



# EPRG Survey 2010 on Smart Energy: some preliminary results

**Laura Platchkov**  
**Michael Pollitt**  
**David Reiner**  
**Irina Shaorshadze**

*University of Cambridge*

Cambridge, 10.12.2010



**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Overview



1. Motivation
2. Survey overview
3. Preliminary results
4. Conclusions



# 1. MOTIVATION

---

**Making networks fit for renewables ...**

**[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)**

# 1. Motivation



- **Background:**

- Increasing interest in the role of the individual (and the community) in moving towards a low carbon economy (Owens and Driffill, 2008; DEFRA, 2008a; DEFRA, 2008b)
- Potential of different energy saving management options and technological tools (Flexnet consortium; IHS GLOBAL INSIGHT, 2009; Faruqi et al., 2010)
- How might research outputs translate in real life? To what extent can they influence attitudes and behaviour?

- **Objectives:**

- **Public preferences, attitudes and opinions on energy**
- **Level of acceptance/engagement towards different energy saving technologies/tools**



## 2. SURVEY OVERVIEW

---

**Making networks fit for renewables ...**

**[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)**

# 2. Survey Overview

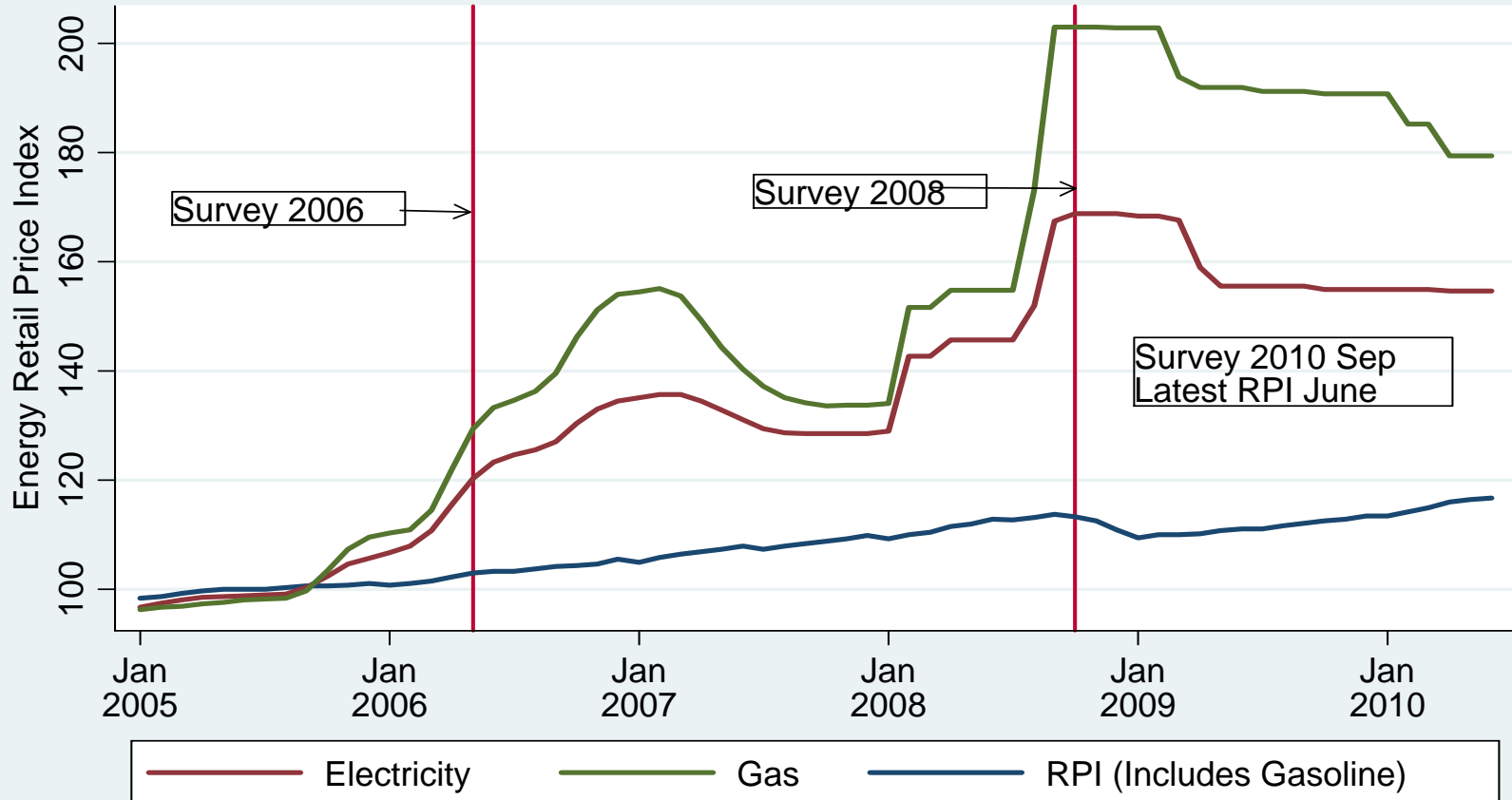


- Online Survey of 2038 Households in England, Scotland and Wales conducted in September 2010
- Quota-Based Survey, conducted by Polling Company Accent, sample of a panel of respondents recruited by ToLuna
- Areas of Focus:
  - I. National Policy Priorities
  - II. Energy Costs
  - III. Energy Efficiency measures
  - IV. Community energy
  - V. Willingness to Accept Appliance Usage Modifications

# Context



## Retail Energy Price Index 2005 - 2010 (May 2005=100)



Source: Department of Energy and Climate Change

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)



# 3. PRELIMINARY RESULTS

---

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)





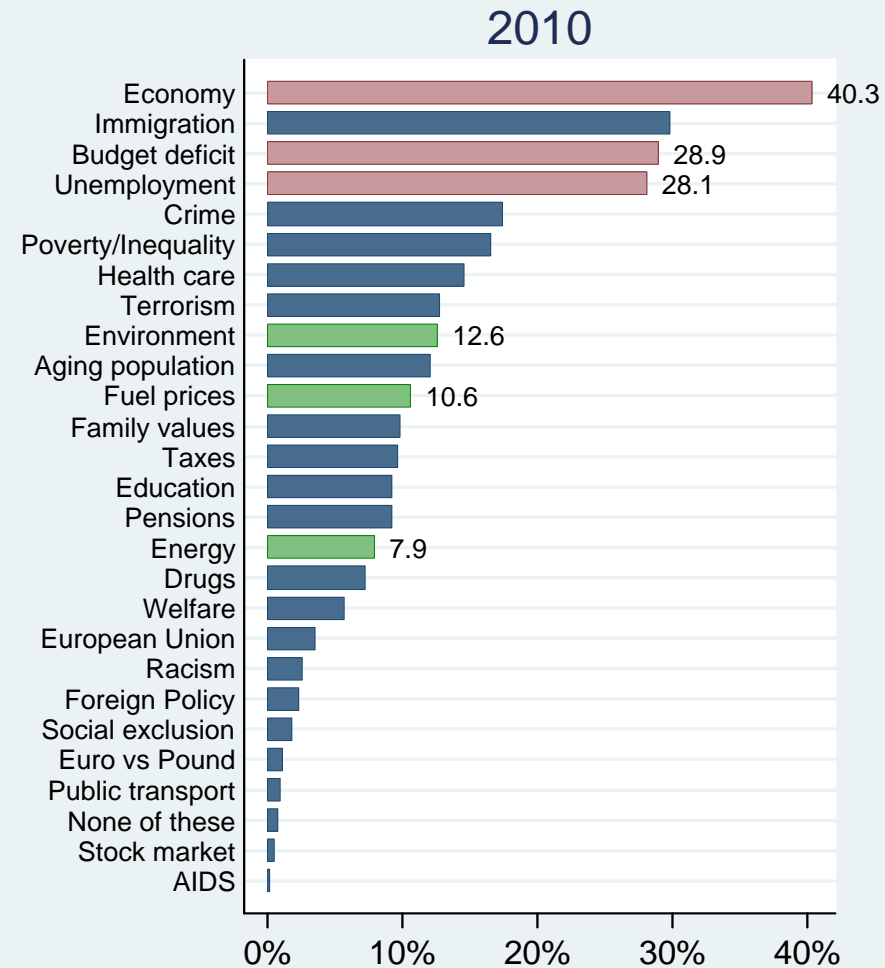
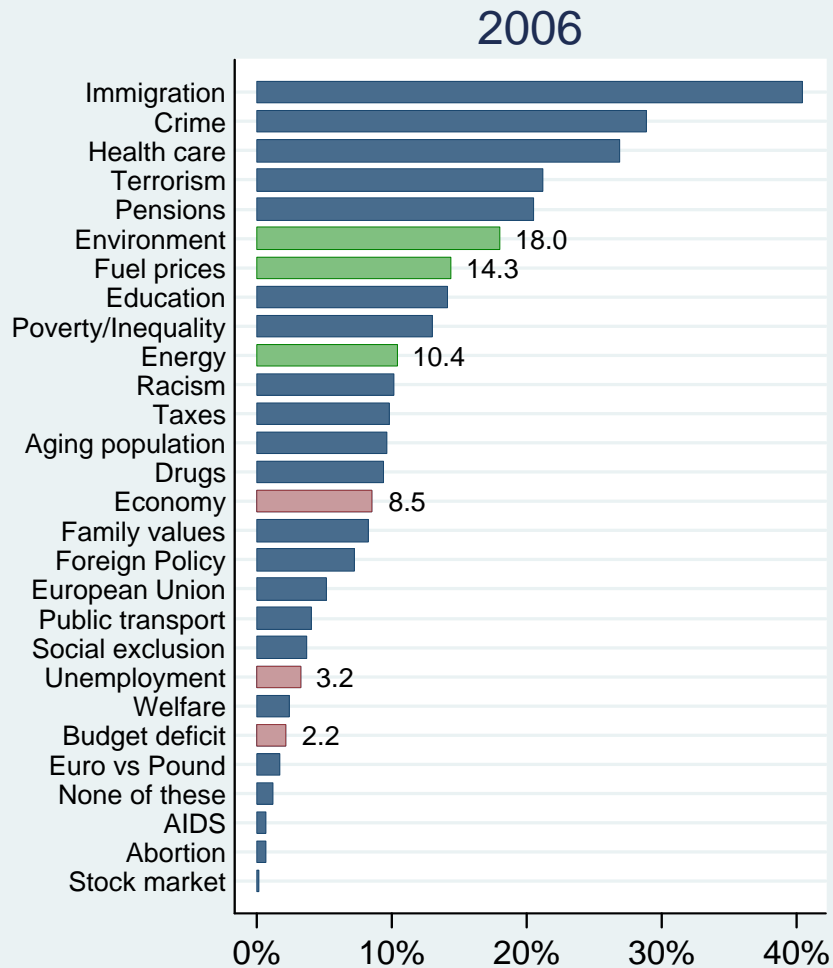
# I. NATIONAL POLICY PRIORITIES



**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Choice of Respondents on Areas Most in Need of Urgent Attention and Improvement in UK - 2006, 2010

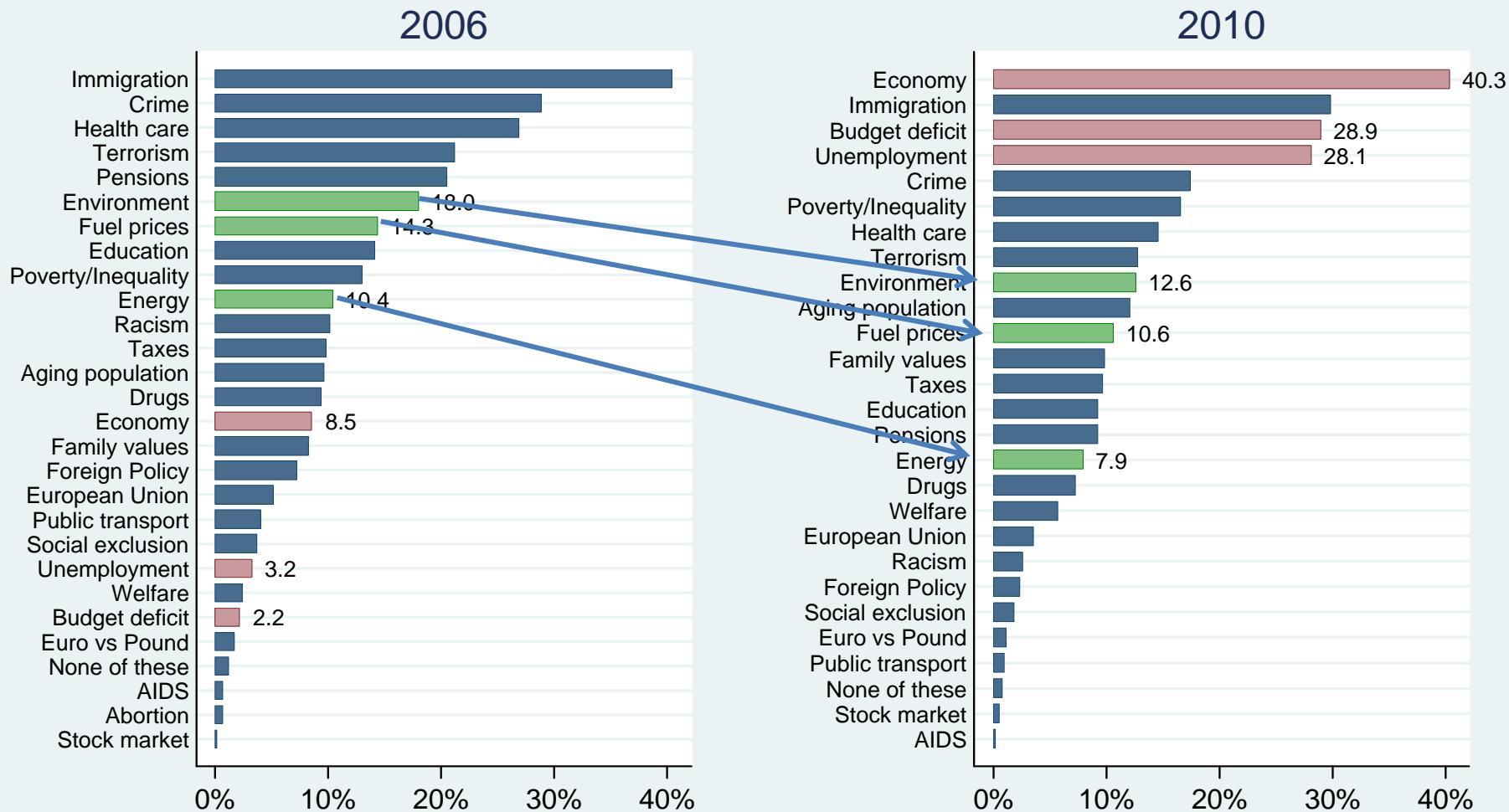


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Choice of Respondents on Areas Most in Need of Urgent Attention and Improvement in UK - 2006, 2010

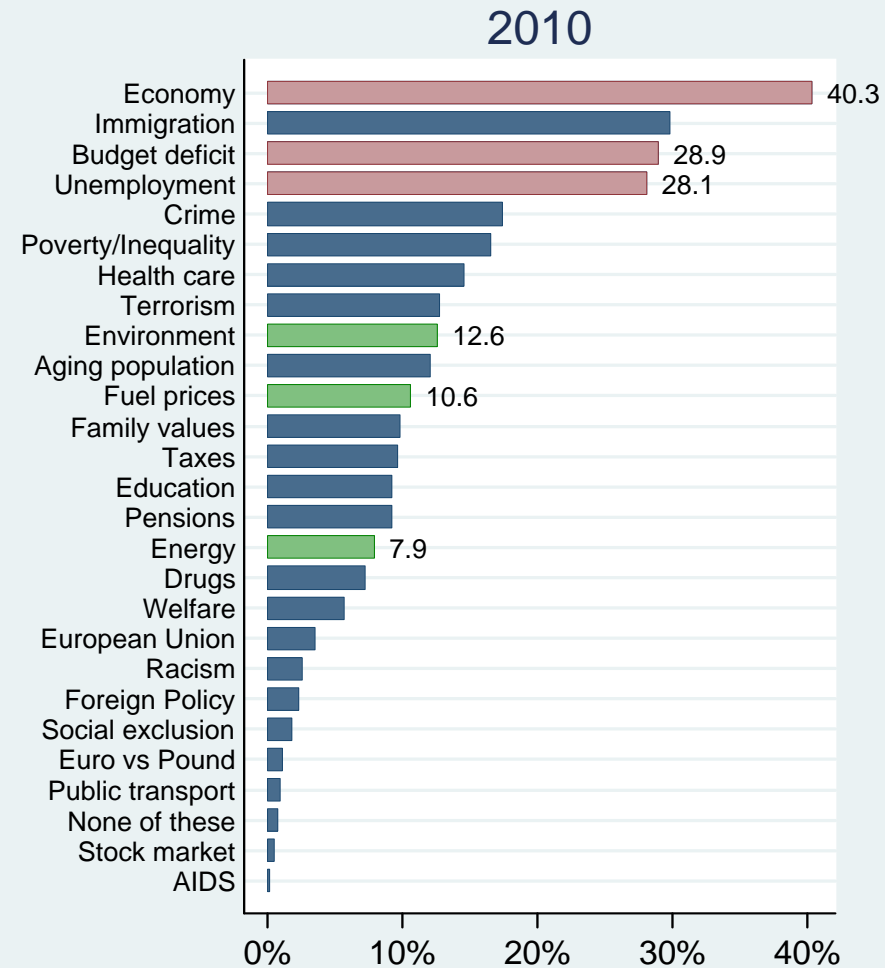
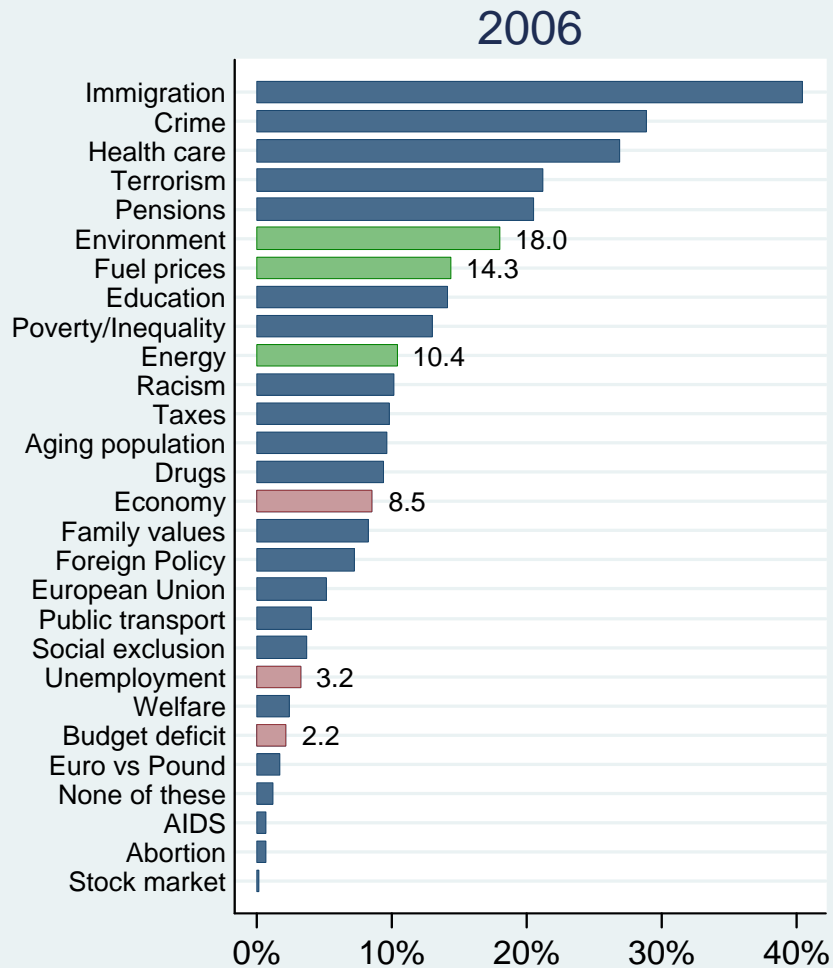


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Choice of Respondents on Areas Most in Need of Urgent Attention and Improvement in UK - 2006, 2010

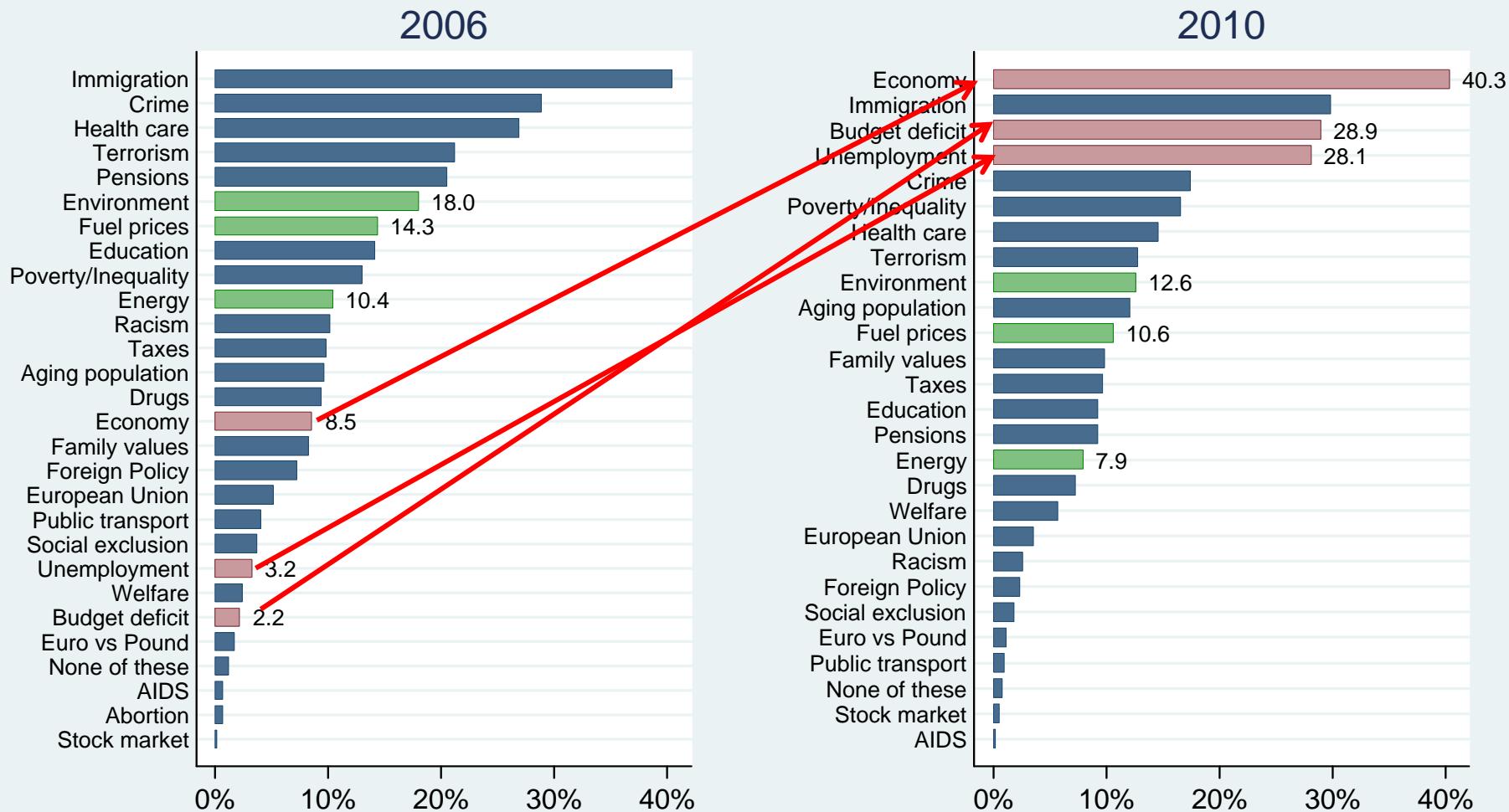


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Choice of Respondents on Areas Most in Need of Urgent Attention and Improvement in UK - 2006, 2010

