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PUBLISHER

Ecsite - the European network of science centres and museums
89/7, Avenue Louise
B-1050, Brussels
Belgium
info@ecsite.eu

AUTHORS

Broerse, J.E.W., Hoopman, R., Van der Ham, L. and Cummings, S. (Athena Institute, VU University Amsterdam)

RESEARCH TEAM

Prof.dr. Jacqueline E.W. Broerse (M.Sc.); Dr. Frank Kupper (M.Sc., M.A.); Dr. Janneke E. Elberse (M.Sc., M.A.); Lia van der Ham (M.Sc.); Barbara M. Tielemans (M.Sc.); Wanda S. Konijn (M.Sc.); Anna van Luijn (M.Sc.); Fiona Budge (M.Sc.); Tirza de Lange (M.Sc.); Durwin H.J. Lynch (M.Sc.); Marzia Mazzonetto (MAS); Willemijn M. den Oudendammer (M.Sc.); Inge Schalkers (M.Sc.); Samuel J.C. Schrevel (M.Sc.); Dr. ir. Rianne Hoopman (M.Sc.); Samuel Ho (M.Sc.); Sarah Cummings (M.Sc.); Rylan Coury (B.Sc.)

EDITORS

Marzia Mazzonetto and Luisa Marino, Ecsite
Francesca Conti, Tatiana Crisafulli and Elisabetta Tola, formicablu Srl
Michael Creek, free-lance

DESIGN/DTP

Teresa Burzigotti, formicablu Srl

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

CONTENTS

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 Portugal, 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

PORTUGAL

3. Country relevant data - Portugal

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, Portugal is one of the smaller EU countries with over 10 million inhabitants. Approximately half of the inhabitants live in urban areas (49%), while others live in rural areas (36%) and intermediate areas (15%).

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

		2011	
Population at 1 January		10 572 157	
Population as percentage of EU27		2.1%	
Gross Domestic Product (PPP)		19 500 Euro	
Population urban-rural typology	Urban	5 188 000	49%
	Intermediate	1 622 000	15%
	Rural	3 827 000	36%

3.2 Factsheet on waste

The amount of municipal waste generated and treated in Portugal is higher than the average amount of waste treated in the EU27. Portugal ranks 19th on the EU27 ranking list on Municipal Solid Waste Recycling (MSW). Portugal has been slowly increasing its recycling rate since 2001 to 19% of MSW generated in 2010. Portugal will need to make an exceptional effort in order to fulfil the EU Waste Framework Directive's target to recycle 50% of MSW by 2020.[9]

Table 3.2 Municipal Waste[10,11]

		Portugal		EU27 average	
Municipal waste generated (kg per person)		514 kg		502 kg	
Municipal waste treated (kg per person)		514 kg		486 kg	
Municipal waste treated	Landfilled	319 kg	62%	185 kg	38%
	Incinerated	98 kg	19%	107 kg	22%
	Recycled (material recycling)	62 kg	12%	122 kg	25%
	Composted (organic recycling)	36 kg	7%	73 kg	15%

3.3 Composition of the focus groups

In Portugal, three focus groups (FGs) took place on the weekend of 16th March 2013. They were held at the Pavilion of Knowledge - Ciência Viva science centre in Lisbon, moderated by Carlos Catalão Alves, member of the Board of Directors and Head of Communication.

In total, 30 people (16 male and 14 female) participated in the three FGs. The age of the participants ranged from 19 to 74: 10 participants were aged between 18 and 35; 10 between 36 and 50 and 10 were aged 51 or over. Educational levels were diverse, with 12 participants with a high level of education, 12 with a medium level and 6 with a low level of education. 21 participants were working, while 6 were unemployed and 3 were retired. 15 participants live in a house and 15 in a flat. Details of the composition of these focus groups are presented in the table below.

Table 3.3 Composition of the Focus Groups

		FG1	FG2	FG3	TOTAL
Participants	Total	10	10	10	30
Gender	Male	5	6	5	16
	Female	5	4	5	14
Age	18 - 35	10	0	0	10
	36 - 50	0	10	0	10
	50+	0	0	10	10
Education	High	5	5	2	12
	Medium	5	3	4	12
	Low	0	2	4	6
Employment	Unemployed	3	1	2	6
	Employed	7	9	5	21
	Retired	0	0	3	3
	Student	0	0	0	0
Housing	Flat	5	5	5	15
	House	5	5	5	15

[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)

4. Results

This chapter describes the overall results of all focus groups held in Portugal. 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 about 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 achieve a 'zero waste society' including concrete information on the 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.[12]

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 go 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. In most areas, the separation is organised as a dual system: (1) a container near the residence for general waste, and (2) recycle points, called 'Ecopoints' (in Portuguese, 'Ecopontos'), for sorting waste, located relatively close to the home.

The number of waste bins varies from one household to the next. These bins are either provided by the council, sometimes for a fee, or bought by residents. Participants mostly talked about three waste streams (a waste stream is described as one type of waste that is collected separately, covering the majority of their household waste), but the type of waste varies across municipalities. The waste streams that were mentioned are: glass, paper, cardboard, food waste, plastic, packaging, metal, clothing and general waste. Most mentioned are glass, paper and food waste. One participant considered that there is no separation in his municipality because there is only one container for all waste. Residents of flats often have collective containers on the ground floor where they can put their separated waste.

The Ecopoints are usually within a few hundred metres of people's homes and generally provide several coloured containers. People bring their own separated waste in bags and put it in the designated container. The number of containers vary according to the municipality: there are usually several containers (often specified as 'three'), but sometimes only one for glass or food waste. A participant from Corroios mentioned that there is a separate battery container and at the supermarket there is a container for electrical goods. Sometimes there are containers for clothes, but people also decide to give clothes away, either to people they know,

[12] 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.

charities or the church. Finally, one participant mentioned that old furniture can be placed beside the Ecopoint for collection.

4.1.2 Waste collection

Each council has its own system for collecting rubbish. In some municipalities, participants put their individual container or their bags with waste (as is the case in Lisbon) on the street or the ground floor of the apartment. There are containers for general waste and food waste. The waste at the Ecopoints and in the streets is collected by council trucks. One participant mentioned the name of this council truck: 'Armasul'. One participant mentioned that they have two Ecopoints in their small street: at one end of the street for paper, metal, plastic and glass and, at the other end of the street, the general green container for residual waste. This waste is collected by two different trucks.
Almost all participants had an Ecopoint nearby (in the street or at the apartment). One participant mentioned that there was no Ecopoint nearby, and another participant had to drive 12 minutes to reach one.

The frequency of waste collection varies. In the city of Almada, the council trucks come every day but in other municipalities they come less frequently: weekly or even irregularly, if there is a strike, for example. One participant mentioned that the local authority provides the citizens with a calendar of collection days at the Ecopoints.

4.1.3 Knowledge about waste pathways

Most participants were not certain what pathways their waste would follow after disposal. The general impression is that separated waste goes for recycling. Participants assumed or knew that all separated waste goes to recycle centres or recycle companies, where everything is recycled. One of these participants knew the exact location of the recycle centre. Two participants knew that old furniture is picked up by a truck for reuse, although sometimes a passer-by just takes it for reuse. Another participant was of the opinion that white goods were taken to a central place by the local authority for sale to a company. Several participants mentioned that general waste goes to landfill. Another participant did not know about the use of landfill for general waste, but was sure that general waste was incinerated as he knew of a disposal centre with incinerators. One participant mentioned both pathways: the incinerator and landfill. One participant mentioned that all collected food waste is buried in the ground to fertilise the land. One participant was of the opinion that only one tenth of separated waste is actually recycled.

