by customer profile type: as innovators, early adopters or early majority. Early adopters received the most sales pitches and the sales team reached few innovators.

193 of the 244 surveyed were non-customers. Graph 1 shows the percentage of innovators, early adopters and early majority from this group.

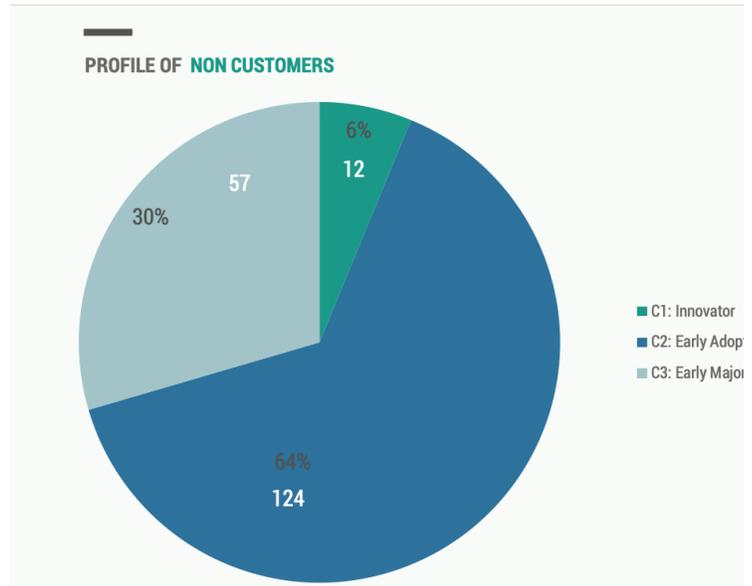
51 of the 244 surveyed were customers. Graph 2 looks at the percentage of innovators, early adopters and early majority who were surveyed who became paying customers. Of the paying customers purchasing electric cooking devices: 78% Early Adopters, 12% Innovators and 10% Early Majority.

From the 193 people surveyed - 12 were innovators. And from the 51 customers surveyed, 4 of these became customers. In total, 18 innovators were surveyed, and 6 of those became customers. Therefore, 33% of innovators who were surveyed became customers.

From the 193 people surveyed - 124 were early adopters. And from the 51 customers surveyed, 40 of these became customers. In total, 164 early adopters were surveyed, and 40 of those became customers. Therefore, 24% of early adopters who were surveyed became customers.

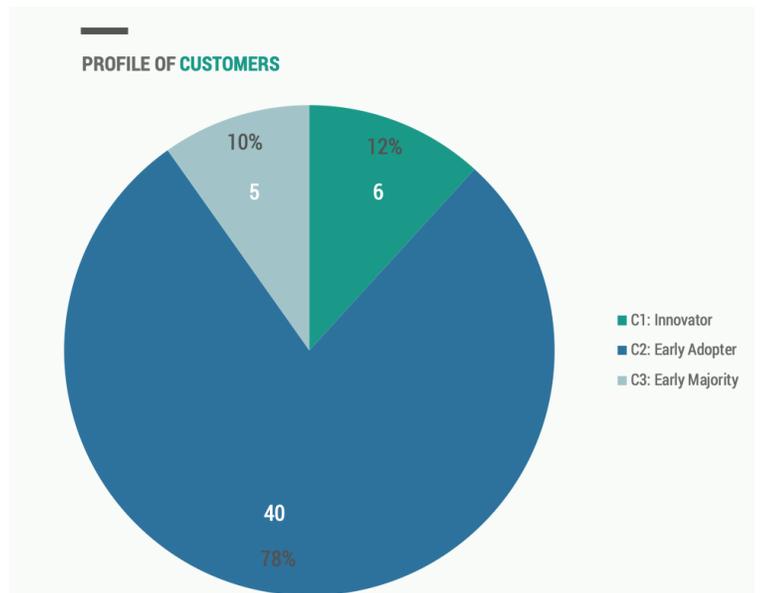
Similarly, of 193 surveys 57 were early majority and from the 51 customers surveyed, 5 of those became customers. In total, 62 early majority were surveyed, and 5 of those became customers. Therefore, 8% of early majority who were surveyed were customers

These percentages may not be fully representative as we surveyed all the customers and a large number of non-customers were not surveyed.



Graph 1: Non customer profiles

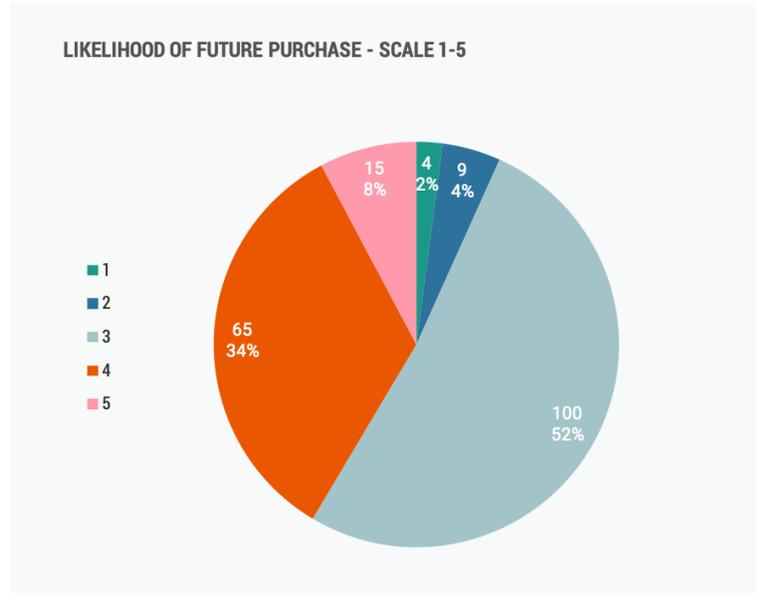
Unit: % non customers Total Sample:193



Graph 2: Customer profiles

Unit: % non customers Total Sample: 51

Customer data alone does not allow us to fully conclude that the largest interest and willingness to transition to electric cooking is coming from the early adopter profile. Reviewing non customer survey data provides additional information. Graph 3 below represents non customers likelihood of future purchase. In spite of non purchase, 42% of non-customers indicated they were either very likely (8%) or likely (34%) to purchase an electric cooking appliance in the future, while 52% indicated they may make a purchase.

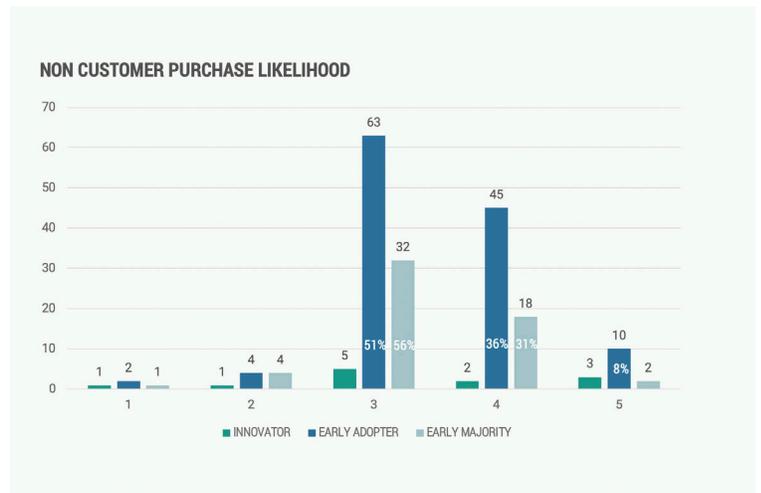


Graph 3: Non customers likelihood of Future Purchase

Unit: Percentage of future purchase likelihood Scale: 1 to 5 (1 = Never and 5 = Very Likely)

Total Sample:193

Graph 4 disaggregates non customers indicating interest in future purchase in terms of the three target customer profiles: 5 out of 12 (42%) innovators indicated a strong interest in making a future purchase -indicating a 'likely' or 'very likely' interest in making a future purchase. Of the non customers 44% (55) of the early adopters indicated a strong interest in making a future purchase, whereas 34%(20) of the early majority indicated a similar 'likely' or 'very likely' interest in making a future purchase.



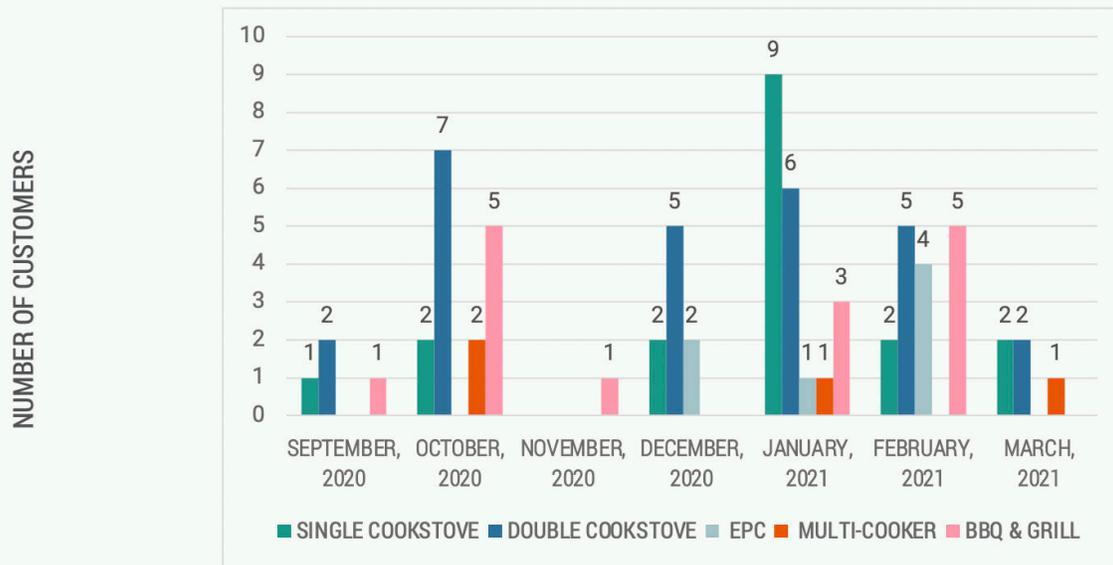
Graph 4: Non customers likelihood of Future Purchase

Unit: Number of non customers in each profile indicating interest in future purchase

Total Sample:193

5.3.2 Products

PRODUCTS SOLD DURING MARKET TEST CYCLES



Graph 5: Products sold per month

Unit: Number of customers Total Products Sold: 71

Over 6 months, 71 products were sold in total including 47 Cookstoves, 14 Electric Grills, 6 EPCs, and 4 Multi Cookers.

The cookstove registered the most sales at 65% (47) of the total products sold. Data and sales agent feedback confirms that the electric cook stove offers an aspirational fit for customers. It matches cooking needs and is packaged with pots and an electricity meter at an affordable price point. The overall package is very well received by customers with no customer complaints to the sales team on safety or reliability. As covered in subsequent sections, it matches with cooking needs and cultures in Cambodia, cooks were able to prepare most everyday dishes without any challenges.

“Cooking with the electric stove is very easy, you just need to press the start button and set the temperature. I also like that there is a child lock so kids cannot accidentally play with it. This is very very safe as compared to LPG and that’s why I am satisfied with the product.”

After the cookstove, the **electric grills** were ranked second in the sales at 20% (14) of the total products sold. They are seen as a convenient alternative to charcoal for grilling. However, the small size of the product appears to be limiting the use as seen in section 5.5.2. An opportunity for future market pilots could be to offer larger sized grills at competitive monthly installment plans

Even with multiple training sessions to improve the **EPC** pitch, only 6 EPCs were sold. **Challenges in marketing the EPC** did exist due to lack of proper understanding of the functions (allowing cooking of a range of dishes) and the buttons required to cook different dishes - for both sales agents and customers. Due to this the sales team struggled to sell the EPCs.

Feedback from sales agents suggests that for most non customers, the primary customers perception of the EPC is of a rice cooker. This highlighted a knowledge gap in the sales pitch. The perception of the EPCs being rice cookers

also triggers cost comparisons with rice cookers available in the market.

“This one looks like a rice cooker that can cook other things, but it’s main use is for cooking rice. The quality looks very good but it is quite an expensive product.”

Rice cookers are common in most peri-urban households in target locations, and customers reported already having a rice cooker, therefore not requiring a new purchase. To be promoted in future pilots, further consideration is necessary to identify contextual application: cooking specific aspirational dishes and meals using the EPC and tailor the sales pitch accordingly, whilst ensuring attractive pricing and value additions.

Even the customers we spoke with used the EPC for rice cooking.

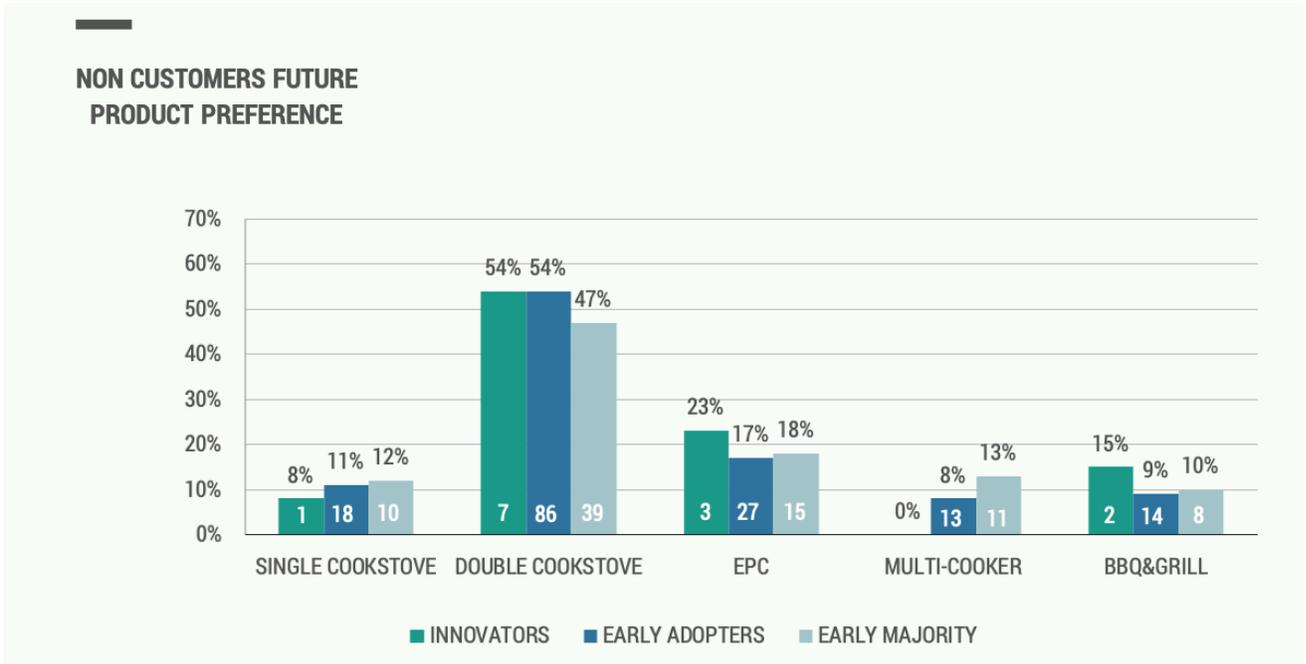
“The rice I cook using the EPC is so much better than the previous rice cooker. It is also easy to clean because of the non-stick pot and has an automatic switch off when the rice is cooked. I like the product but honestly I am still not sure about how to cook chicken or soup using it. The sales agents showed me how to use it during the delivery and one more time later but I forgot what they told me.”

Registering the fewest sales, the **Multi cookers** (4), which are well suited for steaming and boiling, appealed to a very small subset of customers prioritizing healthy cooking/recipes. Similar to the EPC the sales team struggled to sell the Multi Cooker to customers. Limited functionality of the multi cooker causes cooks to question the reason behind purchasing it.

“This is a good product which can cook soup quickly. But how can I cook it for a family of 6 people. It is so small, I will end up spending a lot of time cooking.”

The energy measurement meters included in the product package were received positively by customers. Early feedback indicated that customers like to measure and calculate how much electricity is consumed per meal. This helps overcome the cost-perception barrier that is associated with electricity. However, over time, the interest in measuring energy consumption daily declines with very few customers relying on the meters. Over time, the concern for measurement of energy use goes down.

“I remember the sales agent told me about this meter. I was not very curious about the bill because I wanted to try the stove for one month. If the electricity bill was too much I would have stopped using the product. After the first month, I didn’t really check the meter, actually I have forgotten how to use it to measure the cost.”



