In-Depth Exploration of Cooking entirely with Electricity

Submitted To

MECS
Modern Energy
Cooking Services

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By

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Introduction

MECS is supporting the transition of low-income economies from biomass to the use of modern energy cooking energy. The intended outcome of MECS is a market-ready range of innovations (technology and business models) that would lead to improved choices of affordable and reliable modern energy cooking solutions for consumers. MECS recognizes the need to understand the complexity and scale of both the opportunities and challenges for modern energy cooking transitions in African and Asian contexts.

In India, the energy scenario is a complex mix of various energy sources, including traditional fuels such as firewood, agricultural waste, and animal waste have played a significant role, particularly in rural areas. After universal access to electric energy, **the biggest energy access challenge that India needs to resolve is the transition to clean cooking**. Affordability, reliability, and accessibility of solutions and cooking energy to enable the transition. Despite the large-scale LPG distribution and subsidy programs, still, over 660 million Indian lack access, resulting in a large dependency on biomass-based cooking energy.

India has become a power (electricity) surplus nation; the entire country is connected to the grid and with a strengthened distribution system, which increased the power availability to 22 hours in rural areas and 23.5 hours in urban areas. Currently, India is working towards a 24x7 guaranteed power supply at an affordable price

A recent study by the Council on Energy, Environment and Water (CEEW), on the current market penetration of electric cooking (eCooking) in India, found that only around 5% of Indian homes use eCooking devices, and even among those using electricity as cooking energy, LPG remains the primary clean cooking fuel. Large-scale adoption of any cooking energy would require a significant **policy push**, availability of affordable and reliable solutions, **awareness about benefits and other aspects key to user adoption**, pre-defined safety & quality standards, and **overall infrastructure and ecosystem to enable the transition**.

The cooking diary studies initiated under the MECS programme, build strong evidence of efficiency gains, cost savings, and delivering good cooking outcomes for cooking with efficient electric cooking appliances, particularly Electric Pressure Cookers. The India eCookbook sets out these benefits, when cooking Indian Dishes, but what is lacking is a holistic understanding or a Scenario Analysis of **"Cooking Entirely with Electricity".** For Researchers, device solution companies, electricity utility companies, policy makers and most importantly consumers, it is important that we, understand & analyse the scenario of **cooking entirely with electricity** at a household level. This has established a strong foundation for implementing medium and large-scale pilots, which can help us further understand users' preferences and decisions, the impact of cooking entirely with electricity other Grid level, infrastructure requirements, demand & supply for both electricity and electric cooking solutions.

Project Objective

The project seeks an in-depth exploration of the implications of **households cooking entirely with electricity**, based on a small number of participants (10 Households as outlined in the TOR). By way of this study, MECS aims to expand the research to explore using multiple electric cooking devices in a household. MECS seeks to generate data on a wider range of devices and **how they can be used to meet all household cooking needs.**

The data generated from this study would help gain an understanding of the energy implications at the household level of cooking entirely with electricity.

The findings from this project are needed for a range of purposes;

- **Policymaking**: Several models are now available that support programme design and decision-making on energy access policy.
- **Energy Access**: The utility companies would gain a deeper understanding of energy impacts at the household level, which could then build a base for generating data at the Grid level
- **Device supply chain**: Device manufacturers have engaged with supplying EPCs to LMIC markets; they are aware of consumer barriers to purchasing EPCs and are increasingly interested in offering a range of electric devices.
- **The carbon credit market**: The new MECS-supported Gold Standard for digitally connected cooking is based on calculations that require evidence on the energy use by the project devices (currently expressed as thermal efficiency, but likely to expand to allow the use of data on energy use instead). As companies start to apply this methodology it is becoming clear that the availability of data on eCooking on other energy-efficient devices is required, and data on 100% cooking is a particular gap.

The field trial helped us to document and analyse the following parameters critical to the transition of households to electric cooking:-

- **Electricity Scenario – Supply, Wiring condition & Reliability**: Within the proposed area for study, a detailed study and analysis of the electricity supply in terms of average sanctioned loads for the households, cost for having a metered connection, condition of the electricity supply in terms of the quality of electricity and also w.r.t to its reliability i.e power outages and blackouts, etc
- **Energy Consumption – For Cooking & Other Needs (e.g. Heating Water)**: How much energy is required to cook entirely with electricity? How much energy is required to cook individual dishes using various electric cooking devices? How much energy is required to cook entirely with electricity?
- **Meals & Dished Cooked**: Which dishes do people prefer to cook using different electric devices? Are there any fixed menus that the households are following or does that change frequently? Whether the food is being cooked from fresh or simply reheated? whether any food is being saved for later, for example, batch cooking of cereals by pre-boiling in bulk, storing and frying individual portions at a later date? which cooking processes were used, time and energy consumed. At the Meal level - the purpose of the cooking event (e.g. lunch, dinner, breakfast, or heating water), the number of people catered for, and start and finish time.

- **Cooking Devices**: India has a very wide availability of a range of electric cooking devices. As a part of this study, we would analyse the factors that influence the choice of cooking devices for the consumers, how traditional cooking habits influence the choice of electric cooking appliances, how has this choice been impacted as part of the study, and have the choices changed after they participated in the study. The study would also explore the availability of a wide variety of electric cooking appliances across online and offline retailers.
- **Time Consumed**: In India regularly cooking happens at three discrete times in an average household, but the menu, time of cooking meals, family size and other heating requirements, the actual time taken to cook a meal are important variables. As a part of this study, we would be reviewing the time taken across different phases of the study, for the households to prepare a dish or full means, and how the choice of fuels and cooking appliances have impacted that time.
- **Cost Implications**: What are the cost implications of transitioning to cooking entirely with electricity? This would be analysed not only from a cooking costs perspective but also from the cost of device ownership. Further, the cost of cooking would be analysed across the different phases of the study i.e on the primary/traditional fuels, mixed fuel approach and cooking 100% with electricity. Further, the households use domestic cooking energy not only for cooking but also for heating and thus an analysis of energy consumption and cost implications of the same would be studied. We will also like to analyse the energy expenses (LPG and Electricity) for the last six months to conclude.
- **User Experience of Cooking with Electricity entirely:** What is the experience, safety, and comfort of the households cooking entirely with electricity? What were the habits, conditions led to barriers or any other barriers experienced by households that would prevent them from cooking entirely with electricity? What difficulties do people encounter when cooking entirely with electricity and how do they overcome these?

Project Implementation Methodology

Finovista followed the proposed strategy outlined below to execute the project

Framework development for Cooking Diary Study

A rapid review of the existing work on cooking with electricity was done to understand, what would be the key aspects to capture in the data collection, what would be the framework for data collection across the different stages of the project and what would requirement in terms of the manpower requirement, type of households and location, framework of the study, frameworks for the data collection, analysis and cross verification of the data. We have referred to three documents i.e Cooking Diaries protocol 3.0 and the Data Analysis document as designed by the MECS team and the Indian eCookbook. The below framework was designed for the study. This framework provided a broad guidance to the study, however, it may be noted that there were slight deviations in terms of confirming the framework. Please refer to Annexure I

Area & Households for Cooking Diary Study

The study was conducted across 14 Households across two cities i.e New Delhi and Pune. In New Delhi, we had 5 Households from the lower income group category and in Pune, we had 9 households i.e 5 Middle-Income groups and 5 from the lower income group. The areas were shortlisted based on the quality of the electricity supply.

- **Delhi** - ***"South West District of New Delhi under the postal code 110070"***. This area in New Delhi has a high-quality electricity supply and is serviced by **BSES Rajdhani – A private utility and Joint Venture of Reliance Infrastructure Ltd. & Govt. of NCT of Delhi.** This district is home to large residential colonies as well as urban slum dwellings & unauthorised colonies, with **lower-income households, i.e. house - helps and utility staff lives**. Further, since the electricity supply is linked to the Airport line, there aren't frequent power cuts and if there are cuts – the supply is resumed very fast. **Thus, this area was chosen for working with 5 Lower Income Households.**

- **Pune** – In Pune, the middle-income and lower-income households were scattered throughout the city and suburban area. All the households receive electricity supplied by **Maharashtra State Energy Distribution Company Ltd. (MSEDCL).** The electricity supply is constant. Generally, there are two to three power cuts in a week which are of short duration mainly due to maintenance failure. In such cases, the power is restored back within 20 mins to 2 hours depending on the maintenance issue that might have caused the failure. Apart from that the electricity company announces planned maintenance power cuts once a month. The middle-income households have inverter backups.