4.1.4 Waste management behaviour and convenience

Some participants recycle, are aware of the need and value of recycling and follow the guidelines for recycling. They were satisfied with the council's provisions in their neighbourhood. Participants were not always satisfied with the behaviour of other people and were sometimes annoyed. This happens, for example, if people dump their waste next to the Ecopoint or put it in the wrong container. Some participants noted that it was inconvenient that the trucks do not come frequently to collect the waste, resulting in overfull containers. The rubbish then falls out and the wind blows it around, spreading a foul smell. Furthermore, containers are not always in good condition, due to vandalism, for example.

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 four

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

In all focus groups, barriers and concerns were mentioned, relating to waste prevention and the production of goods. Many participants were concerned about the packaging and the use of plastic bags. Some participants mentioned that one barrier to waste prevention is the marketing and commercialisation of products. This results in over-packaging and multiple packaging of products:

> *"[P8] If we look at the packaging, for example cereals, that should be in a fine plastic bag and well packed, but no, it comes with a box and it comes with...*
> *[P9] A big show.*
> *[P8] Yes, the box is enormous, and that happens with a lot of products, I mean marketing causes an increase in packaging volume and that's the big obstacle." (Portugal FG2)*

In another focus group, participants were of the opinion that Portuguese food legislation is a barrier to the reduction of packaging. Producers in the food industry are obliged to package the food well in order to prevent the proliferation of bacteria. One participant referred to the Portuguese food inspection authority:

> *"For example, I can tell you from my own knowledge that the ASAE* [Autoridade de Segurança Alimentar e Económica/Food Safety and Food Economics Authority] *is going to fine grocers in Amadora because they were selling grains by weight... the grain has to be packaged, beans, all those things..." (Portugal FG2, P2)*

Many participants were also concerned about the plastic bags that are provided in shops and supermarkets. One participant said that the type of plastic used to manufacture them is polluting. Several participants mentioned the excess number of plastic bags as a concern:

> *"Because when I go to the supermarket, I take home 20 or 30 plastic bags. What do I do with them all? I keep them, but sometimes I have to throw them out." (Portugal FG3, P9)*
> *"Bags, bags, bags. The Portuguese have such a habit of plastic bags, do you see?" (Portugal FG3, P 10)*
> *"I see people putting just one of these bottles in one bag, and I see another bag with two small pieces of meat, and in yet another bag a kilo of rice. A person buys 5 or 6 euro worth of products, and takes 7 or 8 bags home..." (Portugal FG 1, P9)*

Other concerns and barriers that were addressed by several participants were over-consumption, over-production and limited interest in recycled products. One participant mentioned excessive consumerism, especially among those with high incomes, which produces a large amount of waste. Some participants said that recycled products are not interesting for consumers, in some respects: people do not like to reuse bottles; recycled toilet paper is more expensive and chlorine (bleach) is used in its manufacture.

> *"I'm not going to use a recycled bottle if it's not in fashion. So we pay fifteen euros for one. If I say that this plastic bottle was reused, automatically people won't touch it." (Portugal FG2, P 10)*
> *"Being ecological is expensive." (Portugal FG2, P8)*

Furthermore, one participant stated that some people do not like the image of recycled products and think that they are of lower quality or not clean, and therefore do not buy them.

Another focus group made a link between over-consumption and over-production. The participants considered that producers have an economic interest in making more products, a serious concern related to the effect on the planet in 100 years:

"[...] when it comes to companies, business, large businesses are also not very interested in people recycling because they want always to launch new things for us to buy." (Portugal FG 1, P5)

One participant mentioned that the most important thing is not that recycling should be increased, but rather that consumption should be reduced.

4.2.2 Waste management in the household

The most important barrier that came up during the discussions on waste management in the household was citizens' lack of awareness of the need to separate waste. Several participants mentioned that more emphasis should be put on raising awareness and educating citizens about the importance of waste disposal and recycling at home.

"I think there is a very small percentage of people who have this awareness about recycling." (Portugal FG3, P 7)

"The lack of education about sustainable development and what this implies in terms of resources. From nurseries to universities, they do not cultivate the habit of recycling." (Portugal FG 1, PX)

"An important barrier has to do with the awareness of people themselves, with their behaviour in order that this process of recycling is carried out well. The reason for this lack of awareness is cultural, from families, from birth, the education that is given at home. But also lack of information from newspapers, in the media, from institutions themselves." (Portugal FG3, PX)

From the three focus groups, several practical reasons were identified for why people do not separate their waste at home for recycling. One participant mentioned that the (three) bins are too expensive, as every bin for a home costs about 50 euros. Another participant stated that people do not separate if there are no Ecopoints nearby. One of the other participants mentioned that people do not waste time on recycling because they have other things they need to do at home.

4.2.3 Waste disposal and pathways

The participants mentioned a number of barriers in the waste management system that hindered them from separating waste correctly, and they complained about the poor organisation of the companies that organise collection of the waste.

Many participants complained about the waste collection company: the system is deficient, the containers are often full, and Ecopoints are located too far apart. Participants do not recycle if the nearest Ecopoint is too far away, or if it takes too long to get there. Several participants complained that there are not enough containers at the Ecopoint for separating several waste streams. One participant mentioned that the container itself is not big enough and that the waste does not always fit. For example, the bottle bank is small and bigger bottles do not fit.

The biggest annoyance that several participants mentioned was that Ecopoints are full for several days, because the company does not collect waste in time. This is a barrier to proper recycling because citizens then dump their waste bags on the ground or in the container for other separated waste:

"The collection is deficient and people end up not worrying about it too much, going there one day it's full, another it's full and the third day [...] or leaving it on the floor [...] and mixing it up [...]. Usually they only collect once a week so people put it on the ground, and this is another problem that I raised which is connected, that there's only one Ecopoint for an extensive area." (Portugal FG 1, P6)

"[...] the containers are always full, with the glass falling out, the rubbish falling out, everything falling out, and when it's windy, everything goes all over the place." (Portugal FG3, P9)

A few participants criticised the municipal services and their employees because they set an example of poor behaviour. One participant complained that the containers are not cleaned and emit a foul smell. Overfull con-

tainers that smell bad are a nuisance, particularly if the Ecopoint is close to people's homes. Another participant observed employees of the municipal services putting sorted and separated bags into the residual container. Other participants mentioned that the containers are sometimes deficient and in poor condition, filthy, and with broken lids. Furthermore, the rubbish trucks are dirty, smell bad and produce noxious fumes. The neglect of Ecopoints and employees' apparent disregard for recycling both discourage citizens from recycling.

Participants also talked about uncooperative citizens.

> *"Improper behaviour at the Ecopoint, that is difficult to understand. People go there to recycle things, but dump them all on the ground in front of the Ecopoint or 20 metres from the Ecopoint, I cannot understand the reasoning." (Portugal FG 1, P2)*
>
> *"They put bags down all over the ground, which break open and everything goes everywhere on the ground; it's oranges, it's bananas, it's a mess. People go by and almost fall over, they slip on all that mess." (Portugal FG3, P 10)*
>
> *"There are a lot of people who say they recycle and really go to do recycling but then change all the disposal points. It's glass in the paper, they put everything together, take their glass bags and put it straight into the first available one." (Portugal FG2, P4)*

This sort of behaviour was also noticed in the bigger cities where people are supposed to put general waste bags out in the street for collection. One participant from Lisbon mentioned that people throw their rubbish bags out of the window as there is no elevator in the flat and they do not want to take the stairs.

Many participants thought that this poor behaviour was part of people's culture. There is a lack of education from childhood and a lack of information in the media, together resulting in a lack of awareness about proper behaviour for waste disposal. One participant living in a city mentioned that there is a cultural mentality problem:

> *"People don't like to walk an extra fifty metres to go to the car park; instead we double park in front of the shops. The same with rubbish: we don't take the trouble going another hundred or two hundred meters, but throw it in the rubbish or throw it out of the window." (Portugal FG2, P3)*

Finally, participants discussed who actually profits from waste separation. Some participants mentioned that people do not receive incentives to separate for recycling. Two participants questioned why they had to pay a rubbish collection fee when they do the recycling and take glass to the bottle bank, while the company (Ponto Verde) who does the recycling makes money out of it. Participants were concerned that companies have an economic interest in processing the recycled waste. One participant mentioned that, in his municipality, there are two organisations involved in the waste collection. The municipal service collects the food and general waste, making it easy for the public with door-to-door collection but making no profit. The other service is a public-private partnership which collects separated waste from the Ecopoints. People have to take their waste there themselves and it is not made easy for them. This service is run from a business perspective, which is, supposedly, cheaper. One participant criticised this approach, arguing that the consumer doing the recycling should benefit rather than the business. Participants considered that the economic interest of recycling companies means that waste prevention is not encouraged because these companies want people to recycle rather than reduce their consumption.

