Household acceptability of energy efficiency policies in the European Union: policy characteristics trade-offs and the role of trust in government and environmental identity

Corinne Faure[a], Marie-Charlotte Guetlein[a], Joachim Schleich[a,b,c], Gengyang Tu[d], Lorraine Whitmarsh[e], Colin Whittle[e]

[a] Grenoble Ecole de Management Univ Grenoble Alpes ComUE, 12 rue Pierre Sémard, 38000 Grenoble, France

joachim.schleich@isi.fraunhofer.de

[b] Fraunhofer Institute for Systems and Innovation Research, Breslauer Str. 48, 76139 Karlsruhe, Germany

[c] Virginia Polytechnic Institute & State University, Blacksburg, Virginia, USA

[d] European Centre for Environment and Human Health, University of Exeter, UK

[e] Department of Psychology, The University of Bath, Claverton Down, Bath, BA2 7AY, UK

Abstract

This research investigates the acceptability of energy efficiency policies amongst European households. Based on large-scale surveys in Italy, Poland, Sweden, and the UK, we use a discrete choice experiment to study the trade-offs made by households between various policy characteristics including policy target level, dependence on energy imports, policy instruments (education and information programmes, standards, taxation, energy consumption limit), costs to the household, and distribution of costs between households and other sectors. In particular, we investigate the role of trust in government and of environmental identity on the acceptability of these policy characteristics. Across the four countries, we find that households prefer effective policies, dislike personal costs, and prefer non-coercive to coercive instruments; further, trust in government helps make coercive policies such as taxes more acceptable, whereas higher environmental identity makes consumption limits more acceptable.

Keywords: energy efficiency policies; policy acceptability; policy instruments; choice experiment; trust, environmental identity.

1 Introduction

Improving energy efficiency of buildings and household appliances is one of the key challenges facing developed countries (European Commission, 2019; IEA, 2013; Wang et al., 2019). Through the Energy Efficiency Directive (EED) 2012/27/EU (2012), the European Union (EU) set energy efficiency targets for EU member states. Due to the principle of transposition, EU member states are free to choose how to achieve this target: they can select between different policy targets (for instance, national target levels – that can be more ambitious than the targets set by the EED – but also targets for specific technologies, or sector-specific targets, such as those for industry or residential sector) as well as between different policy instruments (for instance, use of taxes or standards).

To ensure effective implementation of the selected policies, their acceptability by the population is essential (Dietz & Stern, 2008). Indeed, policies that take account of households' perspectives are more likely to be accepted (Stirling, 2006; Wesselink et al., 2011). Recent research has employed household surveys to elicit acceptability of climate change or energy policies (e.g., Alberini et al., 2018a, 2018b; Kitt et al., 2021; Kyselá et al., 2019; Peterson & Feldman, 2018; Rhodes et al., 2017). This research has shown high heterogeneity in levels of acceptability of policy both within and across countries, therefore stressing the necessity to study policy acceptability in multi-country settings and to explicitly consider sources of heterogeneity.

Although recent studies have considered the acceptability of climate change and energy policies, few have focused on the acceptability of policies for energy efficiency. These previous studies compared the acceptability of energy efficiency policies with that of other environmental policies. Alberini et al. (2018b), for instance, found that citizens in Italy and the

Czech Republic prefer policies pushing the development of renewables, rather than those for improving energy efficiency. Likewise, whilst three quarters of German citizens accepted existing policies providing financial support for saving energy in households and industry, there was even higher acceptance of policies for nuclear energy phase-out and expansion of renewable energy (Ziegler, 2019). Considering that energy efficiency is typically seen as the most cost-effective short- to medium-term measure to achieve greenhouse gas (GHG) emissions targets (e.g., IEA, 2019), understanding the factors that could lead to the greater acceptability of policies for energy efficiency is important and relevant to achieving energy efficiency and emission reduction targets.

Previous research on policy acceptability has either used surveys asking households to directly state their valuation of certain policy attributes (e.g., Kitt et al., 2021; Rhodes et al., 2014, 2017; Ziegler, 2019), or it has used discrete choice experiments (DCEs) (e.g., Alberini et al., 2018b; Ščasný et al., 2016). DCEs simulate a market environment by presenting participants with multiple options that vary in terms of their attributes (i.e., characteristics). This means that trade-offs can be investigated, especially between costs that households may be willing to incur and the specific attributes of the policy, making it possible to estimate the participants' willingness-to-pay (WTP) for these attributes. Alberini et al. (2018b) show that the estimates obtained through such a method are numerically consistent with those obtained through other valuation methods. Further, because they allow the attributes of interest and their levels to be systematically manipulated, DCEs are particularly useful for testing the acceptability of new or hypothetical products or policies (e.g., Hanley et al., 2001). Accordingly, in this paper, we use a DCE to assess the acceptability of energy efficiency policy characteristics.[1]

[1] Our focus is on policy "acceptability", that is, on attitudes prior to implementation of a policy. However, in our review of the literature, we also use references using related constructs. We refer to Kyselá et al. (2019) for a thorough discussion of these constructs, especially those focusing on policy acceptance (that is, attitudes after implementation of a policy) and on policy support (implying a more active assessment of policies) (Batel et al., 2013).

Our study has three main contributions. First, it focuses on the acceptability of energy efficiency policy. In addition to energy efficiency targets and costs to households that have often been studied, our study focuses on two little studied policy characteristics: import dependence reduction and distribution of costs between households and other sectors.

Second, our study investigates the acceptability of specific energy efficiency policy instruments. In other policy areas, households have been found to react strongly to the coerciveness of policy instruments (Drews & van den Bergh, 2015; Eriksson et al., 2008). In this study, we assess preferences for four policy instruments from least to most coercive: education and information programmes, energy efficiency standards, taxes, and energy consumption limits. We are, to our knowledge, the first to investigate household reaction to per capita energy consumption limits, which would be one possible policy instrument considered in order to achieve energy sufficiency (Steinberger & Roberts, 2010).

Third, our study explores sources of heterogeneity in household preferences for specific policy characteristics. We account for heterogeneity in two major ways. First, we conduct our study in four European countries (Italy, Poland, Sweden, and the United Kingdom (UK)), therefore allowing to observe inter-country heterogeneity. There are a limited number of studies that have measured and compared policy acceptability in more than one country. In all four countries, we use the same DCE, with large-scale samples to enable meaningful comparison of the results across countries. Second, we investigate the role of specific attitudinal and value factors that can cause within-country heterogeneity in preferences for policy characteristics.

Our methodology involves first estimating standard mixed logit models to assess the preferences and WTP for specific policy characteristics for the average participant. Second, to analyse the effects of attitudinal and value factors on individual preferences for these policy characteristics, we also estimate mixed logit models with interaction terms between policy characteristics and trust in government and environmental identity.

The remainder of this paper is organized as follows. Section 2 describes the choice experiment, followed by the survey, whilst providing the background literature which informed their design and the hypotheses. Section 3 presents the methodology used to analyse the choice experiments. Section 4 presents the results. Section 5 discusses the results in light of the literature and concludes.

2 Policy attributes and individual characteristics affecting policy acceptability

This section is organized in two separate sections, the first focusing on the policy attributes included in the choice experiment, the second on the role of trust in government and environmental identity on the acceptability of specific policy characteristics.

2.1 Policy attributes

DCEs typically include attributes relating to both benefits and costs to allow for trade-offs to be made, and DCEs on policy acceptability often focus on various policy instruments from which policy-makers can choose. In our DCE, we include, as benefits, energy efficiency targets and also a rarely studied policy objective, dependence on energy imports. As costs, we not only include additional expenses for the household, but also a novel cost attribute, the share of total costs paid by households (compared to other sectors). We also investigate acceptability of four policy instruments that are particularly relevant in the energy efficiency context: information policies, taxes, standards, and consumption limits (this instrument in particular has, to the best of our knowledge, never been studied before in such a setting). Importantly, the study is clearly designed to study acceptability of energy efficiency policies at the national level, and therefore not on how policies affect a particular household's energy use.

2.1.1 Target levels and reduction of import dependence

The EED is designed to achieve two main objectives: first and foremost of these is achieving energy efficiency targets. The original EED of 2012 required EU member states to reduce energy use by 20% by 2020 compared to the projected use of final energy. This target was subsequently increased to 32.5% by 2030 (EED amendment 2018/2002/EU)). To help meet the new EU GHG emission reduction target of 55% by 2030 compared to 1990 emission levels, the 'Fit for 55' package recently proposed by the European Commission (COM(2021) 550 final) requires member states to reduce energy consumption by 9% more than envisaged by the EED amended in 2018.

Furthermore, member states are free to set more ambitious targets. Since these targets are expressed as percentage in the EED, we used the same formulation for the operationalization of this policy attribute in the DCE. We therefore manipulated the target levels for national energy consumption reduction, ranging from the lowest percentage reduction agreed upon in the 2012 EED for 2020 (20%) to a 40% reduction by 2030. The upper limit is consistent with the efficiency target implied by the 'Fit for 55' package.

A secondary objective of the 2012 EED was to achieve a reduction in the member states' dependence on energy imports, as illustrated by the first sentence in the Directive's text: "The Union is facing unprecedented challenges resulting from increased dependence on energy imports". Statistics show that energy import dependence is at approximately 50% for the entire EU, but with large variations across countries. Among the countries included in our survey, Italy appeared particularly dependent (energy dependence rates close to 80%), whereas Sweden, Poland, and the United Kingdom exhibited lower rates of dependence (between 20 and 30%) (Eurostat, 2018b). Still, all countries are striving to reduce these rates through their energy efficiency policies and recent attention to the issue of energy resilience (Gatto & Drago, 2020; He et al., 2015) underlines the importance of energy import dependence in national

policy-making. In our DCE, we chose to express these reductions as percentages compared to the current state of energy import dependence. The levels were chosen to reflect a wide range of import dependence reduction, ranging from a 5% to a 50% reduction.

