



Developing local electric cooking after sales services and the impact of different appliance subsidy mechanisms on electric cooking uptake in Mahankal Rural Municipality

Alina Dangol

Environment Officer

People, Energy and Environment Development Association (PEEDA)





Outline of the presentation

- Background of the study
- Major Findings: impact of appliance subsidies on eCooking usage
- Major findings: developing local after sales services
- EPC & Induction Stove Repair Manuals and Repair Training Module
- Major Takeaways and Recommendations



Background of the study

Objectives:

- Assess the impact of subsidies on the usage of e-Cooking appliances in Mahankal Rural Municipality.
- Developing local after sales services to support a sustainable electric cooking system in Nepal

Site : Mahanakal Rural Municipality , Lalitpur

- Government intervention: provided almost all municipality households (~2000) with a free induction stove.
- PEEDA's intervention: supported 110 municipality households with a 60-70% subsidy on the upfront cost of an EPC.

Questionnaire survey

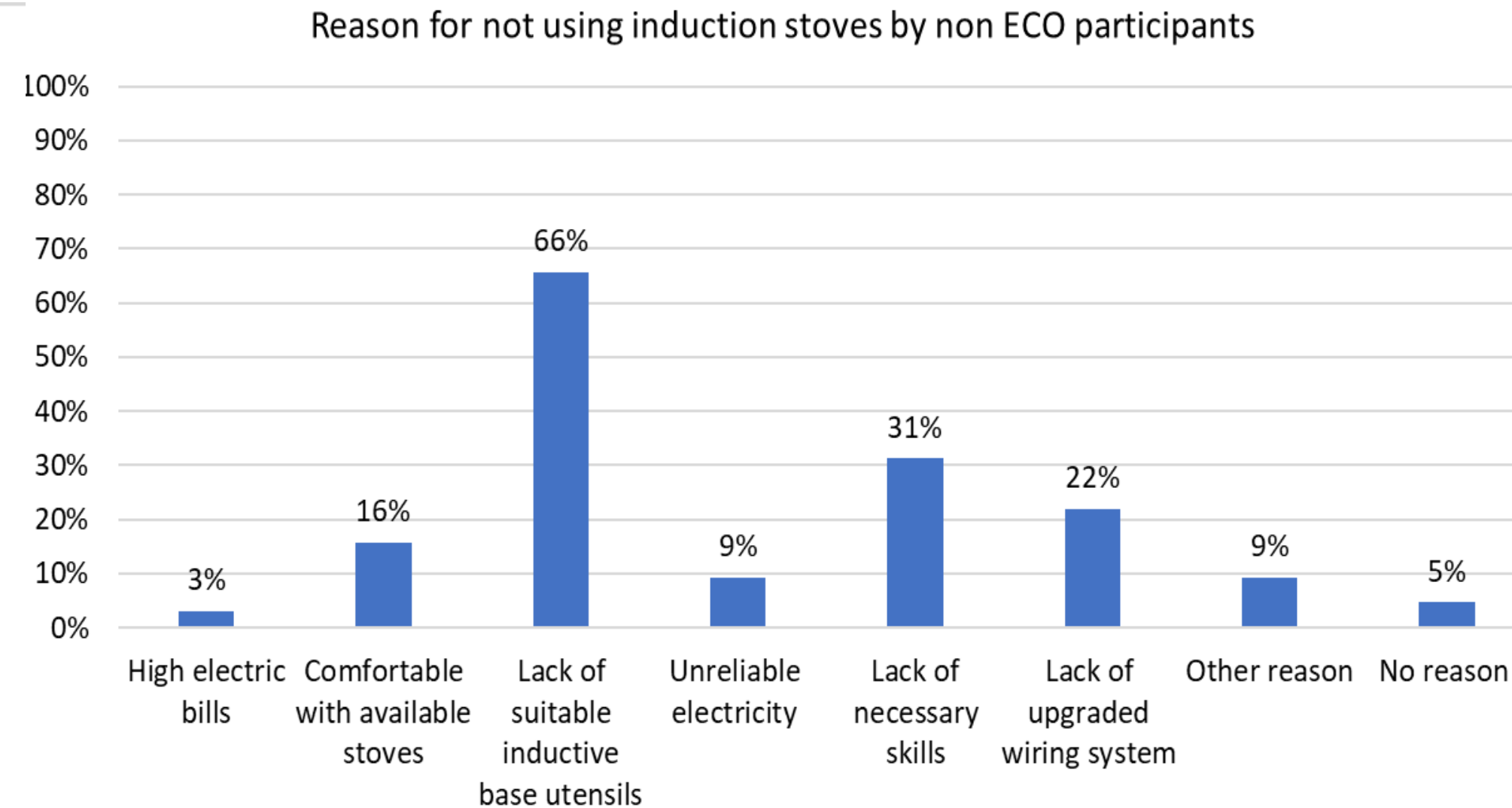
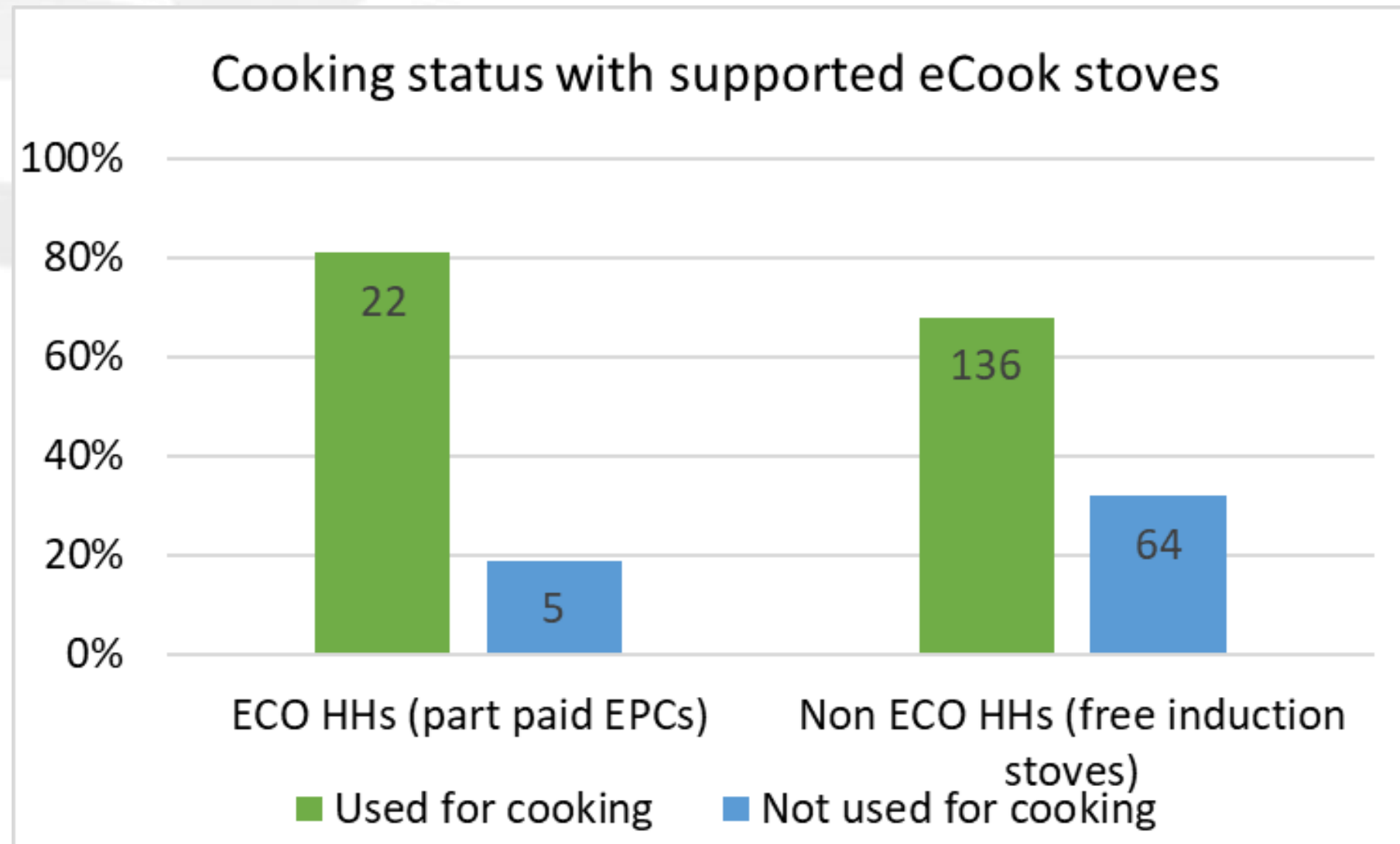
Sample Size: 32 households from PEEDA's beneficiaries (part paid EPC users) and 202 households from government's beneficiaries (free induction stove).