4.2.4 Other urban waste issues

During the focus groups, some more long-term concerns were discussed, such as the effect on the planet. Several participants mentioned that they worry about the depletion of natural resources and the long-term effect of waste on the environment. Other issues that were mentioned included environmental pollution and global warming. One participant was specifically concerned about the contamination of drinking water by rubbish dumped at landfill and also expected a drought in the coming 20 years.
Another participant was concerned about the effects of excessive consumption and over-production:

> *"What interests me is, knowing that if I continue to produce waste and if that waste is not processed within the half-dozen years, then we live on top of the waste." (Portugal FG2, P5)*

Finally, there is a general concern about the lack of awareness and education from childhood, in schools and in media about the importance of recycling.

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

In general, technical innovations related to the effective management of waste in the household were ranked as very high priority (see Table 4.3.1). Most of the proposed devices help to sort and recycle the waste, either in the home or collectively at a central place.

In two focus groups, several high-priority ideas involved technologies or devices that transform waste into energy. The idea of a collective machine was the most popular. People would take their waste to this collective machine, which would transform waste into fuel. Afterwards, they would be able to use this fuel for their car:

> *"The person takes a collective bin and empties it into the machine and then in the afternoon takes the car there and fills up the car." (Portugal FG2, P4)*

Participants who prioritised this idea thought that the advantage of such a technology is that it would benefit many people who would bring their waste and, in return, collect fuel. Other advantages were reductions in pollution and fuel prices. Furthermore, this idea did not seem too utopian. One participant knew that this kind of technology is already in existence: food waste is fermented to release biogas.

Another highly prioritised idea was that of a self-sufficient building that converts domestic sewage and rubbish into energy and heat for the building. This idea was only briefly described by the participants who proposed it. Participants that voted for this idea referred to other technology for self-sufficient houses, such as solar panels that provide energy to the household and save on costs. In addition, this would be convenient for people, including lazy people, as they would not have to transport their rubbish to recycle points. Even the council would save money in waste transport. One participant knew someone who benefitted from this system:

> *"I have a friend who just built a house where that type of technology was used and she said it was the best thing she ever did." (Portugal FG2, P4)*

In another focus group, a variant on this idea was mentioned: people put their separated waste in one of the three pipelines of a transportation system, comparable to the sewage system. People throw their separated waste in one of the pipelines where it gets immediately mashed and transported to corresponding recycle centres or to one recycle centre that deals with all the waste:

> *"[P1] We are thinking here about a house, from which three pipes are coming out. These three*

pipes would naturally conduct things, which would then be centralized…
[P9] … to a centre…
[P 1]… to a centre, which would in turn be linked with the appropriate transformation: paper for recycling…
[P9] It would immediately be mashed; the paper would immediately be mashed." (Portugal FG3)

Participants considered this idea feasible and practical. The advantage is that there would only be residual waste in the house, all the other waste would be transported to the centre. This also implies that the need for landfills would be diminished and, as no containers would be required, it would be cheaper for the local authority and consumers.

In the same focus group, high priority was also given to a similar domestic, built-in disposal system that mashes waste and transports it for the purpose of recycling. One idea was a domestic box-shaped machine, or pipeline, that mashes up the waste and discharges it via a pipeline underground to a factory where it gets recycled:

"Yes, instead of going to a recycle point, that little machine would deal with everything there and then, mashed up. It would deal with all of the recycling right there. It would be just a little thing, and then it would go to a factory to do whatever is needed. It would save us having rubbish bins, recycle points and so on." (Portugal FG3, P 10)

This domestic machine would discharge rubbish to factories so that there would be no rubbish in the street. In addition, people would be obliged to recycle.

In two other focus groups, ideas about a built-in-system were mentioned, but this time with the purpose of recycling at home. One idea was to separate organic and non-organic waste, so that the organic waste could be recycled and used to fertilise the garden, located on the roof of the house:

"Finally we have houses with a system for collecting and sorting waste automatically, which identifies what is organic and channels it to the roof of the house where there is a garden which is fertilised with this waste." (Portugal FG 1, P4)

In one focus group, the participants discussed more specific ideas for transforming the way waste is managed. One participant indicated that nanotechnology should be used to develop energy to process waste so that in the long-term, the future will be 'zero waste'.

In two focus groups, participants came up with ideas of transforming waste into material. One participant was concerned about waste disposal units in kitchens that grind food so that it can go into the drains, often leading to blockages. He proposed the idea of integrating a fat separator into domestic infrastructure that converts fat into 'stone':

"[…] I have to tell you that in industry and in canteens, there is, from a sewage point of view, a starch separator and a separator of fat, because starch from potatoes and all these flour-based products, at the end of a week turn to stone, it's unbelievable, you just have it." (Portugal FG2, P2)

Another participant indicated that we need more research about the transformation of waste to create new material, for example a new kind of cement or alloy.

One participant had the idea of eliminating rubbish by means of a machine that evaporates it. Another participant thought that this was not a good idea as pollution would go into the atmosphere, damaging the ozone layer. Instead, they considered that this waste should be evaporated and transformed into water.

Finally, two futuristic 'out of the box' ideas were put forward. One idea was to make cleaning products unnecessary for personal hygiene:

"There is a device at home, at the entrance to the house, which when you go in, the device would go over you and you would be totally cleaned up, for your own personal hygiene, without needing to use any products." (Portugal FG3, P 10)

The other idea was an 'intelligent house of the future' that eliminates the need to go shopping or buy things like food. This house would have a garden with lots of flowers and, if you step into the garden and breathe, you would stop feeling hungry. The vegetables in the garden would not require any cooking.

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	Collective machine that transforms waste into fuel for your car	Effective use of waste	Consumers	☆☆☆☆☆☆
	Self-sufficient buildings where sewage and rubbish waste are converted into energy and for heating	Effective use of waste/ Convenience in the home	Consumers/ Producers	☆☆☆☆☆
	A house connected to pipelines for separated waste which is then transported through the pipeline to a centre (or more centres) for recycling	Improve recycling/ Convenience in the home	Consumers/ Waste management companies	☆☆☆☆
	A small domestic machine box or pipeline that mashes up the waste and that goes to the factory for recycling (no rubbish in street, no recycling points)	Convenience in the home/ Improve recycling	Consumer/ Waste management companies/ Producers	☆☆☆
	Domestic system for sorting organic and non-organic waste. The organic waste goes to the garden (on the roof)	Effective use of waste/ Improve recycling	Consumers	☆☆☆
	Use waste to create new material, like alloy or cement	Effective use of waste	Producers	☆☆☆
	New fuel created from waste	Effective use of waste	Producers	☆☆☆
	Nanotechnology for producing energy that can be used for the processing of waste	Effective use of waste	Producers	☆☆
	In every house a converter that separates fat and starch in waste food and changes it into stone	Convenience in the home/ Effective use of waste	Consumers	☆☆
	A machine that evapora-tes rubbish	Eliminate waste	Producers	☆☆
	Domestic device for perso-nal cleaning without using any cleaning products	Convenience in the home/ Less waste production	Consumers	☆
	An intelligent house of the future that stops you feeling hungry if you go into the garden. This house has also a vegetable garden for vegetables that do not need cooking	Less waste production	Consumers	☆

MATERIALS

A second category related to the domain of 'environmental sciences and technology' contains ideas that focus especially on the 'material' dimension. These ideas generally involve research into or development of new materials with certain characteristics that are thought to reduce waste. In all focus groups, there were several ideas mentioned, but only two ideas were assigned priority (see Table 4.3.2).

