

Pathway to Zero Natural Gas

Survey Report

Dr. Jamal Mamkhezri, NMSU

Dr. Yuting Yang, UNM

Benjamin Cornelius, UNM

Ahmed A. Jawhari, UNM

Jiaqing Zhao, UNM



THE UNIVERSITY OF
NEW MEXICO.



BE BOLD. Shape the Future.®
New Mexico State University

Outline of the survey report

- Survey summary
 - Demographics
 - Billing information
 - Housing characteristics
 - Appliance stock
 - Switching preferences
- Discrete Choice Experiment statistics
 - Distribution of choices
 - Attribute importance
- Electricity and natural gas consumption patterns
 - Survey respondents VS. rest of LADPU customers
 - Solar vs non-solar household (within surveyed sample)
- Willingness to switch analysis

Survey response summary

- Survey administered from July to September 2025
- Received 912 responses in total (582 complete responses)
- >53% respondents rated survey as “Good” and above, >36% as “Fair”
- Basic demographics
 - Average age of respondents: 58
 - 64% male, 36% female
 - 93% Non-Hispanic
 - 86% Bachelor’s degree and above
 - Median household income: > \$150,000
 - Employment status: 49% employed full time, 40% retired

Household appliance stock

Space heating equipment and fuel type

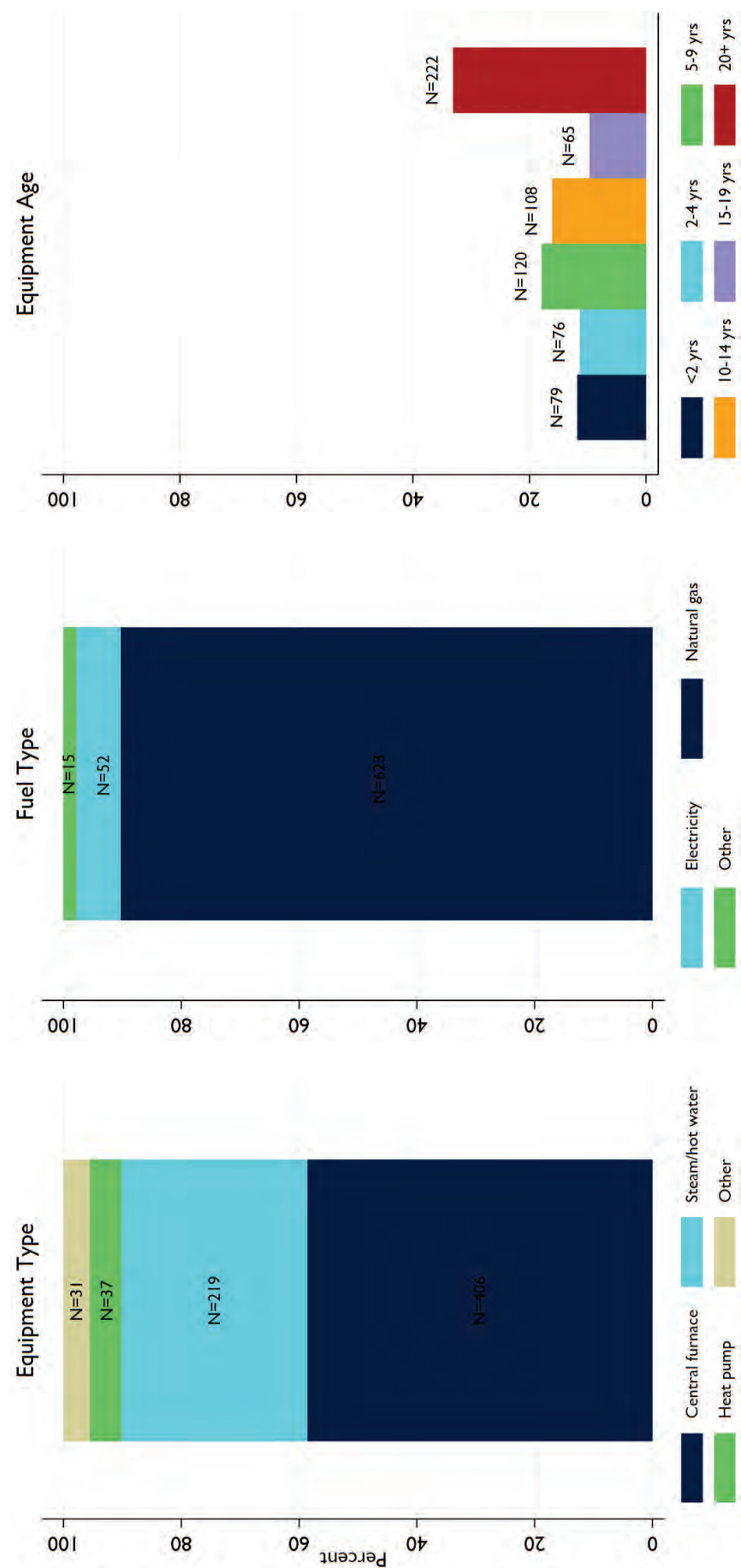


Figure. Primary Space Heating Characteristics.

