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COUNTRY REPORT UNITED KINGDOM

Views, Opinions and Ideas of Citizens in Europe on Science

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Published in June 2013. The views expressed in this publication are those of the authors and not necessarily those of Ecsite Aisbl or the European Commission.

The VOICES project and the present publication have been funded with support from the European Commission (Grant Agreement No 612210), under the Science in Society Environment [Sis ENV] theme, Coordination and Support Action, of the Directorate-General for Research and Innovation (FP7-Adhoc-2007-13). This report reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

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For more information on the report, the results of the VOICES project, please contact Marzia Mazzonetto (mmazzonetto@ecsite.eu).

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1. Introduction

1.1 The VOICES project

VOICES (Views, Opinions and Ideas of Citizens in Europe on Science) is a year-long, Europe-wide citizen consultation exploring the concept of waste as a resource. It represents an innovative method of integrating public opinion into the 'Climate action, resource efficiency, raw materials' dimension of the Horizon 2020 Work Programmes beginning in 2014.

Funded by the European Commission and led by Ecsite, the European network of science centres and museums, the VOICES project is a response to the Science in Society 2013.1.2.1-1 call on citizen participation in science and technology policy. Citizens are invited to give input to the Consolidation Group that will define the priorities for the next work programme on 'Urban Waste' (call SiS.2013.1.2.1-2).

The main aim of VOICES is to yield valuable insight on methods and procedure for engaging citizen participation to help set the research agenda for Europe's Responsible Research and Innovation framework. The knowledge gained through VOICES will be put to use in similar participatory actions across Horizon 2020.

1.2 Citizen participation in social innovation

A national and European capacity-building initiative, VOICES unites science communication practitioners and academics, and, as such, will result in an effective method through which to consult the public on science and technology related issues.

Compared to many other consultation initiatives, VOICES represents a breakthrough because of its scale (covering all of Europe) and because of the methodological approach used on this wide scale: an approach which makes use of a qualitative methodology, which allows a harvesting and deep understanding of citizens' views, fostering real governance processes and social innovation.

VOICES is also very innovative in its commitment to formally include the results of the citizens' consultations in the main policy document that will shape the priorities of European research. Another unique element is that the knowledge gained with this pilot, in terms of methodology, infrastructure and results, can be used to organise similar participatory actions across Horizon 2020.

1.3 The process

One thousand European citizens participated in focus group discussions about 'Waste as a resource' using a structured VOICES methodology which spans training, implementation and analysis. The methods, infrastructure and results of VOICES are fully documented on an open access portal (www.voicesforinnovation.eu) designed for similar participatory actions occurring throughout Horizon 2020.

VOICES engaged citizens in 33 locations covering 27 EU countries. 28 Ecsite network institutions make up the Third Party task force which organised the 100 focus groups, with approximately ten citizens each, in their respective countries.

Ecsite Project Managers and researchers from the Athena Institute, VU University Amsterdam, were responsible for conducting the focus groups, analyzing public consultations, writing the country and synthesis reports and disseminating their outcomes at public events.

1.4 Structure of the report

In this country report on the VOICES outcomes from UK, the VOICES research methodology is further detailed in the following chapter. In Chapter 3, some specific data is provided on the country's population, on national urban waste figures and on specificities of the participants of the focus groups. Chapter 4 presents the results of the citizens' consultation on waste management at household level, barriers and concerns experienced in prevention and management of waste, and ideas for research and innovation, policy, management and communication. The report ends with a summary and discussion of the findings.

2. Methodology

This section provides general information about the focus group method, and in particular about the VOICES approach. It also describes the structure of the VOICES focus groups and the process of data analysis.

As a qualitative research method, the focus group is increasingly used in political and social sciences, and can be defined as "a carefully planned discussion designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment".[1] An important advantage of focus groups in comparison to other research methods is that participants can respond to and build on the views expressed by the other participants. Because of this interaction, focus groups generate a large variety of opinions and ideas which provide insightful information, while maintaining a specific focus during the discussion. The method provides the opportunity to gain in-depth insight into ideas, values, wishes and concerns of participants and stimulates shared creative thinking. A specific characteristic of the focus group method is that it seeks understanding of a research topic from a particular perspective; in the case of the VOICES project, the perspective of European citizens.

2.1 The VOICES focus group approach

In the VOICES project, a total of 100 focus groups were held, each of them with approximately 10 citizens. Participants were selected by local recruitment agencies, according to predefined selection criteria. The selection criteria were applied in order to obtain diversity in focus group participants, and to represent society at large. General selection criteria with respect to demographic information included: sex (50% men and 50% women), education (low, medium and high levels of education)[2] and employment (employed, unemployed, retired and student). The focus groups were stratified by age using the following categories: 18 to 35 years of age, 36 to 50 years of age and 50+. Other criteria addressed elements relevant to the VOICES project's specific topic, including: participants from urban and non-urban areas[3], diversity of types of municipality (at least five different municipalities, including bigger towns and smaller villages), and diversity of housing situation (flat or house). These selection criteria were applied in all EU member states. Because of the local context and the availability of participants there are minor differences between member states in the resulting composition of focus groups.

In most EU member states, three focus groups were conducted, all in one location. However, all member states with a population of above 25 million (Germany, France, Spain, Poland, Italy and the UK) had two sets of three focus groups each in two different locations, resulting in six focus groups in total in these countries.

The focus groups lasted 3 hours and followed a semi-structured script consisting of an introduction, four main exercises and an evaluation part (see box 2.1). During the focus groups, specific attention was paid to keeping the environment noise-free and providing enough space to relax, walk around and engage in the conversation. Each focus group was led by a moderator, who was in charge of stimulating and guiding the discussion. The moderator's role was also to maintain the focus of the discussion by ensuring that key themes were covered, while managing group dynamics.

Moderators facilitated the discussion by following the focus group script, which was provided to them in advance and contained questions and exercises to guide their work and ensure equal individual input as well as group discussion. Because of their crucial role in the focus groups, all moderators involved in the VOICES project followed a specific 2.5 day training course. The training focused on specificities of the VOICES focus group script as well as on refining important competencies of the moderators' role, including interpersonal communication, process management and understanding of the topic addressed.

In order to capture the data generated during the process, audio and/or video recordings were made of all focus groups. A note taker was also required to be present for the entire duration of the focus groups, in order to record additional data and to assist the moderator. All visual data generated by the participants, for example, individual drawings or collective mind maps, were collected at the end of each focus group and photographed.

BOX 2.1 SUMMARY OF VOICES FOCUS GROUP SCRIPT

INTRODUCTION

The moderator introduces himself/herself, the note taker and any observers and asks the participants to introduce themselves. The moderator then explains the aims and topic of the focus group using a PowerPoint presentation.

EXERCISE 1

The goal of Exercise 1 is to raise the focus group participants' awareness of household waste and related waste management systems. It also identifies what people know and do with respect to their household waste. Participants are asked to draw on an A3 sheet of white paper how they think the waste streams are managed around their house. When they have finished, the papers are collected and taped to the wall. The moderator then asks the participants to explain their drawings and encourages them to elaborate.

EXERCISE 2
Exercise 2 aims to identify barriers and concerns of the participants with respect to current urban waste pathways (including prevention) and to go into more depth on the causes and underlying reasons for the reported barriers and concerns. The moderator shows the participants PowerPoint slides about the four most common pathways of waste and prevention. After this, participants are asked to think about barriers and concerns they experience regarding waste, waste management and prevention of waste and to write two examples of these barriers or concerns down on Post-Its. The Post-Its are collected and for each, the moderator asks the participants to explain what they wrote down and why.

EXERCISE 3
The objective of Exercise 3 is to stimulate creative ideas for improvement and solutions for problems and possibly to translate ideas and solutions into research topics or questions. The moderator introduces the concept of a 'zero waste society' to the participants using PowerPoint slides. The participants are then asked to work in groups and brainstorm about ideas for achieving the aims of a 'zero waste society', focusing especially on what research and innovation would be needed for this. Participants are then asked to present their ideas to the entire group, while the moderator uses a flip chart to list all concrete ideas for research and innovation suggested by the participants. The moderator then asks the participants to reflect further on possible futuristic technical solutions and 'wild' ideas regarding waste management and prevention.

EXERCISE 4
The aim of Exercise 4 is to attribute a level of priority to the research topics formulated in Exercise 3.
Participants are given three stickers, which represent money (1 million each) that they can spend on ideas written down during Exercise 3. They are asked to assign one or more stickers to the ideas that they feel should be prioritised because of the importance of the problem it addresses and/or the quality of the solution it provides. Once the participants have assigned their stickers, a plenary discussion is held to talk about which ideas got the most stickers and why.

EVALUATION
The moderator ends the sessions and asks the participants to share feedback on their experience taking part in the VOICES focus group. Participants are also asked to fill in an evaluation questionnaire.

2.2 The VOICES approach to urban waste

In the focus groups, citizens of Europe were consulted on the topic 'Waste as a resource'. Urban waste is defined as solid waste collected by or on behalf of municipal authorities and disposed of through the waste management system. Most of this waste is produced by households, although similar waste from sources such as commerce, offices and public institutions are included. Consumer products disposed of by citizens, like clothes, electronics and furniture etcetera, are also considered urban waste. Industrial waste is not considered urban waste and is outside the scope of this project. On average, each of the 500 million people living in the EU throws away around half a tonne of household rubbish every year.[4] This amounts to 70 million truckloads of household rubbish for the EU as a whole every year (one truckload is considered to be 3500 kg, the maximum weight for a truck). All this waste has a huge impact on the environment, resulting in pollution and greenhouse gas emissions that contribute to climate change, as well as significant loss of materials - a particular problem for the EU, which is highly dependent on imported raw materials. Current EU policy aims to reduce both the environmental impact of waste and the use of raw materials needed for production processes. Nowadays, the challenge of urban waste is approached from two perspectives; the waste hierarchy and the life-cycle approach. These combined approaches are the building blocks of the current thematic strategy on waste.[5]

In order for the results of the focus groups to be translated into outcomes which are relevant and beneficial for European research, the VOICES focus group design explicitly uses these same two approaches in presenting the topic of urban waste and in structuring the exercises. The vision of a 'zero waste society' is used as a

focus for the participants while thinking about possible innovations and the techniques and knowledge necessary to develop them.

