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IMPACT OF THE ELECTRICITY PRICE INCREASE ON HOUSEHOLDS: Targeting the Poor and Vulnerable for Relief

Phase 1- Preliminary findings

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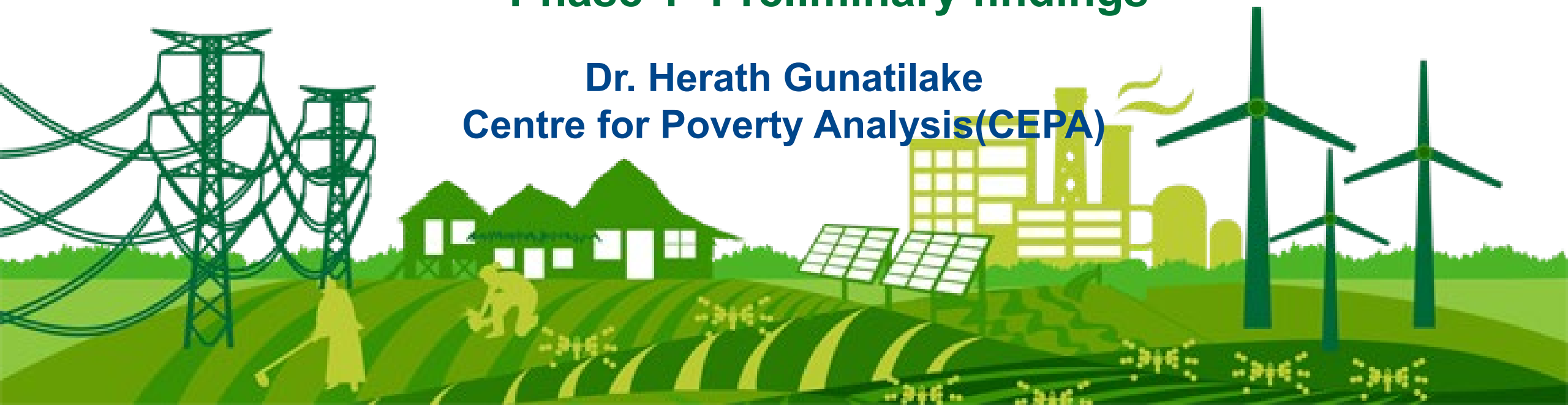
Centre for Poverty Analysis(CEPA)



Context

- Unprecedented Electricity Price Increase since August 2022
  - 705 % increase of Fixed Charges
  - 264% increase of variable charges
- Very high Increases for poor households
  - Less than 30 kWh – 1138% increase
  - 30-60 kWh – 813% increase
- 247,250 HH disconnected in 2022
  Over 1 million HH disconnected in 2023

Objective of the Survey

Assess the impact of electricity price increase on the HH and help design relief measures

Outline of the Presentation

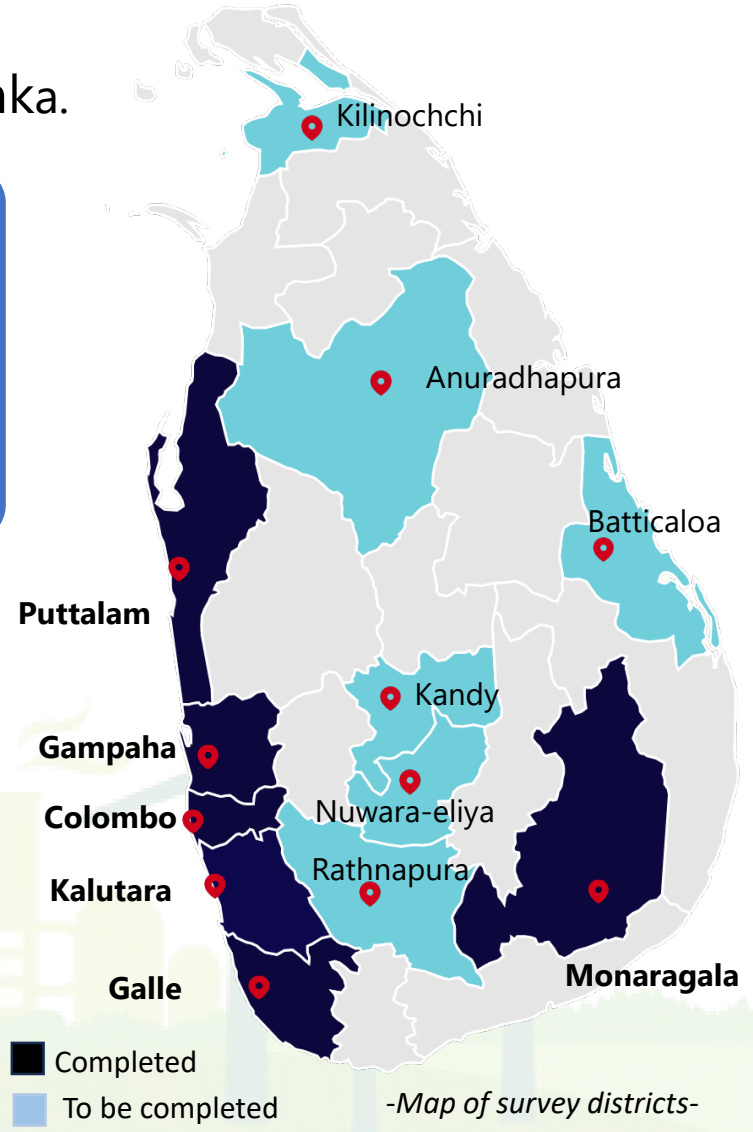
1. Objectives, sampling, and progress of the survey
2. Selected highlights of the impacts of higher tariff
3. Perceptions on pre-paid system and smart metering
4. Measuring poverty using electricity consumption
5. Energy vulnerability assessment
6. WTP for concessionary solar power