Findings from both choice experiments and surveys consistently show that the perceived effectiveness of a specific policy is positively related to its acceptability (e.g., Bostrom et al., 2012; Kim et al., 2013; Schwirplies et al., 2019). Individuals are also more accepting of a policy when they perceive it as having positive outcomes and direct benefits for themselves (e.g. reduced traffic congestion; Furst & Dieplinger, 2014, Schuitema et al., 2020). Choice experiments show that household policy acceptability is higher if the policy generates more environmental benefits, such as reductions in GHG emissions (Alberini et al., 2018a, 2018b; Gracia et al., 2012; Hackbarth & Madlener, 2016; Murakami et al., 2015) or reductions in air pollution (Dietz & Atkinson, 2010).

Based on this literature, we expect that households will prefer more effective policies and therefore, show greater acceptability of policies with more ambitious absolute energy efficiency targets (H1) as well as more ambitious reduction of country's dependence on energy imports (H2).

2.1.2 Policy instruments

As recently reviewed by Kyselá et al. (2019), a wide range of studies focus on the acceptability of specific policy instruments. Because EU member states can choose which policy instruments to put in place to achieve their objectives, it is particularly important for them to find out which instruments are more acceptable. The most studied instruments have been information policies and taxes (e.g., Alberini et al., 2018a, 2018b; Rhodes et al., 2017), which we also included in our DCE. Further, in the context of energy efficiency, two other instruments directed at households appear particularly relevant and have not been systematically studied in the past: standards and consumption limits.

Education and information programmes. Among the energy efficiency policies designed to provide information to households, the introduction of the mandatory EU Energy Label for household appliances and lighting (Directive 92/75/EC, 1992) and of the Energy Performance Certificates (EPC) for buildings (Directive 2010/31/EU, 2010) meant that consumers are provided with energy consumption and performance information for each product or building. Further, smart metering allows providing households with timely feedback on their energy consumption. Because there is a wide range of information programs, in the DCE, we describe information policy in a generic manner as "education and information programmes on energy-saving measures".

Standards. Policies seeking to regulate energy performance include the EU's Ecodesign Directive (Directive 2009/125/EC, 2009), which uses minimum energy performance standards (MEPs) to remove the least energy efficient product or component from the market. Similarly, the Energy Performance of Buildings Directive mandates member states to set minimum energy performance standards for new buildings, major renovations and the replacement or retrofit of building elements (Directive 2010/31/EU, 2010). Such policies imply that the range of products and buildings that consumers may choose from become increasingly energy efficient, meaning that gains in energy efficiency are made with limited consumer engagement. In the DCE, we describe standards in a generic manner as "stricter minimum energy efficiency standards for buildings and appliances".

Taxes. Taxes such as electricity or fuel taxes increase the costs of electricity or fuel usage and are a frequent instrument for energy efficiency policy-making. Taxes as an instrument have often been included in DCEs on climate policy acceptability (typically CO_2 taxes), and have generally been found to be disliked (e.g., Alberini et al., 2018b; Ščasný et al., 2016). Lundhede et al. (2015) specifically investigated acceptance of payment of policy through taxes and found that greater tax levels were negatively associated with choice of conservation policy. In our

DCE, this attribute is described as “an additional tax on energy (for instance, for electricity, gas, oil, coal)”.

Consumption limits. Recent literature proposes that energy efficiency alone is not enough to achieve energy reduction targets and that policy should also encourage energy sufficiency, that is, consuming the energy services that are needed rather than those that are wanted (Darby & Fawcett, 2018; Spangenberg & Lorek, 2019; Steinberger & Roberts, 2010). Among the ideas advanced, energy sufficiency could imply that energy consumption limits are imposed on households (Spangenberg & Lorek, 2019). So far, the acceptability of such policies has not been investigated. In our DCE, this attribute level was presented as “a limit on energy consumption per person”.

Overall, the DCE included four policy instruments: education and information programmes, standards, taxes, and consumption limits. Previous literature shows that households react strongly to the coerciveness of policy instruments, preferring non-coercive instruments such as information policies to coercive ones, such as taxes (Drews & van den Bergh, 2015; Eriksson et al., 2008). For instance, a policy can be considered coercive if it targets behaviours that are perceived as being particularly difficult to change (e.g., car use; Schuitema et al., 2010), if it is perceived as infringing on personal freedom (Attari et al., 2009; Kim et al., 2013), or if it could have a large, direct effect on the individual (e.g. CO_2 taxes and high-frequency car users; Hammar & Jagers, 2007). Among the policy instruments studied, education and information programmes are not coercive; standards are slightly more coercive because they reduce choice; however, because they are not perceived to be as personal, they are likely to be seen as less coercive than taxes. Indeed, Alberini et al. (2018b) find that respondents in Italy and the Czech Republic treat information policies and standards the same way (in contrast to taxes). Finally, consumption limits are expected to be perceived as the most coercive types of policy instrument, since they fulfil all three criteria (difficult to change behaviour, infringing on

personal freedom, and having a large direct effect on the individual). We therefore expect that households will prefer, in order, information policies followed by standards, taxes, and finally consumption limits (H3).

2.1.3 Absolute costs and share of total costs paid by households

To compute WTP for the various policy characteristics, the costs of the policy to households must be included in the experiment, since they enable the translation of trade-offs made between different policy characteristics into monetary terms. In our DCE, costs were described as "additional expenses to your household compared to the current policy"[2] and ranged from 0 (for the current policy) to 300 euros per year. The range of costs was chosen based on calculations derived from National Energy Efficiency Action Plans and are similar to those used by Alberini et al. (2018a, 2018b).

There is consistent evidence that policy acceptability is negatively influenced by perceptions of the perceived or actual personal costs of a policy (e.g. , Bechtel & Scheve, 2013; Kyselá et al., 2019; Shwom et al., 2010). For instance, cost of policies to reduce GHG emissions was negatively associated with policy choice in the UK, Czech Republic and Poland (Ščasný et al., 2016), whilst cost of a climate change mitigation project was negatively associated with selection in Scotland (Glenk & Colombo, 2013). Overall, we therefore expect that households will prefer the less costly policies over the more costly ones (H4).

Besides the absolute level of costs, the EED explicitly leaves it open for member states to decide on the allocation of costs between households and other sectors. Member states are therefore free to choose where to put the emphasis between households and other sectors to achieve their

[2] Compared to taxes, which imply direct costs to households, policy instruments such as information, standards, or consumption limits do not lead to direct costs to households. However, governments implementing such policies will also incur costs and distribute these costs to households and industry within the country. We carefully formulated our DCE framing to ensure that respondents would understand that these costs (and also energy savings achieved) were costs due to the national policy, not costs incurred by the households to implement the policy themselves. From the perspective of a participating household, whether these costs are direct or indirect probably matters less than the actual annual sums involved. Nevertheless, costs to households may have been more difficult to understand and less realistic for some policy instruments.

targets. Where this emphasis is placed, however, may affect perceptions of fairness. This is critical as within the literature, fairness—especially distributive fairness—has been found to be positively related to policy acceptability (e.g., Kim et al., 2013). Generally, an accountability principle (those who are most responsible pay the most) is preferred when deciding who should bear the burden of emission reductions (see also Bechtel & Scheve, 2013; Cai et al., 2010; Schleich et al., 2016). Further, households may prefer rules that are self-serving (that is, implying lowest costs for themselves): Carlsson et al. (2013) find that citizens from China and the USA both prefer the rule that implies the lowest costs for their own country.

In the current experiment, we inform respondents that households are responsible for about 40% of total energy use. We then propose several allocation rules for sharing costs of energy efficiency policy between households and other sectors (industry, agriculture, private and public services), ranging from 30 to 60% paid by households. We expect that households will prefer policies that entail them paying less than or the same amount as what they are responsible for consuming, rather than policies where the share paid by households is higher than the share they are responsible for consuming (H5).

2.2 Individual characteristics affecting the acceptability of policy characteristics

Previous studies have found high levels of heterogeneity in household preferences for policies (Alberini et al., 2018a, 2018b; Ščasný et al., 2016). This heterogeneity can be partly explained by individual characteristics, including attitudes and values as well as socio-demographic characteristics. For instance, Rhodes et al. (2014) found that giving individuals information about a range of climate and energy efficiency policies had little effect on their acceptability, which was more a product of values, such as trust in non-governmental organizations or beliefs on climate change. Building on this work, we investigate the effects of trust and environmental identity on preferences for specific policy characteristics.

2.2.1 Trust in government

The influence of trust on policy acceptability has been frequently explored, especially trust in the government. Trust towards the government has been associated with greater acceptability for a carbon tax policy (Rhodes et al., 2017). Relatedly, Adaman et al. (2011) showed that trust in the institution responsible for the implementation of a policy had a strong, positive effect on WTP. However, Dietz et al., (2007) found that, while trust in environmentalists had a positive effect (and trust in industry a negative effect) on the acceptability of climate change mitigation policies, trust in government agencies (such as the U.S. Department of Energy) did not have a statistically significant effect on climate policy acceptability.

There is evidence that trust in one's government affects policy acceptability by changing the perceived effectiveness of the proposed policies (Kim et al., 2013). It is argued that those with higher trust in the government may have a stronger belief that the policy will be successfully enacted by the government and so they are more accepting of it (Kyselá et al., 2019). We therefore hypothesize that trust in government will increase the acceptability of the more effective policies, that is, those with the higher energy consumption reduction targets (H6). Further, trust in government has been shown to decrease perceived infringement on freedom stemming from coercive policies (Kim et al., 2013). We therefore propose that trust in government will increase the acceptability of the more coercive policies (per capita limit on consumption, taxes) relative to less coercive policies (information, standards) (H7).