The waste hierarchy is initially depicted as a pyramid with a wide base representing disposal in a landfill, a second layer representing recovery of energy through incineration, a third layer representing recycling, a fourth representing reuse and the top (and smallest one) representing prevention. This reflects the current situation of waste management in Europe. In order to achieve a 'zero waste society', this pyramid should be turned around and its top, prevention, should become very wide while its base, landfill, very narrow.

The five-step waste hierarchy can be used as a rule of thumb when choosing between options of waste management, with prevention as the most preferred and disposal in landfill as a last resort. However, all products and services have environmental impacts in various stages of their existence. To avoid shifting negative impact from one stage to another, the life-cycle approach is also considered. Life-cycle thinking involves looking at all stages of a product's life - from the extraction of raw materials for their production to their manufacture, distribution, use and disposal - to find out where improvements can be made to reduce environmental impacts and use of resources.

2.3 Analysis of the focus groups

After each focus group, a summary report was written by the moderators based on the note taker's notes and the information on the flip charts. A draft of this summary report was sent to the focus group participants who were asked to comment on it. Moderators collected any feedback and included it in the final version of the summary report as an annex. The audio recording of each focus group was transcribed word-for-word and translated into English for analysis. The translated transcripts were coded and analysed using MaxQDA, a programme for qualitative data analysis. For the analysis of the data, both structured analysis as well as open coding were used. Structured analysis was carried out by using a predesigned coding sheet based on preliminary research. This type of analysis allows for all relevant outcomes to be extracted from the raw data. Open coding runs parallel to the structured analysis and allows for insights unforeseen by preliminary research to emerge. The summary reports of the individual focus groups have been used to validate and complement the analysis.

2.4 Ethical issues

At the beginning of the focus groups, all participants were asked to sign an informed consent form providing information on the topic and aims of the focus group. It was explained that participation was voluntary and participants were free to withdraw at any time, without giving reason. The form obtained participants' approval for audio and video-recording of the focus group, for the use of the resulting data for research purposes, including the use of anonymous quotes, and for data storage for five years. All data were processed anonymously.

[1]Krueger R.A. (1994). Focus Groups: A Practical Guide for Applied Research. Sage: Thousand Oaks, California

[2]The typology of low, medium and high education level is based on the International Standard Classification of Education (http://en.wikipedia.org/wiki/International_Standard_Classification_of_Education)

[3]The urban-rural typology is based on the new urban/rural typology developed by the European Commission (http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Urban-rural_typology)

[4]Questions and Answers, Thematic Strategy on the prevention and recycling of waste and the proposal for the revision of the Waste Framework Directive (Available at: http://ec.europa.eu/environment/waste/pdf/faq.pdf)

[5] Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee of the Regions on the Thematic Strategy on the Prevention and Recycling of Waste, Brussels, 19.1.2011, COM (2011) 13 final; EU Waste Policy - The Story behind the strategy, 2006

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3. Country relevant data - United Kingdom

This chapter of the report presents relevant data about the country and local focus groups. This includes demographic data, data related specifically to local waste management and information concerning the setting of the local focus groups.

3.1 Demographic country data

In terms of population, the United Kingdom is one of the largest EU countries with over 62 million inhabitants. More than 70% of the inhabitants live in urban areas.

Table. 3.1 Population Data[6,7,8]

		2011	
Population at 1 January		62 515 392	
Population as percentage of EU27		12.4%	
Gross Domestic Product (PPP)		27 300 Euro	
Population urban-rural typology	Urban	44 187 000	71%
	Intermediate	16 032 000	26%
	Rural	1 808 000	3%

3.2 Factsheet on waste

The amount of municipal waste generated and treated in the United Kingdom is higher than the average amount of waste treated in the EU27. The UK ranks 8th on the EU27 ranking list on Municipal Solid Waste Recycling (MSW). In 2001, 80% of the generated waste in the United Kingdom was landfilled, and this was reduced to 49% in 2010. There is a high level of confidence that the 50% MSW recycling target set by the EU will be met by 2020.[9]

Table 3.2 Municipal Waste[10,11]

		United Kingdom		EU27 average	
Municipal waste generated (kg per person)		521 kg		502 kg	
Municipal waste treated (kg per person)	Total	518 kg		486 kg	
	Landfilled	254 kg	49%	185 kg	38%
	Incinerated	62 kg	12%	107 kg	22%
	Recycled (material recycling)	130 kg	25%	122 kg	25%
	Composted (organic recycling)	73 kg	14%	73 kg	15%

3.3 Composition of the focus groups

In the UK, six focus groups (FGs) took place on the weekend of 23rd March 2013: three of them in London at the National History Museum, moderated by Daniel Wormald, Quality Learning Consultant and Curation Manager; and three of them in Newcastle at the Centre for Life science centre, moderated by Naomi Foster, Public Engagement Officer.

In total, 60 people (29 male and 31 female) participated in the six FGs. The age of the participants ranged between 19 and 68 years old: 20 participants were aged between 18 and 34 years; 20 between 35 and 50 years and 20 were 51 or older. Educational levels were diverse, with 17 participants with a high level of education, 20 a medium level and 23 participants with a low level of education. 36 participants had a job, while 12 were unemployed, 10 were retired and 2 were students. Of the participants, 62% live in a house and 38% in a flat. Approximately 65% are from urban areas and 35% from intermediate areas. Details of the composition of these focus groups are presented in the table below.

Table 3.3 Composition of the Focus Groups[12]

		L FG1	L FG2	L FG3	NC FG1	NC FG2	NC FG3	TOTAL
Participants	Total	10	10	10	10	10	10	60
Gender	Male	7	4	4	4	5	5	29
	Female	3	6	6	6	5	5	31
Age	18 - 35	10	0	0	10	0	0	20
	36 - 50	0	10	0	0	10	0	20
	50+	0	0	10	0	0	10	20
Education	High	4	0	3	5	3	2	17
	Medium	5	5	1	1	3	5	20
	Low	1	5	6	4	4	3	23
Employment	Unemployed	2	3	0	3	3	1	12
	Employed	6	7	5	7	7	4	36
	Retired	0	0	5	0	0	5	10
	Student	2	0	0	0	0	0	2
Housing	Flat	5	3	4	4	4	3	23
	House	5	7	6	6	6	7	37
Area	Urban	6	6	7	7	6	7	39
	Intermediate	4	4	3	3	4	3	21

[6] Eurostat Statistics Database Online (http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database)
[7] Eurostat Newsrelease (http://europa.eu/rapid/press-release_STAT-12-51_en.pdf)
[8] The urban-rural typology is based on the new urban/rural typology developed by the European Commission (http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Urban-rural_typology)
[9] European Environment Agency (2013). "Managing municipal solid waste - a review of achievements in 32 European countries" EEA Report No 2/2013 (http://www.eea.europa.eu/publications/managing-municipal-solid-waste)
[10] Eurostat Newsrelease (http://europa.eu/rapid/press-release_STAT-12-48_en.pdf)
[11] The reported quantities of waste *generated* and *treated* do not always match exactly due to one (or more) of the following reasons: Estimates for the population not covered by collection schemes; Weight losses due to dehydration; Double counts of waste undergoing two or more treatment steps; Exports and imports of waste; Time lags between generation and treatment (temporary storage)
[12] L = London; NC = Newcastle-upon-Tyne; FG = focus group

4. Results

This chapter describes the overall results of all focus groups held in the United Kingdom. The chapter includes three sections, which are structured according to the exercises of the focus groups. The first section provides insight into what people think and do with respect to waste management at the household level. The second section provides an overview of barriers and concerns of the participants with respect to current urban waste prevention and management, and identifies underlying reasons for the reported barriers and concerns. The third section presents participants' ideas for research and innovation needed in order to realise a 'zero waste society', including concrete information on research category, the aim of the research, the proposed target group and the perceived priority of the research idea. Participants' ideas for policy, management and communication are included as well. Throughout the results, quotes of focus group participants are provided for illustrative purposes.[13]

4.1 How is waste managed at household level?

This section describes what people know and do with respect to household waste. It includes four parts. First, an overview is given of the types of waste that are generally collected separately and those that goes in the general bin. The second part provides insight into how the waste is collected, while the third part describes what participants think happens to the waste after it is collected. The fourth part describes whether people deal with waste as they are supposed to and to what extent they think waste management is conveniently organised.

4.1.1 Waste separation

Most participants have access to facilities for separating their waste. They typically described four or five waste streams (a waste stream is defined as one type of waste that is collected separately, covering the majority of their household waste) including: paper, cans, glass, plastic and residual waste. The exact organisation differs for each household. A household generally has several waste bins of different colours. Each waste stream has its own colour bin assigned, although the colours differ according to the municipality. Usually, one bin is used for all recyclable waste made of paper, glass and plastic. When municipal bins are not provided, bags and/or boxes are used to separate waste in the household.

Chemical waste, large waste items, clothes and medical waste are disposed of separately in various ways. Food waste is not collected separately and participants did not know if there were any facilities for this. Some participants previously used small composters, but they are no longer in use. In some households, food waste is still used for composting, but more often it is thrown in the general waste bin.

People's housing situation influences their household waste management. For example, flats often have facilities for recycling downstairs, sometimes even with someone employed to sort it. Other flats have no facilities for separating waste at all, while family houses are usually allocated a certain number of bins or bags per household. One participant had recently moved to a new place, only a few miles away, and indicated that the systems were very different.

Some participants have no access to facilities for separating their waste and therefore do not separate at all.

[13] Abbreviations used in quotes: FG# = number of focus group, P# = number of specific focus group participant, PX = number of focus group participant unknown, M = Moderator.

4.1.2 Waste collection

Many participants found methods of waste collection quite complex when different waste types are collected separately. Designated bins or bags for a specific waste stream are generally collected from the house, usually once a week or fortnightly. In flats, the waste is usually located on the ground floor of the building, where it also gets collected regularly. When glass is not collected from the house separately, it can be brought to a bin next to a shop or a bottle bank (a container where bottles can be deposited for recycling).

Garden waste and food waste is only collected in some counties either by separate collection or with a special bin. Households are sometimes charged by the council for this special bin. Otherwise, people have to bring them to a specific location themselves. Garden waste was said to be collected in the summer period only. Some participants take matters in their own hands by recycling organic waste themselves (e.g. composting garden and food waste for their own garden).

