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GREENING HOUSEHOLD BEHAVIOUR

A REVIEW FOR POLICY MAKERS

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Greening Household Behaviour

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OECD ENVIRONMENT POLICY PAPER NO. 3
DECEMBER 2014

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Authorised for publication by Simon Upton
Director, Environment Directorate

Greening Household Behaviour

A review for policy makers

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BETTER POLICIES FOR BETTER LIVES

Greening Household Behaviour

A review for policy makers

The OECD's Environmental Policy and Individual Behaviour Change (EPIC) surveys are a unique public sector data collection initiative focused on household-oriented environmental policies. Drawing on observations from over 12 000 respondents in 11 OECD countries, this policy analysis of the 2011 survey points decision makers towards ways to design well-targeted and effective policies that respond to household constraints and attitudes so as to:

- Promote **energy** efficiency and increased use of renewable energy at home.
- Influence households' **water**-saving behaviour and adoption of water-efficient devices.
- Understand how to reduce CO_2 emissions from **transport**, especially private cars.
- Increase consumption of organic and humanely produced **food**.
- Reduce household **waste**.

1 What's unique about EPIC?

Personal behaviour and choices in daily life, from what we eat to how we get to work or heat our homes, have a significant – and growing – effect on the environment. But why are some households greener than others? And what factors motivate green household choices?

Answering these questions is vital for helping governments design and target policies that promote "greener" behaviour. The OECD's Environmental Policy and Individual Behaviour Change (EPIC) survey is designed to do just that. This large-scale household survey explores what drives household environmental behaviour and how policies may affect household decisions. It focuses on five areas in which households have significant environmental impact: energy, food, transport, waste and water. This policy paper is based on the second round of the EPIC survey, carried out in 2011 (the first was in 2008). The survey collected information from more than 12 000 households in Australia, Canada, Chile, France, Israel, Japan, Korea, the Netherlands, Spain, Sweden and Switzerland.

Key findings

- **Environmental attitudes matter** and governments can have a role in forging them. Well-designed information campaigns and educational programmes to raise people's environmental awareness can change behaviour. Environmentally-aware households are more likely to save energy and water, compost and recycle their waste and invest in energy and water-efficient appliances.

- **Trust in government** is a major factor in the importance that people attribute to environmental issues. For example, trust is a more powerful factor than levels of university schooling in predicting whether people believe climate change is man-made.

- **People want to do more for the environment.** While the survey confirms that prices and costs can be hugely influential in household decisions, it also reveals an overall willingness to be green and to pay more for environmentally-friendly choices. Most surveyed households would be willing to pay more for electricity generated from renewable sources, and for organic and welfare-labelled food. In other words, homes offer untapped green potential; the key to unlocking this potential is the right policy framework.

Did you know?

- Since the global financial crisis, more people now feel that environmental issues should mainly be dealt with by future generations.
- Women are more likely to be environmentally motivated than men.
- Young people are less likely to use organic labels and tend to waste more food.

What does this mean for policy?

- **Carefully crafted pricing policies** – such as water and waste charges, subsidies, taxes and grants – must deliver the right signals to affect behaviour while avoiding harming lower-income households. The survey confirms that prices are a strong driver of greener behaviour. For instance, households charged according to the amount they consume or throw away are more likely to save water and reduce waste.

- **Better – and better targeted – information.** Trustworthy labels on food, on washing machines and on houses all help people make greener choices. Households need to know how to dispose of old medicines and electronics safely and where to find their nearest recycling centre. Well-designed information campaigns and education programmes should target those less sensitised to environmental issues and those least likely to adopt the desired environmentally-friendly behaviours.

- **Clear communication.** Communicating the environmental and economic benefits of policies such as environmental taxes is an essential component in the development and rollout of policy. Making sure that all households are aware of any new charges is an important task for governments and service providers: for a "price" to have an effect on resource use, users must be aware of its existence.

- **Intelligent infrastructure.** This is an essential back-up to prices and information – people will not buy electric cars unless they can charge them easily; they will not walk or cycle to work if it is not safe to do so; they will not stop buying bottled water if tap water tastes bad.

2 Opening up the "black box" of household decision making

The EPIC surveys are unique in their insights into why people make certain environmental choices. This is important because households' awareness and attitudes towards environmental issues mediate the effects of environmental policy. The distinct value of these surveys is that they go beyond the standard economic prescriptions in environmental policy – on prices and market-based instruments – to explore those factors influencing their success.

A complex set of factors underpin people's decisions, including knowledge, the availability of information, trust, the concerns of neighbours, levels of environmental activism, as well as education levels, income and ownership status. Understanding these can help design and target more effective policies.

Who we are has implications for our environmental behaviour

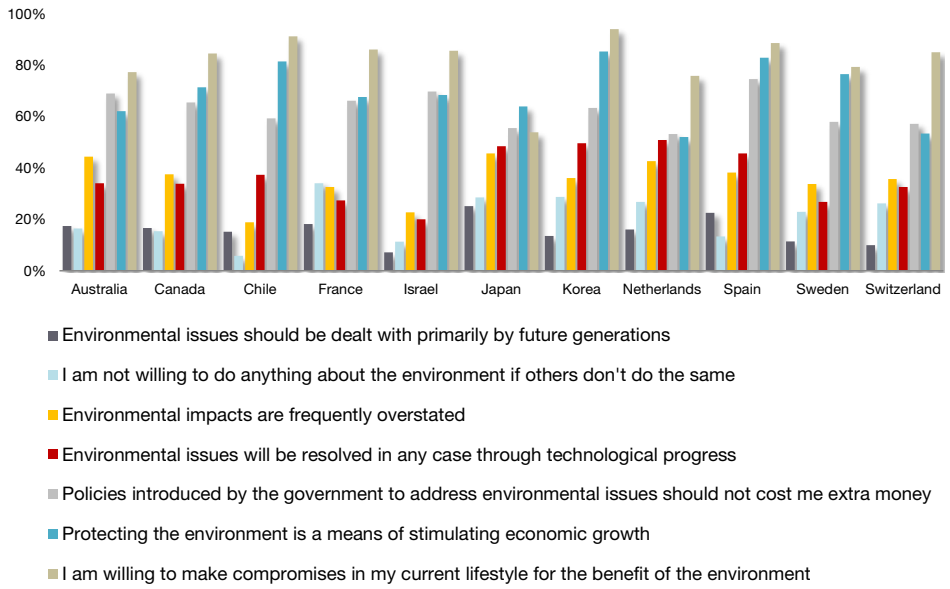
By collecting data from a cross-section of age groups, gender, income levels, locations and attitudes, the EPIC surveys show us how different groups behave differently towards the environment. Targeting these groups specifically, using messages which resonate for them, can increase the impact of awareness campaigns.

For example, younger men are 6% less likely than others to act to save water. This suggests that awareness campaigns targeting this group could complement water pricing. Gender, income and the presence of young children have a significant impact on purchases of organic fruit and vegetables and welfare-labelled meat and poultry.

Attitudes matter

People's attitudes towards environmental policies also matter. Respondents were asked whether they agreed with seven statements about the environment (see Figure 1). In all but one of the countries, the statement with which respondents agreed the most was: *I am willing to make compromises in my current lifestyle for the benefit of the environment*. Agreement with this statement was highest in Korea (95% of respondents). The exception was Japan, where most agreed that: *Protecting the environment is a means of stimulating economic growth*. In all countries, most respondents agreed with this statement, and also that government policies to address environmental issues should not cost households extra money.

Figure 1 | **Levels of agreement with seven statements about environmental policy**



These attitudes have clear implications for the success of policies. For example, taxes on environmentally damaging behaviour, such as on certain fuels, can bring in revenue and benefit the environment, yet low public support has impeded their implementation in many OECD countries. Targeted information can increase support, as can citizens' growing experience and familiarity with such policies. For example, in Japan – where pay-as-you-throw waste schemes are most common – those using such systems are 20% more likely to support the use of these systems than households unfamiliar with them.