2.2.2 Environmental identity

While the influence of environmental beliefs, values, and identity on everyday environmentally-impactful activities (e.g., energy consumption) is typically weak (due to competing motivations and contextual barriers), these factors exert a stronger influence on environmental policy acceptability (Steg & Vlek, 2009; Stern, 2000). For example, pro-environmental beliefs were found to have an indirect effect (via an awareness of climate change

consequences) on acceptability of policies to reduce fossil fuel burning (Dietz et al., 2007); they were also found to have an indirect effect (via perceived effectiveness and trust) on acceptability of transport policies (Eriksson et al., 2008). Values and beliefs are core components of one's self-identity (Gatersleben et al., 2014) and individuals are motivated to act in accordance with their identity (Breakwell, 2015). Indeed, environmental identity has been found to be a distinct and stronger predictor of pro-environmental behaviours than values (Whitmarsh & O'Neill, 2010). As such, we propose that environmental identity will increase the acceptability of the more effective policies, that is, those with the higher energy consumption reduction targets (H8). Environmental concerns have also been found to reduce opposition to coercive policies, such as congestion charging (Eliasson & Jonsson, 2011) and increased taxes on fossil fuels (Eriksson et al., 2008). This suggests that individuals with stronger environmental identity will have more positive attitudes towards coercive policies than those with weaker environmental identity. As such, we hypothesize that environmental identity will increase the acceptability of the more coercive policies (taxes, per capita limit on consumption) relative to less coercive policies (information, standards) (H9).

3 Methods

3.1 Data collection

Data were collected in July and August 2018 through an online household survey in Italy, Poland, Sweden, and the UK. These countries reflect differing levels of trust in government (ESS, 2016), energy import dependence (Eurostat, 2018b), and levels of income. Respondents were members of an online household survey panel provided by NORSTAT; they received a remuneration fee through NORSTAT for completing the survey. Although we were aiming to collect responses from about 1,000 respondents in each country, a programming mistake in the survey for the UK led to a useable sample of only 340 respondents in that country. In each

country, participants were selected among the adult population of 18 to 65-year-olds via quota sampling on the criteria of gender, age, income, and regional population dispersion. The quota categories were provided by the market research institute. Due to difficulties obtaining certain profiles, the income quota had to be loosened at the end of data collection in some countries.

Table 1 reports the descriptive statistics of the samples across the four countries. This table makes it clear that the quotas were well respected for age and gender across all four countries, and for income in the UK. However, the samples exhibit higher income than expected in Italy, Poland, and Sweden[3]. Further, even though education was not used for quota sampling, it can be noted that the samples in all four countries were more highly educated than the population.

Table 1. Sample descriptive statistics.

	Median age		Share of males		Median income (local currency)		Share with higher education degree	
	Sample	Population	Sample	Population	Sample	Population	Sample	Population
IT	43	46	0.52	0.5	29300 €	20128 €	0.41	0.18
PL	41	41	0.5	0.5	54300 ZL	37374 ZL	0.61	0.28
SE	42	41	0.53	0.51	381800 SEK	324011 SEK	0.46	0.39
UK	42	40	0.5	0.5	18100 £	21096 £	0.56	0.41

Note: The population median age is based on the entire population. Source: Eurostat (2018b). The shares of males and of inhabitants with higher education degree are based on the population between 15 and 64 years. Source: Eurostat (2018b). Median income is based on the population between 18 and 65 years. Source: OECD (2018). Sample characteristics are all based on samples between 18 and 65 years.

After collecting initial information required for quota sampling, the survey continued with the DCE and finished with questions on individual and household characteristics, including trust in government and environmental identity.

[3] Note that this might be partly due to the fact that the income variable used to calculate median income in the samples had many missing values in Italy, Poland, and Sweden. It is possible that many low income respondents declined to report their income.

3.2 Discrete choice experiment

Our DCE operationalised key theoretical variables of energy efficiency policy effectiveness, coerciveness, and costs via five attributes, each with several attribute levels (see Table 2). The text used to explain the DCE task and present the different attributes is provided in Appendix A. Great care was taken to use understandable vocabulary and to ensure that respondents understood that they were asked about national-level policies. Attribute levels were chosen to reflect existing or realistic policies and provide a large enough range of options. Both attributes and attribute levels were chosen after exchanges with members of the project team and especially with energy efficiency experts at Fraunhofer Institute for Systems and Innovation research and from the Technical University in Vienna. Before we carried out an empirical pre-test with 50 households from the UK, the DCE was first checked thoroughly by these same experts, which led to some adjustments in wording.

Each participant was shown six choice cards[4] and asked to choose between three options: one of two new policies (A or B) or the current policy. The current policy was de facto the status quo (or opt-out) option in the choice experiment. The attribute levels for the status quo option were the same across all choice tasks and chosen to be similar to energy efficiency policies already in place in the European Union. Specifically, the following levels were retained for the status quo option: lowest possible targets for energy consumption reduction and import dependence reduction, i.e. 20% and 5%, respectively (consistent with the 20% energy efficiency targets for 2020 and no specific targets for import dependence reduction set in the 2012 EED); no additional cost (since all other policies were described as incurring additional costs compared to the current policy); and a neutral distribution of costs reflecting the proportion of

[4] We did not exclude any combinations of attribute levels in the experimental design. Because we focused on aggregate-level policies, costs to households could be incurred indirectly through implementation of policy (for instance, implementation of costly monitoring for consumption limit policy). Further, even though one could imagine some improvements in energy efficiency pertaining to electricity use that would hardly affect energy imports, we do acknowledge a possible interdependency between energy consumption targets and energy import dependence that was not accounted for in the design.

energy consumption stemming from households (40%) compared to other sectors. Standards were retained as policy instrument in the status quo option because they were found to be used in all four countries and also are perceived by households as relatively neutral as far as coerciveness. Figure 1 shows an example of a choice task, including the attribute levels taken by the status quo option.

Table 2. Attributes and attribute levels for the energy efficiency policies.

Attributes	Attribute levels	Number of levels
Reduction in energy consumption by 2030	Policies reduce energy consumption in COUNTRY by 20, 25, 30 or 40 percent, compared to having no energy efficiency policy in place	4
Dependence on energy imports	Policies seek to reduce COUNTRY's energy imports by 5, 10, 30 or 50 percent, compared to having no energy efficiency policy in place	4
Share of total costs paid by households	Total costs to reach the energy consumption target by 2030 are shared between households and other sectors (industry, agriculture, private and public services). The share paid by households is 30, 40, 50, or 60 percent. Currently, households consume about 40 percent of total energy.	4
Main policy measure	The reduction in energy consumption by households is mainly achieved through one of the following policy measures: - Education and information programmes on energy-saving measures. - An additional tax on energy (e.g., for electricity, gas, oil, coal). - A limit on energy consumption per person. - Stricter minimum energy efficiency standards for buildings and appliances.	4
Additional annual costs	Over the next 10 years, Policies A and B will cause additional expenses for your household compared to the current policy. Additional expenses will be 25€, 50€, 100€, 150€, 200€, or 300€ per year	6

Figure 1. Example of a choice card in the UK.

Scenario 1

Which of these policies do you prefer?

	Policy A	Policy B	Current policy
Energy consumption by 2030	25% less	40% less	20% less
Dependence on energy imports	50% less	10% less	5% less
Main policy measure	Education and information programmes	Stricter minimum energy efficiency standards for buildings and appliances	Stricter minimum energy efficiency standards for buildings and appliances
Share of total costs paid by households	50%	40%	40%
Additional annual costs	£50	£200	£0
	Policy A	Policy B	Current policy
I prefer:	○	○	○

To reduce the large number of possible treatment combinations and increase the efficiency of the DCE design, we applied a Bayesian efficient design (Sándor & Wedel, 2001) using the NGENE software (ChoiceMetrics, 2014). Instead of employing fixed prior probabilities (priors) for each attribute, Bayesian efficient designs use random priors that follow a specified distribution. They thus rely less on accurate parameter estimates and are more stable than non-Bayesian efficient designs. In our case, the mean values for priors for all attributes were obtained from a pilot study with 50 UK respondents and we assumed all priors to follow a normal distribution. The final DCE consisted of 12 choice sets divided into 2 blocks, with respondents assigned randomly to one of the blocks.

Since the survey was conducted in countries with different currencies, the monetary amounts used in the DCEs were adjusted to keep the relative value similar between countries in terms of purchasing power; amounts were rounded up to limit respondents' cognitive load. The following rates were applied: Poland: 1€ = 3 PLN; Sweden: 1€ = 10 SEK; UK: 1€ = 1£.

3.3 Measures of household characteristics

Attitudinal and demographic variables were included in the household survey, along with the choice experiment. Measures used for the analyses were trust in government, environmental identity, and income.

3.3.1 Trust in government

Trust in government was measured using a 3-item scale adapted from Kettle & Dow (2016) and Kim et al. (2013) with the following items: *The government takes into account many perspectives when making a decision about policies to lower energy consumption*; *The government provides all of the available information to the public when making a decision about policies to lower energy consumption*; and *In general, I trust the government*. The items were administered on a 5-point scale anchored by *strongly disagree* (1) and *strongly agree* (5).

The scale exhibited good to satisfactory reliability with Cronbach's alpha values of 0.82 in Italy, 0.81 in Poland, 0.67 in Sweden, and 0.84 in the UK. After adding the responses to the three items[5], a dummy variable (*hightrust*) was created that took on the value 1 if respondents were above the median in their country and 0 otherwise.