Secondary data from five other MECS ECO eCooking pilots (4 in Nepal, 1 in Tanzania)

Assessing the impact of subsidies on the usage of eCooking appliances in Mahankal Rural Municipality.

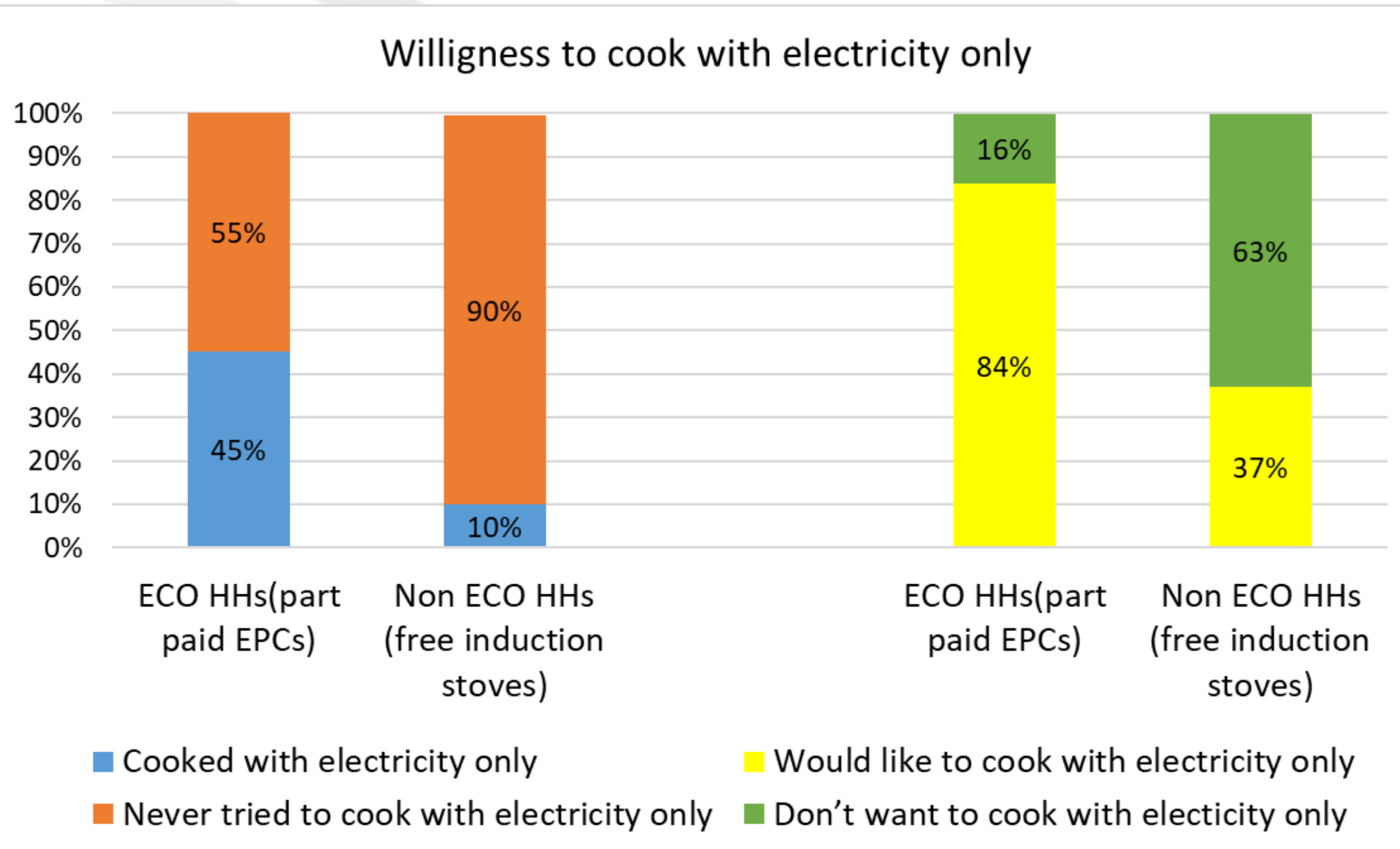


Major findings



- **Subsidy types:** PEEDA subsidy for EPCs = 60-70% of the appliance cost / Local Government subsidy for Induction stoves = free but without compatible utensils provided
- **eCooking stoves in use:** 13% higher among the households that part-paid for their EPCs (ECO HHs) compared with the households receiving free induction stoves.
- **Reason for non-use:** By far the main reason for households not using induction stoves was a lack of compatible cookware