Two focus groups mentioned that there should be more research and investment in developing products from materials that are less polluting and friendlier to the planet. For example, the Portuguese use a lot of bags but certain types of plastic should be avoided. The participants would like more research on materials but have the idea that such studies are not conducted. The other idea came from participants who thought that there should be more investment in the use of materials that are environmentally friendly. No examples were provided of what this would involve.

Table 4.3.2 Ideas within the category 'material' that received priority, ranked accordingly

Category	Idea	Aim	Target Group	Priority
Material	Research on products made with materials that are less polluting and friendly to the planet	Effect on planet	Producers	☆
	Using materials in production that are less polluting and friendlier to the planet	Effect on planet	Producers	☆

BIO(TECHNO)LOGY

The third category in the domain of 'environmental sciences and technology' is concerned with 'bio(techno)logical' ideas. These ideas focus on biological processes and organisms. In the focus groups, three suggestions were proposed in this category. Priority was given to more research on the use of worms and micro-organisms for the composting process in food waste boxes.

> *"[...] there are micro-organisms which do that, they do the composting, purified material, so it's not difficult, anyway that's what happened once when bodies were buried." (Portugal FG2, P7)*

Another participant wanted to make biogas from waste kitchen fat using enzymes. He mentioned an example in Brazil where fat separators are used in kitchens and canteens to separate fat that is purchased by companies to make biogas. However, in Portugal there were previously no companies to make biogas:

> *"The problem is that we also tried at technical college to put a biogas network in. We had it all done and when it came to finalisation it wasn't finalised, because there was no company in those days that would go and remove the liquid to make biogas. So the fundamental problem is finalisation of the chain." (Portugal FG2, P2)*

The third idea was about reducing food to the size of pills. This suggestion was also criticised by other participants in the focus group who did not like the idea of eating pills:

> *"[P6] I had thought about in the food chain, I'd thought about in the food chain transforming instead of having food stuffs, having like pills [...].*
> *[P3] What about the pleasure of gluttony?*
> *[P4] Exactly.*
> *[P9] Forgive me but the Portuguese [cannot go without their] bean stew!" (Portugal FG2)*

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	Biological research on the use of worms, micro organisms and bacteria for composting of food waste	Less waste production	Consumers	☆☆
	Fat waste from canteens should be separated and transformed into biogas using enzymes	Effective use of waste	Producers/ Other	☆
	Reduce food to the size of pills	Less waste production/ Less packaging	Consumers	☆

ICT

The fourth category in the domain 'environmental sciences and technology' is concerned with ideas related to 'ICT'. In one idea that was ranked as priority, participants proposed an electronic gadget that can photocopy and take photos so that documents do not need to be duplicated in paper form. One participant complained that the bureaucracy in Portugal obliges citizens to use a lot of paper. For example, in Portugal, all merchandise has to be accompanied by two papers: the original and a duplicate. The duplicate has to be retained for possible but extremely rare financial inspection.

"But if you reduce it to one paper, and in the case of inspection, the enforcement agency, today it's easy, have a gadget or make a scan or copy or take photos or whatever." (Portugal FG2, P5)

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

Category	Idea	Aim	Target Group	Priority
ICT	New electronic gadget that can scan or take photos so that documents do not need to be duplicated	Less use of resources	Consumers	☆☆

4.3.2 Policy, management and communication

POLICY

Two focus groups brought up ideas related to legislation, regulations and incentives to encourage consumers and producers to change their behaviour. Two of those ideas were given priority (see Table 4.3.5).

Participants wanted more research and studies on social behaviour in order to find out what motivates consumers to recycle. This study could be conducted, for example, as a neighbourhood competition using incentives (this idea was not developed further). During the competition, studies should be conducted on social behaviour, to determine which techniques encourage recycling and how people react.

The other idea is about new legislation aimed at producers to reduce redundant packaging and packaging generally:

"Currently we buy products such as boxes of frozen foods or cereals, and we take it with a cardboard

packaging as well as the other that comes with the product, don't we: normally it's plastic. If there was legislation to reduce packaging, then we would have less packaging, and reduce tons of waste. So this has to do with changes in marketing and distribution." (Portugal FG2, P8)

Table 4.3.5 Ideas within the category 'policy' that received priority, ranked accordingly

Category	Idea	Aim	Target Group	Priority
Policy	Studies on social behaviour: what motivates consumers to recycle	Behaviour change/ Awareness	Consumers	☆☆
	Legislation to reduce packaging	Less packaging	Producers	☆

MANAGEMENT AND LOGISTICS

'Management and logistics' is another category in the domain of 'policy, management and communication'. Many of the previously mentioned ideas require a number of managerial or logistical changes. Many ideas mentioned by the participants fell into this category and approximately half of these ideas were ranked as priority by the participants (see Table 4.3.6).

The highest ranked idea relates to an old system, namely taking your bottles and packaging back to the supermarket for a discount on your new purchases. This would involve standard size packaging, which could be reused and filled with other food products. It would reduce the amount of packaging and the cost:

"Our first idea is to implement a standard size packaging, either plastic or glass, so that it can be reused as there is a concept that weight does not have to be lost, I believe? In other words, we take our packaging, our empty glass bottles and we put them in a machine and it gives us back cents, this existed in hypermarkets. Do this for all types of packaging. I could, for example, take a carton of milk, it wouldn't matter if it was milk or not, it could be refilled with juice, for example, because there would be a standard format. And a motivation to do this would be a discount on the price of the product. If production costs decrease, if they were not going to be constantly making new packaging, the price at which we bought products could be lower." (Portugal FG 1, P4)

This idea was considered feasible and would not be expensive. Reuse of packaging would reduce the production of new packaging, saving raw materials:

"[P3] This would diminish the production of new packaging. So we would reuse the packaging, we would make ten thousand once, then those ten thousand would last ten years for example [...]. [P4] [...] Yes I think it is a brilliant idea, because I think it won't cost much in financial terms. I think it is quite achievable." (Portugal FG 1)

One idea ranked as high priority was that the municipality should provide a network with drinking water so that people do not have to buy plastic water bottles from the shops:

"To improve the network of domestic water. I think this is one of the best ideas we have had so far. Because it is prevention [...]. The municipality has to decide, the municipality has to step forward and make the water network in that area good, because then we don't buy bottles, so we are not buying plastic, which will not be recycled." (Portugal FG 1, P5)

The participants who voted for this idea saw the following advantages: less production and waste of plastic, no need for the transport of bottles, and convenience for consumers. They would like such a network with drinking water, both indoors from the tap in house, as well outdoors for fountains in the parks.