3.3.2 Environmental identity

While environmental beliefs and values are often measured by the New Environmental Paradigm (Dunlap et al., 2000), a more parsimonious measure of environmental identity has been shown to be positively related to policy acceptability for a range of environmental measures and policies (e.g., Whitmarsh & O'Neill, 2010) and was used in this study. Environmental identity was measured using a four-item scale (Whitmarsh & O'Neill, 2010): *To save energy is an important part of who I am; I think of myself as an energy conscious person*;

[5] Treating the Likert scales as interval data, the mean values on the aggregated 15-point scales were of 8.2 in Italy and Sweden, 8.4 in the UK, and 7.1 in Poland, therefore showing relatively neutral trust in government across all four countries.

I think of myself as someone who is very concerned with environmental issues; and *Being environmentally friendly is an important part of who I am*. Again, response options ranged from strongly disagree (1) to strongly agree (5).

The scale exhibited very satisfactory reliability across the four countries, with Cronbach's alpha of 0.90 in Italy, 0.88 in Poland, 0.88 in Sweden, and 0.92 in the UK. After adding the responses to these four items[6], a dummy variable (*highgreenID*) was created that took on the value 1 if respondents were above the median in their country and 0 otherwise.

3.3.3 Income

Household income was measured in three categories in the screening questions (low, medium, and high income), using income levels provided by the market research agency for each country. In the analyses, income was captured by two dummy variables (*lowinc* and *highinc*) that took on the value 1 if reported household income was in the lowest and highest income category, respectively. We also included a more detailed measure of income later in the survey, which we used for robustness checks (see footnote 8 for details).

3.4 Models and analyses

The analysis involves two models. First, we estimated a standard mixed logit model to analyse the preferences for specific policy characteristics for the average participant in each country. The results of this model are also used to calculate the WTP for these policy characteristics for the average participant. Second, to analyse the effects of attitudinal and value factors on individual preference for these policy characteristics, we estimated a mixed logit model with interaction terms, interacting policy characteristics with trust in government, environmental identity, and income.

6 Treating the Likert scales as interval data, the mean values on the aggregated 20-point scale ranged from 13.4 in Sweden to 16.0 in Italy, with values of 14.1 in the UK and 14.3 in Poland. Environmental identity was therefore relatively high across the four countries.

3.4.1 Standard mixed logit analyses

In contrast to conditional logit models, mixed logit models do not rely on the so-called Independence of Irrelevant Alternatives (IIA) assumption because they allow for unobserved heterogeneity of individual preferences (Revelt & Train, 1998). Thus, coefficients may vary across individuals. In a given sample, a total of N respondents is assumed to face T choice situations with a choice set of J alternatives. The (latent) utility for respondent n choosing alternative j in the choice set in choice situation t may be expressed as:

$$U_{njt} = \beta_n X_{njt} + \varepsilon_{njt}, \qquad n = 1, \dots, N, \quad j = 1,2,3 \quad t = 1, \dots, T \tag{1}$$

where X_{njt} is the observed attributes vector of policies in our choice experiment and β_n is a vector of individual-specific parameters associated with each attribute. The parameter β_n varies among respondents according to a distribution with a density$f(\beta|\theta)$, where θ is a vector of parameters of the distribution (Train, 2003). The price parameter is treated as a fixed parameter and all other parameters are assumed to be normally distributed random parameters. The unobserved error term ε_{njt} is assumed to be Gumbel-distributed. In our DCE, participants faced 6 choice situations, i.e., T=6. Each situation involved three alternatives, i.e., J=3. The conditional probability of observing a sequence of choices made by respondent n is given by:

$$\mathrm{P}_n(\beta_n) = \prod_{t=1}^{T} \frac{\exp(\beta_n X_{nit})}{\sum_{j=1}^{J} \exp\left(\beta_n X_{njt}\right)} \tag{2}$$

Since β_n is unknown, the unconditional probability of the observed sequence of choices is the conditional probability integrated over the distribution of β:

$$\Lambda_n(\theta) = \int P_n(\beta_n) f(\beta|\theta) d\beta \tag{3}$$

The log likelihood function is given by:

$$LL(\theta) = \sum_{n=1}^{N} \ln \Lambda_n(\theta) \tag{4}$$

Following Train (2003), the simulated log likelihood is approximated through simulation. Consistent with accepted standards, we used 500 Halton draws for all estimations, and allowed correlation among random parameters (Hensher & Greene, 2003; Hess & Train, 2017). The marginal WTP for an attribute x is then calculated as.

$$\widehat{WTP_x} = -\frac{\hat{\beta}_x}{\hat{\beta}_p} \tag{5}$$

where $\hat{\beta}_x$ is the estimated random parameter associated with attribute x, and $\hat{\beta}_p$ is the estimated price parameter.

3.4.2 Mixed logit analyses with interaction terms

In these models we include vectors of interaction terms between the policy characteristics and the dummies reflecting high trust in the government (*hightrust*) and high environmental identity (*highgreenID*). To control for effects of other individual characteristics, we also include interaction terms between the policy characteristics and the dummies reflecting high and low income levels (*highinc* and *lowinc*). The estimated parameters of all interaction terms are specified as fixed parameters.

4 Results

4.1 Standard mixed logit model

Table 3 reports the estimates for the parameters in equation (1). Standard errors appear in parentheses below the parameter estimates. The corelation matrix associated with this table is provided in Table B1 in Appendix B; we note that for all countries, all correlations except one are statistically significant suggesting that preferences for the attributes included in our DCE

are correlated. Further, the values suggest that these correlations are typically high (i.e. above 0.5). Allowing the parameters to be correlated therefore improves the efficiency of our estimations.

The upper part of Table 3 depicts the mean values of the parameter estimates, the lower part their estimated standard deviations. The variable *cost* denotes additional annual expenses for households compared to the current policy, *statusquo* is a dummy variable for current policy. The variables *target, share* and *import* denote the first three attributes listed in Table 2. Dummy variables are used to represent the attribute levels for policy instruments: *p_tax* for an additional tax on energy, *p_edu* for education and information programmes on energy-saving measures, and *p_limit* for setting a limit on energy consumption per person (standards were used as basis since it was the policy instrument presented in the current policy). The standard deviations in the lower part of Table 3 are all statistically significant, suggesting (unexplained) heterogeneity of these parameters across respondents, and therefore corroborating the appropriateness of using a mixed logit model.

The coefficients associated with *target* and *import* are positive and statistically significant in all countries, implying that households generally prefer more ambitious policies with regard to reduction of both energy consumption and energy imports, therefore providing evidence in support of H1 and H2. As far as policy instruments, in Sweden and Poland, the coefficients for *p_tax* and *p_limit* are negative and significant, implying that the average respondent prefers the status quo policy "stricter minimum standards" over taxes or a per capita limit for energy consumption. Lastly, in Italy, Poland and the UK, implementing education and information programmes rather than stricter minimum standards increases the average respondent's latent utility as hypothesized. These results, therefore, imply that compared to minimum standards, respondents prefer non-coercive policy instruments and particularly dislike coercive instruments, as suggested in H3. The coefficient associated with *cost* is negative and statistically

significant in all countries. Thus, as expected (H4), additional costs lower respondents' latent utility in equation (1), implying that respondents prefer policies with lower costs. We further observe that respondents in Italy, Poland and Sweden are indifferent as to how costs are shared between households and other sectors. In the UK, contrary to expectations, respondents prefer on average higher shares of total costs paid by households; these results are at odds with H5. Note that in the UK, Poland and Italy, respondents generally prefer the status quo (i.e., no change in policy) to alternative policies, independent of other attributes.

Table 3. Results for standard mixed logit models.

	IT	PL	SE	UK
Means of the parameters				
cost	-0.006***	-0.006***	-0.007***	-0.005***
	(0.001)	(0.001)	(0.001)	(0.001)
statusquo	1.155**	0.949*	0.024	2.538***
	(0.470)	(0.504)	(0.492)	(0.957)
target	0.069***	0.065***	0.029*	0.088***
	(0.014)	(0.015)	(0.015)	(0.029)
import	0.015***	0.012***	0.006**	0.017***
	(0.003)	(0.003)	(0.003)	(0.006)
p_edu	0.865***	0.776***	0.064	1.124***
	(0.184)	(0.196)	(0.194)	(0.378)
p_tax	-0.050	-0.341**	-0.876***	-0.379
	(0.149)	(0.166)	(0.171)	(0.343)
p_limit	0.154	-0.734***	-0.724***	0.107
	(0.202)	(0.217)	(0.209)	(0.407)
share	0.010	0.009	-0.011	0.035**
	(0.008)	(0.009)	(0.009)	(0.017)
Standard deviations of the parameters				
statusquo	5.467***	5.800***	4.616***	6.748***
	(0.354)	(0.367)	(0.336)	(0.757)
target	0.120***	0.134***	0.106***	0.163***
	(0.012)	(0.012)	(0.012)	(0.022)
import	0.025***	0.026***	0.013***	0.036***
	(0.003)	(0.003)	(0.003)	(0.006)

p_edu	1.912***	1.983***	1.891***	2.363***
	(0.189)	(0.188)	(0.200)	(0.348)
p_tax	1.008***	1.493***	1.226***	1.720***
	(0.156)	(0.151)	(0.166)	(0.296)
p_limit	2.252***	2.234***	1.865***	2.449***
	(0.210)	(0.199)	(0.205)	(0.389)
share	0.066***	0.075***	0.057***	0.092***
	(0.006)	(0.006)	(0.007)	(0.013)
LL	-5109.965	-5016.092	-4936.130	-1590.218
LL0	-6261.674	-6213.520	-6132.477	-2032.965
BIC	10573.127	10385.523	10225.137	3494.332
AIC	10292	10104	9944	3252
Number of respondents	1013	1017	1004	340

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. *Standard errors in parentheses.*

Table 4 displays the marginal WTP estimates in the cases where the coefficients reported in Table 3 were statistically significant at the 10 percent level or lower. Respondents in Italy, Poland and the UK are on average willing to pay about 185€, 152€ and 496€ per year, respectively, for the current policy. WTP to further reduce energy consumption by 1 percentage point ranges from an average of 4.26€ per year in Sweden to an average of 17.15€ per year in the UK. Similarly, respondents are on average willing to pay 0.9€ per year in Sweden to 3.43€ per year in the UK to reduce energy imports by an additional percentage point. We further estimate that respondents in Poland and Sweden are on average willing to pay up to 130€ per year to keep the status quo policy's stricter minimum standards for buildings and appliances rather than replacing it with an additional tax on energy or a limit on per capita energy consumption. Further, the average respondent in Italy, Poland and the UK is willing to pay more than 125€ per year to replace stricter minimum standards with education and information programmes, whereas the average respondent in Sweden is only willing to pay 9.5€ for the same. Finally, UK respondents are willing to pay 6.87€ for a higher share of total costs paid by households.