Graph 6: Non customers likelihood of future preference by profile

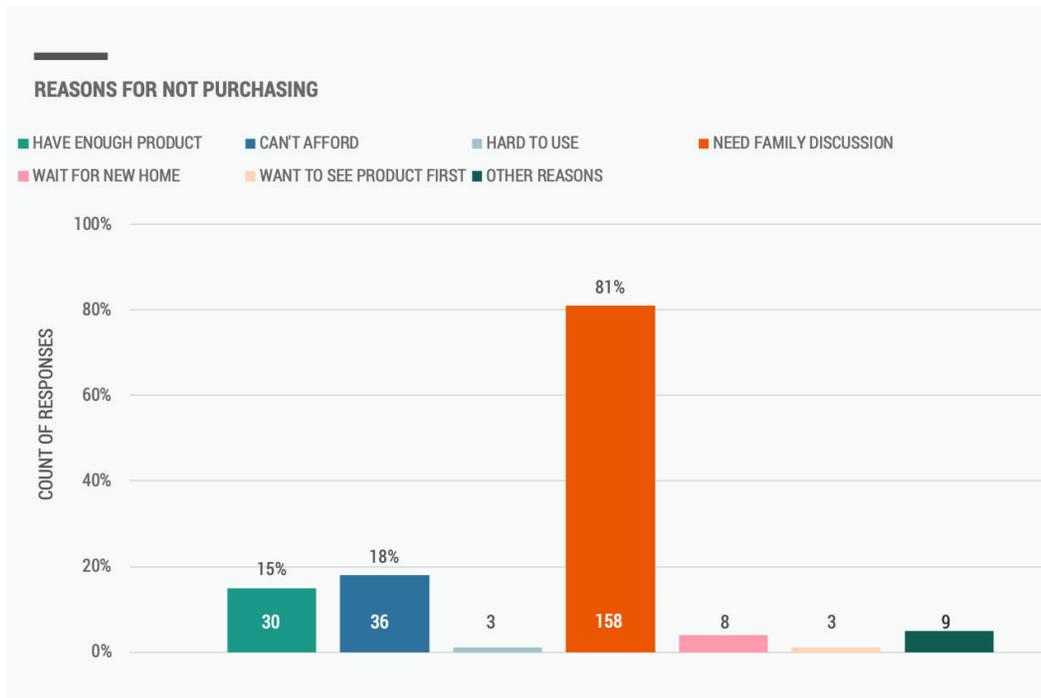
Unit: No of people indicating future purchase preference per appliance. Total Sample:193

Graph 6 above, disaggregates non customers future product preference per each target profile. The double electric cook stove registered the highest interest even from non customers (132), followed by the EPC (45) and the single cook stove (29). Interest in the double stove across all three profiles was high, a majority of the non customers (131) indicated a future purchase preference for it. From raw survey data, 54 of the 124 (43.5%) early adopter non customers were highly interested in making a purchase at a later point.

Even with a limited sample, the Innovators (7 out of 12 innovators) and Early majority (39 out of 57) also indicated the highest preference for purchasing the double electric cookstove. Based on customer data and feedback, **the double electric cookstove was the most versatile and aspirational cooking appliance.**

5.3.3 Promotion

Drivers of Non Purchase: As per Graph 7, the biggest reasons for non purchase are: **81% of people want more time to discuss with family and 18% find the price to be unaffordable.** In spite of adjustments to product pricing (offering discounts and installments) over the 6 months of testing, non customers believe the pricing to be high.



Graph 7: Drivers of non purchase

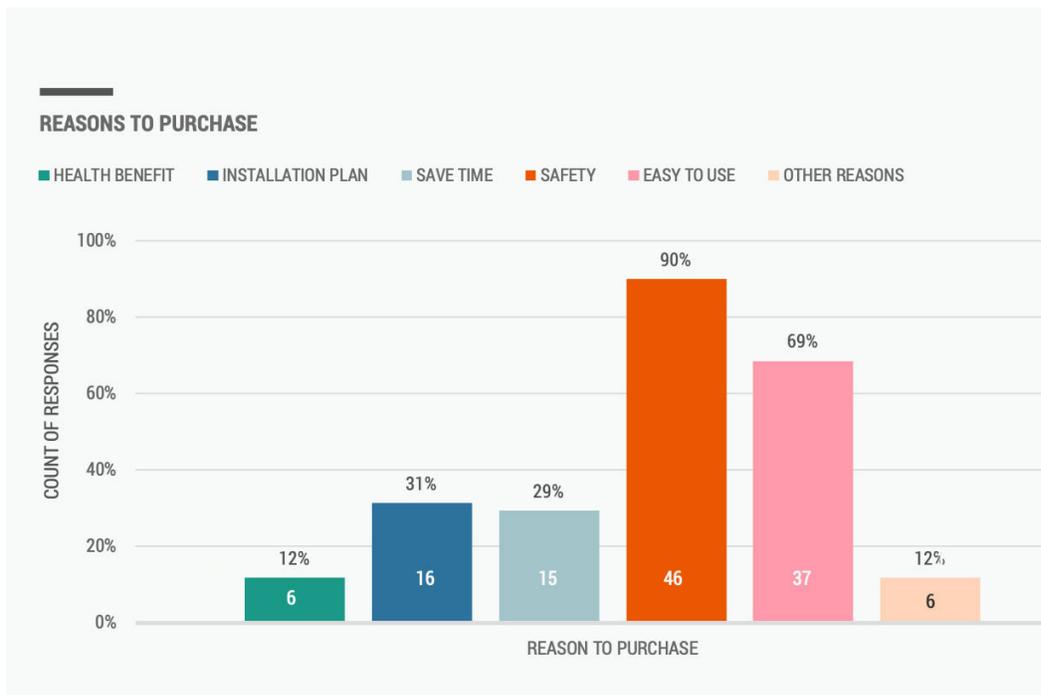
Unit: Percentage of non customers choosing a specific reason Total Sample: 193

In most cases people receiving the sales pitch from iDE Sales Agents would indicate interest in the products, but would want to **discuss the decision to purchase with the family first**. The decision to purchase happens typically in consultation with the family (husband and wife, and grandparents) Data captured from non-customer surveys highlights the following order of reasons why customers were reluctant to make purchases:

1. Wanting to discuss with family,
2. Price
3. Already believe they have sufficient cooking products
4. Wanting to see the product first

By far the biggest reason for not purchasing an appliance was the need to have family discussion; a finding which has implications for the timing of sales pitches. Sales were 3-4 times more likely at the weekend when the whole family was present (not just the cook) and able to engage in the complex decision making surrounding the purchase of a new appliance that represents a brand new way of cooking. Weekend sales pitches were found to facilitate family buy in and result in far quicker decisions to purchase. As a result, sales agent working hours were adjusted to Wed-to Sun - sales conversions in the 2021 sales cycle have averaged 18% (3x more than the ECO pilots)

Drivers of Purchase: Graph 8 shows the key reasons that influenced customers' purchase. The decision to purchase is driven primarily by availability of safer cooking options made available through the project - 90% of customers highlighted **safety** as a factor. **Ease of use** (69%) was the next biggest reason convincing customers to make the switch to electric cooking. Customers also cited the **availability of affordable installments** (31%) plan and **time saving** as additional reasons. Contrary to our hypothesis, health benefits (related to smoke free cooking) were not highlighted as a key factor behind purchase decisions.

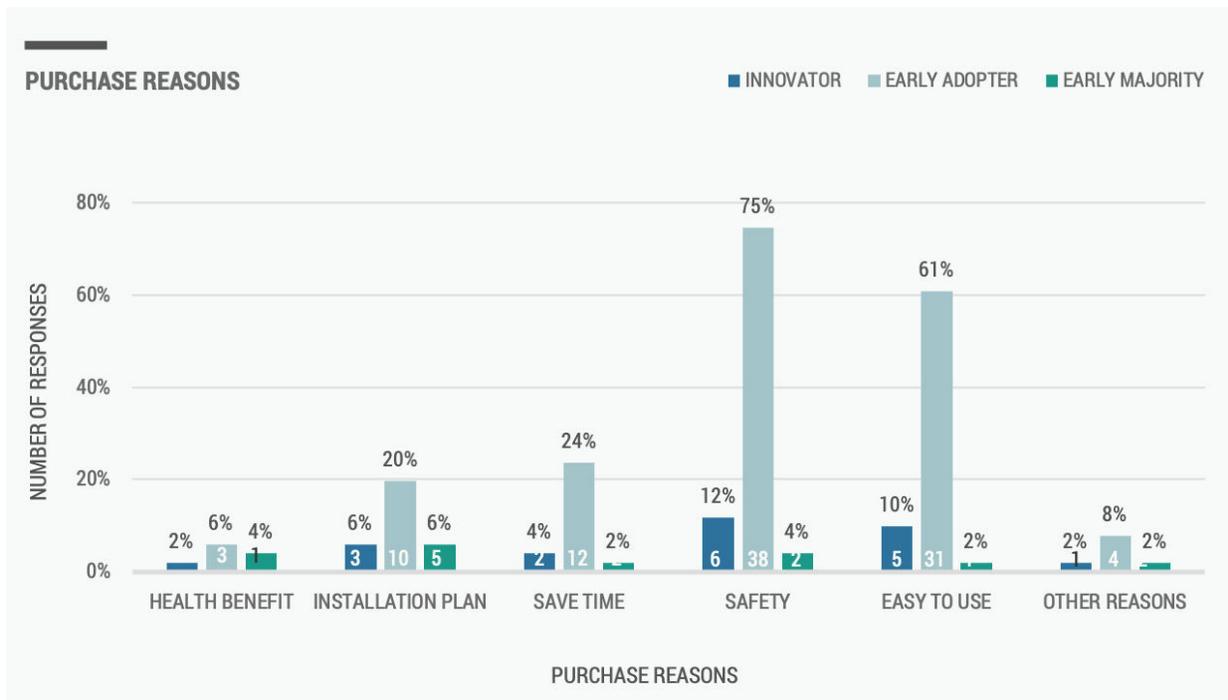


Graph 8: Drivers of purchase

Unit: Percentage of customers choosing a specific reason Total Sample: 51

Graph 9 is aimed to highlight specific drivers of purchase important to each profile. **For the innovators and early adopters' customers, safety emerges as the biggest driver.** 38 of 40 early adopters' customers' decisions to purchase were driven by safety. Contrary to our hypothesis, more than health benefits associated with smoke free cooking, a need for safer alternatives to LPG gas drives the decision for customers to make the purchase. (31 out of 40) early adopters also cited ease of use as the next most significant motivating factors behind their purchase. Convenience of the cooking experience, time saving cooking alternatives were next (12 out of 40) Additional feedback (good quality products, purchasing for a family member, modern) is categorized in OTHER (8%)

To better understand the purchase decisions of the customer profiles, the team conducted rapid phone interviews with 4 innovators and 4 early majority customers towards the project end. Based on early adopter feedback, we wanted to assess whether the innovators and early majority customers' motivations (safety, affordable price, and time saving) for purchase are similar to the early adopters.



Graph 9: Purchase reasons disaggregated per profile

Unit: Percentage of customers within each profile. Total Sample: 51 (6 Innovators, 40 Early adopters, 5 Early majority)

"It is very easy to cook soup with this, just turn on the stove, stir a bit, and then I can do other work as the food is cooking - it will automatically turn off when it is done."

In this case the Innovator customer had gone one step further and understood by herself how to set a timer on the stove.

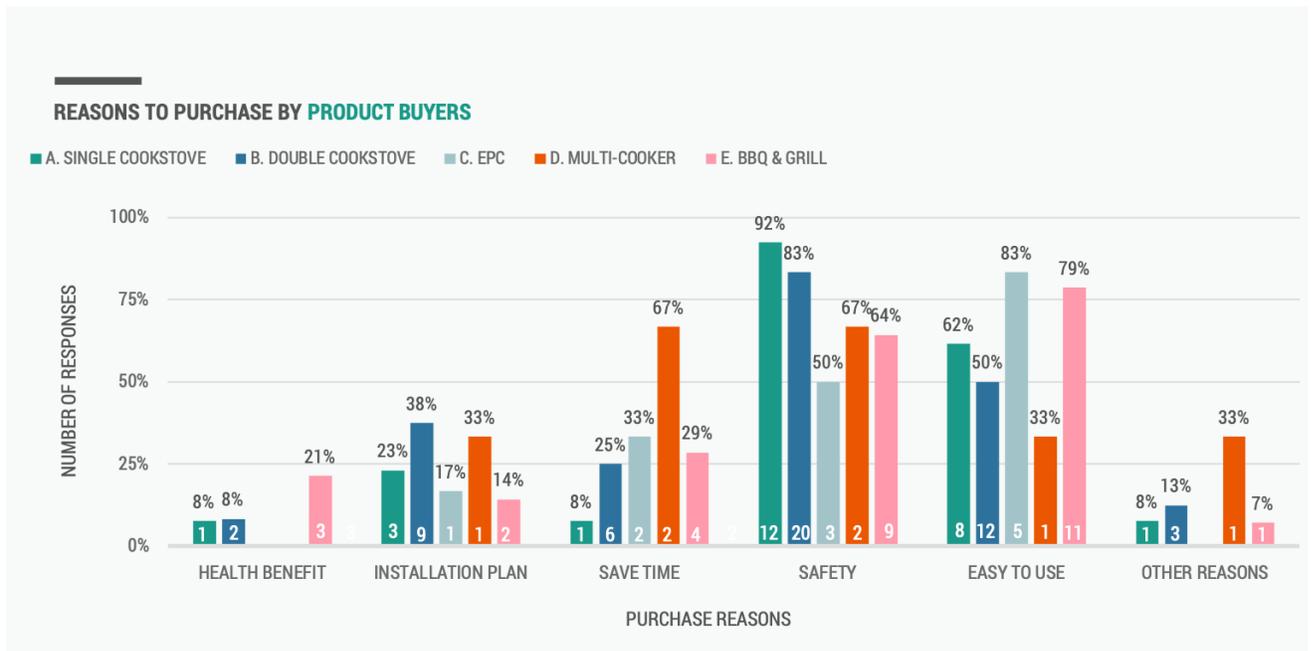
Innovators appear to have a **greater understanding** of how the technology works. We were surprised to learn how quickly innovators could develop an understanding of the appliance and seek out more information about how to make the best use of the products.

"When the sales agent came for the promotion, I was searching for similar products on Facebook. I saw one or two recipes in an online video where the cook was using an electric stove like this."

Innovators also appeared more trusting of the technology as they already had (previously or currently) similar electric cooking devices. Of the 4 innovators spoken to their motivations to purchase were driven by ease of use and convenience (3 out of 4 innovators highlighted both reasons)

The purchase reasons for the early majority are driven by two main reasons:

1. The availability of **safer alternatives** i.e safety - all 4 highlighted fear of fires and gas leaks as a factor behind opting into electric cooking options
2. The prestige associated with owning the **"beautiful" stoves** as another key factor
3. We also found that a common influencing factors for the three profiles is experiencing (seeing the product or seeing the cook food)



Graph 10: Purchase reasons disaggregated per product type

Unit: Percentage of customers Total Sample: 51

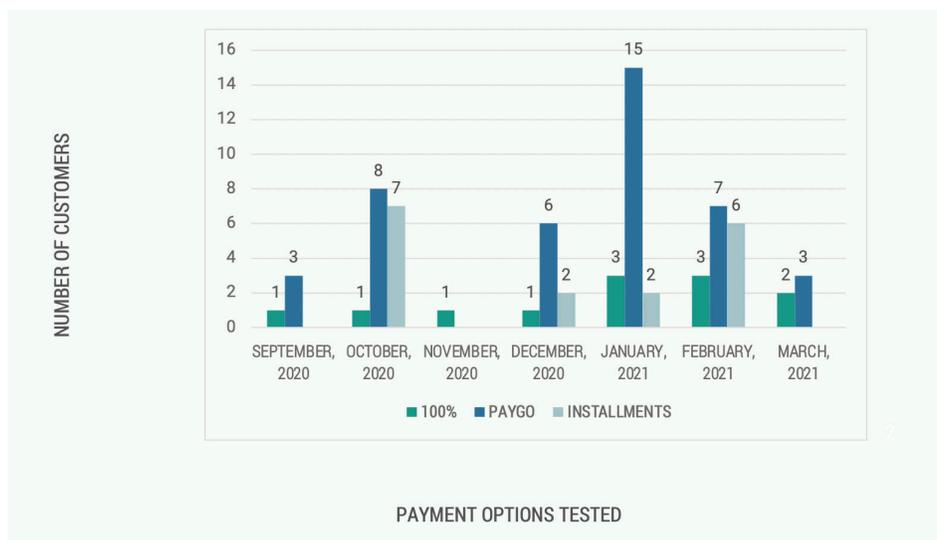
Graph 10 shows customer purchase reasons disaggregated per product type. For each cooking device, safety is the biggest factor influencing purchase decisions. Ease of use and time saving are the second drivers. In the case of the double cookstove, 35% customers highlight the availability of an instalment plan to be a driver for their purchase.