Households Onboarding/Registration - Participants were informed about the activity and their consent for 5 weeks of engagement was secured. This was done by meeting them personally and explaining to them the transition to electric cooking. The following information was shared with participants at the onboarding stage:

Figure 1: Registration Consultation - Delhi - Lower Income Households

- The duration of the exercise/Trial is for 5 Weeks (2 Weeks Primary Fuel + 3 Weeks Cooking with Electricity)
- They would be free to cook the food as per their choice and we would not have any say in that.
- The capturing of the data needs to be done at regular intervals at all stages i.e Registration/Primary Fuel and Transition Stage
- Their consent to sharing information and recording information
- The electrical equipment will be provided to them free of cost and the spike in electricity bills due to electric cooking would be reimbursed to them
- The participants can retain the electric equipment after the trial (optional)

There were two different Registration forms that were sent to each of the participants and information was captured in that. These were the Participant Information Sheet/Registration Sheet and the Weekly Menu Sheet. The registration sheet captured the demographic profiles of the households and the weekly menu sheet captured a glimpse of their weekly household menu and cooking habits. In both locations – consultation activities were done during this phase (Please refer annexures II). The socio-economic profiles have been captured during the registration phase. In both Delhi and Pune, the Lower Income households have an average annual household income upto INR 3,00,000/- , while the middle-income has have an annual household income from INR 10,00,000/- to INR 30,00,000/-. Further, the main cook of the household were either female or had female house helps who were cooking. The Age of the cooks across Delhi and Pune ranged from 25 to 80 years. The houses were carefully chosen keeping the below mentioned considerations i.e.

Figure 2: Consultation with Pune Lower Income Households

- It was ensured that participants from various age groups, gender and economic background participated in the exercise
- All households should have secure access to electricity
- All households should have access to smart phones to record and report data
- Number of family members

Family type	Per Annum income(INR)	Educational background	Family size	Occupation	Electrical Appliances Ownership
Lower-income, Pune)	< INR 3,00,00	Minimum 10th grade Maximum- post graduate	4 members (2 adults and 2 young children, teen agers)	Mainly working as cleanliness staff, cooks , house help etc.	Mixer Grinder, Refrigerator in most of the houses, TV in all. No electric cooking appliance
Lower income, Delhi)	<INR 3,00,00	Minimum 5th grade Maximum- High School Graduate	4 members to 7 members	The male members of the family were	No electrical appliances except for mixer grinder in two houses
Middle income, Pune	INR 10,00,00 to 30,00,00	Post Graduates	2 members to 7 members (senior citizens, children included)	Worked in research, software industry and home makers	Tv, fridge, ac, washing machine, microwave(used just to warm food or used occasionally). No electric cooking appliance apart from 1 house with Rice Cooker

The registration process also gave visibility into the access to electricity, electric infrastructure within the households, and also the profile of their Kitchens. The key observations are captured below:-

- **Kitchen Set-up** – In Delhi 3 of the lower-income households did not have a clear designated area for cooking and kept their gas stoves on the floor along with the LPG Cylinder. Two of them had a clear designated area with a kitchen slab and wash basin to wash vessels. However, in Pune all the lower-income households had a spacious and clearly designated kitchen area. The Middle-Income house holds a fully equipped separate kitchen with all the necessary kitchen utensils and electric appliances.

- **Electric Wiring & Sanctioned Load –** The rooms that the lower income households live in are very small with a submetre and one multiple switch board. It has two or three switches and one or max two plug points. The wires are clearly visible and are old and at times charred. In Pune some of the lower income households had one board in their kitchen area and some did not. Also, power switches for both Pune and Delhi lower income households was an issue. In the Middle income households the wiring and the sockets were not an issue but in some households multiple extra plugs were not there for plugging in additional electrical devices aside to the ones that they already have. In middle income households 3KW to 7KW smart meters were there and in lower income households shared meters were used.

Parameter	Lower income households	Middle income households
Availability of electricity	Weekly and occasional electricity cuts was one concern raised by these participants.	● Most households had electricity backups either in-house or provided by the residential colonies. ● Those who had in-house electricity back-up were sceptical about the power capacity to accommodate additional load.
Permissions required	Yes, permission was sought from the landlord to use additional electricity	No additional permissions were required
Type of electricity connection	Mostly sub-meters provided by landlords	Regular meters/smart meters owned by the participant
Concerns raised	● Time required for electric cooking ● Additional costs ● If found difficult then switching back to LPG ● Safety of devices and wiring in a single room home ● Can this exercise be discontinued if it is too difficult ● Space to accommodate additional equipment ● Unsure about the recording of reading	● Due to holiday season breaks were anticipated ● Not enough cooking is done through out day ● Additional training will be required for cooks/maids ● Safety
Primary cooking fuel	LPG	LPG
Fuel purchase pattern	Purchase from regular market in Pune In Delhi, the LPG bottle is purchased from open market at a higher price i.e INR 1300/- per 14.2 KG bottle	
Consumption pattern	40 to 50 days per LPG bottle	1.5 to 2 months per bottle or even longer in a couple of families

Sanctioned electricity load (KW) - 4KW

Months electricity usage (Units) - 300/Month
expense (INR) - 2280 per month (avg)

Any other Electric Home appliances? - Yes, Microwave Oven
Any Electric Cooking Device at home? - No

Primary fuel used - PNG
Total for 3 months Rs.530.00

Type of cooking stove? - LPG cookstove (3-burner)

Kitchen Profile

Electricity Profile

Vessels used for cooking?

Kadhai

Tawa / Fry Pan

Pressure Cooker

Saucepan

Challenges in cooking with PNG Stoves, if any? - No

SANJIVANI HARSHE

Address - A3-405, Kumar Kruti CHSL, Central Avenue, Kalyaninagar, Pune 411014

Highest Qualification - BSW (Bachelor of Social Work)

Members in Family with Age & Gender - 2 Members
Self 60 Yrs, Husband 67 yrs

Sanctioned electricity load (KW) - 2KW

3 Months electricity usage (Units) - 69/Month
expense (INR) - 340 per month (avg)

Any other Electric Home appliances? - Yes, Mixer Grinder
Any Electric Cooking Device at home? - No

Primary fuel used - LPG (14.2 and 5 kgs)

Type of cooking stove? - LPG cookstove (2-burner)

Kitchen Profile

Electricity Profile

Vessels used for cooking?

Kadhai

Fry pan

Pressure Cooker

Saucepan

Challenges in cooking with LPG Stoves, if any? - Yes
1. Takes a lot of time in cooking
2. Since no formal connection the waiting time is too much sometimes, inconvenience during waiting period

PRIYANKA GHOSH

Address - 67 Harijan Basti, Ground Floor, Masoodpur, Vasant Kunj, New Delhi

Highest Qualification - High School Graduate

Members in Family with Age & Gender - 5 members
Male - 28 years and 50 years
Female- 20 years, 45 years
Girl - 4 years

Weekly Menu Analysis – Households

Lower Income Households – Pune

Morning – Tea, Milk boiling, Chapati, Bhakri Vegetable, Rice and Water heating for bathing

Quantity - 2 to 4 cups tea depending on the family type, half litre milk, 5 to 10 chapati, 4 to 5 bhakri, rice - 100 gm rice (raw)

Lunch – Mainly cooked in the morning itself. No additional cooking. Only tea is made in most houses around 3 pm.

Evening: - Tea (2 to 4 cups) milk, reheating of vegetables, Khichdi -150 gm (raw)

Cooking time : Usually from 6: 00 am to 10 : 00 am and evening from 8:00 pm to 10:00 pm

Since all the households have working women who go outside, the cooking time is fixed

Lower Income Households – New Delhi

Morning – Tea, Milk boiling, Roti, Paratha, Puri, Vegetable, Rice

Lunch – Reheating, Mostly all cooking is done in the morning

Evening: - Tea, coffee and light snacks like Maggi, packaged food (not cooked in their kitchen)

Dinner: Reheating of vegetables, roti, vegetables (curry, etc.), pakora making, rice

Quantity (approximate quantities) : 4 to 8 cups of tea 7 to 10 roti, 10 to 15 Rotis/Puri/Parantha , Rice 350 to 750 grams daily (raw, varies for different families and if rice is being cooked twice or one time in one day), dal – 200 grams, raw vegetables – 250 to 500 grams per dish, Cooking time varied throughout the day as most of them are working from home.