Helping people act on good intentions

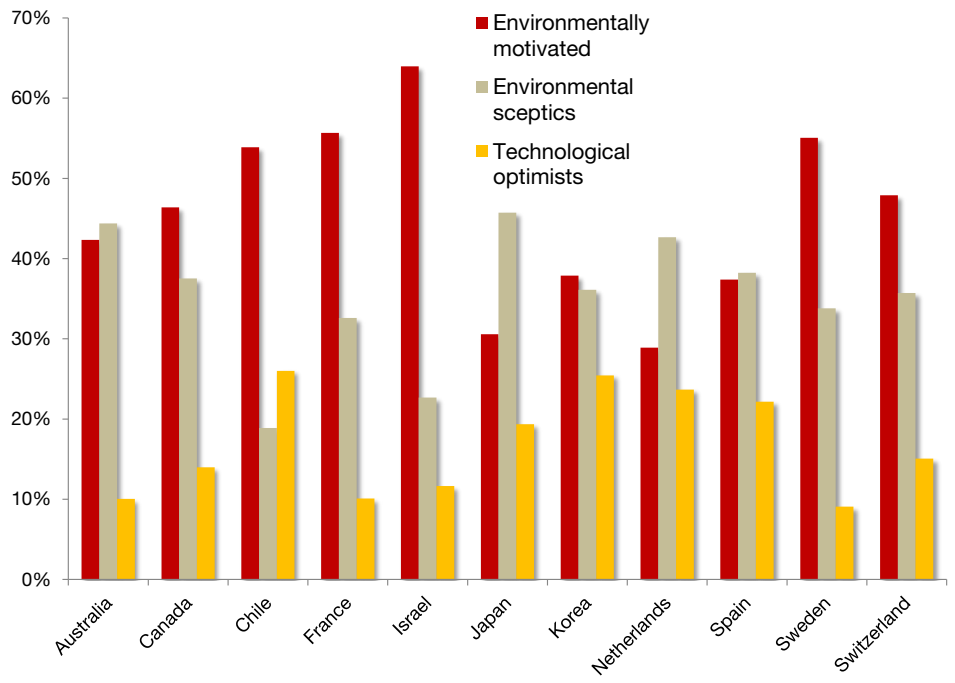
Another important aspect studied is the gap between what people say and what people do. For example, the survey found that respondents can be grouped into categories based on their environmental attitudes:

- **The "environmentally motivated"**, who believe that sacrifices will be necessary to solve environmental problems. This was the most common attitude among respondents, accounting for 46% of the sample.

> ***Where people are willing to change, governments need to have the policies ready to help them do so***

- **The "environmental sceptics"**, who believe that environmental problems are often exaggerated. In Japan, the Netherlands, Spain and Australia, environmental sceptics comprise the largest of the three groups (see Figure 2).
- **The "technological optimists"**, who believe that environmental problems are real, but that technological innovations are key to solving them. They are most prevalent in Chile and Korea, and least so in Sweden.

Figure 2 | **How do environmental attitude groups vary by country?**



However, these clusters are of attitudes, not behaviours. This is important, because intentions do not always match actions. For example, the share who stated willingness to make lifestyle sacrifices and take unreciprocated action to improve environmental conditions does not stack up when compared with the share of people exhibiting inefficient use of energy and water, throwing significant amounts of unused food away, etc. While people may overstate their good intentions for a variety of reasons – to appear to be green, to please the interviewer, etc. – this mismatch between intentions and actions suggests that policies can help eliminate any barriers preventing households from "following through" on their green intentions. These attitudes, behaviours and policies are discussed for each of the five focus themes of the survey in the sections which follow.

3 Greening households' energy use

Households represent a large – and growing – share of energy use in OECD countries. For example, the residential sector consumes about one third of all the electricity and heat generated, and the residential and commercial/public sectors combined account for about 60% of all electricity consumption. Total energy production across OECD countries is still dominated by fossil fuels; energy derived from renewable sources makes up only a small percentage of the total. Any comprehensive policy package that attempts to change the way we generate and use energy must therefore be based on an understanding of what drives household energy use.

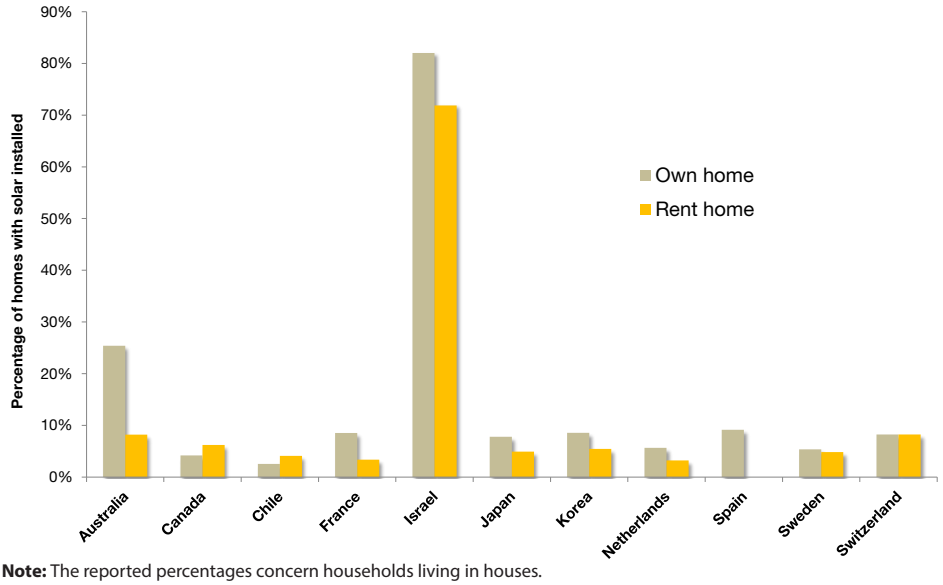
How green is households' energy use?

Respondents report spending about EUR 962 a year on electricity on average. While the average household spends about 3.5% of their budget on electricity, low-income households spend a larger share. Electricity demand is only slightly reduced by price increases, which means that higher prices could undermine the welfare of low-income households. Those who live in houses tend to spend more than those who live in apartments. Spending on electricity

Questions explored in the survey

- How do environmental attitudes affect energy use?
- Which households are willing to pay to use only renewable energy?
- Who acts to save energy and why?
- Do energy efficiency labels have an impact?

Figure 3 | **Substantial room for improvement in solar panel installation**



Note: The reported percentages concern households living in houses.

increases with household income, and higher-income households tend to do less to save energy. The average daily consumption across the countries surveyed is 17 kWh, ranging from 9 to 34 kWh.