Cooking appliances

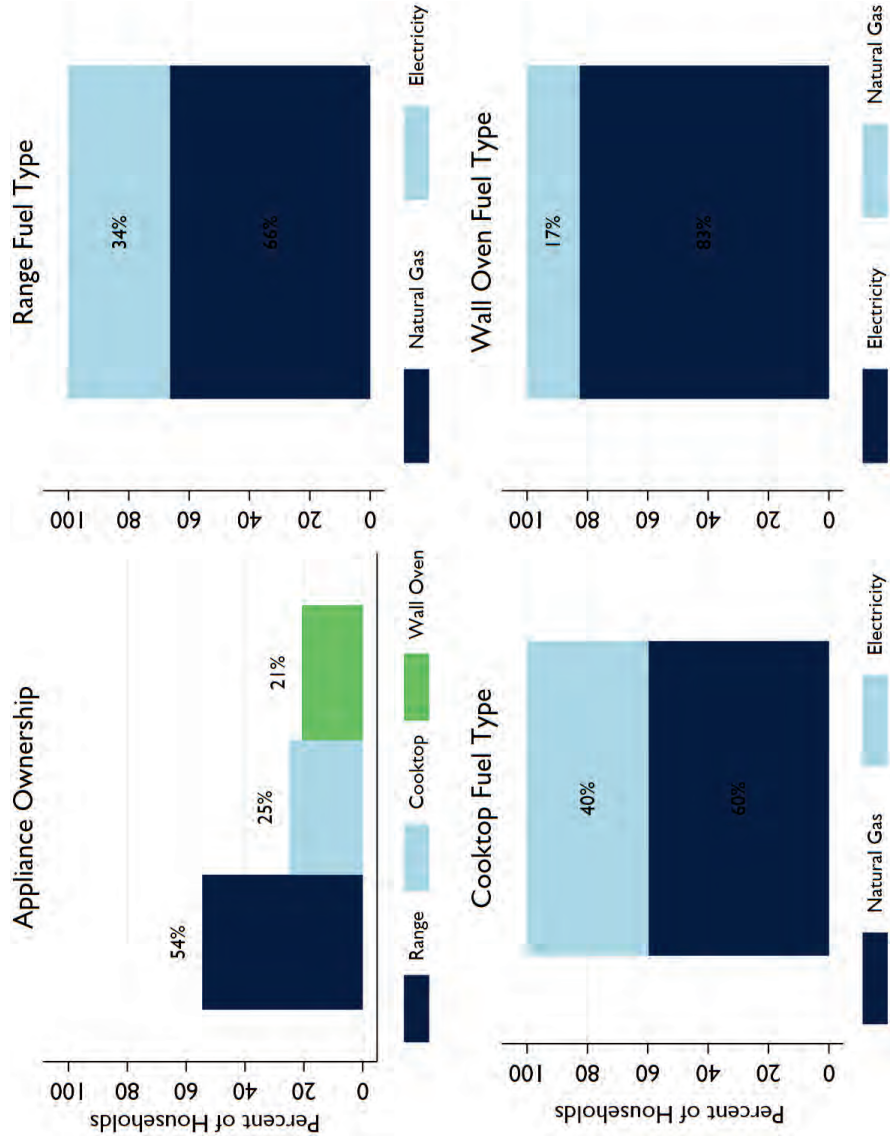


Figure. Cooking Appliances: Ownership and Fuel Types.

Sensitivity to bill increase

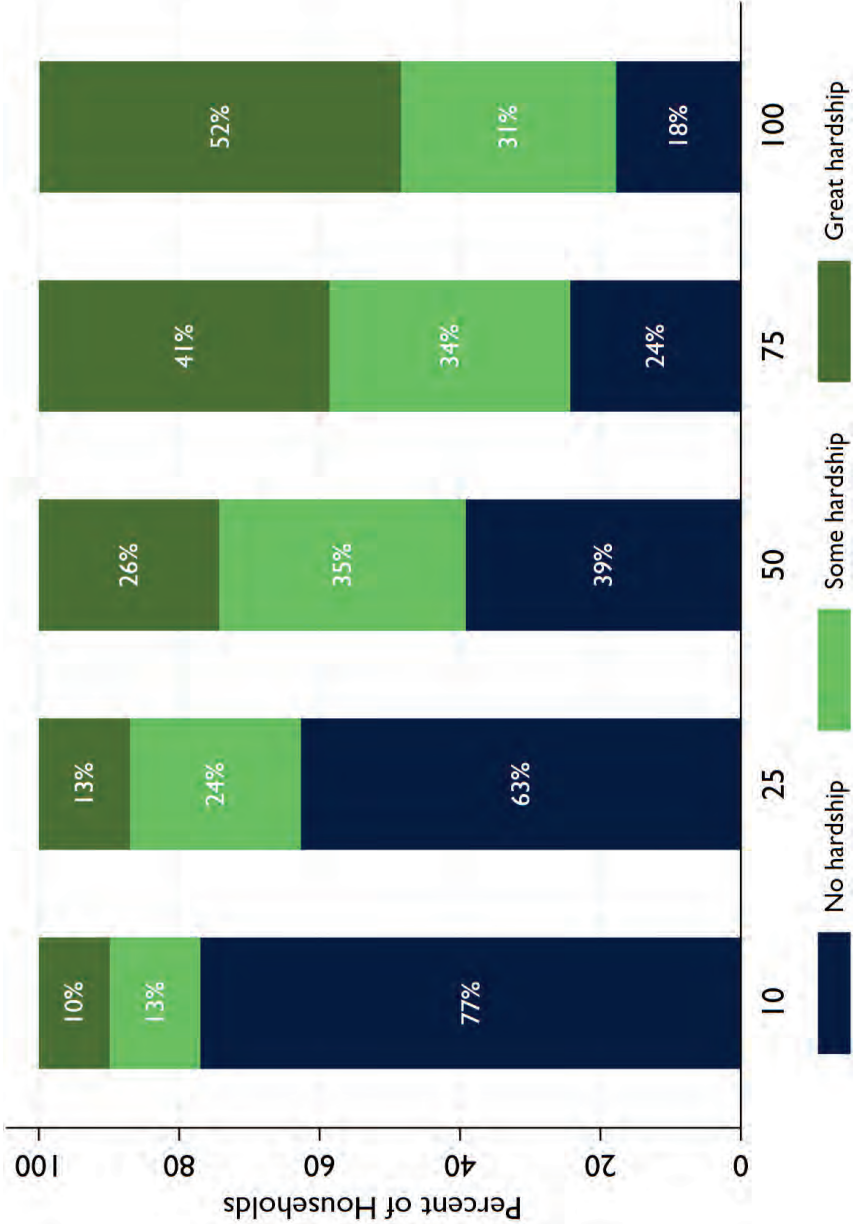


Figure. Hardship from Monthly Energy Cost Increases.