In two of the three focus groups, participants had lengthy discussions about how to reduce the use of packaging and plastic bags by supermarkets and other shops. Participants considered that studies are required to reduce the number of plastic bags that consumers receive in shops and to consider the feasibility of eliminating

plastic packaging and replacing it with glass. For example, participants considered that bottled water and cooking oil should be put in glass bottles. Furthermore, one participant mentioned that the economic impact of the use of plastic versus reusable bottles made from glass should be studied, as should the whole process of cleaning and reuse of packaging. The feasibility of a deposit system for bottles should also be considered:

> *"Probably we have to put a deposit on empty bottles. In the old days we used this, we would exchange the bottles of different types, of soft drinks, of wine, or water and we would go and leave our empty bottles. There was a deposit on the glass and we would receive the deposit, that is the cost of the empties, we used to call it 'tara' [...]. When you buy the bottle you pay for it, and when you return it, it's the 'tara', like it was before. If we turned to this method, a lot of material would not have to be produced, a lot of material would not go into the rubbish." (Portugal FG3, P7)*

Two focus groups sought alternatives to plastic bags provided in shops, and referred to the olden days when shops used less plastic and packaging and when consumers took their own shopping bag to the shop to buy loose items:

> *"So, take a bag from home when you go shopping, you don't need plastic bags, an alternative. In the old days we used a flour bag, made of material, they've disappeared these days. Now we use a plastic bag, or packaging from the bakery to take bread home. If we went back just a little bit in time, tins, fruit juices, they could be all replaced with glass, right, and for this we would need a study about the production of these materials. Glass in relation to plastic, which would be more cost effective; and the whole process of reusing things also." (Portugal FG3, P7)*

Participants considered this idea to be relatively easy to implement. They were concerned about the enormous use of plastic bags and the slow degradation of plastic in the landfill. One suggestion was to make people pay for plastic bags, accompanied by advertising to promote the reuse of plastic bags. At the same time, research should be conducted to develop new material for the bags so that they break down quickly. Participants referred to a supermarket chain, Jumbo, that is already using a new type of material for bags. Furthermore, one participant mentioned that more research is needed to develop products that are less polluting, for example by substituting plastic bags and packaging with material that is environmentally friendly.

The idea of 'intelligent food' was also proposed, reducing the quantity of food that needs to be eaten by concentrating calorific value, although the quality would be the same. For example, replacing a 300-400 gramme steak with a 100-150 gramme steak with the same nutritional value. A variant on this idea was also presented: when the person puts the food in his or her mouth, the food analyses the individual and, depending on the body and needs of that person, the food grows or shrinks, affecting the nutritional value. This would result in less production of waste and less packaging.

Some participants proposed connections between companies and universities to facilitate innovative processes for the development of new products. The example was mentioned of sweaters made of new polar fleece which is made from bottles, and bags made out of cork. Another participant had some critique, however, as these sweaters are highly flammable. Participants gave priority to this idea of collaboration: the university would bring innovative knowledge and students would be motivated to create something practical for society; while companies have the experience and economic capital to apply ideas in a practical manner and to make money. Furthermore, technical skills would be improved, companies would benefit from innovation, and society would win because of new, cheaper, better products. All parties would benefit from this exchange between companies and universities.

One group of participants mentioned the idea of a collective bin in the street for two or three buildings to dispose of organic waste which is then turned into fertiliser. The local authority would collect the compost or fertiliser. The fertiliser could be used in plant pots at home, in gardens and in green public spaces. This will also result in less volume in landfills.

Another group of participants mentioned that there should be incentives for innovative ideas for new type of companies. For example, instead of having a shop with second-hand clothes, there should be an innovative clothing shop where you take your old clothes and, for a fee, the tailor makes something else from the material:

"For example, I'm bored with my coat, I take it to the shop and get some shorts from the coat's material." (Portugal FG 1, P5)

Table 4.3.6 Ideas within the category 'management and logistics' that received priority, ranked accordingly

Category	Idea	Aim	Target Group	Priority
Management/ Logistics	Packaging with standardized sizes, made from plastic or glass that can be reused. It would be handed in at supermarkets and consumers would receive a discount on new purchases	Less use of resources	Producers/ Consumers	☆☆☆☆
	Municipality should improve the water network so that consumers do not have to buy water in bottles	Less plastic	Government/ Consumers	☆☆☆
	Use and study alternatives to plastic bags and plastic packaging, substituting it, for example, with glass or paper	Less plastic	Producers	☆☆☆
	Loose, unpackaged items available for purchase and, like in the olden days, consumers take their own packing or plastic bag to the grocery store	Less packaging	Producers/ Consumers	☆☆☆
	Link universities with companies for innovative waste processing (like polar fleece sweaters made of bottles and bags made of cork)	Improve recycling/ Less waste production	Producers	☆☆☆
	Study the process of cleaning packaging and reusing it, as in the case of bottles, and the consumers should receive a deposit return based on weight	Less use of resources/ Less packaging	Producers/ Consumers	☆☆
	Collective compost bins at apartments where organic waste is transformed into fertiliser and collected by local authorities	Effective use of waste	Consumers/ Waste management companies/ Government	☆

Management/ Logistics	A shop which uses the material of existing clothes to make new ones (old coat into shorts) and for which the consumer receives an incentive/pays less	Use of resources/ Behaviour change	Consumers/ Producers	☆
	Changing edible products in smaller portions with same value and quality	Less waste production/ Less packaging	Producers	☆
	Using products with fewer pollutants, for example substituting plastic bags with other materials that are less polluting	Less plastic/ Effect on planet	Producers	☆

COMMUNICATION AND EDUCATION

Various ideas focused on education, information and marketing. These ideas have been grouped in the category 'communication and education' (see Table 4.3.7). Participants considered that information and raising awareness about waste among citizens could change their behaviour. The highest ranked idea in this category is multimedia advertising to shock the consumer and raise awareness, changing behaviour towards more recycling, producing less waste and reusing:

"[P 10] We had discussed the information here, when we tried to address the issue of recycling, reusing or suchlike. It's always a thing that seems a fairy tale. You think it's fun, it's so sweet. It cannot be like this. We should shock [...].

[P9] Yes, scare consumers more." (Portugal FG 1)

Participants referred to the way the use of tobacco is discouraged in the media. The participants who voted for this idea stressed the real need to conserve the environment and reduce the production of waste. They considered that the best way to do this would involve a strong message, which would appeal to people's emotions so that they become aware of the impact of their behaviour on the future of their children, in terms of environmental pollution.

Another proposed idea involved labelling every product with its ecological footprint. Consumers could compare the footprint of the products in the supermarket and make their choice:

"Local production, local consumption. Nowadays there is the idea that we consume lettuce flown in from South America. I was thinking that it could be done when the products are sold at supermarkets, the same way there is a list of vitamins and everything that is in the product: a label of the ecological footprint and people have a sense of what the product polluted before it reached the consumer. And people can choose from two products, having a summary in the supermarket to try and choose between which pollutes more and which pollutes less." (Portugal FG 1, P2)

In all focus groups, there were ideas for raising awareness of recycling among consumers. In one focus group, there were extensive discussions about lifelong education of citizens on the value of recycling, in combination with providing more resources for Ecopoints, appropriate information and punitive legislation:

"I'd like to say the following: to provide courses, to train and inform people [...] in an organised way, we naturally start from the principle that basic education happens at home, followed by school, and naturally this is reflected throughout your life. And then when they have their own children they will educate them in the same way, and this will help. That's one. The second one is really about the lack of resources, and the lack of information... With more resources we put out more recycling containers, in appropriate places [...]." (Portugal FG3, P 1)

"[P 10] There should be lots of recycle points in Lisbon.
[P 1] Many more, with information from the authorities to say how they should be used, and notices, as the lady has said, about what not to put in, with punitive legislation, in fact everything clearly stated giving this information [...] I think all of this is a bit inter-related." (Portugal FG3)

Table 4.3.7 Ideas within the category 'communication and education' that received priority, ranked accordingly

Category	Idea	Aim	Target Group	Priority
Communication and education	Advertising that shocks consumers, encouraging them to produce less waste, and to reuse and recycle more	Awareness of negative effects	Consumers	☆☆☆☆
	Labelling ecological footprint of products so that the consumer can chose between products in the supermarket	Awareness of possibilities	Consumers	☆☆
	Education on recycling	Awareness	Consumers	☆☆
	Basic education about recycling happens at home, followed at school and throughout life	Awareness/ Behaviour change	Consumers	☆

LOCAL INITIATIVES

Some ideas that were forwarded in the focus groups do not need much research, but merely some organisation. The category 'local initiatives' captures these ideas. One group of participants thought of creating a shared database in the municipality for products that are not used or can be reused, for example products like clothes and accessories. People can exchange or buy products. Rather than recycling, this increases the reuse of products.