Middle income households (Indicative)

Morning – Tea, Milk boiling, Chapati, bhakri ,Vegetable, Rice

Mid-Morning: Snack (some fried snack)

Lunch – Reheating, Chapati

Evening: - Tea, Milk boiling

Dinner : Reheating of vegetables, chapati, bhakri making, rice

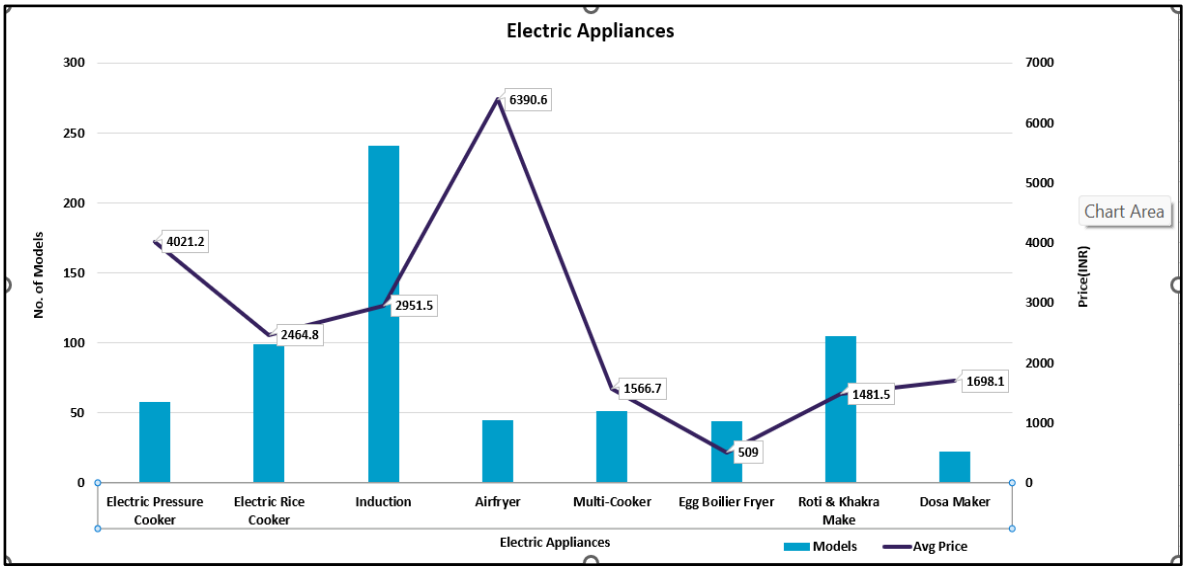
Quantity (approximate quantities): 2 to 4 cups of tea, 4 to 7 chapati, 4 to 6 bhakri, rice 120 grams (raw), dal – 100 grams, vegetable – 250 grams , soup – 500 ml.

Cooking time varied throughout the day as most of them are working from home.

During these 5 weeks, one festival of Makar Sankranti was celebrated when the cooking menu was different in all households.

Electric Appliance Mapping and Analysis

As a part of this study a detailed electric cooking device mapping was conducted. The availability of different type of models, price ranges and brands were studied in both Online/ecommerce marketplaces and also across the local shopping and high street retail. In the online marketplaces, the leading marketplaces were mapped for availability of the devices. Multiple product categories i.e. Induction Cooktops, Electric Pressure Cookers, electric roti makers, air fryers, multi cookers/multi pots, rice cookers etc. See the Graph below for the range of devices being mapped. More than 650 devices, 50 to 60 brands were successfully mapped for their availability. Please refer Annexure III



Graph 1: Range of devices mapped during the study

Further, as per the location of the study, these devices were also accessed for local delivery in the said postal codes and also their availability in the nearby markets and malls. An area of around 5 kms was studied both in Delhi and Pune. Both areas were highly serviceable by the online retailers with a delivery of one to four days. While in online marketplaces like Amazon and Flipkart a wide range of devices were available, in the nearby stores and in the Malls, only limited models and brands were available. Induction Cooktops, electric water kettles, electric sandwich maker, microwaves and rice cookers

were readily available. Brands like Prestige, Philips, Bajaj, Panasonic have wide other brands were available in just one or two categories. Below are some screen shots of images from the local markets of Delhi and Pune.

Field Study – Cooking with Primary Fuel & Cooking with Electricity

Baseline Stage/Cooking with Primary Fuel - The study was done for a duration of **two weeks.** In this stage the households were expected to cook through their primary cooking fuels. The objective of this two weeks of study was to understand their primary fuel consumption, cost implications, current cooking behavior, their meals and dishes cooked, time consumed etc. For doing this monitoring different methods were used across the two locations:-

- **In Delhi** – Weighing Scales with Stands and upto 100kgs of measurement/weighing capability were given to the households for monitoring the energy/LPG consumed
- **In Pune** – The households installed Gas Flow meters to capture the fuel usage/consumption. Each of the houses got the meters installed except for two middle income households which had the PNG metered connection.

Apart from that a weekly record sheet was given to the households for capturing the daily data (Refer Annexure II). This weekly record sheet helped the households to capture data of :-

- Dishes that they were cooking
- Time that was taken to cook each of the dishes
- Capturing the usage of additional activities aside to cooking

Figure 3: Gas meter installation at a lower income household

- Capturing events of reheating
- Vessels/Utensils that they are using to cook the food
- Overall consumption on a daily basis – For this the households were instructed to capture the data once everyday before cooking their 1'st meal and after their last meal.

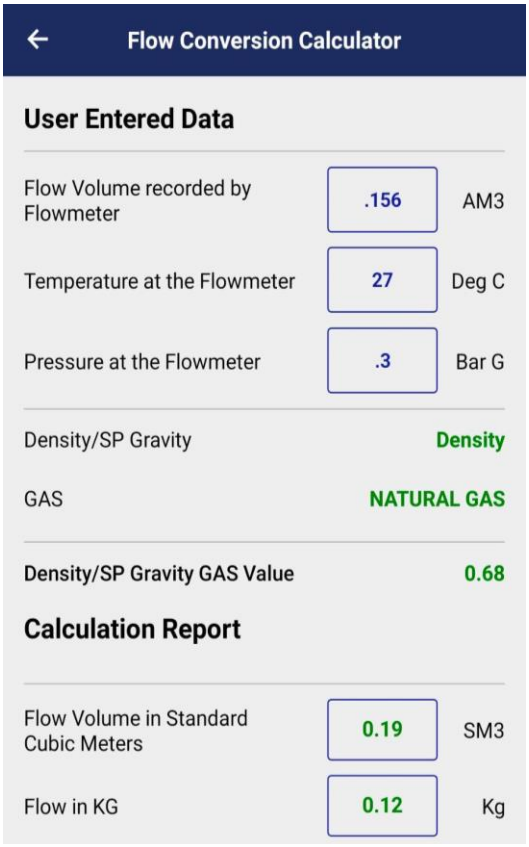


Figure 4: Sample Conversion made with the app.

Initially, it was aimed to record reading after every dish, but most households found that to be difficult, especially during morning hours. Hence, readings were noted down after each session of cooking. The Gas Meters were procured from Pune Gas Company. Each of the meters was ISI marked and the company had the license to formally supply these energy monitoring meters to the households. The readings were captured by some of the households after every cooking session but on some days the same was left in the morning rush time. Thus, the readings have been mostly taken on a daily basis rather than meal basis. The meter reading output is given in Standard Meter Cube, this was further converted into KGs by using the mobile app that the gas flow company provided. App links provided below

Google Play Store (Android) link : https://play.google.com/store/apps/details?id=com.mobile.gastechIn

Apple App store link : https://apps.apple.com/us/app/gastechapp/id1616163115

In Delhi, the households were provided with weighing scales and provided training for noting the weight of the LPG gas cylinder before cooking the meal and after cooking the meal. Further, the field researcher used to visit the households twice on a weekly basis in the next week to verify and record the readings/measurements and interact with the participants.

Training for Capturing Data – The participants of the respective cities were trained to capture the data. Language barriers were also addressed i.e the participants in Delhi had recorded the data in the regional language i.e. Bengali in some cases and in Pune the lower income households captured data in Marathi. To keep a close check and cross verify, the researchers rechecked and confirmed the data on the data basis with what had been noted by the households. In Pune the weekly record sheets were checked on a weekly basis and the gaps management w.r.t data and cross verification was done on a weekly basis. Further, the field executives were sent to the

Transition Stage/Cooking with Electricity

After analysing the data from the baseline study phase for two weeks and analysing the data from the registration stage, a requirement analysis was conducted. This includes analysing the devices used by the households to take care of their cooking requirements, and if they were to transition to electricity what would be required in terms of:-

- **Electrical Extension Boards/Fixing** the electric wiring within households and installing additional power switchboards
- **Electric Appliances**
    - To factor the cooking on two and three burners in the primary fuel set-up
    - The device wattage, in order to ensure that there are no mis - happenings
    - No devices basis the cooking requirements of foods eg Dosa Maker, or Roti Maker to solve the additional needs of making good quality bread
    - Electric immersion rods for heating water for bathing etc
- **Energy meters** were procured to record energy consumption. Appropriate changes in the data record sheets were made to accommodate energy readings.

The information per household was collected in a separate sheet (Refer Annexure VI). The orders were placed for the electric cooking appliances, and complimenting cooking utensils (Induction Friendly), they were duly captured in the asset register (Refer to Annexure V). Further, the type of devices were ordered as below :-

- **6 Litre EPCs, 1000 Watts** were ordered to take care of the Boiling, Pressure Cook, Saute, and Steaming Menu Dishes
- **Induction Cooktops** – 1 per household of 1200watts in New Delhi, 2 Induction per middle-Income group for 1800 watts, to take care of the two burner requirements for all sorts of Boiling, Deep Frying, Boiling, Sauteing etc. In the lower-income households, the houses were given a 1200-watt induction.
- **Roti Makers/Dosa Makers** – A few selected households had placed a separate requirement for Roti and Dosa Maker
- **Extension Boards** – Were used in all the Delhi low-income households, and in some of the low-income households for Pune.
- **MECO energy meters** were given to each of the households to capture data of the energy consumed.
- **Immersion Coils for Water Heating –** They were also provided for the lower-income households in Pune

Training Process through a Consultation Meeting with Households

Training: The participants, from both the lower and the upper-income households, were trained in the respective cities on the below-mentioned aspects:-

- **Cooking with Electric Pressure Cookers** – Multiple demonstrations were done in Delhi and Pune to show the participants how to use the electric pressure cookers and how to effectively use them. Further training was conducted on all that can be cooked using the EPCs. Further important features of automation were explained.