Switching intentions

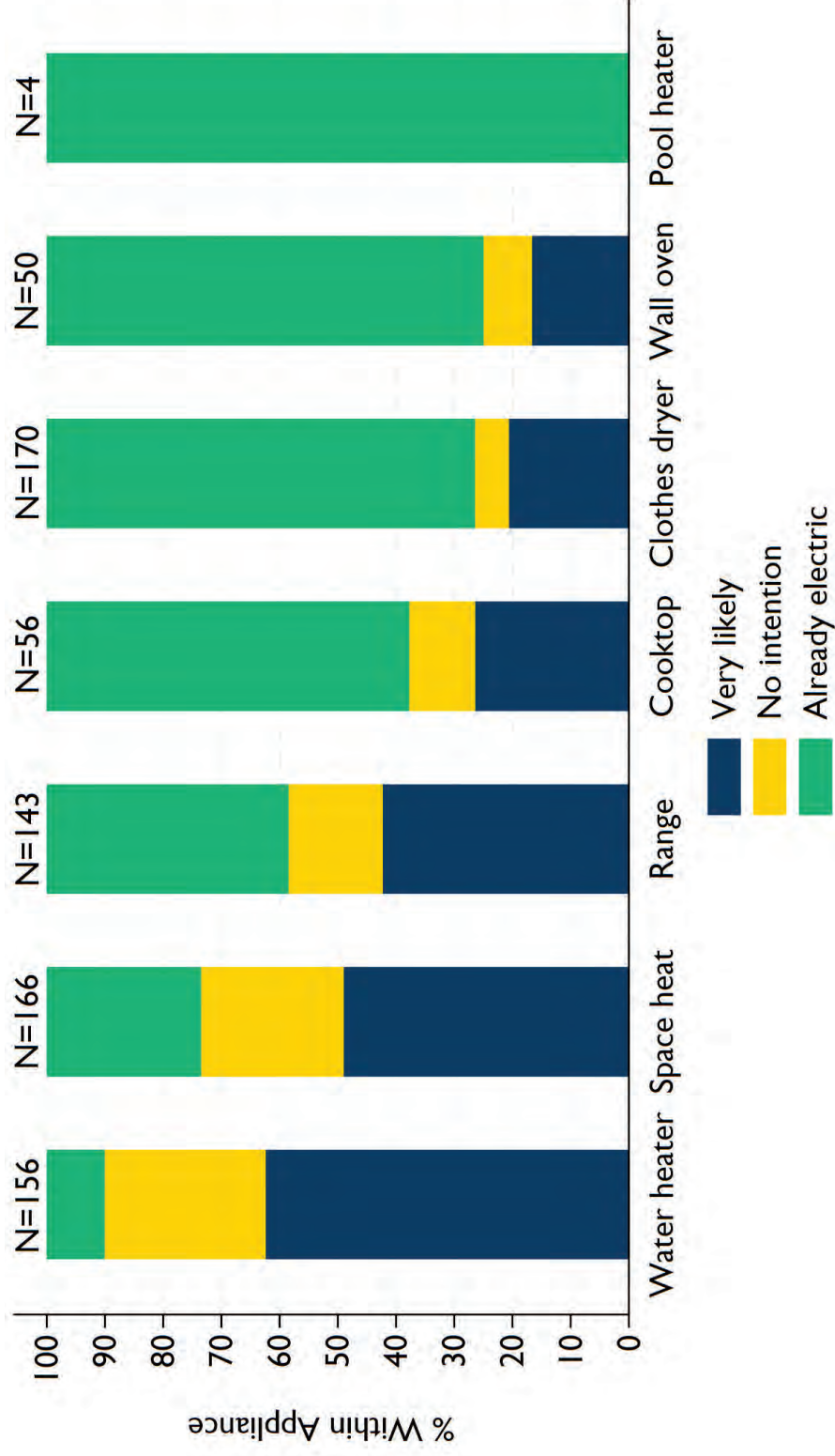


Figure. Intentions to Switch a Given Appliance to Electric.

Switching concerns and barriers

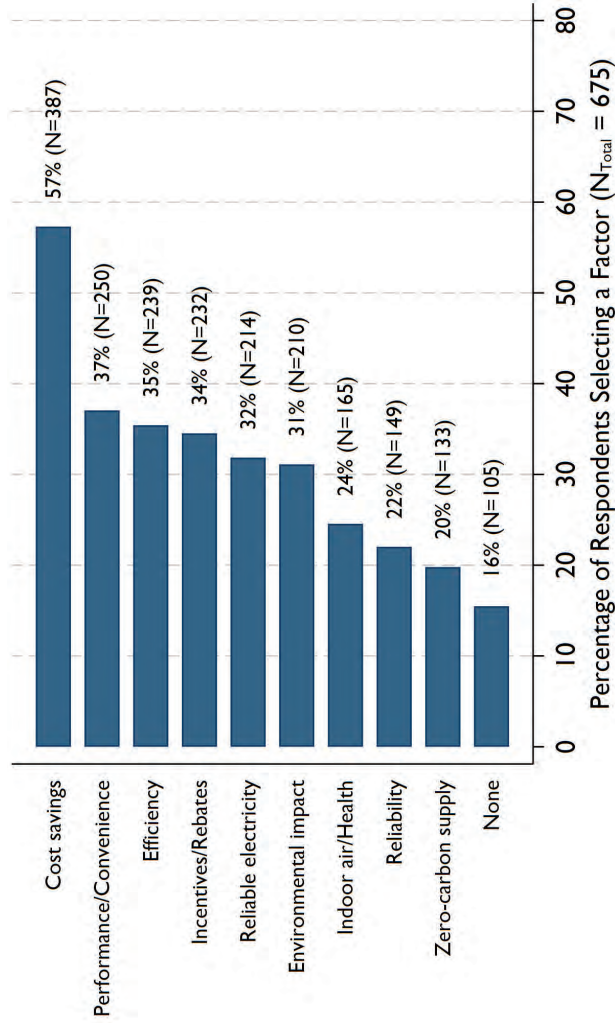


Figure. Factors Influencing Switching to Electric Appliances.

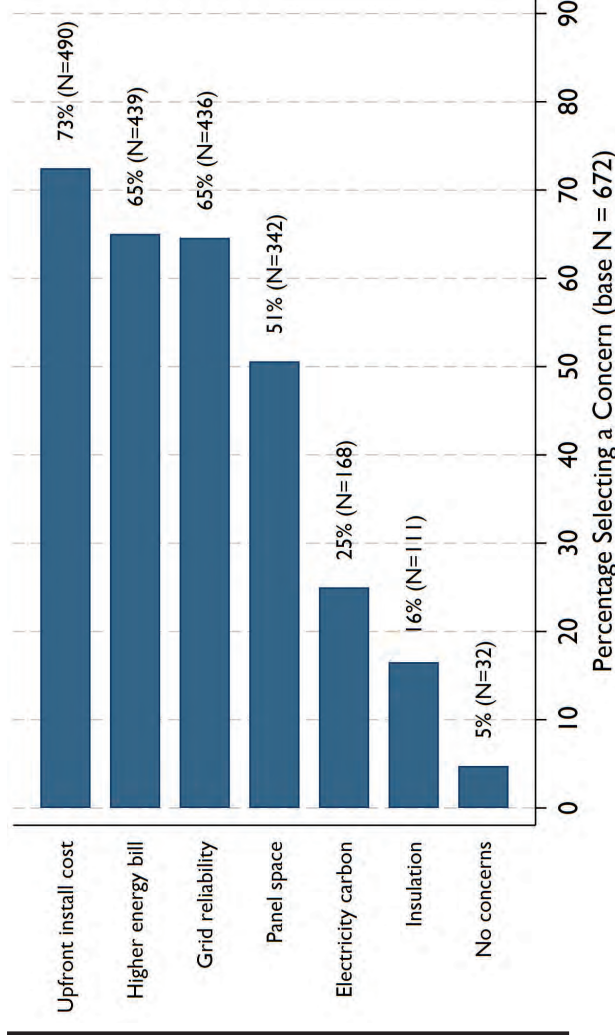


Figure. Concerns & Barriers to Switching to Electric Appliances.