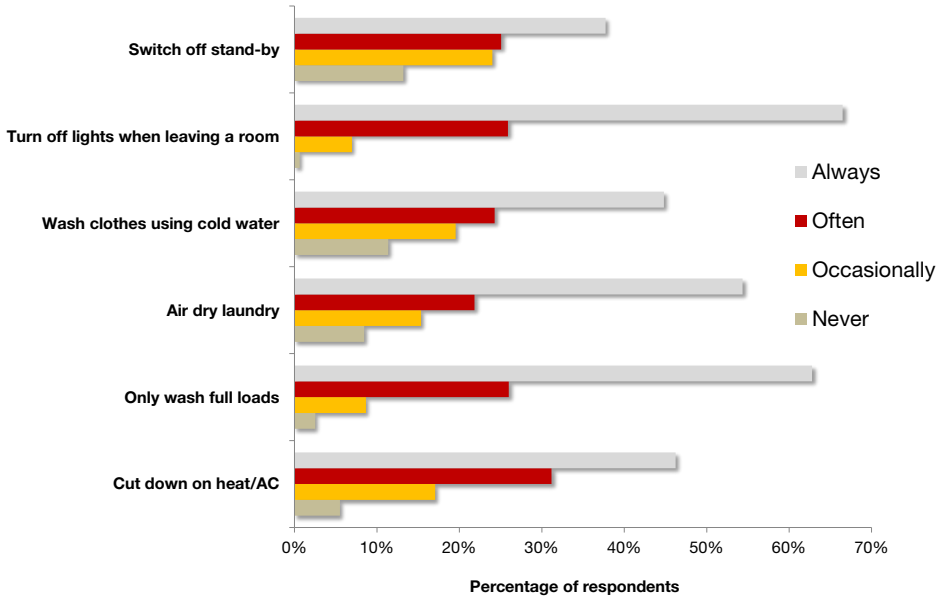
60% of respondents are willing to pay extra for electricity from renewable sources. Yet 45% of those who would be willing to pay more for renewable energy do not have this option. Only between 2% and 10% of households have solar panels, except in Australia and Israel, where investment is much higher (see Figure 3).

50% of respondents would be interested in smart metering but have not been offered the option by their service provider, especially in Spain, Israel and Chile.

25% of respondents claim to take energy costs into account when buying or renting a new home. Countries where respondents report that they take energy costs into account more often (Canada, Sweden and Korea) have all introduced energy labels for buildings.

40% of respondents occasionally" or "never" completely turn off their stand-by appliances, indicating that households can do more to save energy at home (see Figure 4). Women and home owners are the most likely to undertake energy-saving activities.

Figure 4 | **Households can do more to save energy**

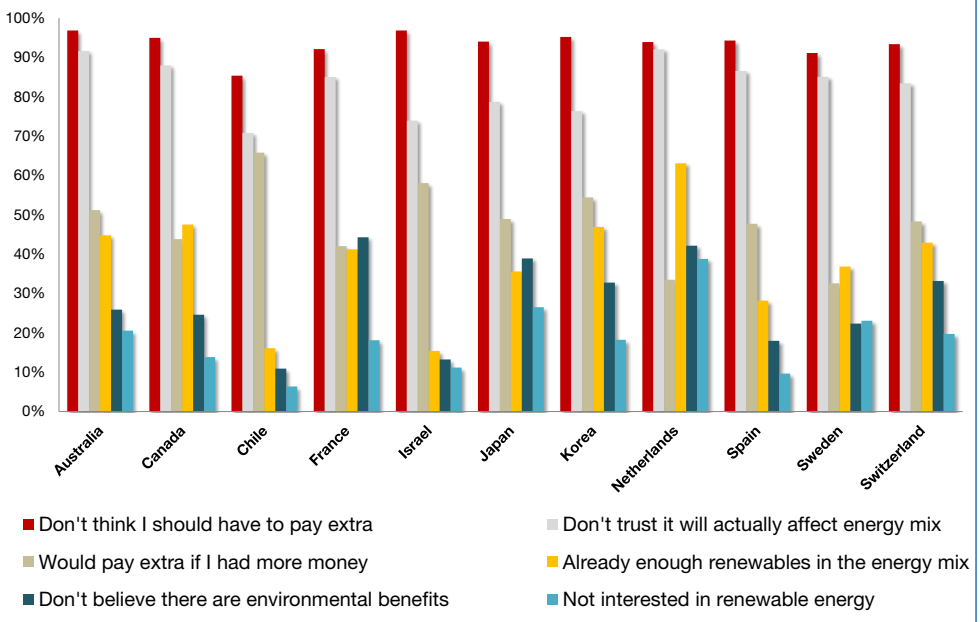


What determines green behaviour?

Prices: the price of energy-efficient equipment is a key factor influencing respondents' purchases in all countries.

Confidence: for example, one of the main motivations for those not being willing to pay anything for switching to renewable energy seems to be lack of confidence that electricity could be entirely produced from renewable sources (see Figure 5).

Figure 5 | **Reasons for not wanting to pay extra for renewable energy**



Information: five countries – Australia, Canada, Israel, Sweden and Switzerland – have relatively high rates of respondents indicating that they "don't know" if services such as smart metering are provided.

Awareness: environmentally-concerned households are more likely to save energy and invest in energy efficient appliances.

Ownership status: owner-occupiers are much more likely to own energy-efficient devices than tenants: they are estimated to be 15% more likely than a tenant to have invested in energy efficient windows, and 19% more likely to have invested in thermal insulation.

Policy implications

The right government support can do much to allow households to act on their willingness to save energy and to use greener energy. For example:

- Take measures to increase consumer trust in service providers' capacity to actually shift generation to renewable sources.
- Carefully target public grants for energy efficient and renewable energy on the most needy groups, such as low-income households and tenants.
- Complement incentive-based measures with information and education targeted at the most sceptical groups.
- Increase awareness of energy conservation in house purchases and rentals.
- Ensure that policies which may increase prices – such as investing in green energy production – are accompanied by measures to ensure that poorer households are not made worse off.

4 Water

Water plays a crucial role in the development, growth and sustainability of local communities. In recent years, water scarcity has become a global environmental problem. Expanding populations and higher demand for water, together with more volatile supplies, have made water management an increasingly important issue for authorities worldwide. Global water use has been growing at more than twice the rate of population increase in the last century and global water demand is projected to increase by 55% by 2050, due to burgeoning needs for manufacturing, energy generation and household use.

How green is households' water use?

Respondents were asked about their water-saving behaviour: turning off water while brushing teeth; plugging the sink when washing dishes; watering the garden in the coolest part of the day; collecting rainwater/recycling waste water; and taking a shower instead of a bath (see Figure 6). They were also asked about their use of water-saving devices: low-volume or dual-flush toilets; water flow-restrictor taps/low-flow shower heads and rainwater tanks. Finally they were asked about their primary sources of drinking water (straight from the tap, bottled water, etc.) and their satisfaction with their tap water.

Questions explored in the survey

- How do environmental attitudes affect water use?
- What makes people choose to save water?
- Who buys water-saving devices?
- Do water charges influence water use?
- Who buys bottled water and why?

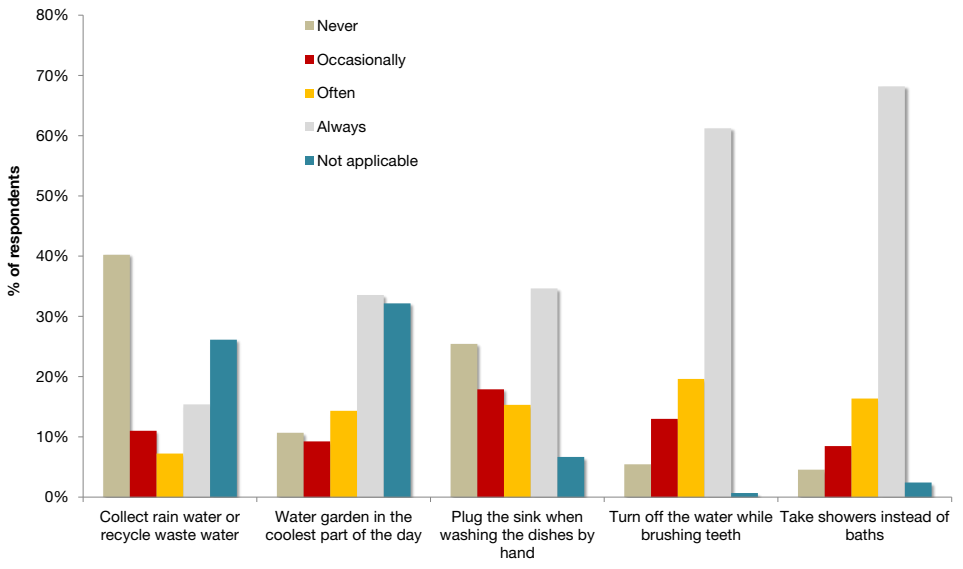
40% of surveyed households never collect rainwater or recycle waste water.

