SUSTAINABLE ENERGY AUTHORITY OF IRELAND

Behavioural Energy and Travel Tracker

Results report 1- heating season 2022/2023

SEAI Behavioural Economics Unit

Behavioural insights for policy: primary research

Rialtas na hÉireann
Government of Ireland

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December 2023

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Sustainable Energy Authority of Ireland
SEAI is Ireland's national energy authority investing in, and delivering, appropriate, effective and sustainable solutions to help Ireland's transition to a clean energy future. We work with the public, businesses, communities and the Government to achieve this, through expertise, funding, educational programmes, policy advice, research and the development of new technologies.

SEAI is funded by the Government of Ireland through the Department of Communications, Climate Action and Environment.

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Background

Becoming more efficient with our use of energy is essential for several reasons: to reduce our greenhouse gas emissions; to insulate ourselves from high energy prices; and to reduce the chance of outages or fuel shortages, among others. The energy crisis that began in 2021 has only heightened the urgency of this issue. Of course, system change – not just individual change – is required to address the current energy and climate crises. However, given the large contributions of the residential and transport sectors to Ireland's energy use and emissions, **the everyday choices that people make have a major role to play**.

To transform the way that energy is used, it is essential to first understand people's current energy behaviours and the factors (structural, sociodemographic, psychological) that underlie them. To address this, SEAI's Behavioural Economics Unit launched the **Behavioural Energy and Travel Tracker (BETT)**, a monthly online survey that gathers **thorough, accurate and granular data about the energy behaviours of Irish citizens over time**. It achieves this by using a behavioural science technique known as the "Day Reconstruction Method", which asks people to think back over their behaviour the previous day, before responding to detailed questions about their travel behaviour and energy use in the home. BETT also includes questions to help understand what factors influence different types of energy behaviour. To account for variations in behaviour over different days of the week, data collection is spread out over at least 7 days for each wave.

This report details results from the **first five waves of BETT** that ran from **December 2022 to April 2023**, roughly corresponding to the winter or heating season. At the time of publication BETT is still an ongoing study. Future reports will focus on behaviour over the summer months as well as more detailed analysis on selected topics.

Main Findings

- Throughout the 2022/2023 heating season, people generally **reported a high understanding of how to save energy and said they were making a substantial effort to use energy efficiently, but there is room for improvement** across domains:
  - Over **one in five participants travelled by car for a short journey** in any given day – an average of 15% for a journey under 2 km, and 10% for a journey under 5 km where public transport was available.
  - Up to **40% of people heated empty rooms or an unoccupied home** on a given day, and a quarter of thermostat owners had theirs set to 21°C or higher. Interestingly, **less than half the sample (44%) said their home had a thermostat installed** in the first place.
  - Over one in ten participants took long or multiple showers/baths in a given day.
  - Over a quarter of participants used energy intensive cooking appliances to cook a small number of portions.
  - **About one in five participants used a tumble dryer** on a given day. Up to 42% used their washing machine inefficiently (on a high temperature, not using eco settings or not a full load).

  In general, the prevalence of these behaviours was steady across the study period.
- **The types of people most likely to use energy inefficiently were not consistently the same across different types of behaviours and activities**. Women, younger people, and those on higher incomes generally engaged in more of the inefficient energy behaviours we defined, but some inefficient behaviours were more common among men, over 55s and those on lower incomes. **Relative to the psychological influences that we measured, sociodemographic factors were more influential on behaviour**.

- People who reported **having a higher understanding of how to save energy engaged in fewer inefficient behaviours**. Some results point to **possible widespread misconceptions** – most participants said their main motivation to shift their electricity use away from peak times was to save money, despite only a small proportion of these being on tariffs that would allow them to do so.
- **People underestimated how much effort others were making** to use energy efficiently, which might make them less inclined to make an effort themselves.
- People say saving money is their main motivation for using energy efficiently and are highly worried about cost of living, but **higher worry about cost of living was not associated with more efficient behaviour**. Worry about climate change, on the other hand, was associated with lower likelihood of using appliances inefficiently.
- Many people were at risk of energy poverty and are likely to be again this winter – **over a third of the sample consistently reported having difficulty paying their energy bills.**

Conclusion

Through its use of behavioural science methods, BETT offers a comprehensive, detailed and accurate picture of the energy use of people in Ireland and the factors influencing it. The analysis presented in this report identifies multiple areas in which excess energy may be being used when not strictly necessary, and gives some insights into the types of people more likely to engage in these behaviours, and psychological factors that might be leveraged to promote behaviour change. Crucially, we use BETT not to attribute blame to particular groups of individuals but rather to identify where additional supports should be targeted to create the right conditions for efficient behaviour to emerge. Overall, most people are doing their best within the confines of their living situation, environment, and an imperfect awareness about what to do.

Nine recommendations for policy and communications based are highlighted in the box below.

Recommendations

1. Consider framing energy saving campaigns around **climate action rather than saving money**. Worry about climate change drove some energy saving behaviours while worry about costs did not.
2. Provide additional **targeted supports for the many people struggling to pay their bills** and cutting back on heat or other essentials to do so.
3. Continue to emphasise **energy saving tips related to home heating**. Inefficient heating behaviours were both the most energy intensive and prevalent we tracked during the 2022/2023 heating season, but there were promising signs that awareness of the Reduce Your Use campaign was associated with greater energy efficiency in this area.
4. Consider **promoting the adoption of thermostats and heating controls**. More than half of people do not currently have a thermostat in their home and thus messaging around reducing thermostat temperatures will not be relevant to most people.
5. Put more emphasis on **avoiding the use of tumble dryers**. Tumble dryer use is both energy intensive and highly prevalent, but is arguably a behaviour most people would be able to change.
6. Take a **targeted approach to communications**. Different types of people are more or less likely to engage in different inefficient behaviours and will have different capacity for change.
7. Identify **common misconceptions** and use communications campaigns to correct these.
8. Highlight the **efforts that other people are making** to save energy. People are less likely to act selfishly in the face of a crisis that requires collective action, especially when they know that others are doing their fair share.
9. Remember that communications can only achieve so much and **structural supports are required to help people use energy efficiently in their day-to-day lives.**

1. Introduction

1.1. Background

The energy crisis that began in 2021 has intensified the urgency with which energy production and consumption must be transformed. The risk of global shortfall of energy supply relative to demand, in tandem with the invasion of Ukraine, has caused significant price hikes layered into a broader cost-of-living crisis. Becoming more efficient with our use of energy is essential for several reasons such as to reduce our greenhouse gas emissions; to insulate ourselves from high energy prices; and to reduce the chance of outages or fuel shortages.

In April 2022, the Irish government launched the "Reduce Your Use" campaign to educate and encourage citizens and businesses to use less energy. SEAI's Behavioural Economics Unit (BEU) has played a supporting role in this campaign, conducting online experiments to pre-test the framing of communications, and publishing a rapid review of communication strategies to encourage energy conservation.[1] The Behavioural Energy and Travel Tracker (BETT) is a continuation of the BEU's efforts to support "Reduce Your Use" – it is a monthly survey that tracks residential and travel-related energy consumption behaviours of Irish citizens. This report summarises results from the first five waves of BETT that ran over the 2022/2023 heating season, from December 2022 to April 2023.

1.2. The role of individual energy behaviour

System change – not just individual change – is required to address the current energy and climate crises. But the activities of governments, systems and individuals are highly interdependent.[2] And while the effect of higher-level societal organisation on individual behaviour might outweigh that of the reverse, the everyday choices that people make can and do have a major role to play. In 2022, residential emissions accounted for a quarter of all energy-related emissions in Ireland, and transport emissions for a further 34%, of which private car use accounted for almost half.[3] Reducing individuals' energy use will have the dual benefit of mitigating climate change while easing energy costs for the individuals concerned.

Ireland is in a fortunate position in that most citizens (85%) are worried about global warming and agree it is a serious threat to humanity, 79% think they personally should do more to address climate change, and only 2% think climate change isn't happening at all.[4,5] Recent energy price rises should serve as an additional incentive for individuals to make an effort to use energy more sustainably. However, climate concern does not translate straightforwardly into climate action (indeed, recent research with a group that are typically considered most concerned and who have the largest stake – young people – shows that few are performing a wide range of high-impact behaviours)[6], and household energy consumption does not seem to be strongly driven by either core sustainability values or financial interests.[7]

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[1] SEAI (2022). Communication strategies to encourage energy conservation: Recommendations based on a rapid review of behavioural science literature. https://www.seai.ie/data-and-insights/behavioural-insights/publications/communication-strategies/

[2] Garnett, E.E. & Balmford, A. (2022). The vital role of organizations in protecting climate and nature. *Nature human behaviour*, 6(3), 319-321. doi: 10.1038/s41562-021-01260-z

[3] SEAI National Energy Balance. https://www.seai.ie/data-and-insights/seai-statistics/key-publications/national-energy-balance/

[4] EPA (2021). Climate Change in the Irish Mind. https://www.epa.ie/publications/monitoring--assessment/climate-change/EPA-Climate-in-the-Irish-Mind-REPORT-19.pdf

[5] https://redcresearch.ie/win-world-survey-climate-change-sustainability/

[6] Andersson, Y., Timmons, S. & Lunn, P. (2022). Youth knowledge and perceptions of climate mitigation. *ESRI Research Series 153*. doi: 10.26504/rs153

[7] Frederiks, E.R., Stenner, K. & Hobman, E.V. (2015). Household energy use: Applying behavioural economics to understand consumer decision-making and behaviour. *Renewable and Sustainable Energy Reviews*, 41, 1385-1394. doi: 10.1016/j.rser.2014.09.026

To transform the way that energy is used, it is essential to understand the energy consumption of individuals and what underlies its varied forms. To know where there is the greatest potential for energy saving through behaviour change and amongst what groups of people, we must first measure behaviour as it is, accurately and comprehensively. To then understand how we can change target behaviours we must uncover the factors (structural, sociodemographic, psychological) that underlie them.

1.3. Tracking everyday energy behaviour

There have been relatively few previous attempts to accurately track household energy behaviours in a granular and comprehensive fashion.

One impressive monitoring study conducted in the UK in 2010/2011 provided detailed insights into household electricity consumption and the relative share of different end uses.[8] A more recent study devised a novel method for calculating the marginal electricity demand that can be attributed to specific household activities.[9] However, both these studies were focused more on the end consumption itself and less on the specific behaviours involved in that consumption, the factors underlying them, or the potential for change. They deal also exclusively with electricity use and do not consider other fuels or travel behaviour. Other approaches involve recording individuals' global self-assessments of their efforts to perform specific energy saving behaviours (e.g. wearing more clothes instead of turning up the heating, turning off lights/appliances when not in use)[10] but these measures may be prone to recall issues or social desirability bias.

In an Irish context, the National Household Travel Survey (NTA) and National Travel Survey (CSO) capture highly granular data about individual journeys, but do not track travel behaviour over the course of the calendar year or link it with other energy behaviours or potential psychological influences.

To our knowledge, no prior work has attempted to granularly track domestic and travel-related energy behaviour and the factors influencing them over an extended period, and certainly not in an Irish context. Instead, BETT draws inspiration from the Social Activity Measure[11], a behaviour tracking survey run by the Economic and Social Research Institute during the COVID-19 pandemic. The study's use of a behavioural science technique known as the "Day Reconstruction Method" [12,13] allowed it to generate accurate, detailed data on social activity and risk-taking, which was used to inform government policy and communications. BETT takes a similar approach to provide a comprehensive, accurate and up-to-date picture of energy consumption in Ireland.

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[8] Zimmermann J. et al (2012). Household electricity survey: A study of domestic electrical product usage. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/208097/10043_R66141HouseholdElectricitySurveyFinalReportissue4.pdf

[9] Grünewald, P. & Diakonova, M. (2019). The specific contributions of activities to household electricity demand. *Energy and Buildings*, 204, 109498. doi: 10.1016/j.enbuild.2019.109498

[10] https://www.nudgeproject.eu/wp-content/uploads/2021/10/D1.1-Profiling-of-energy-consumers-psychological-and-contextual-factors-of-energy-behavior-FINAL.pdf

[11] https://www.gov.ie/en/collection/a7ee4-see-the-results-of-the-social-activity-measure-behavioural-study/

[12] Kahneman, D. et al (2004). A survey method for characterizing daily life experience: The day reconstruction method. *Science*, 306(5702), 1776-1780. doi: 10.1126/science.1103572

[13] Lades, L., Martin, L. & Delaney, L. (2022). Informing behavioural policies with data from everyday life. *Behavioural Public Policy*, 6(2), 172-190. doi: 10.1017/bpp.2018.37

Day Reconstruction Method

The Day Reconstruction Method is a survey method developed by Kahneman and colleagues, founded on principles from cognitive science. The method asks participants to reflect on their experiences and behaviour over the previous day.

The approach involves two steps:

1. First, participants are asked to think back on the previous day, splitting it into a series of episodes, and to make a note of what they did in a diary-type exercise.
2. Second, participants are asked detailed follow-up questions about behaviours of interest.

Through prompting and the use of detailed, granular questioning about a clearly specified time period, the Day Reconstruction Method encourages accurate and unbiased recall of behaviour.

1.3.1. Aims and scope of the Behavioural Energy and Travel Tracker

The aim of BETT is to gather thorough, accurate and granular energy and travel data from a representative sample of Irish citizens over time. It uses the Day Reconstruction Method as a means of achieving this. In order to provide a useful comprehensive view of energy behaviour while keeping the survey to a manageable length, the focus is kept to travel and home energy behaviour (energy use in other environments such as the workplace is excluded), on appliances that use a significant amount of energy (use of lower-intensity appliances such as lights and phones is not examined) and on behaviours that are more likely to vary over time ("always on" appliances such as fridges are not asked about).

Crucially, BETT also aims to help understand the drivers of different levels and types of energy consumption by gathering substantial sociodemographic data, as well as measuring a series of psychological variables, recall of the "Reduce Your Use" campaign and energy poverty indicators. The choice of psychological variables to include in BETT is supported in the next section.

1.4. Factors influencing energy behaviour

Psychological theories of climate-related behaviour change broadly fall into one of three categories: one emphasises the agency of the individual; another emphasises the external and social contextual factors beyond the individual's control; the third considers the interactions of both types of factors.[14,15] A comparison of these theories in the context of energy consumption is beyond the scope of this report, and it is unlikely that any one model or theory will be able to explain all energy-related behaviour. They are nonetheless useful in guiding research questions.

The choice of psychological variables in BETT draws on multiple theories of pro-environmental behaviour, as further detailed below: awareness and understanding of how to save energy; social influence and perceived efficacy; and worry and motivation. Sociodemographic characteristics have been shown to be much more predictive of climate behaviour[16] and so we also measure an extensive set of individual and household characteristics.

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[14] Page, N. & Page, M. (2014). Climate change: time to do something different. *Frontiers in psychology*, 5, 1294. doi: 10.org/10.3389/fpsyg.2014.01294

[15] Whitmarsh, L., Poortinga, W. & Capstick, S. (2021). Behaviour change to address climate change. *Current Opinion in Psychology*, 42, 76-81. doi: 10.1016/j.copsyc.2021.04.002

[16] Whitmarsh, L., Capstick, S., & Nash, N. (2017). Who is reducing their material consumption and why? A cross-cultural analysis of dematerialization behaviours. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 375(2095), 20160376. doi:10.1098/rsta.2016.0376

1.3.1 Awareness & understanding

Linking awareness and understanding of climate issues with behaviour is not straightforward. Intuitively, it seems knowledge must play a role in sustainable behaviours, but the evidence on this relationship is mixed, possibly because different studies focus on different types of knowledge.

Knowing the extent of global warming to date increases concern but does not have a substantial long-term influence on behaviour.[17] Potentially of more relevance is people's knowledge about climate mitigation and the individual actions that are effective in curbing emissions, especially as there is a strong tendency to overestimate the effect of low impact actions.[18] However, awareness campaigns have not always been successful at changing behaviour, even when focused on tangible action-based advice – the 2006 'Power of One' campaign led to increased awareness of the potential savings associated with decreasing thermostat settings, but had no lasting measurable effect on either self-reported behaviour or natural gas consumption.[19]

In BETT, we measure participants' self-reported understanding of how they can save energy in their day-to-day lives. Importantly, this is about understanding of what *to do*, as opposed to knowledge about climate science. We also measure recall of the "Reduce Your Use" campaign, which included energy saving advice.

1.3.2 Social influence & perceived efficacy

The behaviour of others and "social norms" have an influence on a number of pro-environmental actions, including the adoption of renewable energy technologies[20] and energy conservation.[21] While the mechanism for the effect isn't always clear – it might be that seeing others act increases awareness of what is possible, or that it induces a form of social pressure or shame – the visible actions of others are an important factor in what most people themselves do and can foster collective action.[22]

We measure participants' self-evaluated effort to use energy sustainably, as well as the level of effort they perceive others to be making. We also measure participants' confidence in government.

1.3.3 Worry & motivation

As mentioned above, efficient energy use has the dual benefit of reducing costs for the individual and reducing carbon emissions, as well as reducing the chance of electricity outages or fuel shortages. However, it is less clear which of these, if any, is most likely to motivate behaviour change.

It is a common conception that most people are self-interested and will be primarily motivated to act by monetary benefits. However, this is not necessarily the case, and there is evidence that environmental reasons can be more effective at motivating energy saving than financial reasons, and that the latter may

[17] Castiglione, A.C. et al. (2022). Discovering the psychological building blocks underlying climate action—A longitudinal study of real-world activism. *Royal Society Open Science*, 9(6), 210006. doi: 10.1098/rsos.210006
[18] Timmons, S. & Lunn, P. (2022). Public understanding of climate change and support for mitigation. *ESRI Research Series 135*. doi: 10.26504/rs135
[19] Diffney, S., Lyons, S. & Valeri, L.M. (2013) Evaluation of the effect of the Power of One campaign on natural gas consumption. *Energy Policy,* 62, 978-988. doi: 10.1016/j.enpol.2013.07.099
[20] Graziano, M. & Gillingham, K. (2015). Spatial patterns of solar photovoltaic system adoption: the influence of neighbours and the built environment. *Journal of Economic Geography*, 15(4), 815-839. doi: 10.1093/jeg/lbu036
[21] Allcott, H. (2011). Social norms and energy conservation. *Journal of public Economics*, 95(9-10), 1082-1095.
[22] Sabherwal, A. et al (2021). The Greta Thunberg Effect: Familiarity with Greta Thunberg predicts intentions to engage in climate activism in the United States. *Journal of applied social psychology*, 51(4), 321-333. doi: 10.1111/jasp.12737

even backfire where monetary gains are small.[23,24,25] People may also be less likely to act selfishly in the face of a crisis that requires collective action – during the COVID-19 pandemic, people cared more about preventing the spread of COVID than they did about the personal burden of following restrictions[26] and their compliance with public health advice was strongly driven by worry.[27]

Worry about climate change can promote general support for climate policies and public action,[28, 29] but less is known about the relationship between climate worry and individual behaviour change. One study did find a link between the two: worry increased perceived personal responsibility, which in turn increased some mitigation behaviour.[30] Previous work conducted by the BEU in 2022 found an association between energy saving intentions and worry about climate change, but not worry about cost of living.

In BETT, we measure motivations for the efforts that participants report making to use energy sustainably, as well as their levels of worry about climate change, cost of living, and security of energy supply.

Energy poverty

We expect that worry about cost of living may be particularly important given the cost-of-living crisis ongoing at the time of data collection. A 2022 estimate of energy poverty in Ireland had it at 29% of households – the highest recorded rate – where it is defined as spending 10% or more of disposable income on energy.[31]

In BETT, we ask participants about their household monthly energy-related expenditure as well as disposable income (on an optional basis), from which we can estimate what proportion are defined as being in energy poverty according to the 10% measure. Given established reservations about this measure, as well as likely noise in self-reported estimates of expenditure and income, we also include subjective measures of energy poverty.