Survey Sample

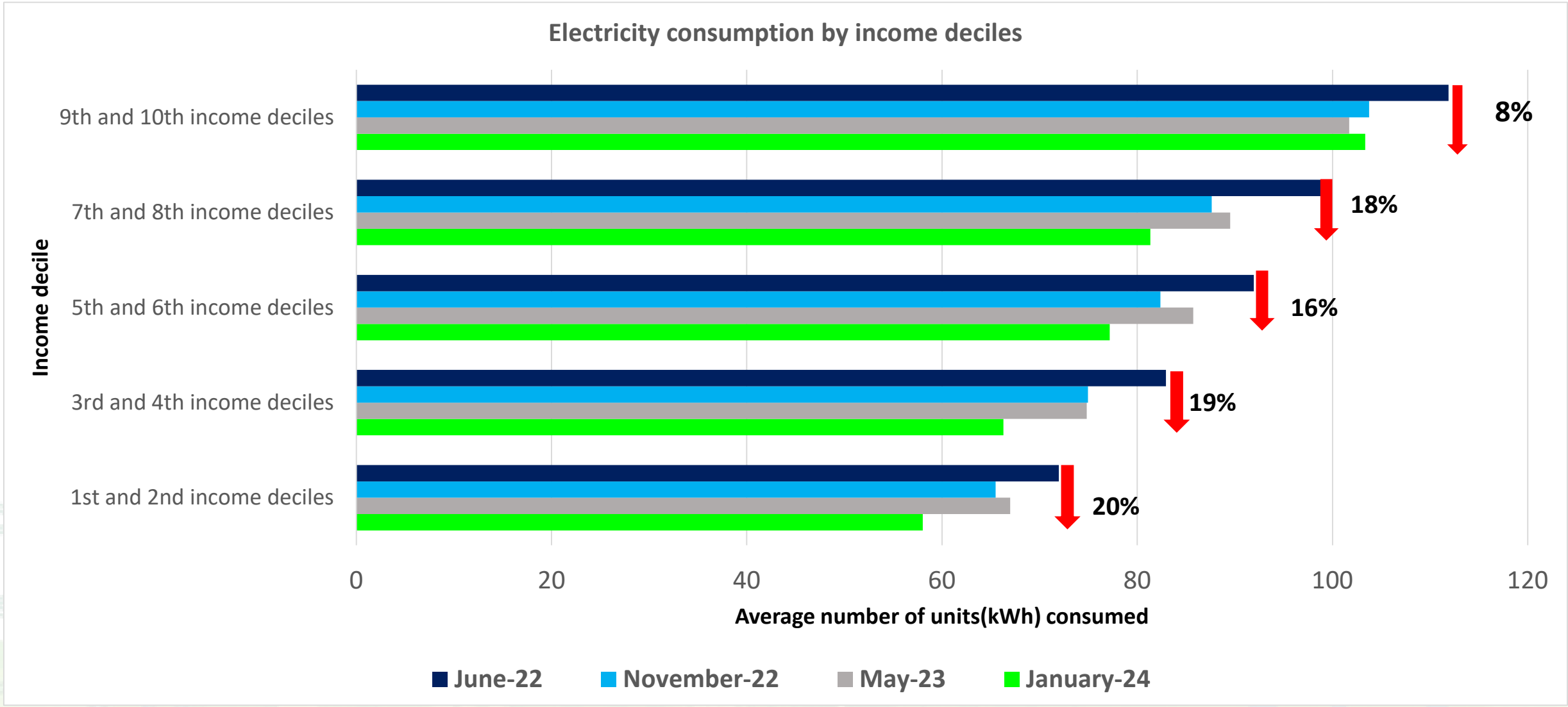
- The total sample comprises of 2500 households in 12 districts in Sri Lanka.

District → **1 Divisional Secretariat Division** (208 Households) → Randomly selected **4 Grama Niladhari Divisions** (52 households per GN division)

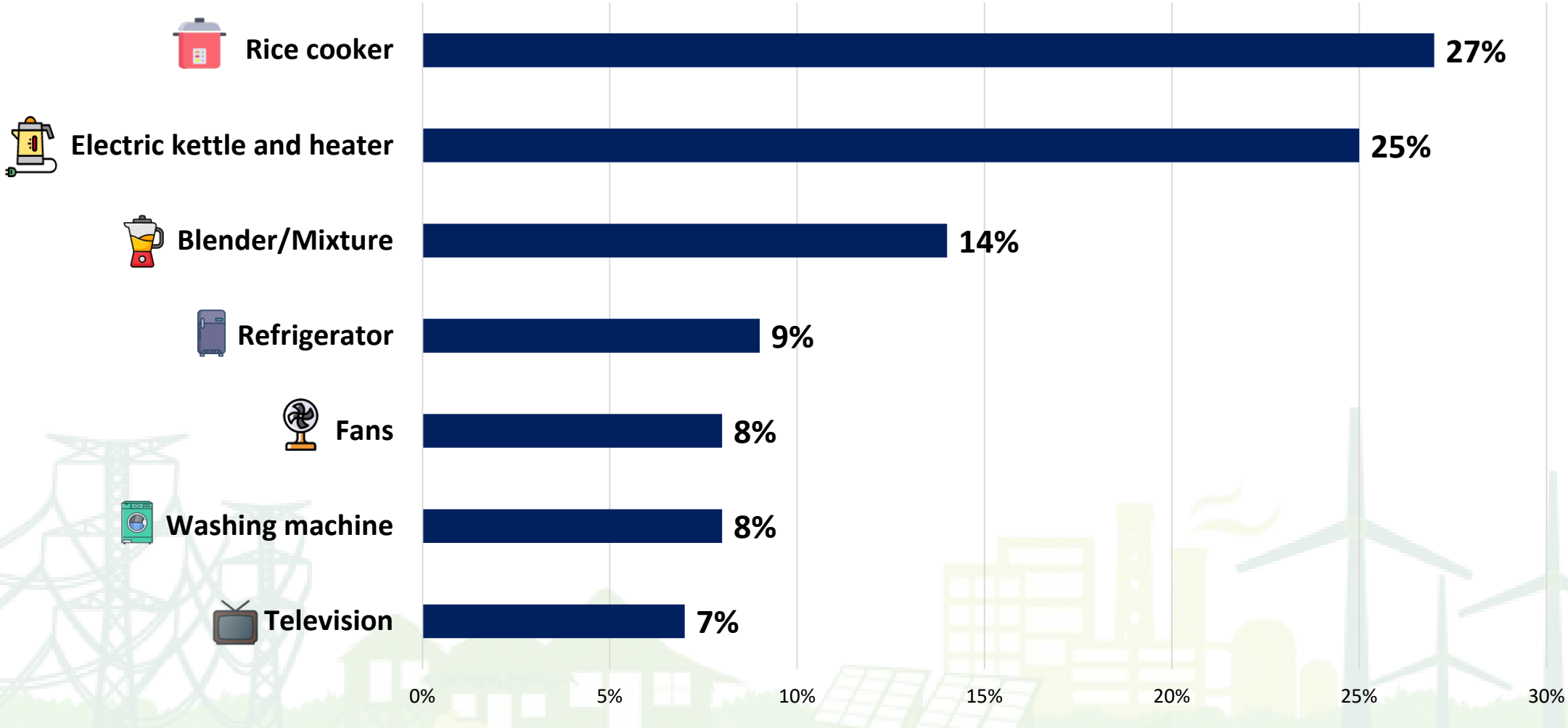
- Phase 1 data collection was completed in 6 districts **(Colombo, Gampaha, Kalutara, Galle, Puttalam and Monaragala)** from February to March 2024, surveying 1301 households.