- **Induction Cooktops –** Mostly the lower income households had to be trained on the induction cooktops, and how to control the temperature, clean the same and manage in case of over-heating etc
- **Using the energy Meters –** All the households were trained to take the reading from the energy meter and how the meter has to be reset to zero.

Figure 5: Training Electric cooking

Figure 6: Cooking with Electricity Phase

The data was captured by the households on a daily basis, the format was mostly the same as used in the baseline stage except for the energy requirements. Thus it captured clearly all the meals that were cooked along with duration and other heating incidents that required electrical energy in the kitchen. In the 1'st week in both Delhi and Pune, there were issues w.r.t capturing data on the energy meters. During three weeks, there were some households in Pune that had experienced flickering of the energy meters. Further in two households there were also incidents of overheating of electric wires and induction cooktop – leading to melting of the body of the induction. These incidents happened in the lower-income households of Pune.

Endline Consultation with Households

After the transition stage the house - holds were consulted on their overall experience of electric cooking and whether or not they would continue using electric cooking in their daily lives. The consultation was conducted through telephonic conversation, face-to-face etc . The key discussions were:-

- What have been the current challenges of cooking with electricity
- How was the experience of using different devices than used in the day to day routine
- Will they continue to use electric cooking or go back to their primary fuel for cooking
- Are there any changes in the weekly menus that they experienced while cooking with electricity
- How was the food cooked on electricity taste ?
- What is the cost that the house holds would like to pay in case they had to transition on electric cooking?

Data Analysis and Key Findings

Key Findings – Lower Income Households Pune

S.No	Parameters	Registration	Baseline	Transition	End line
1	Primary cooking fuel	LPG Two Households have 2 cylinders approved i.e. 14.2kg.However, they are using only one cylinder. The second cylinder is shared with relatives. Current price of the cylinder is INR 1050/- for 14.2 kg cylinder.	LPG 100% LPG usage from 14.2kg cylinder	Electricity and LPG Electricity is been used as primary cooking fuel for most of food. However, in case of 2 times of power outages certain foods were cooked on LPG. Further food like Chapati, bhakri, chiwda were cooked on LPG. There were instances where the induction cookstove got damaged and wiring got heated where they used LPG.	Electricity and LPG Households have expressed their comfort of using electric pressure cooker for rice, dal and khichdi. Households thought that induction cooking took longer specially during evening time when voltages fluctuated more. Households continued cooking chapati and bhakri on LPG.
2	Electricity usage and Infrastructure	None of the households own energy meters. The houseowners charge the electricity to the tenants at a rate of INR 9 per Kwh plus they have to pay 15 units additional for water pumping at the rate of INR 9 per Kwh. The households have single plug points. The ampere rating is 5 Amps for the plug points. The wiring is not of good quality.	Same as registration phase	The households started using electrical extension boards for connecting various devices. They used energy meters to measure their energy usage. Some incidences of wire heating occurred and one incidence of fumes from induction cooktop occurred. Two instances where electricity was not available one meal could not be cooked.	The households found the extension boards useful. They also got some switch boards and wiring changed to better quality material.
3	Weekly menu				
	Breakfast /morning session	Tea- 2 to 4 cups, pohe- 100 gm, upma- 100 gm, milk half litre- 1 litre, chapati- 5 to 8 chapati,	Tea- 2 to 4 cups, pohe- 100 gm, upma- 100 gm, milk half litre- 1	Except for chapati, bhakri and a few instances where induction did not work everything else was cooked.	Except for chapati, bhakri and a few instances where induction did not work everything else was cooked.

		Bhakri 4 to 7 bhakri ,vegetable – half kadhai, rice- 120 gm dal	litre, chapati- 5 to 8 chapati, Bhakri 4 to 7 bhakri ,vegetable – half kadhai, rice- 120 gm dal		
	Lunch	Tea at 3 pm-2 cups	Tea at 3 pm-2 cups	-	As above
	Dinner	Reheating vegetables, khichdi, dal rice, chapati	Reheating vegetables, khichdi, dal rice, chapati	As above	As above
4	Cooking habits	Maharashtrain cuisine Cooking mainly in the morning and evening, no cooking during afternoon. Lunch cooked only on Sundays mostly	Maharashtrain cuisine Cooking mainly in the morning and evening, no cooking during afternoon. Lunch cooked only on Sundays mostly	Bhakri a local food item could not be cooked with electricity	Bhakri a local food item could not be cooked with electricity. Texture of the same can be achieved on an open flame /direct exposure to flame. Which is not possible in electric cooking.
5	Cooking appliances and utensils and kitchen arrangement	Pan, Tawa, kadhai, pressure cooker, cooking pots of various sizes for milk, tea and curry, LPG stove -2 burner Smaller kitchen table	Pan, Tawa, kadhai, pressure cooker, cooking pots of various sizes for milk, tea and curry, LPG stove 2 -burner Smaller kitchen table	Induction friendly Pan, Tawa, kadhai, roti maker, electric pressure cooker, cooking pots of various sizes for milk, tea and curry, induction cookstove, roti maker, and electric pressure cooker **Participants had to keep the electrical on the floor due to space constraint**	Participants are comfortable with the use of electric pressure cooker. None of the participants could use roti maker. The rotis made on roti maker came out to be stiff . Traditional cooking vessels like idli vessel cannot be used on the electric cooking devices. They needed extra attachments for using in the EPC. Cast iron vessels which are used in traditional homes cannot be used with electrical cooking.
6	Cooking fuel consumption	14.2 KG LPG bottle lasts typically from 30 days to 45 days	14.2 KG LPG bottle lasts typically from 30 days to 45 days	The average unit consumption ranged from 20 units to 45 units.	Electricity bills increased by average INR 350/- for households.

				LPG cylinder lasted for additional 13 days approximately	
7	Cooking time and duration	Cooking time : Morning – 6: 00 am to 10 am (typical) Lunch – No cooking Evening- 7:00 pm to 10:00pm Duration: Average 1 hour to 2. 5 hours daily	Cooking time : Morning – 6: 00 am to 10 am (typical) Lunch – No cooking Evening- 7:00 pm to 10:00pm Duration: Average 2. 5 hours daily	Cooking time : Morning – 6: 00 am to 10:00 am (typical) Lunch – No cooking Evening- 7:00 pm to 10:00pm Duration: Average 2 to 3 hours daily	With electric cooking the cooking time increased by atleast half an hour mainly due to insufficient cooktops and plug points. Only one dish could be made at one time and that increased the cooking time. During evenings the induction cooktops took longer time to cook due to low voltage.
8	Cost of cooking	Approximately INR 450 -INR 550 per month	Approximately INR 450 -INR 550 per month	Approximately INR 350 -INR 450 + LPG cost INR 250 (Approximately) (Since, chapati, bhakri were made daily using LPG)	The combined cooking cost of both fuels additionally comes average around INR 600 to INR 650 per month. This is slightly higher than average cost.
9	User experience	LPG is convenient due to the heat regulation that is required for Indian meals, specially millet based cooking. Cost of LPG is a rising concern No prior experience of cooking with electricity	LPG is convenient due to the heat regulation that is required for Indian meals, specially millet based cooking. Cost of LPG is a rising concern	Cooking completely with electricity was an entirely new experience. Electric pressure cooker was found more comfortable by most users. Increased time was a major concern due to single cooktop and monitoring required for induction	Participants are not confident about cooking entirely with electricity. The increase in time due to incapable electric wiring and load capacity. One household uses Electric pressure cooker for heating bathing water
10	Current Challenges	Cost is the major challenge faced by the participants	Cost is the major challenge faced by the participants with LPG	Space availability in single room homes. Insufficient plug points. Plug points are not of appropriate rating. House owners are charging electricity at a much higher price Permission is required from the house owner to use additional electrical equipment	Complete transition to electric cooking is not possible. The participants do not wish to continue due to multiple reasons/challenges mentioned above. Further they used electric devices as they were provided free of cost. But incase

				Indian traditional utensils like cast iron, idli maker etc. cannot be used with electrical cooking Traditional recipes like chapati and bhakri cannot be made with electricity.	they were to pay for the devices they would not buy the same.