Adjustments to Direct Marketing Messages Data in graphs 8, 9 and 10 indicates that more than health related messaging, safety, ease of use and time saving are the most resonant for our customers. A number of messages on aspirational lifestyle, smart meters and energy measurement did not boost customer interest. These were later removed from the sales pitch and pitched only for specific customers per sales agents discretion.

5.3.4 Pricing

Table below highlights the pricing options offered to customers

Appliance	Pricing and Payment Plans Tested
Single Cookstove	<ul style="list-style-type: none"> • 180\$ or offered at 10\$ (18 months) and 20\$ (9months) monthly payment plans • PAYGO: 1 month free trials with 5\$ monthly payments
Double Cookstove	<ul style="list-style-type: none"> • 270\$ or offered at 15\$ (18 months) and 30\$(9 months) monthly payment plans • 1 month free trials with 5\$ monthly payments
EPC	<ul style="list-style-type: none"> • 110\$ or offered at 27.5\$ (4 months) monthly payment plans • Discounted Price Set to 100\$ or offered at 25\$ (4months)
BBQ & Grill	<ul style="list-style-type: none"> • 68\$ or offered at 17.5\$ (4 months) monthly payment plans • Discounted Price Set to 60\$ or offered at 15\$ (4months)
Multicooker	<ul style="list-style-type: none"> • 91\$ or offered at 22.75\$ (4 months) monthly payment plans • Price reduced to 82\$ or offered at 20.5\$ (4 months)



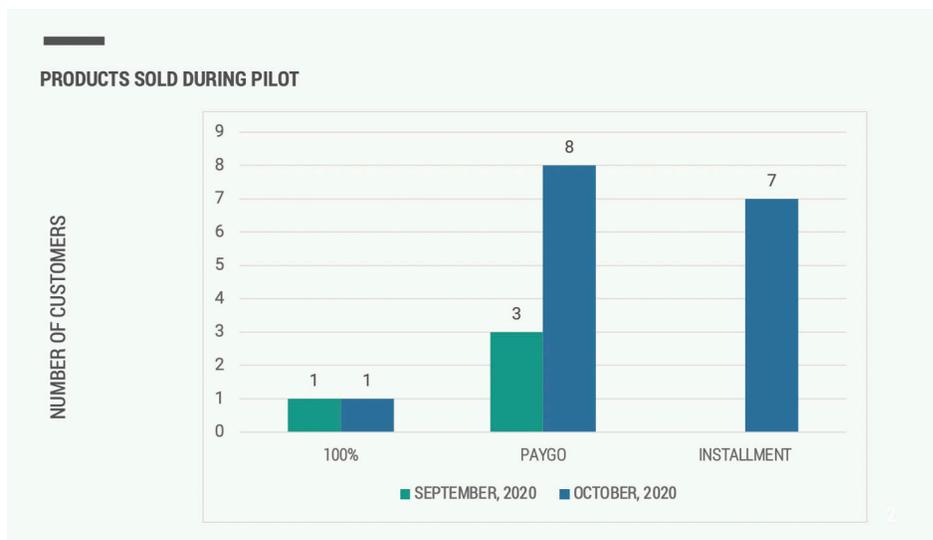
Graph 11: Customer Payment Preferences

Unit: Number of products Total Products: 71

Graph 11 shows the monthly products sold with respect to payment options chosen by paying customers. **83%(59) of the total products were sold through an alternative financing mechanism:** either PAYGO or in installments. Financing options facilitate the sales of these products in Cambodia, especially higher-priced appliances such as the double cookstoves which are priced at \$270. Over the course of the 6 months, adjustments to the individual product price points and the positioning strategy helped to determine this finding. Iterative adjustments to the pricing and payment schemes provided the following learnings:

Evolution of pricing strategy: Pilot Payment Options Test: Graph 12 below shows data on customers payment preferences during the market test pilot. In the first 3 weeks of the pilot, Sales Agents were advised to incentivize the cash sales by emphasizing the 10% discounts during the sales pitch. In the following 3 weeks, Sales Agents emphasized the monthly installments first to customers.

Over the pilot, we observed an emerging customer preference to purchase through monthly payments(PAYGO or Installments) - only 2 out of 14 customers purchased the products upfront. Based on the experience of the pilot, the emphasis on focusing on the monthly installments was retained in future pilots. This decision was also informed by the non customer feedback indicating that pricing was high.



Graph 12: Customer Payment Preferences *Unit: Number of products Sample: 20*

Market Test Cycle 1 and 2: To test customer response in the following pilots, the sales agents continued their pitch emphasizing the monthly prices. However, in spite of retraining this did not result in significant sales of any products. This can be attributed to the sales agents still learning the sales process, COVID-19 travel restrictions, and non customers continuing to cite high prices as a barrier.

Market Test Cycle 3 and 4: At the start of the Market Test Cycle 3, the monthly price points were reduced for electric stoves and dropped to 5\$ and 10\$ monthly. Since January 2021, the electric stoves were offered to customers on a 1 month free trial plan (with 5\$ or 10\$ refundable deposits) to encourage interest in using the products. A marked increase in sales was observed as a result of the trials: 15 stoves were sold in the month of January. From January to March more than half of the stoves (26) were sold thanks to the trials. At the time of writing, no payment defaults amongst the stove customers pointing to the potential of free trial strategies to boost adoption of electric

cooking solutions.

10% Discounts were offered for the EPC, Multi Cookers and Grills. An increase in sales in February could be attributed to the reduced pricing.

Learnings from Pricing Adjustments:

By dropping the price points to 5\$ and 10\$ per month, we were able to position the cookstoves as an efficient, aspirational and safe product with monthly cooking costs being closer to/ less than current monthly fuels (LPG/biomass) costs. Baseline- endline evaluations and qualitative research conducted monthly cooking cost estimates of 14\$ for charcoal and 11.25\$ for LPG (Section 6.1) These monthly price points were competitive and successfully triggered use. The question of whether the initial opt-into electric cooking triggered by the attractive pricing translates into sustained adoption or replacement of other cooking fuels is covered in section 5.5.

For the EPCs, Grills and Multi cookers, it is still difficult to draw the conclusion that the current price points offer a fit with customers. Increase in sales is also attributable to the result of focused retraining of the sales agents to improve sales pitch. On the other hand, the counter effects of COVID-19 pandemic (travel restrictions, reluctance to engage with sales agents, and depressed economy) also need to be considered. Longer term piloting is required to draw more accurate conclusions.

Overall the pricing experiments indicate the need for offering flexible finance options to customers - to enable them to choose a plan that suits them the most. Additionally, a convenient mobile money payment process can be a key driver in facilitating the transition to electric cooking.

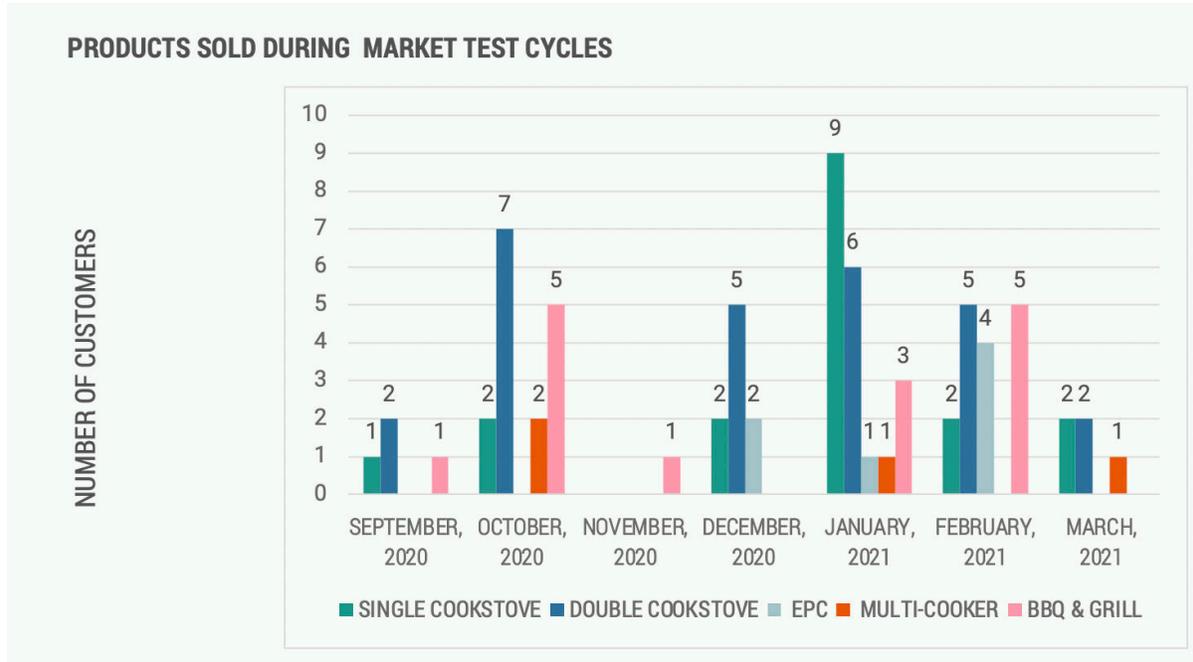
"It's very easy to go to the wing shop nearby to pay the monthly installment. I like paying in this way, especially now that we have to be more careful due to COVID"

"I like that nobody has to come to my house to ask me for money every month."

Keeping the customer financing experience in mind is an essential consideration, this is where PAYGO offers great promise matching efficient technology, attractive price points and smooth payment infrastructure. As observed from the market tests, the combination is desirable for end users as it successfully removes the price barriers for customers. However this does create a risk to the supplier (ATEC*) in terms of extended price/asset recovery period and customer defaults. Therefore it is necessary that PAYGO products have a mechanism to cease functioning should customers not make agreed payments. This mechanism is aimed at encouraging timely payments.

Although PAYGOs core business model can be attractive to last mile customers, when looking at PAYGO from a financing perspective, PAYGO requires grant funding, or debt/equity funding in order to scale which may pose unique challenges (examples: managing risk exposure, limited funding, investor risk perception) not covered in the scope of this study

5.3.5 Place (Channels)



Graph 13: Product Sales Unit: Number of products Total Products: 71

Sales staff hired	People reached (through door to door or community cooking)	Daily People Reached (average)	Total people receiving sales pitch	Daily average people receiving sales pitch	Total conversions*	Daily Average conversions per day	Most Successful Sales Agent Daily Conversion
5	2938	7.18	928 (31.5%)	2.32	7.35%	0.13	0.29

*Conversions: ratio of people receiving sales pitch to paying customers

Summary of 6 months direct sales activities:

The team reached an average of 7.1 people per day (through door to door meetings, group meetings or community cooking promotional events) falling below the expected 10 people per day target set at the beginning of the project. This target was informed by Hydrologic’s sales estimates on the number of people reached previously whilst conducting water filter sales. Disruptions in sales activities due to multiple lockdowns announced in November, December and February limited our team’s ability to travel to sales locations and engage with prospective customers. The impact on the products sold in these months can be seen in graph 13. For example: The team was able to sell only 1 product due to lockdowns.

Of the total number of people reached, on average our sales agents were able to convince 2.32 people to engage in the sales pitch: 31.5% of the people reached had an initial interest in finding out more about electric cooking and our products. This does provide a positive indication of the available market for modern cooking solutions adopters. A 6.35% conversion for the ECO project was affected by three influencing factors:

Shifts in purchasing behaviors: The economic impacts of the COVID-19 pandemic were evident during the market tests. End of cycle feedback from the sales team indicates changes in people's spending habits, making purchases for essential commodities (food, healthcare, living expenses) and limiting discretionary expenses such as cooking products.

COVID-19 transmission risks: Prevented higher quality engagement with the community - customers were hesitant to speak with the sales team (especially in the months of November, December, and February) or allow them inside and social distancing prevented effective pitch deliveries

Sales Executions: Our sales agents starting from scratch (who had no previous experience selling electric cooking appliances) required time to gain mastery over multiple components of the sales process including product understanding, sales flow, pitch execution, territory management. Our two most successful sales agents showed conversion rates of 9.8% and 8.7% and were able to close a sale every 3-5 days. A common package of sales training curriculum, re-training, and performance incentives can still produce different results(in sales) across individual sales agents. In addition to faster learning and application of the sales execution process, the success of our two sales agents can be attributed to the sales agents having active listening skills, and having problem-solving mindsets.

Adjustments to the 'direct sales' strategy:

Through the market test pilot, **two key issues** were identified as blocks in the sales process:

- **Sales agents pitching to people at random:** At the time, sales agents were meeting their monthly target of reaching 200 people but the actual number of sales pitches conducted were under 4 per day. To incentivize the team to conduct more quality pitches, instead of reaching more people, we needed to ensure that they engage with the right profile of people and therefore increasing the sales

SOLUTION: The sales team was retrained to provide the sales conversations to the right target customers. A checklist for the Sales Agent to identify who should receive the sales conversation, was based on validating these factors:

Target profile of innovator, early adopter, early majority (based on work types, access of technology, interest and familiarity with electric cooking)

Time availability (30 minutes)

Cooks

Decision maker

- **Repeated follow ups with non customers were impacting efficiency/sales execution** A number of people asking the sales agent to come back at a later time caused inefficiencies in the sales process with a limited guarantee of sale.

SOLUTION: A consistent logical flow protocol was included in the follow up sales process. In addition to a customer identification checklist. Sales agents were trained in field to follow the process steps of:

Step 1: Divide Territory based on consultation with village chiefs

Step 2: Organize Daily schedule based on the village chief debrief.

Step 3: Conduct door to door visits

Step 4: Introduce self and organization, request for time

Step 5: Identify Decision Maker

Step 6: Conduct the Sales Pitch

Step 7: Close Sale or Create a list of 'Maybe' customers

Step 8: Give a group demo for 'Maybe' customers all together. People like to see, feel and experience the product before purchasing. A one-time demo is key and convinces the customer

5.4 Summary of the key findings from the iterative market test cycle for the 5Ps

People: As per the project's Theory of Change, we deployed market tests aimed at reaching the innovators, early adopters and early majority. From the available data, it can be gleaned that **33% of innovators, 24% of the early adopters and 8% of the early majority who were surveyed were customers** showing a declining level of interest in adopting electric cooking per profile. However, as the dataset is not fully representative of our non customers, only limited conclusions on interest and willingness to transition to electric cooking can be drawn. When we look at the non customers innovator profile sample, 42% (5) innovators indicated a high interest for future purchase. In the non customers early adopter sample, 44% (55) early adopters indicated a high level of interest for future purchase, and 34% (20) indicated a high interest in purchasing electric cooking products in future.

These percentages represent a positive **indication for innovators and early adopters' interest in adopting electric cooking**. Future pilots could retain the 5Ps utilized to reach the early adopters. A greater emphasis on transitioning early majority customers to electric cooking is required and could be achieved by further investigation of and refinements to the 5Ps.

Products: Over 6 months, 71 products were sold in total including 47 Cookstoves, 14 Electric Grills, 6 EPCs, and 4 Multi Cookers. The electric cook stove offers an **aspirational fit for customers, matching peoples cooking needs** at an affordable price point. Challenges in understanding the functions (and buttons) of the EPC was a common issue for both sales agents and customers. The sales team struggled to sell the EPCs. For most non customers, the primary customers perception of the EPC is of a rice cooker. This triggers **cost comparisons with far cheaper rice cookers** available in the market. To be promoted in any future pilots, further considerations are required to identify a suitable brand that matches cooking needs and menus of Cambodian customers whilst ensuring attractive pricing and value additions. The multi cookers appealed to a very small subset of customers prioritizing healthy cooking/recipes. Similar to the EPC the sales team struggled to sell the Multi Cooker to customers. Limited functionality of the multi cooker causes cooks to question the reason behind purchasing it.