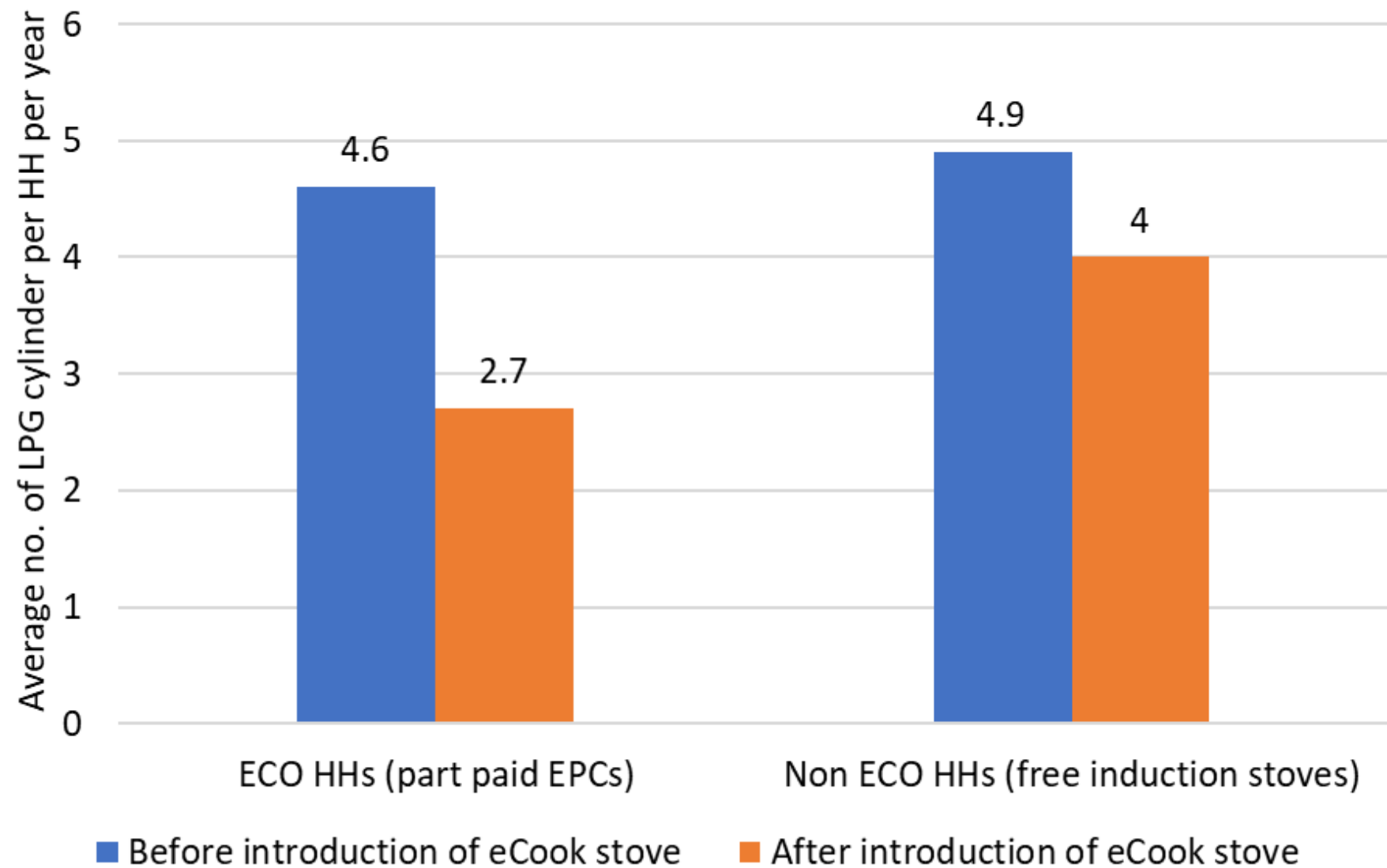
Major findings



- Eco participants were more willing to cook 100% with electricity than non-Eco.
- Eco participants had access to improved choice (most had both and EPC and induction stove) and after sales services – both key for facilitating and potentially motivating larger eCooking transitions.

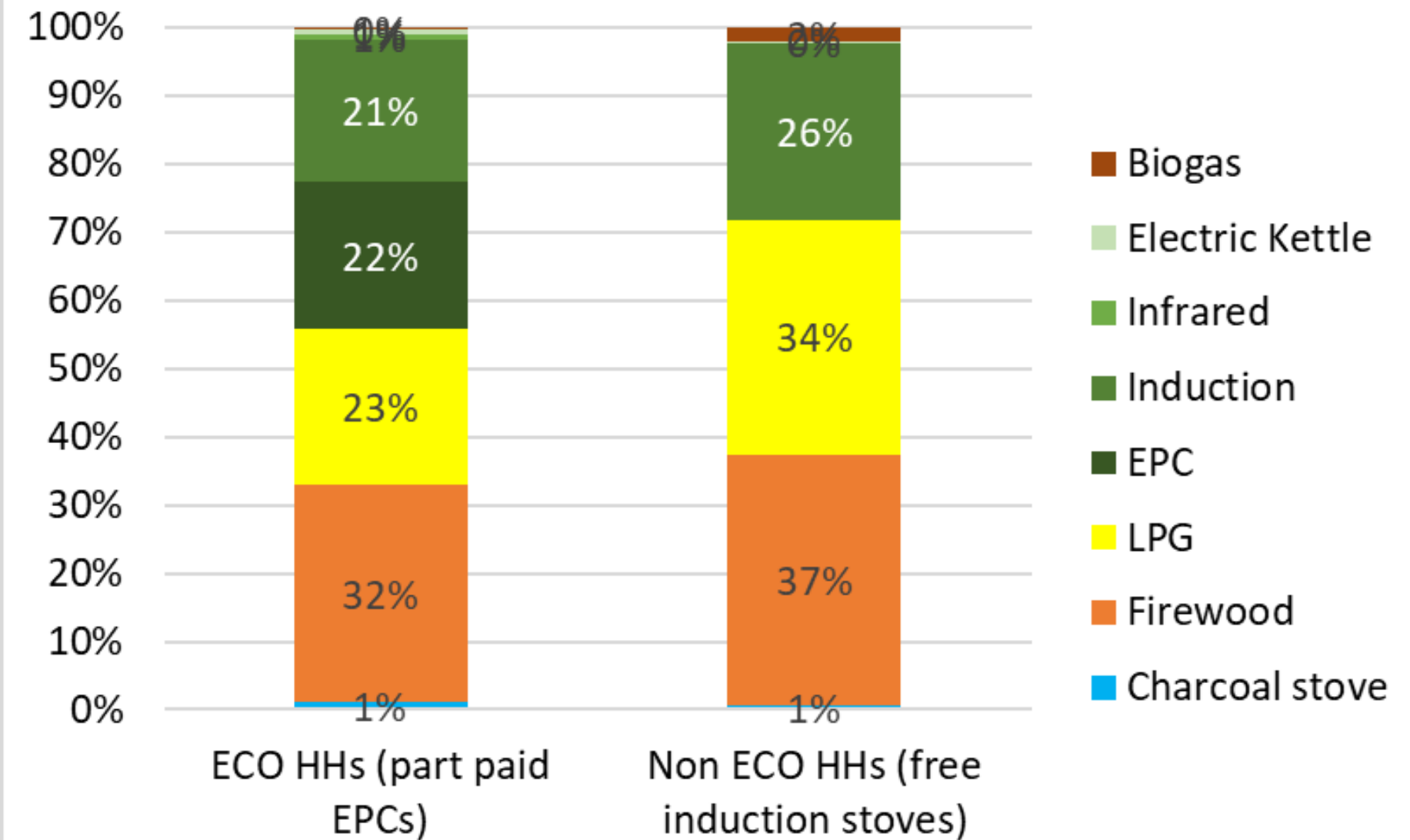
Major findings

Change in consumption of LPG cylinder



ECO HHs reduced their LPG usage by 41.3% compared to 19.6% in non-ECO HHs.

Fuel stack



ECO HHs had a greater choice of electric cooking appliances, which was key to unlocking simultaneous eCooking and the use of electricity as the primary fuel for cooking.