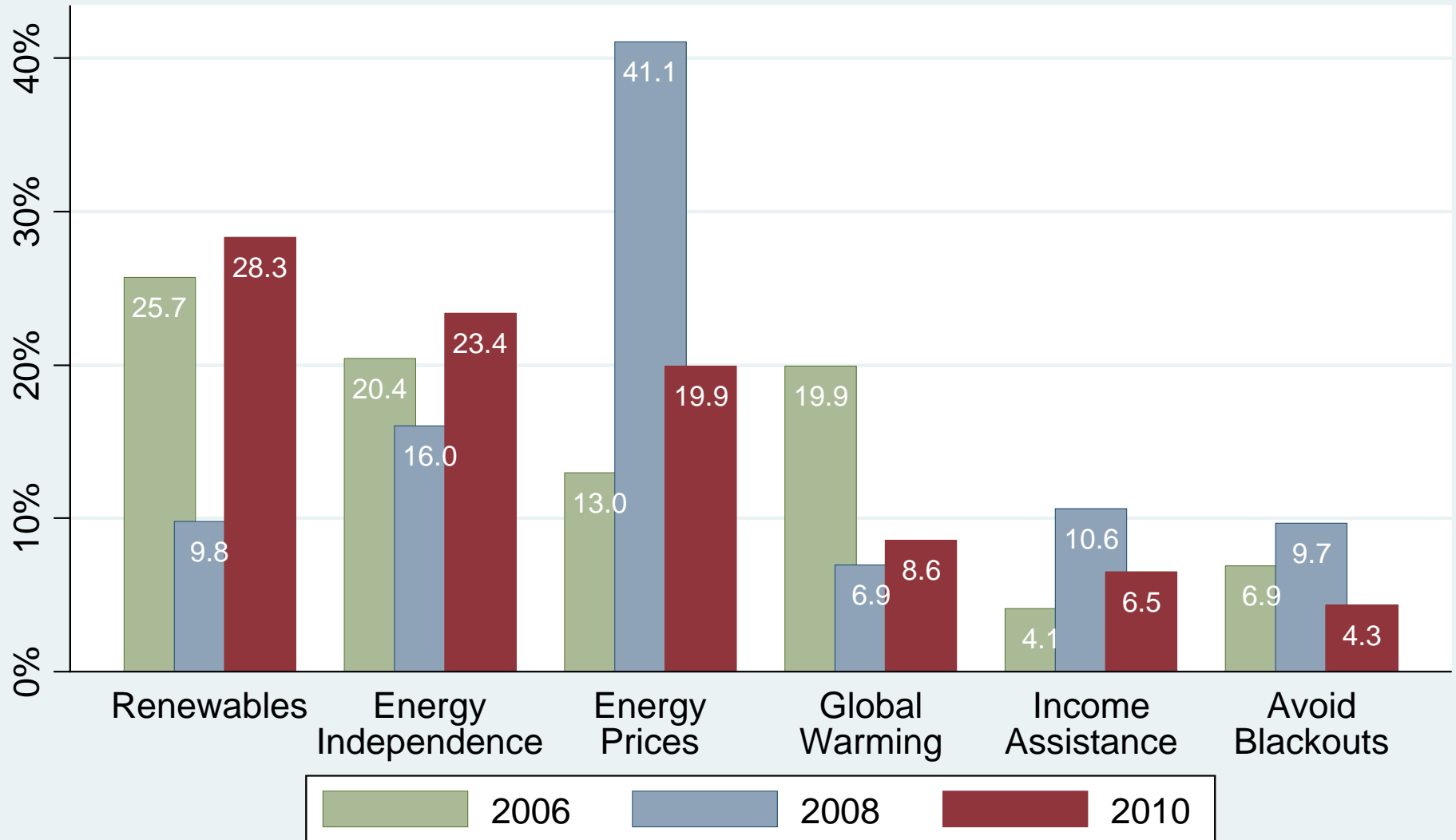


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Top National Energy Policy Priorities - 2006, 2008, 2010

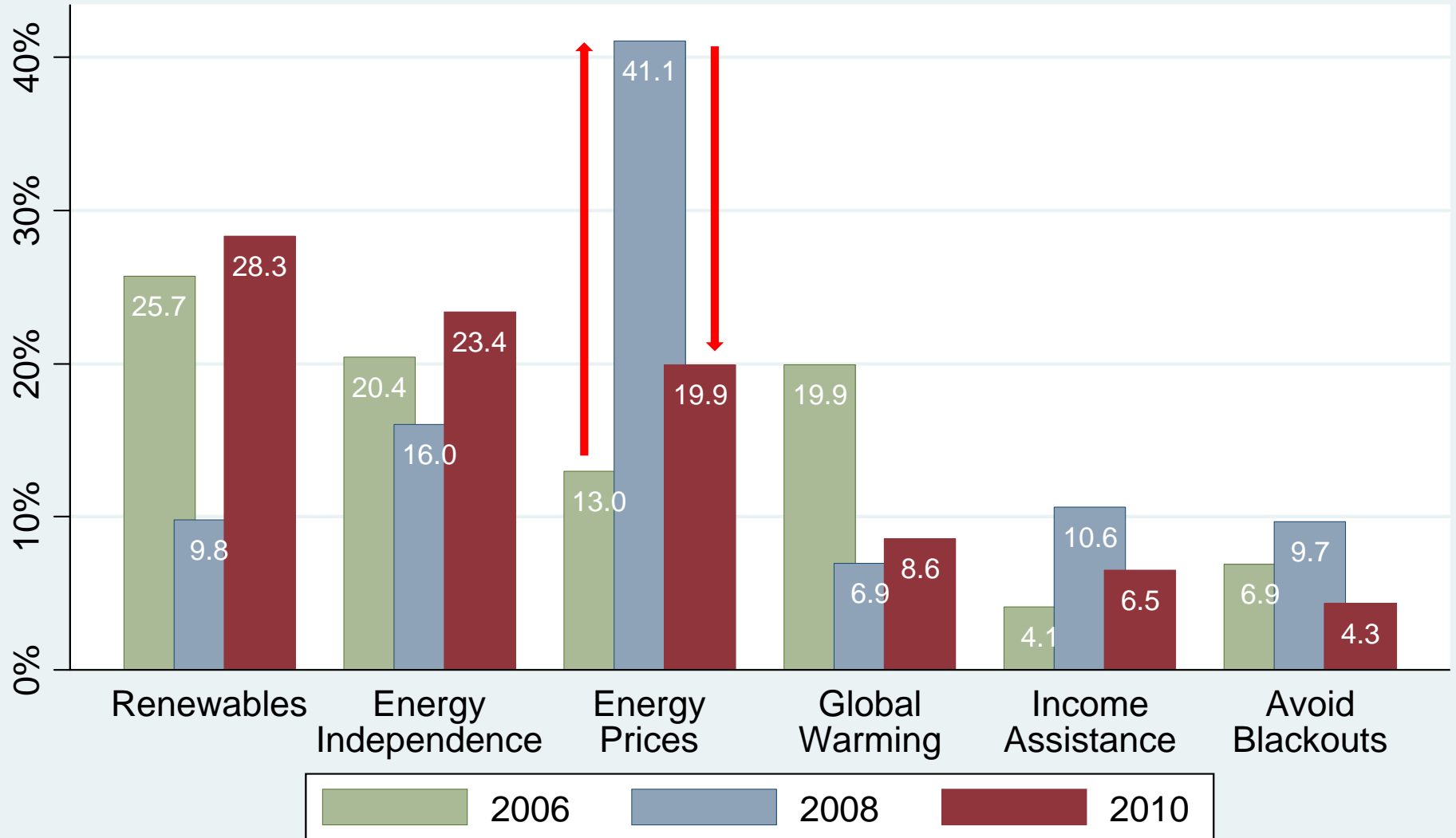


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Top National Energy Policy Priorities - 2006, 2008, 2010

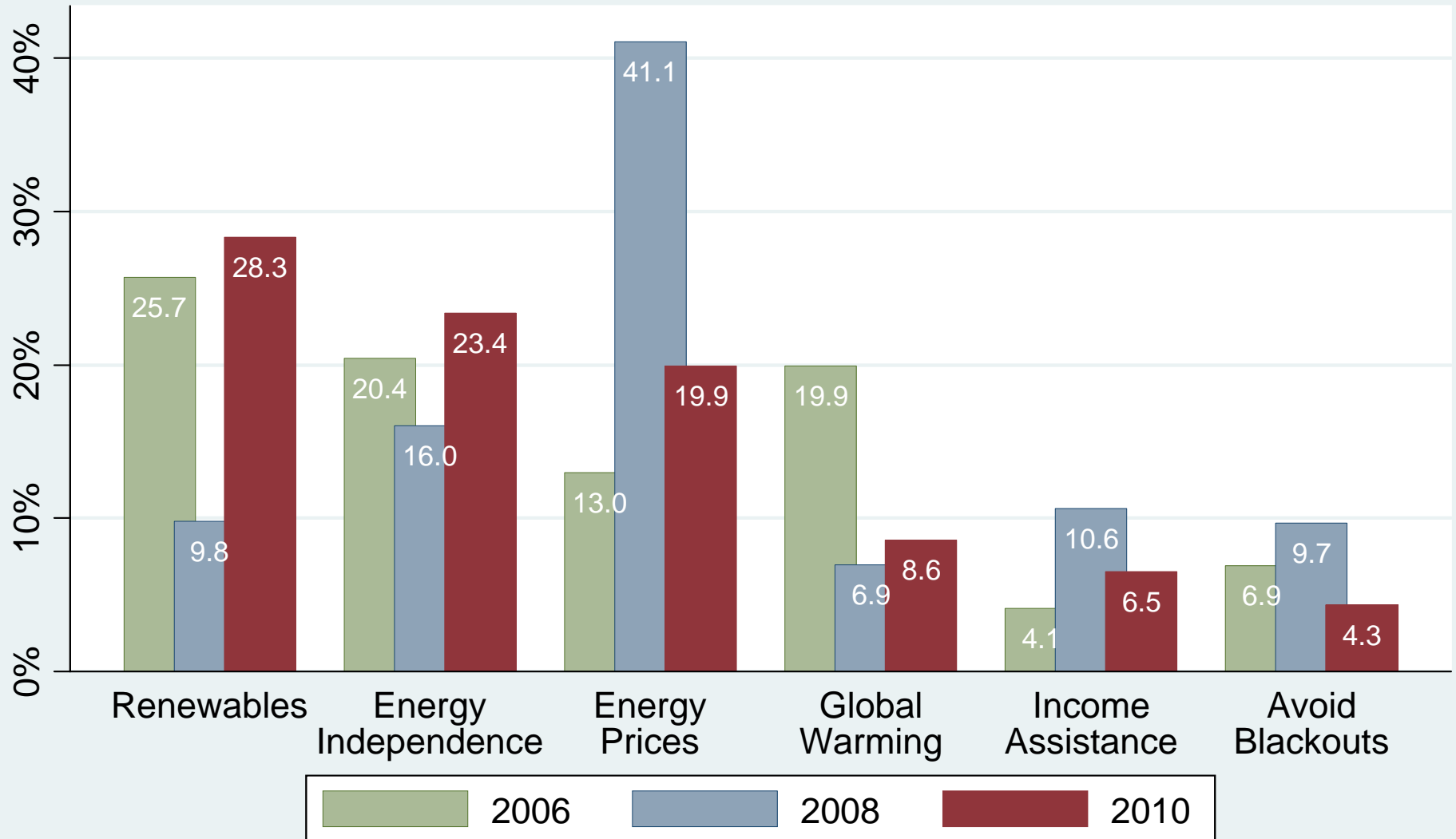


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Top National Energy Policy Priorities - 2006, 2008, 2010



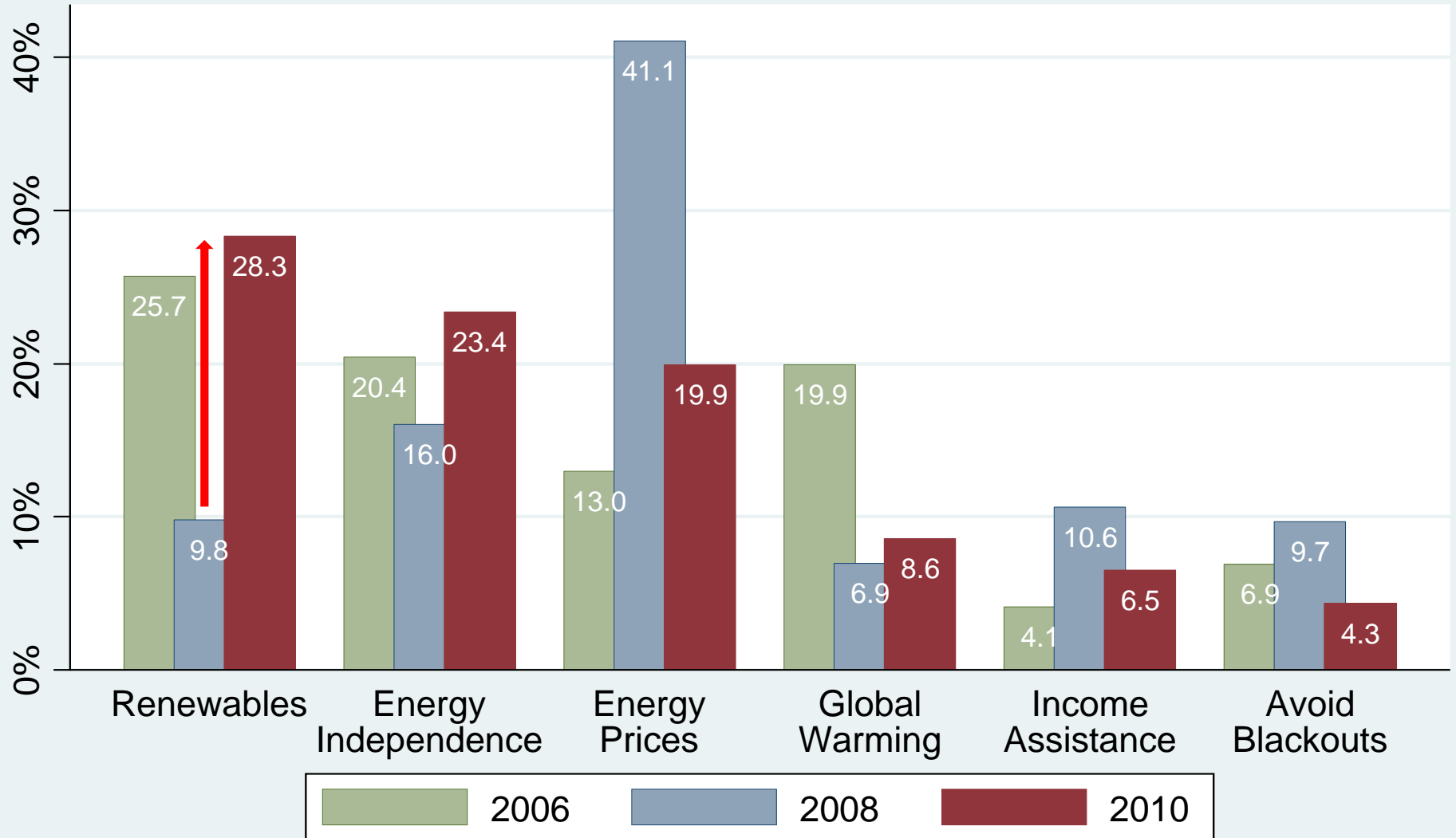
Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)



# Top National Energy Policy Priorities - 2006, 2008, 2010

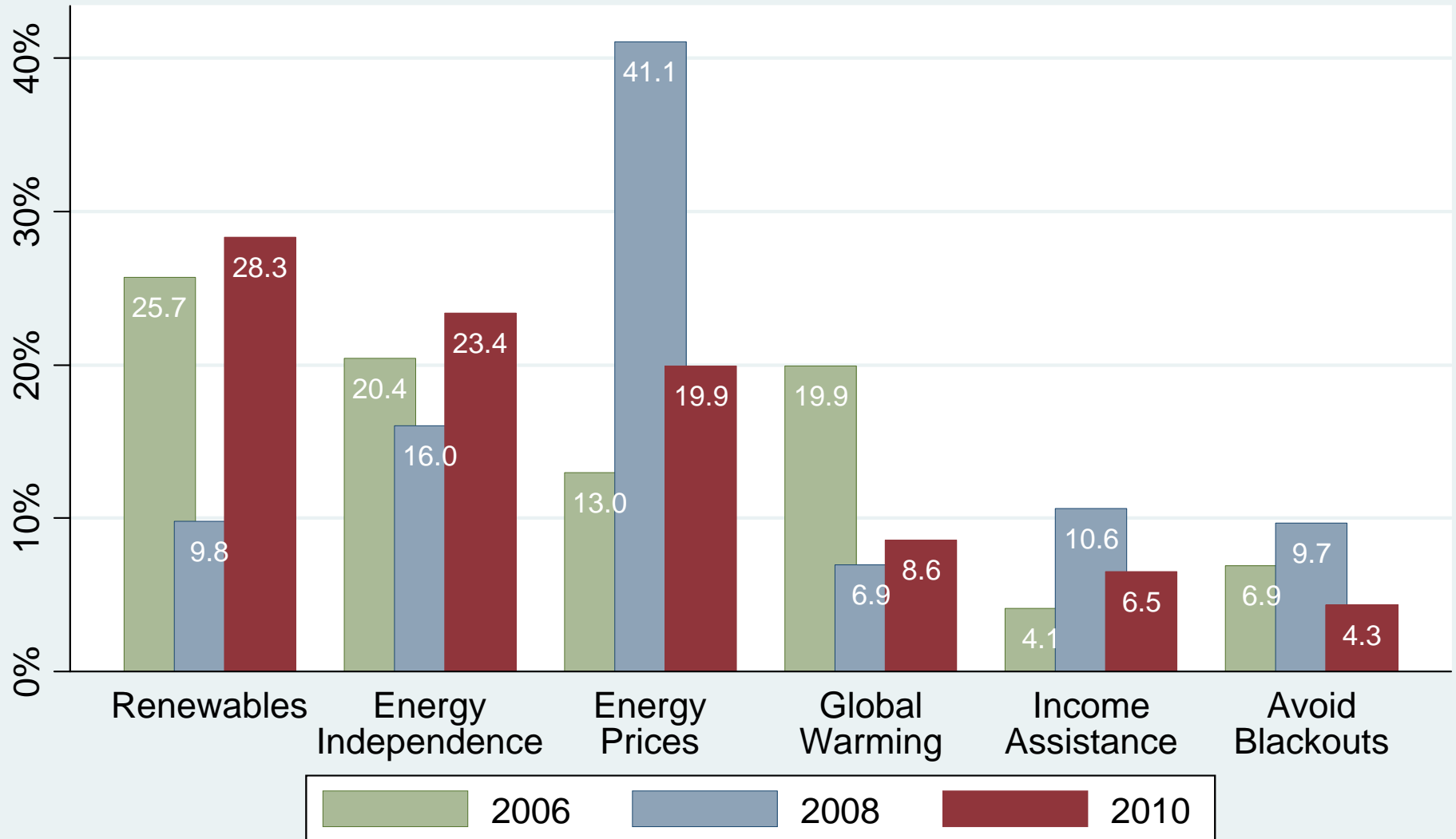


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Top National Energy Policy Priorities - 2006, 2008, 2010