34% of households have invested in low-volume or dual-flush toilets.

41% have invested in water flow restrictor taps or low-flow shower heads. Women and older respondents are generally more likely to save water and to invest in water-efficient equipment.

95% of surveyed households in Korea do not drink the tap water, while in the Netherlands and Sweden the figure is 10%. Households with children under five years old, home owners, and in an urban area are less likely to drink water straight from the tap.

Figure 6 | **Can households do more to save water?**



What determines green behaviour?

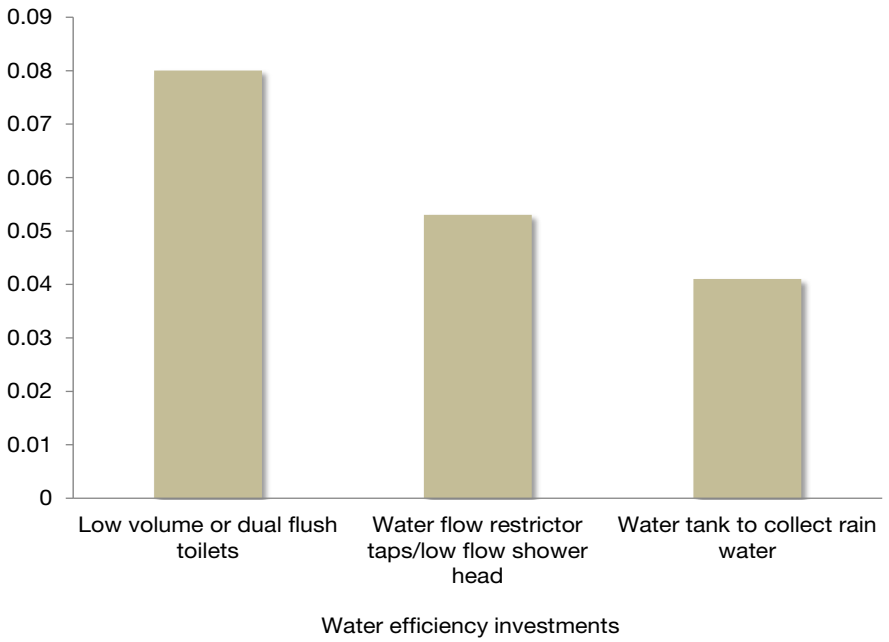
Water charges. Households that are individually metered and whose bill depends on actual water consumption are significantly more likely to save water and buy water-efficient devices (see Figure 7). Among all respondents, 73% of households are charged according to the volume of the water they use. The lowest reported rates of volumetric charges are in water-abundant Canada and Sweden. Chile and Japan have the highest rates.and those living in rented properties buy water-efficient appliances. Bear in mind that general subsidy programmes may be wasteful (if households receive financial support to buy appliances that they would have bought in any case).

Environmental concern. Those respondents who are concerned about the environment and support environmental organisations are more likely to buy water-efficient devices and to use water-efficiency labels, and less likely to drink bottled water.

Income and ownership status. Low-income households more frequently engage in water-saving behaviour, but are less likely to invest in water efficiency improvements. Tenants do less to save water and make fewer financial investments in water efficiency than home owners.

Perceptions of tap water quality. Those respondents who are not satisfied with the taste and the health impacts of tap water are more likely to buy bottled water (see Figure 8).

Figure 7 | **The link between water charging and water-saving investments**



Note: Bars indicate the level of Spearman correlation between water efficiency investments and unit pricing. The higher the correlation the stronger the link between unit pricing and water efficiency investments. The Spearman correlation is similar to a standard correlation (both measure how closely two variables move with each other), but the Spearman correlation is often used to examine the relationships between attitudinal data.

Policy implications

These results show that both price and non-price policies encourage people to reduce water consumption. They also show that environmental attitudes have a significant influence on people's water-saving behaviour and adoption of water-efficient devices. Policy actions include:

- Implement individual water metering across the board, charging households for water based on their actual consumption, including a clear water billing mechanism for households outlining their water consumption and charges.

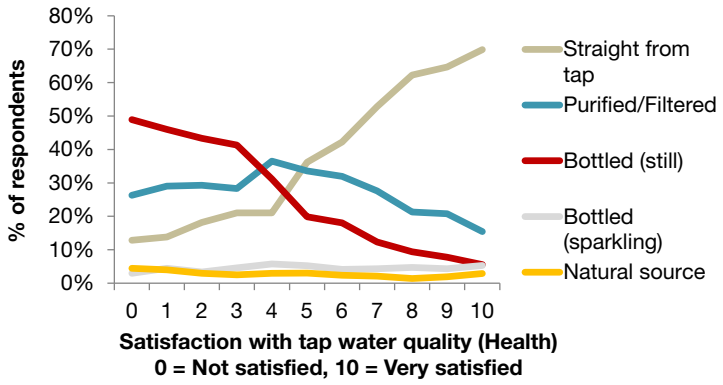
- Use price policies such as water charges in tandem with non-price policies, such as awareness campaigns on the environmental impact of water consumption (including buying bottled water), the things people can do to save water at home, and on how to identify water-efficient equipment. Such campaigns could primarily target men and young adults.

- Expand the use of water efficiency labelling schemes for appliances: of the countries surveyed, only Australia, Israel and the Netherlands currently have such schemes.

- Improve objective information for households on the quality of tap water, for example by distributing leaflets showing the latest water quality data.

- Consider the use of targeted grants and subsidies to help low-income households and those living in rented properties buy water-efficient appliances. Bear in mind that general subsidy programmes may be wasteful (if households receive financial support to buy appliances that they would have bought in any case).

Figure 8 | **How perceptions of tap water quality affect the use of different types of drinking water**



The 2011 EPIC survey covered 11 OECD countries: Australia, Canada, Chile, France, Israel, Japan, Korea, the Netherlands, Spain, Sweden and Switzerland. These pages offer a taster of some of the most notable findings from each of these countries.

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Canadians have one of the highest uses of cars for commuting and for shopping trips – the latter use is possibly because most shops are in out-of-town malls. Canada introduced the ecoEnergy label for personal vehicles in 1999. It provides information on a vehicle's city and highway fuel consumption rating, and the estimated cost of fuelling the vehicle each year.

Respondents from the **Netherlands** display the highest willingness to pay for an electric car, but the lowest for renewable energy. This is mostly due to a perception that there is already enough renewable electricity generation in the supply mix. The Dutch in general appear the most satisfied with the quality of their local environment; 90% of respondents state that they mainly drink tap water.

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French households rely heavily on diesel cars. There is also a high reported intensity of private car use in France despite the country's relatively high population density. The French government uses several incentives to promote renewable energy production. This may explain why France has one of the highest percentages of households reportedly benefitting from government financial support to install solar panels for electricity or water.

Households in **Spain** come top for energy-saving behaviour: electricity has been relatively expensive in Spain and the energy-saving behaviour is a consequence of this. To limit emissions from transport, Spain introduced car-scrapping schemes where car owners received financial support to trade their old cars for more efficient ones.

The use of public transport for daily commuting is one of the highest in **Chile**. Chile appears to have the least availability of recycling/separation services and also has the greatest unmet demand for special electricity options such as renewable energy tariffs, smart electricity meters and reduced tariffs for off-peak hours. It has the lowest reported installation of solar panels.