Lower income households – New Delhi

S.No	Parameters	Registration	Baseline	Transition	End line
1	Primary cooking fuel	LPG Household have 2 cylinders i.e. 14.2kg and 5 kg each. The 5kg cylinder is used as a backup as the cylinders are procured through informal channel resulting in higher cost. INR 1300/- paid for 14.2 kg cylinder compared to INR 1100/- market price for 14.2kg.	LPG 100% LPG usage from 14.2kg cylinder	Electricity and LPG Electricity is been used as primary cooking fuel for most of food. However, in case of 2 times of power outages certain foods were cooked on LPG. Further food like Chapati; deep fried have been sometimes cooking on LPG.	Electricity and LPG Households have expressed their comfort of cooking with induction for foods that require processes like sautéing, boiling and steaming and will be using LPG along with induction cooktops. Some households have expressed that they will continue to cooking with electricity keeping LPG as a backup or for special food requirements which gave better outcome on LPG cookstove.
2	Electricity usage and Infrastructure	They have shared meters. Monthly consumption ranges from 30 to 90 units. Electricity rate is INR 10 per unit . Low quality wiring and they have 1 or 2 plug points in the house.	They have shared meters. Monthly consumption ranges from 30 to 90 units. Electricity rate is INR 10 per unit . Low quality wiring and they have 1 or 2 plug points in the house.	Extension boards were used for accommodating additional devices.	The households found the extension boards very suitable to use the electric cooking devices. Further, though they have made a note of the readings on the energy meter, they are waiting for their bills to get generated. They intend to keep using electric cooking appliance specially induction cooktop.
3	Weekly menu				
	Breakfast	Roti, Paratha, puri, milk, tea, eggs boiling, vegetable, rice	Roti, Paratha, puri, milk, tea, eggs boiling, vegetable, rice	Roti, Paratha, puri, milk, tea, eggs boiling, vegetable, rice	Roti, Paratha, puri, milk, tea, eggs boiling, vegetable, rice.
	lunch	In some households reheating of food cooking in the morning	In some households reheating of food cooking in the morning	In some households reheating of food cooking in the morning	In some households reheating of food cooking in the morning. In some households the water heating happens in the EPC device

	Dinner	Rice, roti, paratha, pakora, vegetable , reheating of dishes made earlier in the day.	Rice, roti, paratha, pakora, vegetable , reheating of dishes made earlier in the day.	Rice, roti, paratha, pakora, vegetable , reheating of dishes made earlier in the day.	Rice, roti, paratha, pakora, vegetable , reheating of dishes made earlier in the day.
4	Cooking habits	Indian Cuisine – North Indian , Bengali style food	Indian Cuisine – North Indian , Bengali style food	Indian Cuisine – North Indian , Bengali style food	Indian Cuisine – North Indian , Bengali style food
5	Cooking appliances and utensils and kitchen arrangement	Sauce pan, kadai, tawa, thick bottom pan, pressure cooker, LPG stove -2 burner, kitchen table with one or two plug points	Sauce pan, kadai, tawa, thick bottom pan, pressure cooker, LPG stove 2 burner , kitchen table , kitchen table with one or two plug points	Induction friendly pan, tawa, kadhai, electric pressure cooker, induction cooktops	The houses have retained the electric cooking appliances and the cooking utensils that were given during the study. They use diligently the induction friendly cookware, however induction is switched on occasionally during any get together etc in their to cook faster.
6	Cooking fuel consumption	LPG bottle of 14.2 KG lasts for about 45 days to 60 days and 5 KG cylinder is used as back up	LPG bottle of 14.2 KG lasts for about 2.5 months and 5 KG bottle is used as back up. The average cost of the households spend on the LPG fuel is INR 25 to INR 50	Average daily consumption of 1 to 3 units per household. So monthly consumption can approximately range from 30 to 90 Units + LPG for roti /paratha and in some case warming water and cooking Rice	The households will keep using LPG alongside electric Induction cooking. Thus, a cleaner fuel stacking would be there. The households mentioned that for foods that require heating, boiling, deep frying, they would prefer using Induction cooktop, however where there are rice steaming, roti puffing, papads and sometimes Dal too they would use LPG.
7	Cooking time and duration	Approximately 1 hour to 2 hours.	Approximately 1 hour to 2 hours.	Approximately 40 mins to 1 hours	Average cooking time with electric cooking devices can be seen to reduce by 20 mins to 30 mins in Delhi
8	Cost of cooking	Approximately INR 900 to 1500 per month – LPG cost	Approximately INR 900 to 1500 per month- LPG cost	Approximately INR 300 to INR 900 + LPG costs INR 450. Total cost can range between INR 750 to INR 1350.	Some saving with electric cooking is possible. Mainly due to high LPG prices.
9	User experience	Better heat control. With LPG cookstoves all the dishes can		Induction cooktop was used more efficiently. Electric pressure cooker	Induction cooktops are more likely to be used.

		be made , though it takes longer sometimes.		for making rice was not found very useful due local cooking practice of discarding rice starch.	
10	Current Challenges	Cost, availability and cooking time is longer	Cost, availability and cooking time is longer	Cost of electricity per unit is high, INR 10 per unit. The overall cooking cost has reduced compared to LPG cooking.	Electric cooking is time taking, inconvenient that they had to wait for one dish to get cooked and then the second ca be prepared. Further certain foods like boiling of daily rice did not take place nicely

Middle income household(Pune) Summary of Cooking patterns and outcome

Middle income household -Pune					
S.No	**Parameters**	**Registration**	**Baseline**	**Transition**	**End line**
1	Primary cooking fuel	LPG Two Households have 2 cylinders approved i.e. 14.2kg. Current price of the cylinder is INR 1050/- for 14.2 kg cylinder.	LPG 100% LPG usage from 14.2kg cylinder	Electricity and LPG -Usage Electricity is been used as primary cooking fuel for most of food. Further food like Chapati, bhakri, chiwda were cooked on LPG. In one household where the family members were 8 and senior citizens cooked a meal or two, LPG was used more frequently along with electricity.	Electricity and LPG Two households have expressed their comfort of using electric cooking for most meals, except for chapati and bhakri. Households continued cooking chapati and bhakri on LPG. Electric cooking along with LPG use was observed in all the houses.
2	Electricity usage and Infrastructure	Most houses had secure electrical connection with electrical back up.	Most houses had secure electrical connection with electrical back up.	Two households started using electrical extension boards for connecting	Electrical infrastructure and wiring was fairly

		A few kitchens had a fewer number of plug points to accommodate new electrical devices along with the existing ones. One kitchen had less space and hence they used a chair to accommodate the electric pressure cooker.	A few kitchens had a fewer number of plug points to accommodate new electrical devices along with the existing ones.	various devices. They used energy meters to measure their energy usage. Some incidences where energy meter fluctuating was reported.	sufficient in the middle income households.
3	Weekly menu				
	Breakfast /morning session	Tea- 2 to 4 cups, pohe- 100 gm, upma- 100 gm, milk half litre- 1 litre, eggs 2 -4, chapati- 5 to 8 chapati, Bhakri 4 to 7 bhakri ,vegetable – half kadhai, rice- 120 gm dal	Tea- 2 to 4 cups, pohe- 100 gm, upma- 100 gm, milk half litre- 1 litre, chapati- 5 to 8 chapati, Bhakri 4 to 7 bhakri ,vegetable – half kadhai, rice- 120 gm dal	Except for chapati, bhakri and a few instances where induction did not work everything else was cooked.	Except for chapati, bhakri and a few instances where induction did not work everything else was cooked.
	Lunch	Chicken , bhakri , rice dal	Tea at 3 pm-2 cups	-	As above
	Dinner	Reheating vegetables, soups , etc.	Reheating vegetables, khichdi , dal rice, chapati	As above	As above
4	Cooking habits	Maharashtrian cuisine Cooking mainly in the morning and evening, light cooking in the afternoon. Lunch cooked only on Sundays mostly	Maharashtrian cuisine Cooking mainly in the morning and evening, light cooking in the afternoon. Lunch cooked only on Sundays mostly	Bhakri a local food item could not be cooked with electricity. Idli vessel could not be used. Brass and cast iron vessels could not be used Rest mostly it remained the same.	Traditional vessels and food items like bhakri, baingan bharta cannot be made using electric cooking deivces.
5	Cooking appliances and utensils and kitchen arrangement	Pan, Tawa, kadhai, pressure cooker, cooking pots of various sizes for milk, tea and curry Larger kitchen tables with more number of equipment –		Induction friendly Pan, Tawa, kadhai, roti maker, electric pressure cooker, cooking pots of various sizes for milk, tea and curry	Participants are comfortable with the use of electric pressure cooker. None of the participants could use roti maker. The