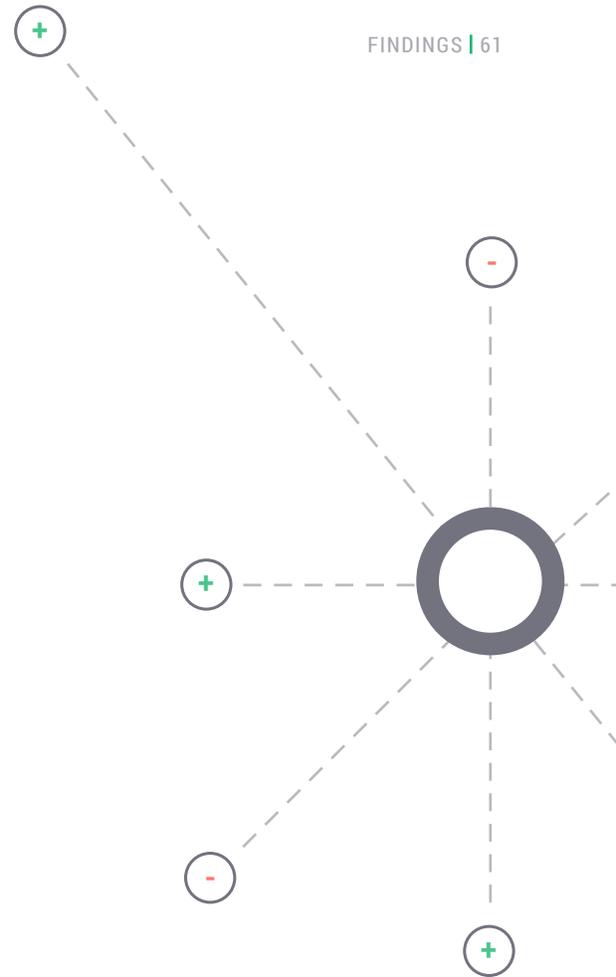
Promotion: By far the biggest reason for not purchasing an appliance was the need to have family discussion (reported by 81% non customers); a finding which has implications for the timing of sales pitches. Sales conversions were observed to be significantly more likely at the weekend when the whole family was present (not just the cook) and able to engage in the complex decision making surrounding the purchase of a new appliance that represents a new way of cooking. Weekend sales pitches were found to facilitate family buy in and result in far quicker decisions to purchase. As a result, sales agent working hours were adjusted to ensure weekend sales - sales conversions in the 2021 sales cycle have averaged 18% (3 times more than the ECO pilots)

On the other hand, the decision to purchase is driven primarily by availability of **safer cooking options** made available through the project - 90% of customers highlighted safety as a factor. **Ease of use** (67%) and **affordable installment plans** (31%) were the next biggest reasons convincing customers to make the switch to electric cooking. More than health related messaging (related to smoke free cooking), safety, ease of use and time saving are the most resonant for our customers.

Pricing: A number of pricing experiments such as adjustment of instalment durations, adjustments to price points, free trial promotions and up front discounts were trialed to trigger sales. **83% of the products sold through an alternative financing mechanism**, either PAYGO or credit installments. These financing mechanisms facilitated the sales of these products in Cambodia, especially for the double cookstoves which price is \$270 In spite of adjustments to product pricing (offering discounts and installments) many non customers believe the pricing to be very high. Overall the pricing experiments indicate the need for offering flexible finance options to customers - **to enable customers to choose a plan that suits them the most**. Keeping the customer financing experience in mind is an essential consideration for uptake

Place: Our sales agents starting from scratch required time to gain mastery over multiple components of the sales process including product understanding, sales flow, pitch execution, territory management. Our two most successful sales agents

showed conversion rates of 9.8% and 8.7% and were able to close a sale every 3-5 days. There is a need for longer term piloting in order to generate confidence and mastery of the sales process, and to convert maximum customers. **31.5% of the people reached were interested in the products which provides a positive indication of the available market for modern cooking solutions adopters.** To boost conversion moving forward, community cooking events, live demos, and engaging customers with video content should be continued



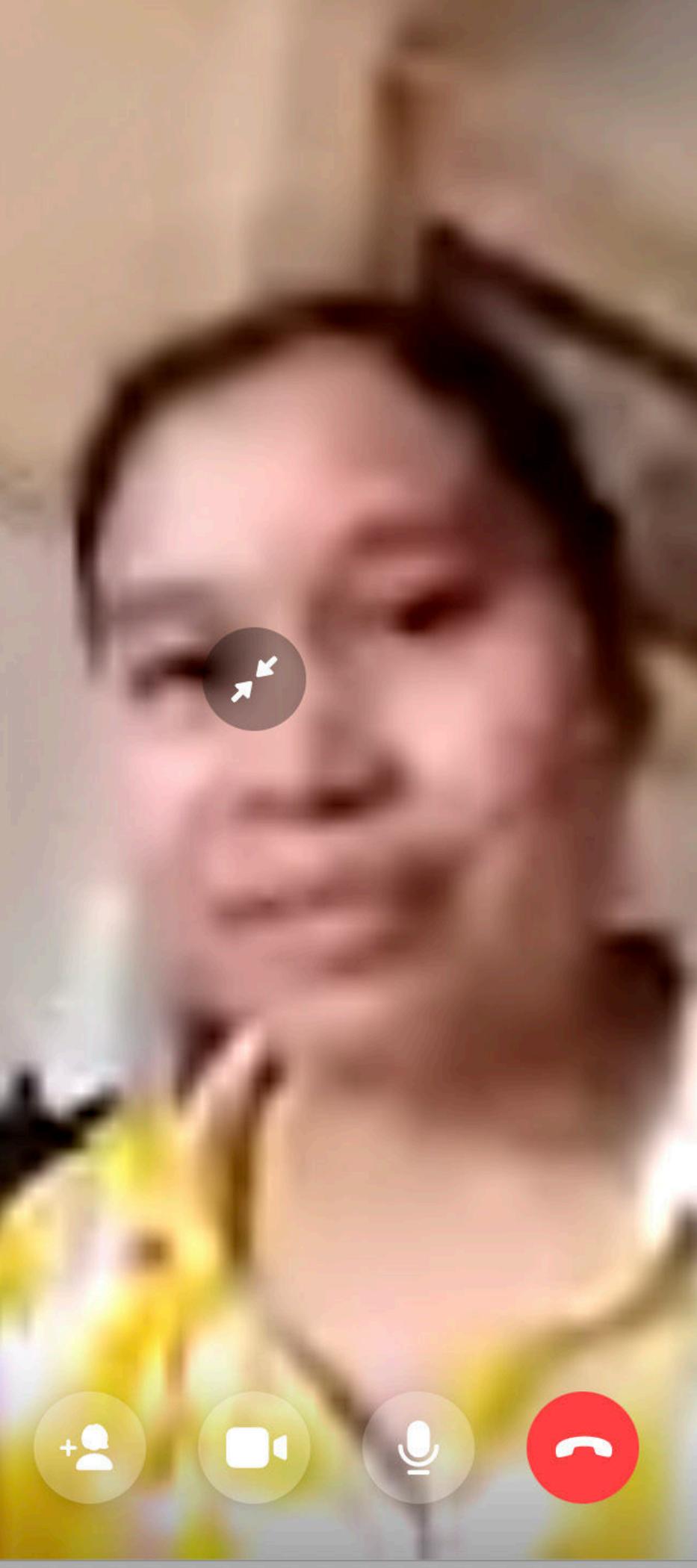
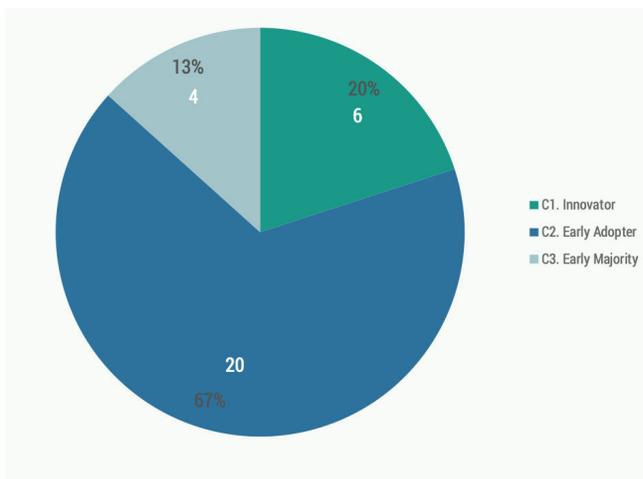


PHOTO: Remote Qualitative Interviews and Kitchen Walkthroughs

5.5 Learnings from baseline-endline evaluations and follow-up qualitative research

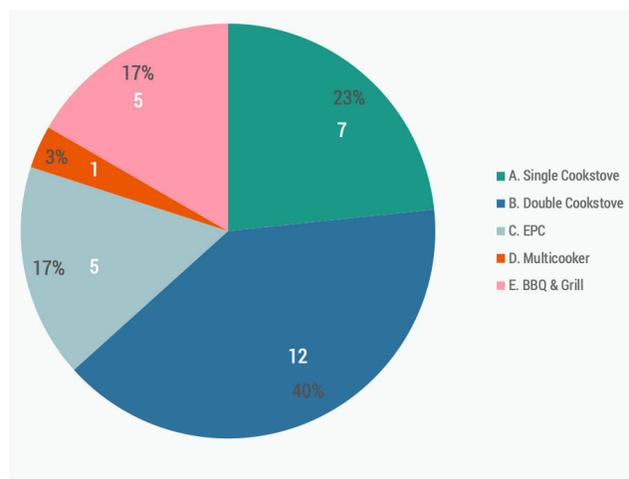
Overview

A longitudinal (initial stage, mid line and end line) evaluation was conducted with a sample of 30 customers to address whether the use of electric cooking fits within the cooking cultures and the available electricity supply in Cambodia. Changes in electric cooking preferences, behaviours perceptions were tracked over the course of the longitudinal study. Knowledge gaps in the longitudinal evaluation were addressed through conducting qualitative research with 25 of the 30 customers at pilot end. This section distills key learnings from the mixed human-centered design research and quantitative data collected



Graph 14: Profiles of surveyed customers

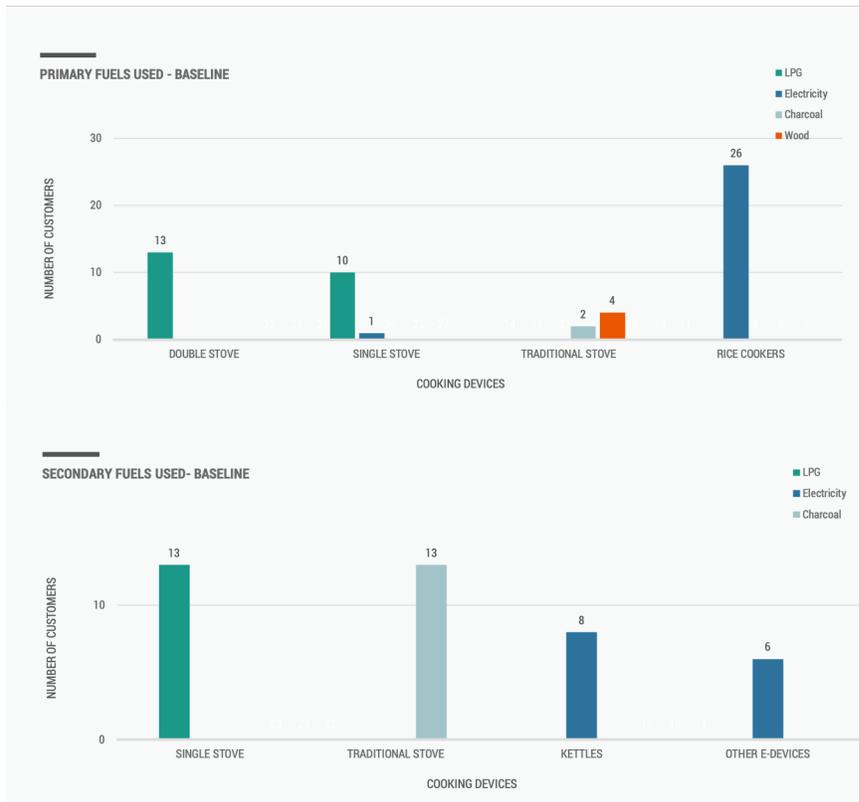
Unit: Percentage of customers Total Sample: 30



Graph 15: sample disaggregated per product

Unit: Percentage of customers Total Sample: 30

5.5.1 Previous Fuel Usage



Graph 16,17: Previous primary and secondary cooking fuel use

Unit: Number of customers Total Sample: 30

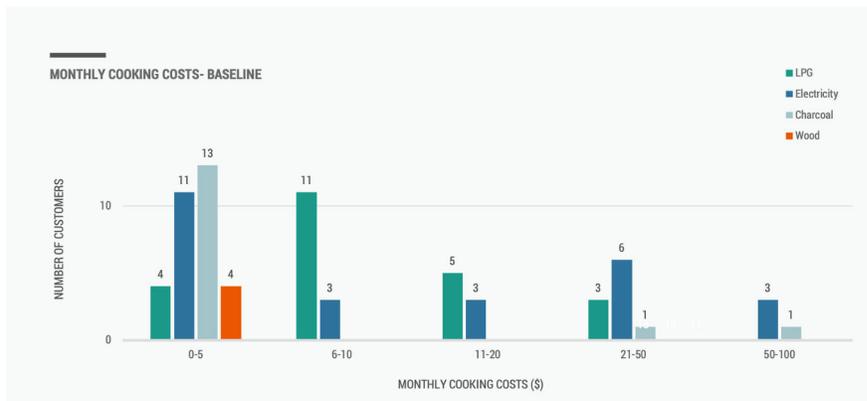
Through the market test cycles, **electricity is being introduced into customers' cooking fuel stack:**

The initial stage evaluation highlighted that, 23 (76%) customers use LPG as the primary fuel indicating the transition to electric cooking is coming from LPG. 6 (20%) customers used biomass as their primary fuel Graph 16 and 17 also indicate that 13 customers used two LPG stoves to satisfy their cooking needs.

prior to purchasing electric cooking solutions, peri-urban HHs use LPG as the primary fuel and kettles; rice cookers (electricity) and wood or charcoal are secondary.

High adoption of electric rice cookers can also be observed, 26 (86%) customers used electricity to cook rice. Whereas commonly available electric cooking solutions such as rice cookers and kettles offered secondary fuel use applications, iDE's electric cooking solutions aimed to replace the primary fuel use and move HHs along the electric cooking ladder (see methodology). Purchasing customers have added clean cooking fuels to their fuel stack and for these customers, suggesting that a decline or substitution of the unclean fuel overtime could be possible.

Graph 18 on customers' monthly cooking costs: 22 (73%) customers' monthly cooking costs using LPG are more than 6\$. This suggests regular LPG use for the customers and that the transition to electric cooking is coming from LPG in peri urban locations targeted by the sales team. Graph 19 also indicates that the extent of charcoal use is not heavy. 13 out of 15 customers using charcoal reported their cooking costs to be less than 5\$.

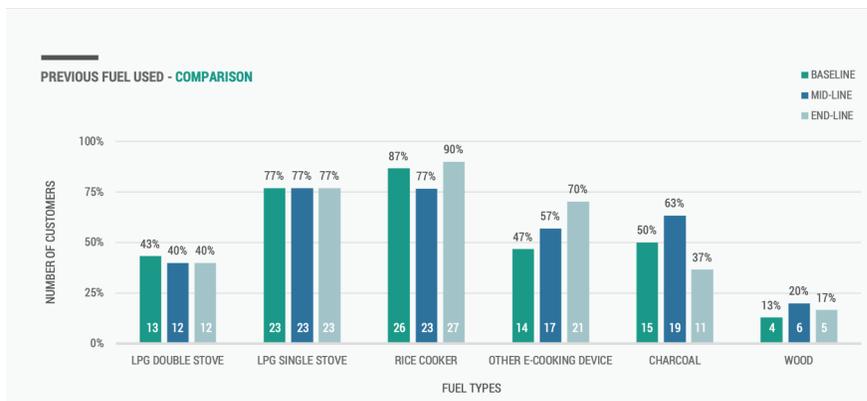


Graph 18: Previous monthly cooking fuel costs

Unit: Number of customers Total Sample: 30

However, in spite of purchasing aspirational cooking solutions, HHs display a reliance on previous cooking fuels:

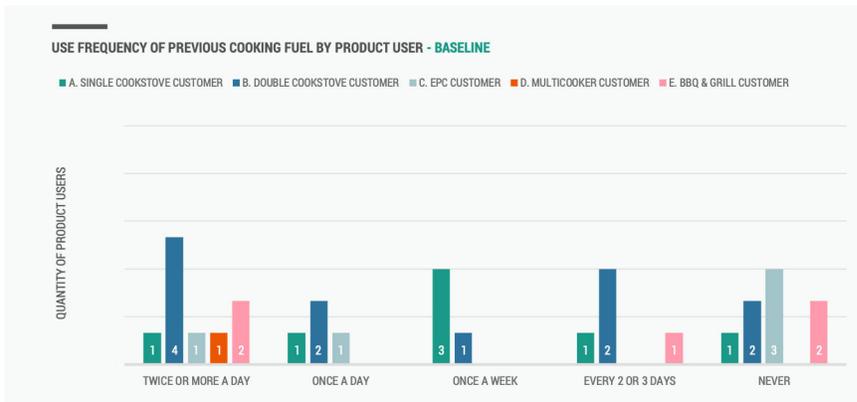
Graph 19 below, shows the number of people that use each of the cooking fuels. A consistently high number of customers continue to use LPG from baseline to end line: 40%(12) customers still use the double burner LPG stove, and 77% (23) customers still use the small LPG stove.