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Israel performs well in water-saving and investment in solar power. Israeli respondents appear to be the most intensive producers of household waste, with each person generating 69 litres a week compared to 42 litres on average in the 10 other countries. Food waste is of particular concern.

Korea has a low share of renewables in its electricity mix and a relatively high willingness to pay for renewable energy. The share of alternative fuel cars (mainly LPG and natural gas) is largest in Korea. Only 5% of Korean respondents drink tap water. Korea offers a unique example of a national pay-as-you-throw (PAYT) unit pricing scheme, in place since 1995. Surveyed households in Korea generate the least amount of mixed waste per person.

Japanese respondents reported receiving the most support for buying low-emission cars. There is a wide scope for improving energy-saving behaviour in Japanese homes. Japanese respondents are the most likely to report that they "never" or "occasionally" switch off stand-by mode, cut down on heating and air conditioning or turn off lights when leaving a room.

Australia combines active water-saving campaigns with the use of rebates and other incentives to encourage the installation of water-saving devices. The results seem good as Australia has the highest percentage of respondents having adopted low-flow shower heads and taps and water tanks. Australia has the highest reported rate of car ownership, with an average of over 1.6 cars per household.

5 Transport

Society bears substantial environmental costs from individuals' transportation choices. Traffic congestion in urban areas decreases air quality and hinders economic productivity and well-being. Within Europe, traffic-related air pollution has been estimated to be responsible for approximately 3% of all deaths every year. Across OECD countries, road travel by car or bus has consistently been both the dominant transportation mode and the largest transport-related contributor to CO_2 emissions.

How green are households' transport choices?

Average car ownership among respondents is a little more than one car for every two adults. Car ownership is not strongly associated with environmental awareness or concern, although these do have a bearing on car *use* – measured as distances driven weekly – which has a much greater impact on the environment. The decision to use a car depends heavily on the proximity of the destination; environmental attitudes play only a minor role. Men use their cars more than women, and younger people's car use is less influenced by environmental concerns.

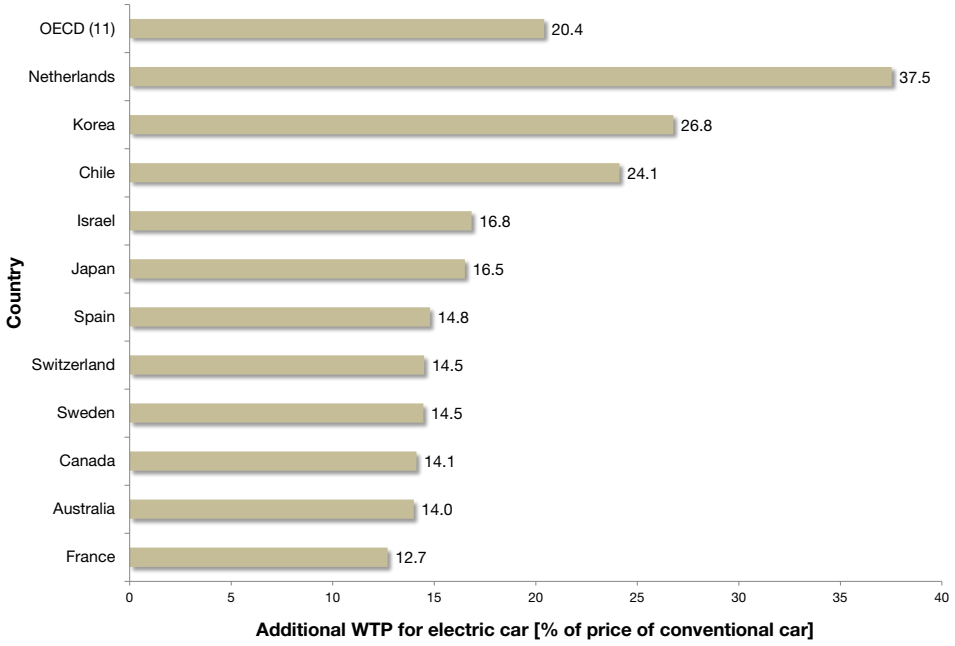
5% is the share of alternative fuel vehicles (LPG, natural gas, electric, hybrid and biofuels) owned across the 11 countries surveyed, while the share of petrol vehicles is 74%.

20% is the additional price, on average, that respondents are willing to pay for an electric vehicle compared to its conventional counterpart (see Figure 9). There is a clear link between willingness- to-pay (WTP) and environmental concerns: those who find it acceptable to bear some of the cost of environmental policies are willing to pay more for an electric car.

Questions explored in the survey

- What's driving car use?
- How does environmental concern affect transport choices?
- Are households willing to pay more for an electric car?
- What factors encourage people to use public transport, walk or cycle?

Figure 9 | **Households' average additional willingness to pay for an electric car**



24% of respondents are not willing to pay more for an electric car. Their main reasons are that they do not think that they should have to pay more for an electric vehicle, as well as the lack of adequate infrastructure (e.g. limited number of charging stations) and the inconvenience of frequent recharging.

190 kilometres is the average weekly distance driven by male respondents; 80km more than the weekly average reportedly driven by women. In the Netherlands, men drive on average more than twice the distance driven by women.

15 minutes tends to be the longest time people will tolerate walking to their nearest public transport stop before choosing to use their cars instead.

What determines green behaviour?

Convenience and time saving. The travel time advantage of the car is by far the most influential factor in households' decision to drive rather than use other travel methods. The convenience of the car can be attributed to the fact that much infrastructure is built for car use – not only the density of streets and highways, but also the spatial pattern of shopping facilities, leisure facilities, residential areas and workplaces. Making public transport more accessible and convenient will therefore reduce reliance on cars (see Figure 10). Switzerland and Japan are the two countries with by far the highest public transport use, measured in person-kilometre per capita.

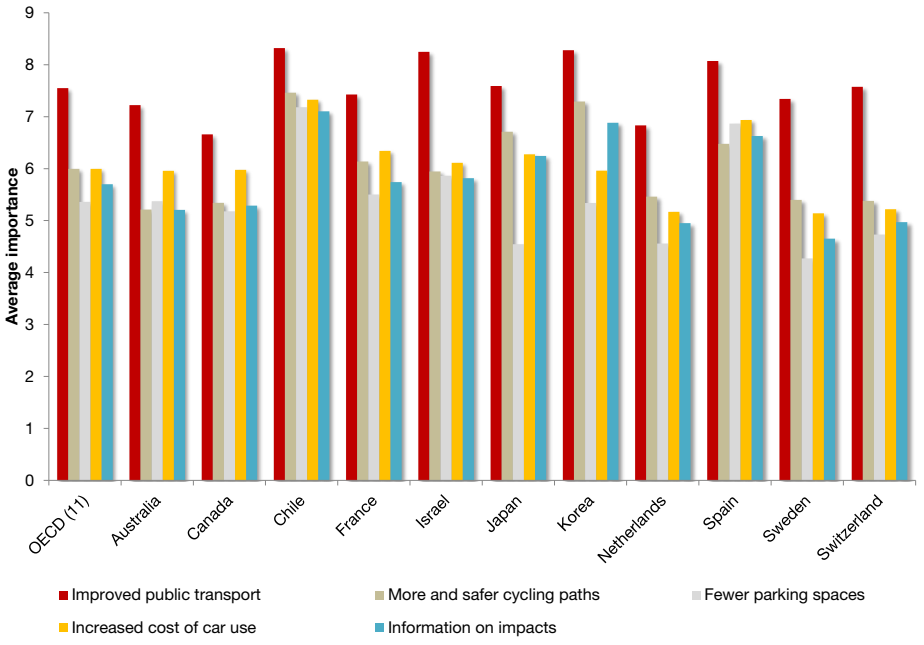
Environmental attitudes play an important but subtle role in households' transportation choices. Households with a greater concern for environmental issues are more likely to use public transport and have a higher willingness to pay for electric cars.