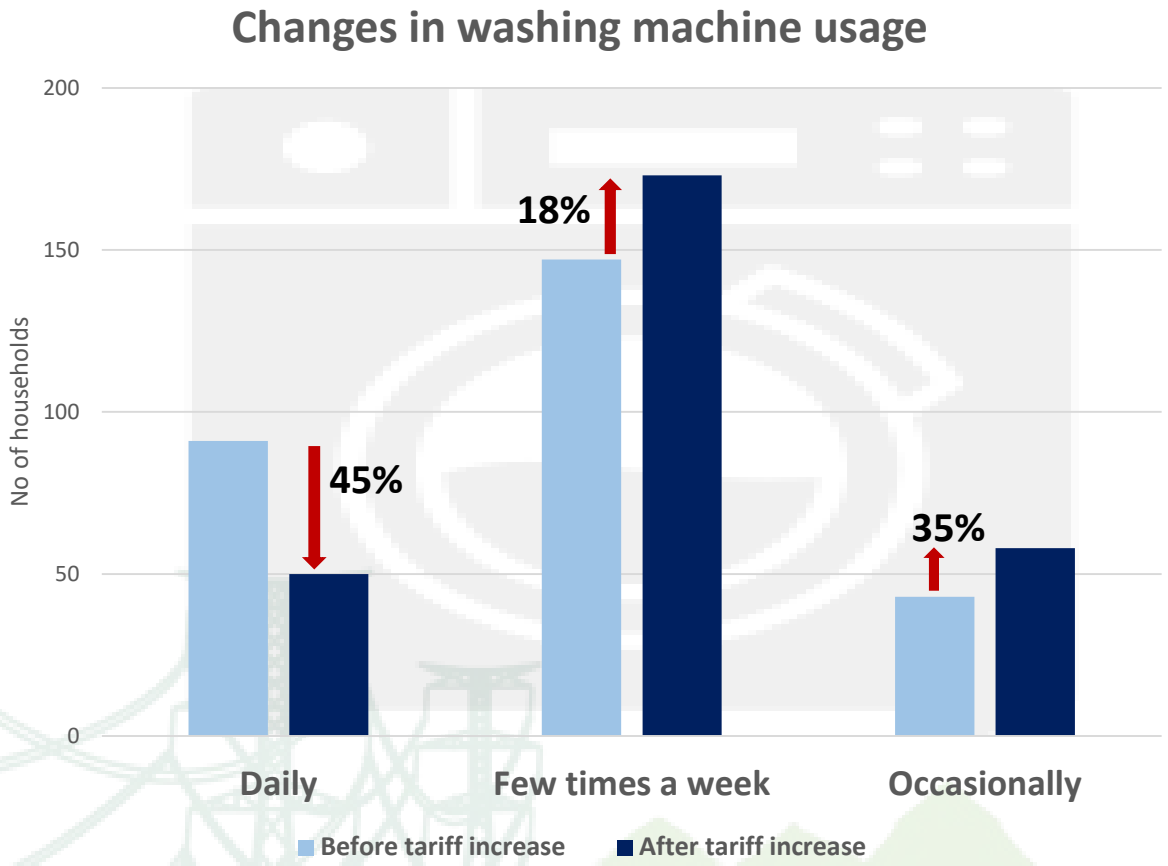


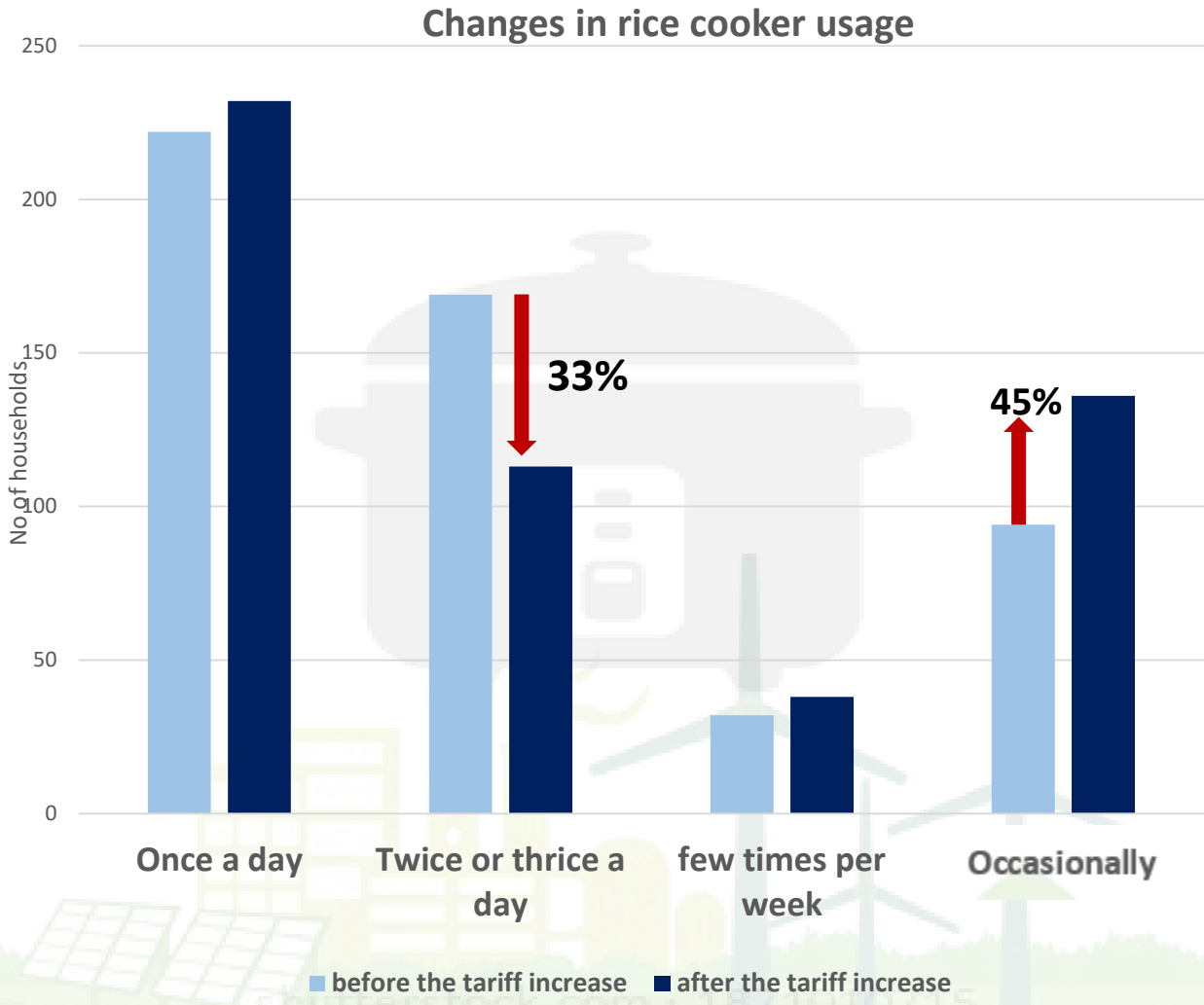
-Map of survey districts-


Electricity consumption by income deciles
9th and 10th income deciles
7th and 8th income deciles
5th and 6th income deciles
3rd and 4th income deciles
1st and 2nd income deciles
Income decile
8%
18%
16%
19%
20%
0
20
40
60
80
100
120
Average number of units(kWh) consumed
June-22
November-22
May-23
January-24

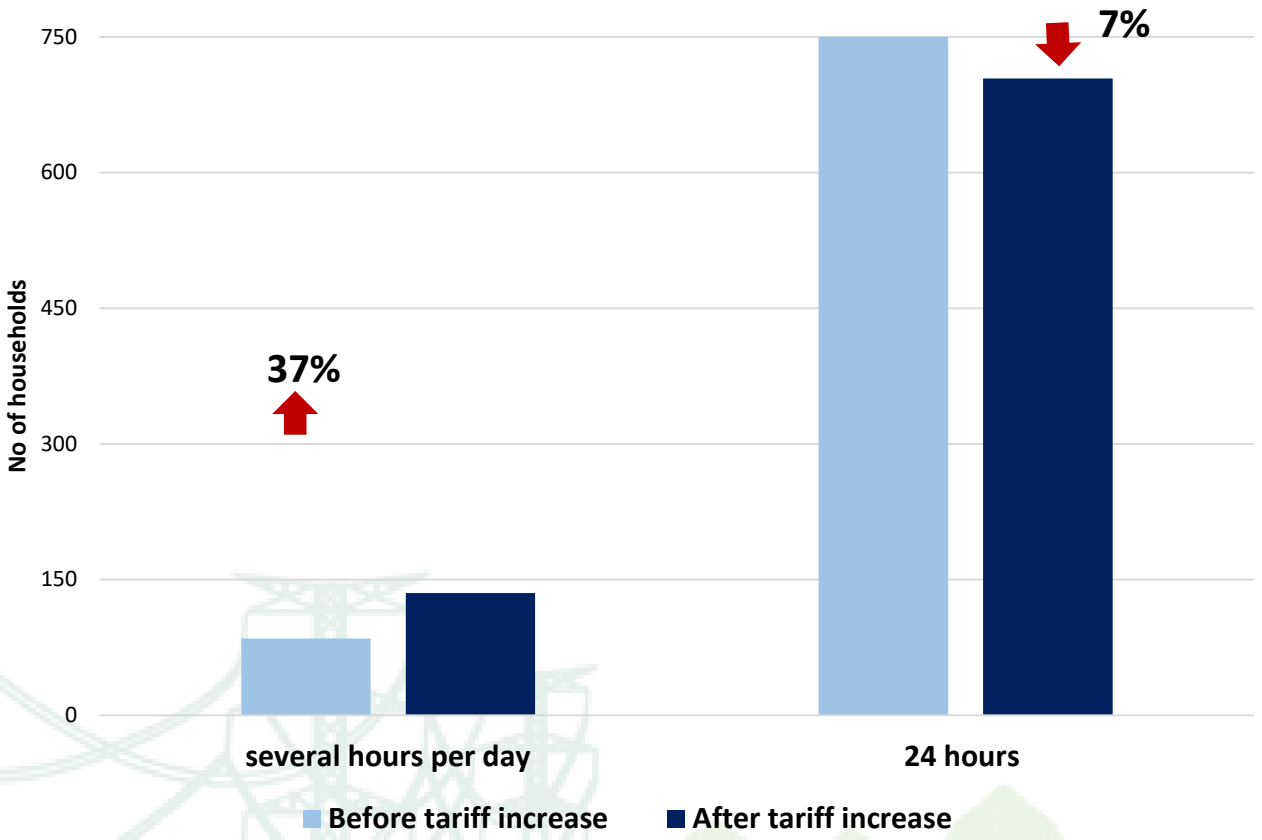
Appliances No Longer in Use due to Tariff Increase