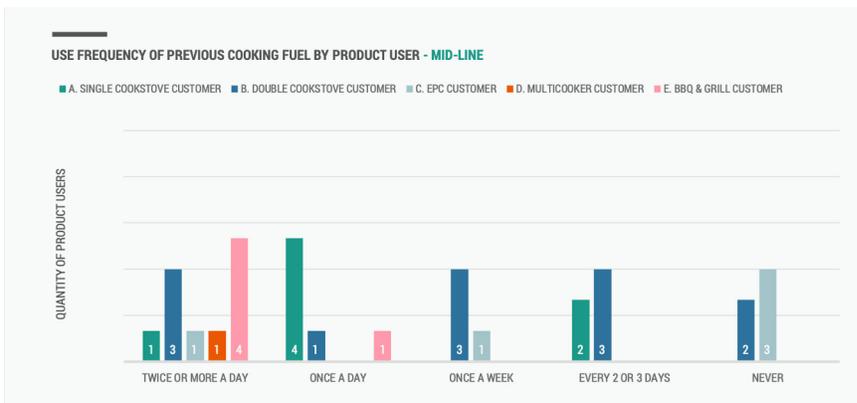
Graph 19: Changes in previous cooking fuel use

Unit: Number of customers Total Sample: 30

The use of wood or charcoal is not completely eliminated at the endline either. **Charcoal use in the graph shows that people continue to use charcoal even after making the switch to electric cooking.** There is also an increase in use of existing electric cooking devices (kettles and rice cookers) suggesting an increase in reliance on electricity for cooking.



Per graph 20 above, 9 (27%) out of 30 customers used previous cooking fuels twice or more per day, and 5 customers used previous fuels once a day - in total 14 (42%) customers used previous fuels daily.



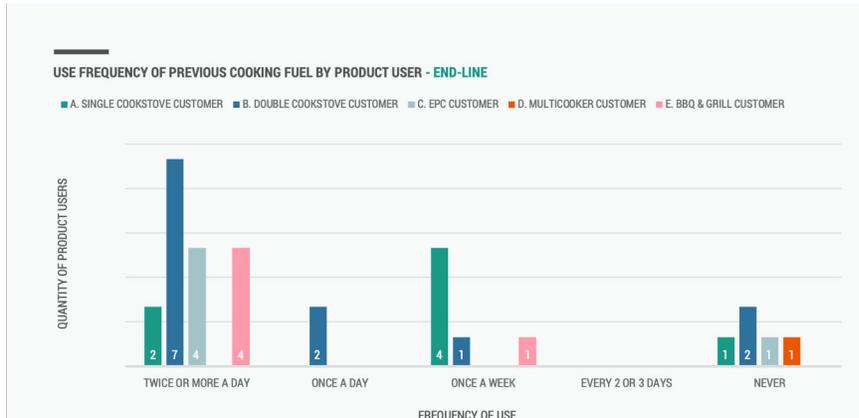
Graph 20,21: Initial, Mid line use frequency of previous fuel

Unit: Number of customers Total Sample: 30

Per graph 21, frequency of previous fuel use increased to 10(30%) and 6(18%) customers using their previous fuels daily, either. 48% customers were using their previous fuels daily and 3 (10%) customers who did not rely on their previous fuels started using them again.

The frequency of previous fuel use is increasing at end line: As per graph 22, at the end line stage, 51% (17) of customers still used their previous cooking fuels twice or more per day with a further 2 customers using previous cooking fuels once a day. Whilst this does indicate frequency but may not necessarily amount to an increase in the amount of fuel used.

Even electric cook stove customers (using the appliance which iDE subsumed to facilitate complete replacement of previous fuels) show increasing previous fuel reliance. Only 2 out of 12 double cookstove customers and 1 out of 7 single cookstove customers stopped relying completely on previous fuel by the endline stage. 4 out of 5 EPC customers increased their reliance on previous fuel.



Graph 22: End line use frequency of previous fuel

Unit: Number of customers Total Sample: 30

This highlighted the need to explore two questions further:

- 1. What factors underpin the use of previous cooking fuels?**
- 2. Do the customers fully understand how to cook with the electric cooking solutions?**

We gathered the following learnings from qualitative research:

1. Customers' continued use of previous fuels (predominantly LPG) is driven by the need to be able to cook large quantities of food than what the electric stoves allowed for

2. The current sets of pots and pans offered as part of the stove package were not seen as big enough to cook the quantity of food required for their households. Anecdotal evidence also suggested that customers perceived that the LPG had a faster speed of cooking

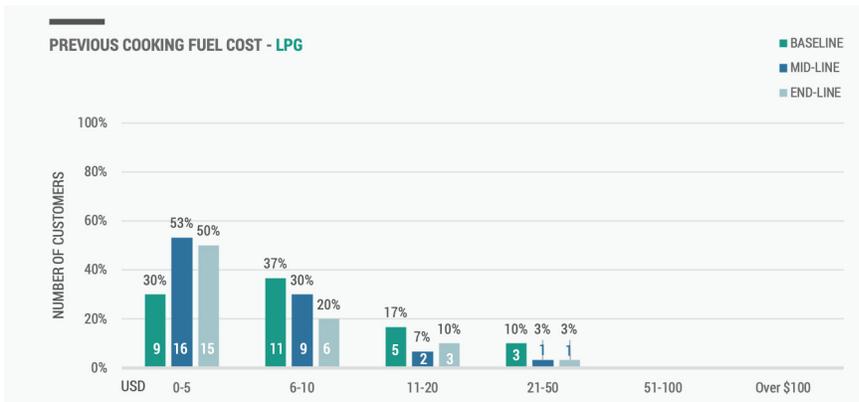
"The LPG stove cooks faster because the size of the flame is very big compared to the cooking area of the electric stove. I would say the LPG stove is able to cook at a higher temperature."

This supports sales agent feedback that the EPC may only be being used for rice cooking

3. It is common for the LPG stoves to be used for reheating food which could explain high use frequency

4. The use of EPCs is often paired with other fuels and devices. This is not only due to the lack of understanding of the full functions of the EPC but also the need for simultaneous food preparation i.e preparing multiple dishes such as soups, stir fries and rice at the same time.

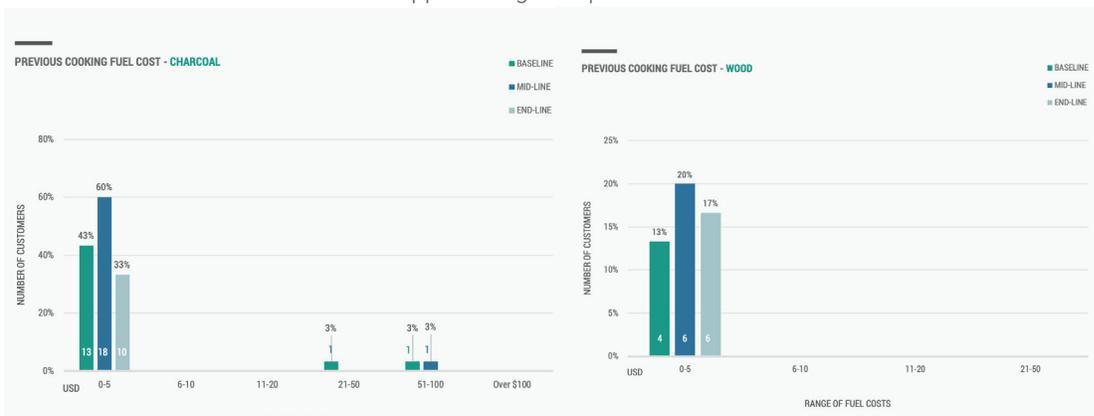
5. The use of the electric grills appears to be declining over time. Contrary to our hypothesis, for the sample households, grilling did not appear to be a common daily cooking process. Grilling was limited to occasional events or family preferences. People don't seem to be using the grill much due to the size of the grilling area being insufficient for customers to cook large portions during a family gathering. The multi cooker and electric grills were not used as primary cooking devices. Customers need to pair their use with other fuels to satisfy their cooking needs.



Graph 23: LPG Fuel Usage Costs

Unit: Number of customers Total Sample: 30

The monthly costs (indicative of the amount of fuel used) of previous fuels are decreasing Graph 23 indicates that customers who add electric cooking fuels to their fuel stack, show a declining trend in LPG fuel usage. People continue to use LPG, but their monthly costs are declining over time. At the end line stage, 50% of the customers had low costs (0-5\$) of cooking with LPG. LPG costs in the 6-10\$ category declined by 17% from initial stage to endline and 10% of customers had stopped using their previous fuels.



Graph 24,25 : Charcoal and Wood Fuel Usage Costs

Unit: Number of customers Total Sample: 30

Graph 24, indicates that similar to LPG, a 10% (3) decline in charcoal costs over time is observed from initial stage to endline. Encouragingly, 10% (3) customers heavily reliant on charcoal (graph 18) spending more than 20\$ per month show a dramatic reduction in charcoal at the end line stage. The number of customers using charcoal dropped from 15 customers at the base line to 10 customers at the end line.

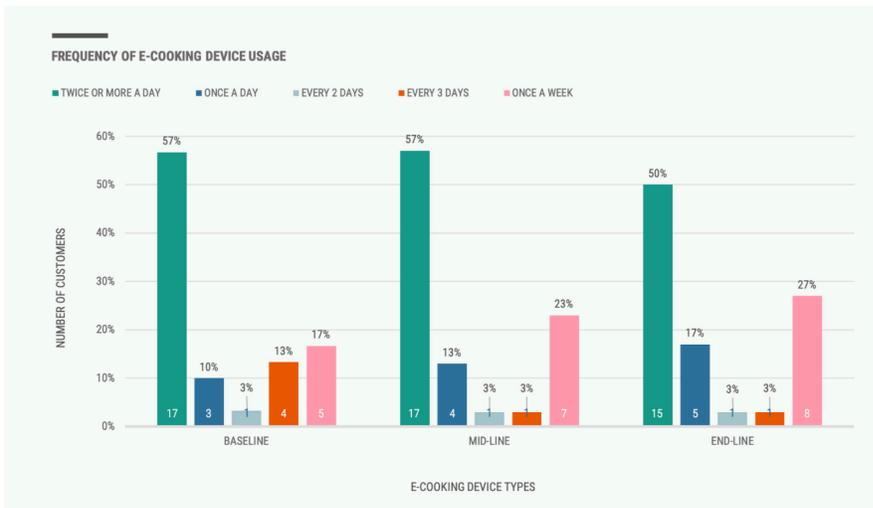
In Graph 25, a small percentage of target customers have an agribusiness, and have increased using wood for boiling water to save expense on the monthly electricity bill. These early majority customers were more sensitive to cost saving due to increase in electricity costs during the summer season.

We note that the fuel prices of LPG and charcoal were constant throughout the course of the evaluation period and were not an influencing factor behind the choice of fuels used by customers.

5.5.2 Use of new electric cooking products

If use of previous fuel still continues, how and how much do customers use their new cooking devices?

There is regular daily use of specific electric cooking devices As per graph 26, at the end line stage, of the 30 customers, 50% (15) use their electric cooking device twice or more times daily. A further 15%(5) customers used their devices at least once per day and only 4 use it once a day.



Graph 26 : Frequency of using electric cooking device

Unit: Number of customers Total Sample: 30

The graphs 27, 28 and 29 below attempt to look at the use preference of 15 customers using their electric cooking devices twice or more daily.

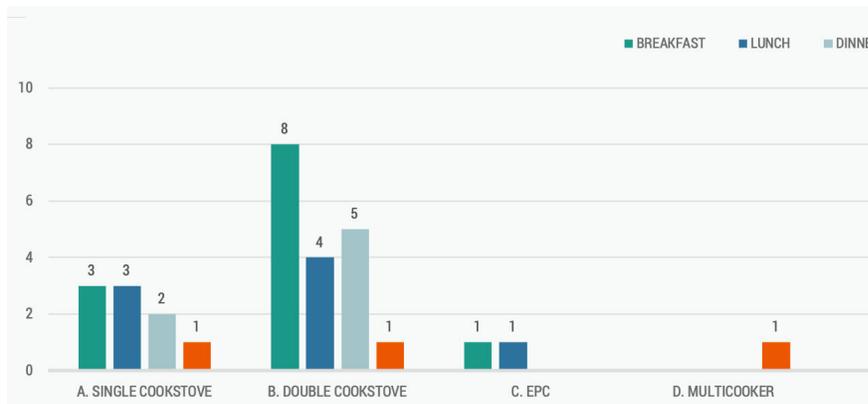
Electric Cookstove Use: Of all devices the double cookstove was the one more consistently: In graph 27, 3 customers reported using the single electric stoves for at least 2 meals. By end line stage (graph 29), single stove customers had increased the number of meals being cooked using the stove.

Graph 27 also indicates that 12 electric stove customers (8 double and 4 single stove) used their stoves for cooking breakfast and 7 of them used it for cooking all three meals suggesting regular use. By the end line stage the number of customers cooking breakfast with the double stove dropped to 6, but the number of customers cooking all three meals remained at 4 suggesting consistent use. Further detail on energy usage, time of day use is captured in section 6.1

EPC Use: As with the cookstove, the EPC are used most often for cooking breakfast and lunch. A common pattern of use can be observed across graphs 27, 28 and 29. Customer feedback indicates rice cooking as the main use of the EPC (also seen in graphs 30,31 and 32 on food types cooked). Their use is paired with the use of an alternative fuel. Further detail on energy usage, time of day use is captured in section 6.2

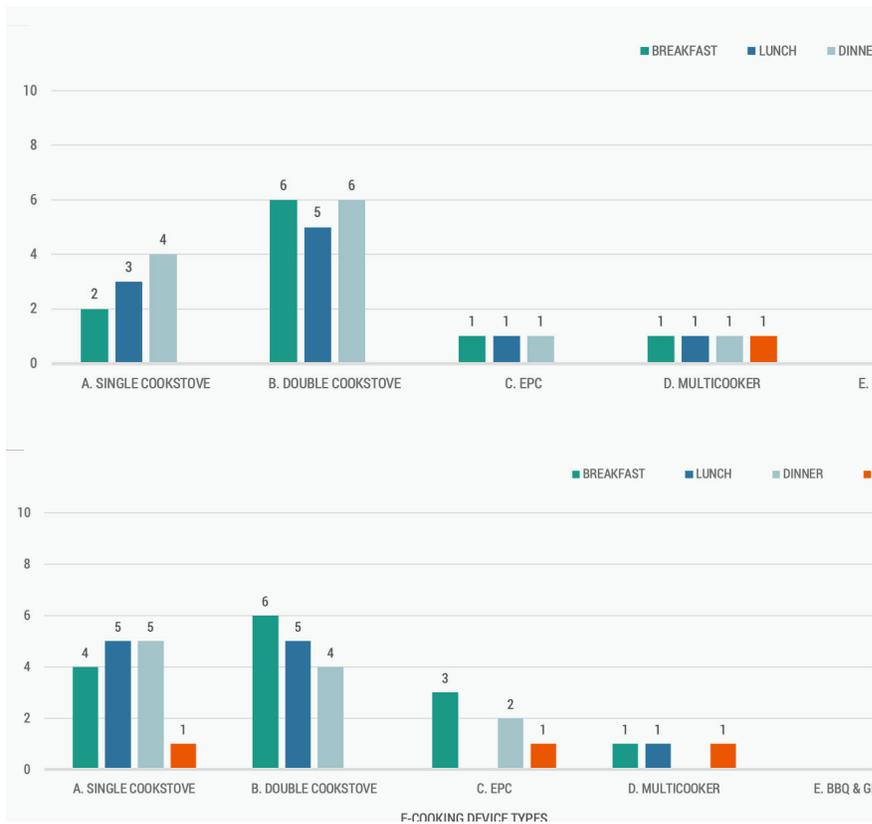
Electric Grill Use: Of all devices, the electric grill was the least used device. 4 out of the 5 customers reported using it once a week at the endline(not represented in graphs). Contrary to our hypothesis, for the sample households, grilling did not appear to be a common daily cooking process. Grilling was limited to occasional events or family preferences. As mentioned previously, customer feedback also indicated that a small size of the product was not suited for cooking for a large group of people.

Multicooker Use: Insufficient sampling prevents greater understanding of multi cooker use



Graph 27: Initial, Mid and End line use frequency of previous fuel

Unit: Number of customers Total Sample: 30



Graph 28,29 : Initial, Mid and End line use frequency of previous fuel

Unit: Number of customers Total Sample: 30

Although graphs indicate that customers use their devices daily, inferring when (time of day) and which specific meals do our customers prefer using their electric cooking devices the most.