		microwave, 4 or 3 number of gas burners, refrigerator, kettle etc. Kitchen cabinet had 4 burner gas stoves installed so less space was available		One household used a chair to accommodate the EPC. Some utensils were of larger size for the family size. Some regular utensils like tea vessel could not be used. EPC was of larger capacity for one family	rotis made on roti maker came out to be stiff . Traditional cooking vessels like idli vessel cannot be used on the electric cooking devices. Cast iron vessels which are used in traditional homes cannot be used with electrical cooking.
6	Cooking fuel consumption	14.2 KG LPG bottle lasts typically from 30 days(for the family having more members) to 65 days		The average unit consumption ranged from 35 units to 80 units. LPG usage bottle lasted for additional 20 days approximately	Electricity bills increased by average INR 450/- for households.
7	Cooking time and duration	Cooking time : Morning – 6: 00 am to 10 am (typical) Lunch – No cooking Evening- 7:00 pm to 10:00pm Duration: Average 1 hour to 2. 5 hours daily	Cooking time : Morning – 6: 00 am to 10 am (typical) Lunch – No cooking Evening- 7:00 pm to 10:00pm Duration: Average 2. 5 hours daily	Cooking time : Morning – 6: 00 am to 10:00 am (typical) Lunch – No cooking Evening- 7:00 pm to 10:00pm Duration: Average 2 to 3 hours daily	With electric cooking the cooking time increased by atleast half an hour mainly due to insufficient cooktops and plug points for the larger family. Two families report marginal change in the cooking time.
8	Cost of cooking	Approximately INR 300 -INR 1000 per month (LPG + electricity) considering kettle, toaster, microwave etc.	Approximately INR 300 -INR 1000 per month (LPG + electricity) considering kettle, toaster, microwave etc.	Approximately INR 130 -INR 680 + LPG cost INR 250 (Approximately) (Since, chapati, bhakri were made daily using LPG)	The combined cooking cost of both fuels additionally comes average around INR 380 to INR 930 per month. This is closer to the

					baseline monthly expenses.
9	User experience	LPG is convenient due to the heat regulation that is required for Indian meals, specially millet based cooking. Cost of LPG is a rising concern A few households who have lived abroad had electric cooking prior experience.	LPG is convenient due to the heat regulation that is required for Indian meals, specially millet based cooking. Cost of LPG is a rising concern A few households who have lived abroad had electric cooking prior experience.	Electric pressure cooker was found more comfortable by most users. Roti maker could not be used by any household. Overall the experience response was mixed.	None of the participants feel that they can cook entirely on electricity. All the participating households want to continue electric cooking devices along with LPG
10	Current Challenges	None	None	Having more plug points Right vessel size and more number of vessels Heat regulation for Indian dishes Accommodating brass , cast iron and idli vessels	Complete transition to electric cooking is not possible. All the participating households want to continue electric cooking devices along with LPG

Key Takeaways

- **Cooking devices and utensils**
  - Traditional utensils like idli cooker, cast iron tawa, brass vessels are still used in many Indian households regularly. Cast iron[i] and brass vessels are generally used in cooking to fulfil mineral intake requirements in the food. These vessels are not induction friendly. Also if these vessels are used for electric cooking with redesigned versions, the efficiency of the cooking device might get compromised.
  - The device operation and maintenance instructions should be available in local languages.
  - Electric Pressure Cookers – Were a very useful addition to the kitchens in this study, however what needs to be kept in mind is :-
    - Households mostly used it to cook their Rice and Dal. In that, there were two issues:-
      - Some households in Delhi could not cook their rice perfectly. Their rice was either overcooked or did not come out in the right consistency as the households want. The output of little moist and bit fluffy rice could not come.
      - Rice cooked in EPC does not expand/fluffs - when they cook their rice in a Handi over LPG, their rice fluffs/expand enough to increase the overall quantity which did not happen when cooking in electric pressure cookers. Thus, they had to slightly increase the quantity of the raw rice
    - **Couldn't set the Right Time and Pressure** - When the rice is undercooked in the normal pressure cookers then the households are accustomed to put one or more whistles, but with an electric pressure cooker, they don't know how many more minutes they need to cook. Also, the preheating of the cooker was a big deterrent, as there was no fixed time for cooker to get preheated, they could not predict how long will it take to cook.
    - Two households continued to cook their rice on LPG because of the above issues. There were incidences of the electric pressure cookers getting non-functional and they stopped working. That also was the issue and a big deterrent.
    - ***Alternate use - A 6ltr EPC came in handy to warm water for bathing and washing hands in winter***

  - **Induction Cooktops**
    - Cooking on an Induction cooktop, was very convenient for dishes like gravy and dry vegetables that require sauteing. Also boiling milk and tea was very convenient as the boil came in very quickly.
    - In the food cooked in the induction-friendly kadai and saucepan, the households found that food required less oil, and despite that, the vegetables and other dishes were not sticking in the bottom of the pan or kadai.
    - They could stir and keep looking at their dishes continuously with electric induction cooking

- . **Electric cooking Training & Awareness Gaps:**

- During the consultation phase many perceptions about electric cooking surfaced starting from time taken to possibility of cooking Indian dishes. A few participants from the middle-income households had prior experience of electric cooking during their travel and stay abroad. Difficulty in making chapati, bhakri and a few other Indian dishes was mentioned.
- The lower income households were concerned about the cost of cooking , buying the equipment and utensils for electric cooking.
- Training session really helped in resolving the anxiety that the participants had of cooking.

➢ **Standardisation of equipment**

- The electrical cooking devices like induction cooktops, heating coils etc have to be standardised with appropriate standards approved by regulatory bodies. During the course of the study two of the induction cooktops extra heated also leading to heating of wires. Th equipment was not standardised.

➢ **Electricity costs**

- The cost of electric cooking varies widely for Indian context. Eg. In Delhi the first 200 units of electricity are free. While in Pune the electricity is charged in various slabs and has the highest rate of electricity across India.

- The lower income households in Pune are charged electricity at a rate of INR 9 per KWh by the house owners.

LT-I (B) Residential 3Ph	युनिट	0-100	101-300	301-500	501-1000	>1000
स्थिर आकार रु. 350	वीज आकार(रू.)	3.36	7.34	10.37	11.86	11.86
	इं.स.आ.(रु.)	0.65	1.45	2.05	2.35	2.35

Electricity official rates.

- Middle income households pay electricity at the official rates. These variations in the electricity costs make it difficult to set a bench mark cost per meal or per dish.

➢ **Costs of equipment and utensils**

- The cost of equipment and utensils will be a deterrent for people to choose electric cooking. Young families will adopt electric cooking faster compared to established kitchens with senior citizens. The lower income households would not have participated in this exercise if they had to purchase the equipment. In Delhi when we consulted the lower income households they mentioned INR 1200 to INR 1300 as the threshold price for electric cooking devices mostly referring to Induction Cooktops.

➢ **Awareness and capacity building**

- Awareness about using electricity safely and appropriately is an useful step to ensure transition to electric cooking. Using cooking devices efficiently for intended purpose will make a huge impact.

- **Cooking with electricity**
  - 100% transition to electric cooking will happen step by step in Indian scenario. The middle-income households can adopt faster to the electric devices. The transition of lower income households will be more complex.
  - Currently, a combination of LPG and Electricity are more widely used fuels.
  - A policy intervention for regularisation of electricity rates for lower income tenants will be more useful to allow social equality and allow wider adoption of electric cooking.
  - After the trials also they are continuing to use the induction to cook their vegetables, milk/tea, and Maggi. Also, very convenient for reheating. They could now calculate the cost of their cooking in realtime and realized that there were savings when cooking with electricity. Three households out of 5 are confident about using Induction Cooktops, alongside LPG Stoves as a part of their daily routine, which again emphasises that how much awareness, capacity building initiatives are required to scale up electric cooking.

Annexures

Annexure I: Framework development for Cooking Diary Study

Table 1 - Cooking Diary Study - Cooking Entirely with Electricity								
Phases	Baseline			Transition				Endline
	Training & Registration	Cooking with Primary Fuels			Transition to Electric Cooking entirely			Exit Survey
Duration	Week 1	Week 2	Week 3	Break	Week 5	Week 6	Week 7	Week 8
Aim	Understand user choices and demographics	record of current practises and as much current data on user behaviour and choices	record of current practises and as much current data on user behaviour and choices	To consult the households on their experience, weekly menu, working towards finalizing of an electric cooking appliance according to menu and requirements	Trail and training for electric cooking. And Get 'enough' data for inefficient electric comparisons	Get enough data on 100% electric cooking. And record if Is a 100% efficient solution possible without changing the menu?	Get enough data on 100% electric cooking. And record if Is a 100% efficient solution possible without changing the menu?	How often will electric appliances be used?
Fuels	User Choice	Primary Fuel	Primary Fuel		100% Electricity	100% Electricity	100% Electricity	Traditional primary or electricity? Or both? What's the division
Appliances	What utensils and stoves are used?	As usual for the user	As usual for the user		User choice of electric appliance	efficient appliances	efficient appliances	What choice will they make?
Menu & Dishes	What is cooked?	As mentioned in the Registration Phase	As mentioned in the Registration Phase		Does it Change?	Does it Change?	Does it Change?	What is the menu now? Or will follow
Data Capture (Energy, Time & Cost)	What is the current data?	What is the impact?	What is the impact?		What is the impact?	What is the impact?	What is the impact?	Is there any change?
Utilization of Fuel(Primary)	What is the current utilization?	100%	100%		Which appliance?	100% efficient electric appliance	100% efficient electric appliance	What is the utilization now? Or will follow
User Experience	What is the current experience?	Does it change? How?	Does it change? How?		Does it change? How?	Does it change? How?	Does it change? How?	Does it Change?