1.5. Scope of this report

This report details results from the first five waves of BETT that ran from December 2022 to April 2023, roughly corresponding to the winter or heating season. Following an outline of the methodology, we give an overview of energy behaviour during this period and the factors influencing it, and a discussion of implications for policy and communications. At the time of publication BETT is still an ongoing study. Future reports will focus on behaviour over the summer months (May to September) as well as more detailed analysis on selected topics.

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[23] Dogan, E., Bolderdijk, J. W. & Steg, L. (2014). Making small numbers count: environmental and financial feedback in promoting eco-driving behaviours. *Journal of Consumer Policy*, 37, 413-422. doi: 10.1007/s10603-014-9259-z

[24] Schwartz, D. et al. (2015). Advertising energy saving programs: The potential environmental cost of emphasizing monetary savings. *Journal of Experimental Psychology: Applied,* 21(2), 158-66. doi: 10.1037/xap0000042

[25] Asensio, O. I. & Delmas, M. A. (2015). Nonprice incentives and energy conservation. *Proceedings of the National Academy of Sciences*, *112*(6), E510-E515. doi: 10.1073/pnas.1401880112

[26] https://www.gov.ie/pdf/?file=https://assets.gov.ie/162669/08aebe3c-0499-49ca-b5c8-af7c9e0ed047.pdf#page=null

[27] https://www.gov.ie/en/collection/a7ee4-see-the-results-of-the-social-activity-measure-behavioural-study/

[28] Smith, N.& Leiserowitz, A. (2014). The role of emotion in global warming policy support and opposition. *Risk Analysis*, 34(5), 937-948. doi: 10.1111/risa.12140

[29] Van der Linden, S.L., Leiserowitz, A. & Maibach, E. (2019). The gateway belief model: A large-scale replication. *Journal of Environmental Psychology*. 62, 49–58. doi: 10.1016/j.jenvp.2019.01.009

[30] Bouman, T., et al. (2020). When worry about climate change leads to climate action: How values, worry and personal responsibility relate to various climate actions. *Global Environmental Change*, 62, 102061. doi: 10.1016/j.gloenvcha.2020.102061

[31] Barrett, M., Farrell, N., & Roantree, B. (2022). Energy poverty and deprivation in Ireland. *ESRI Research Series 144*. https://doi.org/10.26504/rs144

2. Methodology

2.1. Sampling and data collection

BETT is run with a sample of 1,000 people drawn from an online market research panel (RED C Live) at the start of every month. Data collection for each wave is spread out over at least 7 days to capture behaviour from every day of the week. The dates for each wave detailed in this report were:

1. 7th – 13th December (a period of particularly cold weather)
2. 4th – 11th January (including the end of the school holidays)
3. 2nd – 8th February (including a bank holiday Monday)
4. 3rd – 9th March
5. 5th – 11th April (including Easter weekend)

The sample is selected to be representative of the Irish population in terms of age, gender, social grade, and geographical region. Repeat participation by the same individual is possible at a minimum of 2 wave intervals.

The survey itself is programmed in Gorilla Experiment Builder.[32] It is available on all device types to maximise reach and minimise any selection bias. The survey typically takes 15-20 minutes to complete and participants are paid €4.

2.2. Survey design

This section outlines the survey design for BETT.[33] The study was pre-registered in line with best practice.[34]

The study commences by screening participants to ensure they are currently in Ireland and to fill required sociodemographic quotas (gender, age, county, social class). It then introduces them to the study and assures them that their responses are kept anonymous. The rest of the survey is summarised in Figure 1 and described in further detail below.

Figure 1: Schematic overview of BETT's structure

[32] Anwyl-Irvine, A.L. et al. (2020). Gorilla in our midst: An online behavioral experiment builder. *Behavior research methods*, 52(1), 388-407. https://doi.org/10.3758/s13428-019-01237-x

[33] The full questionnaire is available on request from the Behavioural Economics Unit.

[34] https://oecd-opsi.org/bi-projects/behavioural-energy-and-travel-tracker-bett/

2.2.1. Week overview

Participants are first asked some general questions about their travel and home energy behaviour over the preceding week. They are asked about what modes of transport they used, the number of days on which their home was heated, and the number of days on which a range of appliances were used.

2.2.2. Day reconstruction

As detailed in the introduction, the Day Reconstruction Method was chosen as a means of recording energy behaviours. Participants are asked to think specifically about their energy behaviour over the previous day, even if it wasn't a typical day for them.

First participants are asked to reconstruct the previous day in a series of "episodes", using three open text boxes to record any energy-related behaviour in the morning, afternoon, and evening. The responses to this diary exercise are not used for analysis, but rather serve as a tool to prompt recall.

Participants are then asked detailed multiple-choice questions about their travel and home energy behaviours on the reference day. Half the sample are randomly assigned to answer questions about their travel behaviour first, and half to answer questions on their home energy behaviour first.

Travel

Participants are first asked how many separate one-way journeys they made on the reference day, excluding journeys made as part of their job or international overseas journeys. They are then asked detailed follow-up questions about up to four of these journeys[35] regarding purpose, mode of transport used, distance, time of day, duration and whether they were accompanied by others.

If they drove, participants are asked whether they drove more slowly to conserve fuel. If they travelled by car or taxi, they are asked whether public transport was available. If they travelled on public transport, they are asked about the mode of transport used to get to or from the stop.

Home energy

Participants are first asked at what times of day they or others were at home on the reference day, and whether they worked or studied from home. Unless they said they were not home at all on the reference day, they then go on to be asked about heating behaviour, hot water use, cooking and electrical appliance use.

Heating

Participants are first asked what types of heating they used the previous day. For each type of heating they used, they are then asked more detailed questions about the time of day it was used and how long for. Where relevant, they are also asked about fuel types and whether they heated unoccupied rooms.

Hot water use

As with heating behaviour, participants are asked what types of systems they used to heat water on the previous day, at what times of day, and how long for. They are also asked whether they took a shower or bath, and asked follow-up questions about the longest of these regarding type of shower/bath, time of day, duration (for showers) and how full it was (for baths).

[35] Where a participant made over four journeys in a given day, they are asked about four randomly chosen journeys.

Cooking

Participants are first asked how many meals they prepared and cooked at home on the reference day. They are then asked more detailed questions about one (randomly chosen) meal they cooked, about time of day, appliances used, and the number of portions prepared. For some more energy-intensive cooking appliances they are asked further follow-up questions about the specific type of appliance, settings used (e.g., temperature) and duration of use.

Electrical Appliances

Participants are asked how many times they used a wide range of different electrical appliances over the course of the previous day. For some of these, if they said they used the appliance, they are asked more specific questions about one specific (randomly chosen) instance of use. The questions asked vary depending on the appliance but include questions about the type of appliance, time of day, duration of use, settings used, how full a load, whether the appliance was turned off and unplugged after use, and whether the use of the appliance was shared with others.

2.2.3. Other variables

As mentioned in the introduction, BETT also measures a number of different psychological variables, primarily through 7-point rating scales and ranking tasks.

Participants are first asked about how much effort they think they themselves, others in their household and the average Irish person are making to (a) use sustainable transport (b) reduce their home energy use and (c) shift their electricity use away from peak times. If they report making some effort, they are asked to rank their motivations for doing so. They are also asked a general question about how well they feel they can save energy in their day-to-day lives and about how worried or anxious they feel about the cost-of-living crisis, climate change and energy/fuel shortages.

Following this, participants are asked some questions related to energy deprivation including whether they receive a fuel allowance, what their energy expenditure was over the previous month and more subjective measures such as whether they are having difficulty paying bills or having to cut back on heating or other expenditure. This is followed by questions about participants' confidence in government and the response to the cost-of-living, climate change and energy crises, their perceived fairness of the energy crisis response, and their awareness of the Reduce Your Use campaign.

BETT ends with questions about the participant's home and household (type of dwelling, location, tenure, household composition including presence of disabilities), questions about home energy (perceived comfort and BER, type of electricity meter/tariff, heating system, thermostat ownership/settings, solar panel ownership, car ownership, details of last charge for electric vehicles), and standard sociodemographic measures not collected earlier as part of screening (country of origin, education, employment, income).

2.3. Data analysis

Defining inefficient energy behaviours

Aside from directly tracking the proportion of participants engaging in different behaviours, our analysis approach involves constructing several variables to identify a set of inefficient or wasteful ways of performing different behaviours – instances where an individual used energy when they likely did not need to. BETT records behaviour in five main domains: travel, home heating, hot water use, cooking and electrical appliance use. For each of these domains, we define at least one energy inefficient behaviour. Full explanations of how these behaviours are defined are contained in the results section, but they can be summarised as:

1. Using a car for a journey under 2 km
2. Using a car for a journey under 5 km where public transport was available

3. Heating empty space
4. Using high thermostat settings
5. Taking multiple showers/baths or taking a long shower or full bath
6. Using energy intensive appliances to cook a small number of portions
7. Using a washing machine inefficiently
8. Using a tumble dryer
9. Using a dishwasher inefficiently

Identifying factors influencing inefficient behaviour

We use a regression modelling approach to identify the factors that influence engagement with these behaviours. Regression model results are found in Appendix D and referenced in the main text.

We create binary variables for each of the inefficient behaviours listed above that denote whether a participant engaged in it or not. We then use logistic regression analysis to find associations between acting inefficiently and some of the other variables that we record (sociodemographic, household and dwelling characteristics, and psychological). Our models also account for the survey wave and whether the reference day was a weekday or weekend/bank holiday, as well as daily rainfall and temperature. Further detail on weather for the period and how it was linked to BETT data is contained in Appendix A.

Several variables are categorised in the analysis stage. For psychological variables measured on 7-point numbered scales, each participant is grouped as measuring either "high" or "low" on each of them, where "high" represents a response of 5 or above. One exception is for worry about cost of living, which was particularly skewed towards higher scores. A "high" score on this variable represents a response of 6 or above. Distributions for the psychological variables can be found in Appendix B.

BETT generates a very rich dataset that could be used to answer a wide variety of research questions. The analysis presented in this report is by no means exhaustive, and further reports will examine certain topics or behaviour in greater detail.

3. Results

We begin this section with a summary of characteristics of the sample. We then give an overview of energy behaviour from December 2022 to April 2023, with a particular focus on instances of potentially inefficient energy use and their associations with sociodemographic variables. Note that these associations are highlighted to identify groups that have the most potential for energy savings rather than to attribute responsibility or blame. Next, we describe the responses to psychological measures before assessing their associations with energy behaviour. We end the results section with a short description of energy deprivation in the sample.

3.1. Sample characteristics

A full description of the sample, as well as household and dwelling characteristics is included in Appendix C. The sample was broadly nationally representative, with a slight under-sampling of younger people (24% of the sample were aged 18 – 34 compared with the target 28%) and lower social grades (50% fell into the C2DEF[36] category compared with a target of 56%).

The primary heating type for more than 70% of the sample was an oil or gas boiler. A further 7% used a solid fuel boiler, and smaller 4% portions variously used electric boilers, storage heaters or a heat pump as their main heating source. These proportions broadly match the 2021 CSO figures. Fewer than 1 in 20 participants indicated their home did not have a central heating system. Less than half the sample (44%) said their home had a thermostat installed to control the room temperature.

In April, 46% of the sample owned a smart meter, up from 41% in December 2022. Of those with smart meters installed, 15% said they were on smart tariff, but this is likely an overstatement given that Commission for the Regulation of Utilities (CRU) figures, that are based on supplier reporting, indicate that about 8% of smart meter owners were on smart tariffs in May 2023.[37] About 5% of the sample had solar PV installed in their home, with a further 4% having solar thermal.

Just over three quarters of respondents said they drove a petrol or diesel vehicle. A further 9% owned an electric or hybrid vehicle, with only 16% of the sample not driving at all.

3.2 Energy behaviour

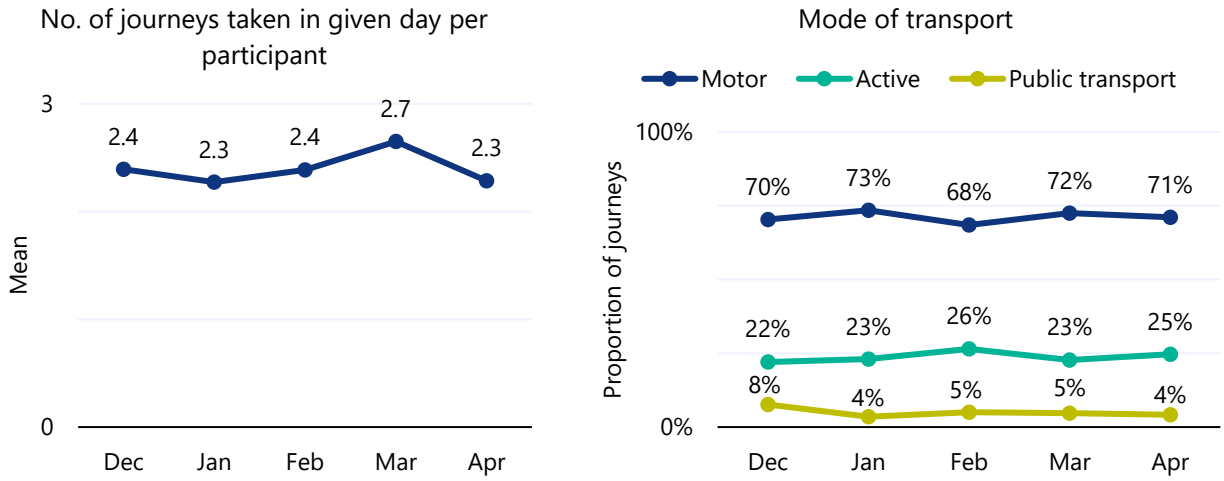
In this section we report descriptive statistics about many of the behaviours of interest that are recorded in BETT. As mentioned in the methods analysis section, for most of these we define a way of doing the behaviour that is considered inefficient or potentially wasteful. We model these behaviours to find associations between acting inefficiently and some of the other variables that we record.

3.2.1. Travel behaviour

Participants took between 2 and 3 journeys on average in a day, with that number remaining relatively stable over waves (Figure 2). Most of these journeys – about 7 in 10 – were taken using motorised transport (whether as a driver, passenger, or in a taxi), with about a quarter being walked or cycled, and only 1 in 20 using public transport. This is consistent with participants' ranking of the modes of transport they used over the preceding week – over two thirds ranked motorised transport as their most used.

[36] The C2DEF social grade includes respondents from households in which the chief income earner belonged to any of the following occupational groups: skilled manual worker, semi or unskilled manual worker, casual worker, retired, not employed, or farmer. The ABC1 group includes higher managerial/professional, intermediate managerial, supervisory or clerical/junior managerial workers.
[37] Email correspondence.

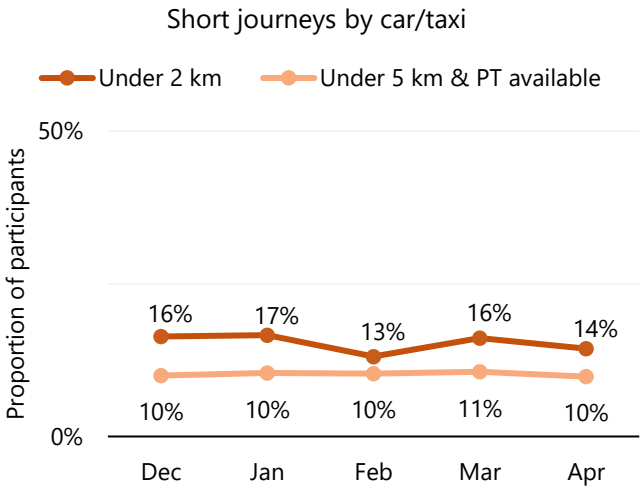
Figure 2: Left, the average number of journeys taken by participants on the previous day. Right, the proportion of journeys taken by different modes of transport.



Inefficient energy behaviour: short car journeys

To gauge the extent of driving that might be unnecessary, we created two binary variables that denoted whether a participant made a short journey by car or taxi that they could conceivably have walked or used public transport for. The first variable assumes that a journey that was 2 km or less could have been walked. The second variable assumes that a journey under 5 km where public transport was available could have been taken using that public transport.[38] Over a fifth of the sample used a car for at least one such journey in any given day. This proportion was highly stable across the analysis period other than a small dip in the number of people using a car for journeys less than 2 km in February (Figure 3).

Figure 3: Proportion of participants who travelled by car or taxi for short journeys.



Results of regression models examining how various factors influence the likelihood of using motorised transport if making a journey under 2 km can be found in Appendix D.1.

[38] Naturally, there are some individuals for whom these assumptions will not hold true because of their particular circumstances. However, those circumstances will be accounted for in the models we produce by the inclusion of sociodemographic variables.

Perhaps surprisingly, weather did not seem to affect how likely people were to travel by car for short journeys - the proportions of participants who drove short journeys when it was dry and when it was raining were not significantly different.

The factors most associated with travelling by car for journeys under 2 km were higher income, being female, aged over 35, living in rural areas, and living as a family. To gauge the extent to which car ownership itself was responsible for these observed associations, we ran a further model that only included car owners. Car ownership accounted for the effects of income and being in the oldest age group (55+) and appeared to account for some of the effect of living in a rural area or living as a family, but the effects of gender or being of middle age remained.

Our model explains car use for journeys under 5 km where public transport is available less comprehensively than the model for journeys under 2 km. There is no longer any effect of gender, age, or income. This time, living in an urban area is more strongly associated with engaging in the behaviour, presumably due to the greater availability of public transport in these areas. Belonging to C2DEF social grades was associated with a lower likelihood to make journeys of this type.

The most common reason to drive short distances was for shopping/errands; doing so accounted for about 40% of car journeys under 2km and 45% of car journeys under 5km where public transport was an option, when "returning home" journeys are excluded. Bringing children to school or other activities accounted for 19% and 13% of these types of journeys, respectively.

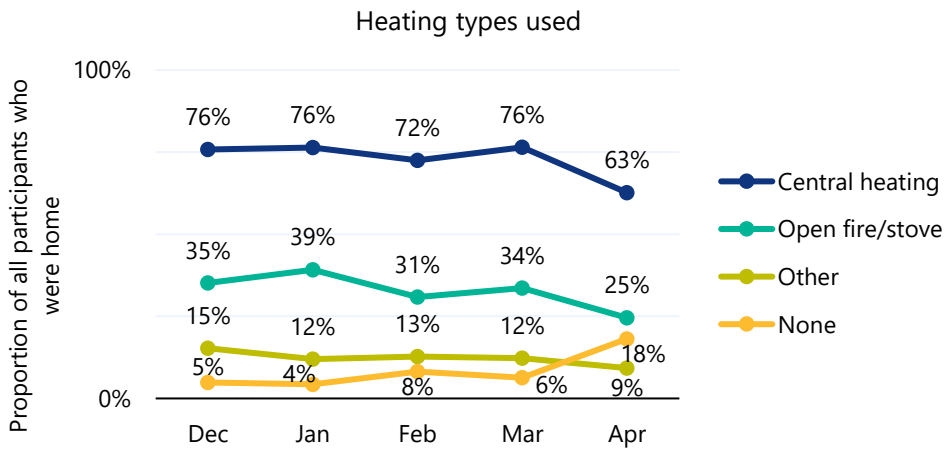
3.2.2. Home energy behaviour

Heating

Unsurprisingly, most people used the central heating on a given day throughout the study period – about three quarters during the colder months of December to March, and a little under two thirds in April (Figure 4). Open fires and stoves were the second most popular space heating methods, with over a third of participants indicating they were used the previous day until heating became less prevalent in April. The most popular open fire fuels were wood (34%), coal (20%), and smokeless coal (19%). About 17% of open fires were fuelled by turf.