Qualitative research attempted to fill in these details on the cooking process in the kitchens of our customers:

1. In line with the findings on previous fuel use(5.5.1), **the use of electric cooking devices is usually paired with previous fuels in the kitchen.**
2. **Cooking process, time of day use and number of meals cooked are linked with individual and household dynamics** (cooking for children, infants or elderly; no of income earners, lifestyle choices, eating habits and diversity of food cooked) We observed the cooking processes in kitchens of our customers to happen through the four scenarios:

Cooking baby food and reheating: To save time in the kitchen, mothers and caregivers try to cook food for the entire family at the same time, requiring more number of cooking devices especially when cooking mashed food for infants (under 2 years of age) Typically, the most common baby food prepared at the beginning of the day is the bo bo sor (rice porridge mixed with soup/broth). Before feeding, caregivers often reheat the mashed food at different points of the day using the new electric device.

“When I wake up, boiling water on the kettle and cooking rice are the first activities in my kitchen. This is for the rice porridge for the baby. After the rice is ready, I mix hot water and fish paste to prepare the porridge. Next I cook soup using the multi-cooker and as the soup cooks, use the gas stove to fry some meat. When the baby is hungry, I try to warm the porridge by just turning the multicooker on.”

Batch cooking and reheating food: For families (especially the early adopter categories) where both men and women in the household work outside their homes throughout the day, the cooking process involves preparing larger amounts of food in the morning and reheating before meals. Batch cooking usually Batch cooking often requires the use of multiple fuels especially if the family size is large. The stacking of fuels observed in the customers can also be attributed to large household sizes.

“For my family of 8, we need to cook a lot of food everyday. Normally, I use the rice cooker, the gas stove and the electric stove at the same time. It is beneficial to have a new electric stove that can save me some time.”

Fresh Cooking: Families with resident cooks (grandparents, stay at home mothers) tend to cook fresh food. Typically these families are the ones who use our electric products the most, their use frequency tends to be the highest i.e cooking breakfast, lunch and dinner.

“I believe that eating freshly prepared food is better for health. I mostly cook all the food on the gas stove and use the EPC for rice cooking or preparing soup sometimes”

Quick Cooking: Takes place in two different ways:

Families who supplement food purchased from vendors/restaurants with a fried fish, eggs or boiling noodles and mix with food

“The pots of the stove are not big enough to cook a large batch of soup. Instead I mainly use it for stir frying meat and vegetables.”

Cooks who prepare midday snacks for their children

“I taught my son how to use the stove to fry an egg when he returned from school.”

Cooking Scenarios	Cooks	Time of day	Time spent	Reheating
Cooking Mashed Food	Mothers/Grand-mothers/ Alternate caregivers	Morning	45-60 minutes	At multiple points of the day and during meal times
Batch Cooking	Working women cooks	Morning	30-45 minutes	During meal times
Fresh Cooking	Stay at home mothers, elderly women cooks	Morning, Noon, Evening	30 minutes	NA
Quick Cooking	Working women, children, HHs who cook less	Random	10-15 minutes	At multiple points reheating food purchased from vendors or restaurants

Table: Cooking Scenarios



Graph 30,31,32 : Disaggregated data of food types cooked

Unit: Number of customers Total Sample: 30

Common Food Types Cooked: Disaggregating the different food types cooked per product, the following details on the cooking processes can be observed:

The two electric cookstoves are the most versatile cooking product. Customers were able to cook a range of food types(stews, stir fried dishes, fried meat, soups, slow cooks). **Soups** are the most common and frequently cooked part of the meal. Qualitative research also highlighted that the electric stove offers customers a positive experience of cooking soups - of all the dishes cooked, a number of customers highlighted that cooking soup on the electric stove was convenient and time saving. The diversity of the food types cooked on the electric stoves fractionally increased over time. The EPC was predominantly used to cook rice(from base-end line), confirming qualitative feedback on its primary use as a rice cooker The Electric Grill, although was not used consistently, it's most common use was for grilling meat to cook soup. This also highlights the need for selecting efficient electric cooking devices which satisfy people's desires to cook their favourite dishes.

5.5.3 Transitioning to electric cooking

Transitioning away from previous cooking fuels is a complex, non-linear process

When comparing data in previous fuel use (5.5.1) and current electric cooking use (5.5.2) we can now see that customers have successfully introduced electric cooking solutions in their kitchens and they do use them regularly, however their use often accompanies alternative fuels. In these households, the decline in LPG and charcoal use does happen, yet stacking of fuels or in some cases a level of backsliding can occur.

The nature of the electric cooking transition is a gradual and incremental process: shifts in people monthly previous fuel costs and use frequency indicate that in spite of having a new aspirational device stacking of previous fuels is a common practice

In addition to filling gaps in understanding customers fuel use behaviours and the cooking scenarios, qualitative indicates a few additional factors preventing a complete transition to using more electricity for cooking:

Cooking with electric cookstoves comes with a trade-off between reduced cooking costs and required specialized pots and pans

"I need to cook for my family of 10 members. In my kitchen I have about 10 pots, out of these I can only use the 3 that came with the stove and even the size is not sufficient to cook a large portion. So to avoid cooking two times, I use the LPG for the big food and side dishes are cooked on the electric stove."

Although electricity supply is reliable in most HHs, the increase in price of electricity during the dry season motivates people to keep backups and be more conscious of their electricity consumption

"Every summer the electricity bill is much higher than the other months. Because of COVID, the family's income from the business is also down so we need to find ways of saving costs. One way we try to reduce the bill is by using wood from our mango trees to boil water in the summer."

HHs don't use the EPC as a primary cooking solution. The most common use is for rice cooking only. Even though people understand that they can cook other dishes with the EPC, most HHs are used to cooking rice and other dishes simultaneously - sequential cooking of multiple dishes using an EPC alone is time intensive.

"If I have 2 EPC's then I will use one for the rice and one to cook soup"

As mentioned previously, For HHs that already own rice cookers, a lack of understanding of the functionality limits use, and the EPC can get overlooked altogether over time.

COVID-19 impacts on the economy create a trigger for cost saving/ rationing behaviours.

A number of customers we spoke with talked about wanting to use the existing stocks of fuels previously purchased in order to avoid increasing their daily expenses.

"I have a bag of charcoal leftover from the previous year. I didn't use it until now but I'm trying to use everything in the next few months to save some money on my electricity bill."



Graph 33,34,35 : Disaggregated appliance data for confidence in safety, regular use and monthly cooking costs

Unit: Number of customers Total Sample: 30

At the same time a positive initial experience of cooking with electricity are necessary to create confidence in switching to electric cooking. As per Graphs 33 and 34, the majority of our participants **indicate positive perceptions of safety and reported confidence in regularly using their products.**

Per graph 35, 40% of double cookstove customers have low or very low confidence whether monthly electricity costs will be affordable. The nature of change (or no change) in these perceptions over time and the underlying reasons are covered in the next section.

5.5.4 Changes in Perceptions

How do the customers' perceptions on costs, safety and willingness to use change over time?

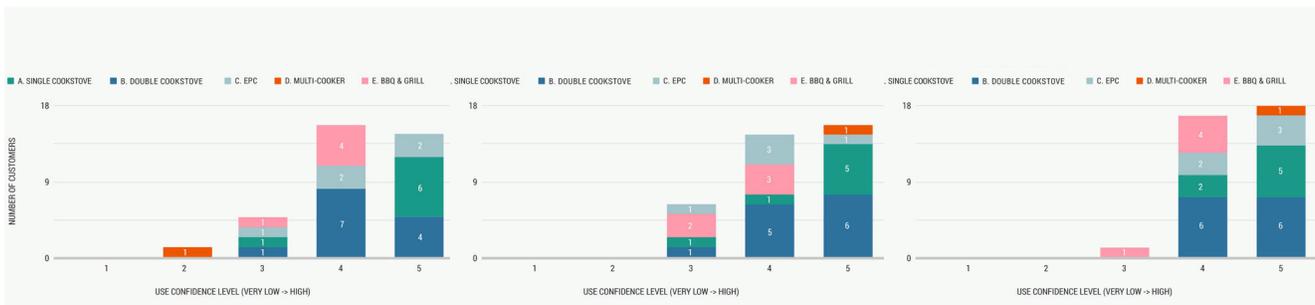
Overall customers reported positive feedback on costs, safety, ease of use, and these tracked over time (base, mid and end line) reveal a positive perception of the key benefits of our solutions. Highlighted below are graphs that show changes in safety, cost perceptions and cooking speed perceptions over time.

Safety: Graphs 36, 37 and 38 below show a positive change in perception of safety.

In graph 37, 5 customers reported a low or medium confidence in the safety of cooking at initial use

In graph 38, by the endline stage, the number of customers having a low or medium confidence dropped to just 1, highlighting a positive change in perception for 4 customers. None of the 30 customers felt any concerns about the safety (fear of electric shocks, use during rainy season or blackouts) of the electric cooking products. The perception of safety of the devices is reinforced over time with frequent or consistent use. **100% of the customers spoken to during qualitative research believe the electric cooking devices are safe.**

"It is definitely a safer way to cook. There's no smoke from the wood, no smell from the gas. The smoke affected my health, and the smell means leakage in the house. Now we don't have to worry about it."



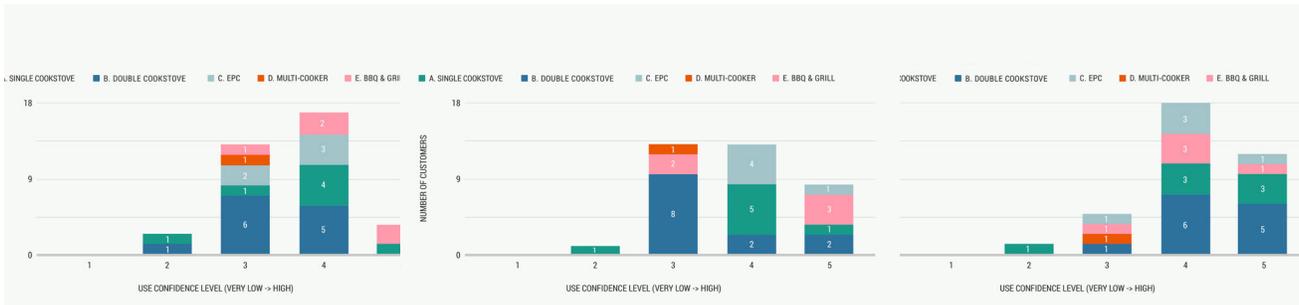
Graph 36, 37, 38 : Changes in Safety Perceptions

Unit: Percentage of customers Total Sample: 30 Scale: 1 to 5 (low to high)

Cost: The graphs 40, 41 and 42 below show a positive change in the perception of monthly cooking costs. 40%(13) of our customers reported a low or medium confidence in monthly costs of cooking at initial use stage with 6% reporting low (2) and 36% reporting medium (3) during initial stage. At the endline stage, this dropped to 15%(5) indicating a **positive shift in cost perception for 8 (27%) customers.** Exploring these perceptions through qualitative research, customers do initially like to measure and calculate how much electricity is consumed per meal. This helps overcome the cost-perception barrier that is associated with electricity. However, over time, the interest in measuring energy consumption daily declined with very few customers relying on the meters. **As comfort and understanding of costs for a new method of cooking is established, the need for measurement of energy use goes down.**

"I did check the meter in the beginning, but I haven't seen any big difference in my electricity bill so I don't use it. I think it is a good device that in the future I could also use in case my electricity consumption become higher"

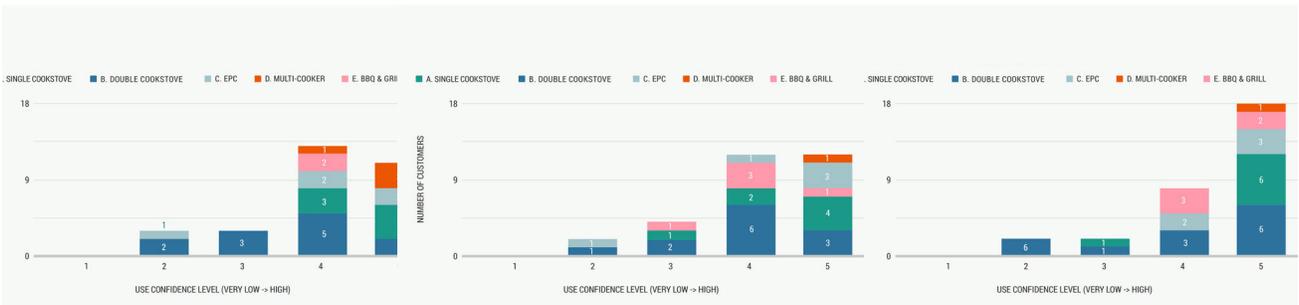
Conventional grid coverage in Cambodia currently stands at 80% and has expanded rapidly to rural areas in the past few years. None of our customers reported any electric supply issues preventing them from using the electric devices. Further, a majority of our customers reported the costs of cooking to be reasonable. Reasonable monthly costs of electric cooking provide reassurances to customers about using it consistently in the long term.



Graph 39, 40, 41 : Changes in Cost Perceptions

Unit: Percentage of customers Total Sample: 30 Scale: 1 to 5 (low to high)

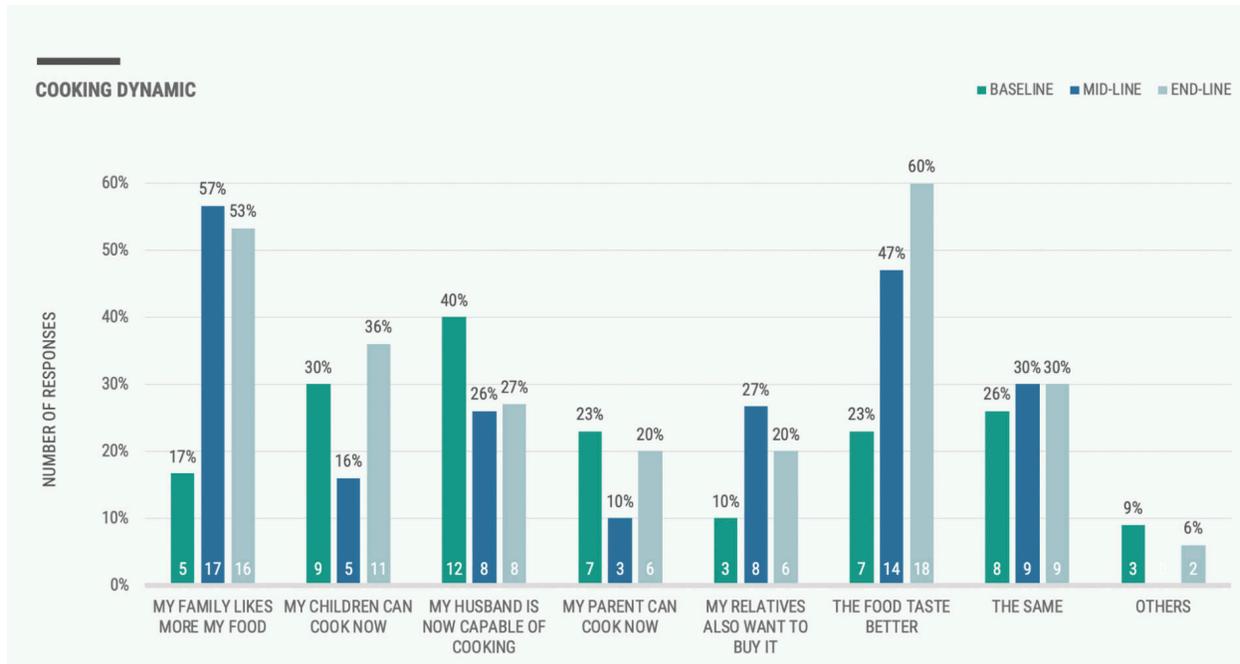
Speed of cooking: In graph 42, 80%(24) customers believe that the speed of cooking is faster than when cooking with a previous fuel (rating 4 or 5) at initial use stage. By end line stage (graph 44) 87% customers believe that the speed of cooking is faster (rating 4 or 5) **A positive change in perception** occurred for 2 customers.



Graph 42, 43, 44 : Changes in speed of cooking perceptions

Unit: Percentage of customers Total Sample: 30 Scale: 1 to 5 (low to high)

5.5.5 Most significant changes in cooking dynamics



Graph 45: Changes in cooking habits inside the household

Unit: Percentage of customers Total Sample: 30

The use of electric cooking devices brings positive changes to the family’s cooking dynamics and experience.

Graph 45 indicates family perceptions of taste linked with the use of electric cooking devices: at the endline stage 53% cooks believed that the family liked the food prepared using the electric device and 60% of cooks also associated an improvement in taste due to the use of electric cooking devices. These dynamics were further explored through qualitative research. At the time of qualitative data collection, customers were generally 2-3 months into using their electric cooking. In this time period changes identified by customers were mainly at individual and household level:

1. A change in cooks’ mindset towards cooking: cooks are beginning to experiment with new dishes and improve their cooking techniques:

“This electric cook stove is indeed very well suited for cooking soup. Other than Cambodian food, I’m interested in trying to prepare some western food for the kids.”