2. Developing local after sales services to support a sustainable electric cooking system in Nepal



Roadmap of Activities

Created repair inventory



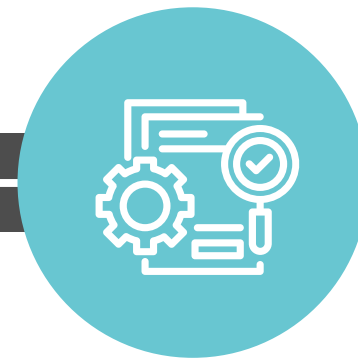
Identifying the trainee profiles and their requirements



Institutionalize electric stove repair sector



Developed repair training module and repair manual



Repair and maintenance training at the local level



Fault points identified with EPCs

Pilot Projects by	EPC Brand	Total Survey	Total Issues	Total Critical Issues
PEEDA (Nepal)	Urban	32	21	10
WACN (Nepal)	Philips	80	6	0
EPC (Nepal)	Geepas	30	36	5
Practical Action Consulting (Nepal)	Sinbo	30	1	1
SESCOM (Tanzania)	SESCOM	40	7	2
Total number		212	71	16

EPC Repair data from 5 MECS ECO Pilot studies analysed.

The most common non-critical issues (but still affecting usability):

- Loss of coating on inner pot (31 devices).
- EPC display not turning on (10 devices).

The most common critical issues (appliance no longer useable):

- EPC not turning on (9 devices),
- Inner pot not heating (3 devices)
- Faulty power cord (3 devices).

Kathmandu repair center interviews reported similar issues

Fault points identified with induction stoves

Induction stoves technical issues: two case studies (Nepal)				
Technical issue	Induction stove		Induction stove	
	Chaudhary Group		PEEDA study	
	n =	41	n =	131
Stove doesn't turn on	1	2.4%	2	1.5%
Making strange noises	1	2.4%	1	0.8%
Electric shock (wet hands)	1	2.4%		
Integrated circuit damaged	1	2.4%		
Fuse damaged	1	2.4%		
wire short circuit due to cockroaches	1	2.4%		
Buttons not working			4	3%
Fractured cooktop			3	2.3%
Blocked air vents/internal fan not moving			3	2.3%
Shuts off unexpectedly			1	0.8%
TOTAL issues	6		14	
Average % of HHs affected by an issue				
TOTAL critical issues	2	4.9%	2	1.5%

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Two Nepal ECO pilot studies analysed (see table)