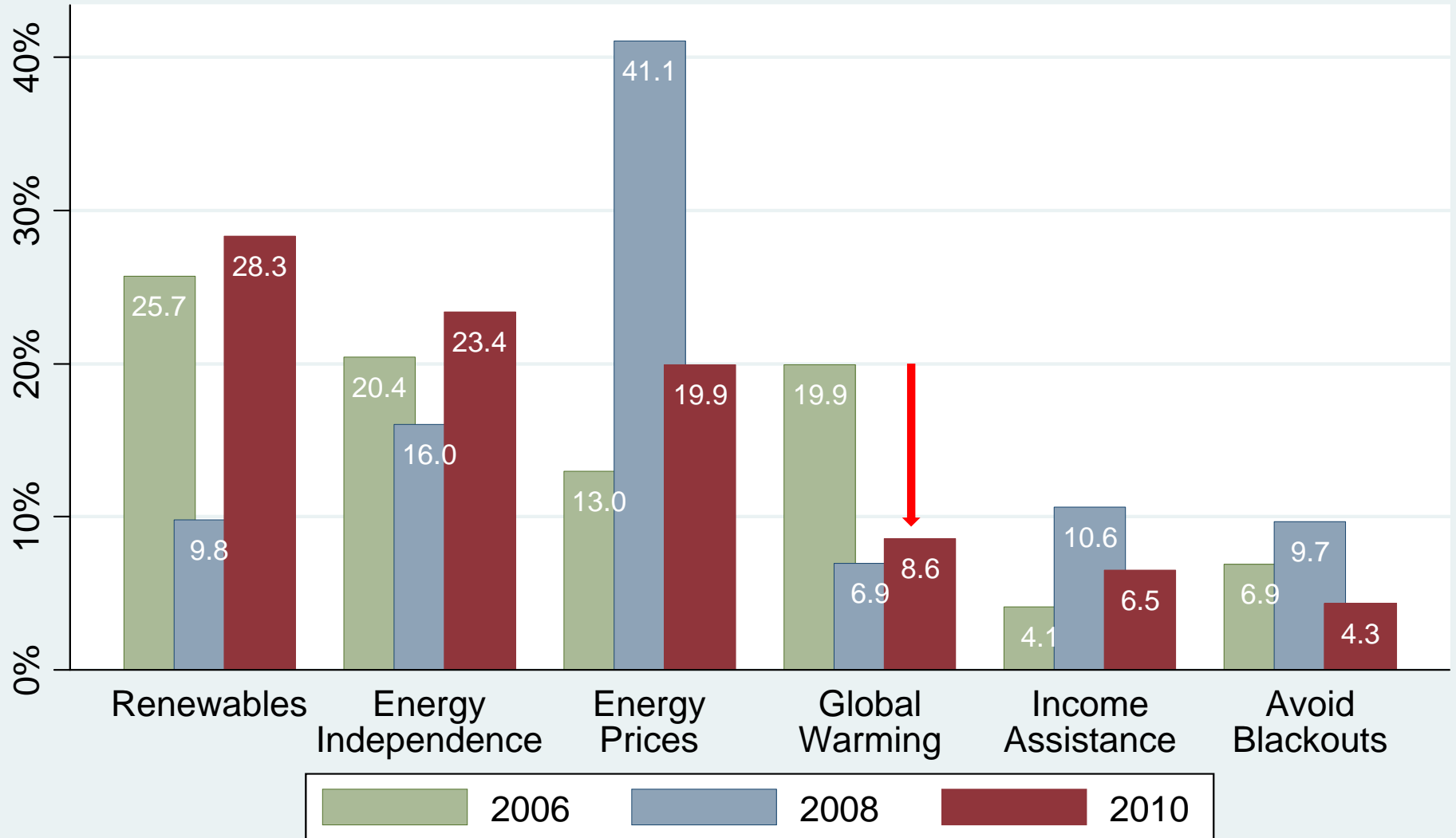


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Top National Energy Policy Priorities - 2006, 2008, 2010

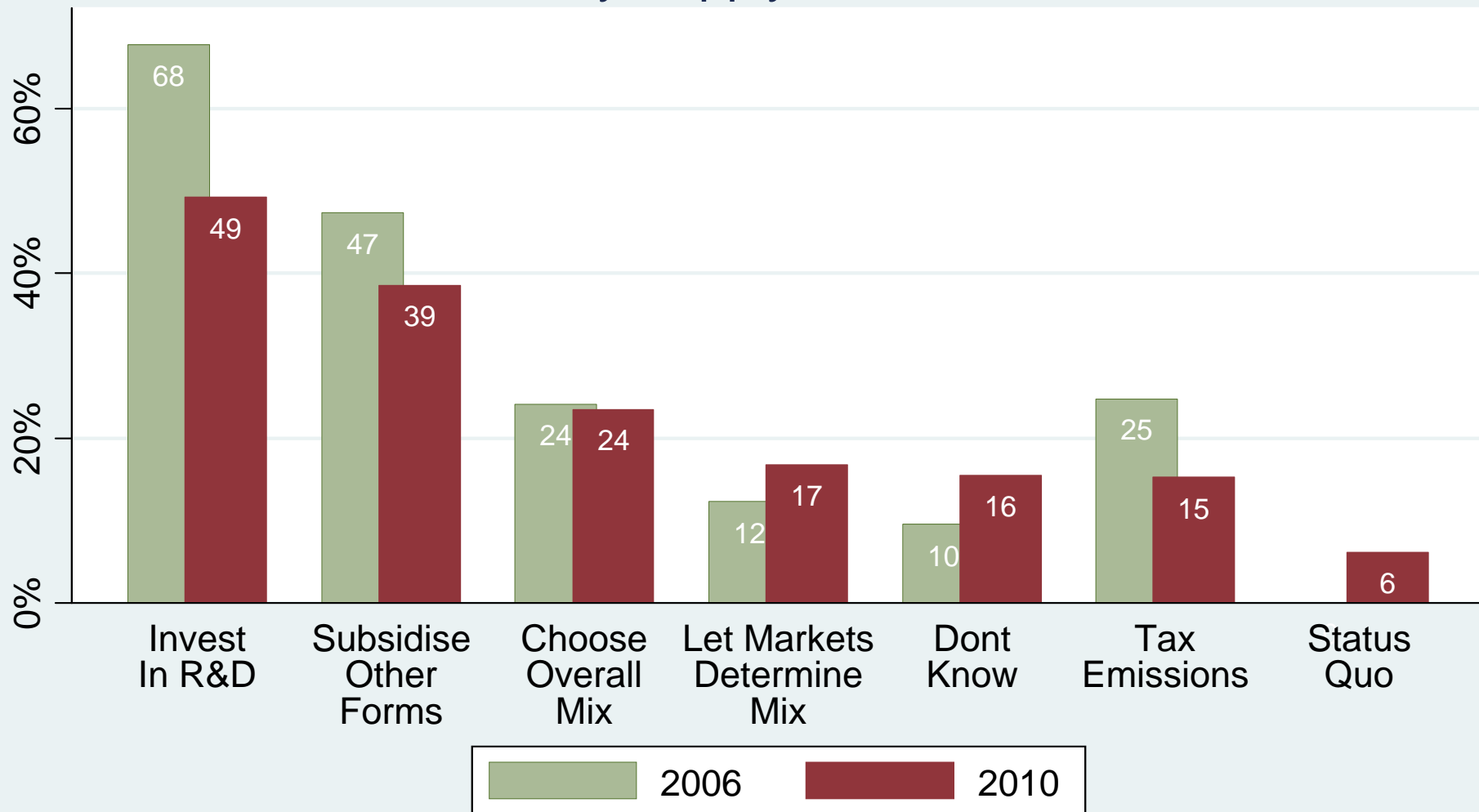


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# What Should Government Do About Electricity Supply - 2006,2010

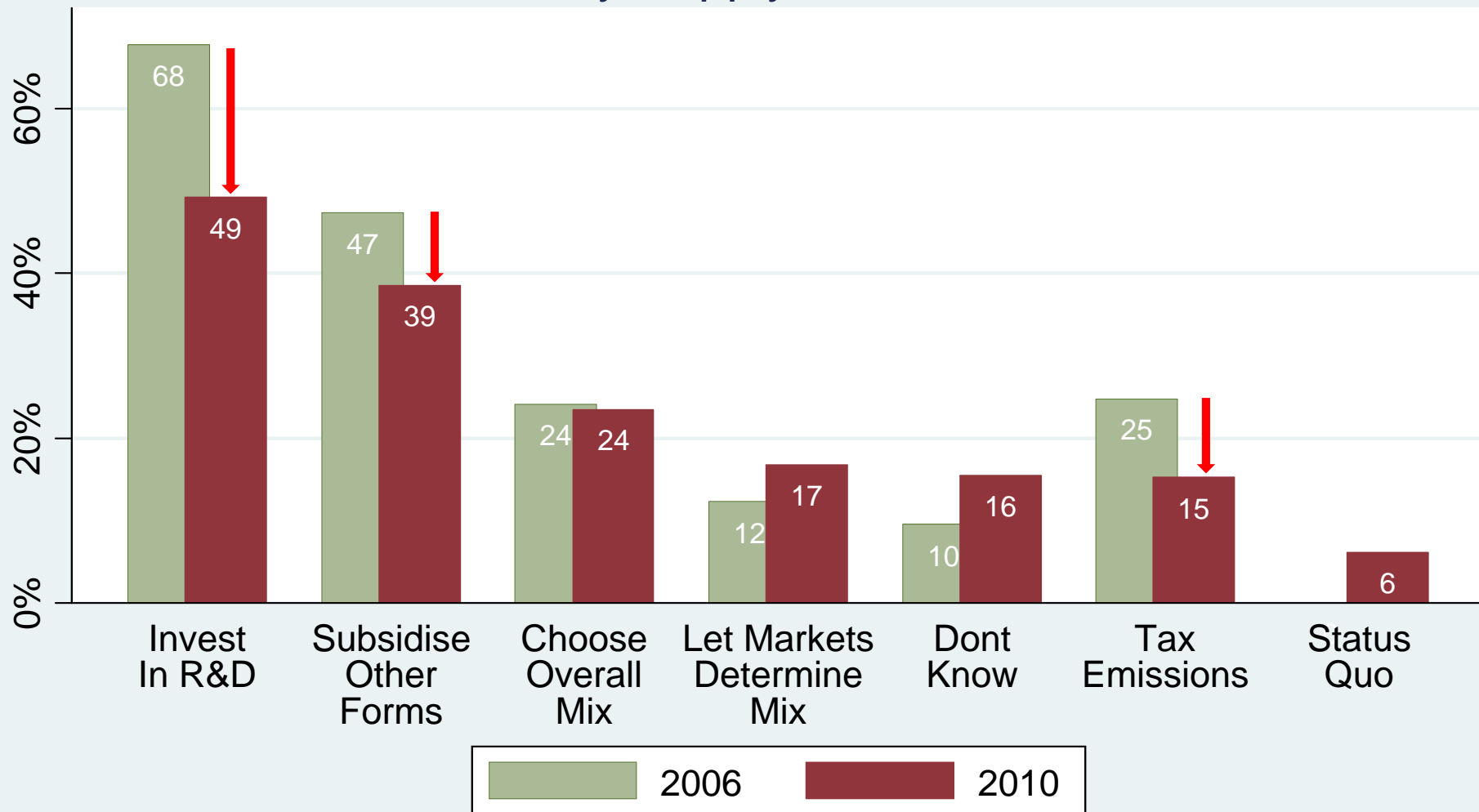


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# What Should Government Do About Electricity Supply - 2006,2010

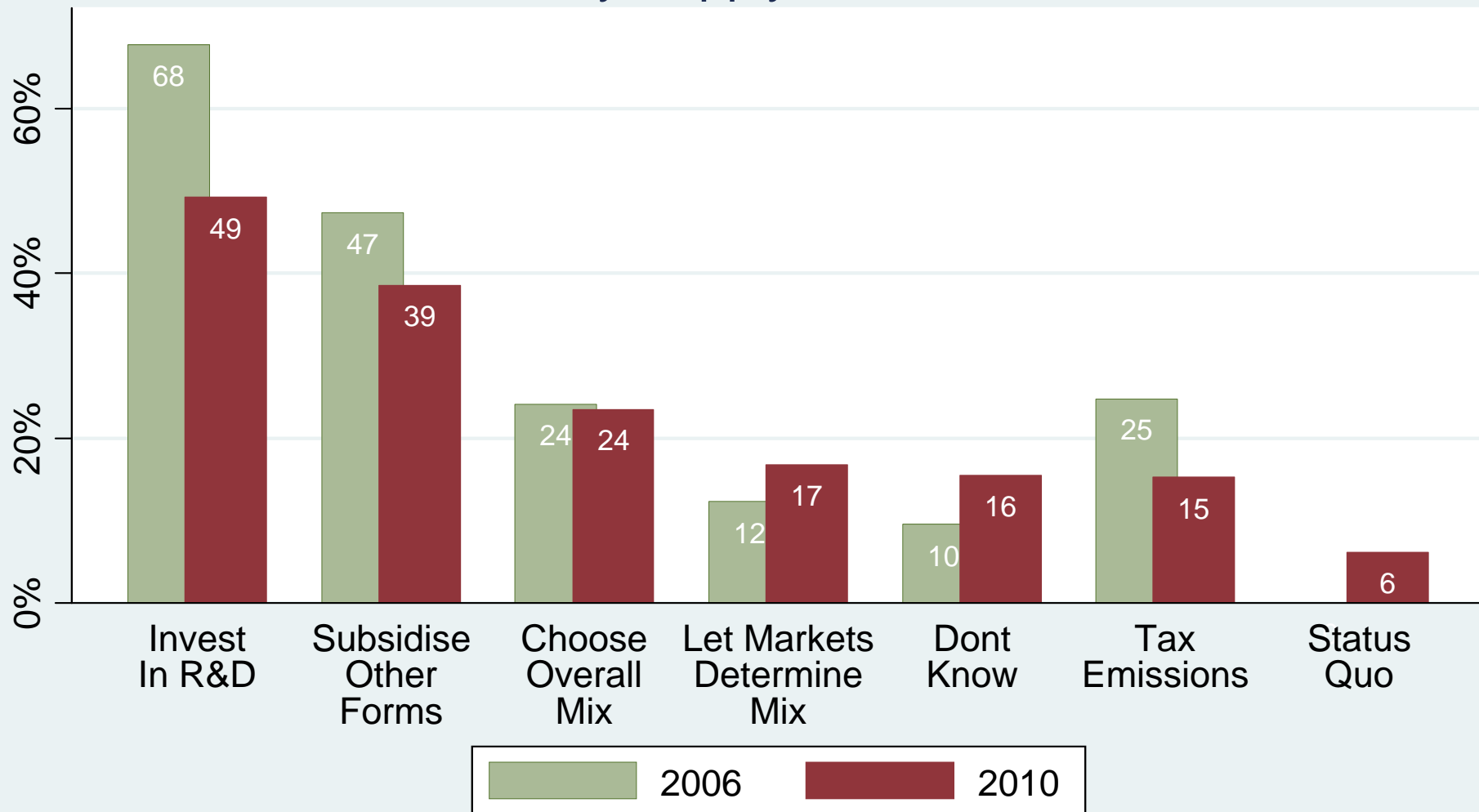


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# What Should Government Do About Electricity Supply - 2006,2010

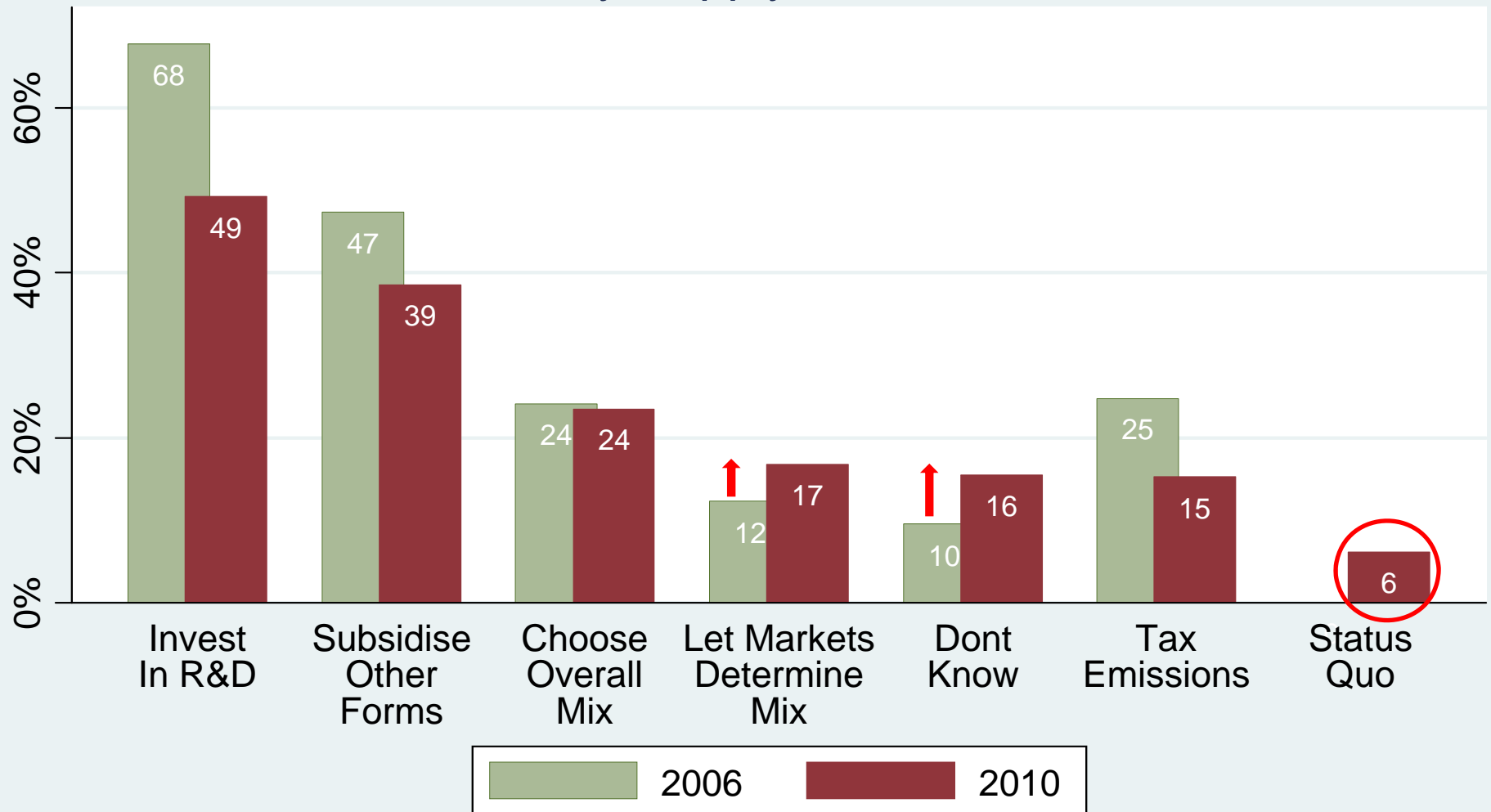


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# What Should Government Do About Electricity Supply - 2006,2010



Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)



## II. ENERGY COSTS

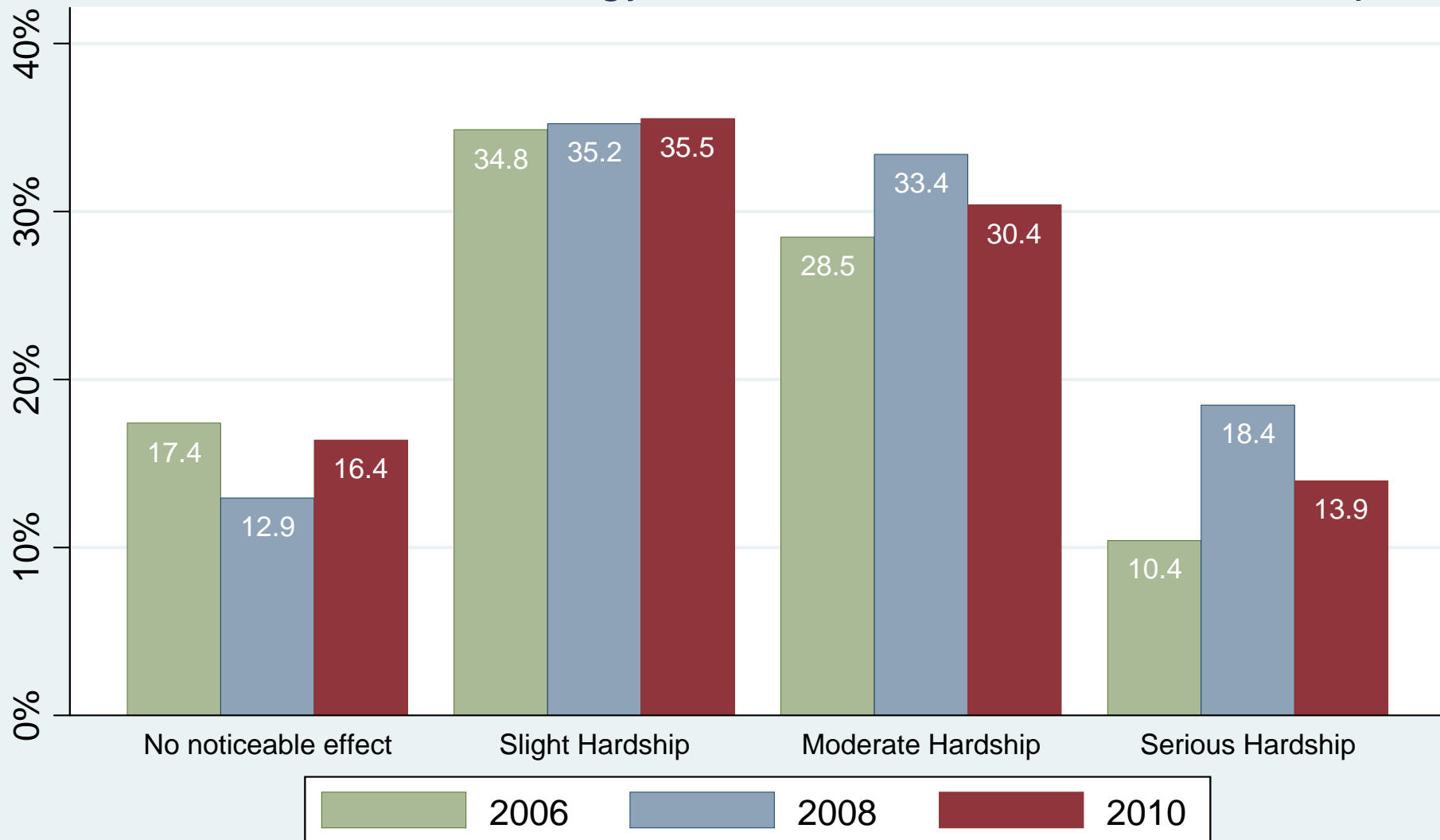
---

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)