Annexure II: Links for data sheets for 14 Households

Link for 5 lower income household-Delhi : Delhi_5 lower income households

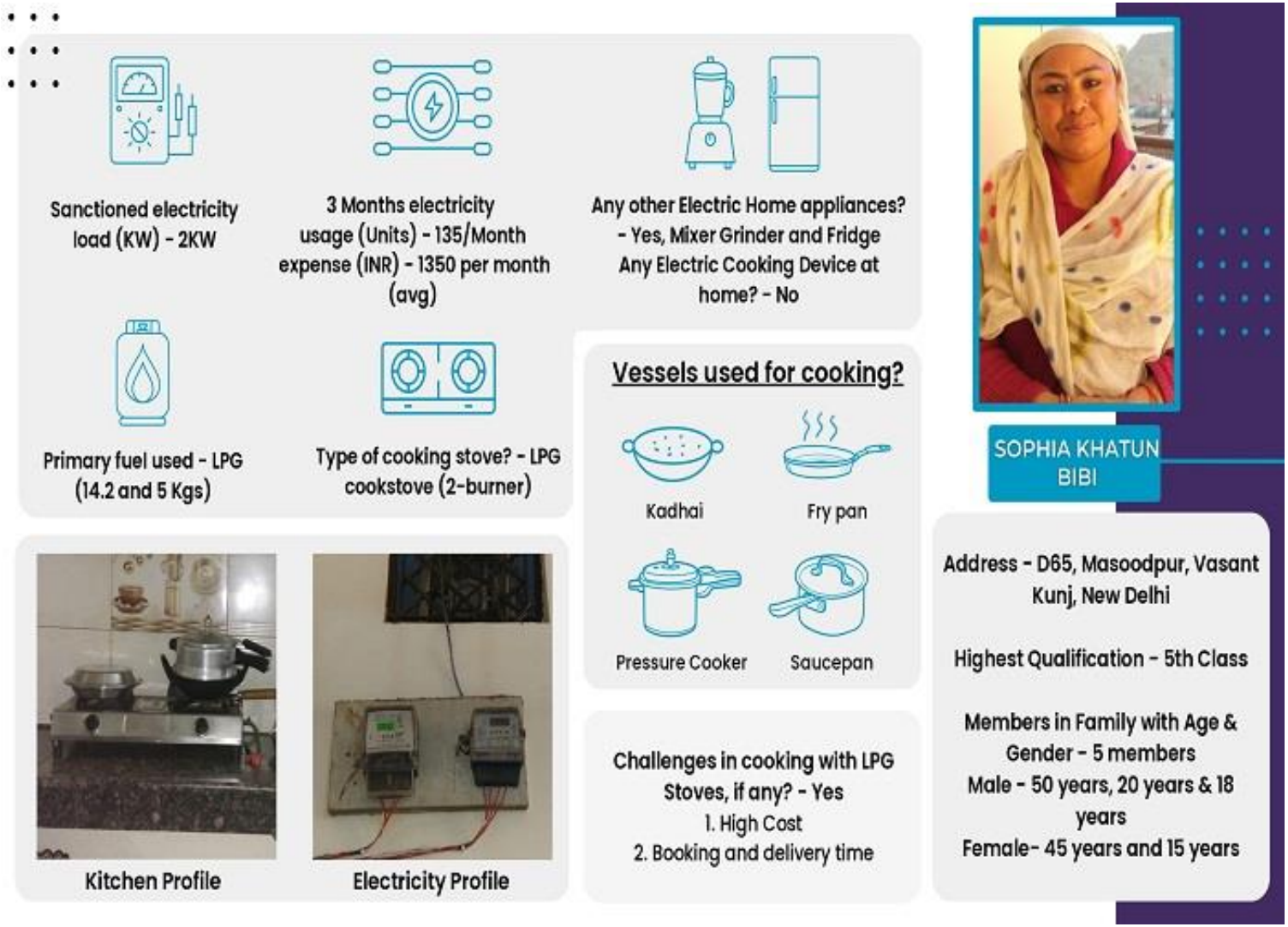
Link for 9 lower and medium income household- Pune: Pune_9 households (5 middle and 4 lower income)

Annexure III: Electric cooking device mapping

During this study, more than 650 devices, 50 to 60 brands were successfully mapped for their availability. The link for the detailed overview of the electric cooking devices is given below:

Link: 1_Appliances Mapping

Annexure IV: Household Profiles of Participants- Delhi and Pune



Sanctioned electricity load (KW) - 2KW

3 Months electricity usage (Units) - 55/Month
expense (INR) - 340 per month (avg)

Any other Electric Home appliances? - Yes, Mixer Grinder
Any Electric Cooking Device at home? - No

Primary fuel used - LPG (14.2 and 5 kgs)

Type of cooking stove? - LPG cookstove (3-burner)

Kitchen Profile

Electricity Profile

Vessels used for cooking?

Kadhai

Fry pan

Pressure Cooker

Saucepan

Challenges in cooking with LPG Stoves, if any? - Yes

1. Takes a lot of time in cooking
2. Since no formal connection the waiting time is too much sometimes, inconvenience during waiting period

PAYAL GHOSH

Address - 67 Harijan Basti, Ground Floor, Masoodpur, Vasant Kunj, New Delhi

Highest Qualification - High School Graduate

Members in Family with Age & Gender - 4 members
Male - 26 years and 30 years
Female- 22 years
Boy - 4 years

Sanctioned electricity load (KW) - 2KW

3 Months electricity usage (Units) - 69/Month
expense (INR) - 340 per month (avg)

Any other Electric Home appliances? - Yes, Mixer Grinder
Any Electric Cooking Device at home? - No

Primary fuel used - LPG (14.2 and 5 kgs)

Type of cooking stove? - LPG cookstove (2-burner)

Kitchen Profile

Electricity Profile

Vessels used for cooking?

Kadhai

Fry pan

Pressure Cooker

Saucepan

Challenges in cooking with LPG Stoves, if any? - Yes

1. Takes a lot of time in cooking
2. Since no formal connection the waiting time is too much sometimes, inconvenience during waiting period

PRIYANKA GHOSH

Address - 67 Harijan Basti, Ground Floor, Masoodpur, Vasant Kunj, New Delhi

Highest Qualification - High School Graduate

Members in Family with Age & Gender - 5 members
Male - 28 years and 50 years
Female- 20 years, 45 years
Girl - 4 years

Sanctioned electricity load (KW) - 2KW

3 Months electricity usage (Units) - 25/Month
expense (INR) - 250 per month (avg)

Any other Electric Home appliances? - Yes, Home Theatre Speaker
Any Electric Cooking Device at home? - No

Primary fuel used - LPG (14.2 and 5 kgs)

Type of cooking stove? - LPG cookstove (3-burner)

Vessels used for cooking?

Kadhai

Fry pan

Pressure Cooker

Saucepan

Kitchen Profile

Electricity Profile

Challenges in cooking with LPG Stoves, if any? - Yes
1. Takes a lot of time in cooking
2. Since no formal connection the waiting time is too much sometimes, inconvenience during waiting period

CHANCHAL GIRI

Address - D66, Masoodpur, Vasant Kunj, New Delhi

Highest Qualification - 7th Class

Members in Family with Age & Gender - 7 members
Male - 50 years, 16 years, 12 years and 30 years
Female- 45 years, 18 years, 10 years and 7 years

Sanctioned electricity load (KW) -

Months electricity usage (Units) - /Month expense (INR) - 4500 per month (avg)

Any other Electric Home appliances? - Yes, Microwave Oven but not in use
Any Electric Cooking Device at home? - No

Primary fuel used - LPG (15Kg)

Type of cooking stove? - LPG cookstove (3-burner)

Kitchen Profile

Electricity Profile

Vessels used for cooking?

Kadhai

Tawa / Fry Pan

Pressure Cooker

Saucepan

Challenges in cooking with LPG Stoves, if any? - Yes
Costs and stove maintainance

URMILA BATWAL

Address - Flat-21, Bldg-14, Sakalnagar, University Baner road, Aundh, Pune- 411007

Highest Qualification - BE

Members in Family with Age & Gender - 6 members
MIL (86), Husband (52), 3 Kids (19 yrs, 14 yrs, 14 yrs) , Myself (44 yrs)

Sanctioned electricity load (KW) - 4KW

3 Months electricity usage (Units) - 435/Month
expense (INR) - 4500 per month (avg)

Any other Electric Home appliances? - Yes, Microwave Oven
Any Electric Cooking Device at home? - No

Primary fuel used - LPG (15Kg)

Type of cooking stove? - LPG cookstove (4-burner)

Kitchen Profile

Electricity Profile

Vessels used for cooking?