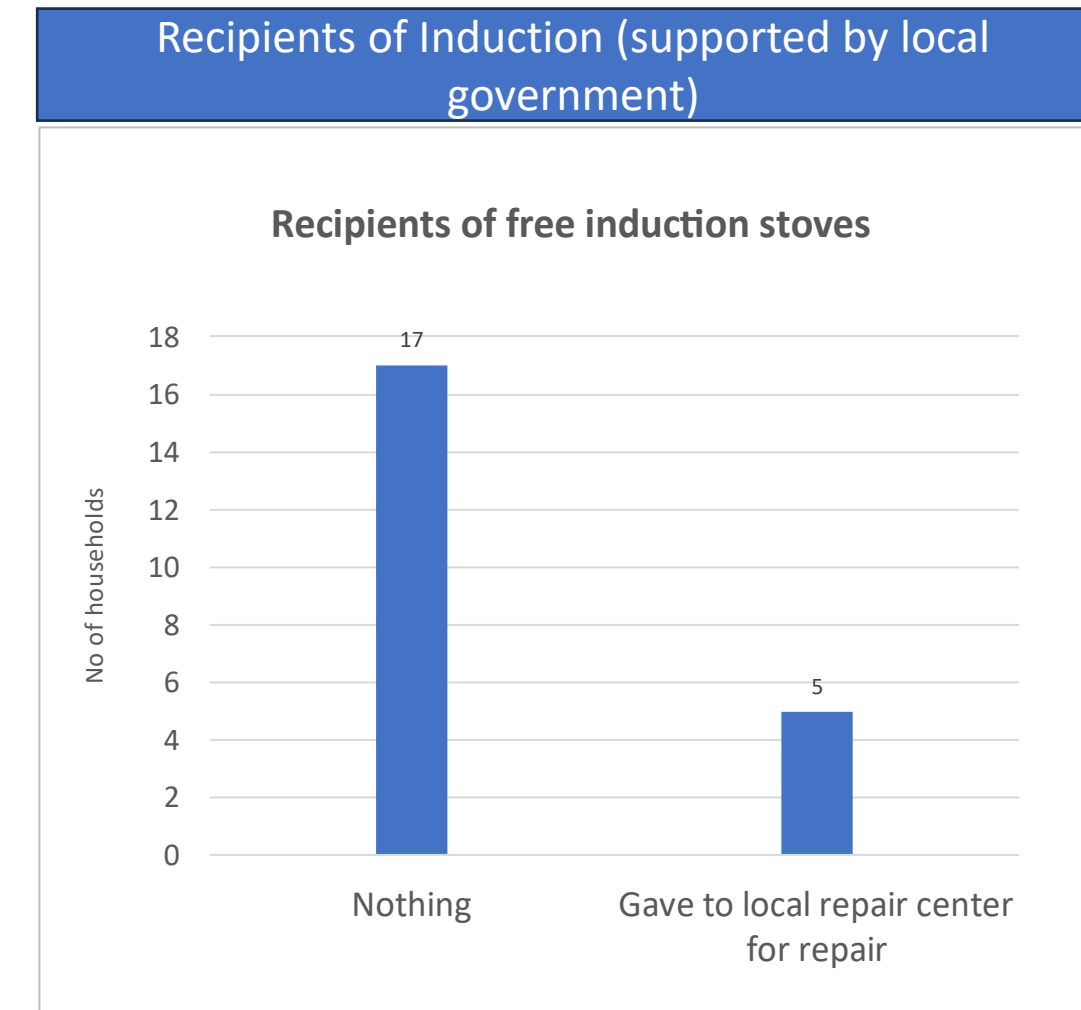
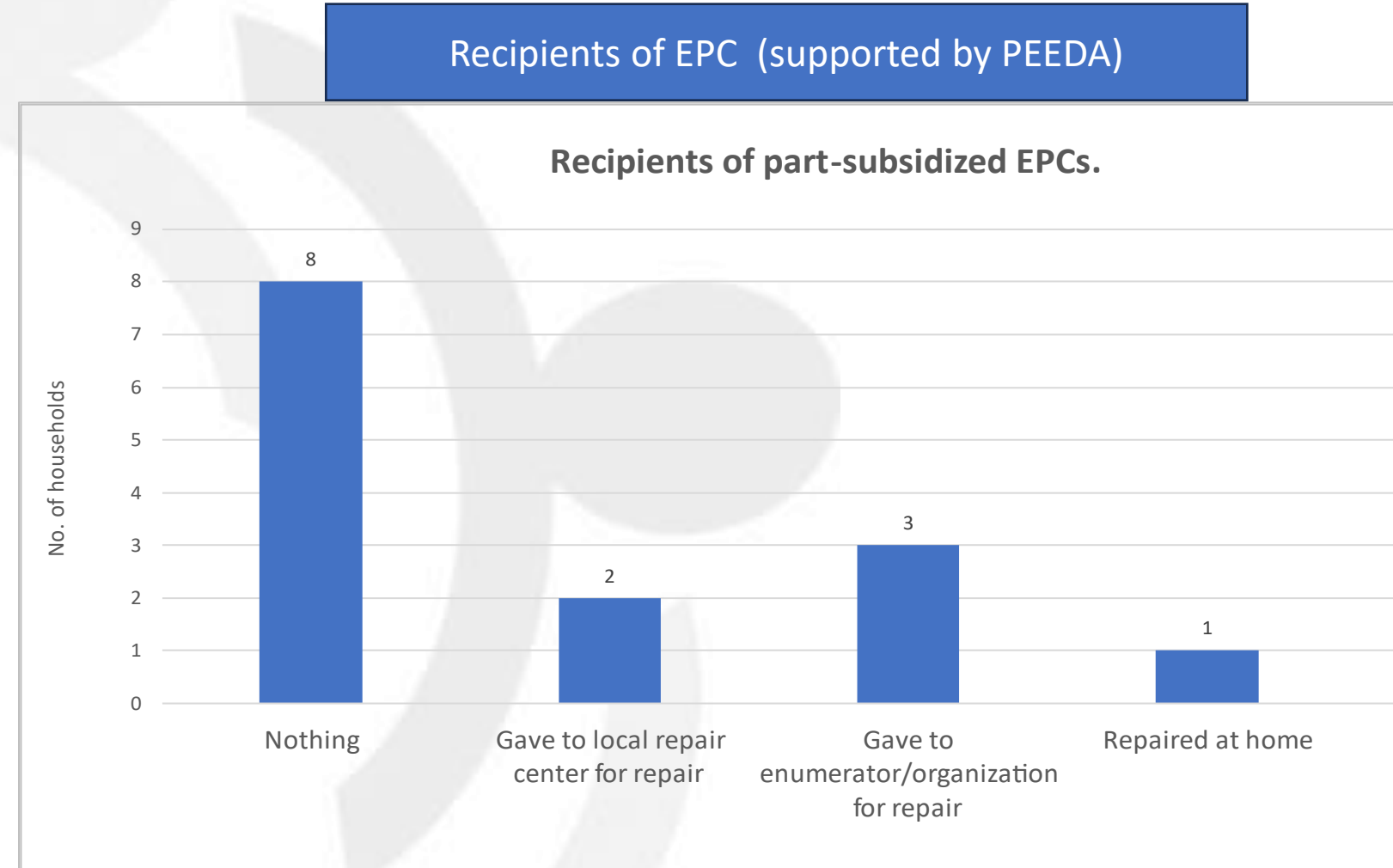
- Reliability and durability was approximately equivalent to the three better performing EPCs

2

Kathmandu repair center interviews

- **Damaged IGBT** (Insulated Gate Bipolar Transistor) **by far the main issue – ~90% of all repairs.**
- Causes. IGBTs get heated over time and melt/burn due to poor ventilation and heat transfer; poor quality parts; short-circuiting from cockroach fecal matter.

How did households deal with repair issues?



- People frequently did nothing if their eCooking appliance malfunctioned
- This problem was far more common with the freely distributed inductions stoves (77%) than the part paid for EPCs (44%) (despite the Electron EPC's poorer durability).
- Recipients of the part paid for EPCs were part of a pilot study and received after sales support; recipients of the free induction stove did not.
- Free distribution of eCook appliances and no provision of after sales services correlates with low use of repair. **These kinds of interventions are therefore not recommended.**

Impacts of unavailability of local repair service

- 1 Households likely to switch back to traditional stoves and firewood.
- 2 Households reduced the frequency of stove usage and refrained from experimenting with different dishes on electric stoves due to fear of damaging the stove.
- 3 Piling of the electric waste in the households.