Discrete Choice Experiment

Discrete Choice Experiment (DCE)

	Option A	Option B
Financial Incentives (Rebates/Subsidies)	0% rebate	75% rebate
Energy Efficiency of Electric Appliances	0% more efficient	50% more efficient
Annual Reduction in Household Carbon Footprint	↓ 33% (1.5 metric tons of CO ₂ e)	↓ 100% (4.5 metric tons of CO ₂ e)
Net Monthly Out-of-Pocket Cost (First 10 Years)	↓ \$50/month	↑ \$50/month

Images from Freepik.com

Figure. Example of DCE choice situation.

DCE outcome

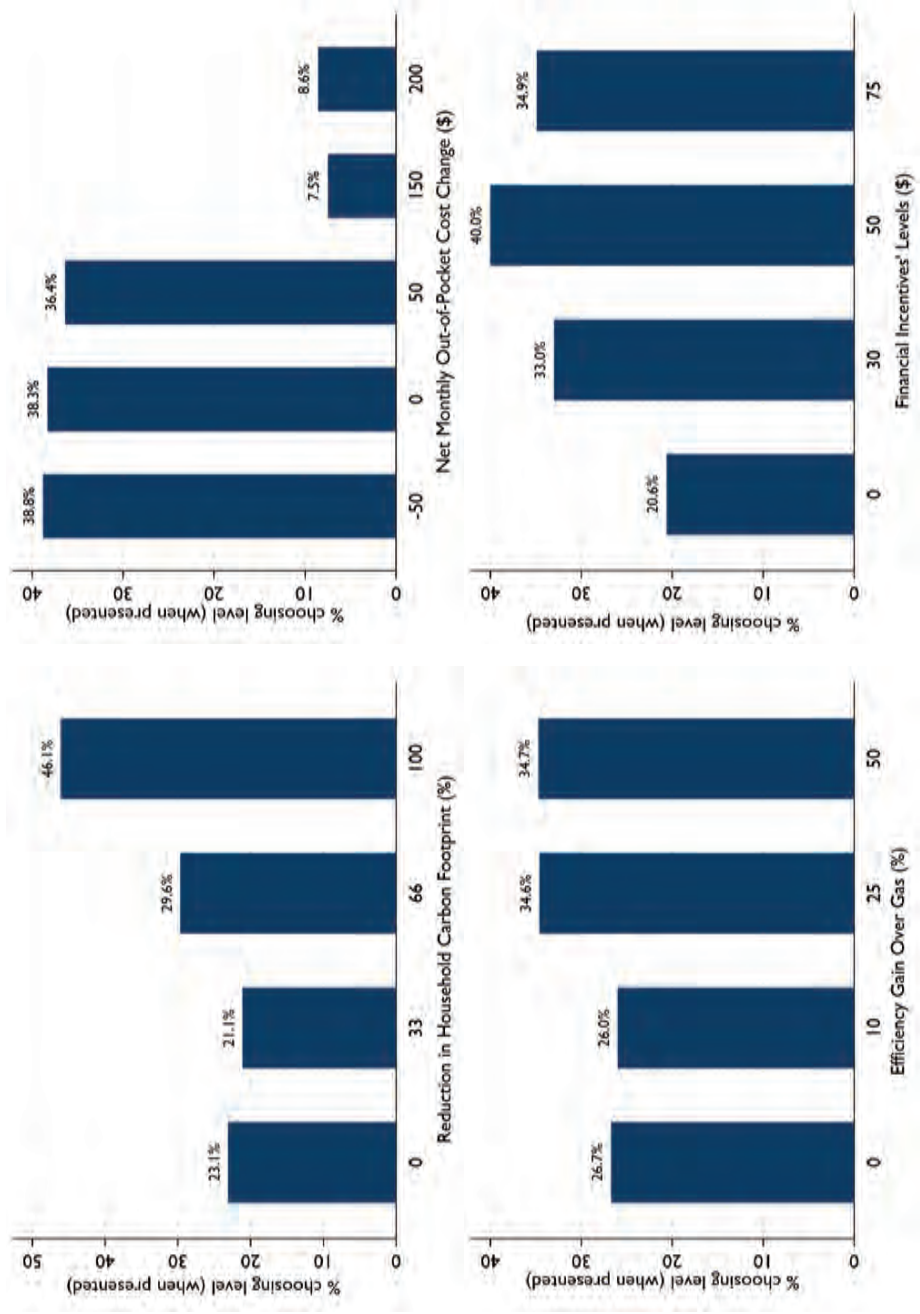


Figure. Choice frequencies by attribute level.

Note. Each panel shows the percentage of times respondents selected alternatives containing each attribute level when presented in the choice set.

Willingness to switch key results

Attribute	MWTP (approx.)	Interpretation
Rebate	+\$0.72–\$0.82	Respondents value financial incentives.
Efficiency	+\$1.91–\$2.10	Strongest preference — high efficiency highly valued
CO₂ Reduction	+\$1.57–\$1.64	Willingness to pay for emissions reduction
Upgrade × Rebate	+\$0.61–\$0.72	Households in need of panel-upgrade are <i>more responsive</i> to rebates
Upgrade × Efficiency	–\$0.31–\$0.48 (ns)	Weak evidence of reduced efficiency valuation
Upgrade × CO₂	–\$0.64–\$0.72	Households in need of panel-upgrade value CO ₂ <i>reduction less</i>
Cost	Negative	As expected — higher costs lower uptake

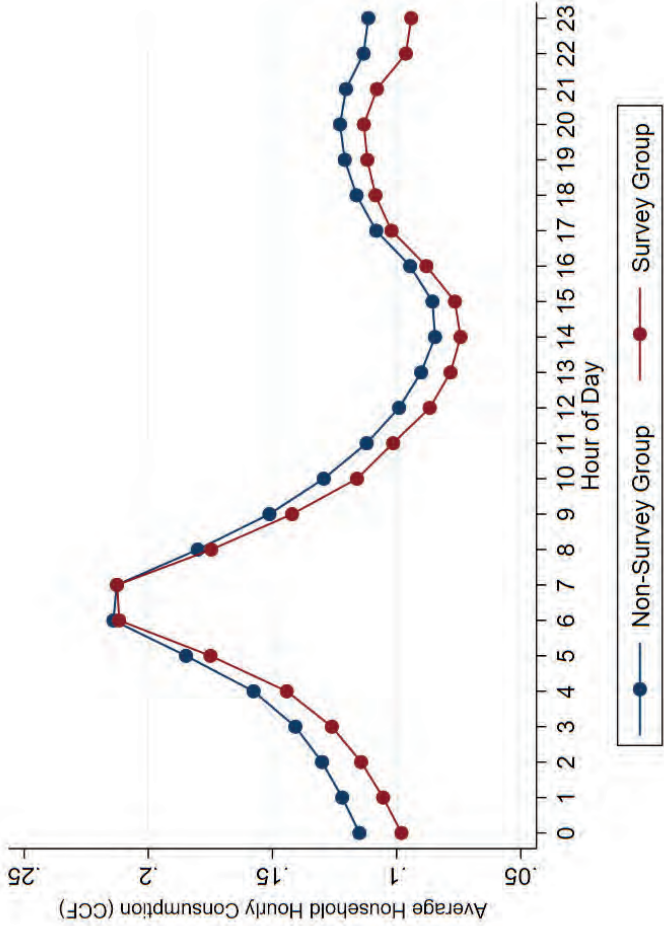
Willingness to switch key results

Factor	Effect	Implication
Income ↑	↓ Opt-out	Higher-income → more likely to electrify
Education ↑	↓ Opt-out	More educated → more likely to electrify
Age ↑	↑ Opt-out	Older → less likely to electrify
Gender	No effect	—