“If the stove is new, we should try to cook some new foods as well. I try to experiment with cooking foods based on whatever is freshly available in the market. Before I would only purchase meat and 1-2 vegetables, but now, I try to purchase new ingredients.”

2. Seeking information on new recipes: cooks were inspired to look for new recipes or information about new dishes through new sources of information:

“I recently started to look into this recipe book I got from Herbalife company. There’s a lot of dishes that I have never cooked before, I plan to cook some pancakes with the EPC”

“My husband prefers fresh prepared food for dinner so I try to look at recipes on YouTube to not cook the same things

for him everyday.”

3. Freeing up more time to focus on childcare tasks. Cooks, especially grandmothers, reported time savings that allowed them to focus on childcare.

“The one thing that this (the electric cookstove) helps with is that now I can reduce the temperature and come back after 10-15 minutes and there is no problem. Since there are 3 kids I have to take care of, it keeps me very busy for the whole day. Now I can do other things whilst the food cooks instead of watching the fire constantly.”

4. Curiosity amongst non-cooks to try using the device or cooking snacks/ quick cooked dishes

“Even my son can cook a fried egg on the cookstove. When he comes back from school he can now prepare a quick snack for himself. ”

“My husband is not really very interested in cooking with it but he boils the water to sterilize the children's formula bottle.”

5. A further deep dive into feedback on “no significant changes” reported by 30% of the customers correlates to a smooth fit of the cooking device with the kitchen/ cooking culture. For cooks do not identify significant changes in the food prepared (and the decision making and the associated family dynamics connected to it) the change is associated with safety and affordability

“As long as it is safe, we can cook whatever we want. The food prepared depends on the skill of the cook so for me there are no big changes in how we cook the food in the house.”

5.5.6 COVID-19 Impacts on people's cooking preferences

As mentioned in the market tests analysis section, the economic impacts of the COVID-19 pandemic were evident during the market tests: people's spending habits have changed. Prioritizing purchases of essential commodities and limiting discretionary expenses such as cooking products also has impacts on the food prepared in households

Lockdowns and restrictions on movement are leading more people to stay at home, triggering more use of their electric cooking devices. This also supports the declining previous fuel use trend in 5.4.2

“Even though my sister prefers to cook with gas more than the electric stove, she is now using the electric stove more because we are all afraid to go out to get the fresh cans for the stove”

Anecdotally, fuel and food rationing behaviors are increasing. Greater investigation on the influence of these factors on peoples diet and eating habits could provide further insights.

Further research is also needed to explore whether these behaviors are temporarily emergent as a result of lockdowns or likely to develop in trends over time becoming part of the new normal. We can only know if practices/routines/ habits have changed later down the line (when lockdowns are over, people are mobile and ‘back to work’, etc)

“For the lockdown my family prepared by buying a few big boxes of instant noodles, now we are all fed up of eating noodles”

5.5.7. Gender dynamics of cooking

Learning from the TRIID research, we created solutions that match the cooking needs of women cooks, promoting health, economic outcomes for their families. The adoption of electric cooking solutions is also linked with women's decision making ability (or inability) to make the purchase.

On one hand, 90% women customers made the decision (either completely independently or a joint family discussion led by the women) to purchase their electric cooking device. Yet at the same time, a substantial 81% of non-customers also reported wanting to discuss first in the household. This could also co-relate with gender dynamics and decision making agency of the women non customers in their households.

Qualitative research provided some insight into barriers that could prevent some women from adopting these solutions:

Deference to elders whilst living in the household: In Cambodia, most women live with their parents before marriage and their influence in the kitchen to introduce new cooking methods/devices is limited - especially when their parents are comfortable with traditional cooking methods or cannot connect with the benefits of transitioning to modern cooking solutions

"My sister saw my stove and wants one too but she will wait to move into her own place(after marriage) to get one"

Head of households don't need family's permission to purchase: Household heads can choose to make decisions on the family's behalf knowing that their decisions would be accepted by the family.

"I had the money so I purchased the stove, so my children could cook in a safer way than before (using LPG). They would accept that this is a good way to cook if I tell them about it."

Men purchasing devices overlooking their family's attitudes and perceptions towards electric cooking, can reinforce established cooking behaviors that prevent long term adoption.

"I purchased the EPC during the community event because I think it is very convenient to cook rice with it. But when I got it home, my wife was scared of getting an electric shock and she doesn't use the EPC. Only my daughter cooks with it."

Men's purchase decisions are motivated by status - to enhance their perception in the community.

The prestige associated with owning an aspirational device and the perceived enhancement of social status is a key driver for men

"I bought it for whenever I host a gathering or party with my friends - actually it is a bit small so it's very hard to cook for a large gathering. But I still use it in parallel with the charcoal stove and my friends think it is also a good product"

Cooking cultures can also be shaped by male household heads - influencing decision for more meals to be prepared freshly

"My husband works in a demanding office job. He likes to eat freshly prepared food so he can maintain good health. I enjoy cooking new things everyday, but he does not like everything that I prepare"

5.6 Summary of learnings from baseline-endline evaluations and follow up qualitative research

The longitudinal behavioural study provided the most reliable form of data on customer experiences, revealing insightful findings on how e-cooking fits existing cooking practises.

Through the pilot, electricity is being introduced into customers' cooking fuel stack. Prior to purchasing electric cooking solutions, peri-urban HHs use LPG as the primary fuel indicating that the transition to electric cooking is happening from LPG. Wood or charcoal are common secondary fuels. However, **in spite of purchasing aspirational cooking solutions, HHs display a reliance on previous cooking fuels.** A consistently high number of customers continue to use LPG from baseline to end line. Even electric cook stove customers (using the appliance which iDE subsumed to facilitate complete replacement of previous fuels based on its versatility) show previous fuel reliance. **The reliance of previous fuels increased for EPC and Electric Grill customers**

Transitioning away from previous cooking fuels is a complex, non-linear process. Although customers have successfully introduced electric cooking solutions in their kitchens and they do use them regularly, the nature of the electric cooking transition is a gradual and incremental process. Factors preventing a complete switch to using electric cooking solutions for all cooking needs include trade-off between reduced cooking costs and requiring specialized pots and pans, unaddressed cooking needs to cook specific dishes, increased cost of electricity during dry season, and rationing behaviors due to COVID-19.

Customers adding electricity to their fuel stack demonstrate that a decline or substitution of their previous fuel usage over time is possible and likely. A declining trend in both LPG and charcoal fuel usage can be observed. Though they continue to use LPG, their monthly costs are declining over time. Lockdowns and restrictions on movement are leading more people to stay at home, triggering more use of their electric cooking devices. This also supports the declining previous fuel use trend in 5.4.2 Customers also need to pair the use of the EPC, Grills or Multi cookers with other fuels to satisfy their cooking needs. **Finding the right appliance specifically suited for a range of popular food types is essential.** Due to the **inability of electric solutions to satisfy these aspects,** fuel stacking remains common. **Pairing of fuels also depends on the cooking scenarios in people's kitchens.**

Depending on household dynamics, the cooking process

in kitchens of our customers happens through any of four scenarios with the choice of fuels determined based on the cooking need: **cooking baby food, batch cooking, fresh cooking, and quick cooking.**

Regular daily use of specific electric cooking devices can be observed in our customers kitchens. From baseline to end line stage, at least 20 customers used their electric cooking device daily. Of all devices **the double cookstove is the one most consistently used, with customers reporting ease cooking multiple dishes using it.**

Soups, stir fries and fried food are the most common dishes cooked, and the stoves being the most suited device to cook these dishes. Disaggregating data per product confirms qualitative feedback on the primary use of EPC for rice cooking. This finding matches the findings in the 5Ps analysis indicating strong customer preference towards the electric stove.

Ensuring a positive experience early during initial use is critical to ensuring regular use. **People have positive perceptions of safety and reported confidence in regularly using their products.** 40%(13) of customers had low or very low confidence whether monthly costs will be affordable, however at the end line stage this dropped to 15%(5) indicating a positive shift in cost perception for 27%(8) customers. High price perception is one of the barriers preventing adoption and evidence of changing customers' price perceptions over time provides a basis for encouraging more customers to make the transition. None of the 30 customers felt a significant concern about the safety of the electric cooking products.

The use of electric cooking devices does bring positive changes to the family's cooking dynamics and experience. Changes in cooks' mindsets, willingness to cook new dishes and freeing up more time to focus on childcare tasks were some positive changes identified by our customers. Households also have a positive perception of food taste, associating improved taste due to the use of electric cooking devices.

Factors which prevent more women from adopting electric cooking include a deference to elders erstwhile cooking preferences whilst living in the household, and household heads purchase decision overlooking family attitudes and perceptions towards electricity could prevent long term adoption.



PHOTO: An InteractiveCommunity
Cooking Event

06. Energy Use Data Analysis

6.1 Electric Stove Use and Costs Analysis:

PAYGO backend data collected from 18 electric stoves was analyzed to generate an in-depth understanding of people's energy use patterns. Each instance of the stove turning on/off is captured including daily power consumption, cost, duration of cooking, and average cooking time per use. Across 18 stoves, this generated a data set of more than 8213 data points over a 5 months period (Jan-May 2021)

Average Power Consumption (KWh/day)	Average Cooking Time (Min/Day)	Average Daily Cost (\$)	Average Stove On/Off Count	Average Power Consumption	Average Cooking Time Per Use	% Of Days Used
0.332	20.315 MINS	0.0942	7.427	0.055	2.78	41.25

On average people used the electric stove for 20 minutes per day for 41% of days since purchase. Per the findings in 6.5.2 this could indicate primary use of electric cooking for reheating and cooking quicker dishes which are part of the meal. People's average cooking costs are 2.926\$ per month. The highest monthly cost of cooking for one customer was 6\$ per month when the stove was used for 70 minutes per day (34.2 KWh) implying that most of the cooking utilized electricity primarily.

An average use of 20 minutes is consistent with initial stage data suggesting that the use of electric cooking devices is being paired with previous fuels. Data collected during qualitative research indicates that cooking one meal on any device (excluding food preparation) takes our customers 20-30 mins. This roughly amounts to one meal per day cooked using electricity.

Monthly Cost of Cooking* with electricity)	Monthly Cost of Cooking* with small LPG**	Monthly Cost of Cooking* with Charcoal**
6\$	11.25\$	14\$

* Cooking three meals

** LPG and Charcoal data is based on approximate averages gathered from the qualitative sampling of 25 customers

Comparing the maximum cooking costs from the PAYGO backend to the reported costs of using LPG and charcoal, cooking with electricity is cheaper than other fuels. A deeper analysis of energy data from 7 customers who used the stove more than 40% of the times per month (since purchase) was conducted:

Average Power Consumption (KWh/day)	Average Cooking Time (Min/Day)	Average Daily Cost (\$)	Average Stove On/Off Count	Average Power Consumption	Average Cooking Time Per Use	% Of Days Used
0.63	33 MINS	0.11\$	13.427	0.054	3.01	73.46%

On average people used the electric stove for 39 minutes per day for 73% of the days since purchase, 2021. People's average cooking costs are 3.385\$ per month. This roughly amounts to two or more meals per day cooked using electricity suggesting that the 7 customers have made a significant switch to electric cooking in this time period. A longer term analysis with a statistically relevant sample is necessary to understand the transition.

In section 5.5.2, graphs 22, 23 and 24 revealed that the use of both single electric stove and double electric stove was consistent and increasing over time for at least 50% of the stove users. In the graphs below we attempt to better understand the nature of that use (daily use, frequency, power and costs) from data analysis of energy use per month during the baseline-endline phases. Data was collected from point of purchase until April 23rd.

Frequency of Use: In graph 46, the 7 customers used their stoves for 13.75 days on average. For 4 out of 7 customers the frequency of use is increasing. During March to April, stove use can be seen to rise for four (number 1,2, 6 and 7) customers. Stove use can also be seen to fall in the months of March and April for (number 3, 4 and 5). The rise and fall of use frequency can be attributed to increased lockdown restrictions enforced in response to high COVID-19 community transmissions.



Graph 46: Frequency of cookstove use (number of days)

Monthly Electricity Consumption: In graph 47, increased power consumption can be observed in March and April for providing a stronger indication that regular use did increase during those months for three customers. However, the overall variability in the power consumption across the sample highlights that cooking activities and preferences can vary based on the the different household scenarios of cooking and reheating (described in 5.5.2)



Graph 47: Average electricity consumption over time

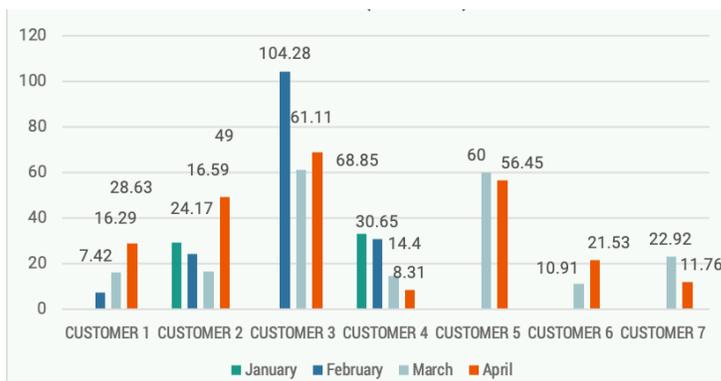
Monthly Cooking Costs: Graph 48 shows that there are a range of monthly electricity cooking patterns, with low usage by customers 6 and 7 possibly indicative of fuel stacking or purchasing meals outside the house. Customer 3 shows there is potential to cook most meals on electricity. Even with daily use for 60 minutes (equating to cooking two meals per qualitative customer feedback) over 25 days, the total cost of cooking for stove 3 came up to 4.78\$ and suggests significantly reduced use of other fuels.

When electricity is used as the primary fuel, it is also likely to significantly reduce overall cooking costs (see table 6.1 for representative cooking costs). However, understanding these trends over a longer period of time is required to fully understand whether the reliance on electric cooking is increasing or not. For example, research from iDE Cambodia Cooking Diaries shows that, switching to electricity from using LPG, wood and charcoal reduces energy consumption by 2 times, 5 times and 8 times respectively, and electrical energy used decreases as the number of people cooked for increases pointing to the efficiency of electricity as a cooking fuel. During MECS-TRIID research, customers indicated a willingness to pay range (for electric cooking) of 5-10\$. The maximum monthly costs of cooking with electricity appears to be below this range. Customer energy use data provides an early indication that cooking with electricity matches people’s willingness to pay and does not add a significant burden to their monthly cooking costs.



Graph 48: Monthly electric cooking costs

Daily Use: Averaging their daily use, customers 1, 6 and 7 used the stove for 16 minutes daily, showing a gradual increase in daily use. For three out of the seven customers, regular use for less time could co-relate to reheating or quick cooking applications. The use of the stove is also closely linked with a household’s eating habits.



“Customers in peri urban and urban locations tend to use their stoves less, it’s very convenient to purchase pork and rice from a food vendor next door. If we go more urban, customers could use their stove for greater time periods.” Sales Manager

Graph 49: Monthly electric cooking costs

Customers 2 and 4 used their stoves for an average 21 and 29 minutes respectively, suggesting that a large portion of 1 meal per day was cooked using the stove. Whereas customers 3 and 5 used their stoves for an average of 78 and 58 minutes respectively, indicating that more than one meal was cooked daily using the stove. In this sample of seven stoves, a gradual increase in stove use does happen for customers, helping to explain reliance on previous fuels seen in section 5.5.1. where the food cooked for most meals is often paired with previous fuels.

6.2 EPC Use

In addition to electric cook stove data, 5 Wi Fi enabled smart meters were set up to track usage for 4 EPC customers and 1 Multi cooker customer. Connections were set up inside customers' kitchens and data was captured through a mobile app. Challenges in the app interface prevented aggregation of energy data - conducting an in depth analysis of energy use and time of day data was not possible.

In total over 300 instances of energy use were manually captured from the app interface. Of these, only 34 manually captured instances provided meaningful information (clarity of data allowing for analysis and interpretation) on cooking use and energy consumption. Inferring broader conclusions on how people cook with their EPCs requires sampling of higher statistical significance. A separate cooking diary study setup for the MECS partnership project will provide iDE with relevant insights on EPC use data. Based on the data captured for the MECS ECO project, we observed the following:

No of Cooking Events Captured	No of morning Cooking Events (6:00-12:00 PM)	No of after-noon cooking events (12:00-4:00 PM)	No of eve-ning cooking events (4:00-10:00 PM)	Average Cook-ing Events per day	Average Power Consumed per cooking event	Average Cooking Interval
34	20	6	8	1.214	407.031W	67* MINS

**Data is captured on the app in 30 minute time intervals, the actual cooking activity may take less than the time intervals and cannot be accurately represented in the data*

Of the 34 cooking instances, 20 occurred in the morning, 6 in the afternoon and 8 in the evening. People used their EPC's the most for the first meal of the day, predominantly for cooking rice (highlighted in 5.5.2) The EPC's are used approximately 1.2 times per day and the average power consumed is 407W per cooking event. The use of the EPC per cooking event does not appear to add a significant load to the HHs power demand.