Table 4.3.8 Ideas within the category 'local initiatives' that received priority, ranked accordingly

Category	Idea	Aim	Target Group	Priority
Local initiatives	A shared database to exchange products, like clothing accessories encouraging reuse	Less use of resources	Consumers	☆

OTHER

Some ideas proposed in the focus groups were not specifically related to urban waste and waste in the household. All ideas in the category 'other' that were given a high priority were related to the use of new forms of energy. Highest ranked was the idea of using hydrogen engines instead of energy from fossil fuels.

In another focus group, participants mentioned that biodiesel is not yet used very much but should receive more emphasis. Other participants said the state should give incentives to producers to introduce renewable

energy to industry. Related to this, more economic and environmental studies need to be conducted into the viability of renewable energy.

Table 4.3.9 Ideas within the category 'other' that received priority, ranked accordingly

Category	Idea	Aim	Target Group	Priority
Other	Cars running on hydrogen engines instead of fossil fuels	Less use of resources	Producers	☆☆☆☆
	More use of biodiesel	Other	Producers	☆
	State should give incentives for research to develop renewable energy like solar energy	Less use of resources	Producers	☆
	Economic and environmental viability studies on renewable energy	Less waste production	Other	☆

5. Conclusion, discussion and evaluation

This country report presents country-specific findings from citizen focus groups in Portugal. 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 six focus groups in two different locations. In Portugal three focus groups were held.

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 Portugal. 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

Portugal ranks 19th on the EU27 ranking list on Municipal Solid Waste Recycling (MSW). The country has slowly been increasing its recycling rate over the last 10 years to 19%, mainly because of an increase in material recycling. Portugal will need to make an exceptional effort in order to fulfil the 50% recycling target of the EU (Waste Framework Directive) by 2020.[13] The results from the focus groups show that nearly all participants separate their waste at household level to some extent and have access to facilities needed to separate waste. This is in line with the findings from the Flash Eurobarometer survey 'Attitudes of Europeans towards resource efficiency'[14] in which 86% of Portuguese respondents indicated they do separate their waste for recycling or composting (see Annex 2). The VOICES focus group results show that most participants know what is expected of them at the household level. However, knowledge about what happens to their waste after disposal is limited and varies among the participants.

During the focus groups, large clusters of barriers and concerns could be distinguished for handling waste appropriately. When talking about production and prevention, the participants of all focus groups were concerned about the amount of packaging, and the type of packaging material that is polluting, such as plastic bags. In addition, the participants expressed a general concern about over-consumption and the economic interest of producers, both of which resulted in over-production and generated excessive waste. At the same time, they mentioned that people are not interested in reusing products because of the image of recycled or reused products. This contradicts the Flash Eurobarometer study, which established that 86% of Portuguese citizens said that they would buy products made of recycled materials.

In terms of waste management at home, many participants considered the major barrier to be lack of awareness and knowledge among citizens about recycling. The participants emphasised that citizens need more education and information about the importance of recycling and the correct way to do it, in order to induce good recycling habits. Participants also mentioned a lack of practical facilities as a barrier for separating waste at home, such as not enough recycle points (Ecopoints). The latter is consistent with the results of the Flash Eurobarometer which established that 82% of Portuguese citizens would like to have more drop-off points for recyclable and compostable waste.

Furthermore, the disposal of waste faces some challenges. Firstly, many participants considered the municipal waste collection service to be deficient and that there are problems with the Ecopoints. For example, there are too few Ecopoints and the containers are often too small and in poor condition (broken, dirty or smelly). Moreover, Ecopoints are not emptied in time, the trucks for waste collection are dirty, and there is a lack of awareness and good behaviour among the employees undertaking refuse collection, for example putting separated bags in the residual container. This discourages people from cooperating in terms of recycling. These results are consistent with the Flash Eurobarometer study, which established that 81% of the citizens would like to have better waste collection services. Secondly, participants mentioned the poor behaviour of citizens themselves at the Ecopoints, for example dumping bags next to the container or putting waste in the wrong container. They considered this lack of good behaviour as part of people's culture, due to a lack of education from childhood and a lack of information about recycling.

Thirdly, participants were critical about the question of who actually benefits from waste separation. They mentioned that citizens make the effort to recycle and bring separated waste to the Ecopoints but that they do not receive incentives to do this, while waste companies collect the separated waste and make money out of it.

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 'environmental sciences and technology', ideas focus mainly on technology (machines and processes) to improve the management of waste in the household, improve recycling and to use waste more effectively. Consumers and producers are the most prominent target groups, followed by waste management companies. Many of the technological ideas relate to the development of collective or domestic machines, where the separated waste is put in, mashed and transported (with pipes) to a recycle centre or for composting at home. Some of these ideas were related to making energy out of domestic waste. The main objectives of these ideas are convenience in the home and the effective use of waste. Furthermore, participants saw the domestic machine as a feasible and practical idea, with less waste going to landfill. Further discussions focused on the possibility of producers making products that are less polluting, the use of biotechnology for composting, and effective use of waste.

Ideas in the second domain 'policy, management and communication' were mainly concerned with managerial and logistical changes to reduce the amount of packaging and plastic used. Communication and education was also emphasised, to create awareness and change recycling behaviour. High priority was given to ideas that would reduce the amount of packaging and plastic from shops. Ideas were focussed on the reduction of plastic and other polluting material by using alternatives or making a system where durable packaging can be used and reused (such as glass bottles). Participants said a collective system is needed for handing in the packaging and receiving a deposit. Other participants suggested loose products should be available without packaging. Participants often referred to the time of their grandparents when such practices were 'normal' and considered that society should reintroduce such normal practices. Furthermore, participants felt that the municipality should provide a network of drinking water on tap at home and in parks so that consumers do not need to buy water in plastic bottles.

Finally, participants were convinced that there should be more information and education to make citizens aware of the value of recycling and to prevent waste production. Education throughout life was considered to be very important, including: shocking media campaigns, programmes at school, parents educating their children, information in the media, and labelling of products to give their ecological footprint so that consumers

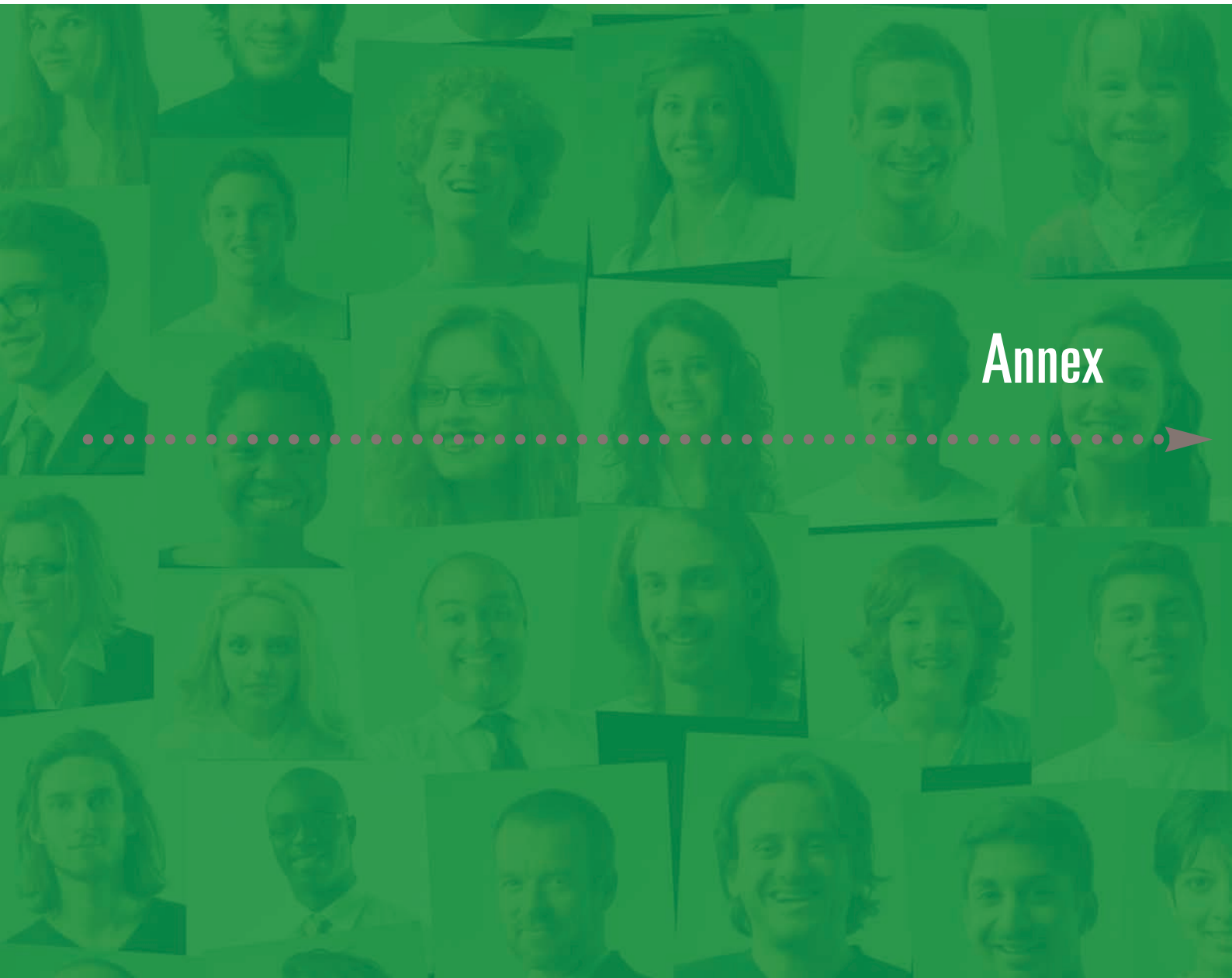
[13] European Environment Agency (2013). "Managing municipal solid waste - a review of achievements in 32 European countries" EEA Report No 2/2013
[14] Flash Eurobarometer No. 316 - The Gallup Organisation (2011)