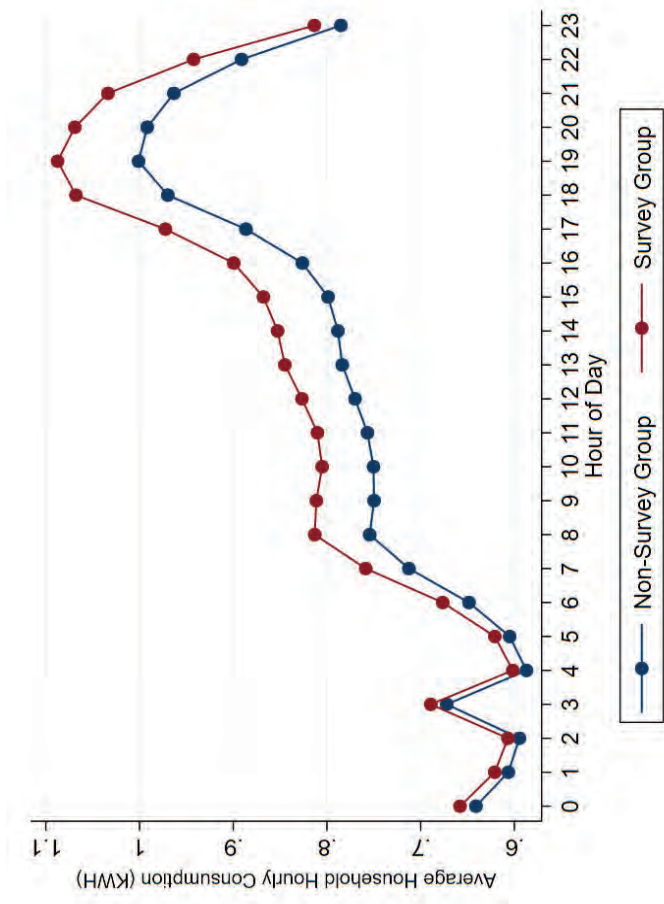
Electrification preference increases with **income** and **education**, but decreases with **age**.

Natural gas & electricity consumption patterns

Average Hourly Consumption (Respondents Vs. Rest of LADPU)

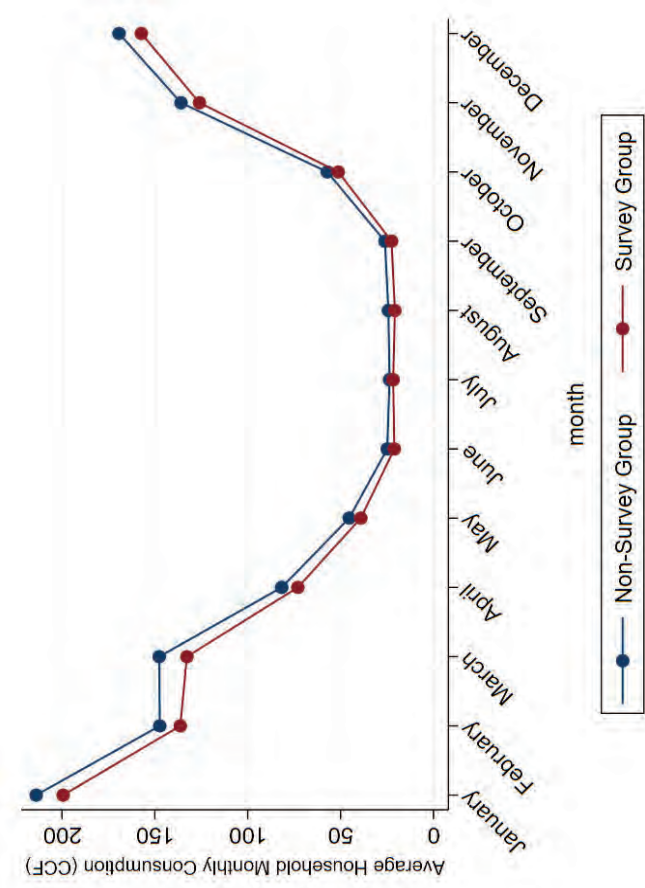


Natural Gas

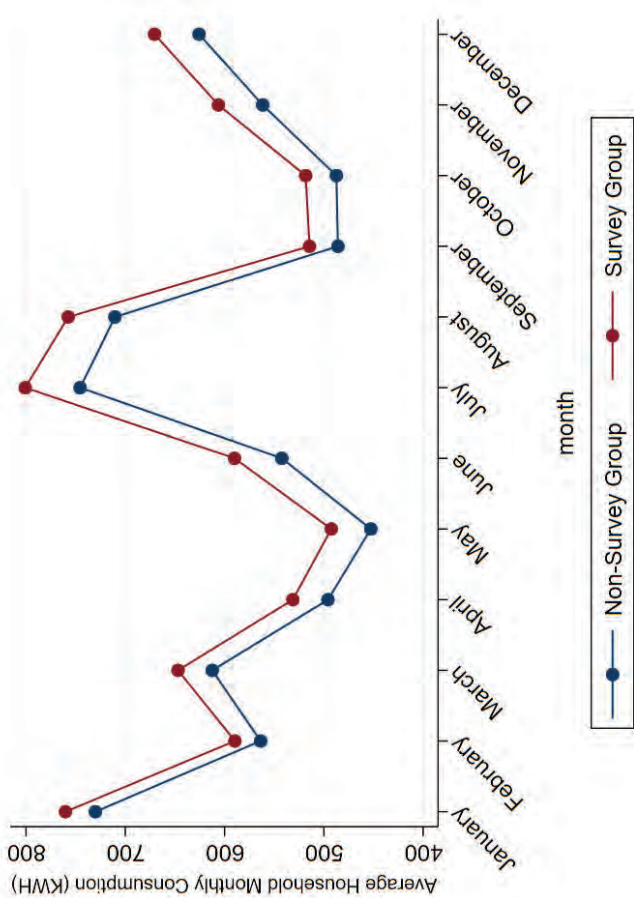


Electricity

Average Monthly Consumption (Respondents Vs. Rest of LADPU)



Natural Gas



Electricity

Questions and comments?