# To What Extent Do Energy Prices Cause Financial Hardship

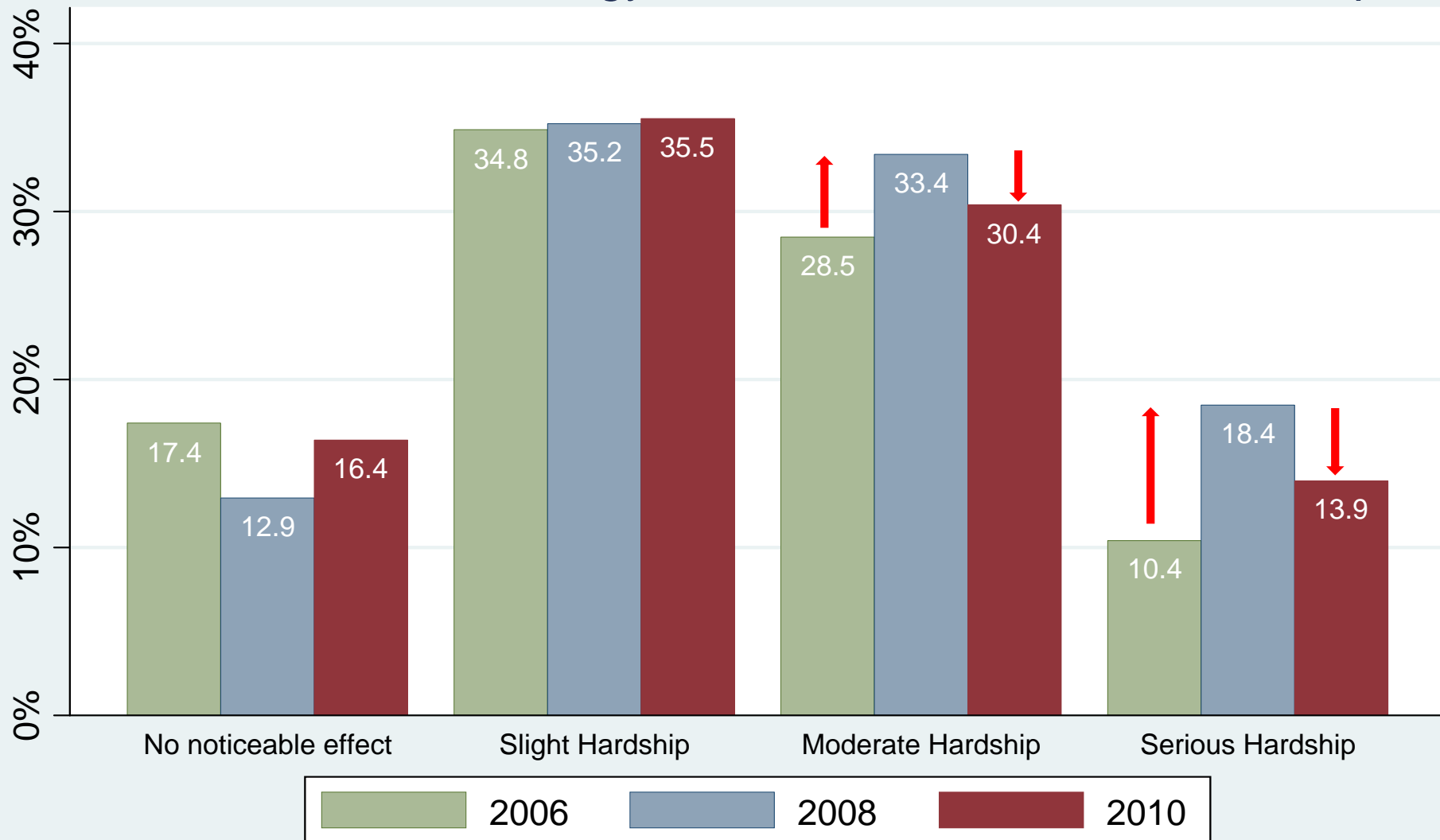


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# To What Extent Do Energy Prices Cause Financial Hardship



Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)



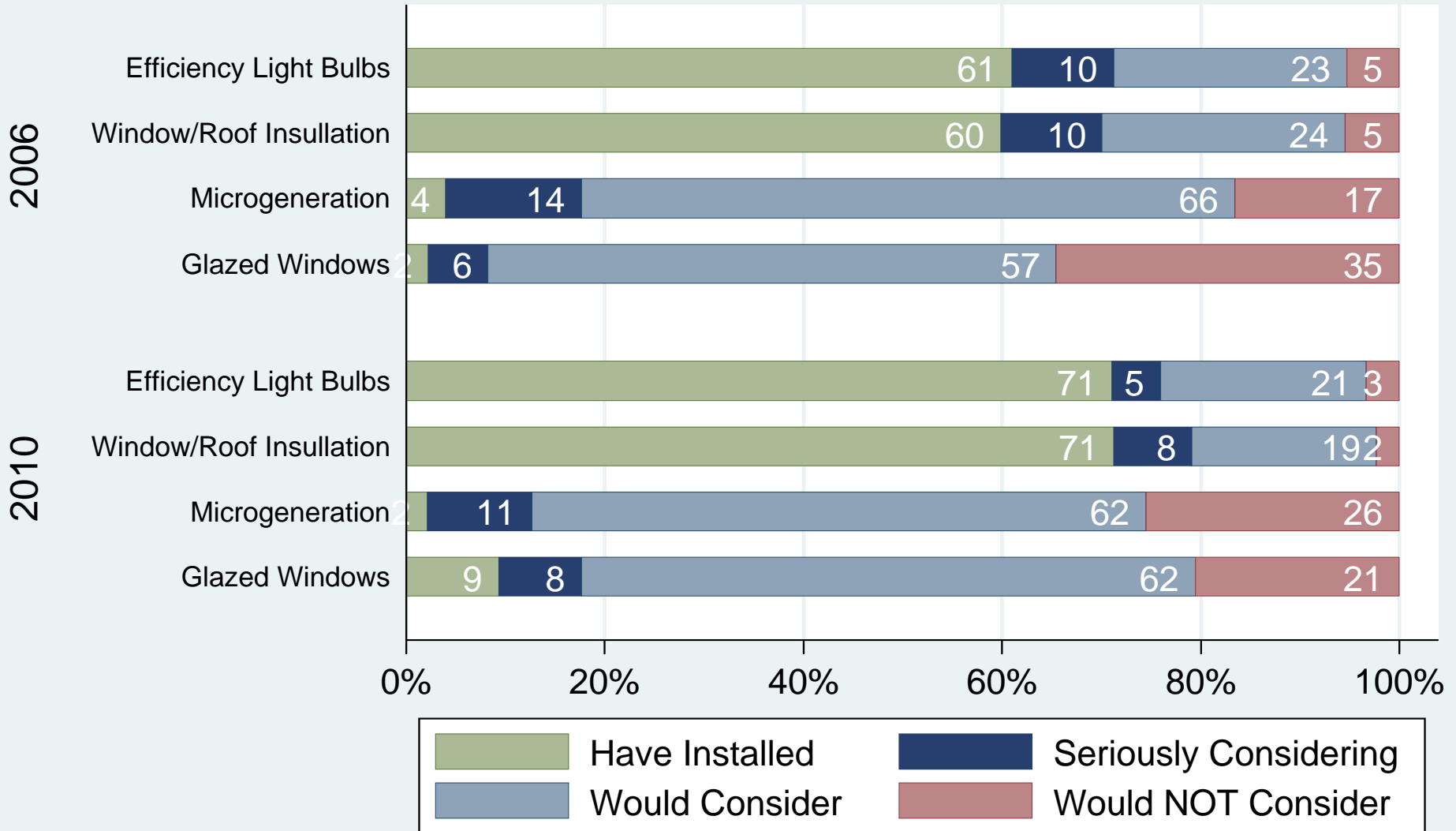
# III. ENERGY EFFICIENCY

---

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Would You Consider Installing Or Have Already Installed...?



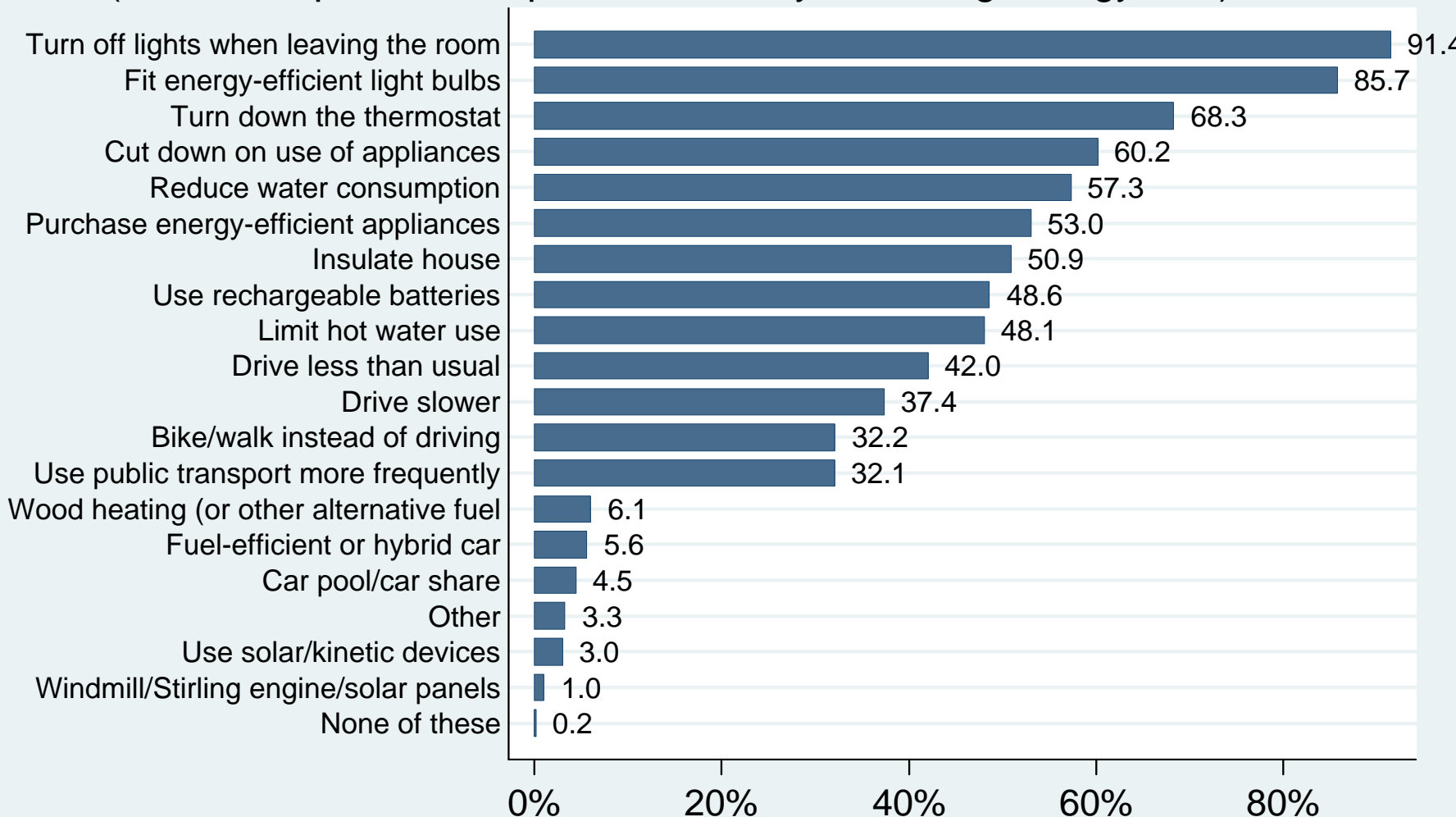
Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Measures Taken To Deliberately Reduce Use of Energy

(89% of respondents report deliberately Reducing Energy Use)



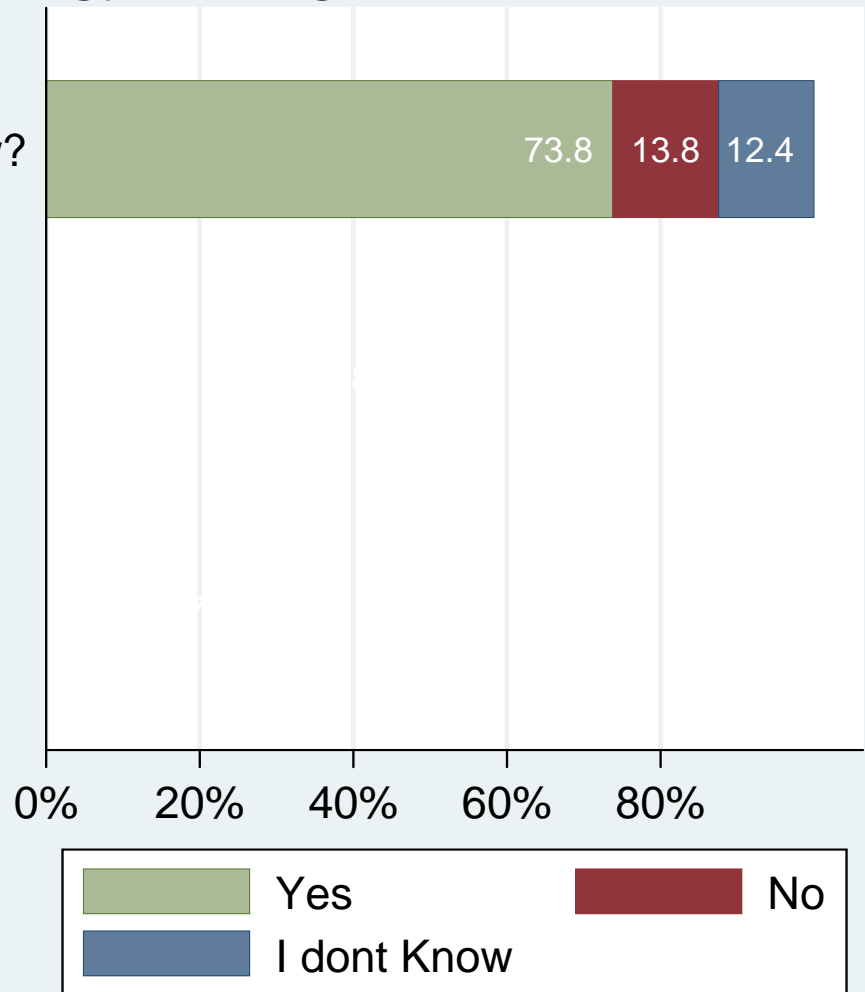
Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Would You Support Law that Makes Manufacturers Include Energy Saving Features

Would You Support Such Law?

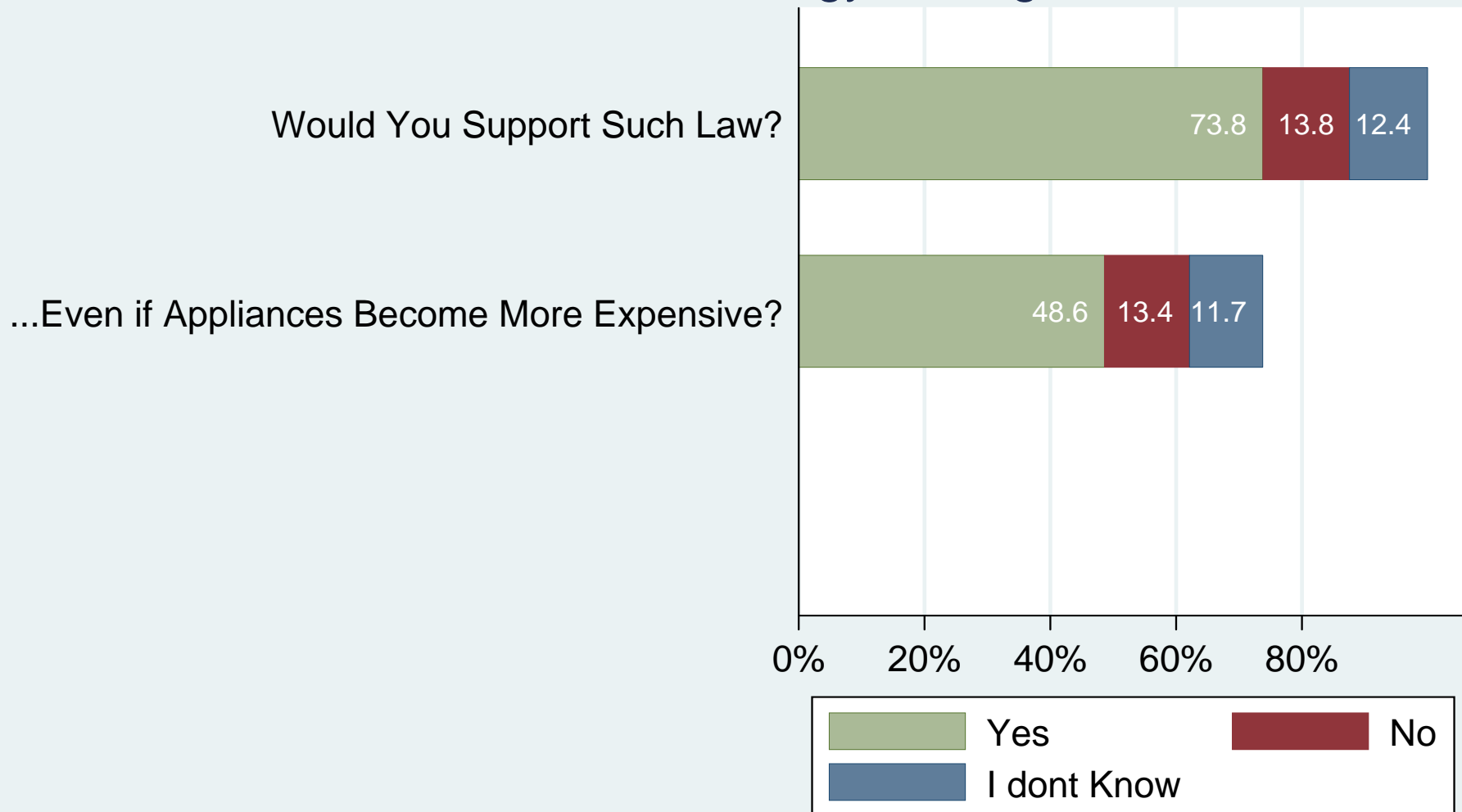


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Would You Support Law that Makes Manufacturers Include Energy Saving Features

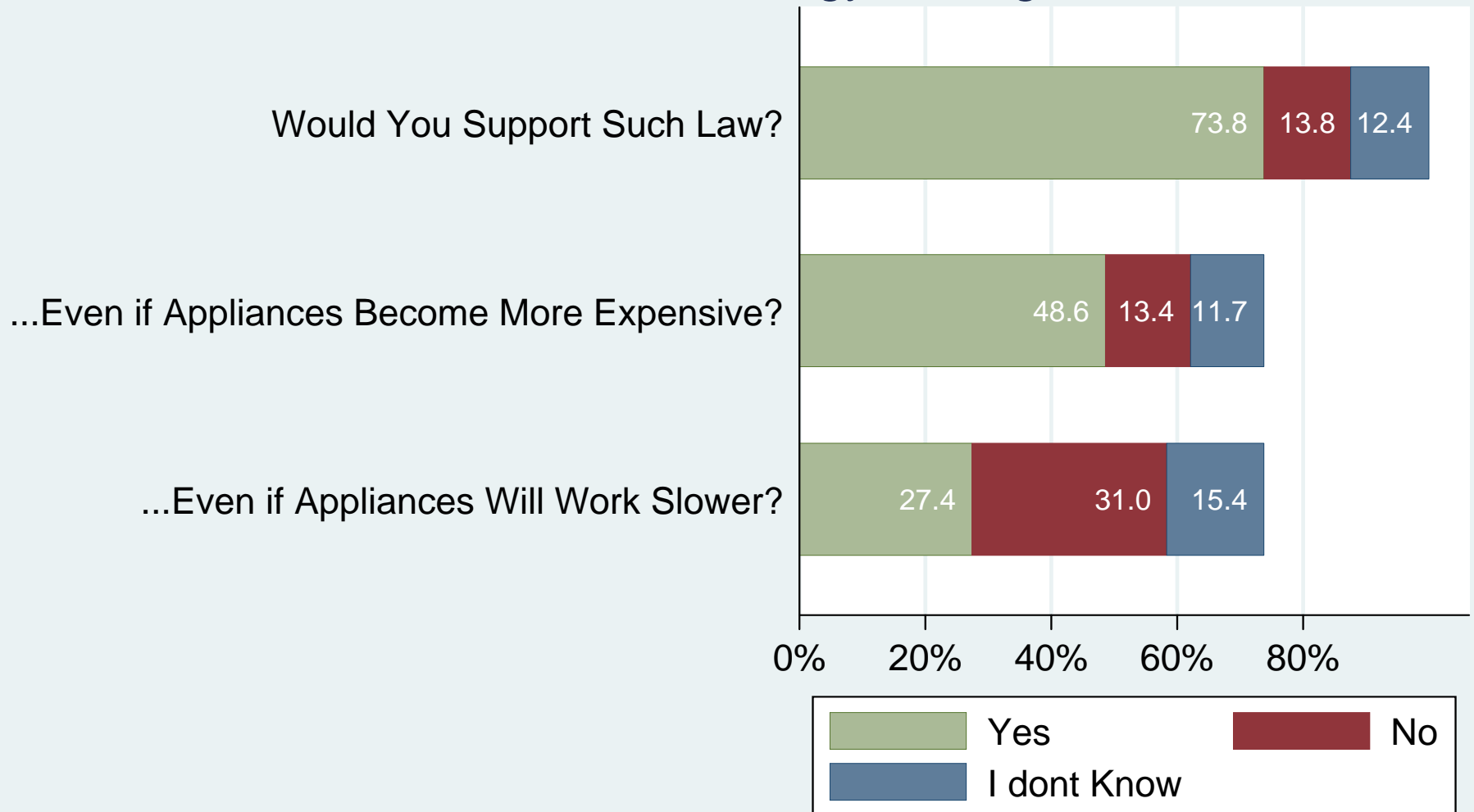


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Would You Support Law that Makes Manufacturers Include Energy Saving Features



Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)