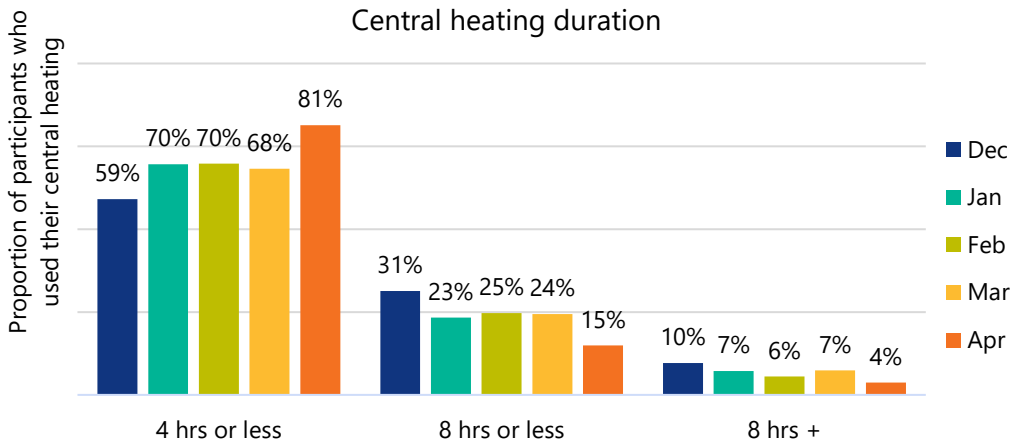
Other heating types such as portable heaters and electric underfloor heating were less widespread. A small number of people who had been at home had not used any heating system across waves.

Figure 4: Space heating used by participants who were at home on the reference day.



The duration for which the central heating was switched on (for those who had it switched on at all) is shown in Figure 5. On average over the five waves, most people (69%) who used the central heating in a given day had it switched on for less than four hours. Just over a quarter had it on for less than two hours in December to March, rising to 45% in April. A small but not insignificant proportion (7%) of participants who used central heating had it switched on for over 8 hours over the course of the day, although 10% of these had a heat pump system.

Figure 5: Duration for which the central heating was switched on (if used at all) on the reference day.



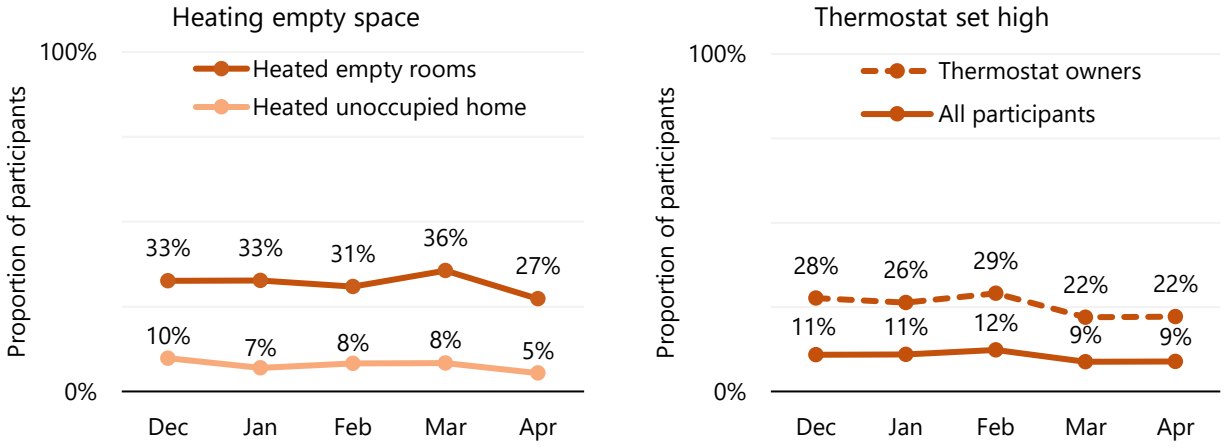
The outside temperature was a significant factor in using a heating system for over four hours in a given day. Being in an older age group was also strongly associated with longer heating time, as was living in a rural area, being unemployed and living as a couple or a family compared to living alone. There were no gender, social grade, or income level differences.

Inefficient energy behaviour: heating

As heating duration will be highly dependent on dwelling characteristics, the heating-related inefficient behaviours we define and model for this report are instead heating unoccupied space and high thermostat settings. The proportion of participants heating empty space is identified in two ways: through their response to a question asking whether they had the central heating on in any unoccupied rooms (excluding those that say they did so but at a lower temperature) and by identifying participants who said the heating was used at times of day when they had previously indicated no one was at home. A high thermostat setting is defined as 21°C or higher.

Over the course of the reporting period, just under a third of the sample heated empty rooms in a given day and 8% had the heating on when no one was home (Figure 6). Between 30% and 40% of participants engaged in at least one of these behaviours. More than a quarter of thermostat owners were using a high setting from December to March, reducing to 22% in March and April.

Figure 6: Left, proportion of participants who heated empty space. Right, proportion of participants who had their thermostat set to 21°C or higher.

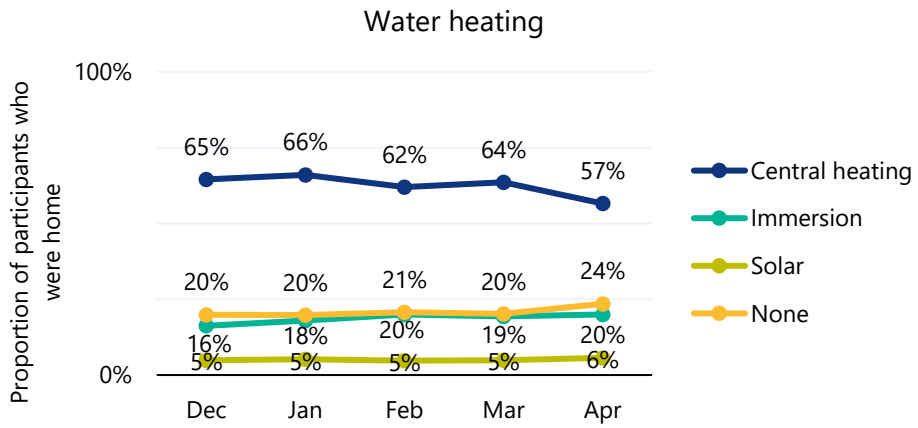


Outside temperature had a strong effect on the likelihood of heating empty space but was not predictive of higher thermostat settings (see Appendix D.2). People belonging to ABC1 social grades were significantly more likely to heat unoccupied rooms than those in the C2DEF group. So were urban dwellers relative to rural dwellers. Unsurprisingly, apartment dwellers were significantly less likely to heat any unoccupied rooms. None of the sociodemographic variables that we measured influenced likelihood to use a high thermostat setting, other than urban dwellers being slightly more likely to do so.

Hot water use

During the reference period, most participants used their central heating system for heating water (Figure 7), although this declined slightly in April in line with space heating results. About one in five used the immersion or other electric water heater, rising to 24% in April. A small proportion (5% on average) used solar panels to heat water and between 16% and 20% did not heat water at all on the reference day.

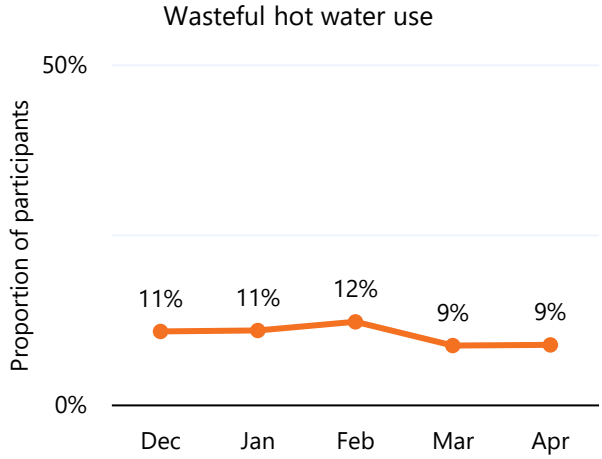
Figure 7: Water heating methods used by participants who were at home on the reference day.



Inefficient energy behaviour: hot water use

In order to model inefficient hot water use, we look at how people used hot water for showers and baths. In particular, we define taking multiple showers or baths in one day, taking a long shower (over 10 mins) or filling a bath as inefficient hot water use. Over one in ten participants engaged in at least one of these behaviours in a given day over the study period (Figure 8).

Figure 8: Proportion of participants who had multiple showers or baths on the reference day or took a long shower or a full bath.

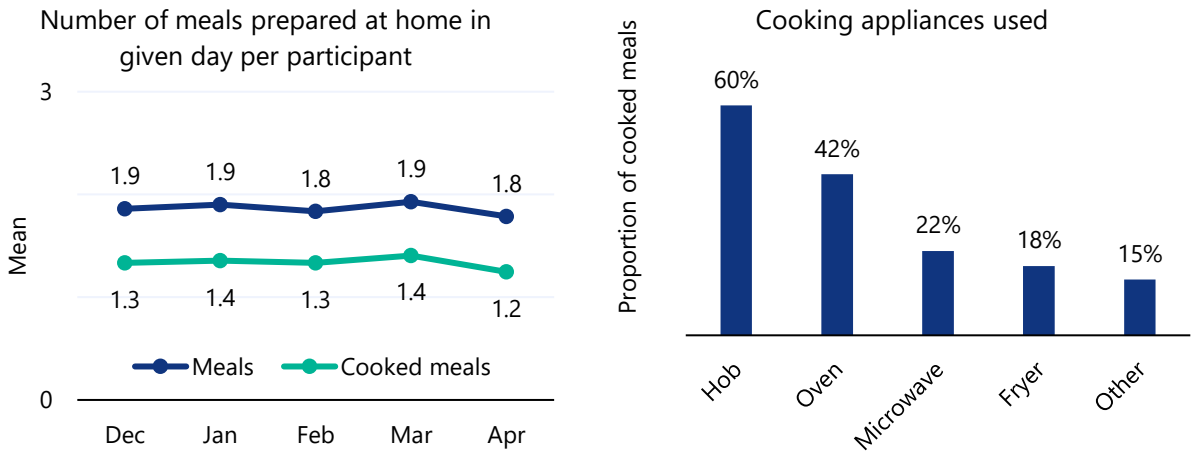


Participants were significantly more likely to use hot water inefficiently on weekends compared with weekdays (see Appendix D.3). Women and younger people were also more likely to do so.

Cooking

Participants prepared an average of just under two meals at home in a given day over the study period, the majority of which involved cooking (Figure 9, left). The most used cooking appliances were the hob (three in five cooked meals) and the oven (two in five), most of which were electric (Figure 9, right). Roughly one fifth of cooked meals were prepared using a microwave and 18% using a fryer (mostly air fryers). The relative prevalence of appliance type did not change over the five waves.

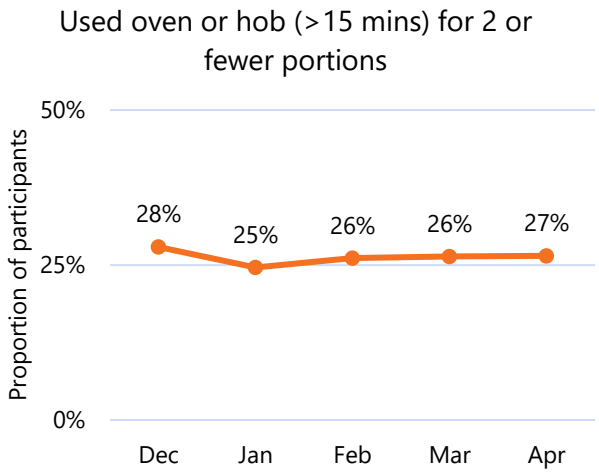
Figure 9: Left, average number of meals prepared and cooked at home in a given day. Right, appliances used for cooked meals, averaged over all five waves.



Inefficient energy behaviour: cooking

We define cooking inefficiently as using energy intensive appliances (the oven, or the hob for longer than 15 mins) to cook only a small number of portions (two or fewer). A little over a quarter of participants cooked inefficiently on a given day over each month of the study period (Figure 10).

Figure 10: Proportion of participants who cooked inefficiently in a given day.

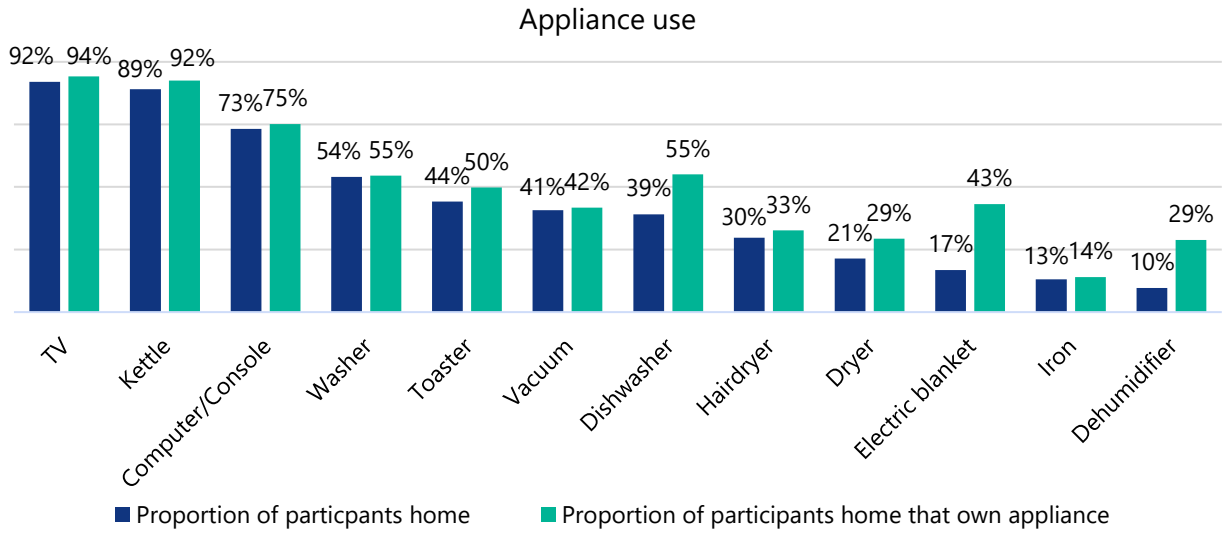


Among participants who had cooked at all, being male was significantly more strongly associated with cooking inefficiently, as was living alone compared to living as a family, being young (under 35), or belonging to the C2DEF social grade bracket (see Appendix D.4). Inefficient cooking was less common at weekends, and among those in the highest income bracket.

Appliances

The proportion of participants who used various electrical appliances is shown in Figure 11. These proportions remained relatively stable over all five waves. The most commonly used appliances of those we asked about were televisions (92% of participants), kettles (89%) and computers or games consoles (73%) and washing machines (54%). For the most part, if an appliance was used, it was used only once over the course of the day, with the exception of kettles, computers/consoles and televisions.

Figure 11: Proportion of participants using a range of appliances in a given day, averaged across waves and ordered by most used.

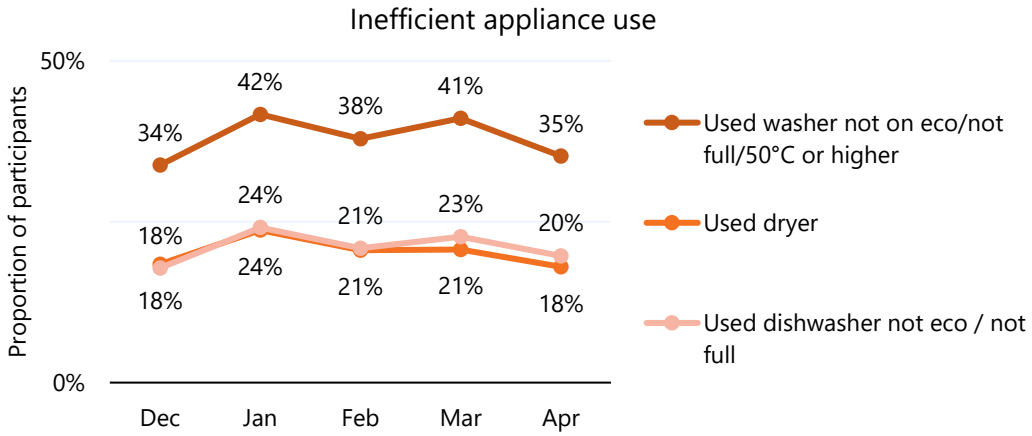


Inefficient energy behaviour: appliance use

To investigate factors influencing the inefficient use of electrical appliances, we focus particularly on the use of larger, more energy intensive appliances such as the washing machine, tumble dryer and dishwasher. For washing machines and dishwashers, inefficient use was defined as not using eco settings, not filling the machine or, for washing machines, setting the temperature to 50°C or higher. Using the tumble dryer was designated as wasteful in and of itself.

Between 34% and 42% of people used their washing machine inefficiently in a given day across the study period (Figure 12). A smaller but still substantial proportion (18% - 24%) used their tumble dryer or used their dishwasher inefficiently. 37% of participants who used their washing machine on a given day also used a tumble dryer.

Figure 12: Proportion of participants who used the washing machine, tumble dryer or dishwasher in an inefficient way on a given day.



Of those participants that had used a washing machine on the previous day, men were less likely to have used it inefficiently, but more likely to have used a tumble dryer (see Appendix D.5). People aged 55 or over, educated to degree level or above, or living in an apartment were less likely to have used a dryer. People in rural areas and in the highest income bracket were more likely to have done so, largely because more of these individuals own a dryer.

Having a degree was associated with a lower likelihood to use a dishwasher inefficiently but no other sociodemographic variables that we measured showed any influence.

Overall inefficient home energy use

As will be apparent from the preceding sections, different sociodemographic groups appear to be engaged to different extents in different inefficient behaviours. To gain a higher-level view of which individuals are more likely to use energy inefficiently in general, we constructed a further variable that summed all inefficient household behaviours to show how many each participant had carried out (excluding setting the thermostat high, which is not relevant to over half the sample). Most people (54%) engaged in fewer than two of the six inefficient behaviours defined on the reference day, with almost a quarter not performing any. A little over one in five people had done three or more.

Regression model results looking at factors influencing the number of inefficient behaviours engaged in can be found in Appendix D.6. Women tended to have a higher count of inefficient behaviours compared to men (though they were also more likely to engage in many home energy related behaviours in the first place, efficient or not). Older age groups had lower counts of inefficient behaviours compared with those aged under 35. People in lower social grades also had a lower count, as did people living alone, apartment

dwellers, and those educated to degree level or higher. When travel variables are included in the count outcome, urban dwelling becomes a significant association, but otherwise, models results are largely unchanged.

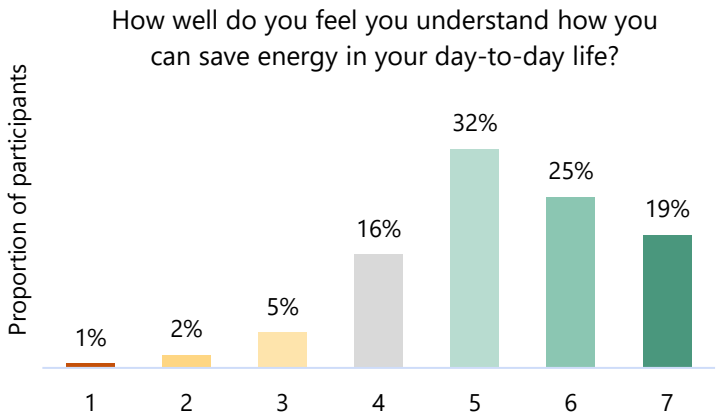
In general, sociodemographic characteristics had a stronger relationship with inefficient behaviour than psychological factors. We report the influence of psychological variables on behaviour in the next section.