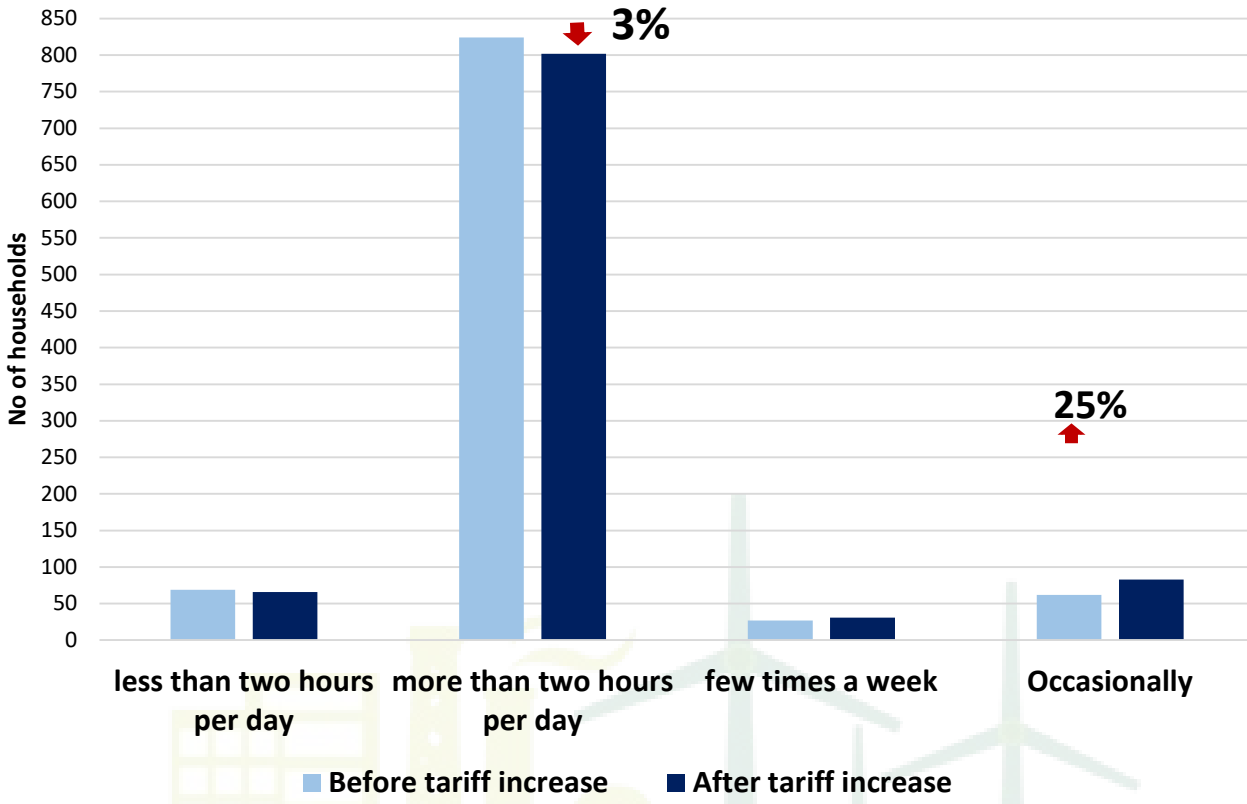

Changes in washing machine usage
No of households
200
150
100
50
0
45%
18%
35%
Daily
Few times a week
Occasionally
Before tariff increase
After tariff increase


Changes in rice cooker usage
No of households
250
200
150
100
50
0
33%
45%
Once a day
Twice or thrice a day
few times per week
Occasionally
before the tariff increase
after the tariff increase