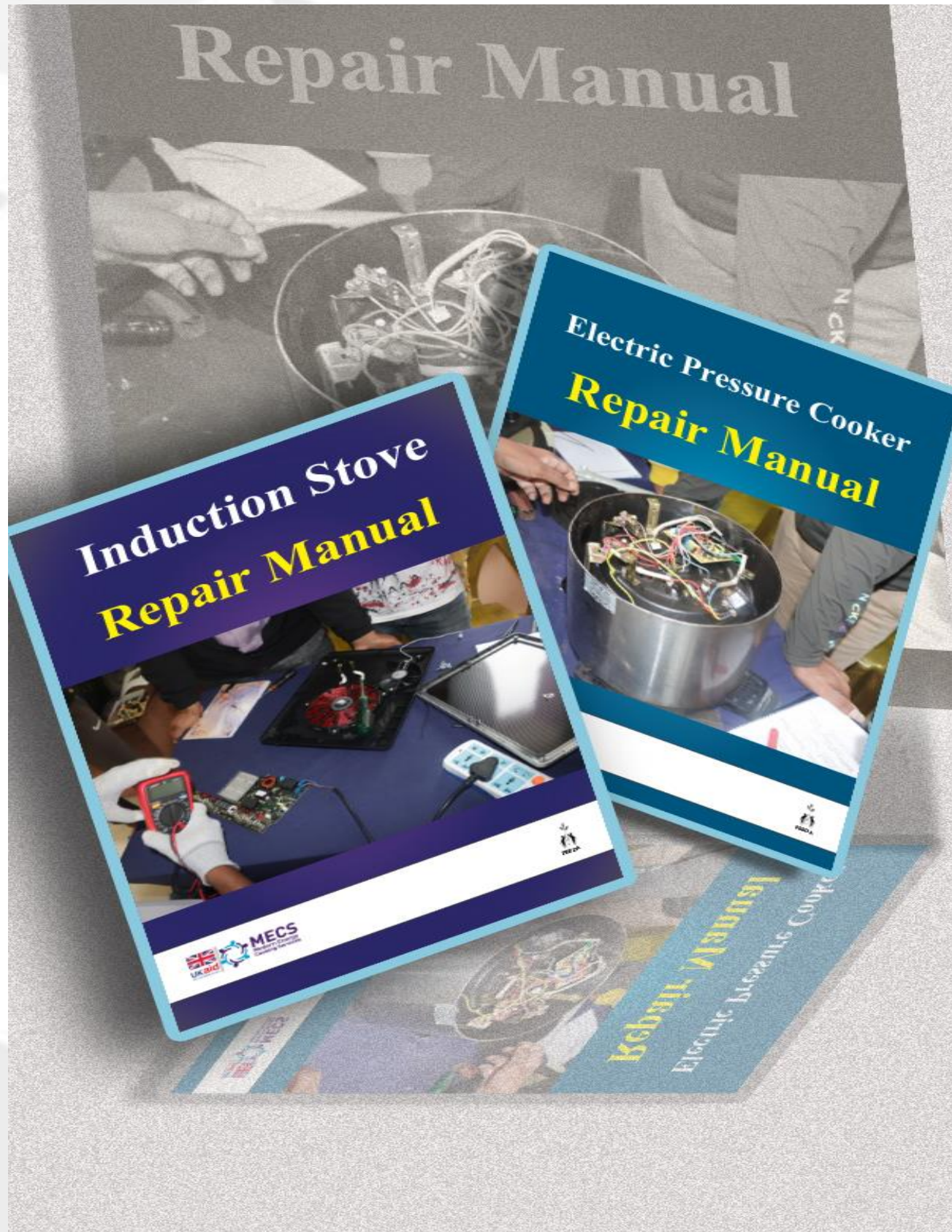
Review of repair and maintenance service of some major technology providers in Nepal

Topics	Him Electronics	Baltra	CG
Information on the structure of service centers	Have a centralized structure . But could send their authorized repairers once a month in demanded areas.	We have a decentralized structure .	Service centers are mostly in the bigger cities in Nepal.
Provision for providing the repairer/technician with certification	Have provision of providing local technicians training and the certification required to repair their products. But the trainees should meet their guidelines.	There is no provision for training and certification of individuals outside their organization.	Training may be provided to individuals outside the organization under certain conditions, but no certification will be given to external participants. This allows technicians to support the community, but the warranty won't be applicable .
Providing spare parts to the certified trainees	Yes, provide the local repair centers with major replacement parts.	N/A	N/A

Availability of spare parts in the Nepali market and the average repair cost for induction stoves and EPCs

Questions	Electron EPC/Induction distributor	Shankar Electronics (Local Shop & repair center	CG Service Center	Urban EPC distributor
Spare parts	Directly from the vendors in China or India. Small common parts like resistors, capacitors from local markets in Kathmandu.	Usually, from the local market in Kathmandu. sometimes, from India	Small components from the local market. Boards or displays are ordered from vendors in China or India.	Mostly from China.
repair/maintenance cost	varies from NPR 500 to 1,000.	costs NPR 1,200 to 3,000.	NRP 500 to 1,500.	around NRP 1,000.