3.3. Psychological variables

3.3.1. Awareness & understanding

Participants' self-reported understanding of how to save energy in their day-to-day lives is shown in Figure 13. People perceive themselves as having relatively good understanding, consistently giving an average rating of 5.3 over the five waves (measured on a 7-point scale). Only 8% of the sample rated their understanding below the midpoint of the scale.

Figure 13: Self-reported understanding of how to save energy, measured on a scale from 1 (Not well at all) to 7 (Very well), aggregated across all five waves.



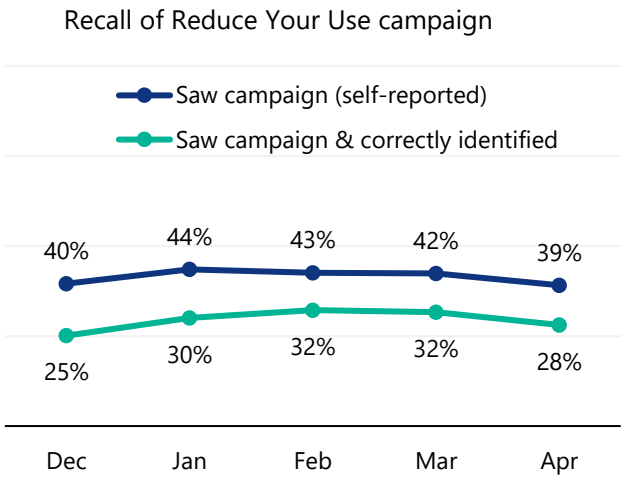
Men rates themselves as having a higher understanding of how to save energy than women, as did older age groups compared to younger people.

Those who reported high understanding were less likely to travel by car for short journeys (50% of journeys under 2 km for people with high understanding vs. 56% for those with low understanding, 17% vs. 23% for journeys under 5 km where public transport was available), to engage in inefficient heating (40% vs. 48% for heating empty space if the heating was on, 24% vs. 32% for high settings among thermostat owners) or to use hot water inefficiently (16% vs. 26% of those who took a shower/bath the previous day) (see Appendix D). Overall, self-reported understanding was the psychological measure most strongly related to the number of inefficient home energy behaviours participants engaged with.

Recall of "Reduce Your Use"

Recall of the "Reduce Your Use" campaign was relatively high throughout the study period, peaking in February with just under a third of participants being able to identify an ad from the campaign from 3 possible options (Figure 14). Note that while roughly two in five participants reported seeing the campaign, about a quarter of those could not identify it correctly.

Figure 14: Recall of the Reduce Your Use campaign.



Importantly, those who recalled seeing the Reduce Your Use campaign were significantly more likely to report strong understanding of how to save energy. It is not possible to say, however, to what extent the campaign increased understanding and to what extent those with higher understanding to begin with were more likely to notice and remember the campaign. Indeed, those educated to degree level and above were more likely to recall seeing the campaign.

Recall of Reduce Your Use was associated with engaging in fewer inefficient home energy behaviours. In particular, those who recalled seeing the campaign were less likely to heat empty space (39% vs. 43% who had the heating on) or to have thermostats set to a high temperature (21% vs. 28% of thermostat owners).

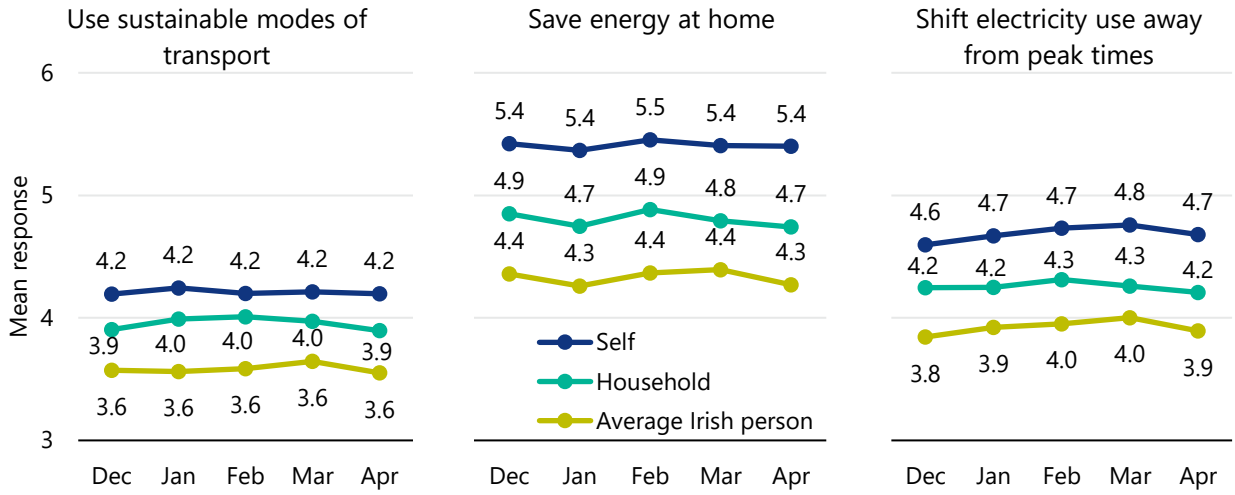
3.3.2. Social influence & perceived efficacy

Effort of self and others

Figure 15 shows participants' responses to questions about the level of effort they thought they themselves, others in their household, and the average Irish person were making to use sustainable modes of transport, save energy at home and shift electricity use away from peak times (4pm – 7pm).

Broadly speaking, people reported the highest level of effort (both for themselves and for others) in saving energy at home, followed by shifting peak electricity use, with the least effort being made with regards to transport. In all domains, participants consistently rated their own efforts more highly than the efforts of others in their household, which in turn were rated higher than those for the average Irish person. There was little change in these responses across waves, other than a slight increase in self-reported effort to shift electricity use away from peak times, particularly in February and March.

Figure 15: Average perceived effort made by oneself and others to use energy efficiently in three domains, as measured on a scale from 1 (Not making an effort) to 7 (Doing everything possible).



Older people reported higher levels of effort compared with younger people across all domains, with the oldest group (over 55s) making the most effort. Women reported making more of an effort to save energy at home and shift their electricity use than men, but there was no gender difference in efforts to use sustainable transport. People on higher incomes reported making less of an effort across the board, as did people living alone.

With regards to the perceived effort of other people ("the average Irish person"), men, those on the highest incomes or from higher social grades, and those with a degree gave lower ratings across all three domains. Younger people also gave lower ratings for the effort of the average Irish person to save energy at home or shift peak use, but there were no age effects on perceptions around efforts to use sustainable transport.

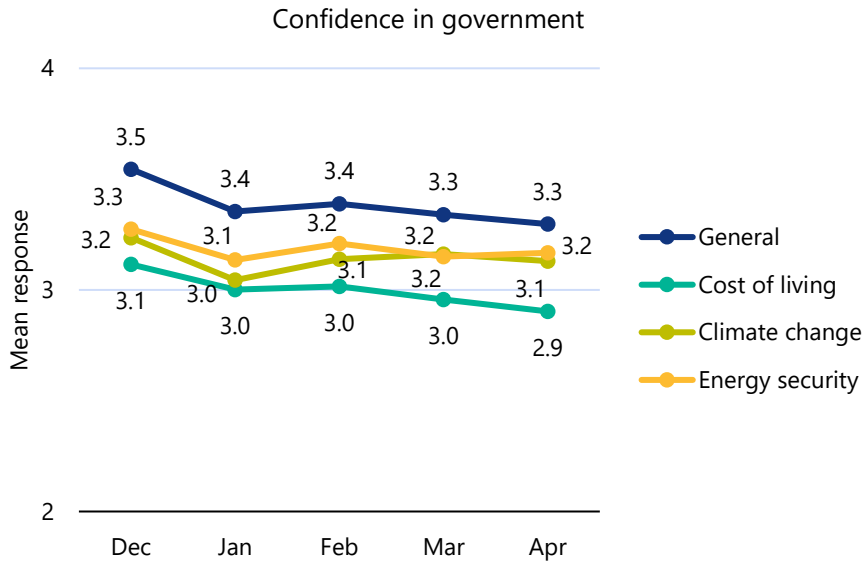
Participants who thought others were making a substantial effort to save energy at home were less likely to use their tumble dryer than those who didn't (35% of those who had used their washing machine vs. 39%) (see Appendix D.5). In addition, among car owners, those who perceive greater effort on the part of others to travel sustainably were slightly less likely to have travelled by car for a journey under 2 km.[39]

Confidence in government

Participants reported having relatively low confidence in the current Irish government (below the midpoint score of 4), with mean scores declining slightly from December to April (Figure 16). The reason behind this low average score is that over a quarter (27%) gave a rating of 1, corresponding to "not at all confident". The remainder reported a moderate level of confidence (see Appendix B). Ratings of confidence in the government's response to cost of living, climate change and energy security issues were lower than that for general confidence in government, but followed similar trends, other than that for climate change which remained relatively stable.

[39] This is only statistically significant at a less conservative threshold. However, given the consistency of the effect when the "others' effort" variable is recategorized, it is likely that the effect would be statistically significant using the more conservative threshold if the sample were larger.

Figure 16: Average confidence in the current Irish government and in their response to various issues, measured on a scale from 1 (Not at all confident) to 7 (Very confident).



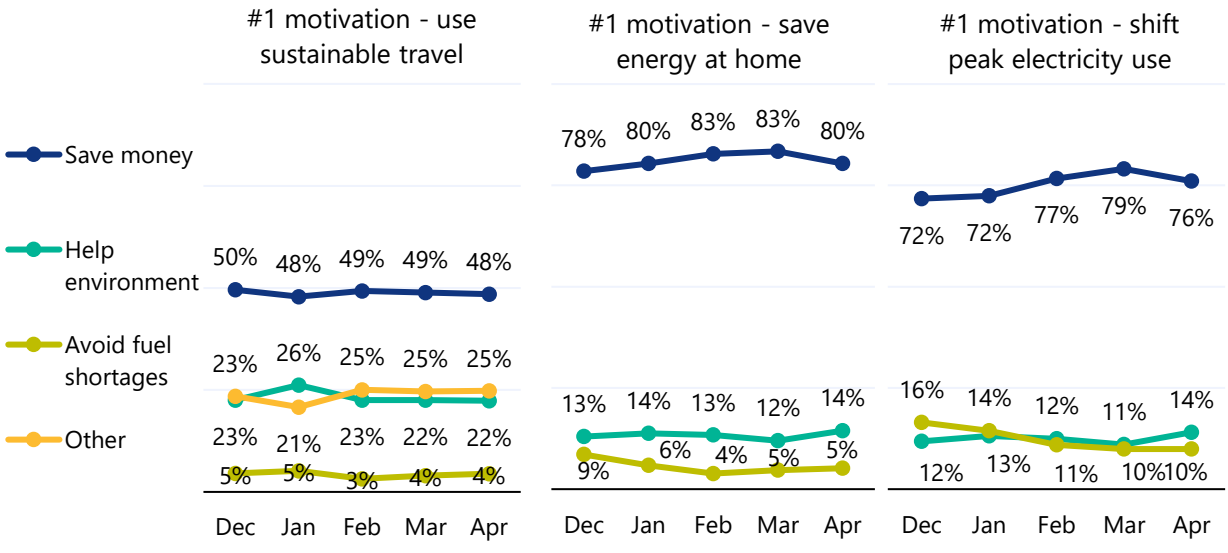
Men, older people (especially over 55), those on higher incomes or from higher social grades, and those educated to degree level or higher all reported higher confidence in government. Individual level of confidence in government did not show any association with inefficient energy behaviour in our models, except for with a somewhat higher likelihood to heat unoccupied space. However, confidence in government was positively correlated with self-reported effort to use energy sustainably.

3.3.3. Worry & motivation

Stated motivations

If participants stated they were making some effort to use sustainable modes of transport, save energy at home or shift electricity use away from peak times, they were asked to rank their motivations for doing so. Their top ranked motivations for doing so are shown in Figure 17.

Figure 17: Stated motivations for using energy sustainably that were ranked highest.



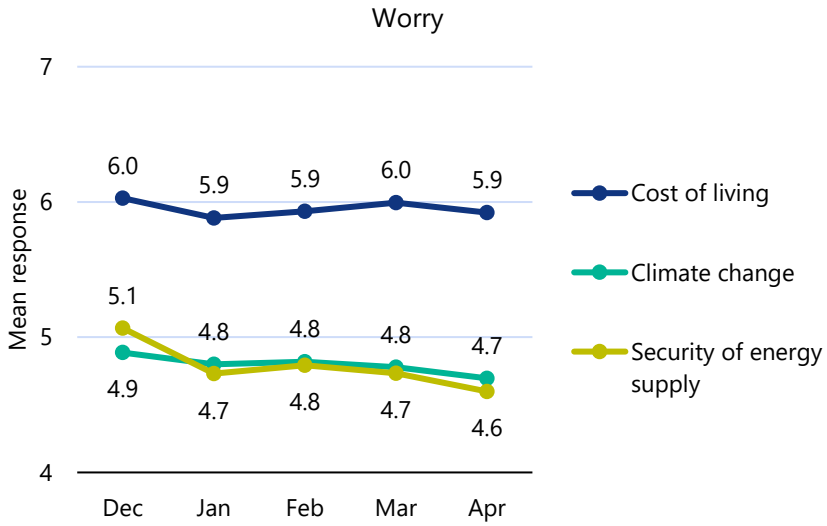
Saving money was consistently the most highly ranked motivation, but this was true both of those who report a higher or lower degree of effort as well as for people who were more or less efficient with their energy use. A smaller but not insubstantial proportion of participants ranked helping the environment as their top motivation, particularly for using sustainable modes of transport. The youngest age group (18 – 34) were significantly more likely to report environmental reasons as their top motivation to save energy at energy at home than the middle age group (35 – 54).

Interestingly, over 70% of participants ranked saving money as their main motivation for shifting their electricity use, despite the fact that most of these people were not on time-of-use tariffs and therefore would not save money by avoiding using electricity at peak times.

Worry

Participants reported very high levels of worry about cost of living throughout the study period (rated 6 on average on a 7-point scale) and lower but still high levels of worry about climate change and energy/fuel shortages (both rated 4.8 on average). The level of worry about climate and cost of living remained relatively constant over the study period, but worry about energy security was half a point lower on average in April compared to December.

Figure 18: Average self-reported level of worry about cost of living, climate change, and security of energy supply as rated on a scale from 1 (Not at all worried) to 7 (Very worried).



Men reported significantly lower levels of all three types of worry. Those aged over 55 reported lower levels of worry about cost of living than younger people but, perhaps surprisingly, were slightly more likely to report high worry about climate change compared to the youngest group; those in the middle age group (35 – 54) were least likely to report high climate worry, though a majority of them still did so. Unsurprisingly, those in C2DEF social grades and those on lower incomes were more worried about cost of living and energy security. Those belonging to lower social grades were less likely to be highly worried about climate change, but there was no effect of income. Having a degree was associated with lower worry about cost of living and energy security.

Those participants who were more worried about climate change engaged in fewer inefficient household behaviours (see Appendix D.6). In particular, compared with people who were less worried, they were less likely to use hot water inefficiently (17% vs. 21% of those who took a shower/bath), use appliances

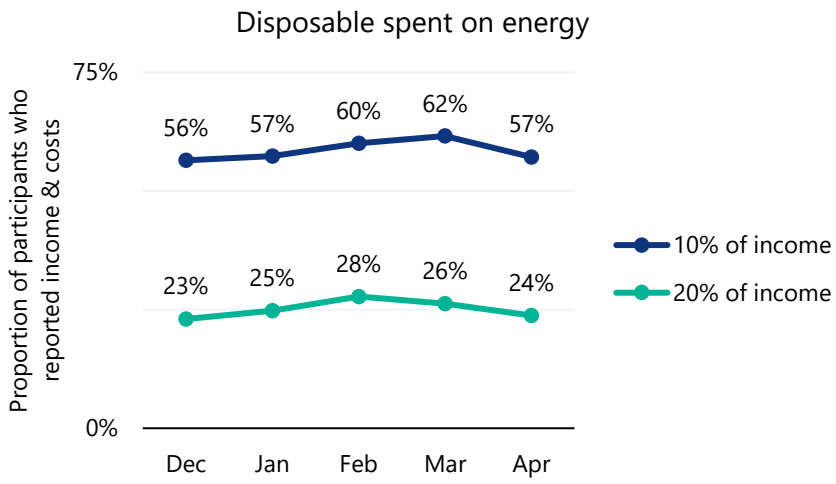
inefficiently (71% vs. 79% of those that used a washing machine, 54% vs. 62% of those that used the dishwasher) or cook inefficiently (31% vs. 34%).

3.4 Energy Poverty

BETT participants are asked to optionally report monthly disposable income and home energy (electricity and heating) spend. Based off those responses we calculate the percentage of income spent on home energy costs, for those participants who provide all this information (69% of the total sample).[40]

Figure 19 shows the proportion of participants who spent 10% or more of their income on energy, a longstanding measure of energy poverty. By this definition, well over half of the sample were in energy poverty over the analysis period, with a quarter spending over 20% of their income on energy. Motor fuel costs are not included in these statistics and represent another potential financial burden on households.

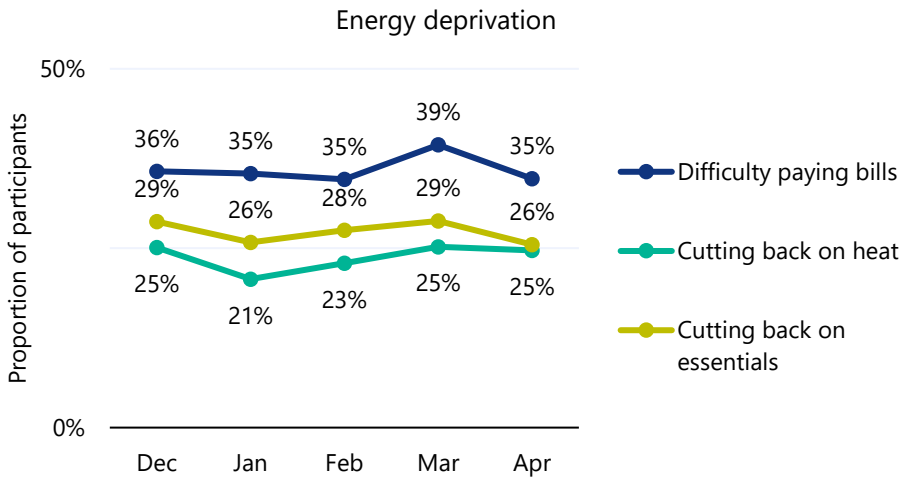
Figure 19: Proportion of participants spending at least 10% or 20% of their disposable income on home energy costs monthly.



To overcome potential flaws with the 10% definition of energy poverty we also include more subjective measures of energy deprivation, the results of which are shown in Figure 20. Over a third of the sample consistently reported having had difficulty paying their last bill, with 7% reporting having been unable to pay it on time or at all. An average of 23% of participants reported having had to cut back on heat over the previous month and a third reported having had to cut back on other essentials.

[40] There is likely to be substantial noise in the resultant figures, given that people often do not know what their energy spend is. Cautious interpretation is thus warranted.

Figure 20: Subjective self-reported measures of energy deprivation.