Price is the most important factor for respondents buying a car and largely outweighs environmental attributes. Higher income households tend to buy less environmentally-friendly cars, as other factors (safety, reliability) are more relevant to them. Furthermore, fuel efficiency increases the end price of cars.

Infrastructure. The lack of infrastructure - for charging electric cars, for cycling and walking safely, for efficient public transport systems – are all major barriers to greener transport choices.

> ***Households most frequently cited "improved public transport" as the factor which would lead them to use their cars less***

Figure 10 | **What incentives would help households reduce car use?**



Policy implications

- Ensure intelligent urban planning that brings home, shops and workplaces closer together and reduces the need for cars. Use zoning and incentives to promote local shops and businesses instead of large, out-of-town shopping malls.
- Improve access to public transport and develop infrastructure for alternative modes of transport (e.g. safe walking and cycling, electric car charging).
- Consider the use of subsidies for environmentally friendly cars while bearing in mind that this might ultimately increase car use and fuel consumption. It is also important to assess the efficiency and equity implications of subsidising wealthy households at the same rate as poorer households.
- Provide communication and public education on the environmental impact of fossil fuel-based cars to encourage greener purchases and reduce car use, especially among the younger age groups.

6 Food

In a context of a growing population, rising incomes and lifestyle changes, food production and consumption exert ever-growing pressure on the environment. At the same time, the intensification of agricultural production methods and a number of food scares have raised consumer concerns over food quality. Coupled with concerns about the environment and health, these have induced some people to increase their consumption of more environment-friendly products, including organic food. This part of the survey examines what drives consumption of and household attitudes towards organic food and other products that take animal welfare into account.

Questions explored in the survey

- Why do people choose organic food?
- How much are they willing to pay for organic and humanely produced food?
- Who's wasting food, and how much?
- Does labelling work?

How green are households' food choices?

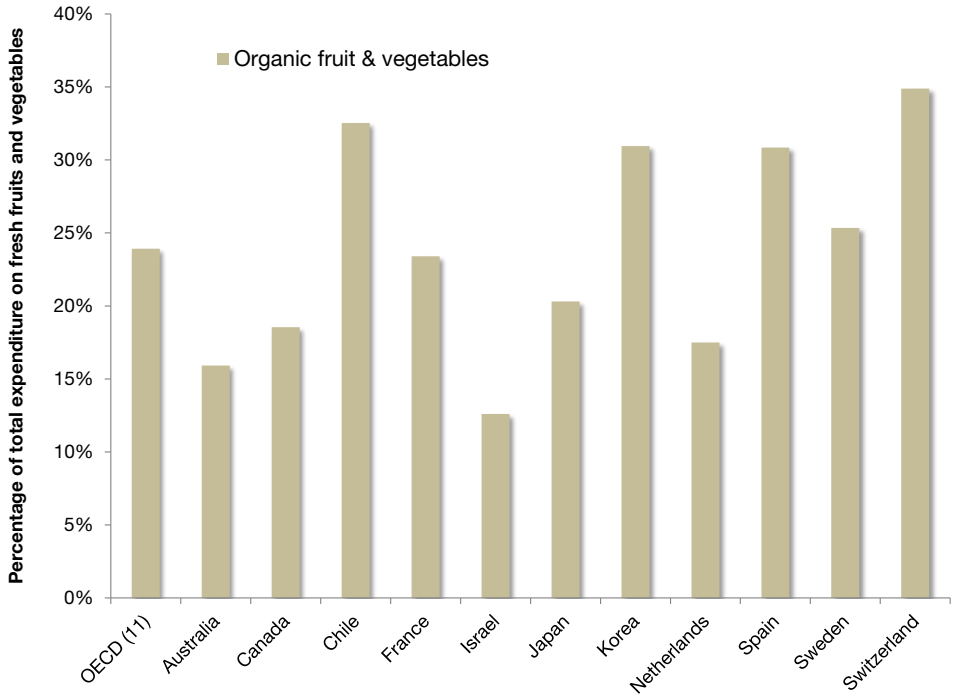
Those who buy more organic fruit and vegetables and humanely-produced meat tend to be driven by environmental concerns; income and demographic factors have less impact, despite often high price premiums for such food. Younger respondents report higher levels of food waste, while older people, the unemployed and those concerned about natural resource depletion are less likely to throw food away.

23% of surveyed households' fruit and vegetable expenditures are reportedly on organic produce (ranging from 13% in Israel to 35% in Switzerland; see Figure 11). This share has increased (except in Australia) since the 2008 survey, especially in France, the Netherlands and Korea. These figures may be overestimations, however, as they are stated by the respondents and not measured using scanner-based data.

32% of households' meat budget goes on products labelled as taking animal welfare into account. The average varies from 23% in Japan and Korea to 53% in Switzerland.

10% is the average price increase people are willing to pay for organic fruit and vegetables. Respondents who are concerned about the environment are willing to pay more.

Figure 11 | **What share of households' fresh fruit and vegetable budget is organic?**



Note: Figures may be overestimated because they depend on respondents' own estimates; there may also be confusion over what constitutes an organic label.

10% of food bought by surveyed households is reportedly thrown away overall. Country averages vary: from 6% in France to 14% in Israel and 15% in Korea.

36% of households on average compost their food waste, ranging from 12% in Israel to almost 62% in Switzerland. Respondents who are more likely to compost are older, have larger households and less income and live in a detached or semi-detached house.

What determines green behaviour?

Price. In all countries, lower prices would encourage respondents to buy more organic food. Those respondents who declared that they were not willing to pay extra for organic fresh fruit and vegetables were asked to state why. In all countries except Korea, the most common response was because "they do not think they should have to pay extra".

Trust and recognition. Trust in the certification and labelling process was the second most important factor cited by respondents. In France and Sweden, more than 90% of respondents recognise the national organic food logo, while in Australia, Canada, Israel, Japan and Spain, less than 30% of the respondents did. About half of the respondents who recognised a logo also used it. Older respondents (55+) are more likely to recognise the national organic label than younger respondents (18-34). Those aged 35 to 44 are the most likely to use the label in their purchasing decisions.

Waste charges. Respondents charged for their waste are 8% more likely to compost their food waste and 5% more likely to regularly purchase food items with less packaging.

Awareness. Environmental concern plays a central role in whether people use and trust organic labels and buy organic food. Those who are concerned about the environment spend more on organic and humanely-produced food. They also tend to throw away less food.

Policy implications

The findings suggest that, in spite of the trend towards more available and cheaper organic products, price is still a barrier to increased demand. Greater awareness may be needed of the higher costs involved in organic and humane farming.