Kadhai

Tawa / Fry Pan

Pressure Cooker

Saucepan

Challenges in cooking with LPG Stoves, if any? - Yes
Costs and stove maintainance

ASHUTOSH DUMBRE

Address - Marvel Fria, Flat no J501, Wagholi Pune 412207

Highest Qualification - Masters In Mechnical Engg

Members in Family with Age & Gender - 3 members
Father (80) Mother (71)
Myself (40)

SANJIVANI HARSHE

Address - A3-405, Kumar Kruti CHSL, Central Avenue, Kalyaninagar, Pune 411014

Highest Qualification - BSW (Bachelor of Social Work)

Members in Family with Age & Gender - 2 Members
Self 60 Yrs, Husband 67 yrs

Sanctioned electricity load (KW) - 4KW

Months electricity usage (Units) - 300/Month
expense (INR) - 2280 per month (avg)

Any other Electric Home appliances? - Yes, Microwave Oven
Any Electric Cooking Device at home? - No

Primary fuel used - PNG
Total for 3 months Rs.530.00

Type of cooking stove? - LPG cookstove (3-burner)

Vessels used for cooking?

Kadhai

Tawa / Fry Pan

Pressure Cooker

Saucepan

Kitchen Profile

Electricity Profile

Challenges in cooking with PNG Stoves, if any? - No

ASHWINI DESHITTY

Address - Gera Trinity Towers, T2-G06, S.No. 64/1, Grant Road, Kharadi, Pune-14

Highest Qualification - Master of Computer Science

Members in Family with Age & Gender - 3 members
Self(40), Husband(40), Daughter(12)

Sanctioned electricity load (KW) - 7KW

Months electricity usage (Units) - 750/Month
expense (INR) - 9000 per month (avg)

Any other Electric Home appliances? - Yes, Microwave Oven
Any Electric Cooking Device at home? - No

Primary fuel used - LPG (15Kg)

Type of cooking stove? - LPG cookstove (4-burner)

Vessels used for cooking?

Kadhai

Tawa / Fry Pan

Pressure Cooker

Saucepan

Challenges in cooking with LPG Stoves, if any? - None

Kitchen Profile

Electricity Profile

Sanctioned electricity load (KW) - 6KW

Months electricity usage (Units) - 470/Month expense (INR) - 5000 per month (avg)

Any other Electric Home appliances? - Yes, Microwave Oven
Any Electric Cooking Device at home? - Yes, Electric Kettle, Rice Cooker

Primary fuel used - LPG (15Kg)

Type of cooking stove? - LPG cookstove (4-burner)

Kitchen Profile

Electricity Profile

Vessels used for cooking?

Kadhai

Tawa / Fry Pan

Pressure Cooker

Saucepan

Challenges in cooking with LPG Stoves, if any? - Yes
getting refill cylinders in time was a challenge. LPG burners modified for PNG therefore some challenges around flame intensity.

MRS. MEENA ANAND KARVE

Address - 402, Koyna Apartments, S.No.133, Kothrud, Pune 411038

Highest Qualification - M.A.

Members in Family with Age & Gender - Mr Anand Dinakar Karve, 86 M and myself

MANJUSHA TORKADE

Address - Thite nagar, Kharadi, Pune 411014

Highest Qualification - No data Available

Members in Family with Age & Gender - No data Available

Do not have their own electricity meter. It is a shared meter

Months electricity usage (Units) - No Data available expense (INR) - 3000 per month (avg)

Any other Electric Home appliances? - Yes, Mixer Grinder, TV etc.
Any Electric Cooking Device at home? - Yes, Induction Cooktop

Primary fuel used - LPG (15 Kg)

Type of cooking stove? - LPG cookstove (2-burner)

Vessels used for cooking?

Kadhai

Tawa / Fry Pan

Pressure Cooker

Saucepan

Kitchen Profile

Electricity Profile

Challenges in cooking with LPG Stoves, if any? - Yes
Cost is High

JANABAI GHAYTIDAK

Address - Thite nagar, Bhapkar niwas, Kharadi, Pune 411014

Highest Qualification - MA, M.ed

Members in Family with Age & Gender - 4 member, 2 male and 2 female ages 36(M),32(M),8(F),6(M)

Do not have their own electricity meter. It is a shared meter

Months electricity usage (Units) - No Data available expense (INR) - 1800 per month (avg)

Any other Electric Home appliances? - Yes, Tv , Refrigerators
Any Electric Cooking Device at home? - No

Primary fuel used - LPG (15 Kg)

Type of cooking stove? - LPG cookstove (2-burner)

Vessels used for cooking?

Kadhai

Tawa / Fry Pan

Pressure Cooker

Saucepan

Kitchen Profile

Electricity Profile

Challenges in cooking with LPG Stoves, if any? - Yes
Cost is High

PRAGATI TORKADE

Address - Thite nagar, Kharadi, Pune 411014

Highest Qualification - No data Available

Members in Family with Age & Gender - No data Available

Do not have their own electricity meter. It is a shared meter

Months electricity usage (Units) - No Data available expense (INR) - 1000 per month (avg)

Any other Electric Home appliances? - Yes, Mixer Grinder, TV etc.
Any Electric Cooking Device at home? - No

Primary fuel used - LPG (15 Kg)

Type of cooking stove? - LPG cookstove (2-burner)

Vessels used for cooking?

Kadhai

Tawa / Fry Pan

Pressure Cooker

Saucepan

Kitchen Profile

Electricity Profile

Challenges in cooking with LPG Stoves, if any? - Yes
Cost is High

GAYATRI PATIL

Address - Thite nagar, Bhapkar niwas, Kharadi, Pune 411014

Highest Qualification - 10th Pass

Members in Family with Age & Gender - 4 member, 2 male and 2 female ages 41 (M),32(F),12(M),5(F)

Do not have their own electricity meter. It is a shared meter

Months electricity usage (Units) - No Data available expense (INR) - 1900 per month (avg)

Any other Electric Home appliances? - Yes, Mixer Grinder
Any Electric Cooking Device at home? - Yes, Induction Cooktop

Primary fuel used - LPG (15 Kg)

Type of cooking stove? - LPG cookstove (2-burner)

Vessels used for cooking?

Kadhai

Tawa / Fry Pan

Pressure Cooker

Saucepan

Kitchen Profile

Electricity Profile

Challenges in cooking with LPG Stoves, if any? - Yes
Cost is High

Annexure V: Asset Register for Delhi and Pune

The link for Delhi and Pune asset register: 4 Asset Register (Delhi and Pune)

Annexure VI: Appliance requirement

Electric Cooking Devices

S. No.	Electric Cooking Device	Details	Quantity	Location	By
1.	Induction Cooktop	1200 Watt	5	Delhi	Amazon
2.	Induction Cooktop	1200 Watt	6	Pune	Aarthi
3.	Induction Cooktop	2100 Watt	8	Pune (5+3)	Aarthi (5)+Amazon (3)
4.	Electric Pressure Cooker	5 litres, 900 Watt	5	Delhi	Aarthi
5.	Electric Pressure Cooker	5 litres, 900 Watt	7	Pune	Aarthi
6.	Electric Pressure Cooker	3 litres, 750 Watt	2	Pune	Aarthi

PUNE

- Total No. of Households - **9** (5 high income group and 4 low-income group)
- **Induction based vessels are required** –

S. No.	Vessel Required	Capacity	Quantity	Remarks
1	Electric Roti Maker	900 Watt	6	Y
2	Electric Dosa Maker	900 Watt	3	Y
3	Immersion rods	1KW	4	Y
4	Tawa	–	4+5	Y
5	Kadhai	4L	9	Y
6	Saucepan	3L	9	Y
7	Cooking Pots	1L	9	Y
		1.5L	9	Y

		2L	9	Y
8	Energy Meters		18	Y
9	Extension Boards with three plug points	5A	4	Ordered
		12A	4	Not ordered

- **Pune Address for delivery**- Vishakha Chandhere, Yashodhan, Thite Nagar, Near Prakash Viva City,Bishnoi Mandir Lane, Kharadi, Pune 411014; Phone- 9890907442

DELHI

- No. of Households - **5** (low-income group)
- **Induction based vessels are required**–

S. No.	**Vessel Required**	**Capacity**	**Quantity**	**Remarks**
1	Electric Roti Maker	900 Watt	5	Y
2	Kadhai	5L	5	5 pieces of 3L
		3L		
		2L		
3	Saucepan	2L	3	5 pieces- 2L
		1.5L	2	
4	Tawa		5	Y
5	Dekchi/Handi/Round bottom cooking pots	1L	5	Y
		2L	5	Y (Saucepan)
		3L	5	
6	Extension boards points (3 plug points)	6A	5	Y
		12A	5	Y
7	Energy Meters	--	10	Y

[i] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6719866/