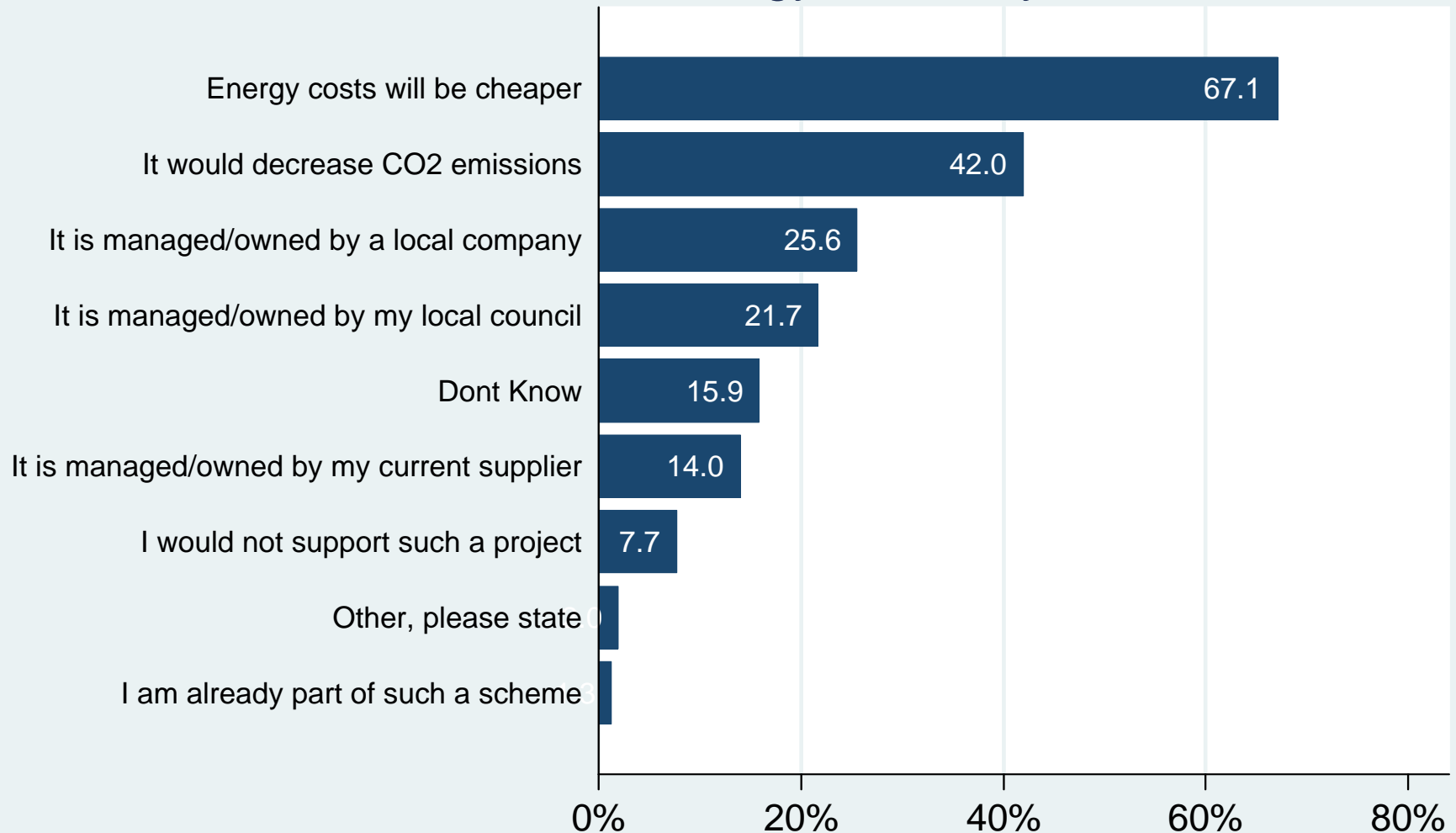
# IV. COMMUNITY ENERGY

---

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Which Factors Would Encourage You To Accept Small Scale Low Carbon Energy Plant in your District

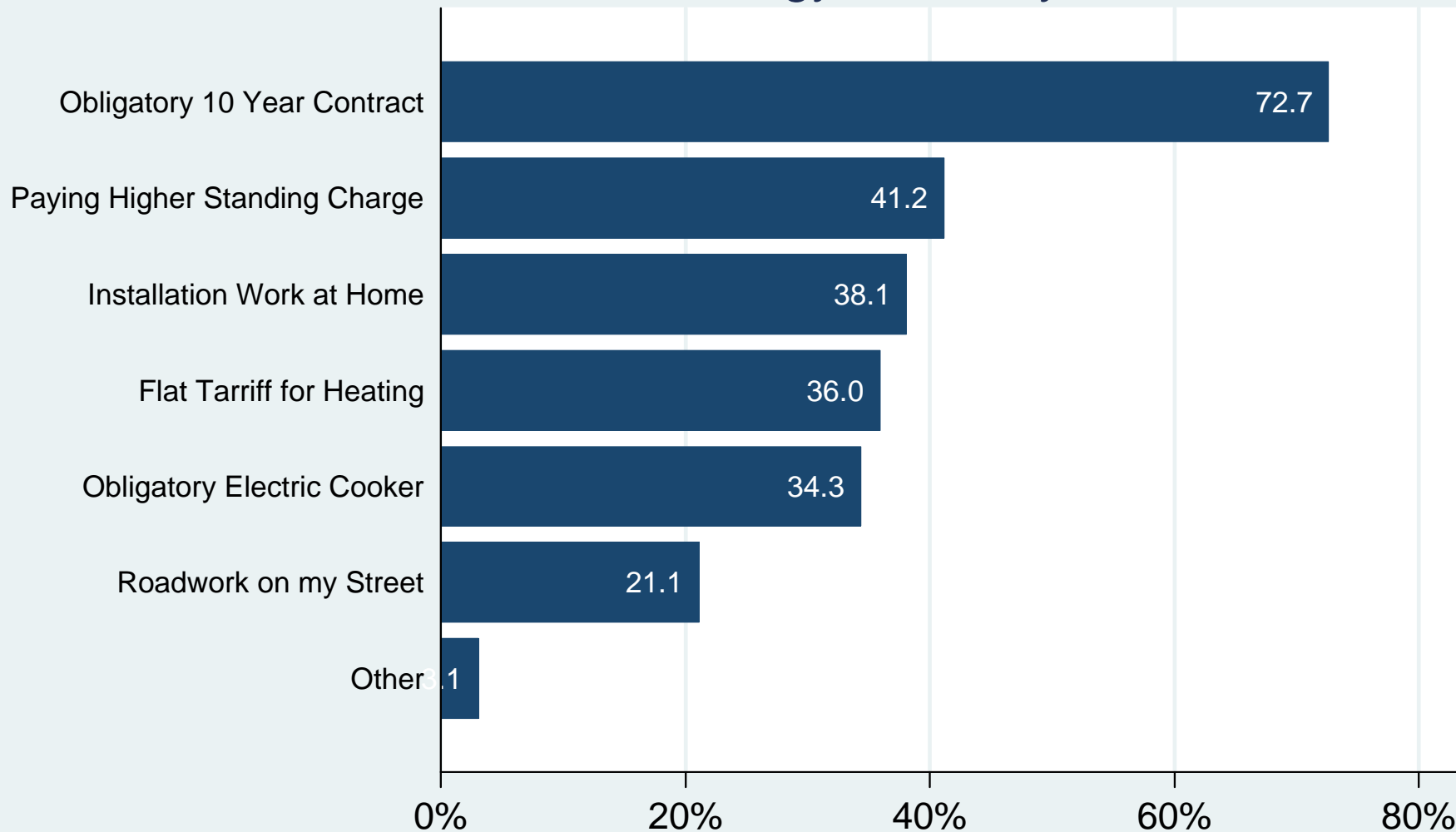


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Which Factors Would DISCOURAGE You To Accept Small Scale Low Carbon Energy Plant in your District

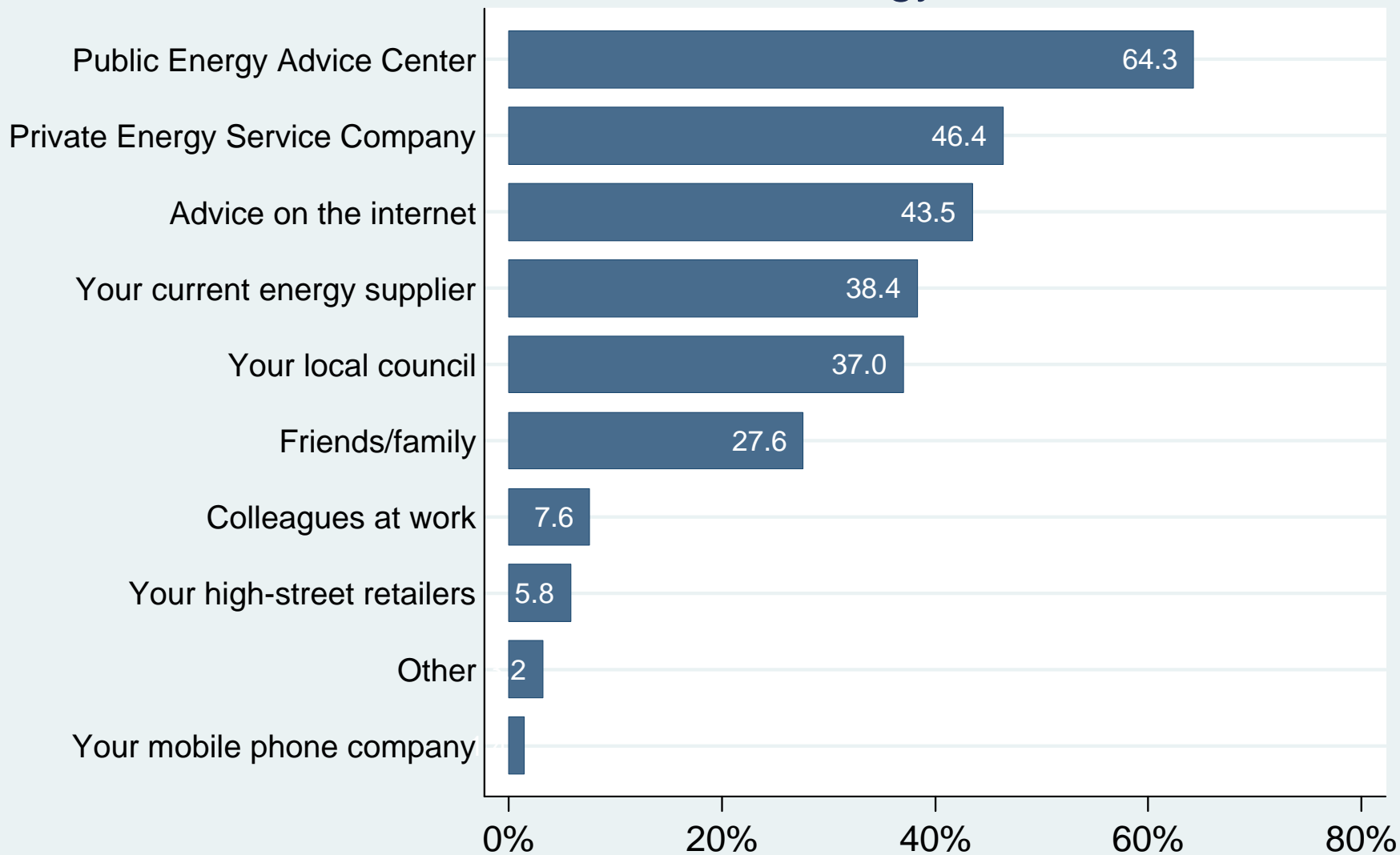


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Who Would You Trust for Energy Advice



Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)



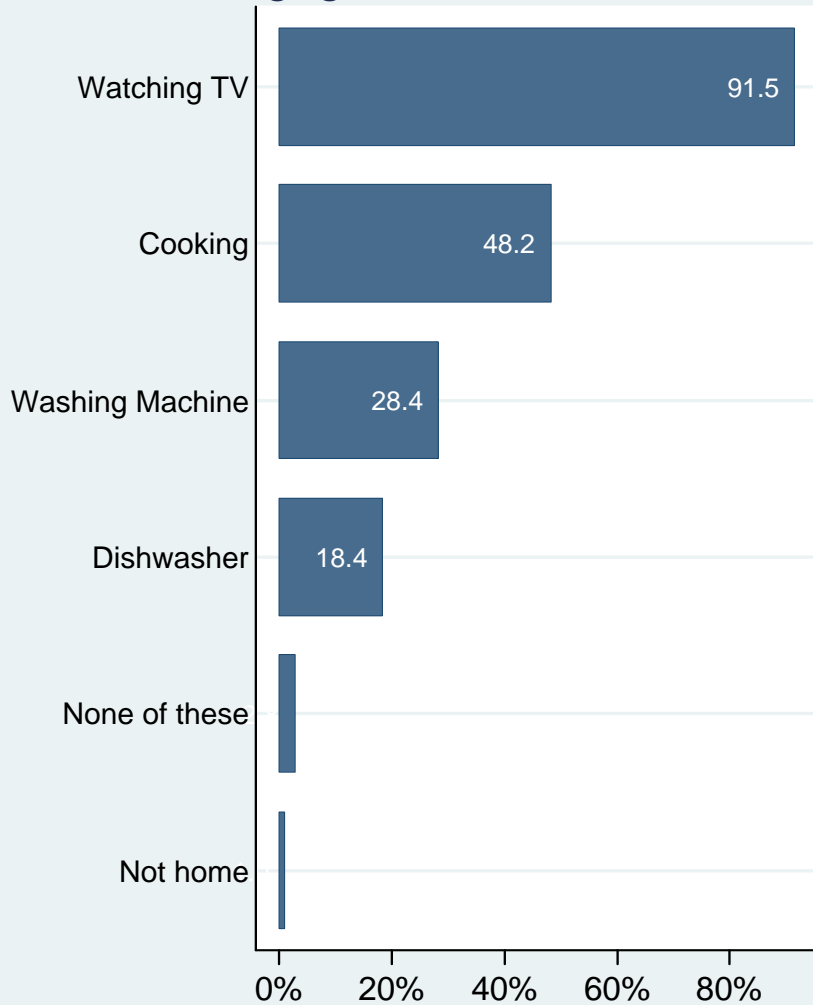
# V. WILLINGNESS TO ACCEPT APPLIANCE USAGE MODIFICATIONS

---

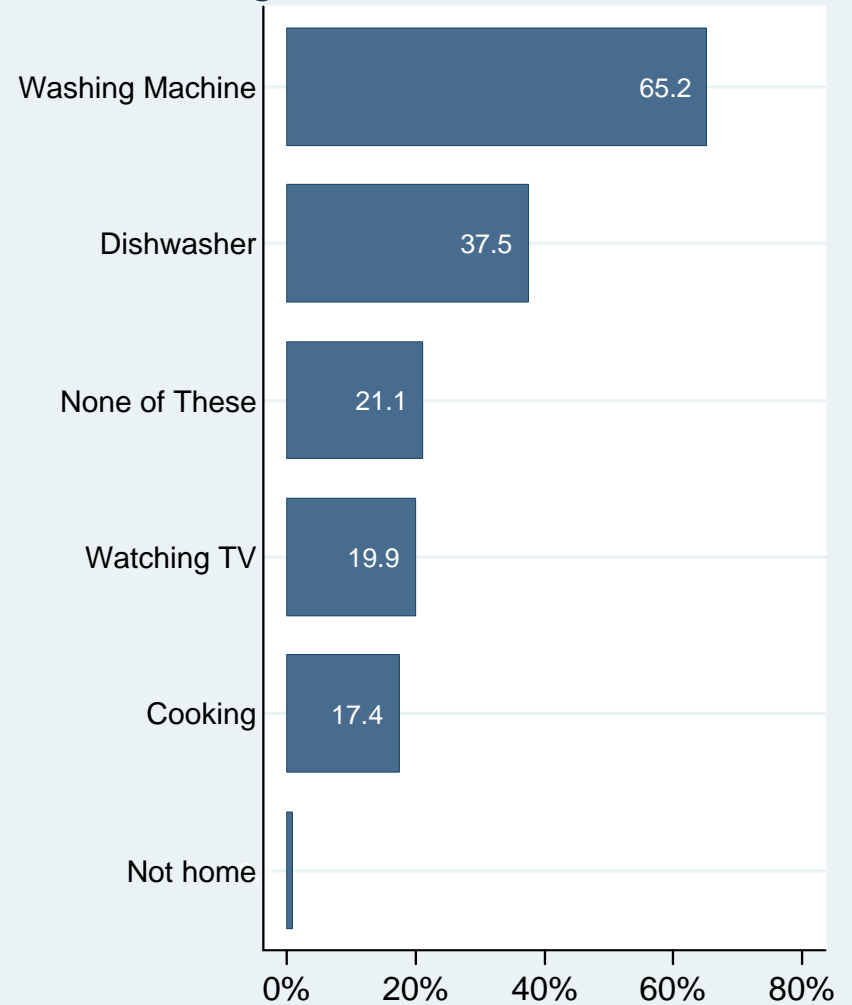
**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

### Which Activity Do You Engage in 7-9PM



### Which Activity Are You Willing to Shift After 9PM

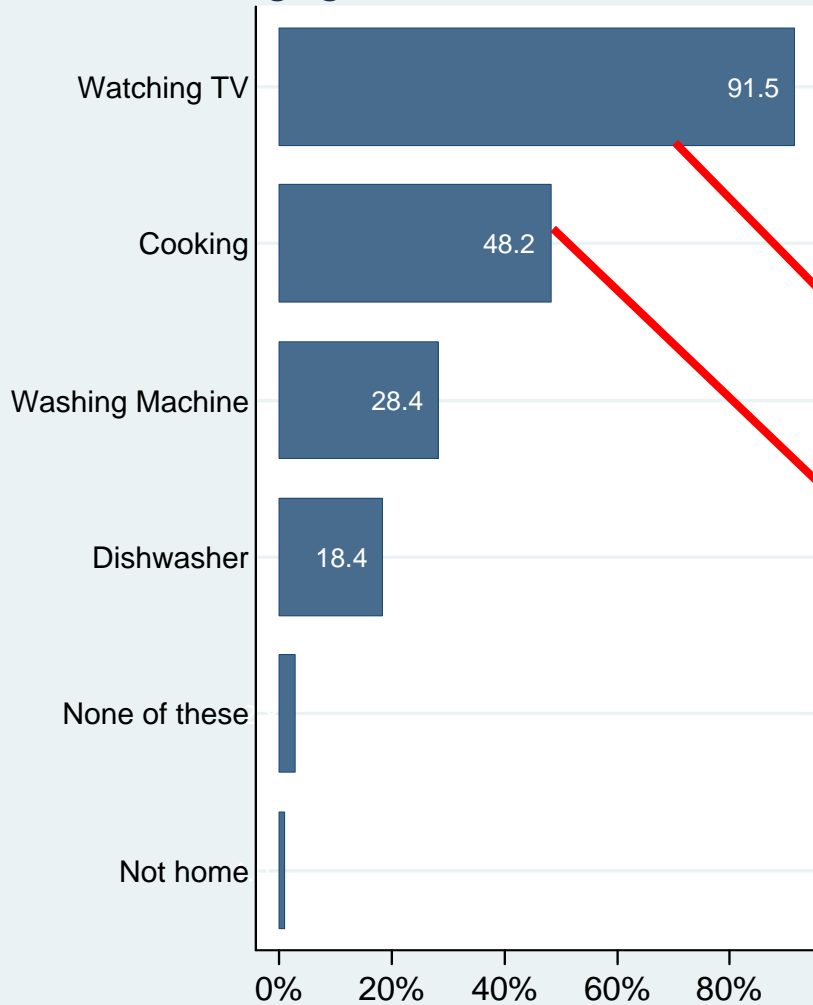


Source: EPRG Survey of UK Households

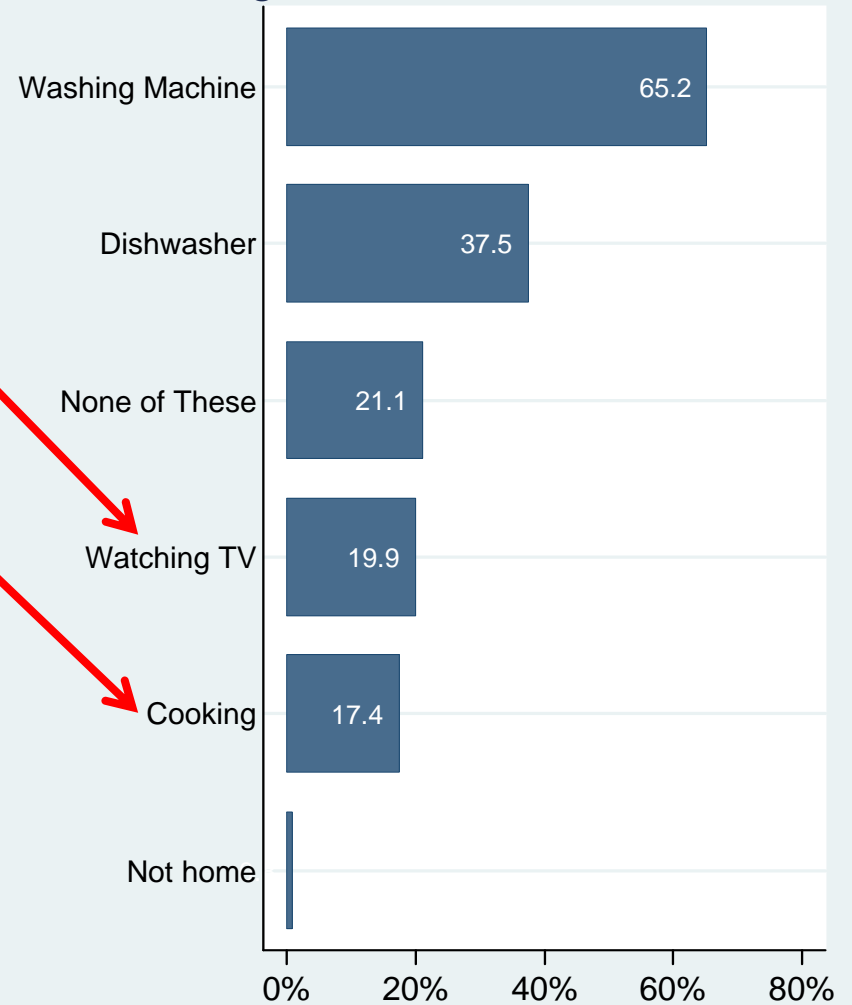
**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