can make the right choices. All these interventions are thought to increase awareness and improve recycling behaviour among citizens.

Of the most highly prioritised ideas, the first is a collective machine that transforms waste into fuel for your car (6 stickers). The second involves self-sufficient buildings where sewage and rubbish waste are converted into energy and for heating (5 stickers), followed by three ideas that received the same number of stickers (4): a house connected to pipelines for separated waste which is then transported through the pipeline to a centre (or more centres) for recycling; packaging with standardised sizes, made from plastic or glass that can be re-used (it would be handed in at supermarkets and consumer would receive a discount on new purchases); advertising that shocks consumers, encouraging them to produce less waste, and to reuse and recycle more.

5.3 Reflection

The focus groups were effective in eliciting citizen's preferences, values, needs and expectations concerning urban waste and innovation. The focus group participants generally found it easy to express their views and were keen to share their experiences. The structure for conducting the activities and the atmosphere surrounding the discussion were appreciated and provided them with a learning environment. The focus group gave participants an opportunity to exchange ideas with others and reflect on important issues in their daily lives. Many participants were happy to be consulted about the direction of research and innovation in Europe for the future. They were pleased to be engaged and have the opportunity to give their opinion, and they were optimistic about the impact.



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	Collective machine that transforms waste into fuel for your car	Effective use of waste	Consumers	☆☆☆☆☆ ☆
	Self-sufficient buildings where sewage and rubbish waste are converted into energy and for heating	Effective use of waste/ Convenience in the home	Consumers/ Producers	☆☆☆☆☆
	A house connected to pipelines for separated waste which is then transported through the pipeline to a centre (or more centres) for recycling	Improve recycling/ Convenience in the home	Consumers/ Waste management companies	☆☆☆☆
	A small domestic machine box or pipeline that mashes up the waste and that goes to the factory for recycling (no rubbish in street, no recycling points)	Convenience in the home/ Improve recycling	Consumer/ Waste management companies/ Producers	☆☆☆
	Domestic system for sorting organic and non-organic waste. The organic waste goes to the garden (on the roof)	Effective use of waste/ Improve recycling	Consumers	☆☆☆
	Use waste to create new material, like alloy or cement	Effective use of waste	Producers	☆☆☆
	New fuel created from waste	Effective use of waste	Producers	☆☆☆
	Nanotechnology for producing energy that can be used for the processing of waste	Effective use of waste	Producers	☆☆
	In every house a converter that separates fat and starch in waste food and changes it into stone	Convenience in the home/ Effective use of waste	Consumers	☆☆
	A machine that evaporates rubbish	Eliminate waste	Producers	☆☆
	Domestic device for personal cleaning without using any cleaning products	Convenience in the home/ Less waste production	Consumers	☆
	An intelligent house of the future that stops you feeling hungry if you go into the garden. This house has also a vegetable garden for vegetables that do not need cooking	Less waste production	Consumers	☆
	Developing new forms of energy for small domestic appliances to reduce the use of batteries	Less use of resources	Consumers/ Producers	

	Domestic waste transformer that makes waste disappear into another dimension	Eliminate waste/ Convenience in the home	Producers/ Consumers	
	Domestic machine that turns waste into drinking water	Effective use of waste/ Convenience in the home	Producers/ Consumers	
	A system that produces everything you need without packaging just by thinking about it, it appears through a hatch	Less packaging	Producers/ Consumers	
	A computer that sends your shopping list, and with a teleporting device so shopping appears without packaging	Less packaging	Producers/ Consumers	
Material	Research on products made with materials that are less polluting and friendly to the planet	Effect on planet	Producers	☆
	Using materials in production that are less polluting and friendlier to the planet	Effect on planet	Producers	☆
	Edible food packaging	Less waste production	Consumers/ Producers	
	Biodegradable packaging	Less waste production	Consumers/ Producers	
	Reusable, aesthetically designed packaging	Less use of resources	Producers/ Consumers	
	Packaging is made of flexible material and should be reduced to the volume of the product	Less packaging	Producers	
	Packaging that evaporates after using	Eliminate waste	Consumers/ Producers	
Bio(techno)-logical	Biological research on the use of worms, micro organisms and bacteria for composting of food waste	Less waste production	Consumers/ Other	☆☆
	Fat waste from canteens should be separated and transformed into biogas using enzymes	Effective use of waste	Producers/ Other	☆
	Reduce food to the size of pills	Less waste production/ Less packaging	Consumers/ Other	☆
	Change skins of humans in a way that does not need clothing	Less waste production	Consumers/ Other	
ICT	New electronic gadget that can scan or take photos so that documents do not need to be duplicated	Less use of resources	Producers/ Consumers	☆☆
	Build a chip in people's brain that will make people have civic duty, conscious and responsible regarding waste	Awareness of values	Consumers	

POLICY, MANAGEMENT AND COMMUNICATION

Category	Idea	Aim	Target Group	Priority
Policy	Studies on social behaviour: what motivates consumers to recycle	Behaviour change/ Awareness	Consumers/ Other	☆☆
	Legislation to reduce packaging	Less packaging	Producers	☆
	Legislation forcing consumers to recycle enforced punishments, such as community work or fines	Behaviour change/ Improve recycling	Consumer	
	Financial incentives for individual recycling, for example discounting water bills	Behaviour change/ Improve recycling	Consumers	
	Rules are needed in the home and workplaces, for example where to put the rubbish	Behaviour change/ Improve recycling	Producers/ Consumers	
	Punishment for the polluter	Behaviour change/ Effect on planet	Consumers/ Producers	
	The European Community should regulate and ban highly polluting and poorly biodegradable packaging	Effect on planet	Producers	
	More research on chemistry and renewable energy	Less waste production	Others	
Management/ Logistics	Packaging with standardized sizes, made from plastic or glass that can be reused. It would be handed in at supermarkets and consumer would receive a discount on new purchases	Less use of resources	Producers/ Consumers	☆☆☆☆
	Municipality should improve the water network so that consumers do not have to buy water in bottles	Less plastic	Government/ Consumers	☆☆☆
	Use and study alternatives to plastic bags and plastic packaging, substituting it, for example, with glass or paper	Less plastic	Producers	☆☆☆
	Loose, unpackaged items available for purchase and, like in the olden days, consumers take their own packing or plastic bag to the grocery store	Less packaging	Producers/ Consumers	☆☆☆
	Link universities with companies for innovative waste processing (like polar fleece sweaters made of bottles and bags made of cork)	Improve recycling/ Less waste production	Producers	☆☆☆
	Study the process of cleaning packaging and reusing it, as in the case of bottles, and the consumers should receive a deposit return based on weight	Less use of resources/ Less packaging	Producers/ Consumers	☆☆
	Collective compost bins at apartments where organic waste is transformed into fertiliser and collected by local authorities	Effective use of waste	Consumers/ Waste management companies/ Government	☆
	A shop which uses the material of existing clothes to make new ones (old coat into shorts) and for which the consumer receives an incentive/pays less	Use of resources/ Behaviour change	Consumers/ Producers	☆