Batteries are usually collected in special facilities at various public places, like shops or libraries. Scrap metal and electrical waste might be collected from the house by people who will sell it again. Manufacturers might take away old appliances, like old fridges and freezers, and in some cases even take away packaging of the new appliance. There are several ways for people to handle their large waste items, depending on their municipality. Sometimes it is possible to have them collected by the council or picked up by passers-by. There might be a maximum number of times for collection per month or year, or specific days when people can place items outside and have them picked up. This collection is free of charge in some counties; others charge a fee. Some households need to bring this waste to a special site (the 'local tip'). Chemical and electrical waste can also be deposited at the local tip.

Reuse is institutionalised in several ways. Charity organisations might collect unwanted items that are still in relatively good shape from the house. One example is charity bags, in which clothes, toys, shoes, household items etc. are collected. Items for reuse can also be taken to a charity shop or church. There are also websites, like Freecycle[14], that help to give unwanted items a new life through reuse. Some (primary) schools accept certain types of waste for reuse, like cardboard boxes and egg cartons. One participant mentioned bringing newspapers to the vet for use during surgery. Medical waste is also mentioned: this is taken back to the doctor.

4.1.3 Knowledge about waste pathways

Most participants were not certain about the waste pathways after disposal of their waste. Some guessed or knew that their general waste went to landfill. Participants generally did know that electrical items are stripped for metals and other reusable parts; for example, old phones are broken down for the gold they contain. Some knew that grass and food waste can be used for composting; this waste is composted and sent to gardeners or farmers, or sold commercially. There is even the possibility to collect a bag of this compost at the council to use in gardens; this is free of charge.

Participants expressed several other ideas about waste pathways. One participant mentioned that gas from landfill is used for other purposes, although no specific purposes were mentioned. It was also mentioned that a certain incinerator in the area is used to heat a cathedral. Finally, some participants believed that the municipality earns money by collecting glass separately.

Interestingly, most participants seemed suspicious about whether recycling actually took place. It could be that waste merely gets collected separately, but then is recombined and sent to landfill by the municipal authority.

[14] The Freecycle Network is a non-profit organization, managing a worldwide network, aiming to divert reusable goods from landfills. It provides a worldwide online registry, and coordinates the creation of local groups and forums for individuals and non-profits to offer and receive free items for reuse or recycling.

4.1.4 Waste management behaviour and convenience

The extent to which people separate and recycle correctly differs greatly between counties. In some counties, the system is relatively easy and people do not have to separate a lot, while in other counties people feel they have to make a lot of effort to recycle. Even when participants do have the facilities, some people admitted that they do not recycle or that they know people who do not recycle. Some admitted that, often, all waste will end up in the general waste bin or that they hide waste in a certain bin, knowing it should not be in that one. Sometimes it is unclear where the waste should go, for example used cat litter. In cases like this, the waste generally goes into the residual bin, even when this is not correct. Batteries should be brought to a shop or local tip, but some throw them into the general waste bin as well. It seems to be common practice that residents of a flat do not dispose of cardboard boxes properly. Instead of flattening and recycling them, they stuff them down the chutes.

Quite a lot of participants said they do recycle. They follow the guidelines because they feel they should or because it is part of their daily routine. Interestingly, those people believe that others also take recycling seriously. A few participants indicated they are very happy with the facilities in place. It is considered convenient to have one bin for all recyclable waste as it does not require too much thought.

4.2 Barriers and concerns regarding urban waste

This section provides an overview of the participants' barriers and concerns with respect to current urban waste and identifies underlying reasons for the reported barriers and concerns. The section consists of three parts. The first part, 'Waste prevention and production', focuses on barriers and concerns related to goods in the phase before they enter the household including both waste prevention and production. The second part, 'Waste management in the household', addresses goods and waste in the phase while they are in the household. The third part, 'Waste disposal and pathways', describes barriers and concerns related to the phase in which waste is disposed. Relevant issues related to urban waste management that could not specifically be related to the three parts mentioned before are described in the fourth section, 'Other urban waste issues'.

4.2.1 Waste prevention and production

When talking about waste prevention and production, many barriers and concerns regarding packaging were mentioned. First of all, many participants indicated that a lot of packaging is unnecessary and thus that too much packaging is used. The following examples were given: a box of cereal is already packed in a plastic bag, but then also wrapped in a cardboard box; or the bag of cereal only takes up half of the space in the cardboard box. It was also noted that packaging is often not made out of recyclable materials; e.g. manufacturers use multiple types of plastics, some which are not recyclable. Moreover, some participants worried that packaging is made from chemicals that are bad for the environment. Participants thought that manufacturers and advertisers use a lot of packaging to make the product more attractive and persuade consumers to buy it:

> *"The problem is, the manufacturers and advertisers are making us buy their products because you only get the products on the shelves. You don't get plain bottles on the shelves, you only get pretty bottles on the shelves." (London FG2, P4)*

Participants also expressed the concern that producing all the packaging costs a lot of money, which is added to the price of the product. Getting rid of the waste costs money as well:

> *"It's the actual producing of the materials in the first instance. Which must be adding a cost to what we're buying, and then we've got the additional cost of getting rid of all that rubbish." (Newcastle-upon-Tyne FG3, P8)*

Another concern is that the shops often use a lot of plastic carrier bags, which is not necessary, according to several participants:

"Well, you can just take an ordinary shopping bag." (Newcastle-upon-Tyne FG2, P2)

Furthermore, there is a lack of alternatives to allow consumers to prevent waste. Supermarkets give no option other than buying products with a lot of packaging. Everything you buy is covered in plastic. There are alternatives to supermarkets, for example farmers' markets, where you can buy vegetables without packaging or milk deliveries where you can have your glass milk bottle replaced. But those alternatives are considered too expensive and therefore unsuitable.

Many participants pointed out that producers are not the only ones to blame. We live in a 'lazy society' and people want things to be pre-made and pre-packaged, because it is easy and quick:

"If you cook from scratch then you're not using processed food, foods in packaging. But lots of people haven't the time, if you work full-time." (London FG2, P2)

It was also said that people do not really care about waste and so a lot of waste is produced.

Lastly, one participant expressed the concern that it might be impossible to prevent the production of waste:

"[...] Doubts that we have the technological ability to prevent waste from ever occurring, so that would be a barrier to prevention." (London FG2, P1)

4.2.2 Waste management in the household

Although many participants said they recycle at home, they still faced many barriers and concerns with respect to disposing of their waste appropriately. An important barrier that came up during all focus groups is that recycling is complicated. Not only do participants find the waste management system very complex, sorting household waste takes a lot of effort, for several reasons. First, it is complicated to go through all the waste to separate it. Second, mixed packaging makes it difficult to separate waste, for example tops of bottles are too difficult to unscrew and separating cartons into cardboard and plastics is hard to do. Third, some participants want to wash bottles and tins, because of the smell. But since people are on metered water, this was considered problematic by the participants.

In addition to the abovementioned barriers, other obstacles to recycling were mentioned. When waste is separated, it can pile up in the house. In addition, separating waste was seen as inconvenient because of several other problems. For example, when the bags or bins are not properly closed, the paper can get wet and heavy and tins can get filled with water, so the person carrying it through the garden can get wet. And, as some participants explained, when in a hurry, or during bad weather, it is simply much easier to put waste in the general waste bin.

Many barriers and concerns were raised with respect to waste bins. Many participants mentioned that the bins, boxes or bags are not big enough to collect the recyclable waste or that bins are not collected often enough. It was indicated that the bin for residual waste is big enough, but that the bin for recycling is too small. In some counties, bins are not emptied when the lid is open. But when the bin is not emptied, people cannot separate their waste because there is no bin space until the following week. What bothered some participants is that often the packaging cannot be compressed and it takes up a lot of space in the bins. Keeping a small bin for food waste in the kitchen is seen as inconvenient. Some participants do not like to have a small bin in the kitchen. Others mentioned the unpleasant smell of the waste. Another issue with food waste is that many participants do not like to leave it outside for two weeks, until it is collected; especially during the summer months, as it might attract animals like foxes. Moreover, the bins take up a lot of space in the house and people feel that the bins look untidy. Several participants explained that the wheelie bins have to be taken through the house. This leaves a mess, since there might also be slugs on them.

Another important barrier to separating waste is people's lack of information. Participants indicated that they

(and other people in their municipality) tend to throw everything in the general bin, because they are not aware of the system or what the council does. Some participants indicated that they do not know how to deal with waste properly. It is difficult to know which materials are recyclable and which are not. There are labels for this, but they are often difficult to understand. For example: should perfume bottles be thrown in bottle banks? What should be done with cat litter?

"Cat waste? I looked it up and... well, clearly you don't recycle it... you're not meant to put it into your normal rubbish. And you're not meant to flush it down the toilet, so....I'm not entirely sure what their policy is on that. But I just put it in the bin." (Newcastle-upon-Tyne FG 1, P4)

Various participants admitted they are too lazy or cannot be bothered and for that reason do not separate their waste. They said they are unaware of the incentives to dispose of waste according to regulations. Participants also mentioned that many people do not care about the environment and for that reason they do not recycle.

The aforementioned barriers are not the only reasons people do not dispose of waste correctly. In some cases they just do not have the facilities in the apartment building or in the neighbourhood to do so.

4.2.3 Waste disposal and pathways

Participants mentioned a number of flaws in the waste management system that keep them from separating their waste. In some cases, the recycling bins are not easily accessible. This also concerns tips. For some participants, they are simply too far away. For people without a car, it is difficult to bring large items to the recycling centre. In addition, some participants complained that the council charges them for waste collection. For areas with a high density population, it is not possible to have bins for separating waste, because there is no space. A specific example of inefficiency of the system is that the council refuses to place bins for compost, because of health and safety risks.

Many participants pointed out that waste is not collected often enough; this might discourage people from recycling and they simply put everything in the bin that is collected that week. Some participants indicated that effective waste disposal is hampered by a lack of national policy. Currently, it differs per county:

"Depending on what area you live in, and what kind of council, it is by political party, determines what type of system you get." (London FG 1, P8)

Another issue regularly referred to is financial constraints: participants do not want to pay a large amount of money to 'do the right thing.' For example, it was mentioned that there might be a charge for large items to be collected and when you want to bring your large items to a tip, you might need a permit. People are fined if their bin is not put out correctly. If the lid is open, the dustmen might refuse to take it.

"They won't take it if the bin's too heavy." (Newcastle-upon-Tyne FG 1, P7)

As a result people dump their waste elsewhere, e.g. on the street.