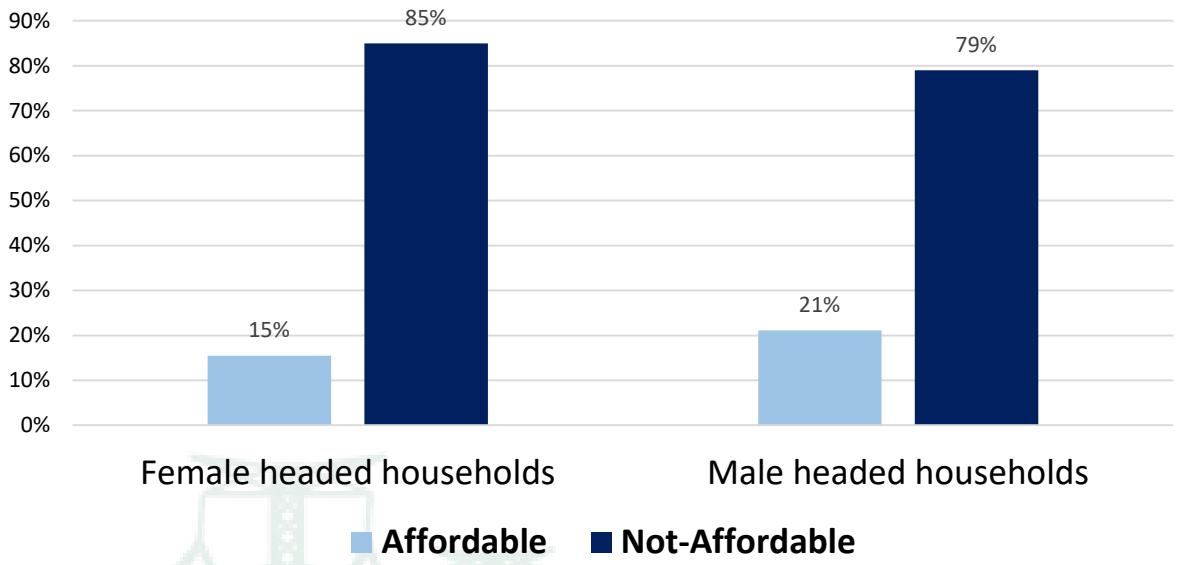
Changes in refrigerator usage



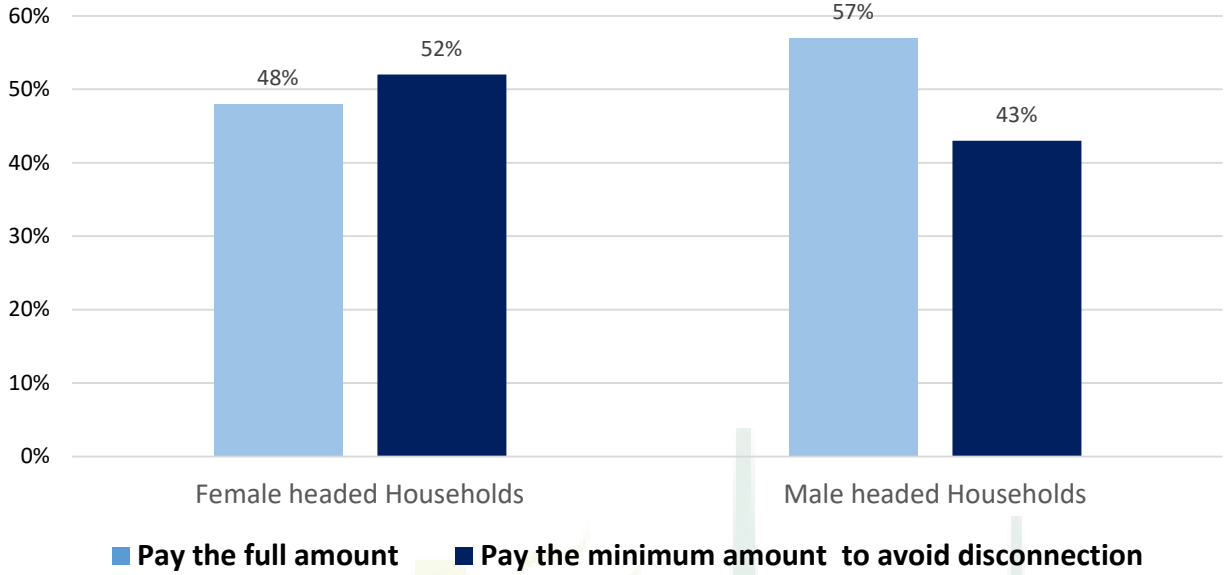
Changes in television usage



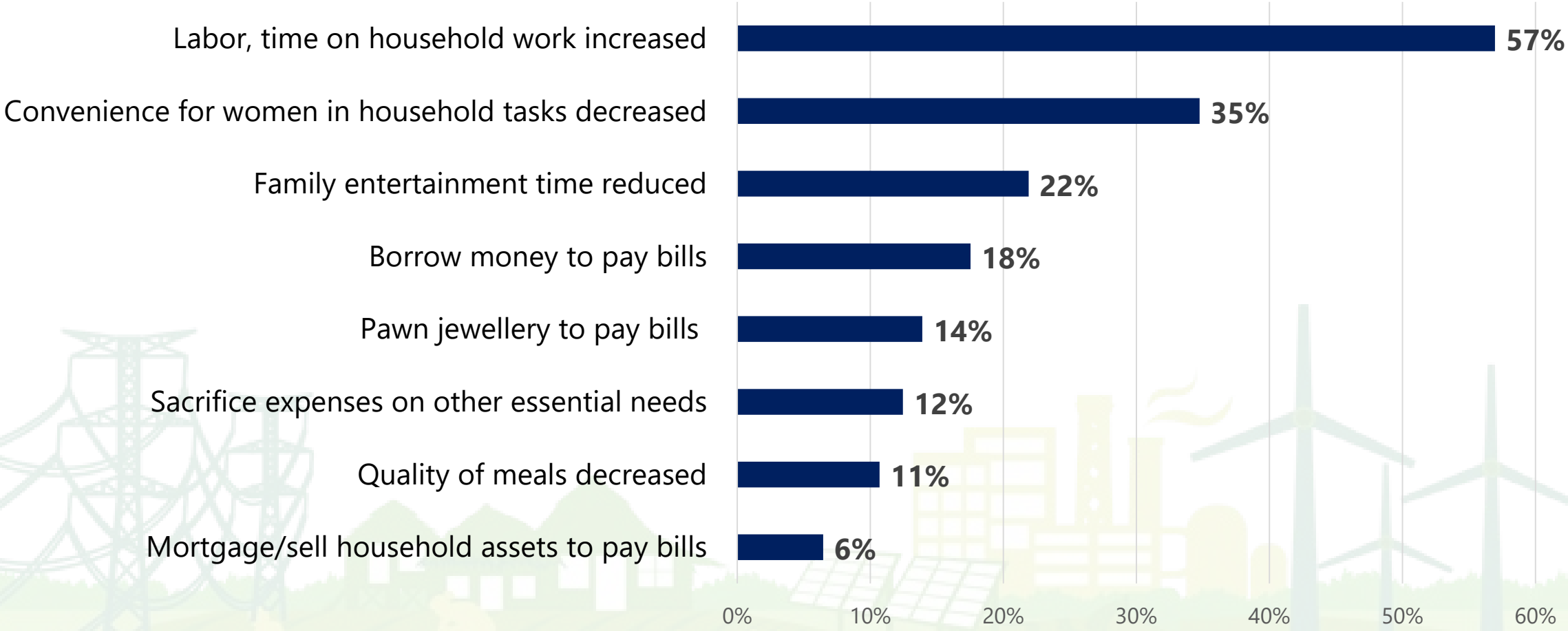
Affordability of the electricity costs disaggregated by gender of head of household



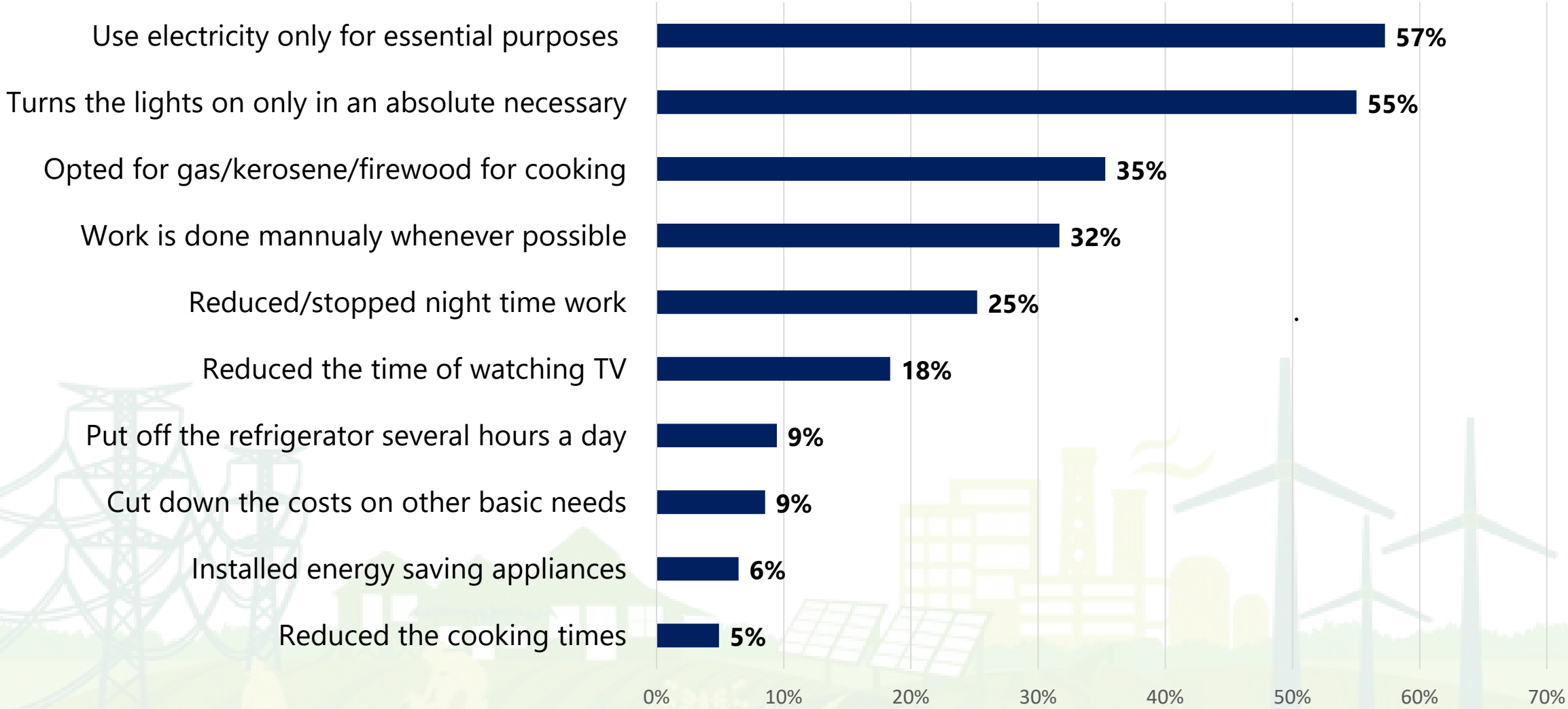
Practice of electricity bill payment disaggregated by gender of head of household