### Which Activity Do You Engage in 7-9PM



### Which Activity Are You Willing to Shift After 9PM

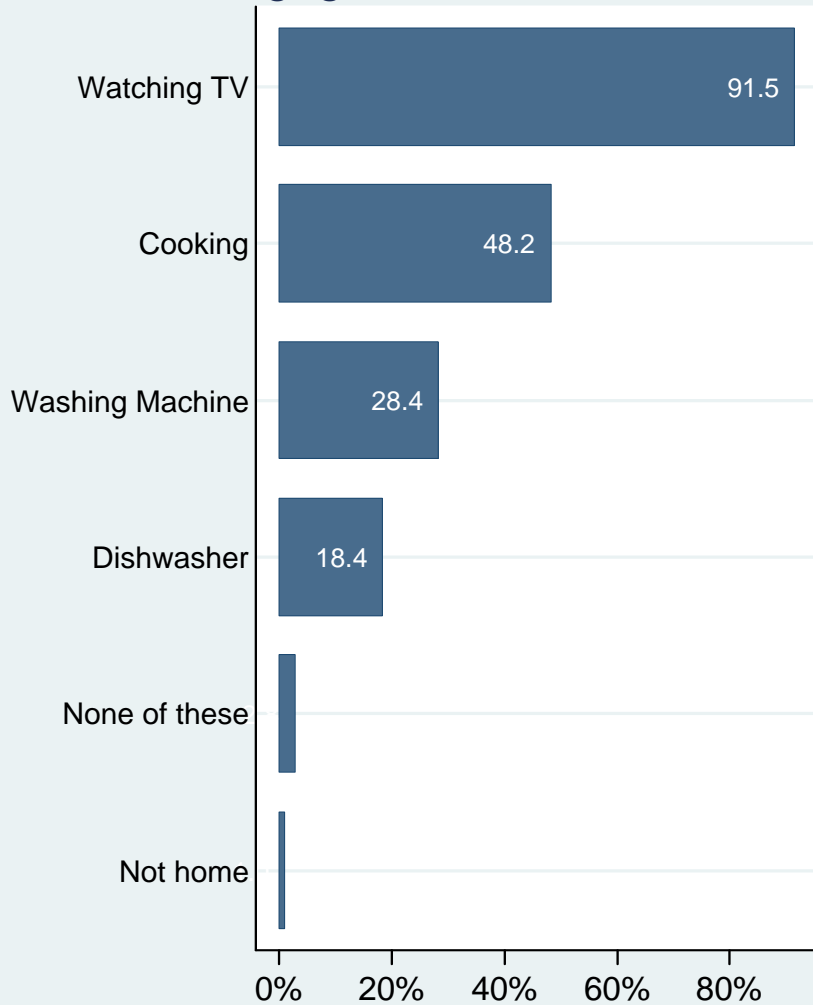


Source: EPRG Survey of UK Households

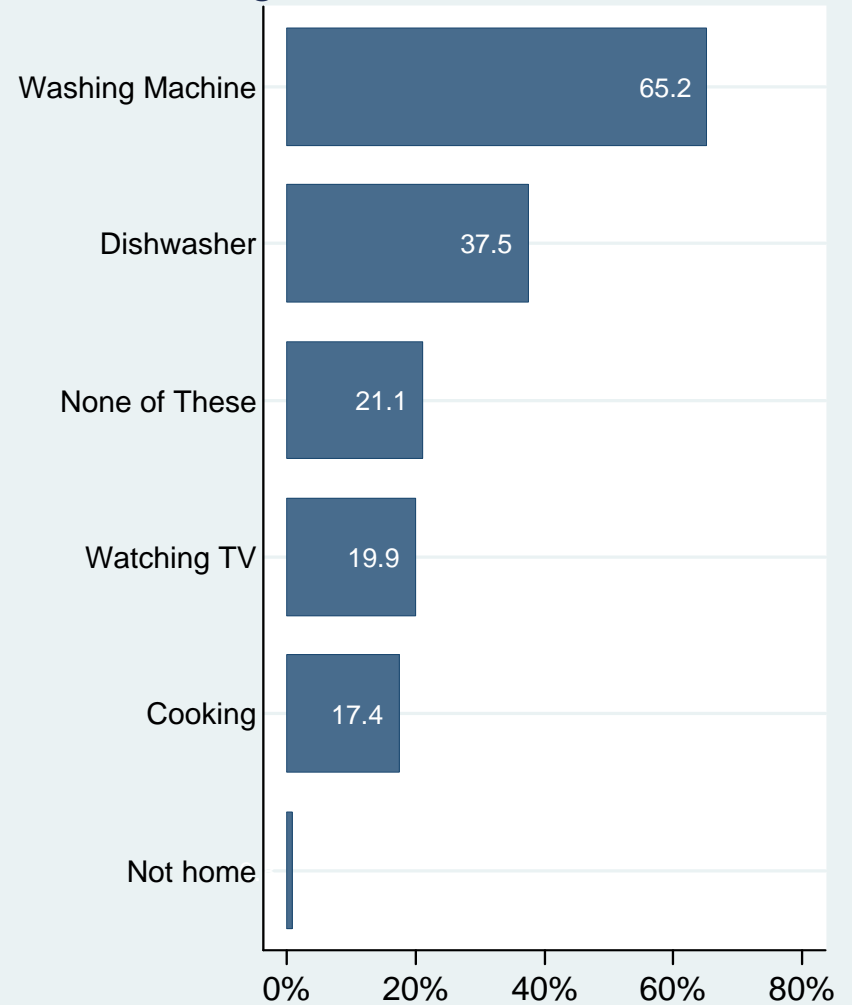
**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

### Which Activity Do You Engage in 7-9PM



### Which Activity Are You Willing to Shift After 9PM



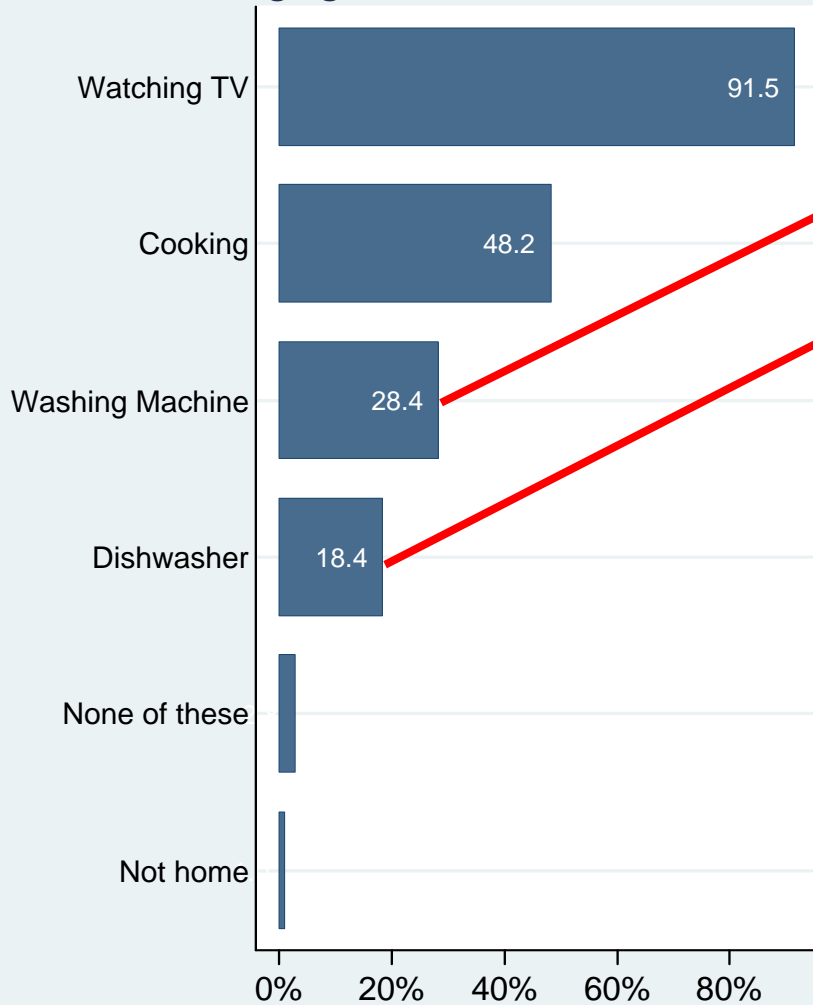
Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

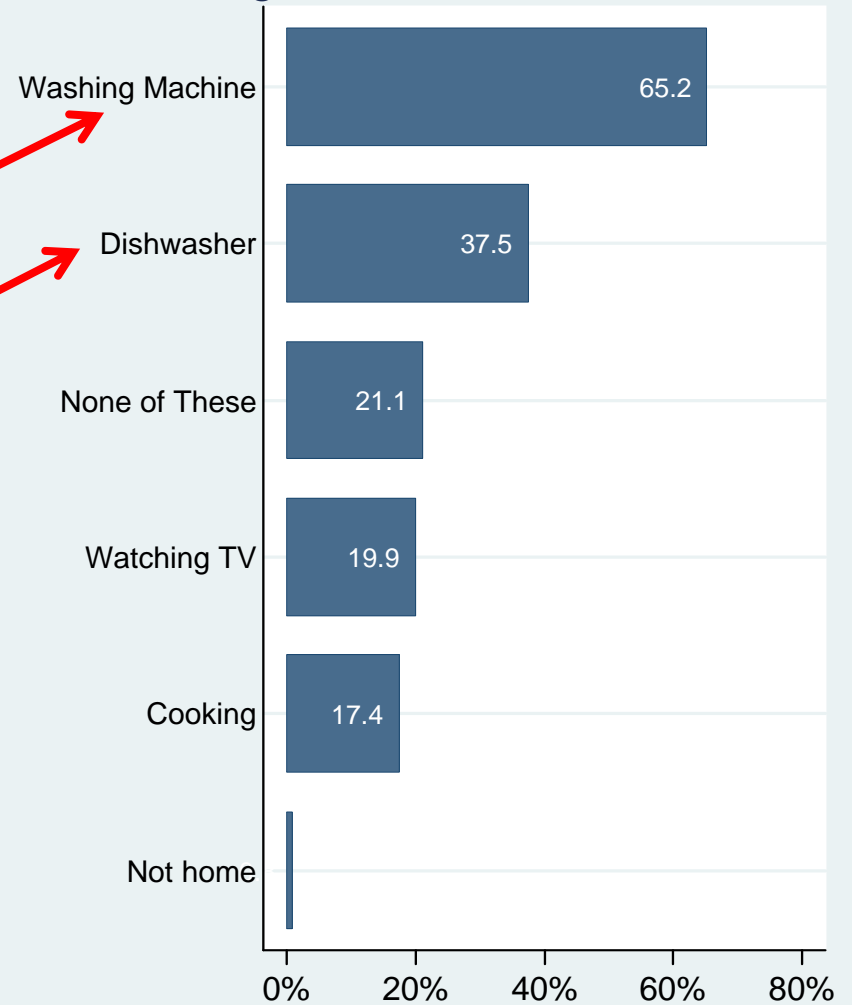
[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)



### Which Activity Do You Engage in 7-9PM



### Which Activity Are You Willing to Shift After 9PM

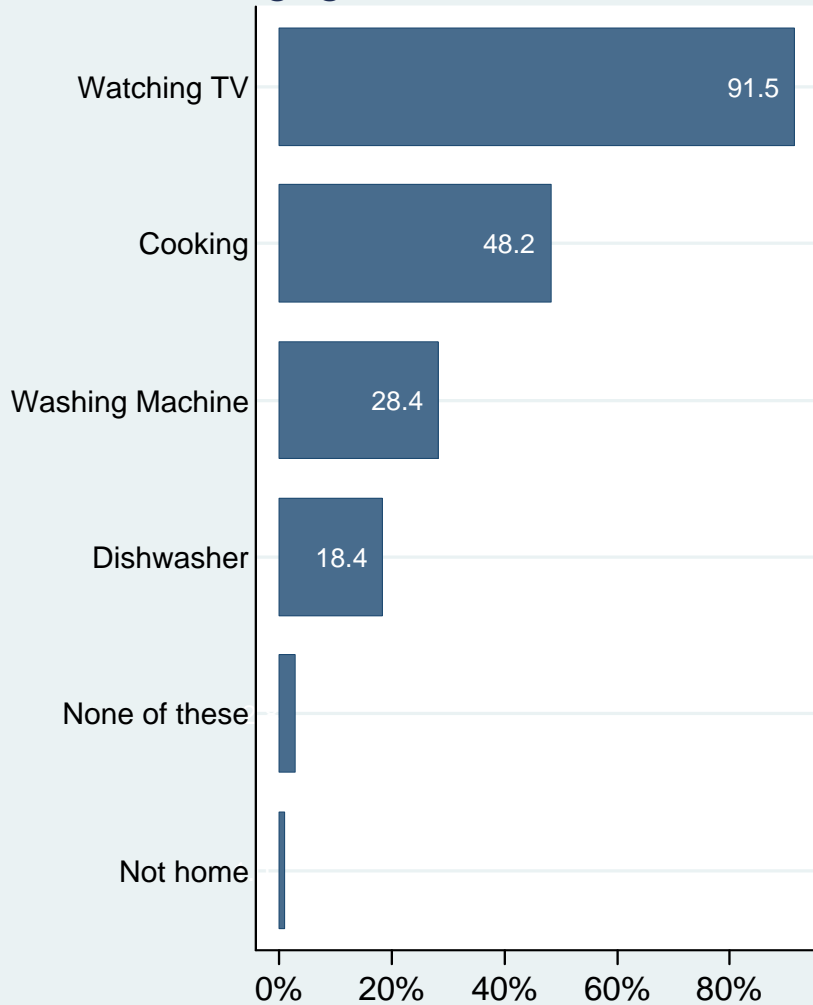


Source: EPRG Survey of UK Households

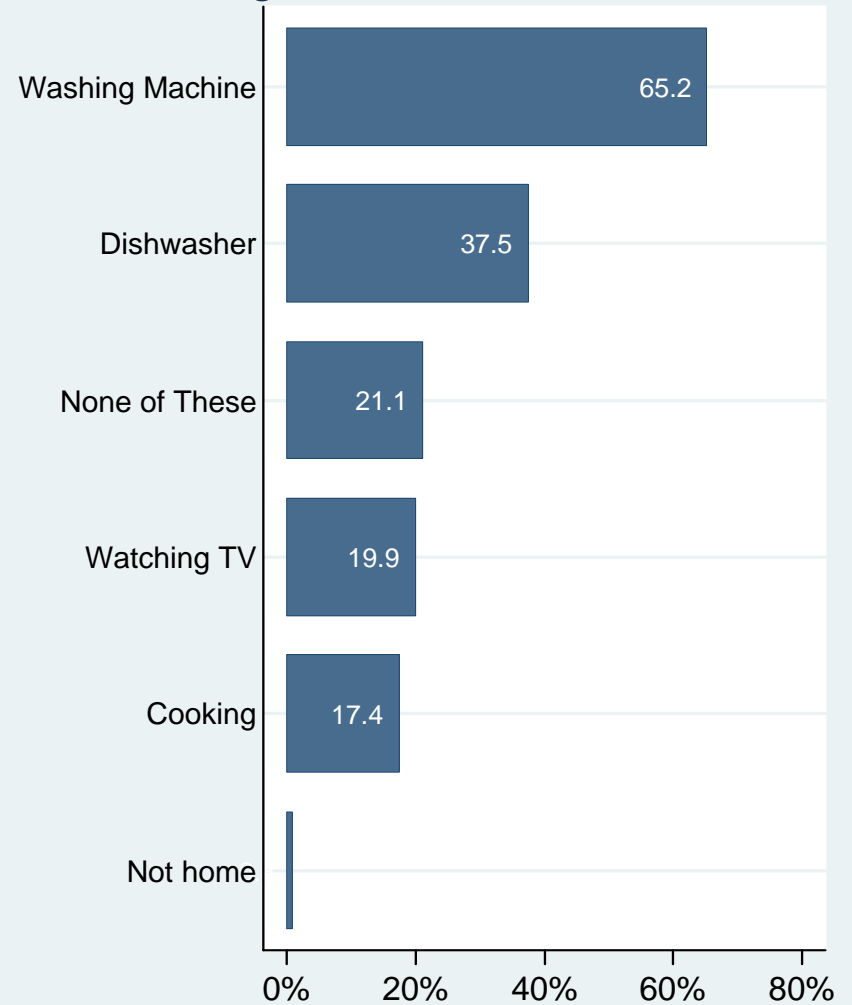
**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

### Which Activity Do You Engage in 7-9PM



### Which Activity Are You Willing to Shift After 9PM



Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

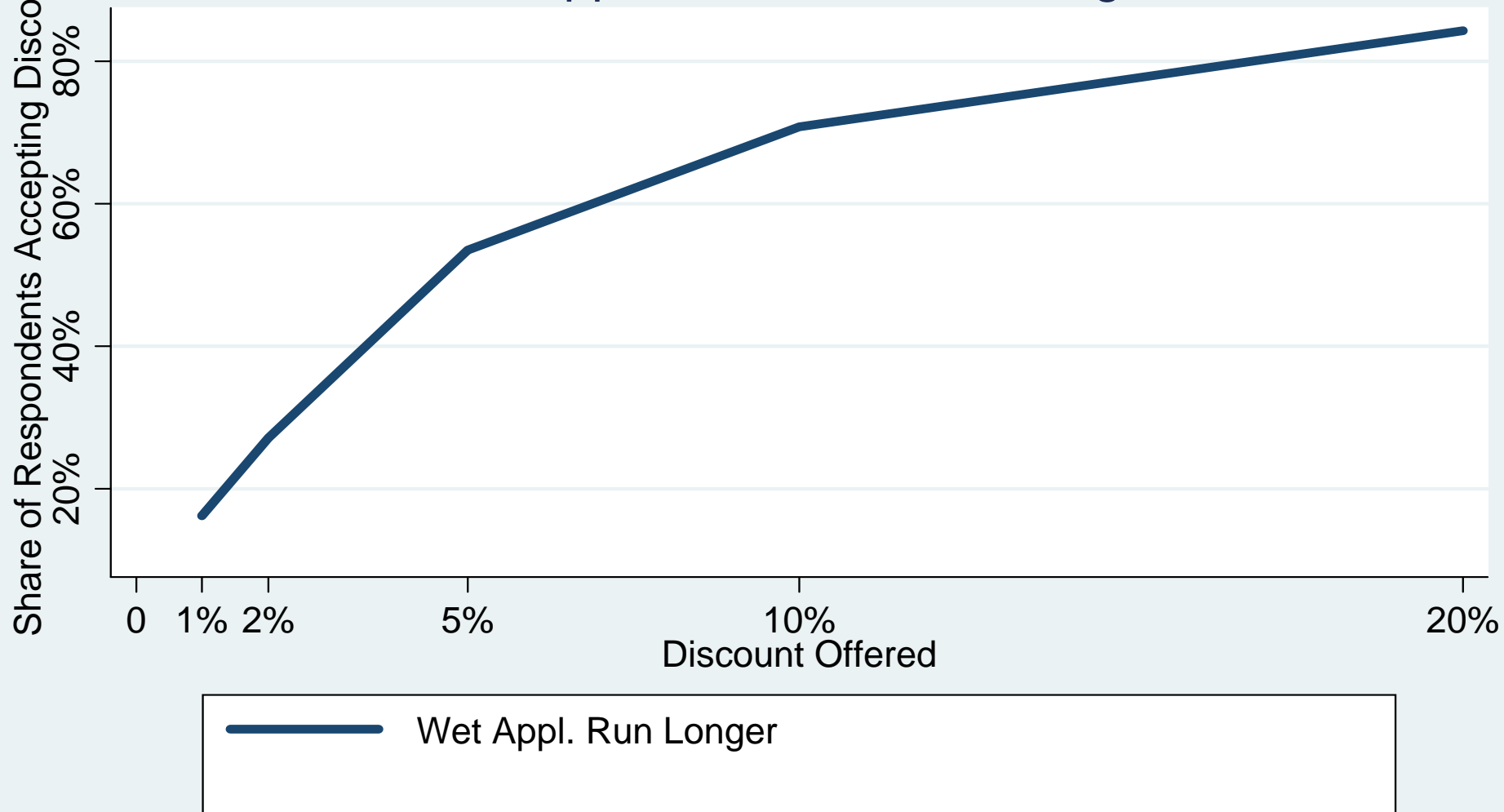
[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# In Exchange for Discount, Would You accept:



- 1) Having your Wet Appliances (**Dishwasher, Washing Machine, Dryer**) run over longer time
- 2) Having White Appliances (**Fridges and Freezers**) Interrupted for periods of 1-3 minutes
- 3) Having Wet Appliances preset to operate 9PM – 7AM
- 4) Not being able to use cooker for 30 min intervals over 15 times a year (Capped usage)
  - Discounts asked for consideration: 1%, 2%, 5%, 10%, 20%