Many participants complained that the information provision about waste collection is insufficient: it has to be clear which bins are collected on which day. Many concerns about what happens to the waste were raised in the focus groups. Participants wondered if their actions really make a difference. They expressed the belief that even after they put all the effort into recycling, in the end it will all go to landfill. Their lack of knowledge about what happens to waste made many participants concerned about several things: what are the effects of landfill on the long term? How is chemical waste, like drugs, handled? What are the effects of putting one item in the bin that should not be in there? Does it jeopardise the whole of that bin? They question what happens to waste that is not recyclable: does it go to landfill? Participants regularly emphasised that they want to have more information about the waste pathways.

4.2.4 Other urban waste issues

During the focus groups, some more long-term concerns were discussed. Several participants stated that they worry about the effect of waste on the environment: poisons and toxins that end up in rivers; the ozone layer is in danger and there are countries that are not concerned and the fumes from burning or transforming waste, such as plastics, might cause a lot of pollution.

"What worries me is what's going on with that, and how it's being controlled. How the fumes and things from plastic, where's that go? Cause obviously there is fumes off plastic." (Newcastle-upon-Tyne FG 1, P6)

They also saw the need for a more efficient waste management system, as the population continues to grow. Finally, some participants wondered if the whole waste management process is not much more energy-consuming than putting everything in landfill. In that case, it might not be better to recycle. The same issue was raised for the costs of the system.

4.3 Citizens' ideas on how to realise a 'zero waste society'

This section presents participants' ideas for achieving a 'zero waste society'. A distinction is made between ideas related to environmental sciences and technology, and ideas related to policy, management and communication. Below, these ideas are described separately in tables. For each idea in the table, the research category is mentioned as well as the aim of the research and the proposed target group. In addition, the priority of the research idea as perceived by the participants is indicated in the tables, using stars to indicate the number of stickers assigned to a specific idea by the participants. Only ideas that were prioritised by the participants are described in this section. Ideas that were not prioritised are included in the full list of research ideas which is provided in Annex 1.

4.3.1 Environmental sciences and technology

TECHNICAL, PHYSICAL, CHEMICAL, ENGINEERING

For waste management in the home, convenience is an important aim for participants. Many participants are excited about the idea of machines to assist them in the process of managing waste properly at home, especially regarding the different types of recyclables. An example was given by a participant who would like to:

"[...] Have a machine that automatically will recycle different parts and then clean it to the point where it can be used again. I don't know, yes, ultra-fission ways of separating raw materials, yeah." (London FG 1, P8)

In general, technical innovations related to the effective management of waste in the household received high priority (see Table 4.3.1). Most of the envisioned devices help sorting, cleaning and/or compressing waste. Sometimes the collection and transport of waste is also taken into account, which results in various ideas related to (underground) infrastructure to take the waste to be processed.

In the focus groups, several versions of a personal waste disposal unit were proposed, receiving the highest priority from the participants. A personal waste disposal unit should fit in the house and dispose of waste in an effective way. It should sort recyclables and residual waste and ideally create something useful from it. Its output might be secondary raw materials, ready-made items or energy in the form of heat or electricity. Voice control would be an interesting extra feature.

"[PX] We have microwaves now, so we cannot be that far off from personal waste disposal. An electronic machine, of some sort, larger than a microwave. You can put it in there, push the button and Whirrrrr!

[PY] If you could just speak to it and...

[P4] It could be something else that works on the atoms, maybe turn it into useful stuff rather than just a bit of plastic." (London FG3)

Ideas concerning homes with built-in disposal systems were also mentioned by several participants and were considered a high priority. Many different versions were suggested, including trap doors inside the house, trap doors in the back yard, special gadgets to cut waste into smaller pieces, cleaning systems and sorting systems.

"I thought one thing, hidden bins, maybe under your floor or something like that. It's to reduce the space that the bins do actually use. So in your kitchen or something like that, having something underneath your floorboards or underneath the ground." (Newcastle-upon-Tyne FG 1, P3)

The simplest version suggested was inspired by the current sewer system: transporting all waste through a system of underground pipes to a location where it is treated en masse. Another idea had a stronger focus on the community. Waste should be transported underground to a local site where the waste is used to generate energy for the local community. Another envisioned system would sort recyclables and residual waste and have them transported to their separate locations for processing. Another would sort waste, but transport only the recyclables and use the residual waste to generate heating for the house.

"Individual, underground recycling plants attached to your house, which recycle your water and your waste into energy, which heats your home and water, and surplus energy is fed back to the national grid to heat, to light the streets and motorways and whatever else. And plug your cars in to recharge them." (Newcastle-upon-Tyne FG3, P 7)

A less complex idea is that of a 'compacter'. This machine would compress your waste so that it takes up less space when stored in bins or elsewhere in the household. An extra benefit is that the household bins would have to be emptied less often, as it would take longer before they are full, saving on energy and costs of the collection service.

"[P4] You said the compacter [...] that can crush cans so it's tiny. You could do that with all your rubbish just to make it smaller, so take up less space in the landfill.
[P 10] And then they'd have to be emptied less times, so...
[P4] Yeah, but, if you could crush everything down, they could change your bins to fortnightly, you know so, then it'd be less petrol, diesel or whatever they run the things on." (Newcastle-upon-Tyne FG 1)

Another important aim related to technical innovations is to use fewer resources in combination with effective use of waste. The aforementioned ideas also contribute to these aims to some extent, but other ideas had this as their primary focus. These ideas are mainly concerned with creating secondary raw materials from waste that would otherwise end up in a landfill or an incinerator. The idea that targets this issue most directly is to develop a machine that could extract all useful material from landfills. This would clean up landfill sites and provide quite a lot of secondary raw materials for production processes.

"Don't forget, for 50 years we've been filling landfills with everything, metals, plastic, old bikes - they're in there still..If we could take them back out, we could salvage a lot of that and reuse it. Recycle it." (London FG2, P4)

Another idea, related to the aims of using less primary raw material and using waste effectively, focused on building waste. This idea surfaced several times in different focus groups. Its core feature is a machine that could reconstitute building waste into new building material.

"[...] a good one at the moment is plasterboard, [...] it used to go straight into landfill. When you renovate your home they collect the plasterboard, it goes back to the manufacturers, and it is remade into plasterboard. All the off-cuts that aren't used on construction sites, even the tip that... And it's now become financially viable... What they do to it back at the plant, to send out plasterboard, so it is almost zero-waste in plasterboard on construction sites." (London FG3, P5)

In a variation on this idea, the machine can also process other types of waste into building material. The final result would be buildings completely made of recycled material.

"[...] Homes made from recycled waste material...You know, breeze blocks that would be plastics or paper." (London FG2, P 1)

Other ideas with the same aims propose to use by-products of a certain process as input for another product, to turn waste plastic into petrol and to develop local methods of extracting useful raw materials instead of shipping waste to China. The most futuristic idea to reduce primary raw material and improve use of waste was a laser process to 'zap' waste into its molecular components to be reused. It was also suggested that if the aim is not to recycle but simply to eliminate waste, it could be sent into space.

In every focus group, the reduction of food waste received special attention from the participants. Related to technical innovations, a super microwave and a device to check the quality of food were suggested. A super microwave would be able to create a new meal from your leftovers:

"We want a super microwave as well. So you put all your leftovers in, you key in the ingredients, and it brings you out a brand new meal." (Newcastle-upon-Tyne FG2, P 10)

The other device would determine if your food is spoiled or not. The level of bacteria is thought to be a good-measure for this, but some other techniques might be developed that serve the same purpose:

"Researchers should come up with some device which will actually, where you could scan your food and it tells you whether it's... what the level of bacteria is. Because that's one, there's an acceptable level, isn't there." (Newcastle-upon-Tyne FG3, PX)

One last idea in this category that received some priority concerned teleportation technology. It aims primarily at reducing packaging, but also improves convenience in the household. Items bought in a shop or online would be teleported directly into the household of the customer.

Table 4.3.1 Ideas within the category 'technical, physics, chemical, engineering' that received priority, ranked accordingly

Category	Idea	Aim	Target Group	Priority
Technical/ Physics/ Chemical/ Engineering	Personal waste disposer (with voice control), possibly turning your waste into some useful item or generating power	Effective use of waste/ Convenience in the home	Consumers	☆☆☆☆☆☆☆☆☆☆☆☆ ☆☆☆☆☆☆☆☆☆☆☆☆
	Homes with a built in disposal system, for example with trap doors and gadgets to cut up the waste, linked to a system of pipe and tubes to take it somewhere	Convenience in the home	Consumers	☆☆☆☆☆☆☆☆☆☆
	A personal robotic device to sort and clean all your recyclables	Convenience in the home	Consumers	☆☆☆☆☆
	Teleportation of bought items directly from the shop into your house	Less packaging waste	Producers	☆☆☆☆☆

A laser process to "zap" waste into its molecular components to be used anew	Less use of primary resources	Consumers/ Waste management companies	☆☆☆
A super microwave to turn your leftovers into a brand new meal	Effective use of waste	Consumers	☆☆☆
A machine to reconstitute (building) waste to create new building materials; build houses or other buildings with recycled materials	Effective use of waste/ Less use of resources	Producers	☆☆
(Local) methods of extracting useful raw material from waste (instead of shipping it to China)	Less use of resources/ Effective use of waste		☆☆
A machine to extract all useful material (components) from landfills	Less use of resources	Other/Waste management companies	☆
Research into turning plastic into petrol	Less use of raw material/ Effective use of waste	Other	☆
Send waste into space/to another planet/the sun	Eliminate waste	Waste management companies	☆
A "compacter" machine to compress waste so that it does not take up so much space in the house	Convenience in the home	Consumers	☆
Develop a process or a machine to use waste for energy	Effective use of waste	Waste management companies/ Other	☆
A (portable) machine to determine if your food is still edible, instead of using an expiry or sell by date	Less waste production	Consumers	☆

MATERIALS

A second category related to the domain of 'environmental sciences and technology' brings together ideas that focus on the 'material' dimension (see Table 4.3.2). These ideas generally involve research into, or development of, new materials with certain characteristics that are thought to reduce waste. Reducing the use of plastic is an important aim, often linked to effective use of waste.

A frequently proposed solution to excess packaging material is the use of biodegradable, compostable packaging material instead of plastic (polystyrene).