Table 4. Willingness-to-pay results for standard mixed logit models.

	IT	PL	SE	UK
statusquo	185.13	152.85	-	496.01
target	11.36	10.53	4.26	17.15
import	2.45	1.89	0.90	3.40
p_edu	140.78	125.02	9.55	219.68
p_tax	-	-54.99	-129.76	-
p_limit	-	-118.18	-107.23	-
share	-	-	-	6.87

Table 5 reports the share of respondents who preferred the status quo over the alternative policies in all six scenarios as well as the share of scenarios in which the status quo was chosen. In the UK, the status quo option was chosen in more than half of the scenarios and 28% of respondents always chose the status quo. (This partly explains the high WTP for *statusquo* in Table 4.) In the other three countries, fewer respondents always preferred the status quo option over the alternative policies—though the share of scenarios in which the status quo was chosen remains high.

Table 5. Preference for status quo over alternative policies.

	IT	PL	SE	UK
Share of respondents always choosing the status quo option	19%	21%	24%	28%
Share of scenarios in which the status quo option was chosen	43%	46%	47%	56%

4.2 Mixed logit model with interaction terms

Results for the mixed logit model with interaction terms appear in Table 6. Standard errors are again shown in parentheses below the parameter estimates.[7] In the upper part of Table 6, we

[7] As was the cas for the standard mixed logit models, for the mixed logit models with interaction terms estmated correlations of the random parameters are tpyically statistically significant and large. The correlation matrix for this model is available upon requst.

are particularly interested in the interaction terms of high levels of trust in government (*hightrust*) and high environmental identity (*highgreenID*) with the policy characteristics. We also included interaction terms with income as control variable to account for potential omitted variable bias.[8]

Energy efficiency target

In accordance with hypothesis H6, we find that preferences for more ambitious energy efficiency targets are stronger for respondents with a high level of trust in government in Italy and Sweden compared to respondents with low trust (at $p<0.1$). In Italy, Poland and Sweden, respondents with high environmental identity have stronger preferences for *target* compared to respondents with low environmental identity. This finding therefore supports H8. We further find that preferences for *target* are stronger for high income households in Italy, and weaker for low income households in Italy and the UK and for high income households in Poland.

Table 6. Results for mixed logit models with interaction terms.

	IT	PL	SE	UK
Means of the parameters				
cost	-0.006***	-0.006***	-0.007***	-0.005***
	(0.001)	(0.001)	(0.001)	(0.001)
hightrust_target	0.015**	-0.000	0.017*	-0.013
	(0.007)	(0.007)	(0.009)	(0.016)
hightrust_p_edu	-0.064	-0.086	0.088	0.093
	(0.140)	(0.141)	(0.178)	(0.287)

[8] To assess the robustness of our findings, we ran additional analyses using an alternative specification of income. As explained earlier, in order to avoid missing value and sampling issues, we used for our main specification the income categories from the quota screening questions. The survey also included a more detailed income question (with missing values ranging from 10% in the UK to 20% in Poland). We used this question to categorize respondents in each country in three income categories based on quartiles: respondents in the lower (higher) quartile of the distribution were classified low (high) income, and those in the two middle quartile served as baseline. The results from this robustness check are reported in Table C1 in Appendix C. The majority of the findings for hypothesis tests are almost identical to those found through the main specification (see Table 6). We find some differences using this alternative specification in Italy, where the interaction term between *target* and trust in government becomes statistically significant, the interaction term between *target* and environmental identity does not reach statistical significance, and respondents trusting the government significantly prefer taxes over standards. The other differences primarily relate to the interactions of income with policy attributes, which were not the focus of the hypothesis tests.

hightrust_p_tax	0.215	0.604***	0.550***	-0.602
	(0.146)	(0.158)	(0.194)	(0.396)
hightrust_p_limit	0.058	0.113	0.007	0.235
	(0.170)	(0.181)	(0.198)	(0.402)
highgreenID_target	0.013**	0.015**	0.045***	0.016
	(0.007)	(0.007)	(0.008)	(0.014)
highgreenID_p_edu	0.217	0.160	-0.048	0.341
	(0.138)	(0.139)	(0.162)	(0.265)
highgreenID_p_tax	-0.009	0.182	0.129	0.447
	(0.145)	(0.157)	(0.179)	(0.347)
highgreenID_p_limit	0.504***	0.526***	0.529***	0.513
	(0.168)	(0.183)	(0.180)	(0.370)
lowinc_target	-0.013*	-0.000	0.005	-0.033**
	(0.007)	(0.007)	(0.010)	(0.016)
lowinc_p_edu	-0.065	0.132	-0.279	0.039
	(0.150)	(0.150)	(0.186)	(0.297)
lowinc_p_tax	-0.222	0.036	-0.226	-0.547
	(0.158)	(0.169)	(0.209)	(0.393)
lowinc_p_limit	-0.235	0.282	-0.174	-0.045
	(0.183)	(0.195)	(0.208)	(0.405)
highinc_target	0.028***	-0.042**	0.015	0.006
	(0.010)	(0.018)	(0.012)	(0.019)
highinc_p_edu	-0.277	0.552	0.074	0.073
	(0.209)	(0.371)	(0.231)	(0.351)
highinc_p_tax	-0.192	0.243	0.237	0.478
	(0.216)	(0.414)	(0.245)	(0.460)
highinc_p_limit	-0.262	0.069	0.417*	0.346
	(0.252)	(0.476)	(0.251)	(0.485)
statusquo	1.125**	0.995*	-0.088	2.239**
	(0.467)	(0.509)	(0.496)	(0.964)
target	0.073***	0.061***	-0.004	0.088***
	(0.015)	(0.017)	(0.017)	(0.033)
import	0.015***	0.012***	0.006*	0.016**
	(0.003)	(0.003)	(0.003)	(0.006)
p_edu	0.862***	0.634***	0.043	0.773*
	(0.219)	(0.241)	(0.230)	(0.459)
p_tax	-0.040	-0.727***	-1.135***	-0.319

	(0.194)	(0.232)	(0.223)	(0.451)
p_limit	0.063	-1.266***	-1.060***	-0.394
	(0.249)	(0.286)	(0.255)	(0.545)
share	0.010	0.010	-0.013	0.027
	(0.008)	(0.009)	(0.009)	(0.017)
Standard deviations of the parameters				
statusquo	5.488***	5.775***	4.542***	6.477***
	(0.355)	(0.366)	(0.331)	(0.729)
target	0.119***	0.135***	0.121***	0.172***
	(0.012)	(0.012)	(0.012)	(0.022)
import	0.025***	0.027***	0.016***	0.038***
	(0.003)	(0.003)	(0.003)	(0.006)
p_edu	1.887***	1.961***	1.988***	2.428***
	(0.190)	(0.190)	(0.186)	(0.340)
p_tax	1.032***	1.521***	1.393***	1.787***
	(0.159)	(0.155)	(0.180)	(0.307)
p_limit	2.231***	2.211***	2.028***	2.583***
	(0.207)	(0.203)	(0.208)	(0.389)
share	0.066***	0.076***	0.058***	0.092***
	(0.006)	(0.006)	(0.006)	(0.012)
LL	-5085.302	-4995.234	-4905.338	-1581.446
LL0	-6225.463	-6165.086	-6008.785	-1988.213
BIC	10680.777	10500.847	10320.386	3616.297
AIC	10275	10094	9915	3267
Number of respondents	1013	1017	1004	340

$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. *Standard errors in parentheses.*

Specific policy instruments

In Poland and Sweden, we observe that preferences for additional taxes, compared to standards, are stronger for respondents with high trust in government as postulated in H7. In contrast, we find no evidence that trust is related with preferences for per capita limits on energy consumption, or for education and information programmes compared to standards. In line with H9, high environmental identity is associated with stronger preferences for consumption limits

compared to standards in Italy, Poland, and Sweden. But environmental identity does not appear to be related with preferences for taxes or education and information programs compared to standards.

Finally, unlike for *targets*, we find no statistically significant relation between income levels and preferences for policy instruments, with the exception of a surprising preference for consumption limits compared to standards for high income respondents in Sweden at $p<0.1$

5 Discussion & Conclusions

Our study provides findings from a choice experiment conducted in four EU European countries – Italy, Poland, Sweden, and the United Kingdom – that manipulated policy attributes in order to quantify trade-offs between one classic and one rarely studied policy objective (absolute consumption targets and reduction of import dependence), one classic and one rarely studied cost characteristics (absolute costs and distribution rule between households and other sectors), and two classic and two rarely studied policy instruments (education and information programmes, standards, taxes, and consumption limits). Table 7 summarizes the hypotheses tested in the study and the main results obtained.

Table 7. Summary of hypotheses and results.