# Cumulative Share of Respondents that Accept Modifications to Appliance Use in Exchange for Discount

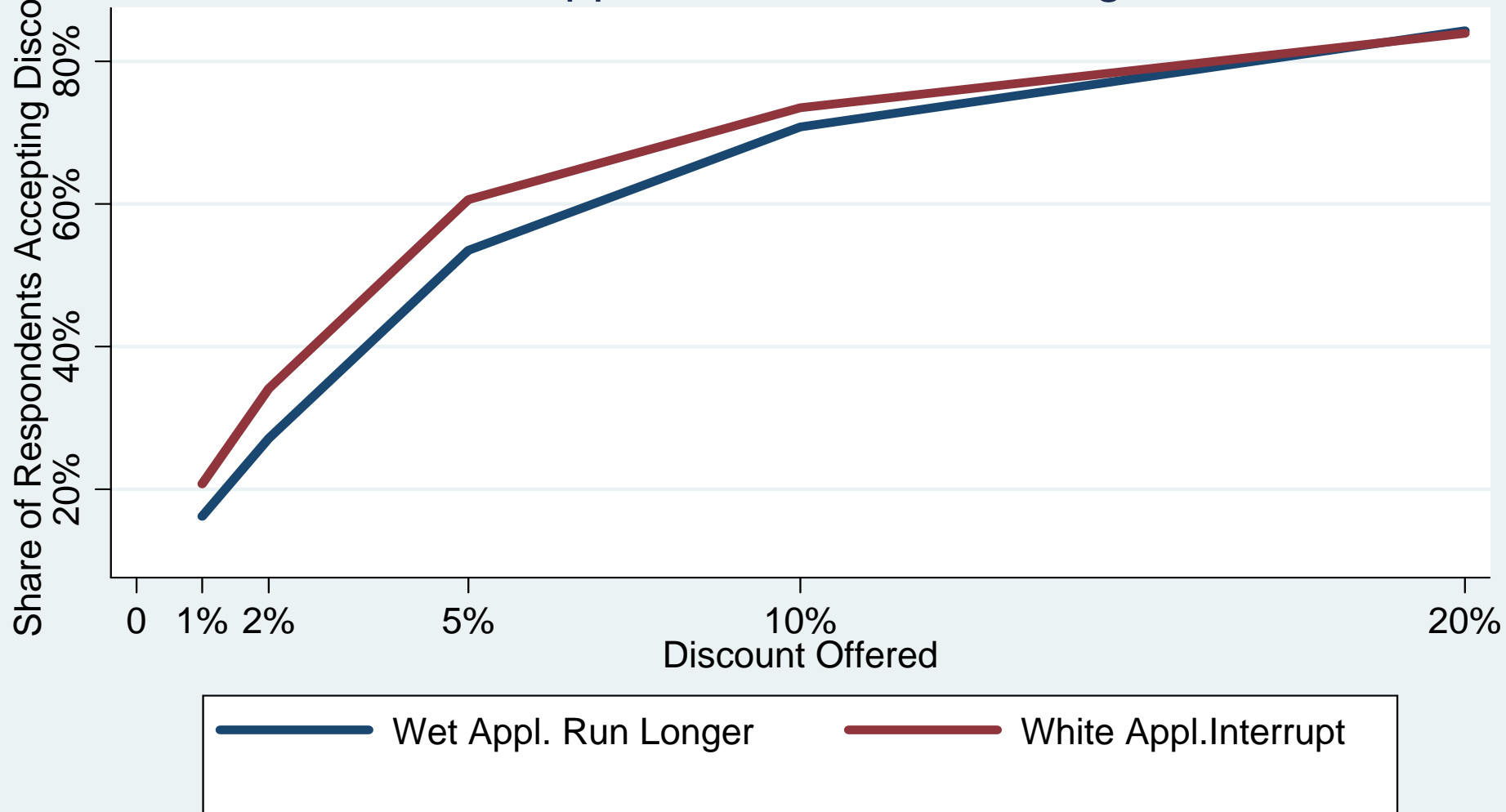


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Cumulative Share of Respondents that Accept Modifications to Appliance Use in Exchange for Discount

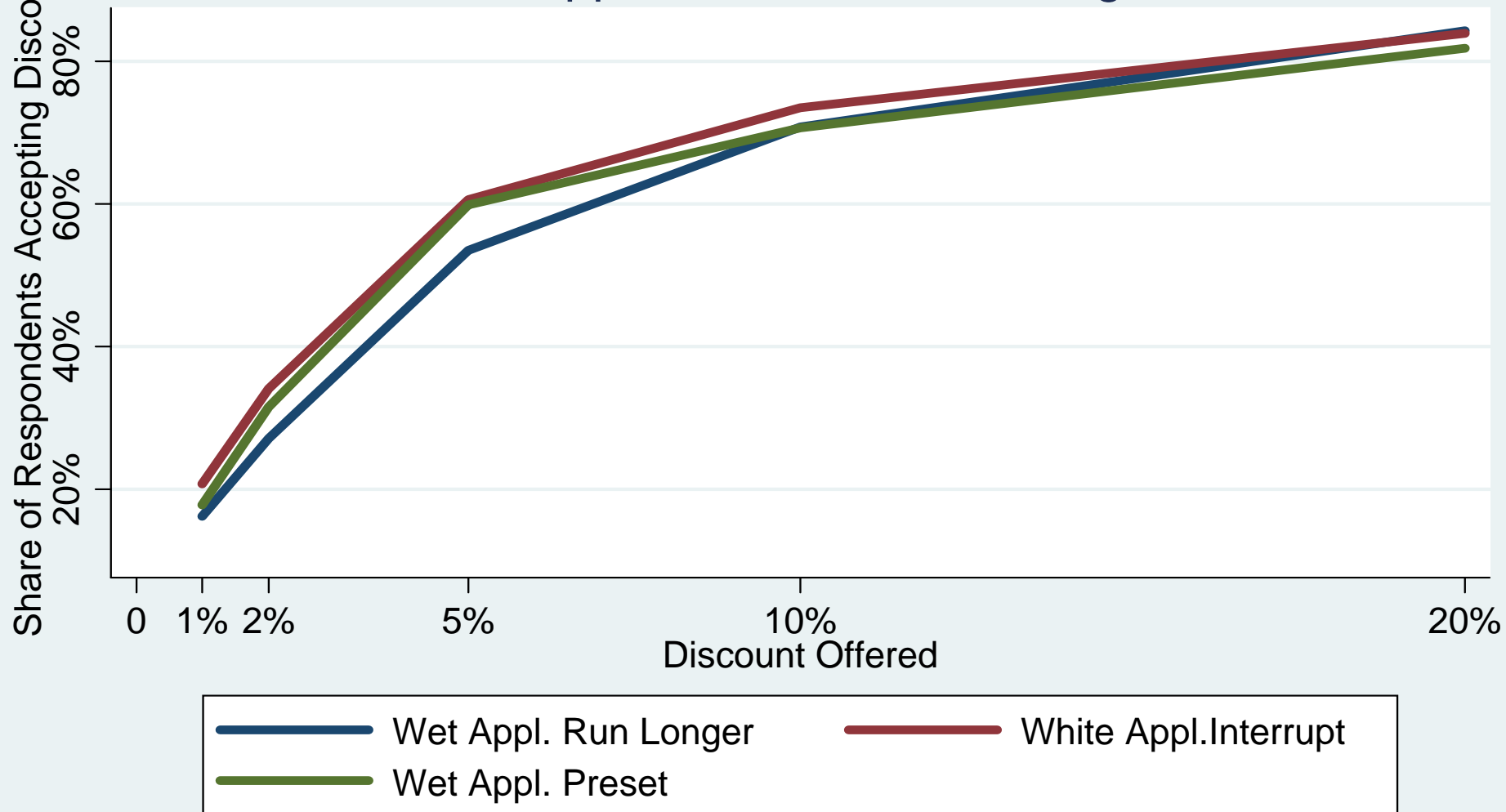


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Cumulative Share of Respondents that Accept Modifications to Appliance Use in Exchange for Discount

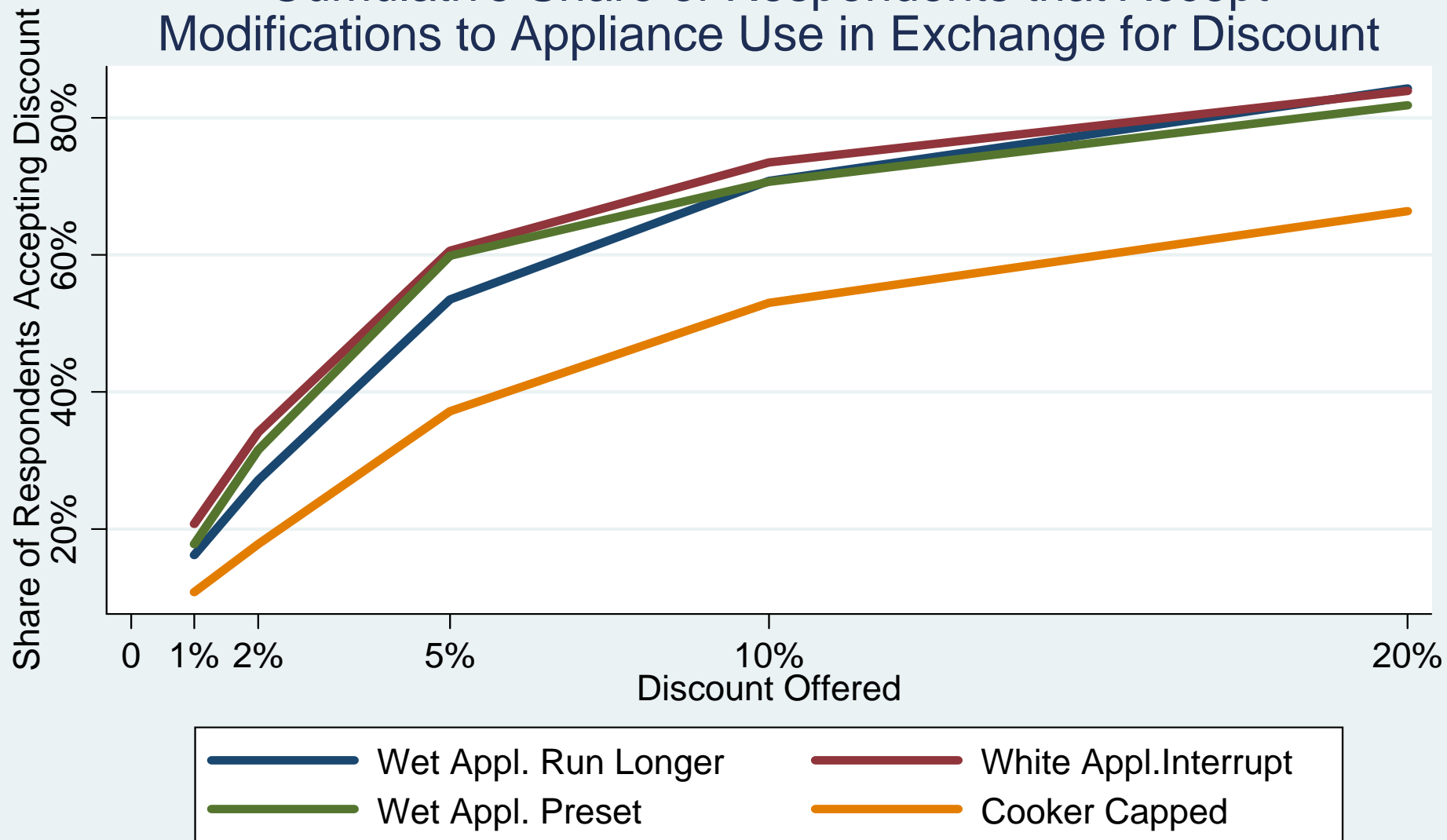


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Cumulative Share of Respondents that Accept Modifications to Appliance Use in Exchange for Discount

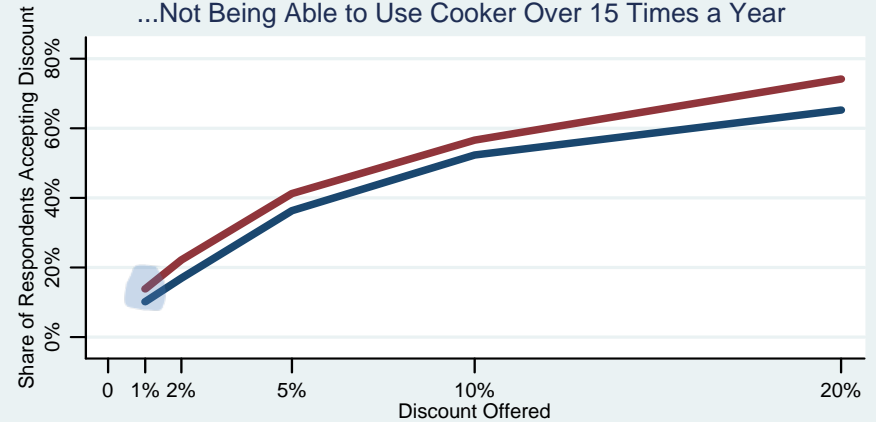
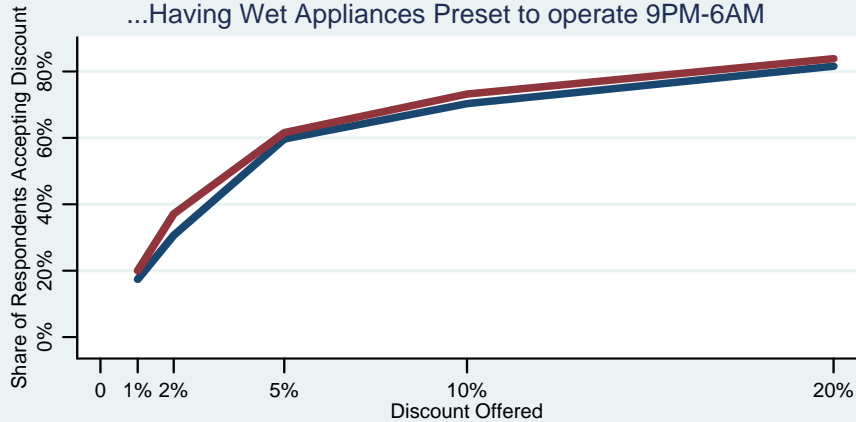
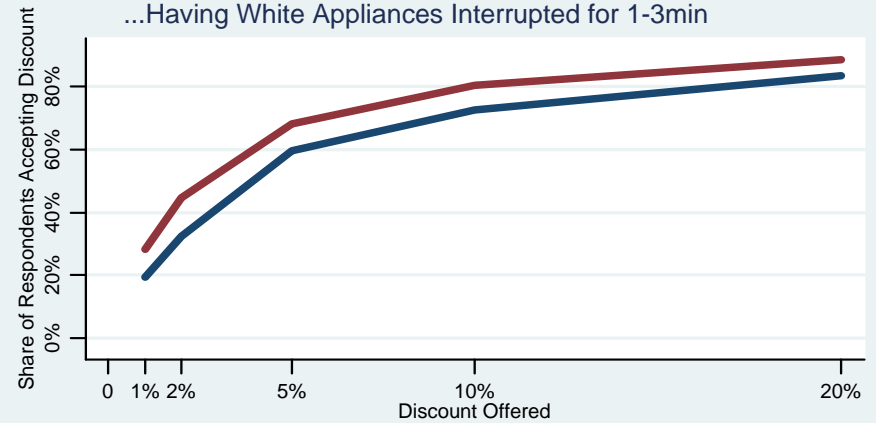
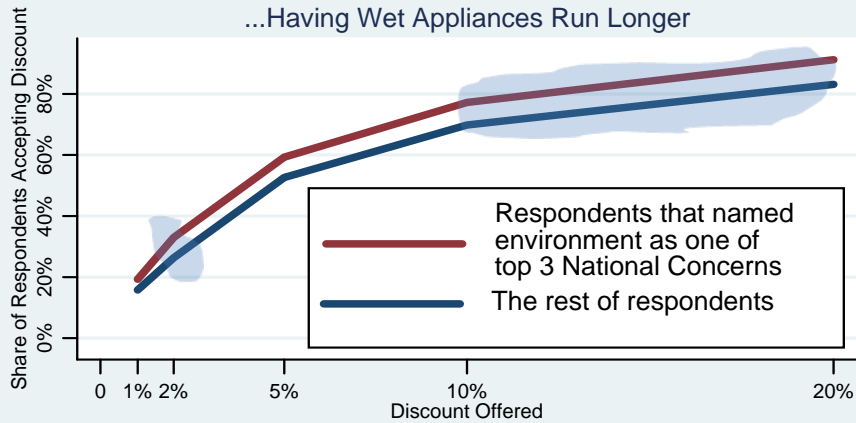


Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Cumulative Share of Respondents that Accept: (According to Concern for ENVIRONMENT Expressed as Priority)\*



\* Shaded area indicates regions where responses were significantly different by at least 90% confidence level

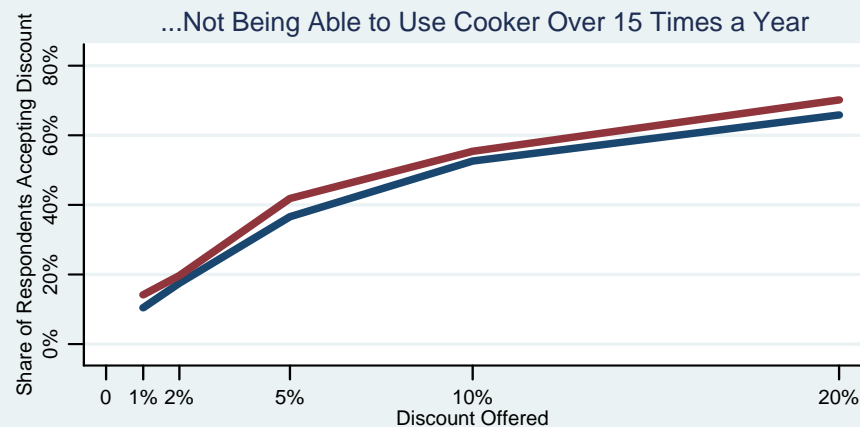
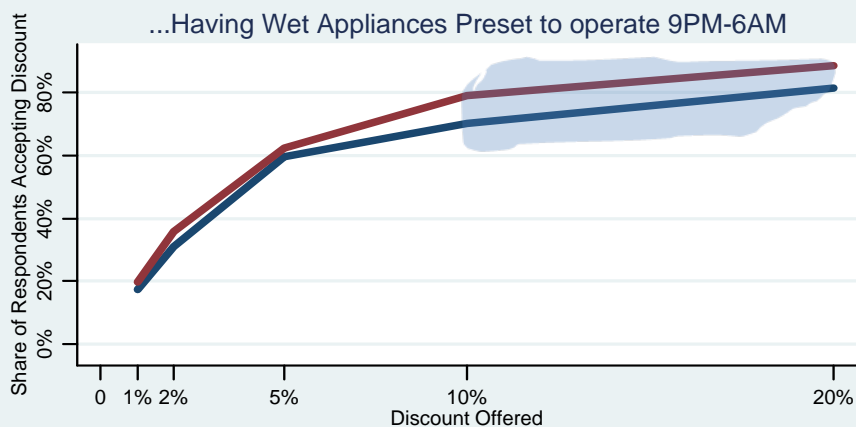
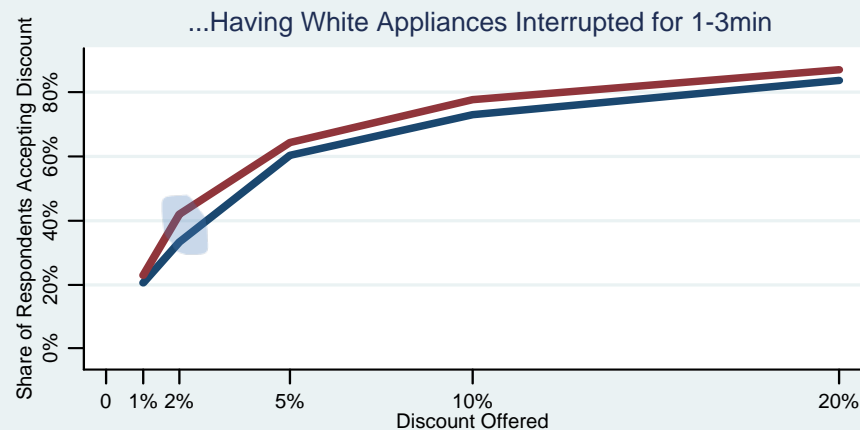
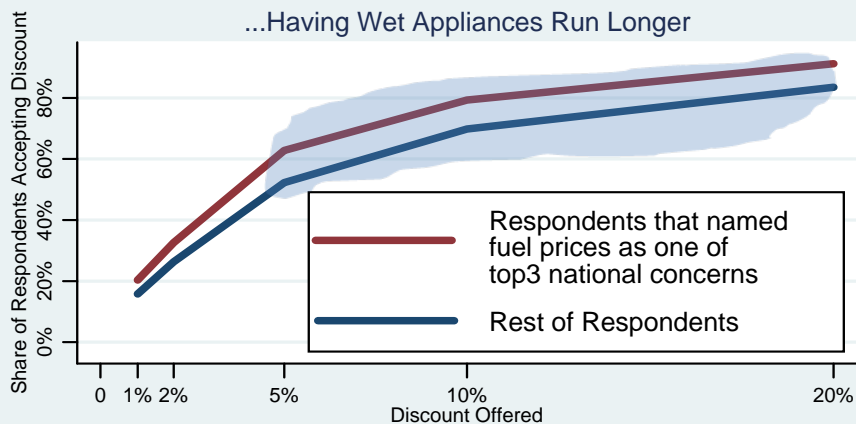
Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)