> *"We thought about organic biodegradable packaging, research into that. So ultimately that will go round and be used as compost [...]." (London FG 1, PX)*
>
> *"New or some more biodegradable, compostable materials used in packaging, whether they be new materials or materials that are already around now. Cause I don't understand why we still use black bags and things that are not biodegradable." (London FG2, PX)*

Other ideas drop the condition of it being biodegradable, but emphasise that the alternative packaging material should be fully recyclable and the whole process cost-effective. The latter is an important condition so

that producers will be inclined to use it.

"[...] cheap, fully recyclable packaging to replace polystyrene, which is everywhere. [...] Polystyrene is unbelievable but it needs to be cheap so that people will use it and you can even put a tax on it after that so to stop people from using it, but investing in research into something that is just as cheap to produce but is fully recyclable, then there is no reason why manufacturers wouldn't use it." (London FG2, PX)

Another idea focuses not so much on the packaging material, but on the material of products themselves. Products should be made of more durable material so they last longer and can be reused more often.

"[...] materials that could be recycled longer, or more times, that might be more durable so they last longer [...] They're less likely to break. But also you can recycle them more times, so there's not like a limit of how many times." (Newcastle-upon-Tyne FG 1, PX)

Apart from these benefits in relation to waste, this might also improve recycling, as better quality materials in the original product would result in better quality recycling materials as well. This would make for better quality recycled products that are more likely to appeal to a wider public.

"[...] the quality of goods that you get from recycling like paper, for example, is a lot less than stuff from original raw materials, so you put down ... increase the amount of research that goes into increasing the quality of recycled goods." (London FG 1, PX)

One final idea that received priority in this category was concerned yet again with convenience in the household and related to packaging material. It is generally accepted that some packaging is needed to protect the product during transportation, but once it has fulfilled its function, it should be easy to dispose of. Packaging material should be designed to be strong when in use, but easy to break down afterwards.

"[...] surely they can change what kind of plastics they use to make it easier to recycle them. So, say for example if you've got a milk bottle, and you want to make it smaller, you'll be lucky if you can get it to half the size sometime, cause if it's rigid you maybe get it to three quarters. If they could make that packaging, I don't know, stronger when it's in use, and then once you take the lid off, you can crush it down to basically nothing. [...] And the same for metals and tins, if they built in a weak point, and you could twist it and turn it or something..." (Newcastle-upon-Tyne FG2, PX)

Table 4.3.2 Ideas within the category 'material' that received priority, ranked accordingly
BIO(TECHNO)LOGY

Category	Idea	Aim	Target Group	Priority
Material	Biodegradable compostable packaging material instead of plastic	Effective use of waste/ Less plastic	Producers/ Consumers	☆☆☆☆☆☆
	Cost-effective, fully recyclable packaging material to replace plastic	Less plastic/ Effective use of waste	Producers	☆☆☆☆☆
	Durable material that lasts long and can be reused and recycled more times and results in better (second hand/ recycled) products	Less use of resources/ Improve recycling	Producers	☆☆☆☆
	Packaging material that is strong when in use, but easy to compress when wasted	Convenience in the home	Consumers	☆

The third category in the domain of 'environmental sciences and technology' is concerned with bio(techno)logical ideas (see Table 4.3.3). These ideas focus on biological processes and organisms. An idea that came up several times in different focus groups is rubbish-eating bacteria, which in some cases should also produce energy.

"What about bacteria? It would eat your waste and then you could use that bacteria to power something, to burn it. [...].I know you can do that with carbon at the moment, can't you? In the ocean with algae, like carbon capture, then use that to power power-stations." (Newcastle-upon-Tyne FG 1, PX)

How and where to introduce such bacteria into the waste management system is another matter entirely. The participants suggested to first implement this locally, partly because they are aware that there are risks involved.

"I think a good idea would be to localise it, then once you've got it so that you can come get your rubbish collected, you know, if you had a big unit at every block of flats where you just thump your rubbish in and it got eaten." (London FG3, PX)

Another suggestion to reduce packaging of fresh foods is to produce food items that are naturally antibiotic. This would protect food from germs directly, killing them as soon as they get in contact with it. Naturally this idea would meet with some resistance, as indeed happened in the focus group where it came up (see below quote).

"Basically to stop the packaging of food, antibiotic food will help - it does not matter how many hands it come in contact with it, you know there is no germs spreading on it - you eat it and ... [Horror expressed]." (London FG2, PX)

Table 4.3.3 Ideas within the category 'bio(techno)logical' that received priority, ranked accordingly

Category	Idea	Aim	Target Group	Priority
Bio(techno)-logical	Rubbish eating bacteria, possibly producing energy	Eliminate waste/ Effective use of waste	Waste management companies	☆☆☆☆☆☆ ☆☆☆
	Food which is naturally antibiotic against germs and the like	Less packaging	Producers	☆☆

4.3.2 Policy, management and communication

POLICY

Ideas related to regulations and incentives were abundant in all focus groups. These are grouped in the category 'policy' (see Table 4.3.4). In general, ideas related to regulation target producers and ideas concerned with incentives target consumers. Reducing packaging material is the main concern behind most ideas.

Related to producers several ideas were prioritised in different focus groups, which carried the same core messages. First, producers should be made responsible for the proper disposal of the packaging material they wrap around their products. Current practices put this responsibility on customers, who did not ask for all this packaging material. Enforced responsibility for producers is believed to result in more efficient packaging and/or improved recycling and reuse.

"Yeah, it's not our fault if some company decides to put their chicken in three different sets of packaging, but we're left with the outcome of what to do with it afterwards, so it's up to the company to package its products better." (London FG 1, PX)

"I think you should be able to take your jars and this and that and other back to the supermarket and

then they can be handed back on to the manufacturers. Who can deal with it. They made it, they want to sell it, they should be able to recycle it." (Newcastle-upon-Tyne FG2, PX)
"Well the idea about the packaging, some way to get the companies to reduce it, or make it biodegradable [...] and the major companies, fine them if they don't adhere, so guidelines could be set up that they've got to come up to with some ideas of reducing it or making it biodegradable." (Newcastle-upon-Tyne FG3, PX)

Apart from producers, another option is to make supermarkets or schools responsible for the disposal of packaging material their customers and students produce. Moreover, the type and amount of packaging material that is acceptable should be regulated. Especially the types of plastic that can be used for both packaging and products should be standardised, preferably allowing recyclable plastics only.

"It is being more restrictive over what suppliers can actually use to package, 'cause we were saying, if one supplier can use, for example, certain packaging, there's no reason why everybody else can't..We were saying we need to stop non-recyclable packaging." (London FG 1, PX)

Standardisation of waste management all over the country or even across Europe was also suggested several times. This is thought to make the whole system more efficient, easier to understand and easier to police.

"The only other thing was the actual system of recycling, research into making it efficient, so that it takes the least time for people. And then, if they have one system which was for everyone to do, because they'd done the actual research in to what works; what is easy and also gives results, good results." (Newcastle-upon-Tyne FG 1, PX)

Related to consumers, one idea that groups many different suggestions is to increase incentives for recycling. The proposed incentives are mainly financial, though convenience is also aimed for.

"About the bottles in Holland and I've seen the same things in Cyprus: you get a crate [...] and you send that back and they reuse the box. And it works really well, because you get incentives to do that - you get money for every crate you take back so..." (London FG 1, PX)
"If you didn't pay for your rubbish collection within your council tax, if that was deducted from it and then, you actually got charged for how much rubbish you got taken away but recycling was free, people would be more inclined to think 'can I recycle that?' Rather than it costing to get taken away." (Newcastle-upon-Tyne FG2, PX)

Another idea related to consumers is to allocate 'wasteland' for allotments. In their municipality, some participants see land that could be used for growing their own vegetables, but they are not allowed to use it that way. Producing their own vegetables is thought to greatly reduce packaging waste for a household.

"[P9] ... if we had allotments then people would be more self sufficient, and then they wouldn't be spending.
[P 1] There wouldn't be the packaging and waste, yeah." (Newcastle-upon-Tyne FG2)

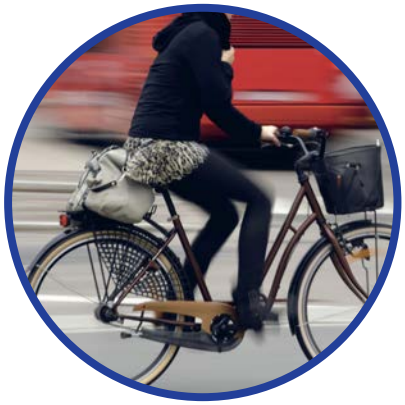


Table 4.3.4 Ideas within the category 'policy' that received priority, ranked accordingly

Category	Idea	Aim	Target Group	Priority
Policy	Regulations to make businesses responsible for the burden of packaging	Less packaging/ Improve recycling	Producers	☆☆☆☆☆☆☆ ☆☆☆☆☆☆☆ ☆
	Incentives to make consumers recycle more and better	Improve recycling	Consumers	☆☆☆☆☆☆☆ ☆☆☆☆
	Regulations to restrict the amount and type of material businesses can use for packaging	Less plastic/Less packaging	Producers	☆☆☆☆☆☆☆ ☆☆☆
	Standardise waste management across the country/Europe, so it can all mix and match in an optimal way	Increased recycling/ Eliminate waste	Waste management companies/ Government	☆☆☆☆
	Disincentives (e.g. taxes, boycott) for multinational companies to use "bad" technology, positive incentives for good technology	Behaviour change	Producers	☆☆☆
	Allocate "wasteland" to use for allotments (for consumers to grow their own food) so people buy less packaged foods	Less packaging	Consumers	☆☆
	Regulations to make supermarkets and schools responsible for the packaging waste their customers/students generate	Improve recycling	Other	☆

MANAGEMENT AND LOGISTICS

'Management and logistics' is another category in the domain of 'policy, management and communication' (see Table 4.3.5). Many of the aforementioned ideas require a certain amount of managerial and/or logistical changes, but only some ideas have this as their primary focus. Only one idea, mentioned in several variations in different focus groups, received priority.

The various versions of the idea are all concerned with bulk sales in supermarkets and aimed at reducing the amount of packaging involved in current ways of supermarket shopping. Supermarkets should be redesigned to allow customers to bring their own container and buy directly from bulk stock. Food and other wares should be offered in a convenient way for customers to take the amount they need, pay for it and take it home in their own reusable 'packaging'.