0

1

2

3

4

5

6

7

8

9



8888

07. Boosting Electric Cooking in the Future

iDE's ECO project setup with intention to trigger a nascent demand for modern cooking solutions demonstrated that there is a growing number of early adopters who are making the transition to electric cooking if their needs (aspirations, safety, cost, reliability, and cooking culture) can be addressed. Over time, customers form positive perceptions of the cooking costs and device safety, and report confidence in regularly using their products. Findings also show that use over time also creates positive shifts in peoples cost perceptions of cooking energy costs over time. The use of electric cooking devices brings positive changes to the family's cooking dynamics and experience.

Versatile cooking solutions such as the electric cookstoves (allowing people to cook a range of dishes) do fit with the cooking cultures and the electricity supply in Cambodia. Paired with alternative financing mechanisms (PAYGO, credit installments) and deployed through marketing and distribution strategies, electric cooking solutions can be taken to scale in the Cambodian market.

Expanding the transition to electric cooking will require a phased approach. This project aimed at triggering demand for early adopting customer profiles. In future phases, sustained efforts need to focus on expanding marketing proven electric cooking solutions to reach early and late majority profiles to facilitate the switch to electric cooking for rural HHs most affected by the impacts (health, time, economic impacts) of using biomass for cooking

Insights through sales surveys, longitudinal evaluations and qualitative research provide a basis for understanding drivers and barriers to electric cooking adoption from a holistic customer and market perspective. Utilizing this evidence base iDE will continue to develop a deeper understanding of people's needs to explore how the clean cooking transition could be scaled and where progress could be secured in the immediate short term. Further the integration of new methods such as human-centered design, behavioral research and energy use monitoring can be leveraged to drive product and service development from the start ups/private enterprises side but also potentially generate a dialogue on the government side in order to improve the enabling policy environment for electric cooking uptake.

No single solution can deliver universal access to modern cooking solutions. Large more diverse pools of funding and financing are necessary to unlock risk taking and innovation. Designing smart subsidy programs without distorting markets and targeting subsidies to the most-in-need HHs are required to facilitate a broad transition to electric cooking. Digital technology such as smart meters can be useful to enable subsidy and financing mechanisms: for example results based financing or carbon financing mechanisms, traditionally associated with high monitoring and verification costs, can be implemented through smart meters at far lower costs. These digital technologies can make solutions more affordable by unlocking new financing mechanisms

For no households to be left behind in the transition, a greater dialogue with government is necessary to frame policies and priorities with regards to the cooking needs of rural, last mile households. Enlisting in the support and collaboration of governments, NGOs and private sector actors to create a shared commitment for scaling modern solutions is required. A number of aid programs and startups are increasingly focused on renewable energy. Introducing clean/electric cooking in the same conversation as a key component in the energy ladder of people's needs is essential.

Greater efforts are also required in creation of state owned regulatory mechanisms. Few policies or initiatives addressing the issue of indoor air pollution currently exist and generating dialogue with government actors in the energy sector is key to unlocking new innovations.

Our work also highlights the need to engage with cooks and potential customers on the downsides of cooking with biomass. Helping people connect with these problems, and enable understanding of the impacts in the long term is the first step to ensuring positive change in cooking practices. Engaging more local voices and communities in promoting the positive impacts of electric cooking - informing rural customers on the time and cost saving benefits of efficient electric cooking solutions, and identifying and supporting government champions is a potential strategy to create ground up behavior change.

Grandmothers and stay at home mothers are another potentially very important customer base as iDE sales data shows the two groups use electric cooking appliances the most, while the ECO project found elders were active in and drove decision making regarding cooking fuel and appliance choices. In Cambodia, many grandparents are compensated for looking after grandchildren (by the parents) which sometimes leads to a higher motivation among grandmothers (typically the grandparent who cooks) to cook fresh nutritious food for children and seek out new recipes and ways of cooking. These dynamics may help to explain why grandmothers appear to be a key demographic to target for e-cooking.

Furthermore, as many people in Cambodia learn to cook from their grandmothers, it may be that by targeting grandmothers they could be (long-term) facilitators of e-cooking as teachers by passing on the electric cooking, knowledge, and skills, to the next generation. This possibility is complicated by the history of cooking culture in Cambodia. The intense food insecurity under the Khmer Rouge along with the propaganda against all forms of creativity including cooking had long term impacts on cuisine and food traditions, leading to many being eroded or forgotten. Whether this legacy has an impact on the potential of grandmothers to be facilitators of e-cooking therefore requires further investigation.



08. References

1. Ministry of Planning. 2013. Integration of Demographic Perspectives in Development, Cambodia. Phnom Penh
2. Asian Development Bank. Promoting women's economic empowerment in Cambodia. Mandaluyong City, Philippines: Asian Development Bank; 2015.
3. Save the Children. NOURISH Gender Analysis and Integration Strategy. Phnom Penh, Cambodia: Save the Children - NOURISH; 2016
4. Chhorvann, Chhea, Nou Keosothea, and Ros Bandeth. 2014. "Complementary Feeding Communication Campaign on Child Nutrition: An Assessment of Its Influence on Child Feeding Practices." In Annual Development Review 2013-14: Development Inclusiveness, Sustainability and Governance in Cambodia, 41–51. Phnom Penh: Cambodia Development Policy Research Institute
5. Reiss-Wilchins G. Taught to Be Worthless - World Affairs Council [Internet]. Conversations that Matter. 2013 [cited 2019 Jul 20]. Available from: <http://worldaffairs.nonprofitsoapbox.com/blog/383-taught-to-be-worthless>
6. Salvá A. The "perfect" Cambodian woman [Internet]. Equal Times. 2016 [cited 2019 Jul 20]. Available from: <https://www.equaltimes.org/the-perfect-cambodian-woman>
Bit, Seanglim. The Warrior Heritage: A Psychological Perspective of Cambodian Trauma. El Cerrito, CA: S. Bit, 1991.
7. ESMAP, 2017
8. ATEC* Biodigesters International, Cambodia market review, based on desk review and Baseline Survey (BS*) for Gold Standard Certification 2018
9. LPG Market and Household Cooking Assessment in Cambodia, UNDP, 2015
10. Communes are third-level administrative divisions in Cambodia - consisting of 3-30 villages



09. Annex 1 Digital Marketing Findings

Following the digital marketing strategy, we set up customer demographic segments, tested creative ads, and tested the efficacy of our messages based on the data collected from the facebook ad analytics platform. Four iterative online ads campaigns were deployed and the data collected was used to analyze and optimize our ads to generate iterative improvements to the ads performance (in terms of designing the right content, reaching the right people and triggering conversations with potential customers. The table below summarizes the key adjustments made after each marketing cycle.

Notes:

1. The following review of marketing data is aimed to provide high level overviews of effective messages interesting to our customers. Deep dive analysis not covered in the scope of this project will enable greater understanding of specific visual content, customer segments, calls to action and product interest
2. Specific findings especially on costs per clicks, ads performance and optimization shared in this section may vary significantly across audience, geography, content and local trends and marketing focus
3. Optimizing ads performance is a continuous process. Aspects of the online marketing execution require constant analysis and adjustments and require a high level of craft

Digital Marketing Cycle	PURPOSE	TYPE OF CAMPAIGN
CYCLE 1	The first cycle was deployed as an awareness campaigns to boost brand awareness and test the messages/ ad content	Awareness
CYCLE 2	Awareness Campaigns to test messages. Optimized for traffic and clicks	Awareness
CYCLE 3	Campaigns with calls to action, aimed at triggering conversations with interested potential customers	Lead Generation (triggering conversations with potential customers)
CYCLE 4	Final campaigns with calls to action, aimed at triggering conversations with interested potential customers in specific sales geography	Lead Generation (triggering conversations with potential customers)

09. Digital Marketing Annex



ចំអិនអាហារដោយប្រើអគ្គីសនីតាមបែប
ទំនើប - **Modern Electric Cooking
Services**



Sponsored ·

សូមចុច “ទិញតែឡើយ” ដើម្បីទទួលបានតម្លៃប្រូមូសិនពិសេស



ក្លាយជាម្តាយដ៏អស្ចារ្យ គឺមិន
ពិបាកនោះទេ
លែងជាបញ្ហាទៀតហើយសម្រាប់...

SEND MESSAGE

32

PHOTO: Facebook ad aimed at generating brand awareness

Following the digital marketing strategy, we set up customer demographic segments, tested creative ads, and tested the efficacy of our messages based on the data collected from the facebook ad analytics platform. Four iterative online ads campaigns were deployed and the data collected was used to analyze and optimize our ads to generate iterative improvements to the ads performance (in terms of designing the right content, reaching the right people and triggering conversations with potential customers. The table below summarizes the key adjustments made after each marketing cycle.

Notes:

1. The following review of marketing data is aimed to provide high level overviews of effective messages interesting to our customers. Deep dive analysis not covered in the scope of this project will enable greater understanding of specific visual content, customer segments, calls to action and product interest
2. Specific findings especially on costs per clicks, ads performance and optimization shared in this section may vary significantly across audience, geography, content and local trends and marketing focus
3. Optimizing ads performance is a continuous process. Aspects of the online marketing execution require constant analysis and adjustments and require a high level of craft

Overview of Ad Campaigns

Cycle	Date	Spend (USD)	People Reached	Cost per 1000 ppl (USD)	Impres-sions	Reac-tions	Com-ments	Messenger Conver-sations triggered	Link Clicks	Cost Per Click (USD)
V1	16/08/2020 - 20/08/2020	56.13	203969	0.25	310357	235	1	7	773	0.07
V2	05/09/2020 - 14/10/2020	64.54	84016	2.66	106951	172	5	1	3089	0.02
V3	01/12/2020 - 04/12/2020	29.96	33368	0.90	48241	58		60	8464	0.004
V4	21/02/2021 - 05/03/2021	146.1	63721	2.29	109273	210	16	76	3152	0.04

Key Outcomes from Cycle 1: Ads were deployed for a general audience. As a result, even though we reached a lot of people, the engagement was low. In the first cycle, low engagement could also be attributed to reaching more men than women. Of the total clicks, 78% men (533) 22% (151)

Key Outcomes from Cycle 2: Ads were optimized to reach more female audiences. Links were clicked by 74% women (2,263) and 26% men (811) These registered a higher number of clicks indicating more people were interested to find out more. We also brought down the cost per clicks further to 0.02\$. From cycle 1 and 2, the key messages that performed well were retained in future cycles

Key Outcomes from Cycle 3: In this cycle we built on previous results. In addition, videos to match the key short-listed messages were designed to include simple calls to action (for example: click here to get 10% off). These were necessary for improving on these results. Deploying rich video content is critical to reach audiences who are not guaranteed to read text. They help create an incentive to stay on the ad for a longer time duration. In a three day campaign, a high number of clicks and messenger conversations were started. The cost per clicks for 0.004\$ can also be considered as a very good result.

Key Outcomes Learnings from Cycle 4 :The final campaign was deployed close to target peri urban locations where the sales teams were actively conducting door to door sales. Although this resulted in triggering 76 conversations, which can be considered as a good result, the costs per clicks were high. This can be attributed to a limited target audience in the area who were interested in our ads.

Overview of results from the online ad campaigns

Ad Theme/ Key Message	Spend (USD)	People Reached	Cost per 1000 ppl (USD)	Impres-sions	Reac-tions	Com-ments	Messenger Convers-ations triggered	Link Clicks	Cost Per Click (USD)
MODERN: Modern Family Cooking	7.77	43228	0.179	48047	71		2	123	0.0631
ASPIRATIONAL: Cooking with Smart Electric Products	20.80	106368	0.195	130041	57		4	340	0.0611
MODERN: Modern Cooking Starts with MECS	10.46	12612	0.829	13738	37			580	0.0180
CONVENIENCE: Easy to cook recipes for Electric Cooking	10.28	14016	0.733	15808	15		17	2535	0.0040
CONVENIENCE: Cooking made easy, quick and affordable	9.93	14468	0.686	16860	22		25	3009	0.0033
ASPIRATIONAL: Impress your Family with your cooking	12.87	16227	0.793	18508	29		21	906	0.0142
AFFORDABLE: Modern electric cooking at 5\$ per month	16.40	6696	2.449	8624	24	3	10	135	0.1214
CONVENIENCE: Automatic cooking using 5 functions	23.49	10086	2.328	13616	39	3	3	167	0.1406

Overall Conclusions:

As per the table, thematic ads on ease and convenience registered the highest number of clicks. The ads on convenience titled 'easy to cook recipes for electric cooking' were clicked 2535 times and the ad titled 'Cooking made easy, quick and affordable' registered 3009 clicks. These also triggered 17 and 25 conversations with individual customers, which can be considered as a very good return on the amount spent. In the convenience themed ad title 'automatic cooking using 5 functions' messages advertising ease and convenience of using the EPC with 5 functions did trigger engagement but low conversations.

As seen in the findings from direct marketing (community sales) ease and convenience were the most significant reasons for triggering customers to purchase. Facebook ad data indicates that ease and convenience is the most interesting to the audience based on the high number of link clicks and conversations triggered.

After convenience themes, messages on aspirational cooking and modern electric cooking can also be considered a driver of potential customer interest. The ad titled 'Impress your family with your cooking' registered 906 link clicks and started 21 conversations which can be considered as a positive return.

Ad Theme/ Key Message	Spend (USD)	People Reached	Cost per 1000 ppl (USD)	Impres-sions	Reac-tions	Com-ments	Messenger Conver-sations triggered	Link Clicks	Cost Per Click (USD)
CONVENIENCE: Easy for elders to use, take back to your hometown	1.05	1739	0.603	2010	1	1		60	0.017
ASPIRATION: Being a supermum/ super grandma is easy	1.57	7118	0.220	7467	2			54	0.029
ASPIRATION: Transform your kitchen with electric cooking	1.06	597	1.775	605	2		1	5	0.212
SAFETY: Are you concerned about the safety of your LPG?	1.1	988	1.113	1083	1		2	26	0.042
ASPIRATION: Moving to a new house? switch to modern cooking	0.17	140	1.214	157				4	0.042
HEALTH: Cook healthy recipes for your Family using mecs	6.06	2299	2.635	2991	4		2	31	0.195

All 6 ads in the above table were not successful in registering potential customer engagement or triggering conversations. Within the themes of convenience and aspiration, not all ads performed well.

The convenience themed ad with messaging on elderly friendly use titled 'easy for elders to use, take back to your hometown' only registered 1 reaction and 60 clicks. Similarly ads encouraging transforming customers' kitchens or switching to electric cooking when changing the house did not perform well.

Conceptual messaging of becoming a super mom/super grandmother did not perform well with the audience either. Ads highlighting safety issues related to LPG, health also did not trigger any significant interest as seen by the low clicks and engagement metrics.

09. Annex 2 Lifetime Costs Calculation

The initial price points for the single and double cookstoves – the most in demand appliances – did not generate many sales and so a series of downward adjustments were made until the price points of 10\$ per month over a 18 month period and 15\$ a month over a 18 month period were reached for the single and double cookstoves. These price points brought the appliances to the level of charcoal and LPG in terms of monthly costs and generated a buzz during sales pitches that created interest, enabling the sales conversation to develop whereas before it had often stopped if people found the price to be too high during initial questioning.

The interest generated from the price point experiments led to lifetime cost comparison calculations between electric cooking and cooking on other fuels being integrated into the sales pitch. This cost comparison incorporated various factors such as appliance, fuel, and maintenance costs and also took into account the potential cost savings from the one year warranty provided with the electric appliances sold. An example template of the cost comparison calculator is given below. Feedback from the field highlighted that incorporating these lifetime cost comparison calculations had a positive impact on the sales conversation and may be a contributing factor to the improved sales towards the end of the data collection period. Although incorporating these calculations requires further training of sales agents, the potential shown means it is highly likely that cost comparisons will be included in future refinements of the 5Ps.

Lifetime costs calculation: a series of prompts used by Sales Agents in field during the sales pitch to calculate cost savings



ងាយស្រួលចម្អិន



ងាយស្រួលសម្អាត

ដំណោះស្រាយ



PREPARED BY

AMEY BANSOD

Design Strategist, iDE Innovation Lab
abansod@ideglobal.org

MOUNG VANDY

Research & Operations Officer, iDE Innovation Lab
mvandy@ideglobal.org

www.ideglobal.org/country/cambodia
All Rights Reserved Worldwide





មេកិស៊ី
សេវាកម្មឃីតូបដំបូងបំផុត

ការចម្អិនអាហារគួរតែ ការរីករាយសម្រោមនុស្សគ្រប់រូប

Cooking should always be delightful.