	Changing edible products in smaller portions with same value and quality	Less waste production/ Less packaging	Producers	☆
	Using products with fewer pollutants, for example substituting plastic bags with other materials that are less polluting	Less plastic/ Effect on planet	Producers	☆
	Pay for plastic bags in shops	Less plastic	Consumers	
	Make bottles return to the shop for reuse	Less packaging	Consumers/ Producers	
	Alter the market and distribution system to supermarkets, requiring less packaging	Less packaging	Producers	
	Reuse plastics and tyres, for example use tyres to cover the side barriers along motorways and in playgrounds, to increase safety	Effective use of waste	Producers	
	The municipalities take charge of rubbish collection and transform into business with the money they should provide more recycle points	Other	Government	
	More recycle points per street, and give money for piles of paper and cardboard per weight	Improve recycling	Waste management companies/ Consumers	
	More recycling points (with information and in appropriate places)	Improve recycling	Waste management companies/ Consumers	
	Large containers with a lid, where everything fits	Improve recycling	Waste management companies/ Consumers	
	Recycle old clothes to produce new material or new products	Less use of resources	Producers/ Consumers	
	A personal control system for food proportions, based on weight and height	Less waste production	Consumers	
	Individual doses of medication, with a precise amount so that there are no leftovers	Less packaging/ Less waste production	Consumers/ Producers	
Communication and education	Advertising that shocks consumers, encouraging them to produce less waste, and to reuse and recycle more	Awareness of negative effects	Consumers	☆☆☆☆
	Labelling ecological footprint of products so that the consumer can chose between products in the supermarket	Awareness of possibilities	Consumers	☆☆
	Education on recycling	Awareness	Consumers	☆☆
	Basic education about recycling happens at home, followed at school and throughout life	Awareness/ Behaviour change	Consumers	☆
	Giving children incentives at school for recycling	Behaviour change	Consumers	
	Education in school for information and awareness about recycling	Awareness	Consumers	

Communication and education	Awareness raising actions at work to put things into practice	Behaviour change/ Awareness	Consumers	
	Changing behaviour by reusing what you have, reducing consumption needs	Behaviour change/ Less use of resources	Consumers	
	Information in local newspapers and media about the recycle sites	Awareness	Consumers	
	More information about collection and reuse of clothes, furniture, shoes, and information on recycling in appropriate places	Improve recycling/ Awareness of possibilities	Consumers	
	Educate the user where the product should go for recycling (pen, cartridge)	Improve recycling/ Awareness of possibilities	Consumers	
Local initiatives	A shared database to exchange products, like clothing accessories encouraging reuse	Less use of resources	Consumers	☆
	Competition in the city: which neighbourhood produces the least rubbish	Less waste production/ Awareness of possibilities	Consumers	
	Give food waste to animals, and companies collect the food leftovers	Effective use of waste	Consumers/ Waste management companies/ Producers	
	Business that recycles furniture and sells it as new	Less use of resources	Consumers/ Producers	
	The school sends children to clear up the rubbish in the streets	Behaviour change	Consumers	
Other	Cars running on hydrogen engines instead of fossil fuels	Less use of resources	Producers	☆☆☆☆
	More use of biodiesel	Other	Producers	☆
	State should give incentives for research to develop renewable energy like solar energy	Less use of resources	Producers	☆
	Economic and environmental viability studies on renewable energy	Less waste production	Other	☆
	Creation of ecological buildings with non-polluting materials, such as using solar panels, this can heat the house and be transformed into energy	Less effect on planet	Producers/ Consumers	

Annex 2: Attitudes of citizens from Portugal 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 Portugal.

Question	Answer	%	EU27 Average
Do you think Europe could be more efficient in its use of natural resources?	Yes	90%	87%
	No	1%	5%
	DK/NA*	9%	8%
Do you think that your household is producing too much waste or not?	Yes	42%	41%
	No	56%	58%
	DK/NA*	2%	1%
Do you separate at least some of your waste for recycling or composting?	Yes	86%	89%
	No	14%	11%
	DK/NA*	0%	0%
What initiatives would convince you to separate (more) waste?	More and better drop-off points for recyclable and compostable waste	82%	76%
	Improve separate waste collection at your home	70%	67%
	More information on how and where to separate waste	67%	65%
	Legal obligation to separate waste	61%	59%
	Taxes for waste management	34%	39%
What initiatives would improve waste management in your community?	Better waste collection services	81%	70%
	Stronger law enforcement on waste management	60%	65%
	Make producers pay for collection and recycling of waste	51%	63%
	Make households pay for the waste they produce	24%	38%
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	17%	14%
	To pay proportionally to the quantity of waste you generate	47%	75%
	DK/NA*	36%	11%

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	26%	25%
	Include the cost of waste management in the price of the products you buy	30%	59%
	DK/NA*	44%	16%
Can you estimate what percentage of the food you buy goes to waste?	None	19%	11%
	15% or less	64%	71%
	16% to 30%	9%	13%
	More than 30%	3%	4%
	DK/NA*	5%	1%
What would help you to waste less food?	Better estimate portion sizes (how much food you cook) to avoid excess food	72%	62%
	Better information on food product labels, e.g. how to interpret "best before" dates, information on storage and preparation	65%	61%
	Better shopping planning by my household	71%	58%
	Smaller portion sizes available in shops	54%	58%
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	56%	39%
	Rather important	23%	41%
	Rather not important	13%	12%
	Not at all important	4%	6%
	DK/NA*	4%	2%
Are you willing to buy second-hand products?	Yes	66%	68%
Base: all respondents, % of yes			
Would you buy the following products second hand?	Furniture	60%	56%
Base: all respondents, % of yes	Electronic equipment	48%	45%
	Textiles (clothing, bedding, curtains, etc)	32%	36%
What reasons prevent you from buying second-hand products?	Quality/usability of the product	51%	58%
	Health and safety concerns	51%	50%
	Less appealing look of the product	22%	25%
	Afraid of what others might think	4%	5%
Would you buy products made of recycled materials?	Yes	86%	86%
	No	8%	11%
	DK/NA*	6%	3%
What would be the most important factors in your decision to buy products made of recycled materials?	Quality/usability of the product	49%	51%
	Environmental impact of the product	27%	26%
	Price of the product	20%	18%
	Brand/brand name of the product	2%	2%
	DK/NA*	2%	3%
What prevents you from buying recycled products or products containing recycled materials?	Health and safety concerns	22%	44%
	Quality/usability of the product	41%	42%
	No clear consumer information on the recycled product	4%	32%
	Less appealing look of the product	21%	17%
	Afraid of what others might think	0%	5%

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

PAVILION OF KNOWLEDGE
CIÊNCIA VIVA
PORTUGAL

Parque das Nações, Alameda dos Oceanos
1990-223 Lisboa, Portugal
pavconhecimento.pt

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.

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