Backup slides

Natural gas vs. Electric appliances preference

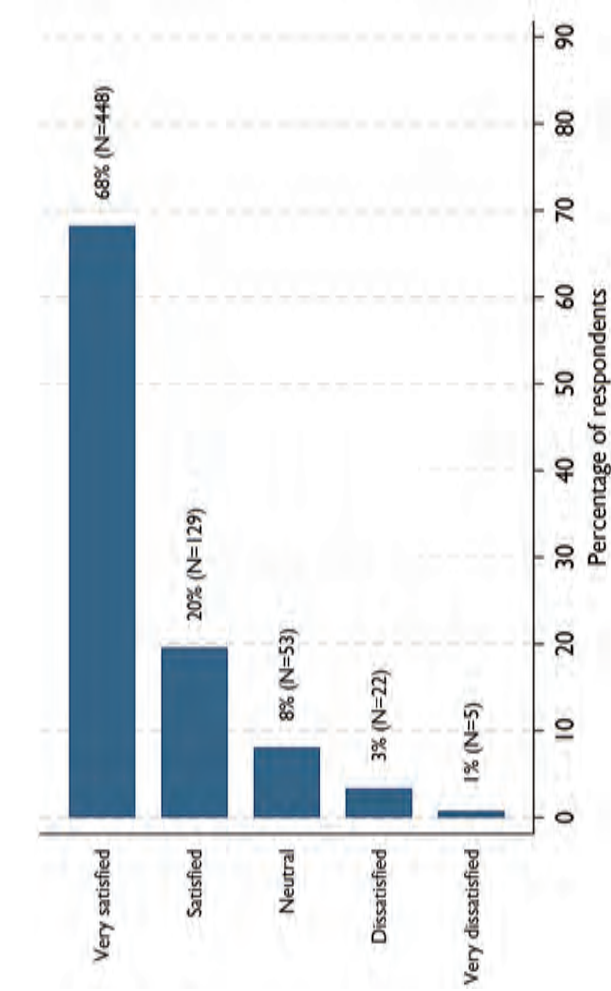


Figure. Satisfaction with Current Gas Appliances.

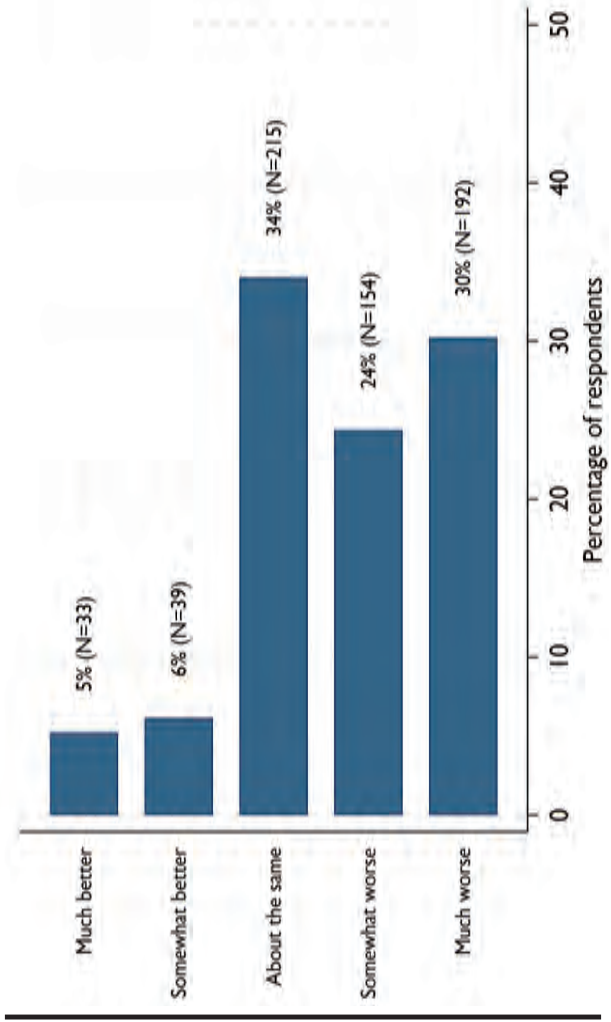


Figure. Perceived Reliability of Electric Appliances compared to Gas.