Household level impacts of the electricity tariff increase

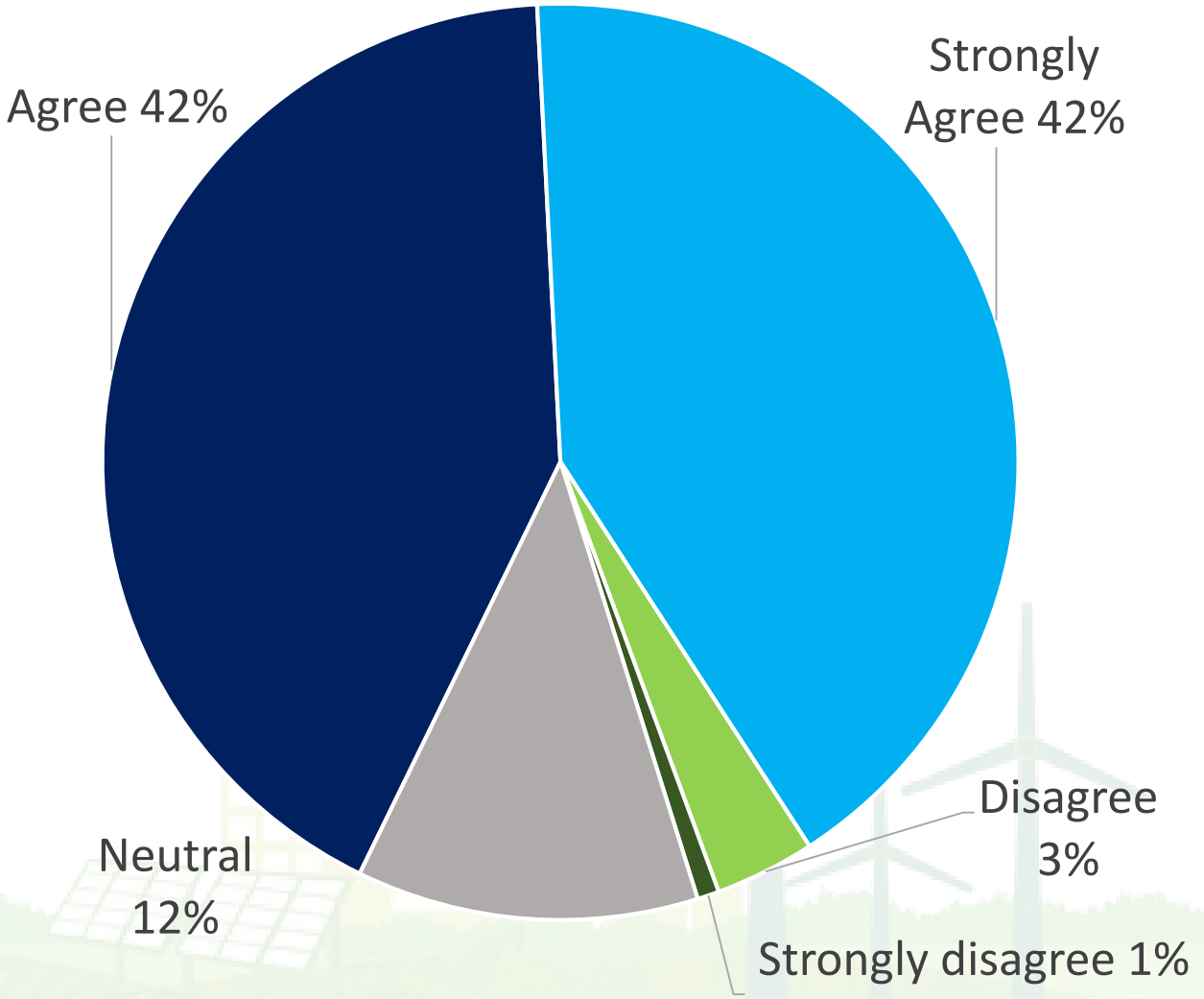


Actions taken to manage the electricity costs



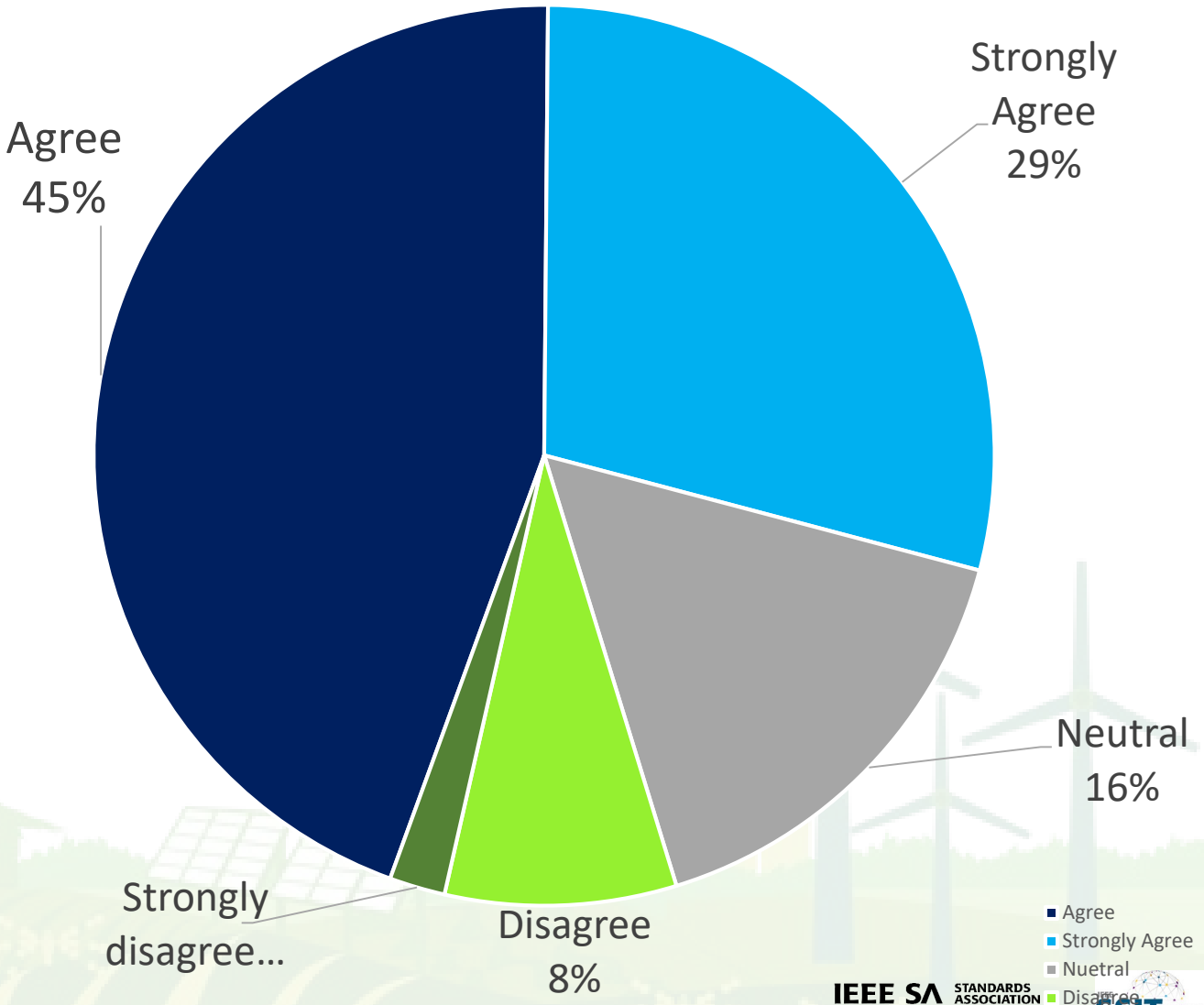
Perceptions on Electronic Metering System