Detail of the Repair Manual and Training Module



Training module for the repair and maintenance of electric pressure cookers and induction stoves.

Guide for Trainers

Contents of the Repair Manual

Developed
from the repair
study findings

- Step-by-step instructions for diagnosing issues and repairing
- Information on tools required
- Dismantling stoves and familiarising with stove parts
- Safety and storage
- end of life and eWaste
- Component testing
- Troubleshooting of the issues (error codes)

Importance of Repair Manuals for Electric Cookstove Repair

- **Standardized Procedures:** Training manuals provide clear, step-by-step guides that ensure consistent repair practices, reducing errors and improving safety.
- **Skill Development:** Helps technicians gain practical skills, fostering self-reliance, especially in remote communities.
- **Sustainable Impact:** Manuals enable participants to reference critical repair information after training, leading to long-term empowerment.
- **Promoting Best Practices:** Manual ensures the longevity and efficiency of electric cookstoves, reducing E-Waste, contributing to climate action.

Importance of Training Modules for Participants and Trainers

- Comprehensive Curriculum: Modules ensure both technical and non-technical aspects of electric cookstove repair, including diagnostics, component replacement, and energy efficiency.
- Capacity Building for Trainers: Provides trainers with standardized tools and methods to deliver high-quality, consistent instruction.
- Techniques to enhance cookstove performance, focusing on recalibration, insulation improvements, and promoting energy-efficient cookware.
- Promoting Gender Inclusion: Training modules can focus on empowering women entrepreneurs in e-Cooking repair, fostering entrepreneurship and inclusive growth, modeled after successful international examples like Kenya.

Developing Repair Training Module and Repair Manual

- Training institutes lacked proper training modules or manuals, relying mostly on the trainer's experience.
- Vocational institutes only offer repair training for traditional electric appliances, excluding induction stoves and electric pressure cookers.
- The training module and manual was developed in coordination with the vocational institution

Based on trainee profiles, two versions of the training module are developed

1

Version 1 – a shorter 2-day programme for more experienced technicians
(Theory Time: 2 hrs
Practical time: 10 hrs)

2

Version 2- a longer 5-day programme for less experienced technicians
(Theory Time: 6 hrs
Practical time: 24 hrs)

Identifying the Trainee Profiles and their Requirements

	Untrained potential trainee	Technician with basic training and no experience in repair	Technician with basic training and experience in repair
Profile	Have interest but lack technical training	Completed Basic electrical and electronic training but no hands-on experience	Completed Basic electrical and electronic training and more self-reliant and capable of handling basic repairs independently
Requirement before taking module	Should take the course of basic electrical and electronics training	None	Trainees should be embedded within the local repair supply chain
Type of training module	5-days version	5-days version (Theory Time: 6 hrs Practical time: 24 hrs)	2-days version (Theory Time: 2 hrs Practical time: 10 hrs)

Local level training workshop

- 2-day training program in Mahankal Rural Municipality
- 4 technicians trained

Trainee Profile

- Three had repair shops and had been carrying out repairs for many years of other electronic devices such as TVs, radios, water pumps, and mobiles
- Have been doing house wiring work in the local communities. No previous experience of electronic repair



Evaluation of the training

The training facilitated hands-on success:

- 12 induction stoves and 5 EPC (Electric Pressure Cookers) were diagnosed and repaired following the theoretical session.
- Participants demonstrated strong learning outcomes and technical skills.

Challenges Observed:

- Some participants were overwhelmed with the tools and repair process.
- While others finished early, a few skipped appropriate steps, impacting their understanding of the repair sequence.

Feedback from Trainees/Trainers:

- Positive feedback highlighted the clarity of theoretical sessions and practical application.
- Participants expressed confidence in diagnosing and repairing similar devices in the future

Impact:

- Enhanced repair capacity among participants.
- Practical outcomes showcase the training's immediate success while identifying areas for improvement in pacing and support

Endorsements

Statements of support at PEEDA workshop 1

- **The Council for Technical Education and Vocational Training (CTEVT):** willing to integrate the manuals into their training module on home appliance repair and maintenance.
- **Alternative Energy Promotion Centre (AEP):** willing to make the module and manual a key component of the provision of the aftersales service in their future interventions including the GCF-funded eCooking project targeting 500,000 households.

Supported by:



Major Takeaways and Recommendations

- Interventions should prioritize sensitization on eStoves and provide eStove operation training to the community
- Subsidy schemes which require beneficiaries to buy compatible cookware for induction stoves provided for free result in lower usage rates.
- To help enable electricity to be the primary cooking method, subsidy schemes in rural communities should consider providing support for suitable cookware and upgrades to household wiring infrastructure
- Lack of repair facilities is identified as a key barrier to adoption.
- Alongside other more easily tested assessment criteria, durability is important to be considered to inform procurement decisions and enable sustained eCooking use.

Major Takeaways and Recommendations

- Prioritization of cost over quality and reliability through bulk procurement risks potential future benefits (e.g. from carbon finance). The aim of clean cooking promotion is its uses not the distribution
- To maintain standards of repair and enable widespread outreach, the repair training and materials should be institutionalized
- Spare parts: When stocking spare parts, prioritize replacement components for common fixable issues.
- Local development of eCooking repair services is urgently needed with training and materials covering (as a minimum) the most common repairable issues.



“The future of electric cooking is its uses, not only the distribution.”