We modelled the likelihood to have difficulty paying bills to investigate further which groups were most at risk of energy deprivation (Appendix D.7). Unsurprisingly, the most at-risk group were those with the lowest incomes – 48% of people in the low-income bracket (under €2,000 monthly disposable income) reported having difficulty paying bills compared with 36% in the middle-income bracket (€2,000-€4,000) and 22% in the highest (€4,000+). Being in the C2DEF category was also associated with difficulty paying bills. Households with someone with a chronic health issue or disability were also significantly more likely to be at risk. The youngest group was significantly more likely than both older groups to be at risk.

People at risk of energy poverty were highly worried about the cost of living, but no less worried about the climate than people not in energy poverty. They also reported a lower level of understanding about how to save energy in the home. Their confidence in government was significantly lower than those not having trouble paying energy bills.

4. Discussion

4.1. Prevalence of inefficient energy use & potential for savings

Throughout the 2022/2023 heating season examined in this report, people reported a high understanding of how to save energy and said they were making an effort to use energy efficiently, but there was room for improvement, and this is reflected in the behaviour we measured.

Some of the most energy intense inefficient behaviours were also the most prevalent. Up to 40% of participants had the heating on when no one was home or heated unoccupied rooms on a given day and a quarter of thermostat owners had theirs set to a high temperature. There is thus **significant potential for energy saving by encouraging more efficient heating behaviours**, even without asking people to reduce the length of time for which they heat their homes.

Another area with a good deal of potential is in transport. Cars were used for over 70% of journeys during the report period, a proportion consistent with other travel surveys conducted in Ireland[41]. Across the five months of data collection, an average of 15% of participants used a car for a journey under 2 km on a given day, and 10% did so for a journey under 5 km where public transport was available. According to our models, this had less to do weather than might be expected. Many of these short journeys were to bring children to school, but their most common purpose was for shopping and errands.

Another of the more energy intense behaviours tracked – using a tumble dryer – was also prevalent. In any given wave about a fifth of participants reported using a tumble dryer on the day in question. Less energy intense, but more common, is using a washing machine inefficiently. This was typically twice as common as tumble dryer use, and thus represents an area of potential energy saving as well.

4.2. Sociodemographic differences in energy behaviour

The types of people most likely to engage in the different inefficient behaviours tracked were not consistently the same. Women generally engaged in more inefficient behaviours, but men were more likely to cook inefficiently and use the tumble dryer. Young people were less likely to travel by car for short journeys but were more likely to use hot water and cook inefficiently. Over 55s were the age group least likely to use the tumble dryer and engaged in fewer inefficient behaviours overall, consistent with their reporting making the most effort. People in urban areas were less likely to use the car for short journeys or use the tumble dryer but more likely to engage in wasteful home heating practices. Those on higher incomes or from higher social grades engaged in more inefficient behaviours overall, but those on lower incomes or from C2DEF social grades were more likely to use energy inefficiently for cooking. All of this suggests that **communications will be most effective if targeted by specific behaviour and sociodemographic groups**.

Relative to the psychological influences that we measured, sociodemographic factors were more influential on behaviour. They do not tell the whole story though, and some findings require further careful interpretation. For example, women were significantly more likely to use a car for short journeys than men. One interpretation of this finding might be that men made more of an effort to use active modes of transport. But this is likely an oversimplification: men in the sample did not report higher levels of effort in this domain. Instead, factors such as infrastructure quality might account for some of the difference – cycling remains a dangerous mode of transport in most urban areas and men may simply be more likely to take the

[41] National Household Travel Survey 2023: https://www.ipsos.com/sites/default/files/ct/news/documents/2023-10/23-051874-NTA-NHTS%202023%20-%20Ipsos%20Privacy%20Notice%20September%202023.pdf

risk. In Ireland, routes with safer infrastructure have significantly higher cycling rates and while the effect is not statistically different by gender, it is stronger among females.[42] Differences in energy behaviour may also be due to gendered division of labour in the home.

In summary, **a large range of factors – infrastructural, convenience-related, sociological – are likely what result in sociodemographic differences such as gender effects that surface in our models.** They outweigh conscious motivations for many energy-related behaviours. However, as we discuss now, some psychological factors did play an important role as well.

4.3. Psychological factors

4.3.1. Awareness & understanding

Self-reported understanding of how to save energy at home was one the most influential psychological factors across our models of energy behaviours, particularly with regards to transport, home heating and hot water use. Combined with the fact that higher education was also associated with engaging with fewer inefficient behaviours, this points towards **further potential for education and awareness to reduce energy use in Ireland, particularly amongst younger age groups who report lower understanding.**

Although it is impossible to establish causality, we do see promising signs that the Reduce Your Use awareness campaign may have had some impact on behaviour over the 2022/2023 heating season – **participants who recalled seeing the Reduce Your Use campaign were less likely to engage in wasteful home heating behaviours**. Recall of the campaign was high overall – at its peak in February just under a third of people were able to identify it.

Our results also point to **potential misconceptions around energy** that could be corrected through information campaigns. Most participants reported their main motivation to shift their electricity use away from peak times as being to save money, despite only a small proportion of these being on the types of tariffs that would allow them to do so. This suggests some people might think that electricity is cheaper at off peak times for everyone, regardless of what tariff they use. Further waves of BETT incorporated additional questions designed to probe participant's comprehension of energy related matters and uncover further potential misconceptions, the results from which will be included in future reports.

4.3.2. Social influence & perceived efficacy

Across different types of behaviour, **participants consistently rated their own efforts as higher than those of others in their household and of the average Irish person**. Interestingly, participants rated the efforts of others in their household higher than efforts of average Irish person, which might suggest a need for greater visibility and awareness raising of the actions of others.

Given previous research showing the importance of social norms in the context of climate action, we expected the perceived effort of others to be an important influence on energy behaviour. This was true for one or two behaviours (travelling by car for journeys under 2 km and tumble dryer use), but the effect was not as widespread as expected. Previous research has found that young people typically underestimate the concern of older people about climate, and that correcting this misperception increases belief in collective action[43]. Together, these findings support the contention that **if people were more aware of the efforts of others to save energy, they might make more of an effort themselves,** at least in some domains.

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[42] Carroll, J., Brazil, W., Morando, B., & Denny, E. (2020). What drives the gender-cycling-gap? Census analysis from Ireland. *Transport Policy*, 97, 95-102.

[43] Timmons, S., Y. Andersson and P.D. Lunn (2022). 'Framing climate change as a generational issue: Experimental effects on youth worry, motivation and belief in collective action', PsyArXiv. https://doi.org/10.31234/osf.io/4kjmp

4.3.3. Worry & motivation

The most frequently reported top motivation for using energy efficiently was to save money, and participants were highly worried about cost of living, but higher worry was not associated with more efficient behaviour. Granted, worrying about cost of energy is different to using less energy to save money. But given that saving money is by far the most common reported motivation, one might expect to see cost worry influence behaviour.

This is not to say that cost is not an important factor in sustainable behaviour; we outline below concerns about people at risk of energy poverty. Rather, the point is that **using financial framing might not be the optimal way of appealing to people to make behavioural changes in the way they use energy.** This is a nuanced point – BETT is a survey and as such we can make no firm causal conclusions based on its results – but it is nonetheless supported by other research.[44,45,46]

Rather than worry about cost, it was **worry about the climate** that was more strongly associated with energy behaviour, particularly a **lower likelihood to use appliances inefficiently**. However, there remained a majority of behaviours for which it made little or no difference. It is likely that in many cases, this is simply because there is not a way for it to make a difference – infrastructural barriers preclude any influence worry might have for likelihood of cycling for many people for example. But there is no doubt that a substantial portion of people are both highly worried about climate change while, for example, unthinkingly heating unoccupied rooms in their home.

4.4. Prevalence of energy deprivation

Our results suggest **a significant minority of people were at risk of energy deprivation last winter and are therefore likely to be at risk this winter also**. In April 2023, over a third of people were having some difficulty paying energy bills, and a quarter were cutting back on heat or other essentials. The most at-risk groups were those with the lowest incomes and those in households with a person with a chronic health issue or disability. **People at risk of energy poverty were, of course, highly worried about the cost of living, but no less worried about climate change.** There is an apparent need for additional government supports for those on lower incomes and those living with chronic illness. People who are having difficulty paying for life essentials will not have the same opportunity to think about acting more sustainably; their basic needs must be addressed first.

4.5. Conclusion

Through its use of the Day Reconstruction Method, BETT offers a highly detailed and comprehensive picture of individuals' energy behaviour in Ireland over time. The results account for day-of-week effects, as well as broader seasonal effects. With these variables controlled for, we can isolate the effects of sociodemographic factors and provide targeted recommendations. We also track attitudes to climate and energy issues over time and investigate predictors of inefficient behaviour. In sum, BETT offers a comprehensive picture of energy use and the factors influencing it.

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[44] Parag, Y. (2021). Which factors influence large households' decision to join a time-of-use program? The interplay between demand flexibility, personal benefits and national benefits. Renewable and Sustainable Energy Reviews, 139, 110594. https://doi.org/10.1016/j.rser.2020.110594

[45] Steinhorst, J., & Matthies, E. (2016). Monetary or environmental appeals for saving electricity?–Potentials for spillover on low carbon policy acceptability. Energy Policy, 93, 335-344. https://doi.org/10.1016/j.enpol.2016.03.020

[46] Bolderdijk, J. W., Steg, L., Geller, E. S., Lehman, P. K., & Postmes, T. (2013). Comparing the effectiveness of monetary versus moral motives in environmental campaigning. Nature climate change, 3(4), 413-416. https://doi.org/10.1038/nclimate1767

While a vast majority of people recognise the climate emergency and are highly worried about, translating associated attitudes into behaviour change is far from straightforward. There is less than optimal awareness about how behaviour translates to emissions and how to save energy and reduce costs. Concurrently, much of the inefficient behaviour that is happening is due to infrastructural barriers to change – i.e., it is often outside the control of individuals. Where people do have the power to change, it is often within domains where behaviour is either habitual and non-thinking, and therefore difficult to change, or where more sustainable alternatives are less convenient. Most people are doing their best within the confines of imperfect awareness about what exactly to do.

4.5.1. Future directions

The current report focused on results from the first five waves of BETT only, corresponding to the 2022/2023 heating season. A subsequent report will focus on the warmer months of May to September and include comparisons between the two periods. At the time of publication BETT is an ongoing study and continues to produce rich data. Future reports will focus on more detailed analysis on selected topics such as energy deprivation, heating behaviour, time of use profiling for electricity use and travel mode choices.

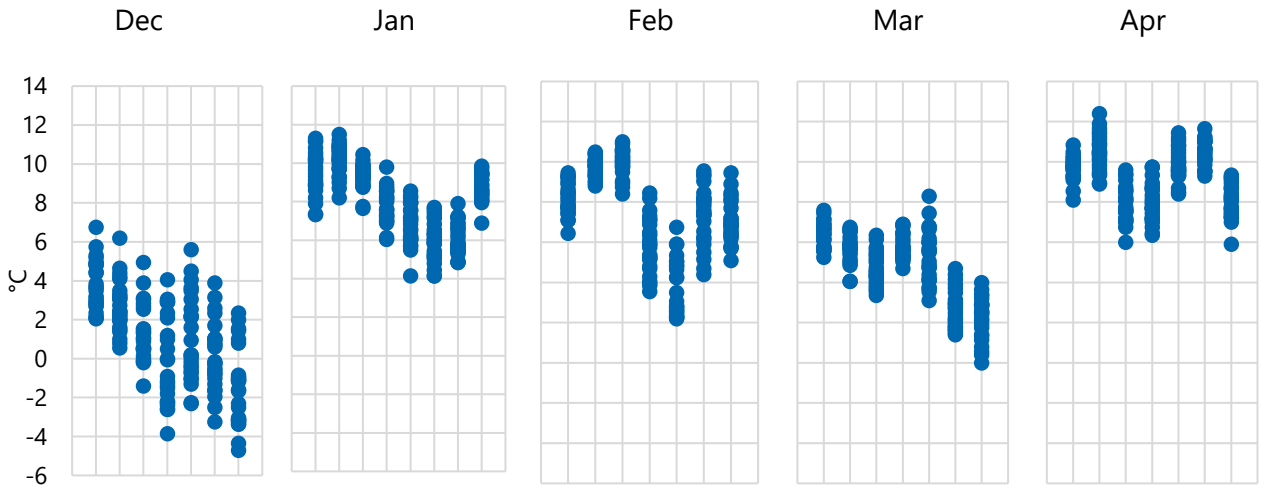
Appendices

Appendix A - Weather

We incorporate average daily temperature and rainfall into our regression models by matching a participant's county to the closest of 25 synoptic weather stations for which Met Éireann provide recent data.

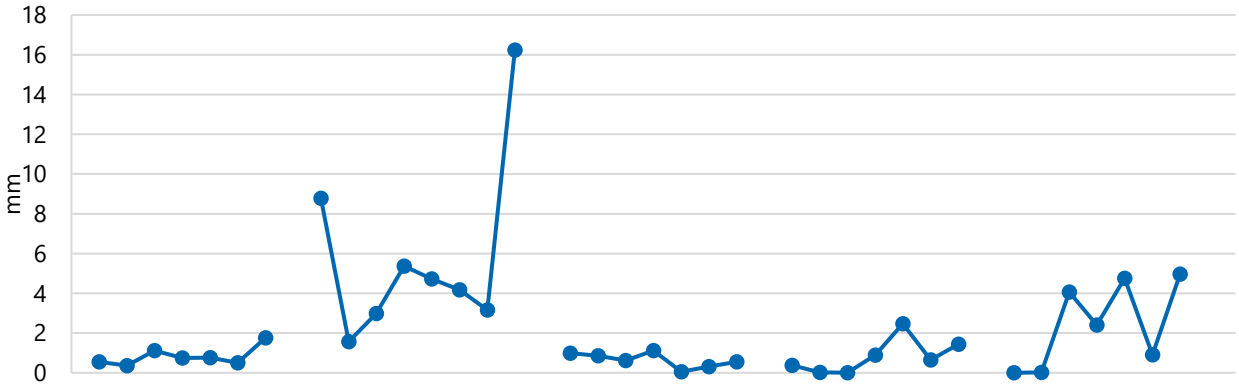
Figure 21 charts the average daily temperatures on each of the days about which participants responded.[47] Each dot on the chart represents the mid temperature at one of the 25 stations.

Figure 21: Mid daily temperatures for each study reference day at each of the 25 synoptic weather stations.



We categorise rainfall into "no rain" (0mm), "wet day" (1-9mm), and "very wet day" (10mm+).[48] Figure 22 charts the rainfall averaged across the weather stations for each of the reference days in the study.

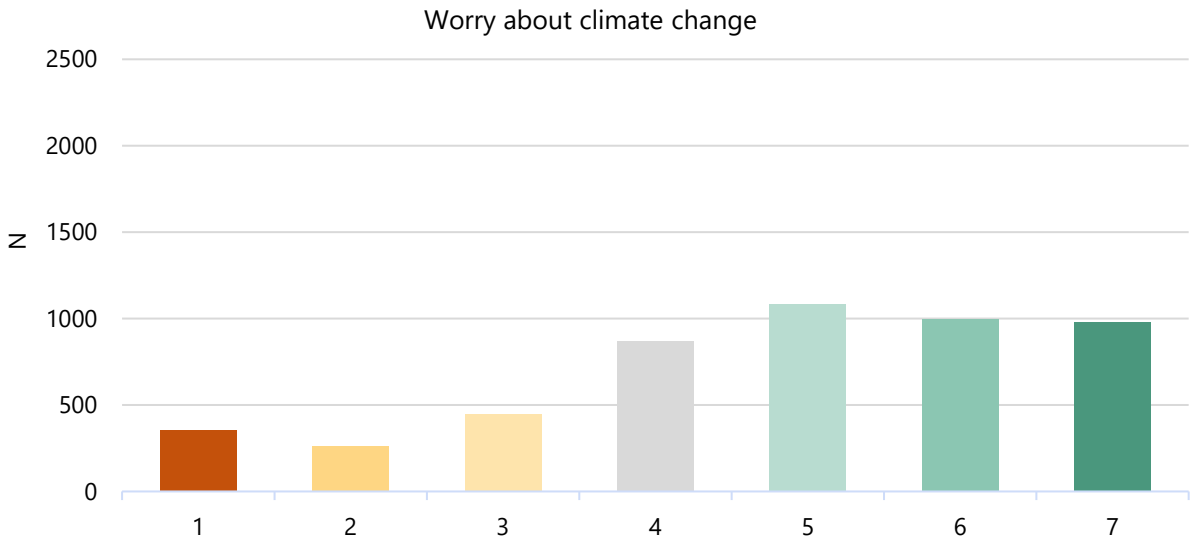
Figure 22: Average daily rainfall during study periods.

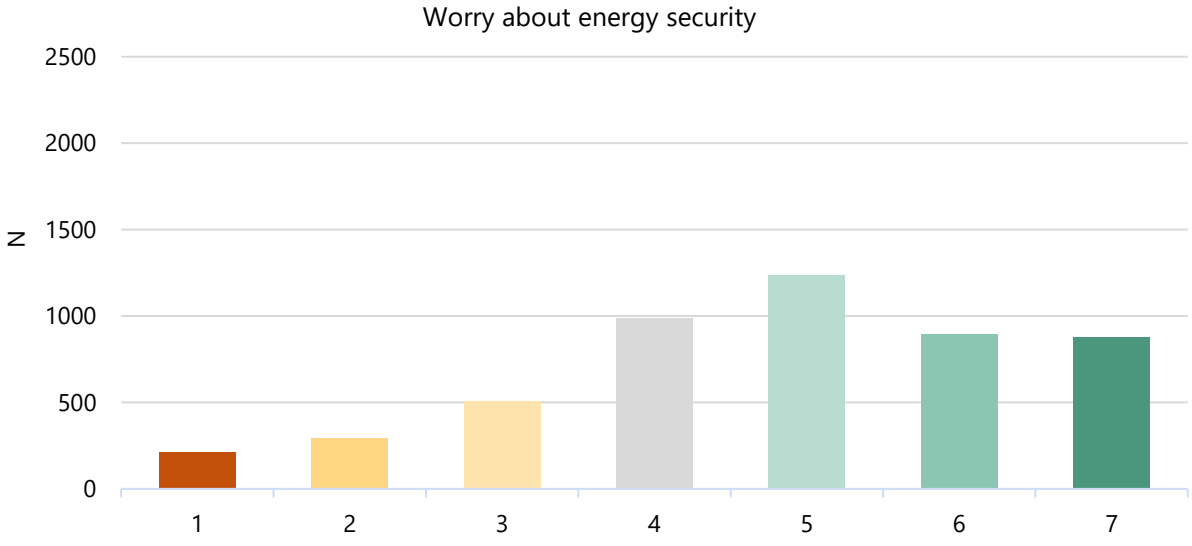


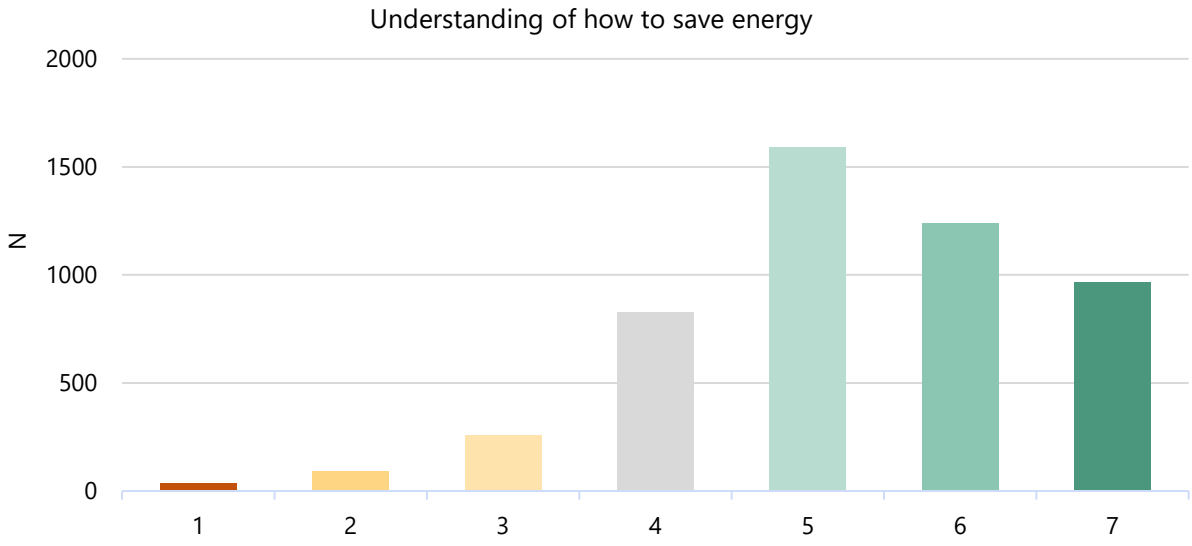
[47] There were 8 data collection days in the January wave.