	IT	PL	SE	UK
Hypotheses on policy attributes				
H1: Households prefer policies with more ambitious energy efficiency targets	✓	✓	✓	✓
H2: Households prefer policies with more ambitious reduction of country's dependence on energy imports	✓	✓	✓	✓
H3: Households prefer, in order, education and	✓ (prefer education and	✓ (prefer education and	✓ (prefer standards to	✓ (prefer education and

information programmes followed by standards, taxes, and finally consumption limits	information programmes to standards)	information programmes to standards, prefer standards to taxes and consumption limits)	taxes and consumption limits)	information programmes to standards)
H4: Households prefer less costly policies	✓	✓	✓	✓
H5: Households prefer policies that entail them paying less than or the same amount as what they are responsible for consuming, rather than policies where the share paid by households is higher than the share they are responsible for consuming	n.s.	n.s.	n.s.	X
Hypotheses on role of trust in government and environmental identity for policy acceptability	✓	n.s.	✓	n.s.
H6: Trust in government increases the acceptability of higher energy consumption reduction targets				
H7: Trust in government increases the acceptability of coercive policy instruments	n.s.[a]	✓ (taxes)	✓ (taxes)	n.s.
H8: Environmental identity increases the acceptability of energy consumption reduction targets	✓	✓	✓	n.s.
H9: Environmental identity increases the acceptability of coercive policy instruments	✓ (consumption limits)	✓ (consumption limits)	✓ (consumption limits)	✓ (consumption limits)

✓ Results statistically significant and in support of the hypothesis.

n.s. Results not statistically significant.

X Results statistically significant and in contrast to the hypothesis.

[a] Positive interaction effect of trust with preference for taxes over standards was found in the robustness check analysis.

Policy characteristics. Consistent with H1 and H2, we found that respondents generally prefer more ambitious policies with regard to reduction of both energy consumption and energy

imports. These findings are in line with previous research, which consistently finds that the perceived effectiveness of a specific policy is associated with acceptability of the policy (e.g., Eriksson et al., 2008). Results for energy import dependence are particularly interesting since reducing import dependencies is a major objective in the EED. Results confirm that households value reduction of energy imports, even though WTP for a lower energy import dependence is rather small; interestingly though, Italian households do not put a higher value on this objective than households in the other three countries, even though Italy's import dependence is much higher.

As expected, and in line with H3, policy coerciveness negatively affected policy acceptability (cf. Ščasný et al., 2016). Specifically, we hypothesized that education and information programs on energy-saving measures would be preferred to standards, which themselves would be preferred to taxes and limits on consumption. This was largely supported, although effects were statistically significantly negative only for taxes and for consumption limits in Poland and Sweden, and positive for education and information programmes in all countries except Sweden. These national differences may reflect different cultural contexts or historical policies. The results that respondents prefer standards to consumption limits in Poland and Sweden are particularly interesting since ours is the first study investigating the acceptability of a consumption limit policy. Our results indicate that efforts to implement energy sufficiency policies through consumption limits may lead to some backlash among households in these countries.

In support for H4, we found that in all countries, additional costs to households reduced acceptability of energy efficiency policies compared to the status quo. However, acceptability was lower for lower-income respondents only in Poland, even though previous research suggests that the negative relationship between policy costs and policy acceptance is likely to be stronger for lower-income respondents (e.g., Kallbekken & Sælen, 2011).

Contrary to expectations, respondents appear largely indifferent as to how costs are shared between households and other sectors (though in the UK there was actually a preference for households to pay more than other sectors). We therefore do not find support for H5. In the literature, perceived distributional fairness and procedural fairness have been positively associated with environmental policy acceptability (e.g., Kim et al., 2013). Here, we explored distributional fairness, which did not seem to be related to acceptability of energy efficiency policies, perhaps because respondents did not have a clear sense of who is 'to blame' for problems arising from energy consumption. In previous studies involving distribution rules, the groups to blame were easier to identify – for instance, emissions from transport are readily attributed to motorists (Dietz & Atkinson, 2010). Even though we explicitly stated in the introduction of the DCE that households are responsible for 40% of energy consumption, responsibilities might not have been completely understood. Households, as end users of products and services, may also have felt indirectly acountable for energy use by other sectors. Future research should explore this surprising finding further.

Role of trust in government and environmental identity for policy acceptability. Previous research found trust to be positively related with policy acceptability, including for environmental policies (e.g., Rhodes et al., 2017). Consistent with H6, we found that trust in government increases the acceptability of energy reduction targets. Our findings for taxes (but not for consumption limits) provide support for the hypothesis that higher trust in government increases the acceptability of more coercive policies compared to standards in Poland and Sweden (and in Italy when using the alternative specification for income) (H7; see also Kim et al., 2013). The lower sample size in the UK might explain the non-significant results in that country.

We also posited two hypotheses related to environmental identity. Consistent with H8 and previous research (e.g., Steg & Vlek, 2009), we found that environmental identity increased the

acceptability of more ambitious policies in three of the four countries (the non-significant results in the UK may be due to the lower sample size). Our results for consumption limits (but not for taxes) suggest that environmental identity increases the acceptability of more coercive policies in all four countries, thus generally providing support for H9.

We started this research with the observation that previous research has found considerable heterogeneity in policy preferences within and across countries (Alberini et al., 2018a; Ščasný et al., 2016). By including four countries in our study, our research can shed some light on this issue. Indeed, while we found variation across countries, some results were remarkably consistent across countries. Across all four countries in the study, we found consistent preferences (albeit with different levels of WTP) for ambitious policies (for both energy efficiency targets and import dependence reduction), for less coercive policy instruments (albeit expressed differently), and for lower costs, as well as a consistent reinforcing effect of trust in government and environmental identity on the acceptability of ambitious energy efficiency policy. However, the fact that we found differences across countries reinforces the importance of cross-national studies. Future work should expand the number and range of nations examined in order to identify reasons for these cross-national differences, such as culture, energy mix, GDP (Demski et al., 2018) or previous experience of related policies (Kim et al., 2013).

Policy implications. Overall, we identified household preferences and resistance to specific policy attributes as well as variation in preferences amongst different countries and groups of households. In particular, our research highlights that energy efficiency policies are more acceptable when they are particularly effective (i.e., ambitious in reducing energy consumption and energy import dependency) while also incurring minimal costs on, or coercion of, households. In practice, these criteria may be difficult to reconcile as the most effective policies are likely to include at least some degree of 'push' or coercion that limit household choices or 'punish' them for choosing the most energy-intensive options. At the same time, however, we

also found that those who trust government more and have higher environmental identity are generally more accepting of ambitious energy efficiency policies (albeit with some cross-national variation) and interestingly, that households who trust the government more appear more accepting of taxes, while households with higher environmental identity appear more accepting of consumption limits.

These findings point to where policy-makers might focus in making future energy efficiency policies more acceptable. For example, building trust in government would appear to be an important pre-condition for public acceptability of more ambitious energy efficiency targets and of tax policies, and therefore should be a focus of efforts (e.g., through more transparent and participatory policy-making). Environmental education might also serve to increase environmental identity and values amongst the public, which may also lead to greater acceptability of energy efficiency targets and sufficiency-oriented policies such as limiting per capita energy consumption. Finally, since policy acceptability in some countries, like the UK, appears to be higher than elsewhere (as reflected in much higher WTP from the average household), and in light of cross-national variation in the antecedents of policy acceptability for particular policy characteristics, policies may need to be established with cultural or national differences in mind.

Acknowledgements

This research benefitted from funding by the European Union's Horizon 2020 Framework Programme under the project CHEETAH - CHanging Energy Efficient Technology Adoption in Households (Grant agreement ID: 723716). We are grateful to the reviewing team for its insightful comments. We also acknowledge the help of members of the project consortium of the Fraunhofer Institute for Systems and Innovation Research and of the Technical University of Vienna for their comments on the choice of attributes and attribute levels for the choice experiment.

References

Adaman, F., Karah, N., Kumbaroglu, G., Or, I., Ozkaynak, B., & Zenginobuz, U. (2011). What determines urban households' willingness to pay for CO2 emission reductions in Turkey: A contingent valuation survey. Energy Policy, 39(2), 689-698. doi:10.1016/j.enpol.2010.10.042

Alberini, A., Ščasný, M., & Bigano, A. (2018a). Policy-v. individual heterogeneity in the benefits of climate change mitigation: Evidence from a stated-preference survey. Energy Policy, 121, 565-575.

Alberini, A., Bigano, A., Ščasný, M., & Zvěřinová, I. (2018b). Preferences for energy efficiency vs. renewables: What is the willingness to pay to reduce CO2 emissions? Ecological Economics, 144, 171-185.

Attari, S. Z., Schoen, M., Davidson, C. I., DeKay, M. L., Bruine de Bruin, W., Dawes, R., & Small, M. J. (2009). Preferences for change: Do individuals prefer voluntary actions, soft regulations, or hard regulations to decrease fossil fuel consumption? Ecological Economics, 68(6), 1701-1710. doi:10.1016/j.ecolecon.2008.10.007

Bechtel, M. M., & Scheve, K. F. (2013). Mass support for global climate agreements depends on institutional design. Proceedings of the National Academy of Sciences of the United States of America, 110(34), 13763-13768. doi:10.1073/pnas.1306374110

Breakwell, G. (2015). Identity process theory. In G. Sammut, E. Andreouli, G. Gaskell, & J. Valsiner (Eds.), The Cambridge Handbook of Social Representations (pp. 250-268). (Cambridge Handbooks in Psychology). Cambridge, U. K.: Cambridge University Press.