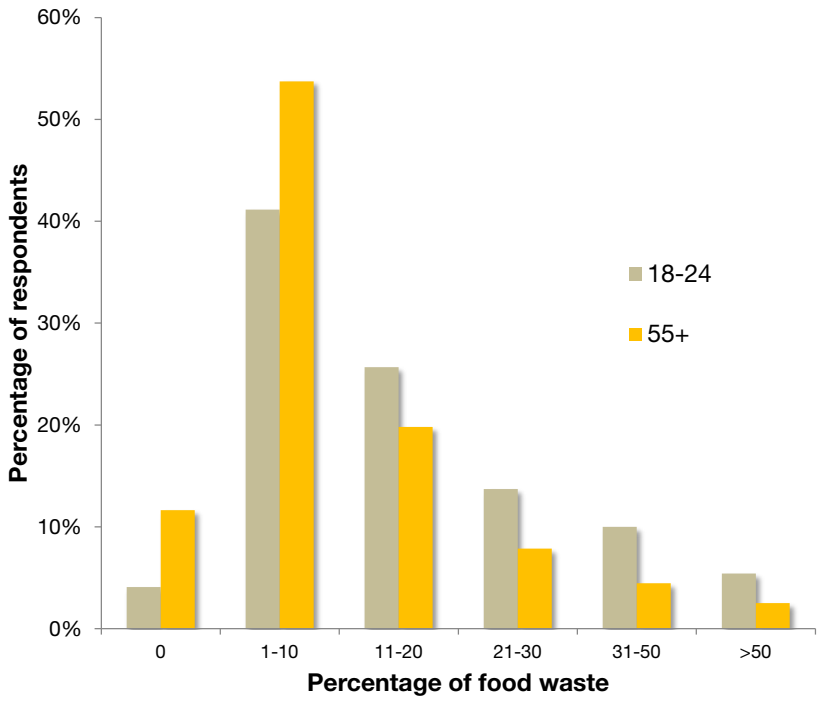
- Consider supply side policies measures which can help to decrease the organic food price premium compared to conventional products.
- Improve communication between the agricultural sector and the general public on the higher costs involved in organic and humane farming.

- Do more to increase awareness and knowledge of the benefits of organic food, in particular among young respondents – especially men – who consume less organic and humanely-produced food.

- Increase awareness of and trust in organic food labels, in particular among young respondents (18 to 34 year olds). The growing number of (private and public) labels for agricultural practices and food quality may have caused some confusion among consumers. In Australia, for instance, there are as many as six different labels for organic food.

- Focus on food waste collection systems in urban areas, and on promoting composting in rural areas. Consider introducing a waste fee based on the volume or weight of waste collected (see next section) to encourage households to waste less food. Target campaigns to diminish food waste towards younger individuals and households with young children (see Figure 12).

Figure 12 | **Younger people tend to waste more food**



7 Waste

Changes in lifestyle, the increasing use of disposable materials and excessive packaging are all contributing to a rise in waste. Waste management is now not only a local, but also a global concern, affecting land and water quality, as well as climate change. Between 1980 and 2005, municipal waste generation (half of which came from households) in OECD countries increased by 2.5% every year, even though the number of OECD households only rose by 0.8% a year. Each person in the OECD generates an average of 2.2 kilos of waste every day, double that of other regions.

How green are households when it comes to waste?

Households are separating out more different types of materials from the general waste for recycling than in the previous study. In 2008, an average of 2.5 materials were separated per household, while the average for 2011 is 3.5 materials. While waste generation increases with household size, the larger the household, the lower the volume of waste produced per person. Respondents living in towns/villages or rural areas produce between 6% and 17% less waste on average than those in cities and suburban areas. Richer households generate more waste, but they are also more likely to separate recyclable materials (though not enough to offset their greater waste generation). Household hazardous waste such as electronic components and (particularly) old or unused medicines are still being disposed of inappropriately, especially by younger people.

Questions explored in the survey

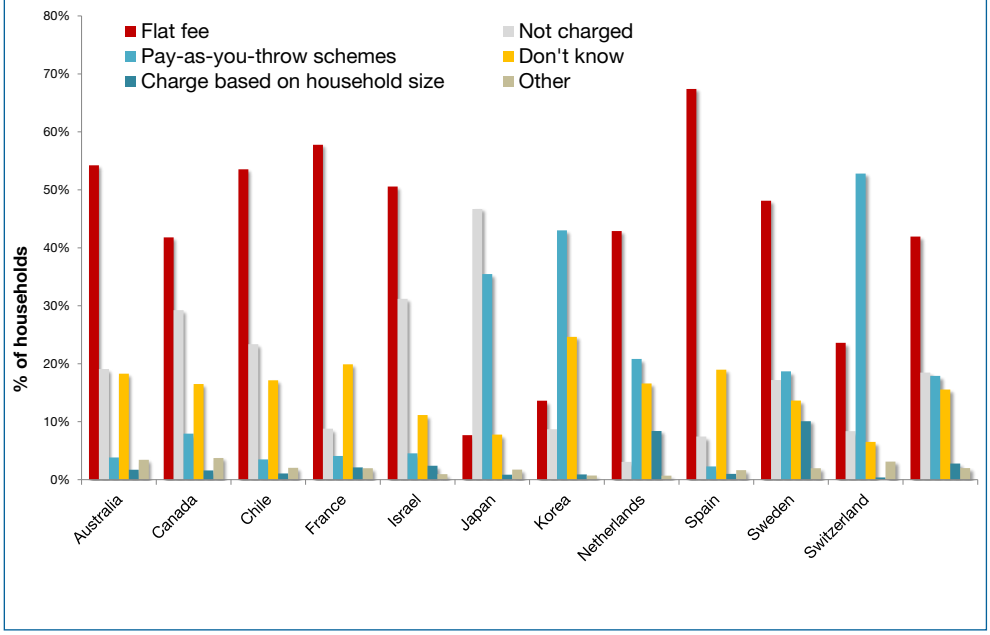
- Who produces the most waste?
- How do environmental attitudes link to waste levels, recycling and waste prevention?
- What are the most effective policies for reducing waste?
- How do households dispose of hazardous waste?

19% of respondents aged between 18 and 24 choose not to recycle their waste.

19% of surveyed households do not know what collection services are available for recyclables in their area.

34% of households throw old or unused medicines out with their general household waste, rather than taking them to be safely disposed of. The figure rises to 50% for the younger age groups in many countries. 12% of respondents reported disposing of their old electrical equipment with their mixed waste collection.

Figure 13 | **Untapped potential for pay-as-you-throw waste charging**



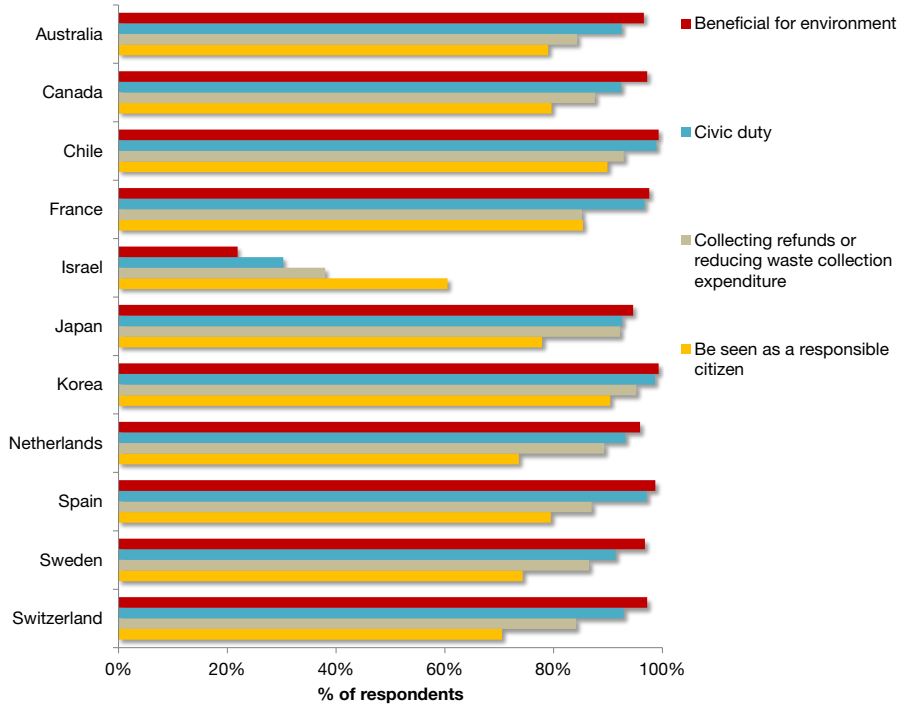
What determines green behaviour?