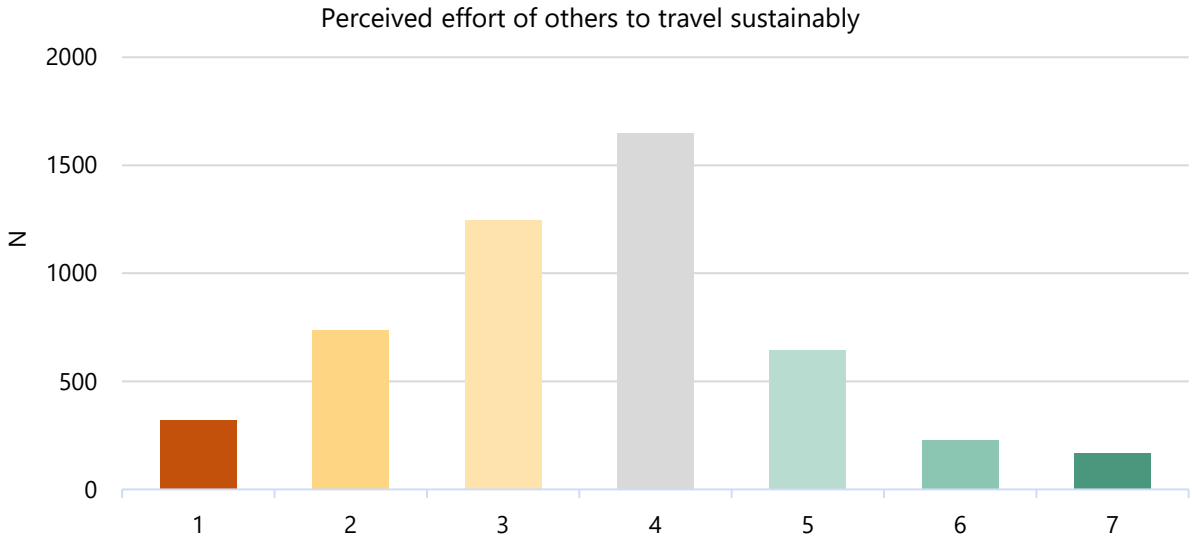
[48] https://www.epa.ie/publications/monitoring--assessment/freshwater--marine/hydrology-bulletin/hydrology-bulletin/EPA-Hydrology-Bulletin-September-2021v2.pdf

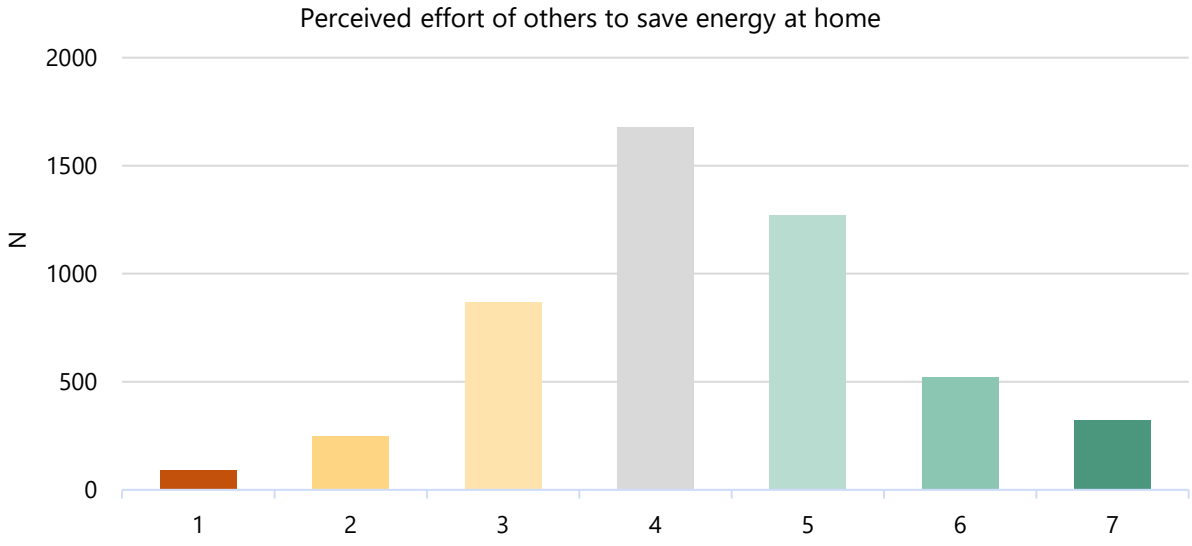
Appendix B – Distributions of psychological variables

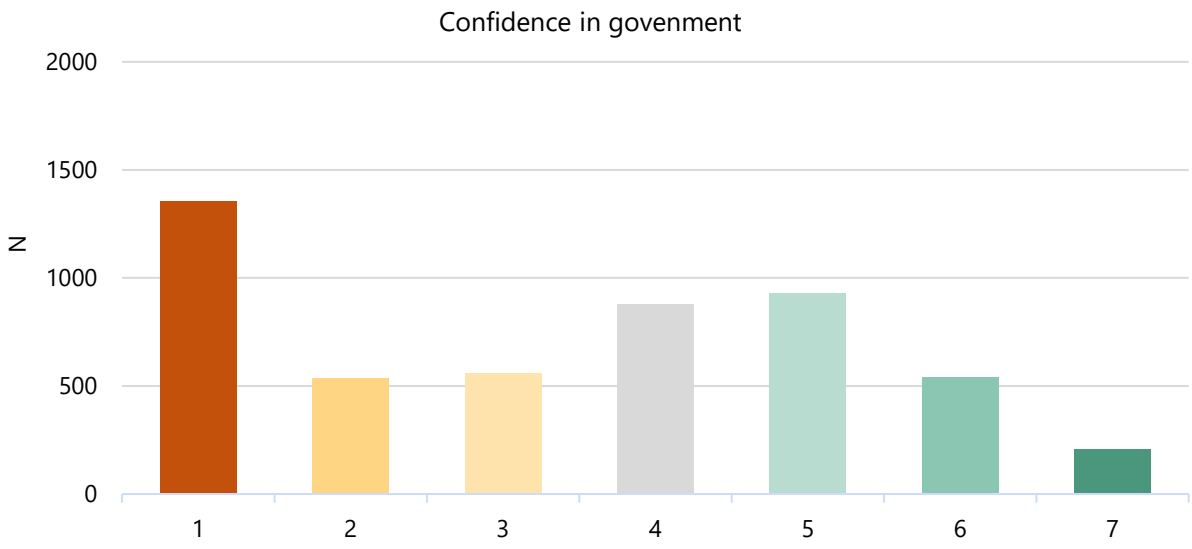





Understanding of how to save energy
N
2000
1500
1000
500
0
1
2
3
4
5
6
7


Perceived effort of others to travel sustainably
N
2000
1500
1000
500
0
1
2
3
4
5
6
7


Perceived effort of others to save energy at home
N
2000
1500
1000
500
0
1
2
3
4
5
6
7


Confidence in govenment
2000
1500
1000
500
0
N
1
2
3
4
5
6
7

Appendix C – Sample characteristics

Individual

Table 1: Sociodemographic characteristics of the sample

		Proportion
Gender	Male	46.9%
	Female	52.9%
	Other	0.2%
Age	18 – 34	23.9%
	35 – 54	42.0%
	55+	34.0%
Region	Leinster	54.6%
	Munster	27.5%
	Connacht/Ulster	17.8%
Social grade	ABC1	49.9%
	C2DEF	50.1%
Education	Degree or above	37.4%
	Below degree	62.6%
Employment	Employed - full time	44.1%
	Employed - part time	15.6%
	Homemaker/carer	10.5%
	Student	2.2%
	Unable to work	4.2%
	Retired	15.9%
	Self-employed	3.7%
	Unemployed	3.9%
Net monthly income	Under €2k	28.9%
	€2k- €4k	39.3%
	€4k+	21.2%
	Unknown	10.6%

Household

Table 2: Household characteristics for the sample.

		Proportion
Living situation	Living alone	14%
	Couple	26%
	Family	55%
	Unrelated/Mix	5%
Under 18s in home	Yes	36%
	No	64%
Over 65s in home	Yes	25%
	No	75%
Person with chronic illness or disability in home	Yes	28%
	No	72%
Dwelling type	Detached house	40%
	Semi-detached/end of terrace house	35%
	Terraced house	14%
	Apartment/flat/bedsit	10%
	Mobile home/caravan/temporary building	0%
Dwelling tenure	Own home outright	34%
	Own home with loan/mortgage	31%
	Renting (private landlord)	18%
	Renting (local authority or housing association)	9%
	Living rent-free (e.g. with parents or friends)	8%

Dwelling

Table 3: Dwelling energy characteristics for the sample.

		Proportion
BER rating	A/B/C	31%
	D/E/F/G/Exempt	12%
	Don't know	58%
Electricity meter type	Standard (24 hour) meter	34%
	Pay as you go	8%
	Day & night (Nightsaver) meter	9%
	Smart meter	42%
	Don't know	6%
Tariff type	Standard	57%
	Pay as you go	8%
	Nightsaver	12%
	Time-of-use	7%
	Don't know	16%
Central heating system	Oil boiler	40%
	Gas boiler	33%
	Electric boiler	4%
	Solid fuel boiler	7%
	Storage heaters	4%
	Heat pump/Geothermal	4%
	Don't know	3%
	No central heating	4%
Thermostat	Yes – smart thermostat (e.g. Nest or similar)	13%
	Yes – other thermostat	31%
	No	50%
	Don't know	6%

Appendix D – Regression model results

For all models, beta coefficients (B) and associated standard errors (SE), odds ratios (OR) and confidence intervals (CI) are reported. Statistical significance is denoted by "." where p<.1; a "*" where p < .05; ** where p < .01; and ***p < .001.

D.1. Short car journeys

Table 1. Models of using a car for journeys of 2 km or less. Models 1-3 include all participants who travelled 2 km or less; model 4 excludes people who did not own a car.

	Model 1				Model 2				Model 3				Model 4			
	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)
Wave [ref=Apr]																
Dec	0.06 (0.18)	1.06	0.74	1.53	0.07 (0.18)	1.07	0.74	1.53	0.05 (0.19)	1.05	0.73	1.51	-0.09 (0.22)	0.91	0.59	1.40
Jan	-0.02 (0.18)	0.98	0.69	1.40	-0.02 (0.18)	0.98	0.69	1.40	-0.02 (0.18)	0.98	0.68	1.40	-0.17 (0.21)	0.84	0.56	1.28
Feb	-0.36* (0.18)	0.70	0.49	0.99	-0.36* (0.18)	0.70	0.49	0.99	-0.37* (0.18)	0.69	0.48	0.98	-0.52* (0.21)	0.60	0.39	0.90
Mar	-0.05 (0.18)	0.95	0.66	1.36	-0.06 (0.18)	0.95	0.66	1.35	-0.06 (0.18)	0.94	0.66	1.34	-0.28 (0.21)	0.75	0.50	1.14
Weekend	0.12 (0.12)	1.13	0.89	1.44	0.12 (0.12)	1.13	0.88	1.44	0.13 (0.12)	1.14	0.89	1.46	0.11 (0.14)	1.11	0.84	1.48
Rain [ref= 0mm]																
1-9mm	0.03 (0.13)	1.03	0.80	1.32	0.03 (0.13)	1.03	0.80	1.32	0.02 (0.13)	1.02	0.80	1.31	-0.09 (0.15)	0.92	0.68	1.22
10mm +	0.3 (0.46)	1.35	0.55	3.38	0.3 (0.46)	1.35	0.55	3.40	0.32 (0.46)	1.38	0.57	3.48	0.4 (0.56)	1.50	0.53	4.94
Male	-0.46*** (0.12)	0.63	0.50	0.79	-0.47*** (0.12)	0.63	0.50	0.78	-0.45*** (0.12)	0.64	0.51	0.80	-0.43** (0.14)	0.65	0.50	0.85
Age [ref= 18 - 34]																
35 - 54	0.7*** (0.15)	2.02	1.50	2.72	0.7*** (0.15)	2.02	1.50	2.72	0.75*** (0.15)	2.12	1.57	2.88	0.66*** (0.18)	1.94	1.36	2.77
55+	0.62*** (0.17)	1.87	1.33	2.62	0.62*** (0.17)	1.87	1.33	2.62	0.7*** (0.18)	2.01	1.42	2.86	0.38. (0.21)	1.46	0.97	2.19
Urban [ref= rural]	-0.54*** (0.13)	0.59	0.46	0.75	-0.54*** (0.13)	0.59	0.46	0.75	-0.55*** (0.13)	0.58	0.45	0.74	-0.33* (0.14)	0.72	0.54	0.95
C2DEF	-0.05 (0.12)	0.95	0.75	1.21	-0.05 (0.12)	0.95	0.75	1.21	-0.06 (0.12)	0.94	0.74	1.20	0.02 (0.14)	1.02	0.78	1.35
Degree	-0.05 (0.13)	0.95	0.74	1.22	-0.06 (0.13)	0.94	0.73	1.21	-0.05 (0.13)	0.95	0.74	1.22	-0.12 (0.15)	0.89	0.67	1.18
Not employed	-0.11 (0.13)	0.89	0.69	1.15	-0.11 (0.13)	0.90	0.70	1.16	-0.08 (0.13)	0.92	0.71	1.19	-0.17 (0.15)	0.84	0.63	1.13
Income [ref= <2k]																
2k - 4k	0.48*** (0.14)	1.62	1.23	2.15	0.48*** (0.14)	1.62	1.22	2.14	0.5*** (0.14)	1.65	1.24	2.18	0.17 (0.17)	1.18	0.85	1.65
4k+	0.69*** (0.18)	2.00	1.40	2.85	0.68*** (0.18)	1.97	1.38	2.82	0.7*** (0.18)	2.02	1.41	2.90	0.25 (0.21)	1.28	0.85	1.94
Living situation [ref= alone]																
Couple	0.03 (0.19)	1.03	0.71	1.49	0.03 (0.19)	1.03	0.71	1.49	0.05 (0.19)	1.05	0.73	1.53	-0.1 (0.22)	0.91	0.59	1.39
Family	0.5** (0.18)	1.64	1.16	2.33	0.5** (0.18)	1.65	1.16	2.34	0.5** (0.18)	1.65	1.16	2.35	0.36. (0.21)	1.43	0.94	2.16
Unrelated/mix	-0.34 (0.28)	0.71	0.41	1.21	-0.34 (0.28)	0.71	0.41	1.22	-0.35 (0.28)	0.70	0.41	1.21	-0.52 (0.32)	0.59	0.31	1.11
Recall RYU campaign					0.1 (0.12)	1.11	0.88	1.40								
Climate worry (hi)									-0.04 (0.12)	0.96	0.76	1.22	-0.02 (0.14)	0.98	0.75	1.29
Energy security worry (hi)									0.04 (0.12)	1.04	0.81	1.33	-0.04 (0.14)	0.96	0.72	1.27
Cost of living worry (hi)									-0.03 (0.13)	0.97	0.75	1.25	0 (0.15)	1.00	0.75	1.35
Understanding (hi)									-0.29* (0.14)	0.75	0.57	0.98	-0.21 (0.16)	0.81	0.59	1.11
Government confidence (hi)									-0.1 (0.13)	0.90	0.71	1.16	-0.1 (0.14)	0.91	0.68	1.21
Others' effort (hi)									-0.12 (0.14)	0.89	0.67	1.17	-0.27. (0.16)	0.76	0.56	1.04
Observations	1,490				1,490				1,490				1,183			

Table 2. Models of using a car for journeys of 5 km or less where public transport was available. Models 1-3 include all participants who travelled 5 km or less; model 4 excludes people who do not own a car.