- If an electronic meter system with ability to reconnect the electricity without charging a fee after a disconnection, it would provide a relief to our household.



Perceptions on Pre-Paid Billing System

- A billing system enabling prepayments at any day of the month (like mobile phone recharging) would reduce the risk of being disconnected



Determinants of Poverty

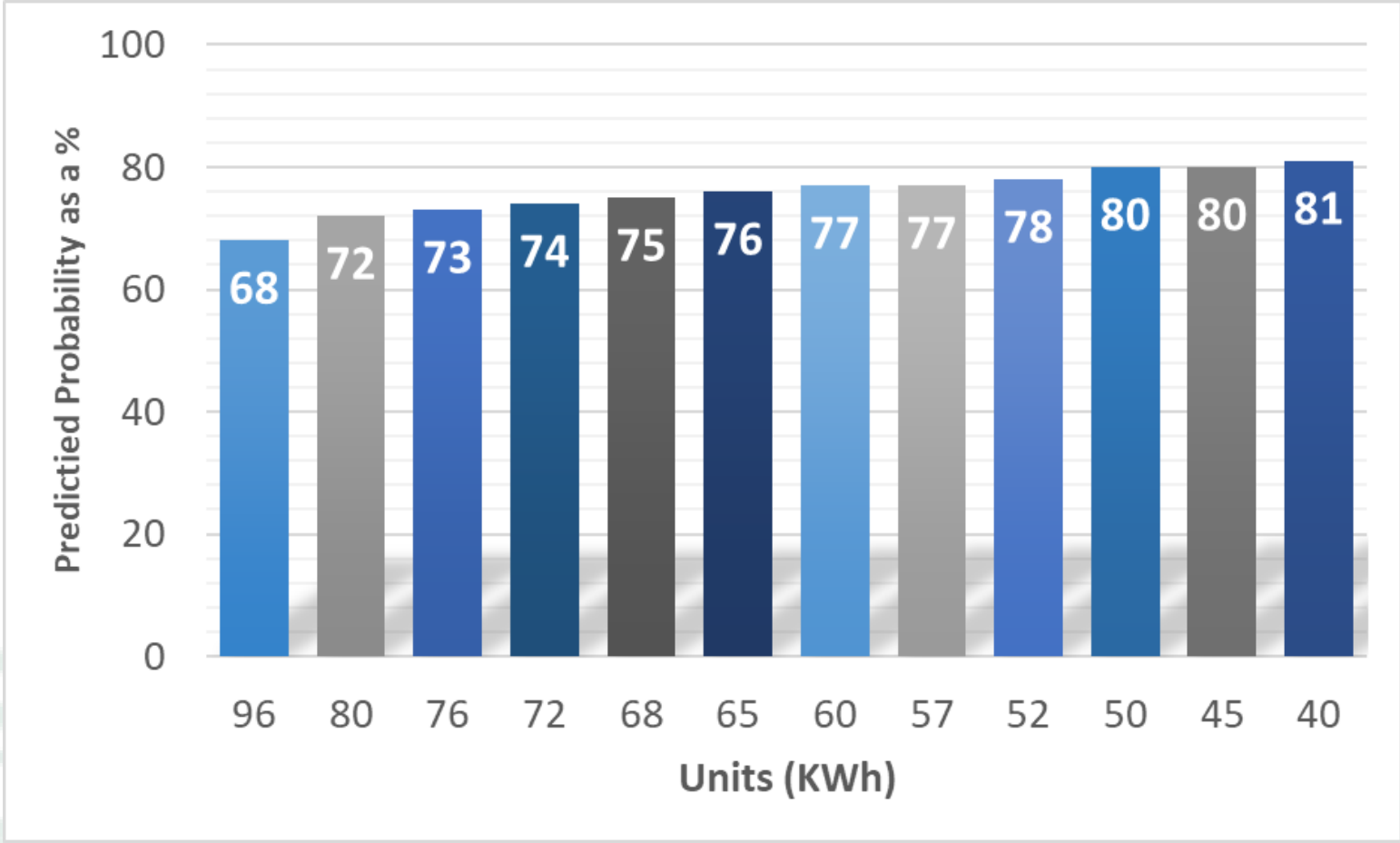
Poor_1	Coefficient	Standard Error	z	P>z
Household Size**	0.3850036	0.0329172	11.7	0.000
Female-headed Households	0.0009145	0.1063844	0.01	0.993
Years of Schooling**	-0.0084426	0.0039555	-2.13	0.033
Do not Earn Monthly Income	0.000134	0.0904678	0	0.999
Receives Social Protection**	0.59001	0.0921807	6.4	0.000
Consumes Less than 3 Meals a Day**	0.3234474	0.1124837	2.88	0.004
HH Members above 65 Years*	-0.2044654	0.1200447	-1.7	0.089
HH Members below 17 years*	0.0839951	0.0392875	2.14	0.033
Electricity Units Consumed***	-0.0070721	0.0008258	-8.56	0.000
Total Household Debt***	-2.33E-07	5.73E-08	-4.07	0.000
Constant	-0.749984	0.1564179	-4.79	0.000

Log likelihood = -697.93806

Number of obs	=	1,301
LR chi2 (10)	=	354.98
Prob > chi2	=	0.0000
Pseudo R2	=	0.2027