Switching Attitudes

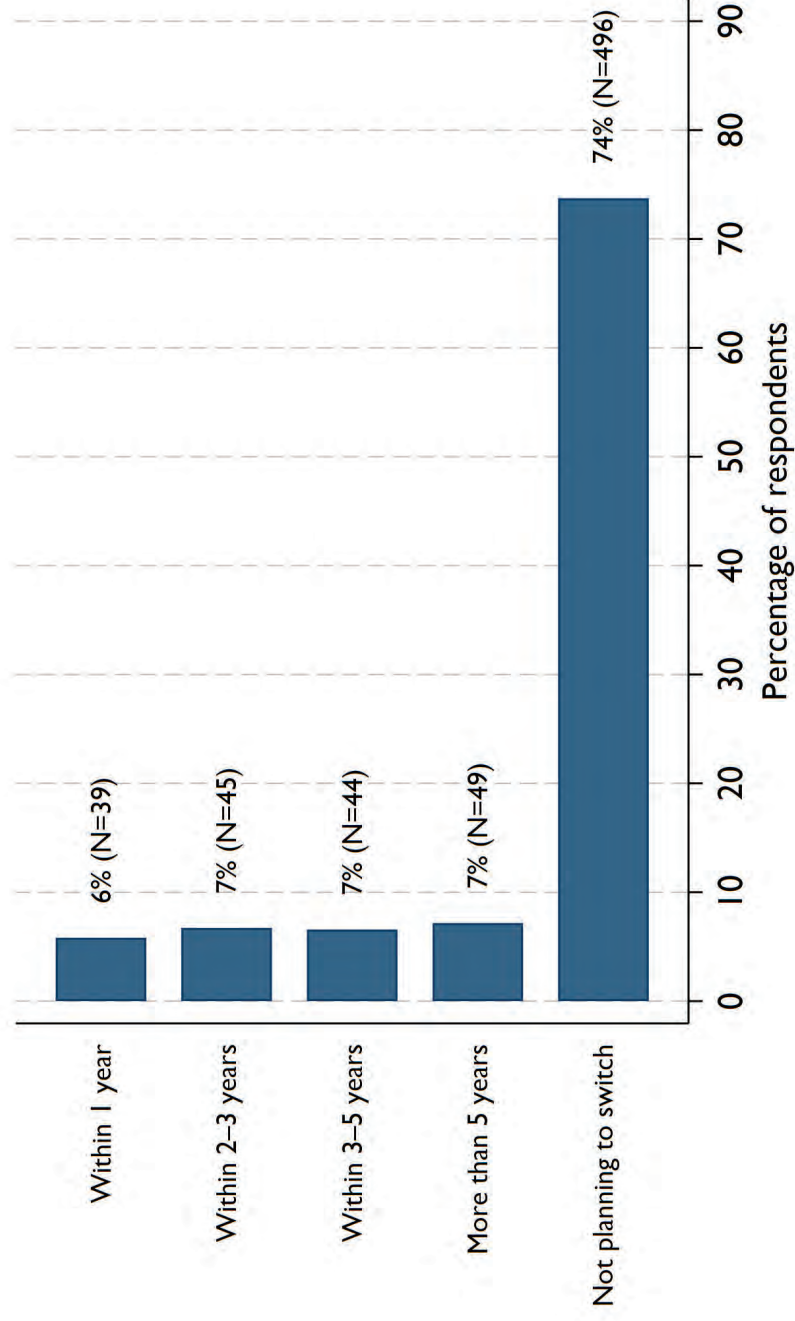
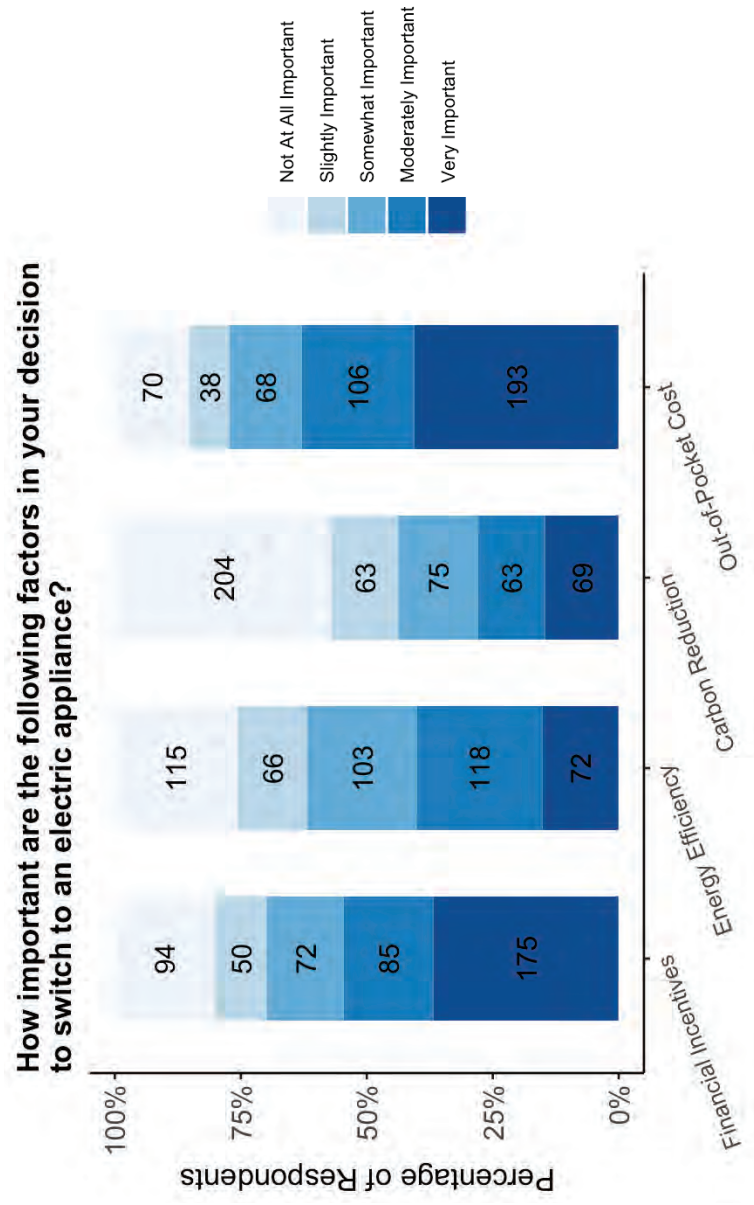


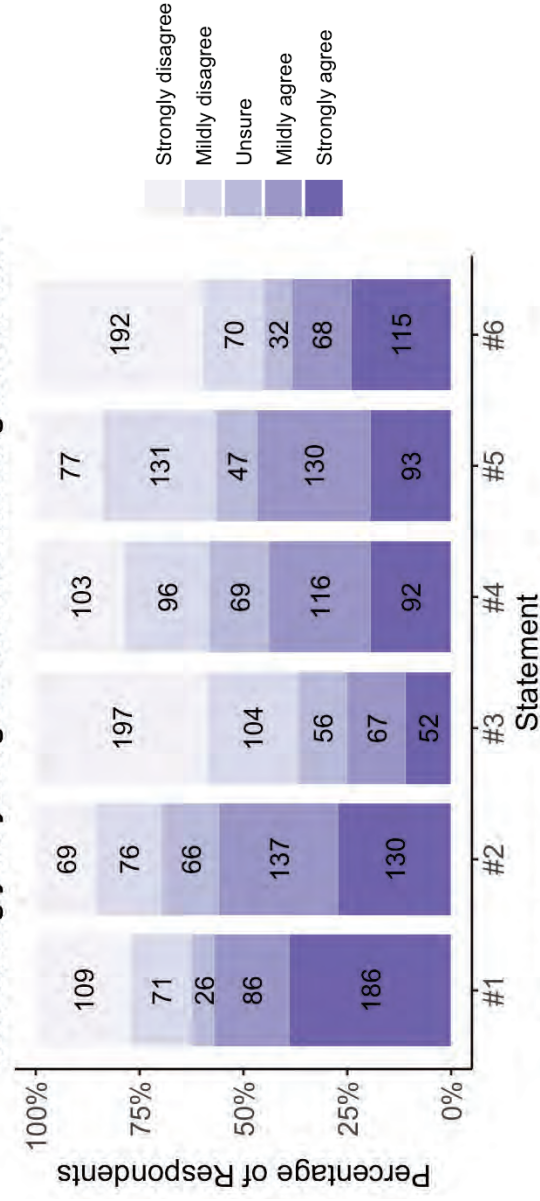
Figure. Intended Timeframe to Switch to Electric Appliances.