Bostrom, A., O'Connor, R. E., Bohm, G., Hanss, D., Bodi, O., Ekstrom, F., & Saelensminde, I. (2012). Causal thinking and support for climate change policies: International

survey findings. Global Environmental Change-Human and Policy Dimensions, 22(1), 210-222. doi:10.1016/j.gloenvcha.2011.09.012

Cai, B., Cameron, T. A., & Gerdes, G. R. (2010). Distributional preferences and the incidence of costs and benefits in climate change policy. Environmental and Resource Economics, 46(4), 429-458. doi:10.1007/s10640-010-9348-7

Carlsson, F., Katariab, M., Krupnickc, A., Lampia, E., Löfgrena, Å., Qind, P., Sterner, T., (2013). A fair share: Burden-sharing preferences in the United States and China. Resource and Energy Economics, 35, 1, 1-17.

ChoiceMetrics (2014). Ngene 1.1.2 User Manual & Reference Guide, Australia.

Darby, S., & Fawcett, T. (2018). Energy sufficiency – an introduction: A concept paper for ECEEE. doi: 10.13140/RG.2.2.31198.08006

Demski, C., Poortinga, W., Whitmarsh, L., Böhm, G., Fisher, S., Steg, L., Umit, R., Jokinen, P. & Pohjolainen, P. (2018). National determinants of energy security concerns across Europe. Nature Energy, 3, 882–888.

Dietz, S., & Atkinson, G. (2010). The Equity-Efficiency Trade-off in Environmental Policy: Evidence from Stated Preferences. Land Economics, 86(3), 423-443. Retrieved from <Go to ISI>://WOS:000279413500003

Dietz, S., & Stern, N. (2008). Why economic analysis supports strong action on climate change: a response to the Stern Review's critics. Review of Environmental Economics and Policy, 2(1), 94-113.

Dietz, T., Dan, A., & Shwom, R. (2007). Support for climate change policy: Social Psychological and social structural influences. Rural Sociology, 72(2), 185-214. doi:10.1526/003601107781170026

Drews, S., & van den Bergh, J. C. J. M. (2015). What explains public support for climate policies? A review of empirical and experimental studies. Climate Policy, 16(7), 855-876. doi: 10.1080/14693062.2015.1058240

Dunlap, R. E. V. L., Liere, K. V., Mertig, A., & Jones, R. E. (2000). Measuring endorsement of the new ecological paradigm: A revised NEP scale. Journal of Social Issues, 56(3), 425-442.

Eliasson, J., & Jonsson, L. (2011). The unexpected "yes": Explanatory factors behind the positive attitudes to congestion charges in Stockholm. Transport Policy, 18(4), 636-647. doi:10.1016/j.tranpol.2011.03.006

Eriksson, L., Garvill, J., & Nordlund, A. M. (2008). Acceptability of single and combined transport policy measures: The importance of environmental and policy specific beliefs. Transportation Research Part A - Policy and Practice, 42(8), 1117-1128. doi:10.1016/j.tra.2008.03.006

ESS (2016). ESS Round 8: European Social Survey Round 8 Data (2016). Data file edition 2.1. NSD - Norwegian Centre for Research Data, Norway – Data Archive and distributor of ESS data for ESS ERIC.

European Commission (2019). Report of the work of the task force on mobilising efforts to reach the EU energy efficiency targets for 2020. Directorate General for Energy, Brussels.

Eurostat (2018a). Over half of EU's energy consumption from imports. https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20180420-1

Eurostat (2018b). https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=demo_r_d2jan&lang=en

Furst, E. W. M., & Dieplinger, M. (2014). The acceptability of road pricing in Vienna: the preference patterns of car drivers. Transportation, 41(4), 765-784. doi:10.1007/s11116-013-9485-2

Gatersleben, B., Murtagh, N., & Abrahamse, W. (2014). Values, identity and pro-environmental behaviour. Contemporary Social Science, 9(4), 374–392. https://doi.org/10.1080/21582041.2012.682086

Gatto, A. & Drago, C. (2020). Measuring and mdeling energy resilience. Ecological Economics, 172, 106527. doi: 10.1016/j.ecolecon.2019.106527

Glenk, K., & Colombo, S. (2013). Modelling outcome-related risk in choice experiments. Australian Journal of Agricultural and Resource Economics, 57(4), 559-578.

Gracia, A., Barreiro-Hurlé, J., & y Pérez, L. P. (2012). Can renewable energy be financed with higher electricity prices? Evidence from a Spanish region. Energy Policy, 50, 784-794.

Hackbarth, A., & Madlener, R. (2016). Willingness-to-pay for alternative fuel vehicle characteristics: A stated choice study for Germany. Transportation Research Part A: Policy and Practice, 85, 89-111.

Hammar, H., & Jagers, S. C. (2007). What is a fair CO2 tax increase? On fair emission reductions in the transport sector. Ecological Economics, 61(2-3), 377-387. doi:10.1016/j.ecolecon.2006.03.004

Hanley, N., Mourato, S., & Wright, R. E. (2001). Choice modelling approaches: a superior alternative for environmental valuatioin? Journal of Economic Surveys, 15(3), 435-462.

He, P., Ng, T. S., & Su, B. (2015). Energy import resilience with input-output linear programming models. Energy Economics, 50, 215-226. doi: 10.1016/j.eneco.2015.05.007

Hensher, D.A., & Greene, W.H. (2003). The mixed logit model: The state of practice. Transportation, 30(2),133-176.

Hess, S., & Train, K. (2017). Correlation and scale in mixed logit models. Journal of Choice Modelling, 23, 1-8.

IEA (2013). IEA. Transition to sustainable buildings - strategies and opportunities to 2050. International Energy Agency, IEA-OECD, Paris.

IEA (2019). World Energy Outlook. International Energy Agency, IEA-OECD, Paris.

Kallbekken, S., & Sælen, H. (2011). Public acceptance for environmental taxes: Self-interest, environmental and distributional concerns. Energy Policy, 39(5), 2966-2973. doi:10.1016/j.enpol.2011.03.006

Kettle, N. P., & Dow, K. (2016). The role of perceived risk, uncertainty, and trust on coastal climate change adaptation planning. Environment and Behavior, 48(4), 579-606.

Kim, J., Schmöcker, J. D., Fujii, S., & Noland, R. B. (2013). Attitudes towards road pricing and environmental taxation among US and UK students. Transportation Research Part A: Policy and Practice, 48, 50-62. doi:10.1016/j.tra.2012.10.005

Kitt, S., Axsen, J., Long, Z., & Rhodes, E. (2021). The role of trust in citizen acceptance of climate policy: Comparing perceptions of government competence, integrity and value similarity. Ecological Economics, 183, 106958. doi:10.1016/j.ecolecon.2021.106958

Kyselá, E., Ščasný, M., & Zvěřinová, I. (2019). Attitudes toward climate change mitigation policies: A review of measures and a construct of policy attitudes, Climate Policy, 19(7), 878-892. DOI: 10.1080/14693062.2019.1611534

Lundhede, T., Jacobsen, J. B., Hanley, N., Strange, N., & Thorsen, B. J. (2015). Incorporating outcome uncertainty and prior outcome beliefs in stated preferences. Land Economics, 91(2), 296-316.

Murakami, K., Ida, T., Tanaka, M., & Friedman, L. (2015). Consumers' willingness to pay for renewable and nuclear energy: A comparative analysis between the US and Japan. Energy Economics, 50, 178-189.

Organization for Economic Cooperation and Development (OECD) (2018). Income distribution database. https://stats.oecd.org/index.aspx?queryid=66670

Peterson, M., & Feldman, D. (2018). Citizen preferences for possible energy policies at the national and state levels. Energy Policy, 121, 80-91.

Revelt, D., & Train, K. (1998). Mixed logit with repeated choices: Households' choices of appliance efficiency level. Review of Economics and Statistics, 80(4), 647–657.

Rhodes, E., Axsen, J., & Jaccard, M. (2014). Does effective climate policy require well-informed citizen support? Global Environmental Change, 29, 92-104.

Rhodes, E., Axsen, J., & Jaccard, M. (2017). Exploring citizen support for different types of climate policy. Ecological Economics, 137, 56-69.

Sándor, Z., & Wedel, M. (2001). Designing conjoint choice experiments using managers' prior beliefs. Journal of Marketing Research, 38, 430–444.

Ščasný, M., Zvěřinová, I., Czajkowski, M., Kyselá, E., & Zagórska, K. (2016). Public acceptability of climate change mitigation policies: a discrete choice experiment. Climate Policy, 17(sup1), S111-S130.

Schleich, J., Dütschke, E., Schwirplies, C., & Ziegler, A. (2016). Citizens' perceptions of justice in international climate policy – an empirical analysis. Climate Policy, 16 (1), 50-67. doi:10.1080/14693062.2014.979129

Schuitema, G., Steg, L., & Rothengatter, J. A. (2010). The acceptability, personal outcome expectations, and expected effects of transport pricing policies. Journal of Environmental Psychology, 30(4), 587-593. doi:10.1016/j.jenvp.2010.05.002

Schwirplies, C., Duetschke, E., Schleich, J., & Ziegler, A. (2019): The willingness to offset CO2 emissions from traveling: Findings from discrete choice experiments with different framings. Ecological Economics 165, 106384. doi:10.1016/j.ecolecon.2019.106384

Shwom, R., Bidwell, D., Dan, A., & Dietz, T. (2010). Understanding U.S. public support for domestic climate change policies. Global Environmental Change, 20(3), 472-482. doi:10.1016/j.gloenvcha.2010.02.003

Spangenberg, J., & Lorek, S. (2019). Sufficiency and consumer behaviour: From theory to policy. Energy Policy, 129, 1070-1079.

Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. Journal of Environmental Psychology, 29(3), 309-317. doi:10.1016/j.jenvp.2008.10.004

Steinberger, J., K., & Roberts, J., T. (2010). Fromconstraint to sufficiency: The decoupling of energy and carbon from human needs,1975–2005. Ecological Economics, 70, 425-433.