	Model 1				Model 2				Model 3				Model 4			
	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)
Wave [ref=Apr]																
Dec	0.07 (0.17)	1.07	0.77	1.50	0.07 (0.17)	1.07	0.77	1.50	0.07 (0.17)	1.07	0.76	1.50	0.1 (0.19)	1.11	0.77	1.60
Jan	0.13 (0.17)	1.14	0.82	1.59	0.13 (0.17)	1.14	0.82	1.59	0.13 (0.17)	1.14	0.82	1.59	0.12 (0.18)	1.12	0.79	1.60
Feb	0 (0.16)	1.00	0.72	1.38	0 (0.16)	1.00	0.72	1.38	0 (0.17)	1.00	0.72	1.38	-0.06 (0.18)	0.94	0.66	1.33
Mar	0.02 (0.17)	1.02	0.74	1.42	0.03 (0.17)	1.03	0.74	1.42	0.02 (0.17)	1.02	0.73	1.42	-0.04 (0.18)	0.96	0.68	1.37
Weekend	0.02 (0.12)	1.02	0.81	1.27	0.02 (0.12)	1.02	0.81	1.27	0.02 (0.12)	1.02	0.81	1.28	0 (0.12)	1.00	0.78	1.27
Rain [ref= 0mm]																
1-9mm	-0.02 (0.12)	0.98	0.78	1.24	-0.02 (0.12)	0.98	0.78	1.24	-0.01 (0.12)	0.99	0.78	1.24	-0.06 (0.13)	0.94	0.73	1.20
10mm +	-0.33 (0.45)	0.72	0.28	1.63	-0.33 (0.45)	0.72	0.28	1.63	-0.33 (0.45)	0.72	0.28	1.63	-0.32 (0.46)	0.72	0.27	1.70
Male	-0.15 (0.11)	0.86	0.70	1.06	-0.15 (0.11)	0.86	0.70	1.06	-0.15 (0.11)	0.86	0.70	1.06	-0.03 (0.12)	0.97	0.77	1.21
Age [ref= 18 - 34]																
35 - 54	-0.25. (0.14)	0.78	0.60	1.02	-0.25. (0.14)	0.78	0.60	1.02	-0.23. (0.14)	0.80	0.61	1.04	-0.43** (0.15)	0.65	0.48	0.87
55+	0.09 (0.15)	1.09	0.81	1.46	0.09 (0.15)	1.09	0.81	1.46	0.12 (0.15)	1.13	0.84	1.53	-0.15 (0.17)	0.86	0.62	1.20
Urban [ref= rural]	1.2*** (0.14)	3.31	2.53	4.38	1.2*** (0.14)	3.31	2.53	4.38	1.21*** (0.14)	3.34	2.55	4.42	1.33*** (0.14)	3.80	2.88	5.08
C2DEF	-0.31** (0.11)	0.73	0.58	0.92	-0.31** (0.11)	0.73	0.58	0.91	-0.34** (0.12)	0.71	0.57	0.89	-0.34** (0.12)	0.71	0.56	0.90
Degree	0.19 (0.12)	1.21	0.96	1.52	0.19. (0.12)	1.21	0.96	1.52	0.19 (0.12)	1.21	0.96	1.52	0.15 (0.13)	1.16	0.91	1.48
Not employed	-0.13 (0.12)	0.88	0.69	1.12	-0.13 (0.12)	0.88	0.69	1.11	-0.11 (0.12)	0.90	0.71	1.14	-0.12 (0.13)	0.89	0.68	1.15
Income [ref= <2k]																
2k - 4k	0.05 (0.14)	1.05	0.80	1.38	0.05 (0.14)	1.05	0.80	1.38	0.04 (0.14)	1.05	0.80	1.38	-0.14 (0.15)	0.87	0.65	1.17
4k+	0.29. (0.16)	1.34	0.97	1.85	0.3. (0.16)	1.34	0.98	1.86	0.28. (0.17)	1.32	0.96	1.83	0.07 (0.18)	1.07	0.76	1.52
Living situation [ref= alone]																
Couple	-0.04 (0.19)	0.96	0.67	1.40	-0.04 (0.19)	0.96	0.67	1.40	-0.03 (0.19)	0.97	0.67	1.41	-0.2 (0.2)	0.82	0.56	1.22
Family	0.33. (0.18)	1.39	0.99	1.98	0.33. (0.18)	1.39	0.99	1.98	0.34. (0.18)	1.41	1.00	2.01	0.11 (0.19)	1.12	0.78	1.64
Unrelated/mix	0.29 (0.25)	1.33	0.81	2.17	0.28 (0.25)	1.33	0.81	2.17	0.26 (0.25)	1.29	0.78	2.12	0.26 (0.28)	1.29	0.74	2.24
Recall RYU campaign					-0.02 (0.11)	0.98	0.79	1.22								
Climate worry (hi)									-0.16 (0.11)	0.85	0.68	1.06	-0.12 (0.12)	0.89	0.70	1.12
Energy security worry (hi)									0.12 (0.12)	1.13	0.90	1.41	0.12 (0.12)	1.13	0.89	1.44
Cost of living worry (hi)									-0.17 (0.12)	0.85	0.67	1.07	-0.13 (0.13)	0.88	0.68	1.13
Understanding (hi)									-0.31** (0.12)	0.74	0.58	0.93	-0.31* (0.13)	0.73	0.57	0.94
Government confidence (hi)									-0.01 (0.12)	0.99	0.79	1.24	-0.08 (0.13)	0.92	0.72	1.18
Others' effort (hi)									0.11 (0.13)	1.11	0.85	1.43	0.07 (0.14)	1.07	0.81	1.41
Observations	2,725				2,725				2,725				2,255			

D.2. Inefficient heating behaviour

Table 3: Heating empty rooms or an unoccupied home (given the individual used some form of heating on the reference day).

	Model 1				Model 2				Model 3			
	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)
Weekend	0.07 (0.07)	1.07	0.94	1.22	0.07 (0.07)	1.07	0.94	1.22	0.07 (0.07)	1.07	0.94	1.22
Temperature	-0.03** (0.01)	0.97	0.96	0.99	-0.03** (0.01)	0.97	0.96	0.99	-0.03** (0.01)	0.97	0.96	0.99
Weekend	0.07 (0.07)	1.07	0.94	1.22	0.07 (0.07)	1.07	0.94	1.22	0.07 (0.07)	1.07	0.94	1.22
Rain [ref= 0mm]												
1-9mm	-0.04 (0.07)	0.96	0.84	1.10	-0.05 (0.07)	0.95	0.83	1.10	-0.04 (0.07)	0.96	0.84	1.11
10mm +	-0.43. (0.25)	0.65	0.39	1.04	-0.44. (0.25)	0.64	0.39	1.04	-0.39 (0.25)	0.67	0.41	1.09
Male	-0.02 (0.06)	0.98	0.86	1.11	-0.02 (0.06)	0.98	0.86	1.11	-0.05 (0.07)	0.95	0.83	1.08
Age [ref= 18 - 34]												
35 - 54	-0.06 (0.08)	0.94	0.80	1.11	-0.06 (0.08)	0.95	0.80	1.12	-0.05 (0.09)	0.96	0.81	1.13
55+	-0.04 (0.1)	0.96	0.80	1.16	-0.03 (0.1)	0.97	0.80	1.17	-0.02 (0.1)	0.98	0.81	1.19
Urban [ref= rural]	0.27*** (0.07)	1.32	1.16	1.50	0.27*** (0.07)	1.32	1.16	1.50	0.27*** (0.07)	1.31	1.15	1.49
C2DEF	-0.23** (0.07)	0.80	0.69	0.91	-0.23*** (0.07)	0.79	0.69	0.91	-0.22** (0.07)	0.80	0.70	0.92
Degree	-0.05 (0.07)	0.96	0.83	1.10	-0.03 (0.07)	0.97	0.84	1.12	-0.06 (0.07)	0.95	0.82	1.09
Not employed	-0.15* (0.07)	0.86	0.74	0.99	-0.15* (0.07)	0.86	0.74	0.99	-0.15* (0.07)	0.86	0.74	0.99
Income [ref= <2k]												
2k - 4k	0.1 (0.08)	1.10	0.94	1.30	0.1 (0.08)	1.11	0.94	1.30	0.08 (0.08)	1.08	0.92	1.28
4k+	0.18. (0.1)	1.19	0.98	1.45	0.19. (0.1)	1.21	0.99	1.47	0.13 (0.1)	1.14	0.93	1.39
Living situation [ref= alone]												
Couple	0.1 (0.11)	1.10	0.89	1.37	0.1 (0.11)	1.11	0.89	1.38	0.12 (0.11)	1.13	0.91	1.41
Family	0.04 (0.11)	1.04	0.85	1.29	0.03 (0.11)	1.03	0.84	1.28	0.07 (0.11)	1.08	0.87	1.33
Unrelated/mix	0.27 (0.17)	1.31	0.93	1.84	0.26 (0.17)	1.30	0.92	1.82	0.28 (0.18)	1.33	0.94	1.87
Apartment dweller	-0.65*** (0.12)	0.52	0.41	0.66	-0.65*** (0.12)	0.52	0.41	0.66	-0.65*** (0.12)	0.52	0.41	0.66
Recall RYU campaign					-0.19** (0.07)	0.83	0.72	0.95				
Climate worry (hi)									-0.12. (0.07)	0.89	0.78	1.02
Energy security worry (hi)									-0.06 (0.07)	0.95	0.82	1.09
Cost of living worry (hi)									-0.12 (0.08)	0.89	0.77	1.03
Understanding (hi)									-0.32*** (0.08)	0.73	0.63	0.84
Government confidence (hi)									0.15* (0.07)	1.16	1.01	1.34
Others' effort (hi)									0 (0.07)	1.00	0.88	1.14
Observations	4,333				4,333				4,333			

Table 4: Having a thermostat set at 21˚C or higher (given the individual has a thermostat).

	Model 1				Model 2				Model 3			
	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)
Weekend	-0.05 (0.11)	0.95	0.77	1.18	-0.05 (0.11)	0.95	0.76	1.18	-0.05 (0.11)	0.96	0.77	1.19
Temperature	-0.01 (0.01)	0.99	0.96	1.02	-0.01 (0.02)	0.99	0.96	1.02	-0.01 (0.02)	0.99	0.96	1.02
Weekend	-0.05 (0.11)	0.95	0.77	1.18	-0.05 (0.11)	0.95	0.76	1.18	-0.05 (0.11)	0.96	0.77	1.19
Rain [ref= 0mm]												
1-9mm	0.01 (0.12)	1.01	0.81	1.28	0.01 (0.12)	1.01	0.81	1.28	0.04 (0.12)	1.04	0.83	1.31
10mm +	-0.83. (0.5)	0.44	0.15	1.06	-0.84. (0.5)	0.43	0.14	1.05	-0.77 (0.5)	0.46	0.15	1.13
Male	-0.12 (0.11)	0.88	0.71	1.09	-0.11 (0.11)	0.90	0.72	1.11	-0.12 (0.11)	0.89	0.71	1.10
Age [ref= 18 - 34]												
35 - 54	0.01 (0.14)	1.01	0.76	1.35	0.02 (0.15)	1.02	0.77	1.36	0.06 (0.15)	1.06	0.79	1.41
55+	-0.09 (0.16)	0.91	0.66	1.26	-0.09 (0.16)	0.91	0.66	1.26	-0.04 (0.17)	0.96	0.69	1.34
Urban [ref= rural]	0.27* (0.11)	1.31	1.05	1.63	0.27* (0.11)	1.30	1.05	1.63	0.26* (0.11)	1.30	1.05	1.63
C2DEF	0.16 (0.12)	1.18	0.94	1.47	0.16 (0.12)	1.17	0.93	1.47	0.14 (0.12)	1.15	0.91	1.44
Degree	0.06 (0.12)	1.06	0.84	1.33	0.09 (0.12)	1.09	0.87	1.38	0.07 (0.12)	1.07	0.85	1.35
Not employed	-0.02 (0.13)	0.98	0.76	1.25	-0.02 (0.13)	0.98	0.76	1.25	-0.02 (0.13)	0.98	0.76	1.26
Income [ref= <2k]												
2k - 4k	0.13 (0.14)	1.14	0.87	1.52	0.15 (0.14)	1.16	0.88	1.54	0.12 (0.14)	1.12	0.85	1.49
4k+	0.18 (0.17)	1.19	0.86	1.66	0.2 (0.17)	1.22	0.88	1.71	0.15 (0.17)	1.16	0.83	1.62
Living situation [ref= alone]												
Couple	-0.07 (0.19)	0.93	0.64	1.36	-0.05 (0.19)	0.95	0.66	1.39	-0.06 (0.19)	0.94	0.65	1.38
Family	-0.15 (0.19)	0.86	0.60	1.25	-0.14 (0.19)	0.87	0.60	1.26	-0.13 (0.19)	0.87	0.61	1.27
Unrelated/mix	-0.38 (0.36)	0.68	0.33	1.34	-0.39 (0.36)	0.67	0.32	1.33	-0.41 (0.36)	0.66	0.32	1.30
Apartment dweller		1.31	0.90	1.89	0.27 (0.19)	1.31	0.90	1.88	0.27 (0.19)	1.30	0.90	1.88
Recall RYU campaign					-0.39*** (0.11)	0.68	0.54	0.85				
Climate worry (hi)									-0.21. (0.11)	0.81	0.65	1.01
Energy security worry (hi)									0.09 (0.12)	1.10	0.87	1.39
Cost of living worry (hi)									-0.17 (0.12)	0.85	0.66	1.08
Understanding (hi)									-0.38** (0.13)	0.69	0.53	0.88
Government confidence (hi)									0.02 (0.12)	1.02	0.81	1.29
Others' effort (hi)									0.17 (0.11)	1.18	0.96	1.46
Observations	2,037				2,037				2,037			

D.3. Inefficient hot water use

Table 5: Taking multiple baths/showers, a long shower or full bath (given a participant took a shower or bath on the reference day).

	Model 1				Model 2				Model 3			
	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)
Wave [ref=Apr]												
Dec	0.25 (0.16)	1.29	0.94	1.78	0.25 (0.16)	1.29	0.94	1.78	0.26 (0.17)	1.30	0.94	1.79
Jan	0.15 (0.16)	1.16	0.85	1.59	0.15 (0.16)	1.16	0.85	1.59	0.14 (0.16)	1.15	0.84	1.58
Feb	0.33* (0.15)	1.39	1.02	1.88	0.34* (0.16)	1.40	1.03	1.90	0.33* (0.16)	1.39	1.02	1.89
Mar	0.25 (0.16)	1.28	0.94	1.75	0.25 (0.16)	1.29	0.94	1.76	0.25 (0.16)	1.28	0.93	1.75
Weekend	0.35*** (0.1)	1.41	1.15	1.73	0.35*** (0.1)	1.41	1.15	1.73	0.34** (0.1)	1.41	1.15	1.73
Rain [ref = 0mm]												
1-9mm	0.06 (0.11)	1.06	0.86	1.32	0.06 (0.11)	1.06	0.86	1.32	0.06 (0.11)	1.06	0.86	1.32
10mm +	0.12 (0.37)	1.13	0.52	2.27	0.12 (0.37)	1.13	0.52	2.27	0.17 (0.37)	1.19	0.55	2.39
Male	-0.46*** (0.1)	0.63	0.52	0.77	-0.45*** (0.1)	0.64	0.52	0.77	-0.45*** (0.1)	0.64	0.52	0.78
Age [ref= 18 - 34]												
35 - 54	-0.61*** (0.11)	0.54	0.44	0.68	-0.6*** (0.11)	0.55	0.44	0.68	-0.57*** (0.11)	0.57	0.45	0.70
55+	-1.38*** (0.15)	0.25	0.19	0.34	-1.37*** (0.15)	0.25	0.19	0.34	-1.3*** (0.15)	0.27	0.20	0.37
Urban [ref= rural]	-0.12 (0.1)	0.89	0.73	1.08	-0.12 (0.1)	0.89	0.73	1.08	-0.11 (0.1)	0.90	0.74	1.09
C2DEF	-0.13 (0.11)	0.88	0.71	1.09	-0.14 (0.11)	0.87	0.71	1.08	-0.15 (0.11)	0.86	0.70	1.07
Degree	-0.13 (0.11)	0.87	0.70	1.09	-0.12 (0.11)	0.89	0.71	1.10	-0.11 (0.11)	0.90	0.72	1.12
Not employed	0.1 (0.11)	1.10	0.88	1.38	0.09 (0.11)	1.10	0.88	1.38	0.11 (0.12)	1.12	0.89	1.40
Income [ref= <2k]												
2k - 4k	-0.15 (0.12)	0.86	0.67	1.10	-0.15 (0.13)	0.86	0.68	1.11	-0.14 (0.13)	0.87	0.68	1.12
4k+	-0.1 (0.15)	0.90	0.67	1.21	-0.09 (0.15)	0.91	0.68	1.22	-0.06 (0.15)	0.94	0.70	1.27
Living situation [ref= alone]												
Couple	0.25 (0.2)	1.28	0.87	1.92	0.25 (0.2)	1.28	0.87	1.91	0.24 (0.2)	1.27	0.86	1.90
Family	0.43* (0.19)	1.53	1.08	2.23	0.42* (0.19)	1.52	1.06	2.20	0.41* (0.19)	1.50	1.05	2.19
Unrelated/mix	0.46. (0.27)	1.58	0.93	2.68	0.45. (0.27)	1.56	0.92	2.64	0.41 (0.27)	1.51	0.89	2.57
Recall RYU campaign					-0.19. (0.11)	0.83	0.67	1.02				
Climate worry (hi)									-0.31** (0.1)	0.74	0.60	0.90
Energy security worry (hi)									0.11 (0.11)	1.12	0.90	1.39
Cost of living worry (hi)									0.19 (0.12)	1.21	0.95	1.53
Understanding (hi)									-0.43*** (0.11)	0.65	0.53	0.80
Government confidence (hi)									0.06 (0.11)	1.07	0.85	1.33
Others' effort (hi)									-0.06 (0.1)	0.94	0.77	1.15
Observations	3,135				3,135				3,135			

D.4. Inefficient cooking

Table 6: Using the oven or hob (for over 15 mins) to cook two or fewer portions (given a participant cooked a meal at home the previous day).

	Model 1				Model 2				Model 3			
	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)
Wave [ref=Apr]												
Dec	-0.02 (0.12)	0.98	0.78	1.23	-0.02 (0.12)	0.98	0.78	1.23	0 (0.12)	1.00	0.79	1.26
Jan	-0.05 (0.12)	0.96	0.76	1.20	-0.04 (0.12)	0.96	0.76	1.20	-0.04 (0.12)	0.96	0.77	1.21
Feb	-0.09 (0.11)	0.91	0.73	1.14	-0.09 (0.11)	0.92	0.73	1.15	-0.08 (0.11)	0.93	0.74	1.16
Mar	0 (0.12)	1.00	0.80	1.26	0 (0.12)	1.00	0.80	1.26	0 (0.12)	1.00	0.80	1.26
Weekend	-0.2* (0.08)	0.82	0.70	0.96	-0.2* (0.08)	0.82	0.70	0.96	-0.2* (0.08)	0.82	0.70	0.95
Rain [ref = 0 mm]												
1-9mm	-0.07 (0.08)	0.93	0.79	1.09	-0.07 (0.08)	0.93	0.79	1.09	-0.07 (0.08)	0.93	0.79	1.10
10mm +	-0.23 (0.29)	0.80	0.45	1.39	-0.23 (0.29)	0.80	0.44	1.39	-0.21 (0.29)	0.81	0.45	1.42
Male	0.23** (0.07)	1.26	1.09	1.45	0.23** (0.07)	1.26	1.09	1.46	0.21** (0.07)	1.24	1.07	1.43
Age [ref= 18 - 34]												
35 - 54	-0.66*** (0.1)	0.52	0.43	0.62	-0.66*** (0.1)	0.52	0.43	0.62	-0.65*** (0.1)	0.52	0.43	0.63
55+	-0.46*** (0.1)	0.63	0.51	0.78	-0.46*** (0.1)	0.63	0.52	0.78	-0.43*** (0.11)	0.65	0.53	0.80
Urban [ref= rural]	0 (0.07)	1.00	0.87	1.16	0 (0.07)	1.00	0.87	1.16	0 (0.07)	1.00	0.87	1.16
C2DEF	0.18* (0.08)	1.20	1.03	1.40	0.18* (0.08)	1.20	1.03	1.40	0.18* (0.08)	1.20	1.03	1.41
Degree	-0.12 (0.08)	0.89	0.76	1.05	-0.11 (0.08)	0.89	0.76	1.05	-0.12 (0.08)	0.89	0.75	1.04
Not employed	-0.01 (0.08)	0.99	0.84	1.17	-0.01 (0.08)	0.99	0.84	1.17	0 (0.08)	1.00	0.85	1.17
Income [ref= <2k]												
2k - 4k	-0.12 (0.09)	0.88	0.74	1.06	-0.12 (0.09)	0.89	0.74	1.06	-0.14 (0.09)	0.87	0.73	1.04
4k+	-0.25* (0.12)	0.78	0.62	0.98	-0.25* (0.12)	0.78	0.62	0.98	-0.28* (0.12)	0.75	0.60	0.95
Living situation [ref= alone]												
Couple	0.04 (0.11)	1.04	0.83	1.29	0.04 (0.11)	1.04	0.83	1.29	0.06 (0.11)	1.06	0.85	1.32
Family	-1.21*** (0.11)	0.30	0.24	0.37	-1.21*** (0.11)	0.30	0.24	0.37	-1.19*** (0.11)	0.30	0.24	0.38
Unrelated/mix	-0.35* (0.18)	0.71	0.50	1.00	-0.35* (0.18)	0.70	0.49	0.99	-0.36* (0.18)	0.70	0.49	0.99
Recall RYU campaign					-0.07 (0.08)	0.94	0.80	1.09				
Climate worry (hi)									-0.16* (0.08)	0.85	0.73	0.99
Energy security worry (hi)									-0.08 (0.08)	0.92	0.79	1.08
Cost of living worry (hi)									-0.07 (0.09)	0.93	0.79	1.10
Understanding (hi)									-0.17. (0.09)	0.85	0.72	1.00
Government confidence (hi)									0.04 (0.08)	1.04	0.89	1.21
Others' effort (hi)									-0.01 (0.07)	0.99	0.86	1.15
Observations	4,082				4,082				4,082			

D.5. Inefficient appliance use

Table 7: Using the washing machine not on eco/not full/at 50°C or higher (given a participant used the washing machine at all on the reference day).