# Cumulative Share of Respondents that Accept (According to Concern for FUEL PRICES Expressed as Priority)\*



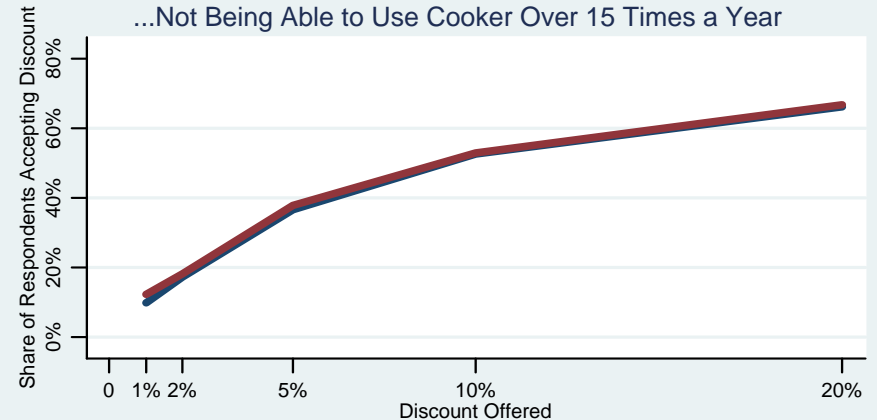
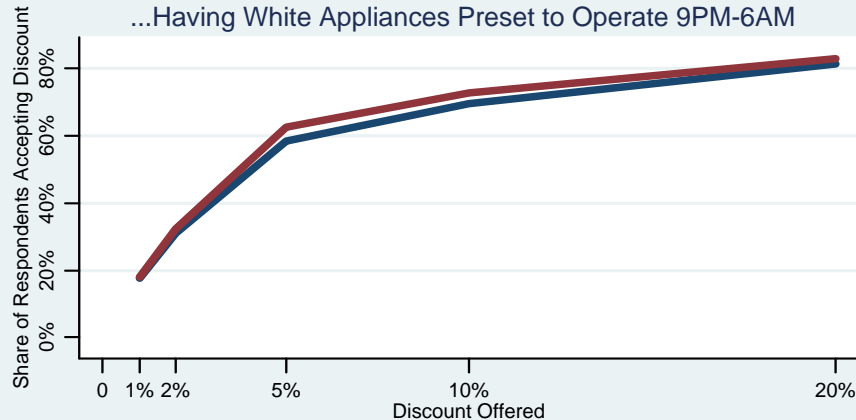
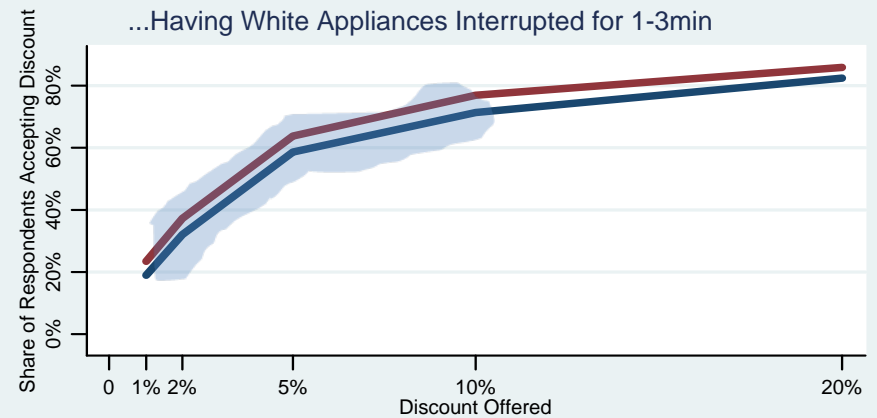
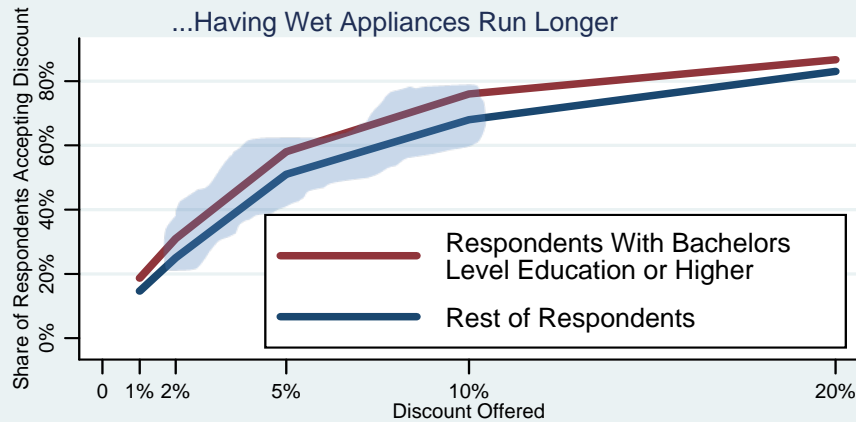
\* Shaded area indicates regions where responses were significantly different by at least 90% confidence level

Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Cumulative Share of Respondents that Accept (According to EDUCATION)\*



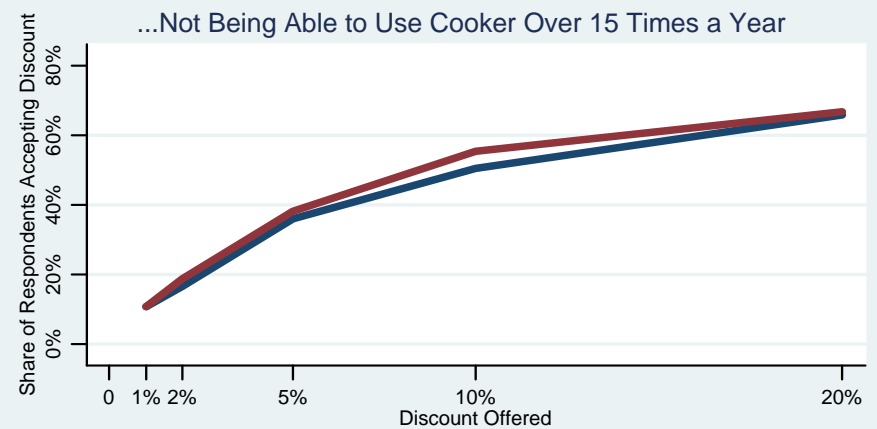
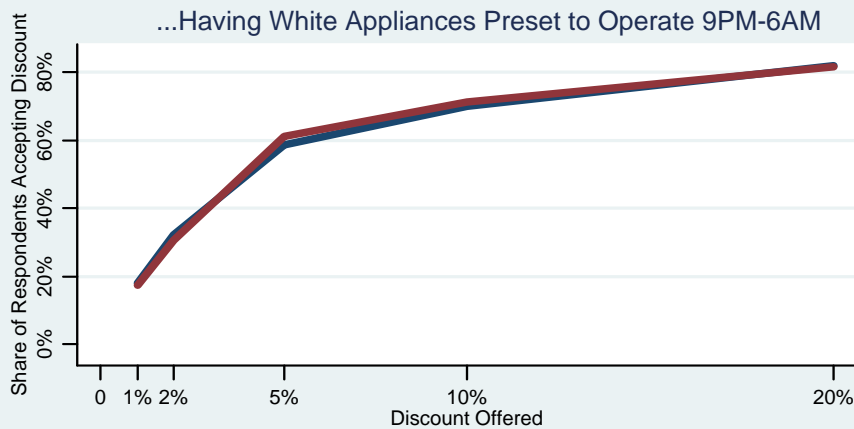
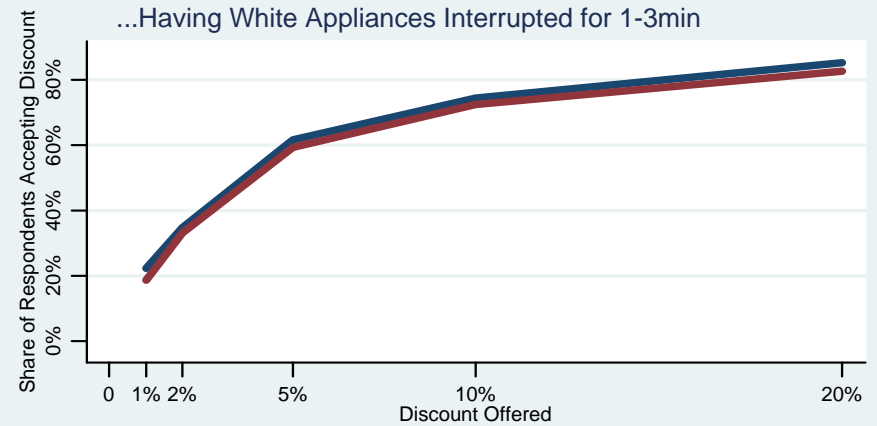
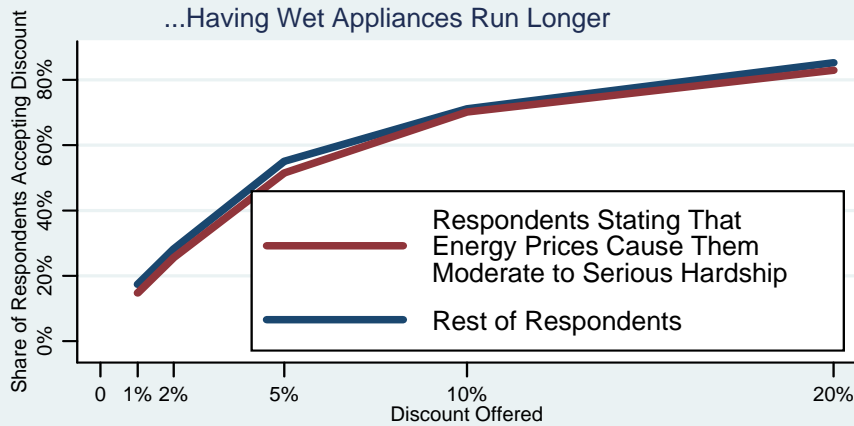
\* Shaded area indicates regions where responses were significantly different by at least 90% confidence level

Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Cumulative Share of Respondents that Accept (According to HARDSHIP Experiences Due to Energy Prices)\*



\* Shaded area indicates regions where responses were significantly different by at least 90% confidence level

Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

# Preliminary conclusions



## I. NATIONAL POLICY PRIORITIES

- Variability & importance of the external context

## II. ENERGY COSTS

- Share of households reporting hardship from energy prices has declined since 2008

## III. ENERGY EFFICIENCY

- Popularity of low-cost measures & that do not involve major lifestyle changes (e.g. transport)

## IV. COMMUNITY ENERGY

- Local ownership might stimulate acceptance
- Trust depends on the source of information

## V. WILLINGNESS TO ACCEPT APPLIANCE USAGE MODIFICATIONS

- Different demand response activities perceived similarly
- Subjective financial hardship is not a significant determinant
- Depending on TOU price differential, there might be scope for load shifting

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)



# THANK YOU



Making networks fit for renewables ...

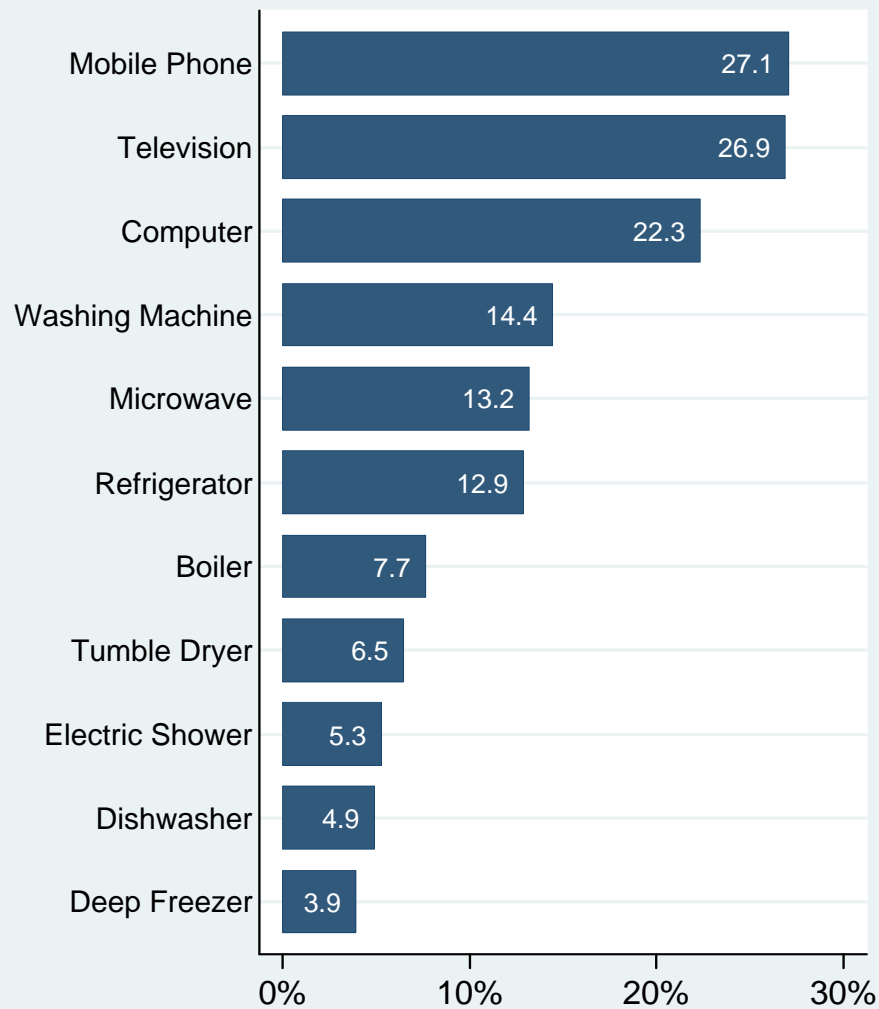
[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

- BARR, S. & GILG, A. W. (2007) A Conceptual framework for understanding and analysing attitudes towards environmental behaviour. *Geografiska Annaler: Series B, Human Geography*, 89, 361-379.
- BROPHY HANEY ET AL. (2011) From Citizen to Consumer: Energy Policy and Public Attitudes in the UK. IN POLLITT, P. T. J. A. D. M. (Ed.) *The Future of Electricity Demand: Customers, Citizens and Loads*. Cambridge, Cambridge University Press.
- DEFRA (2008a) A framework for pro-environmental behaviours. London, Department for Environment, Food and Rural Affairs.
- DEFRA (2008b) The Potential for Behavioural and Demand-Side Management measures to save electricity, gas and carbon in the domestic sector, and resulting supply-side implications. *A report by Enviro Consulting Limited: November 2008*. London, Department for Environment, Food and Rural Affairs.
- DECC (2010a) UK Energy in Brief 2010. London, Department for Environment and Climate Change.
- DECC (2010b). UK Energy Sector Indicators. London, Department for Environment and Climate Change.
- FARUQUI, A., HARRIS, D. & HLEDLIK, R. (2010) Unlocking the 53 billion savigs from smart meters in the EU: How increasing the adoption of dynamic tariffs could make or break the EU's smart grid investment. *Energy Policy*, 38, 6222-6231.
- IHS GLOBAL INSIGHT (2009), Demand Side Participation Report for the DECC, July 2009, London.
- MTP (2009) Factors influencing the penetration of electrical energy efficient appliances into national markets in Europe, report by SoWatt and Bush Energie GmbH, Paris.
- OWENS, S. and DRIFFILL, L. (2008) How to change attitudes and behaviours in the context of energy, *Energy Policy*, 36, 4412-4418.
- SILVA, V., STANOJEVIC, V., AUNEDI, M., PUDJIANTO, D. & STRBAC, G. (2011) Smart domestic appliances as enabling technology for demand side integration: modelling, value and drivers. IN POLLITT, P. J. A. D. (Ed.) *The Future of Electricity Demand: Customers, Citizens and Loads*. Cambridge, Cambridge University Press
- STEPHENSON, J., BARTON, B., CARRINGTON, G., GNOTH, D., LAWSON, R. & THORSNES, P. (2010) Energy cultures: A framework for understanding energy behaviours. *Energy Policy*, 38, 6120-6129.
- WARREN, C. R. & MCFADYEN, M. (2010) Does community ownership affect public attitudes to wind energy? A case study from south-west Scotland. *Land Use Policy*, 27, 204-213.

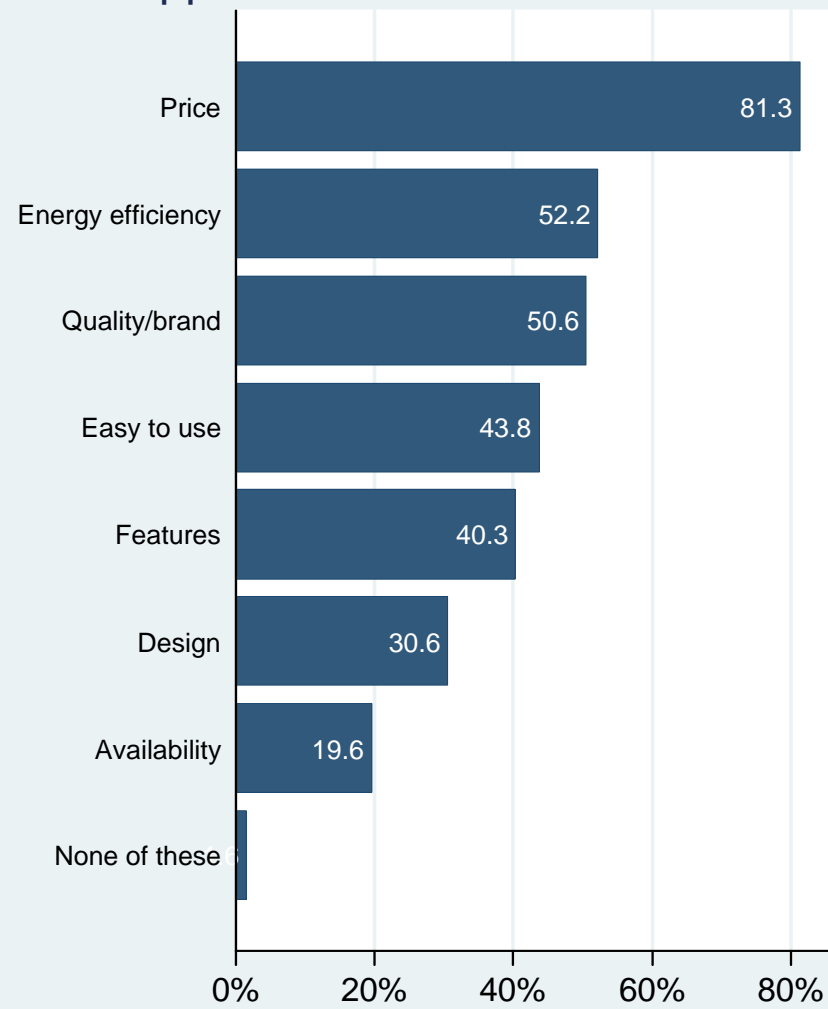


# Annexes

## What Appliances Have you Purchased Within Last Year



## What Was the Most Important Factor In Appliance Purchase Decision



Source: EPRG Survey of UK Households

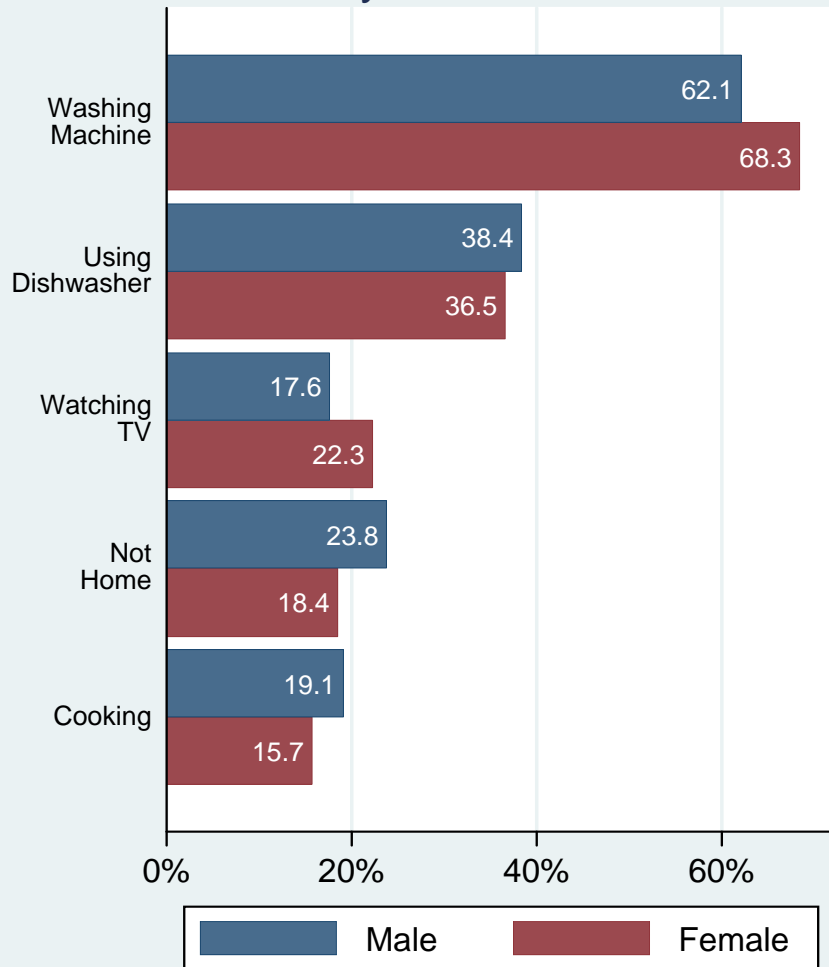
**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)

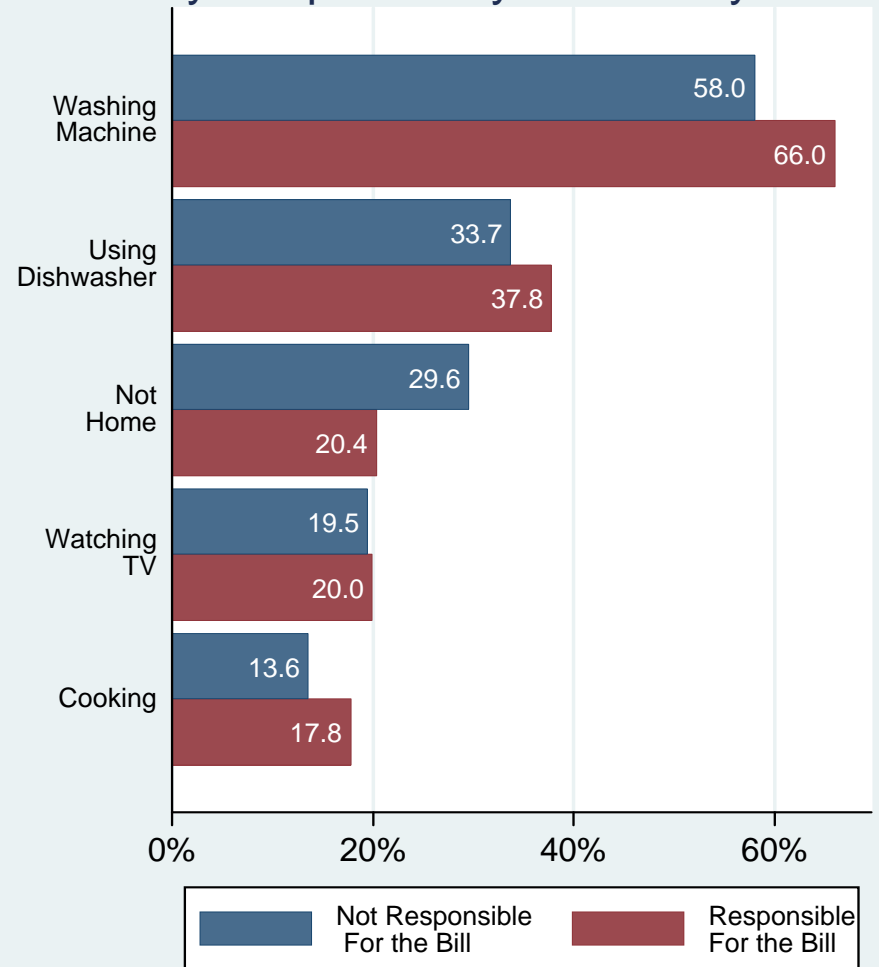


# Which Activity Are You Willing to Shift After 9PM

## By Gender



## By Responsibility for Bill Payment



Source: EPRG Survey of UK Households

**Making networks fit for renewables ...**

[www.eprg.group.cam.ac.uk](http://www.eprg.group.cam.ac.uk)