Waste charges. Households that are charged for the amount of waste they generate tend to throw out between 20% and 30% less than those charged a flat rate. These "pay-as-you-throw" schemes are most widespread in Switzerland, Korea and Japan. Elsewhere their potential remains largely unexploited (see Figure 13). Charging also encourages households to compost and to reduce packaging. A large majority of respondents in most of the surveyed countries indicated "collecting refunds or reducing waste charges" as a major motivation for recycling.

Convenience. The presence of recyclable material collection services reduces waste generation and increases the amount of recyclable waste sorting done by households. In Canada, the Netherlands, Sweden and Switzerland, expanding recycling services from drop-off to door-to-door collection seems to have helped reduce waste volumes by between 23 and 27%. Combining pay-as-you-throw (PAYT) waste charging with waste collection and recycling services is estimated to reduce mixed waste generation by as much as 50% (where there is door-to-door collection), compared to a situation without any separation services or PAYT.

Information. The fact that nearly one-fifth of respondent households do not seem to know what collection services are available for recyclables in their area implies that many recyclable materials are still being landfilled.

Figure 14 | **What motivates households to separate waste?**



Note: The responses varied between 0 (not important) and 10 (extremely important). In this figure, only the percentage of responses that were above 5 (the midpoint) for each of the categories is presented.

Environmental awareness. Concern for the environment is the single most important factor motivating respondents to recycle in all countries except Israel (see Figure 14). Affiliation with an environmental organisation is also the single most powerful predictor for whether respondents used reusable shopping bags (17% more likely), whether they composted food waste (14% more likely), and whether they tried in general to purchase food items with less packaging (20% more likely).

Policy implications

The results of the survey indicate that although current waste policies are helping to divert a proportion of valuable materials from landfill and reduce environmental impacts, these policies can go still further:

- Expand pay-as-you-throw or PAYT systems, which offer untapped potential and ensure that households are aware of their existence: 15% of respondents did not know whether they were charged for waste.
- Use PAYT systems and recycling programmes in tandem: this can have a powerful effect on reducing household waste.
- Introduce policies to encourage retailers to use less packaging and households to purchase products with less packaging.
- Increase the availability of drop-off centres and door-to-door collection of recyclables, and ensure households have clear information on the waste disposal and recycling services available in their area.
- Target specific household groups: the age group producing the most waste varies, but appears to be mainly the 18 to 24 age group.
- Do more to increase safe disposal of hazardous waste, especially old and unused medicines.

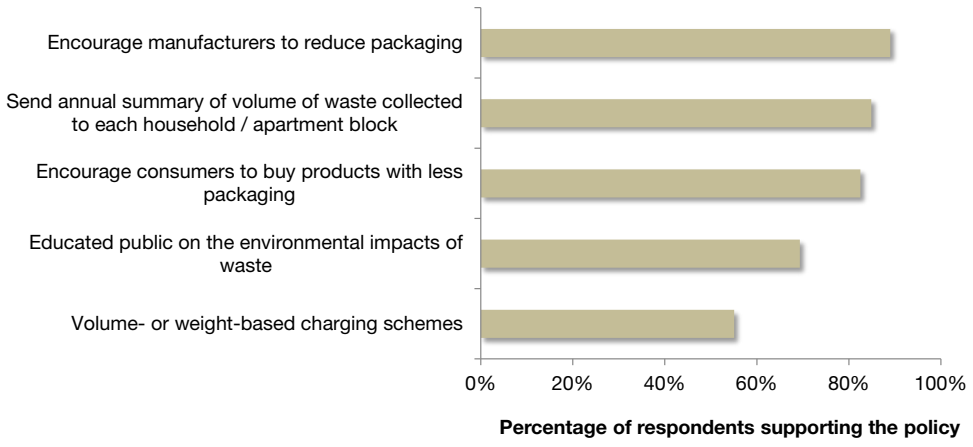
8 Towards successful policy design

This policy paper has assessed a broad variety of instruments used by governments to influence environmental behaviour, including economic instruments (e.g. waste charges, grants for insulation), direct regulation (e.g. water use restrictions, technical standards of appliances), labelling and information campaigns (e.g. eco-labels), as well as the provision of environment-related public services (e.g. recycling schemes, public transport). Often the success of these instruments depends on the attitudes and knowledge of individual consumers and households. Understanding how these interact with exposure to different policies can produce beneficial behavioural changes.

The EPIC survey found that households vary in their exposure to the different types of policies across the countries surveyed. For example, when it comes to charges – shown in this study and many others to be effective in changing behaviour – nearly all households pay according to how much electricity they consume, most of them are charged for water on a per-unit basis, but relatively few are charged for the volume or weight of their waste. This represents untapped potential for increasing waste charges, as discussed in the previous section. Yet when asked which waste policies households support, waste charges were the least popular (see Figure 15).

Unsurprisingly, households are most supportive of measures from which they stand to gain, and least supportive of those which may affect them – especially financially. Nevertheless, despite being the least popular policy compared to other measures, environmental taxes and charges still garner significant support – over 50% in the case of household waste charges.

Figure 15 | **Popularity of different policies to reduce household waste generation**



Realising that what households and governments consider to be the "best" policies do not always coincide is important for successful policy design. The reasons may vary:

- Poor communication of the justification and motivation for the policy.
- Disproportionate impact on vulnerable groups.
- Failure to provide the services to harness individuals' desire to be green.

Policy design can respond in many ways. For example, offsetting the burden of fuel tax increases with reductions in other taxes – such as income or sales taxes – can improve the fairness of these policies, and may enhance popular support. Policy exposure itself may induce a change in attitude – once households are exposed to particular policies, they may be more supportive of them. For example, unexposed households were found to be more sceptical of unit-based charges for waste collection and water provision than households familiar with such systems.

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BETTER POLICIES FOR BETTER LIVES

Further reading

OECD (2011), *Greening Household Behaviour: The Role of Public Policy*, OECD Publishing, Paris, DOI: http://dx.doi.org/10.1787/9789264096875-en.

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kcp4911 @ Flickr Creative Commons, p.16-17 World Map

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Greening Household Behaviour

A review for policy makers

The OECD Survey on Environmental Policy and Individual Behaviour Change (EPIC) provides a unique opportunity to improve our understanding of households' decision making in terms of environmental behaviour in general, and of the role of public policies in particular. This brochure summarises the key policy implications of the 2011 EPIC survey, which covered more than 12 000 households in 11 countries: Australia, Canada, Chile, France, Israel, Japan, Korea, the Netherlands, Spain, Sweden and Switzerland.

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Designed for a wide readership, the OECD Environment Policy Papers distil many of today's environment-related policy issues based on a wide range of OECD work. In the form of country case studies or thematic reviews across countries, the Papers highlight practical implementation experience. They are available in either English or French, with a summary in the other language when possible.

1. OECD (2013), "Climate and Carbon: Aligning Prices and Policies", *OECD Environment Policy Papers*, No. 1, OECD Publishing, Paris, DOI: http://dx.doi.org/10.1787/5k3z11hjg6r7-en.

2. OECD (2013), "The Swedish Tax on Nitrogen Oxide Emissions: Lessons in Environmental Policy Reform", *OECD Environment Policy Papers*, No. 2, OECD Publishing, Paris, DOI: http://dx.doi.org/10.1787/5k3tpspfqgzt-en.

3. OECD (2014), "Greening Household Behaviour: A review for policy makers", *OECD Environment Policy Papers*, No. 3, OECD Publishing, Paris.

Contacts

For further information, please contact:

Walid Oueslati
Team Leader, Empirical Policy Analysis
OECD Environment Directorate
Tel.: +33 (0)1 45 24 19 83
Email: Walid.Oueslati@oecd.org

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