> *"Well they can refill them in supermarkets, you know instead of buying things and packaging, you could actually take your packaging back, that you're responsible for cleaning in your own household, and you could fill a jar up with tomato sauce, fill the jar with jam." (Newcastle-upon-Tyne FG2, PX)*
>
> *"[...] if you want a pint of milk, do you take your own pint container in and literally turn the tap and you fill it up to the top, and that's it - you go home. That's 40p, perhaps, but then if you don't do that, a normal pint of milk is 70p." (London FG 1, PX).*

Some variations of the idea envision pre-shaped trays or trolleys, with space to put eggs, milk, and so on, for customers to take home and reuse for their next shopping trip. Others would have this pre-shaped tray slide directly into a fridge, only to be taken out and cleaned when it is empty and needs a refill.

Table 4.3.5 Ideas within the category 'management/logistics' that received priority,

ranked accordingly

Category	Idea	Aim	Target Group	Priority
Management/ Logistics	Provide possibilities in supermarkets for customers to bring their own containers and buy from a bulk stock	Less packaging	Producers	☆☆
	Standardising types of plastics for products and packaging that can be used, preferably only the recyclable ones	Less plastic/ Improve recycling	Producers	☆

COMMUNICATION AND EDUCATION

Many ideas focused on education, information and marketing. These ideas have been grouped in the category 'communication and education' (see Table 4.3.6). Raising awareness and bringing about behavioural change (mostly increased recycling) are the most common aims in this category. Significant change is expected when the public at large is better informed and educated about issues related to the topic of waste management.

Several ideas for campaigns targeting the general public or a specific group were forwarded. Recycling was the most common concern that should be addressed in these campaigns. The public should be explained *why* they should recycle, not only be told *how* they should do it. When people understand the importance, it is expected that they will make an increased effort to recycle their waste.

> *"I think everybody needs to know why we need to recycle. It's not that they've got to do it, they tell you all, it's everything's imposed on you. If they just sort of explained to people why, and the benefits of recycling... I think that doesn't get through, because they just can't be bothered." (Newcastle-upon-Tyne FG3)*

Understanding the benefits of recycling is thought to be enhanced by providing more explicit information about the negative effects of landfills. Graphic adverts confronting people with the effects of landfills on the natural environment, especially animals, were deemed quite effective.

> *"[P4] You said more graphic adverts about the effects of the waste on animals and stuff, like they did on smoking where you had the actual...*
> *[P 10] Yeah, they have enough of them but they don't have them on waste...*
> *[P4] Because usually the adverts are to show you what you should do, or, just about recycling. Rather than about what effects it had, or actually, what effect landfill will have on people." (Newcastle-upon-Tyne FG 1)*

In every focus group, suggestions were made for educational campaigns targeting children especially, mostly through (primary) schools. When people are taught at an early age to recycle, they are assumed to adopt this as a norm and the practice will come naturally to them. Moreover, through the children, the parents are expected to be affected as well.

> *"[P9] So, basically research into education, improvement for understanding in children the importance of reusing and recycling. So kids, they'll understand better how to do it.*
> *[P 10] Yeah, starting them from school, because not every parent recycles. A lot of them just throw it in the bin, and if the kids start to think like, well, my teacher's told me to do this, mum you're not doing it right! They would tell you, they will!" (Newcastle-upon-Tyne FG 1)*

Campaigns with a more specific message related to recycling were also thought useful to promote the aim of a zero waste society. Again, packaging material received due attention in this respect. People should be made aware of the (often) misleading promises and temptations of luxurious and "fancy" packaging and instead make their choice based on the quality of the goods inside.

> *"[...] people possibly buy just what's pretty food in pretty packaging and it doesn't necessarily reflect the nutritional value of what's in that packaging. And possibly some stuff that's packaged in recycled pack-*

aging or it comes from the farm - maybe it doesn't look so great and people aren't buying it. So again, it is re-educating people by having some sort of awareness campaign that this is not reflected in the goods that are inside it and encouraging people to buy stuff in recycled packaging." (London FG 1)

Concerns about too much packaging material also generated ideas to stimulate people to buy more at markets and do more home cooking, using non-prepared ingredients.

"[PX] We need a movement to encourage people to cook from scratch again. [...]
[M] So we need some kind of awareness campaign?
[PX] Exactly.
[PY] The markets and cook from scratch." (London FG3)

A campaign targeting a very specific audience, students and scientists, was forwarded in one of the focus groups and received quite some priority by the participants. Science is thought to have the potential to reduce waste, so the people doing science should be inspired to take up this challenge. Inspiring future scientists through motivational campaigns during their education could help to put waste more prominently on their agenda.

"[...] we had investment in particularly science education, schools to encourage new scientists to come up with [ideas]." (London FG3, PX)

One last prioritised idea in the category of 'communication and education' is to provide information, for example on a website, about companies that offer a recycling service for certain products. There are many companies that offer such a service, but this information is not offered in a centralised way.

"Yet things like printer cartridges. There are companies who will recycle for you, but finding those companies can be a challenge so [...] open it up and advertise their services for free." (London FG 1, PX)

Table 4.3.6 Ideas within the category 'communication and education' that received priority, ranked accordingly'
LOCAL INITIATIVES

Category	Idea	Aim	Target Group	Priority
Communication and education	Public campaign explaining why it is important to recycle, instead of just telling people they have to do it	Awareness	Consumers	☆☆☆☆☆ ☆☆☆☆☆ ☆☆☆☆☆
	Educational programs in schools to teach children the importance of and methods to recycle	Improve recycling	Consumers	☆☆☆☆☆ ☆☆☆
	Science education to inspire students and scientists to come up with new ideas and technologies to reduce waste	Less waste production	Other	☆☆☆☆☆ ☆
	Education of the public by a campaign on the benefits of recycled versus non-recycled packaging	Behaviour change	Other	☆☆
	A website that collects and presents all information about companies where you can return items for recycling	Increased recycling	Consumers	☆
	Awareness campaign about buying at markets and home cooking from scratch (unprepared ingredients)	Awareness/ Behaviour change	Consumers	☆
	Graphic campaign about the negative effects of landfills and waste in the environment, especially on animals	Awareness/ Behaviour change	Consumers	☆

Some ideas that were put forward in the focus groups do not need much research as they merely need some organisation and someone to start it. The category 'local initiatives' captures these ideas. In general, these ideas focus on raising awareness and/or mobilising people to take part in recycling and/or reusing. One such idea is to link waste management to a local waste challenge. This challenge would be a competition between different neighbourhoods or streets to see who generates the least waste. The element of competition should motivate people and confrontation with the generated amount of waste should raise their awareness.

> *"[P8] I think if it was more personal though, like a local issue, one estate say, all their waste went to one depot or something. So then you could see like, the effect that was having on the estate, compared to [others]. You could have like a challenge of something to, you know [...]*
> *[P 10] Cause everyone likes to boast don't they? Like, my street's better than your street." (Newcastle-upon-Tyne FG 1)*

Another idea is to reuse unwanted clothes to make new ones to sell or wear. This can be organised quite formally through a shop, offered as a workshop or even very informally at home.

> *"I think they've done that in a place called Site where I used to work. They had a company called 'My sister's wardrobe' and they took all the old clothes from Site, all the ones that you couldn't sell anymore, from like 2004. And they used shirts and made them in to dresses [...] They'll get an old, oversized shirt, and they'll like trim it and make it into a woman's fitted shirt. Sometimes they'll cut the sleeves off to make it like..." (Newcastle-upon-Tyne FG 1, P3)*

Table 4.3.7 Ideas within the category 'local initiatives' that received priority, ranked accordingly

Category	Idea	Aim	Target Group	Priority
Local initiatives	Local challenge/competition for dealing with waste and knowing the impact of it	Awareness	Consumers	☆☆☆
	Redesign unwanted clothes to make new clothes	Less use of resources	Consumers	☆

5. Conclusion, discussion and evaluation

This country report presents country-specific findings from citizen focus groups in the UK. It is part of a wider consultation process called VOICES, which involves almost one thousand European citizens across 27 EU member states in discussing the European research priorities for the theme 'Waste as a resource'. In most member states, three focus groups were conducted. The bigger member states had a set of three focus groups in two different locations. In the UK being one of the bigger member states, three focus groups were held in London and three in Newcastle-upon-Tyne, making six focus groups in total.

The overall aim of the VOICES project is to identify citizens' preferences, values, needs and expectations with respect to research priorities for the theme 'Waste as a resource'. This provides input for the Consolidation Group that will define the actual priorities for the next work programme on 'Urban Waste' (call SiS.2013.1.2.1-2). In addition, it provides the methodology, the tools, the know-how and recommendations that can be adapted and used in coming years for similar initiatives.

Below, we present the main findings of the focus groups in the UK. First, we focus on waste management, barriers and concerns. Next, we go into the ideas identified and prioritised by the focus group participants. We close with a short reflection on the methodology of the study.

5.1 Waste management, barriers and concerns

The UK ranks 8th on the EU27 ranking list on Municipal Solid Waste Recycling (MSW). The country has managed to reduce landfill by 31% over the last 10 years and there is a strict policy to increase recycling to meet the target set by the EU by 2020.[15] This policy is clearly visible in the management of waste at the household level as described by the participants of the focus groups. It seems that most people have access to the facilities needed for handling waste according to the regulations and a lot of waste is recycled at household level. This is in line with findings from the Flash Eurobarometer survey 'Attitudes of Europeans towards resource efficiency'[16] in which almost all respondents from the UK indicated that they separate at least some waste (see Annex 2). The VOICES focus groups results show that most participants know what is expected from them on the household level. However, knowledge about what happens to waste after collection is very limited. Some assume waste is handled appropriately, while others express the concern that after separating waste, everything still goes to landfill.

During the focus groups some large clusters of barriers and concerns for handling waste appropriately could be distinguished. When talking about production and prevention in all focus groups, several participants worried about the amount of packaging that is produced, and the lack of alternatives to prevent them from buying over-packaged items. The lazy attitude and carelessness of people in our society is also seen as a cause of not handling waste appropriately.

Concerning convenience in the home, two large clusters can be described; many participants experience recycling as complicated and inconvenient. This inconvenience is often related to waste bins. It is also mentioned that people need more information about the waste management system to help them understand why separation is important and how to handle their waste appropriately.