	Model 1				Model 2				Model 3			
	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)
Wave [ref=Apr]												
Dec	0.07 (0.16)	1.07	0.79	1.45	0.07 (0.16)	1.07	0.79	1.46	0.07 (0.16)	1.08	0.79	1.46
Jan	0.1 (0.15)	1.11	0.83	1.48	0.11 (0.15)	1.12	0.84	1.49	0.12 (0.15)	1.13	0.84	1.50
Feb	0.08 (0.15)	1.09	0.82	1.44	0.09 (0.15)	1.10	0.82	1.46	0.09 (0.15)	1.10	0.82	1.46
Mar	0.29. (0.15)	1.33	0.99	1.80	0.3. (0.15)	1.35	1.00	1.82	0.31* (0.15)	1.37	1.01	1.85
Weekend	0 (0.1)	1.00	0.82	1.22	0 (0.1)	1.00	0.82	1.23	-0.01 (0.1)	0.99	0.81	1.22
Rain [ref = 0mm]												
1-9mm	-0.02 (0.11)	0.98	0.79	1.21	-0.02 (0.11)	0.98	0.79	1.21	-0.03 (0.11)	0.97	0.79	1.20
10mm +	0.17 (0.37)	1.19	0.59	2.58	0.16 (0.37)	1.17	0.58	2.54	0.16 (0.38)	1.18	0.58	2.56
Male	-0.36*** (0.1)	0.70	0.58	0.84	-0.35*** (0.1)	0.70	0.58	0.85	-0.36*** (0.1)	0.70	0.57	0.84
Age [ref= 18 - 34]												
35 - 54	-0.13 (0.12)	0.88	0.69	1.10	-0.13 (0.12)	0.88	0.70	1.11	-0.11 (0.12)	0.89	0.71	1.13
55+	-0.09 (0.14)	0.91	0.69	1.20	-0.09 (0.14)	0.92	0.70	1.21	-0.03 (0.15)	0.97	0.73	1.28
Urban [ref= rural]	-0.07 (0.1)	0.93	0.77	1.12	-0.06 (0.1)	0.94	0.78	1.13	-0.06 (0.1)	0.94	0.78	1.13
C2DEF	0.11 (0.1)	1.11	0.91	1.36	0.11 (0.1)	1.11	0.91	1.36	0.07 (0.1)	1.07	0.87	1.31
Degree	-0.08 (0.11)	0.92	0.75	1.14	-0.07 (0.11)	0.94	0.76	1.15	-0.06 (0.11)	0.94	0.77	1.16
Not employed	-0.06 (0.11)	0.95	0.77	1.17	-0.06 (0.11)	0.94	0.76	1.17	-0.05 (0.11)	0.95	0.77	1.18
Income [ref= <2k]												
2k - 4k	-0.13 (0.12)	0.88	0.69	1.12	-0.12 (0.12)	0.89	0.70	1.13	-0.15 (0.12)	0.86	0.67	1.09
4k+	-0.14 (0.15)	0.87	0.65	1.16	-0.12 (0.15)	0.89	0.66	1.18	-0.16 (0.15)	0.85	0.64	1.14
Living situation [ref= alone]												
Couple	-0.05 (0.21)	0.95	0.63	1.42	-0.05 (0.21)	0.95	0.63	1.42	-0.04 (0.21)	0.96	0.64	1.44
Family	-0.15 (0.19)	0.86	0.58	1.24	-0.17 (0.19)	0.85	0.57	1.23	-0.14 (0.2)	0.87	0.58	1.26
Unrelated/mix	0.14 (0.31)	1.15	0.64	2.14	0.12 (0.31)	1.13	0.62	2.10	0.08 (0.31)	1.09	0.59	2.02
Recall RYU campaign					-0.19. (0.1)	0.82	0.68	1.00				
Climate worry (hi)									-0.45*** (0.1)	0.64	0.52	0.78
Energy security worry (hi)									0.14 (0.11)	1.15	0.93	1.42
Cost of living worry (hi)									-0.09 (0.12)	0.91	0.73	1.14
Understanding (hi)									-0.21. (0.12)	0.81	0.65	1.02
Government confidence (hi)									-0.03 (0.11)	0.97	0.79	1.19
Others' effort (hi)									0.05 (0.1)	1.05	0.87	1.27
Observations	2,558				2,558				2,558			

Table 8: Using the tumble dryer (given a participant used the washing machine on the reference day).

	Model 1				Model 2				Model 3			
	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)
Wave [ref=Apr]												
Dec	0.11 (0.14)	1.12	0.84	1.49	0.12 (0.14)	1.12	0.85	1.49	0.08 (0.15)	1.08	0.81	1.44
Jan	0.16 (0.14)	1.17	0.90	1.53	0.16 (0.14)	1.17	0.90	1.53	0.15 (0.14)	1.16	0.89	1.51
Feb	0.17 (0.14)	1.18	0.91	1.55	0.17 (0.14)	1.19	0.91	1.55	0.17 (0.14)	1.18	0.90	1.54
Mar	0.08 (0.14)	1.08	0.82	1.42	0.08 (0.14)	1.09	0.83	1.43	0.08 (0.14)	1.08	0.82	1.42
Weekend	0.03 (0.09)	1.03	0.85	1.23	0.03 (0.09)	1.03	0.86	1.24	0.02 (0.09)	1.02	0.85	1.22
Rain [ref = 0mm]												
1-9mm	0.06 (0.1)	1.06	0.88	1.29	0.06 (0.1)	1.06	0.88	1.29	0.05 (0.1)	1.05	0.87	1.27
10mm +	0.43 (0.32)	1.54	0.81	2.91	0.42 (0.32)	1.53	0.81	2.88	0.46 (0.32)	1.58	0.84	3.00
Male	0.24** (0.09)	1.27	1.07	1.52	0.25** (0.09)	1.28	1.08	1.53	0.26** (0.09)	1.29	1.08	1.55
Age [ref= 18 - 34]												
35 - 54	0.02 (0.11)	1.02	0.83	1.25	0.02 (0.11)	1.02	0.83	1.25	0.02 (0.11)	1.02	0.83	1.26
55+	-0.54*** (0.13)	0.58	0.45	0.75	-0.54*** (0.13)	0.58	0.45	0.75	-0.54*** (0.13)	0.58	0.45	0.76
Urban [ref= rural]	-0.22** (0.09)	0.80	0.67	0.95	-0.22* (0.09)	0.80	0.67	0.95	-0.23** (0.09)	0.79	0.67	0.94
C2DEF	-0.07 (0.09)	0.93	0.78	1.12	-0.07 (0.09)	0.93	0.78	1.12	-0.07 (0.1)	0.93	0.77	1.12
Degree	-0.29** (0.1)	0.75	0.62	0.90	-0.28** (0.1)	0.75	0.62	0.91	-0.26** (0.1)	0.77	0.63	0.93
Not employed	0.07 (0.1)	1.08	0.89	1.30	0.07 (0.1)	1.07	0.89	1.30	0.07 (0.1)	1.07	0.88	1.30
Income [ref= <2k]												
2k - 4k	0.04 (0.11)	1.04	0.84	1.30	0.05 (0.11)	1.05	0.85	1.30	0.03 (0.11)	1.03	0.83	1.29
4k+	0.32* (0.13)	1.38	1.06	1.79	0.33* (0.13)	1.40	1.07	1.81	0.34* (0.13)	1.40	1.07	1.82
Living situation [ref= alone]												
Couple	-0.06 (0.19)	0.94	0.65	1.38	-0.06 (0.19)	0.94	0.64	1.38	-0.08 (0.19)	0.92	0.63	1.36
Family	0.19 (0.18)	1.21	0.86	1.73	0.18 (0.18)	1.20	0.85	1.72	0.17 (0.18)	1.19	0.84	1.70
Unrelated/mix	0.11 (0.27)	1.11	0.65	1.89	0.09 (0.27)	1.10	0.64	1.87	0.09 (0.27)	1.09	0.63	1.86
Apartment dweller	-.34* (0.17)	0.72	0.51	0.99	-0.34* (0.17)	0.71	0.51	0.99	-0.36* (0.17)	0.70	0.50	0.97
Recall RYU campaign					-0.14 (0.09)	0.87	0.73	1.05				
Climate worry (hi)									-0.08 (0.09)	0.93	0.77	1.11
Energy security worry (hi)									0.17. (0.1)	1.19	0.98	1.44
Cost of living worry (hi)									0.27* (0.11)	1.31	1.06	1.61
Understanding (hi)									-0.12 (0.1)	0.89	0.73	1.08
Government confidence (hi)									0.1 (0.1)	1.11	0.91	1.34
Others' effort (hi)									-0.21* (0.09)	0.81	0.68	0.97
Observations	2,558				2,558				2,558			

Table 9: Using the dishwasher not on eco/not full (given a participant used the dishwasher at all on the reference day).

	Model 1				Model 2				Model 3			
	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)
Wave [ref=Apr]												
Dec	-0.13 (0.17)	0.87	0.63	1.21	-0.14 (0.17)	0.87	0.63	1.21	-0.12 (0.17)	0.88	0.64	1.23
Jan	0.03 (0.16)	1.03	0.76	1.41	0.03 (0.16)	1.04	0.76	1.41	0.06 (0.16)	1.06	0.78	1.44
Feb	-0.02 (0.16)	0.98	0.72	1.34	-0.01 (0.16)	0.99	0.73	1.35	-0.02 (0.16)	0.98	0.72	1.33
Mar	-0.04 (0.16)	0.96	0.70	1.30	-0.04 (0.16)	0.96	0.71	1.31	-0.03 (0.16)	0.97	0.71	1.32
Weekend	0 (0.11)	1.00	0.81	1.22	-0.01 (0.11)	0.99	0.81	1.22	0 (0.11)	1.00	0.81	1.23
Rain [ref = 0mm]												
1-9mm	0.05 (0.11)	1.05	0.85	1.30	0.05 (0.11)	1.05	0.85	1.30	0.05 (0.11)	1.05	0.84	1.30
10mm +	0.22 (0.37)	1.24	0.60	2.63	0.21 (0.37)	1.24	0.60	2.62	0.21 (0.37)	1.24	0.60	2.63
Male	0.08 (0.1)	1.09	0.89	1.32	0.08 (0.1)	1.09	0.89	1.32	0.08 (0.1)	1.08	0.89	1.32
Age [ref= 18 - 34]												
35 - 54	-0.11 (0.13)	0.90	0.70	1.15	-0.11 (0.13)	0.89	0.70	1.14	-0.08 (0.13)	0.92	0.72	1.18
55+	-0.1 (0.14)	0.90	0.68	1.20	-0.1 (0.14)	0.90	0.68	1.20	-0.02 (0.15)	0.98	0.73	1.31
Urban [ref= rural]	-0.05 (0.1)	0.95	0.78	1.15	-0.05 (0.1)	0.95	0.79	1.16	-0.04 (0.1)	0.96	0.79	1.17
C2DEF	0.12 (0.11)	1.13	0.92	1.39	0.12 (0.11)	1.12	0.91	1.38	0.08 (0.11)	1.08	0.88	1.34
Degree	-0.25* (0.11)	0.78	0.63	0.96	-0.23* (0.11)	0.79	0.64	0.98	-0.24* (0.11)	0.78	0.63	0.97
Not employed	0.02 (0.11)	1.02	0.82	1.27	0.02 (0.11)	1.02	0.82	1.27	0.02 (0.11)	1.02	0.82	1.28
Income [ref= <2k]												
2k - 4k	-0.08 (0.14)	0.92	0.70	1.20	-0.08 (0.14)	0.92	0.71	1.20	-0.08 (0.14)	0.92	0.70	1.20
4k+	-0.26. (0.15)	0.77	0.57	1.05	-0.25 (0.15)	0.78	0.58	1.06	-0.25 (0.16)	0.78	0.58	1.06
Living situation [ref= alone]												
Couple	-0.26 (0.23)	0.77	0.48	1.21	-0.27 (0.23)	0.77	0.48	1.21	-0.28 (0.23)	0.75	0.47	1.19
Family	-0.26 (0.22)	0.77	0.49	1.18	-0.28 (0.22)	0.76	0.49	1.17	-0.29 (0.22)	0.75	0.48	1.16
Unrelated/mix	-0.37 (0.34)	0.69	0.36	1.34	-0.38 (0.34)	0.68	0.35	1.32	-0.42 (0.34)	0.66	0.34	1.28
Recall RYU campaign					-0.16 (0.1)	0.85	0.70	1.04				
Climate worry (hi)									-0.26* (0.11)	0.77	0.62	0.95
Energy security worry (hi)									-0.04 (0.11)	0.96	0.77	1.20
Cost of living worry (hi)									-0.02 (0.12)	0.98	0.78	1.23
Understanding (hi)									-0.16 (0.12)	0.85	0.68	1.07
Government confidence (hi)									-0.11 (0.11)	0.89	0.72	1.11
Others' effort (hi)									0.07 (0.1)	1.07	0.88	1.31
Observations	1,850				1,850				1,850			

D.6. Number of inefficient home energy behaviours

Table 10: Number of inefficient home energy behaviours engaged in in a given day, out of a possible six.

	Model 1				Model 2				Model 3			
	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)	B (SE)	OR	CI (low)	CI (high)
Wave [ref=Apr]												
Dec	0.06 (0.04)	1.06	0.98	1.14	0.05 (0.04)	1.06	0.98	1.14	0.05 (0.04)	1.05	0.98	1.14
Jan	0.14*** (0.04)	1.15	1.06	1.23	0.14*** (0.04)	1.15	1.07	1.24	0.14*** (0.04)	1.14	1.06	1.23
Feb	0.09* (0.04)	1.10	1.02	1.18	0.1* (0.04)	1.10	1.02	1.18	0.09* (0.04)	1.10	1.02	1.18
Mar	0.13*** (0.04)	1.14	1.06	1.23	0.14*** (0.04)	1.15	1.06	1.24	0.13*** (0.04)	1.14	1.06	1.23
Weekend	0.02 (0.03)	1.02	0.97	1.07	0.02 (0.03)	1.02	0.97	1.07	0.01 (0.03)	1.01	0.97	1.07
Rain [ref = 0mm]												
1-9mm	-0.01 (0.03)	0.99	0.94	1.05	-0.01 (0.03)	0.99	0.94	1.05	-0.01 (0.03)	0.99	0.94	1.05
10mm +	-0.02 (0.09)	0.98	0.82	1.17	-0.02 (0.09)	0.98	0.82	1.17	-0.01 (0.09)	0.99	0.83	1.18
Male	-0.07** (0.02)	0.93	0.89	0.97	-0.07** (0.02)	0.93	0.89	0.98	-0.08** (0.02)	0.93	0.88	0.97
Age [ref= 18 - 34]												
35 - 54	-0.06* (0.03)	0.94	0.89	1.00	-0.06. (0.03)	0.94	0.89	1.00	-0.06. (0.03)	0.94	0.89	1.00
55+	-0.17*** (0.04)	0.84	0.78	0.90	-0.17*** (0.04)	0.84	0.78	0.90	-0.17*** (0.04)	0.85	0.79	0.91
Urban [ref= rural]	-0.01 (0.02)	0.99	0.94	1.04	-0.01 (0.02)	0.99	0.94	1.04	-0.01 (0.02)	0.99	0.94	1.04
C2DEF	-0.06* (0.03)	0.94	0.90	0.99	-0.06* (0.03)	0.94	0.90	0.99	-0.06* (0.03)	0.94	0.89	0.99
Degree	-0.08** (0.03)	0.92	0.87	0.97	-0.08** (0.03)	0.93	0.88	0.98	-0.08** (0.03)	0.92	0.88	0.97
Not employed	0.04 (0.03)	1.04	0.99	1.10	0.04 (0.03)	1.04	0.99	1.10	0.05. (0.03)	1.05	0.99	1.10
Income [ref= <2k]												
2k - 4k	0.03 (0.03)	1.03	0.97	1.09	0.03 (0.03)	1.03	0.97	1.09	0.03 (0.03)	1.03	0.97	1.09
4k+	0.07. (0.04)	1.07	1.00	1.15	0.07* (0.04)	1.08	1.00	1.16	0.07. (0.04)	1.07	0.99	1.15
Living situation [ref= alone]												
Couple	0.24*** (0.04)	1.27	1.17	1.39	0.24*** (0.04)	1.27	1.17	1.39	0.24*** (0.04)	1.27	1.17	1.39
Family	0.28*** (0.04)	1.32	1.21	1.43	0.27*** (0.04)	1.31	1.21	1.43	0.28*** (0.04)	1.32	1.22	1.44
Unrelated/mix	0.12. (0.07)	1.13	0.99	1.28	0.12. (0.07)	1.12	0.98	1.28	0.12. (0.07)	1.12	0.99	1.28
Own home	0.01 (0.03)	1.01	0.96	1.07	0.01 (0.03)	1.01	0.96	1.07	0.01 (0.03)	1.01	0.96	1.07
Live in apartment	-0.15*** (0.04)	0.86	0.79	0.94	-0.15*** (0.04)	0.86	0.79	0.94	-0.15*** (0.04)	0.86	0.79	0.94
Recall RYU campaign					-0.07** (0.03)	0.93	0.88	0.98				
Climate worry (hi)									-0.06* (0.03)	0.94	0.89	0.99
Energy security worry (hi)									0 (0.03)	1.00	0.95	1.06
Cost of living worry (hi)									0.02 (0.03)	1.03	0.97	1.08
Understanding (hi)									-0.1*** (0.03)	0.90	0.86	0.95
Government confidence (hi)									0.06* (0.03)	1.06	1.00	1.11
Home effort (hi)									-0.01 (0.02)	0.99	0.94	1.04
Observations	5,000				5,000				5,000			

D.7. Energy deprivation

Table 11: Model of reporting having difficulty paying energy bills (binary outcome, logistic regression).

	B (SE)	OR	CI (low)	CI (high)
Wave [ref=Apr]				
Dec	-0.04 (0.11)	0.96	0.78	1.19
Jan	0.05 (0.11)	1.05	0.85	1.29
Feb	-0.03 (0.11)	0.97	0.79	1.19
Mar	0.23* (0.11)	1.26	1.03	1.56
Male	0.06 (0.07)	1.06	0.92	1.22
Age [ref= 18 - 34]				
35 - 54	-0.3** (0.09)	0.74	0.62	0.89
55+	-0.64*** (0.11)	0.53	0.43	0.65
Urban [ref= rural]	-0.07 (0.07)	0.94	0.82	1.07
C2DEF	0.22** (0.08)	1.24	1.07	1.44
Degree	-0.38*** (0.08)	0.68	0.58	0.80
Not employed	-0.18* (0.08)	0.83	0.71	0.98
Income [ref= <2k]				
2k - 4k	-0.54*** (0.09)	0.58	0.49	0.69
4k+	-1.09*** (0.11)	0.34	0.27	0.42
Living situation [ref= alone]				
Couple	-0.02 (0.12)	0.98	0.78	1.23
Family	0.51*** (0.11)	1.67	1.35	2.06
Unrelated/mix	0.37* (0.17)	1.44	1.03	2.03
Climate worry (hi)	-0.04 (0.07)	0.96	0.83	1.11
Energy security worry (hi)	0.33*** (0.08)	1.39	1.19	1.62
Cost of living worry (hi)	1.27*** (0.09)	3.54	2.98	4.23
Understanding (hi)	-0.46*** (0.09)	0.63	0.53	0.75
Government confidence (hi)	-0.46*** (0.08)	0.63	0.54	0.74
Home effort (hi)	0.05 (0.09)	1.05	0.87	1.26
Observations	4,632			

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