Stern, P. C. (2000). Toward a coherent theory of environmentally significant behavior. Journal of Social Issues, 56(3), 407-424.

Stirling, A. (2006). Analysis, participation and power: justification and closure in participatory multi-criteria analysis. Land Use Policy, 23(1), 95-107.

Train, K. E., (2003). Discrete Choice Methods with Simulation. Cambridge University Press.

Wang, H., Chen, W., & Shi, J. (2019). Low carbon transition of global building sector under 2- and 1.5-degree targets. Applied Energy, 222, 148-157.

Wesselink, A., Paavola, J., Fritsch, O., & Renn, O. (2011). Rationales for public participation in environmental policy and governance: practitioners' perspectives. Environment and Planning A, 43(11), 2688-2704.

Whitmarsh, L., & O'Neill, S. (2010). Green identity, green living? The role of pro-environmental self-identity in determining consistency across diverse pro-environmental behaviours. Journal of Environmental Psychology, 30(3), 305-314.

Ziegler, A. (2019). The relevance of attitudinal factors for the acceptance of energy policy measures: A micro-econometric analysis. Ecological Economics, 157, 129-140.

Appendix A: Experiment framing

Text used for the choice experiment (UK version)

Current UK energy efficiency policies include a wide range of measures that are designed to reduce the energy consumption of households, businesses, and government agencies.

Suppose **the government is considering a change to its current energy efficiency policy** and thus proposes two alternatives, Policy A and Policy B. On the following pages, you will be asked to indicate whether you **prefer Policy A, Policy B, or the current policy.**

You will see six separate scenarios with different energy efficiency policy alternatives (A and B). In all six scenarios, Policy A, Policy B, and the current policy differ on the following attributes:

Energy consumption by 2030: Policies **reduce energy consumption** in the UK by 20, 25, 30, or 40 percent, compared to having no energy efficiency policy in place.

Dependence on energy imports: Policies seek to **reduce the UK's energy imports** by 5, 10, 30 or 50 percent, compared to having no energy efficiency policy in place.

Main policy measure: The reduction in energy consumption by households is mainly achieved through one of the following **policy measures**:

- **Education and information** programmes on energy-saving measures.
- An additional **tax** on energy (e.g., for electricity, gas, oil, coal).
- A **limit** on energy consumption per person.
- Stricter minimum **energy efficiency standards** for buildings and appliances.

Share of total costs paid by households: **Total costs** to reach the energy consumption target by 2030 are **shared between households and other sectors** (industry, agriculture, private and

public services). The **share paid by households** is 30, 40, 50, or 60 percent. Currently, households consume about 40 percent of total energy.

Additional annual costs: **Over the next 10 years,** Policies A and B will cause additional expenses for your household **compared to the current policy. Additional expenses will be £25, £50, £100, £150, £200, or £300** per year**.**

Appendix B: Correlation matrices for mixed logit analyses

Table B1. Correlation matrix of the random coefficients of the standard mixed logit model (associated with Table 3).

IT							
	statusquo	target	import	p_edu	p_tax	p_limit	share
statusquo	1.000***						
target	0.897***	1.000***					
import	0.659***	0.802***	1.000***				
p_edu	0.851***	0.862***	0.761***	1.000***			
p_tax	0.533***	0.797***	0.659***	0.701***	1.000***		
p_limit	0.654***	0.889***	0.716***	0.817***	0.919***	1.000***	
share	0.923***	0.567***	0.500***	0.868***	0.847***	0.843***	1.000***
PL							
	statusquo	target	import	p_edu	p_tax	p_limit	share
statusquo	1.000***						
target	0.891***	1.000***					
import	0.687***	0.707***	1.000***				
p_edu	0.857***	0.921***	0.782***	1.000***			
p_tax	0.522***	0.684***	0.699***	0.663***	1.000***		
p_limit	0.609***	0.814***	0.722***	0.674***	0.849***	1.000***	
share	0.859***	0.408***	0.816***	0.853***	0.821***	0.780***	1.000***
SE							
	statusquo	target	import	p_edu	p_tax	p_limit	share
statusquo	1.000***						
target	0.694***	1.000***					
import	0.711***	0.711**	1.000**				
p_edu	0.720***	0.797***	0.907***	1.000***			
p_tax	0.129	0.506***	0.669**	0.509***	1.000***		
p_limit	0.495***	0.716***	0.799***	0.759***	0.664***	1.000***	
share	0.878***	0.258***	0.830***	0.831***	0.447**	0.636***	1.000***
UK							
	statusquo	target	import	p_edu	p_tax	p_limit	share
statusquo	1.000***						
target	0.877***	1.000***					
import	0.838***	0.878***	1.000***				
p_edu	0.923***	0.958***	0.977***	1.000***			
p_tax	0.406*	0.715***	0.738***	0.614**	1.000***		
p_limit	0.671***	0.880***	0.778***	0.788***	0.670***	1.000***	
share	0.943***	0.472***	0.968***	0.913***	0.611***	0.721***	1.000***

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ pertain to the statistical significance of the elements of the variance-covariance matrix.

Appendix C: Robustness checks using alternative income specification

Table C1. Results for mixed logit models with interaction terms with alternative income specification.

	IT b/se	PL b/se	SE b/se	UK b/se
Means of the parameters				
cost	-0.007***	-0.006***	-0.007***	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)
hightrust_target	0.017**	0.004	0.018*	-0.012
	(0.007)	(0.008)	(0.010)	(0.018)
hightrust_p_edu	-0.046	-0.034	0.073	0.033
	(0.157)	(0.162)	(0.190)	(0.311)
hightrust_p_tax	0.287*	0.615***	0.486**	-0.558
	(0.164)	(0.178)	(0.201)	(0.446)
hightrust_p_limit	0.058	0.214	0.139	0.241
	(0.185)	(0.215)	(0.208)	(0.450)
highgreenid_target	0.012	0.017**	0.044***	0.015
	(0.007)	(0.008)	(0.009)	(0.015)
highgreenid_p_edu	0.151	0.084	-0.061	0.340
	(0.155)	(0.162)	(0.178)	(0.282)
highgreenid_p_tax	0.017	0.151	0.117	0.160
	(0.162)	(0.176)	(0.192)	(0.372)
highgreenid_p_limit	0.420**	0.687***	0.423**	0.618
	(0.185)	(0.220)	(0.196)	(0.399)
lowincome_target	-0.035***	-0.015	0.005	0.003
	(0.010)	(0.009)	(0.010)	(0.018)
lowincome_p_edu	0.200	0.301	0.004	0.433
	(0.208)	(0.196)	(0.207)	(0.351)
lowincome_p_tax	-0.396*	0.167	0.194	0.374
	(0.232)	(0.211)	(0.222)	(0.447)
lowincome_p_limit	0.190	0.215	0.195	0.793
	(0.248)	(0.262)	(0.228)	(0.499)
highincome_target	0.014	-0.001	0.003	0.030*
	(0.009)	(0.010)	(0.010)	(0.018)
highincome_p_edu	0.231	0.101	0.239	0.267
	(0.189)	(0.202)	(0.208)	(0.322)
highincome_p_tax	0.126	0.442**	0.107	0.916**
	(0.190)	(0.223)	(0.223)	(0.436)
highincome_p_limit	0.411*	0.421	0.104	0.845*
	(0.224)	(0.269)	(0.231)	(0.451)
statusquo	1.160**	1.070*	-0.141	3.247***
	(0.513)	(0.603)	(0.518)	(1.061)
target	0.074***	0.062***	0.000	0.092***
	(0.016)	(0.020)	(0.018)	(0.035)
share	0.009	0.011	-0.014	0.045**
	(0.009)	(0.011)	(0.009)	(0.019)
import	0.015***	0.012***	0.007**	0.022***
	(0.003)	(0.004)	(0.003)	(0.007)

p_tax	-0.171	-0.798***	-1.155***	-0.526
	(0.205)	(0.245)	(0.238)	(0.448)
p_edu	0.743***	0.664**	-0.095	1.001**
	(0.234)	(0.266)	(0.255)	(0.488)
p_limit	-0.195	-1.422***	-1.168***	-0.593
	(0.265)	(0.321)	(0.277)	(0.575)
share	0.009	0.011	-0.014	0.045**
	(0.009)	(0.011)	(0.009)	(0.019)
Standard deviations of the parameters				
statusquo	5.749***	6.030***	4.813***	6.985***
	(0.382)	(0.428)	(0.369)	(0.808)
target	0.124***	0.146***	0.121***	0.186***
	(0.012)	(0.014)	(0.013)	(0.026)
import	0.027***	0.030***	0.015***	0.042***
	(0.003)	(0.004)	(0.004)	(0.007)
p_tax	1.126***	1.500***	1.295***	1.814***
	(0.163)	(0.183)	(0.176)	(0.351)
p_edu	2.061***	2.022***	1.881***	2.735***
	(0.206)	(0.230)	(0.200)	(0.381)
p_limit	2.418***	2.467***	1.908***	2.884***
	(0.219)	(0.252)	(0.213)	(0.441)
share	0.072***	0.078***	0.055***	0.095***
	(0.007)	(0.007)	(0.007)	(0.013)
LL	-4270.438	-3995.214	-4192.451	-1444.865
LL0	-5278.986	-4935.754	-5184.817	-1809.908
BIC	9042.716	8489.356	8886.803	3338.332
AIC	8645	8094	8489	2994
Number of respondents[a]	863	816	864	310

** p < 0.10, ** p < 0.05, *** p < 0.01; Standard errors in parentheses.*

[a] Respondents who did not answer the alternative income question were not included in these analyses.

Note: The correlation matrices associated with this table are available from the authors upon request.