*Significance levels denoted as follows: * p < 0.05 (*), p < 0.01 (**),

Predicting Poverty Incidence at Different Electricity Consumption Levels



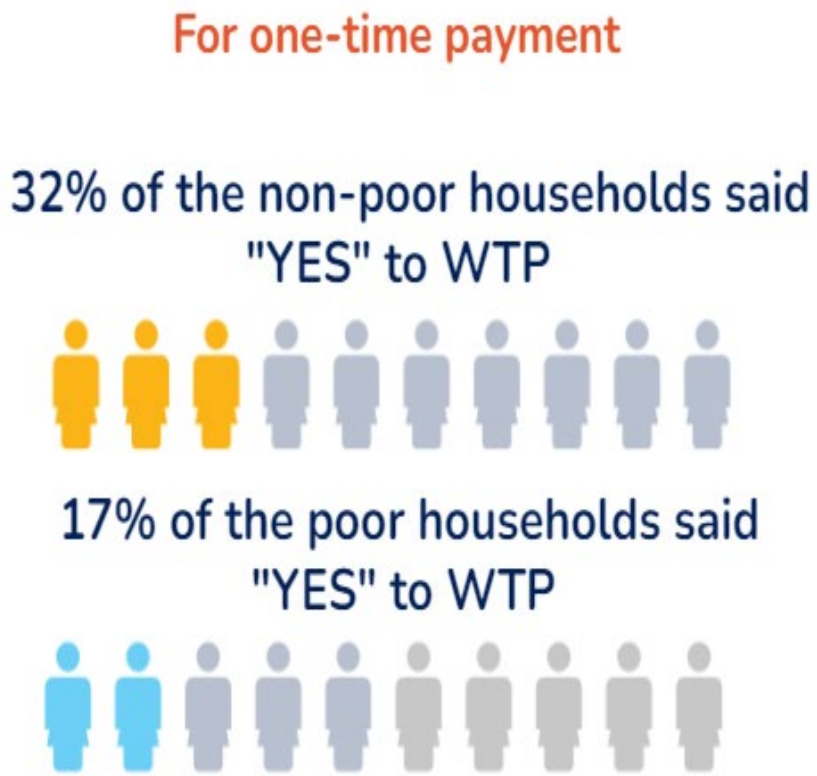
Logit Model Output - Energy Vulnerability

Variable	Coefficient	Std. Err.	P>|z|
Total HH monthly Expenditure	-0.00000291	1.88E-06	0.122
Daliy wage earner**	0.4805137	0.1503743	0.001
No. of schooling age children	0.0675244	0.080056	0.399
Female Headed Households**	0.4551003	0.1569932	0.004
Family size***	0.2849358	0.0483509	0.000
No. of Electrical Appliances***	-0.0430972	0.0097588	0.000
Total Debt amount*	0.00000018	7.85E-08	0.025
_cons	-0.8854989	0.2389902	0.000

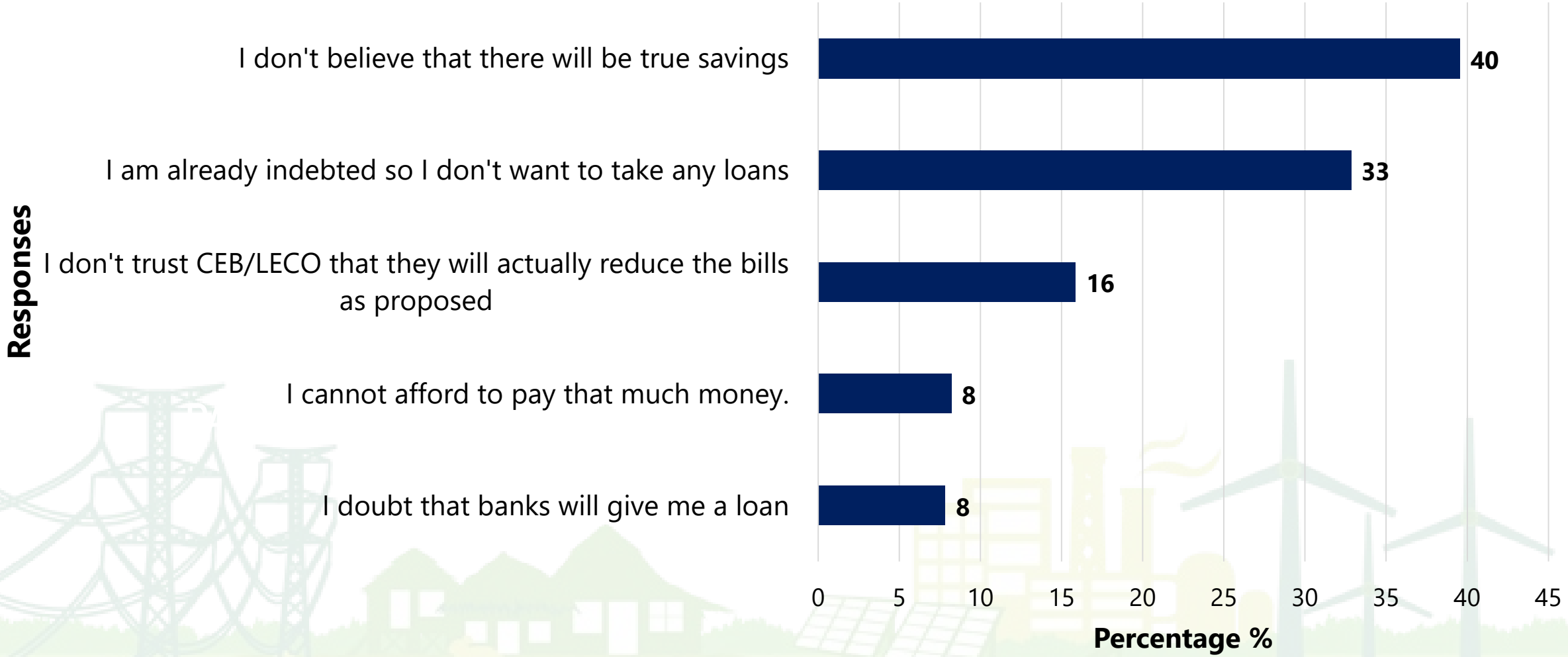
*Significance levels denoted as follows: * $p < 0.05$ (*), $p < 0.01$ (**).

Willingness to Share the Cost of Solar Panels

Under this project, solar panels will be installed in public places like religious establishments, or government owned buildings. The installation of solar units, arranging electronic metering and maintenance will all be undertaken by LECO/CEB. It is proposed that up to **60 units** of electricity (60 kwh) generated through solar power will be allocated for selected households. This will contribute to reducing your total electricity bill. In this proposed project, we are interested to know if you would be willing to make a contribution, either as a one-time payment or through a loan. If you choose to participate, you would not be required to deal with the banks. The project would arrange it for you through a selected bank at an interest rate of approximately **7.5%** for a period of **15 years**. If you default on the loan repayment, you will be disconnected from the solar system and You will have to pay your usual electricity bill.



Reasons for Rejecting WTP Scenario



Willingness to Share the Cost of Solar Panels One-time Payment

One-time payment	Coefficient	Std. Err.	P>|z|
Bid Value	-.0000169	2.11e-06	0.000
_cons	.1819849	.177653	0.306

LR chi2(1) = 68.90 , Pseudo R2 = 0.0506

Mean WTP

LKR 10768.33

Variable	Type	Expected Sign	Observed Sign
Bid Value***	Continuous	-	-
Total Monthly*** Expenditure	Continuous	+	+
# of units	Continuous	+	+
Family size	Continuous	+	-
Monthly wage-earning household	Dummy Yes=1 No=0	+	+
Education level of the respondent	Dummy >=secondary education=1 < secondary education=0	+	+
Total debt amount	Continuous	-	+

*Significance levels denoted as follows: * $p < 0.05$ (*), $p < 0.01$ (**), and $p < 0.001$ (***).

Tentative Conclusions

- Electricity Tariff increase has reduced household welfare significantly
- Women bear a bigger share of the burden
- Use of existing social protection program to target poor is ineffective
- Electricity consumption may provide a reasonably accurate measure of poverty
- Disconnection is a good measure of energy vulnerability
- WTP for sharing costs for concessionary solar power may be low