Furthermore, the disposal of waste faces some challenges. Participants would like to have waste collected more often, but it is emphasised that one does not want to pay a lot of money to follow the regulation. In addition, many participants would like to have more information regarding waste disposal, for example to see whether their efforts really do make a difference. This relates to findings from the Flash Eurobarometer survey

showing that the majority of the UK respondents think that better waste collection services and more information on waste separation would convince them to separate more waste. The survey also indicates that most of the respondents do not want to pay for waste management through taxes. Instead, they prefer to have the cost of waste management included in the price of the products they buy or to pay proportionally to the quantity of waste you generate. When talking about the disposal of waste, participants expressed some long-term concerns. They worry about the effects on the environment and believe that with a growing society there is a need for a more efficient waste management system.

5.2 Ideas for achieving a 'zero waste society'

The results are divided into two main research domains, 'environmental sciences and technology' and 'policy, management and communication', which are both further divided into four categories. In the first domain, ideas focus mainly on technology (machines and processes) to improve the management of waste in the household, to use less raw material and to use waste more effectively. Reduction of the use of plastic and increasing possibilities for recycling are the main drivers behind the majority of ideas. Consumers and producers are the most prominent target groups, followed by waste management companies.

In this domain, many ideas relate to waste management directly. The envisioned technologies help to sort, clean, transport, and process, with emphasis on increasing recycling, reuse and/or generating energy. Other ideas relate to the original product (before it becomes waste) and aim to reduce waste by making the (packaging) material recyclable, biodegradable, more durable or simply easier to dispose of.

An important consideration that concerns virtually all ideas in the domain of 'environmental sciences and technology' is implementation. Both development *and* implementation of the envisioned technologies require research. Moreover, the development should be paired with implementation research as the technology should be designed to 'fit' the target group, not only to accomplish a certain functional aim.

Ideas in the second domain 'policy, management and communication' circled mainly around regulations, incentives, communication and education to reduce (packaging) waste, foster awareness and change behaviour. As in the first domain, reduction of the use of plastic and increasing the practice of recycling surface as dominant drivers for these ideas. Consumers are the main target group with producers quite close in their wake and some ideas targeting waste management companies and/or the government.

Responsibility for the proper disposal of waste is a core issue in this domain. It is thought that current practices put the burden of disposal almost entirely on the consumer, who has no direct influence on the production process. Other parties with more influence, for example the producer, the supermarket, or possibly schools, should be made to share this responsibility through regulation. Nonetheless, it is acknowledged that the consumer will always remain important in waste management. Educational programs, public campaigns and more readily available information on local practices related to recycling and/or reuse are thought to improve consumer behaviour related to waste.

Although only rarely mentioned explicitly by the participants, in the domain of 'policy, management and communication' an important role for research is to determine which regulation, incentives or communicative measures would be cost-effective in accomplishing a certain aim.

Of the three most highly prioritised ideas, the first is a personal waste disposer (with voice control), possibly

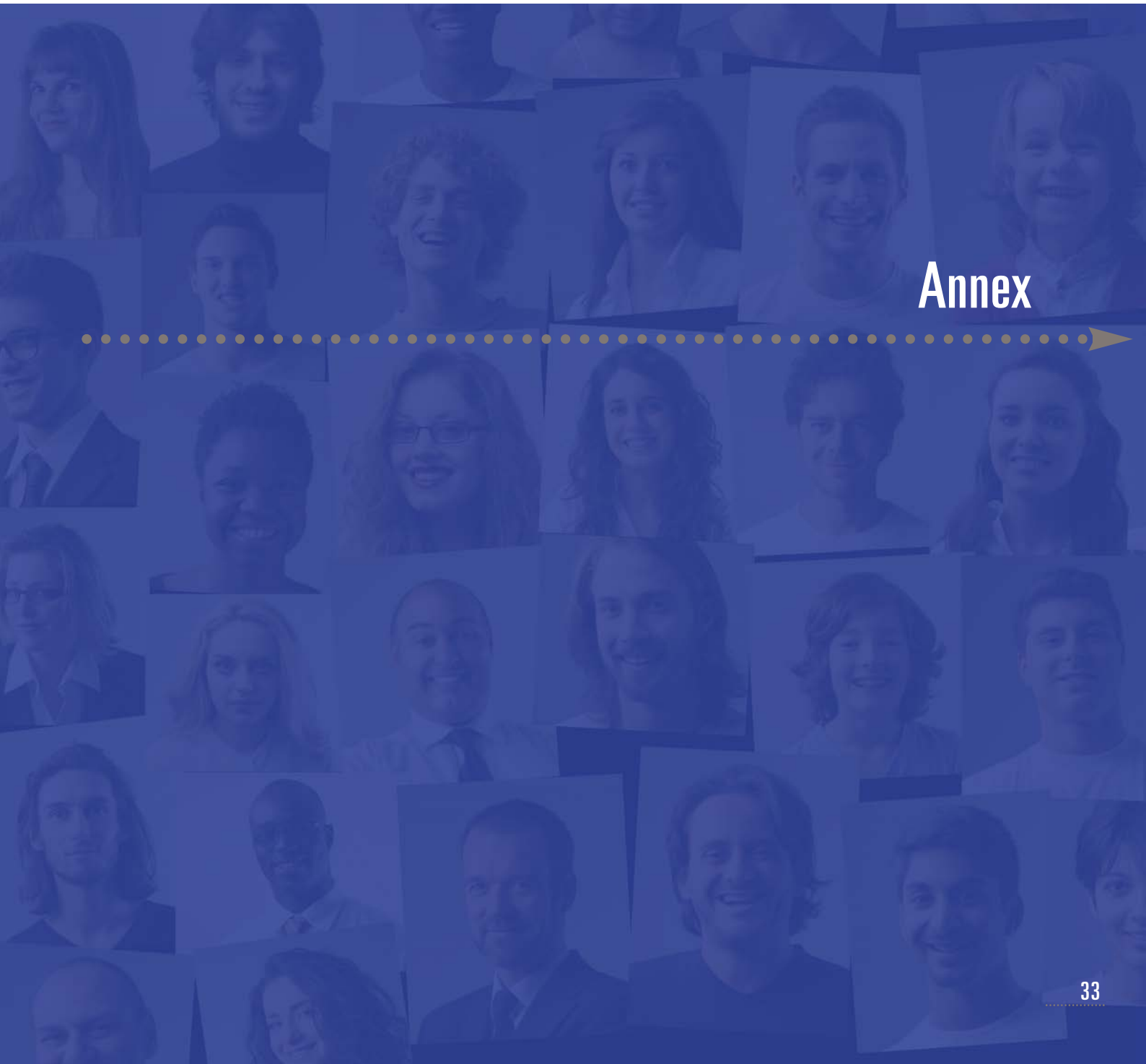
[15] European Environment Agency (2013). "Managing municipal solid waste - a review of achievements in 32 European countries" EEA Report No 2/2013

[16] Flash Eurobarometer No. 316 - The Gallup Organisation (2011)

turning your waste into some useful item or generating power. The second was shared between two ideas that received the same number of stickers: regulations to make businesses responsible for the burden of packaging; a public campaign explaining why it is important to recycle, instead of just telling people they have to do it.

5.3 Reflection

The focus groups were effective in eliciting citizen's preferences, values, needs and expectations concerning 'Waste as a resource'. The focus group participants generally found it easy to express their views and were keen to share their experiences. Sometimes, the three hours seemed too short for all participants to share the stories and experiences they wanted to share. Many participants indicated that they found the topic interesting and particularly the different types and pathways of waste management. They also enjoyed hearing other participants' ideas, and enjoyed discussing ideas for research on waste management. Many participants mentioned that the focus group made them more aware of waste management and some explicitly stated that they learned a lot. Participants said they are pleased that the EU is taking an interest in their ideas and are curious to find out what will be done with the ideas brought up in the focus groups.



Annex

Annex 1: Full list of ideas for research and innovation, policy, management and communication

This table includes all ideas for research and innovation, policy, management and communication that emerged from the focus groups. For each research idea, the research category is mentioned, as well as the aim of the research and the proposed target group. In addition, the priority of the research idea as perceived by the participants is indicated in the tables, using stars to indicate the number of stickers assigned to a specific idea by the participants.

ENVIRONMENTAL SCIENCES AND TECHNOLOGY

Category	Idea	Aim	Target Group	Priority
Technical/ Physics/ Chemical/ Engineering	Personal waste disposer (with voice control), possibly turning your waste into some useful item or generating power	Effective use of waste/ Convenience in the home	Consumers	☆☆☆☆☆ ☆☆☆☆☆ ☆☆☆☆☆ ☆☆☆☆☆ ☆☆☆☆
	Homes with a built in disposal system, for example with trap doors and gadgets to cut up the waste, linked to a system of pipe and tubes to take it somewhere	Convenience in the home	Consumers	☆☆☆☆☆ ☆☆☆☆☆
	A personal robotic device to sort and clean all your recyclables	Convenience in the home	Consumers	☆☆☆☆☆
	Teleportation of bought items directly from the shop into your house	Less packaging waste	Producers	☆☆☆☆☆
	A laser process to "zap" waste into its molecular components to be used anew	Less use of resources	Consumers/ Waste management companies	☆☆☆
	A super microwave to turn your leftovers into a brand new meal	Effective use of waste	Consumers	☆☆☆
	A machine to reconstitute (building) waste to create new building materials build houses or other buildings with recycled materials	Effective use of waste/ Less use of resources	Producers	☆☆
	(Local) methods of extracting useful raw material from waste (instead of shipping it to China)	Less use of resources/ Effective use of waste		☆☆
	A machine to extract all useful material (components) from landfills	Less use of resources	Other/Waste management companies	☆
	Research into turning plastic into petrol	Less use of resources/ Effective use of waste	Other	☆
	Using byproducts as a means of creating another product	Effective use of waste	Producers	☆
	Send waste into space/to another planet/ the sun	Eliminate waste	Waste management companies	☆
	A "compacter" machine to compress waste so that it does not take up so much space in the house	Convenience in the home	Consumers	☆
	Develop a process or a machine to use waste for energy	Effective use of waste	Waste management companies/Other	☆
	A (portable) machine to determine if your food is still edible, instead of using an expiry or sell by date	Less waste production	Consumers	☆