DCE outcome - Factors in Switching Decisions



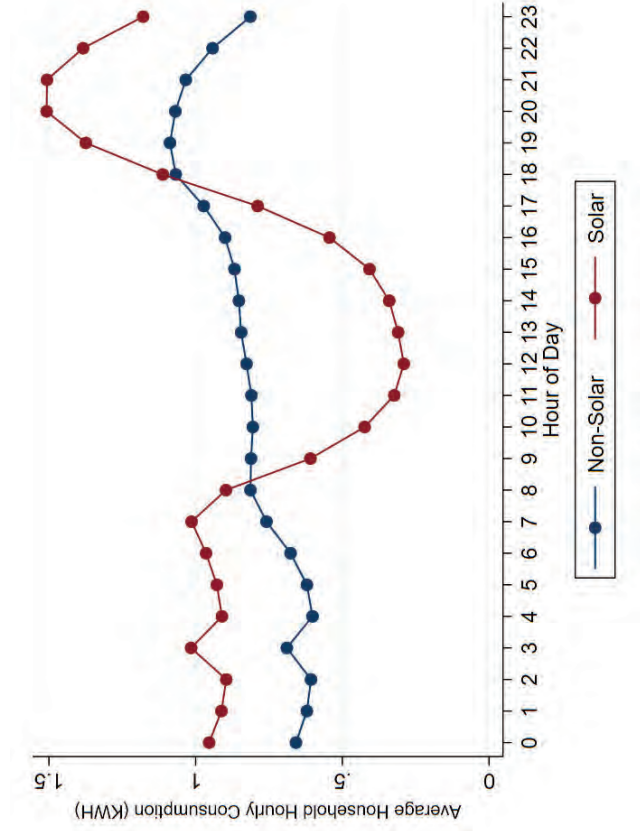
Environmental sentiments

How strongly do you agree with the following statements?

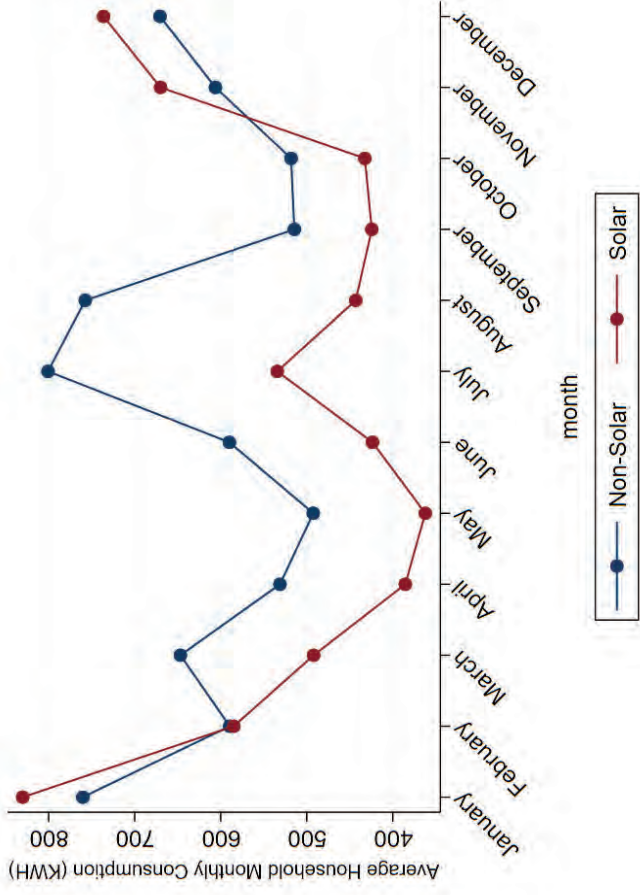


- #1: Humans are severely abusing the environment.
- #2: The earth has plenty of natural resources if we just learn how to develop them.
- #3: The balance of nature is strong enough to cope with the impacts of modern industrial nations.
- #4: Human ingenuity will ensure that we do NOT make the earth unlivable.
- #5: The balance of nature is very delicate and easily upset.
- #6: The so-called "ecological crisis" facing humankind has been greatly exaggerated.

In-Survey Consumption (Solar Vs. Non-solar)

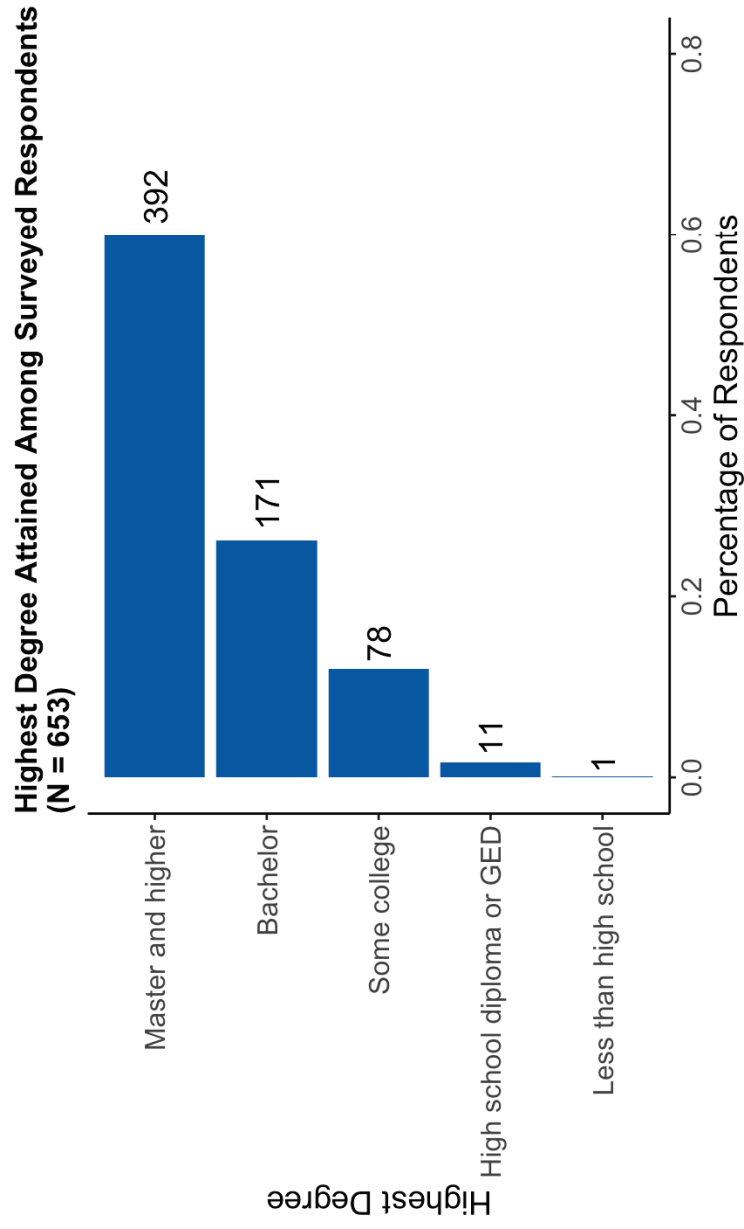


Hour-of-day



Month-of-year

Demographics - Survey respondents' highest education attainments



Demographics - Survey household total income for the past year