	Make products so that they are more easy to recycle than to dispose of	Convenience in the home	Consumers	
	Protective force field instead of packaging	Less packaging	Producers	
	Using byproducts as a means of creating another product	Effective use of waste	Producers	
	Bury waste underneath the sea	Eliminate waste	Waste management companies	
	Dispose of waste in a volcano	Eliminate waste	Waste management companies	
	A 3D printer that can use waste as input	Effective use of waste	Consumers/ Producers	
	Using heat from incinerator for heating of local community	Effective use of waste	Waste management companies	
	A machine to process your food waste into something you could burn, like a pellet for example, and heat your house with this	Effective use of waste	Consumers	
	A pill to put into your bin that degrades everything that is degradable	Convenience in the home	Consumers	
Material	Biodegradable compostable packaging material instead of plastic	Effective use of waste/ Less plastic	Producers/ Consumers	☆☆☆☆☆ ☆
	Cost-effective, fully recyclable packaging material to replace plastic	Less plastic/ Effective use of waste	Producers	☆☆☆☆
	Durable material that lasts long and can be reused and recycled more times and results in better (second hand/recycled) products	Less use of resources/ Improve recycling	Producers	☆☆☆☆
	Packaging material that is strong when in use, but easy to compress when wasted	Convenience in the home	Consumers	☆
	Edible packaging material	Effective use of waste/ Eliminate waste	Consumers/ Producers	
	Reversible plastic, from rigid to malleable/powder, so that it can more easily be recycled	Effective use of waste/ Improve recycling	Producers	
	Develop building materials so that they can be easily reconstituted, like plasterboards	Improve recycling	Producers	
	Biodegradable coffins made from waste	Effective use of waste	Producers	
	Clothing fabrics made from recycled plastic	Effective use of waste	Producers	
	Something to help food last longer	Less waste production	Other	
Bio(techno)-logical	Rubbish eating bacteria, possibly producing energy	Eliminate waste/ Effective use of waste	Waste management companies	☆☆☆☆☆
	Food which is naturally antibiotic against germs and the like	Less packaging	Producers	☆☆
ICT	A text message service for reminding of collection days	Convenience in the home	Consumers	

POLICY, MANAGEMENT AND COMMUNICATION

Category	Idea	Aim	Target Group	Priority
Policy	Regulations to make businesses responsible for the burden of packaging	Less packaging/ Improve recycling	Producers	☆☆☆☆☆ ☆☆☆☆☆ ☆☆☆☆☆
	Regulations to restrict the amount and type of material businesses can use for packaging	Less plastic/ Less packaging	Producers	☆☆☆☆☆ ☆☆☆☆☆
	Incentives to make consumers recycle more and better	Improve recycling	Consumers	☆☆☆☆☆ ☆☆☆☆☆ ☆
	Standardise waste management uniform across the country/ Europe, so it can all mix and match in an optimal way	Improve recycling/ Eliminate waste	Waste management companies/ Government	☆☆☆☆
	Disincentives (e.g. taxes, boycott) for multinational companies to use "bad" technology, positive incentives for good technology	Behaviour change	Producers	☆☆☆
	Allocate "wasteland" to use for allotments (for consumers to grow their own food) so people buy less packaged foods	Less packaging	Consumers	☆☆
	Regulations to make supermarkets and schools responsible for the packaging waste their customers/students generate	Improve recycling	Other	☆
	Ban plastic carrier bags in shops or make people pay (quite an amount) for them	Less plastic	Consumers	
	More flexibility in "sell-by" and "use-by" dates	Less waste production	Producers/ Consumers	
	Relax regulations for restaurants and supermarkets related to giving food away	Less waste production	Other	
	Regulations to get "misshapen" foods on the shelves (possibly for a lesser price), instead of the farmer throwing them away because they cannot be sold	Less waste production	Producers	
	Maximum statutory charge for recycling by the municipality, less than the costs for dumping waste on the general heap	Increased recycling	Consumers	
	Taking power out of the local council so that there is more uniformity in the system	Eliminate waste	Government	
	Legislation to demand products with a longer lifespan, availability of spare parts, etc.	Less use of resources/ Less waste production	Producers	
	Legislation to make all batteries rechargeable	Less waste production	Producers	
Management/ Logistics	Provide possibilities in supermarkets for customers to bring their own containers and buy from a bulk stock	Less packaging	Producers	☆☆

	Standardising types of plastics for products and packaging that can be used, preferably only the recyclable ones	Less plastic/ Improve recycling	Producers	☆
	Internet home shopping at one "location" so that all items can be transported at once and with less separate packaging	Less packaging	Producers	
	More recycling points, closer together, so that many people can get to them	Improve recycling	Waste management companies/ Government	
Communication and education	Public campaign explaining why it is important to recycle, instead of just telling people they have to do it	Improve recycling	Consumers	☆☆☆☆☆ ☆☆☆☆☆ ☆☆☆☆☆
	Educational programs in schools to teach children the importance of and methods to recycle	Improve recycling	Consumers	☆☆☆☆☆ ☆☆☆
	Science education to inspire students and scientists to come up with new ideas and technologies to reduce waste	Less waste production	Other	☆☆☆☆☆ ☆
	Education of the public by a campaign on the benefits of recycled versus non-recycled packaging	Behaviour change	Other	☆☆
	A website that collects and presents all information about companies where you can return items for recycling	Improve recycling	Consumers	☆
	Awareness campaign on buying at markets and home cooking from scratch (unprepared ingredients)	Behaviour change/ Less packaging	Consumers	☆
	Graphic campaign about the negative effects of landfills and waste in the environment, especially on animals	Behaviour change	Consumers	☆
	Education of the general public on recycling and reusing packaging material	Less waste production	Consumers	
	A campaign to make second hand clothing and goods fashionable	Behaviour change	Consumers	
Organisational	Local challenge/competition for dealing with waste and knowing the impact of it	Awareness	Consumers	☆☆☆
	Redesign unwanted clothes to make new clothes	Less use of resources	Consumers	☆

Annex 2: Attitudes of UK citizens towards resource efficiency

The data in this annex is based on the Flash Eurobarometer No. 316 - The Gallup Organisation (2011). The primary objective of the Flash Eurobarometer survey 'Attitudes of Europeans towards resource efficiency' (Flash No. 316) was to gauge EU citizens' perceptions, attitudes and practices concerning resource efficiency, waste management and recycling. In detail, the survey examined:

- citizens' perceptions of Europe's efficiency in its use of natural resources
- the amount of waste EU households produce and whether they separate that waste for recycling or composting
- preferred actions to improve EU households' and communities' waste management
- citizens' views on how to pay for waste management
- EU households' food waste production and preferred ways of decreasing that waste
- citizens' perceptions of the importance of a product's environmental impact when making purchasing decisions
- citizens' willingness to buy second-hand products and products that are made of recycled materials.

The survey obtained interviews - fixed-line, mobile phone and face-to-face - with nationally representative samples of EU citizens (aged 15 and older) living in 27 Member States. The target sample size in all countries was 1,000 interviews. Below we give the results from the United Kingdom.

Question	Answer	%
Do you think Europe could be more efficient in its use of natural resources?	Yes	80%
	No	7%
	DK/NA*	13%
Do you think that your household is producing too much waste or not?	Yes	37%
	No	61%
	DK/NA*	2%
Do you separate at least some of your waste for recycling or composting?	Yes	93%
	No	7%
What initiatives would convince you to separate (more) waste?	More and better drop-off points for recyclable and compostable waste	75%
	Improve separate waste collection at your home	75%
	More information on how and where to separate waste	66%
	Legal obligation to separate waste	57%
	Taxes for waste management	50%
What initiatives would improve waste management in your community?	Better waste collection services	74%
	Stronger law enforcement on waste management	63%
	Make producers pay for collection and recycling of waste	62%
	Make households pay for the waste they produce	27%
Which one would you prefer: to pay taxes for waste management or to pay an amount related to the quantity of waste your household generates?	To pay taxes for waste management	16%
	To pay proportionally to the quantity of waste you generate	67%
	DK/NA*	17%

Which one would you prefer: to pay taxes for waste management or to include the cost of waste management in the price of the products you buy?	To pay taxes for waste management	20%
	Include the cost of waste management in the price of the products you buy	68%
	DK/NA*	13%
Can you estimate what percentage of the food you buy goes to waste?	None	3%
	15% or less	77%
	16% to 30%	12%
	More than 30%	6%
	DK/NA*	2%
What would help you to waste less food?	Better estimate portion sizes (how much food you cook) to avoid excess food	59%
	Better information on food product labels, e.g. how to interpret "best before" dates, information on storage and preparation	60%
	Better shopping planning by my household	55%
	Smaller portion sizes available in shops	59%
How important for you is a product's environmental impact - e.g. whether the product is reusable or recyclable - when making a decision on what products to buy?	Very important	33%
	Rather important	43%
	Rather not important	13%
	Not at all important	10%
	DK/NA*	1%
Are you willing to buy second-hand products?	Yes	77%
Base: all respondents, % of yes		
Would you buy the following products second hand?	Furniture	64%
Base: all respondents, % of yes	Electronic equipment	46%
	Textiles (clothing, bedding, curtains, etc)	44%
What reasons prevent you from buying second-hand products?	Quality/usability of the product	69%
	Health and safety concerns	67%
	Less appealing look of the product	41%
	Afraid of what others might think	6%
Would you buy products made of recycled materials?	Yes	95%
	No	4%
	DK/NA*	1%
What would be the most important factors in your decision to buy products made of recycled materials?	Quality/usability of the product	54%
	Environmental impact of the product	22%
	Price of the product	20%
	Brand/brand name of the product	2%
	DK/NA*	2%
What prevents you from buying recycled products or products containing recycled materials?	Health and safety concerns	35%
	Quality/usability of the product	40%
	No clear consumer information on the recycled product	36%
	Less appealing look of the product	29%
	Afraid of what others might think	7%

*Abbreviation DK/NA = Don't know / No Answer

NOTES

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VOICES, CITIZEN PARTICIPATION IN SOCIAL INNOVATION

VOICES is a Europe-wide citizen consultation process, led by Ecsite, the European network of science centres and museums, which helps set the agenda for the environmental research dimension of Horizon 2020 - the European Union's strategy to advance research and innovation.

VOICES represents a valuable insight on methods and procedure for engaging citizen participation to inform Europe's Responsible Research and Innovation framework. Focus groups, academic analyses of public consultations and dissemination of results will lead to an effective method through which to consult the public on science and technology related issues.

VOICES is engaging citizens in 27 EU countries through science centres and museums - all of which are expert, impartial and powerful partners in public engagement with science as members of Ecsite.

One thousand European citizens have joined VOICES focus group discussions on innovative uses and solutions for urban waste. The outcomes of this European consultation process are presented in the VOICES Reports Collection.

VOICES for innovation

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SCIENCE CENTRES & MUSEUMS

European Commission

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