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COUNTRY REPORT BELGIUM

Views, Opinions and Ideas of Citizens in Europe on Science

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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

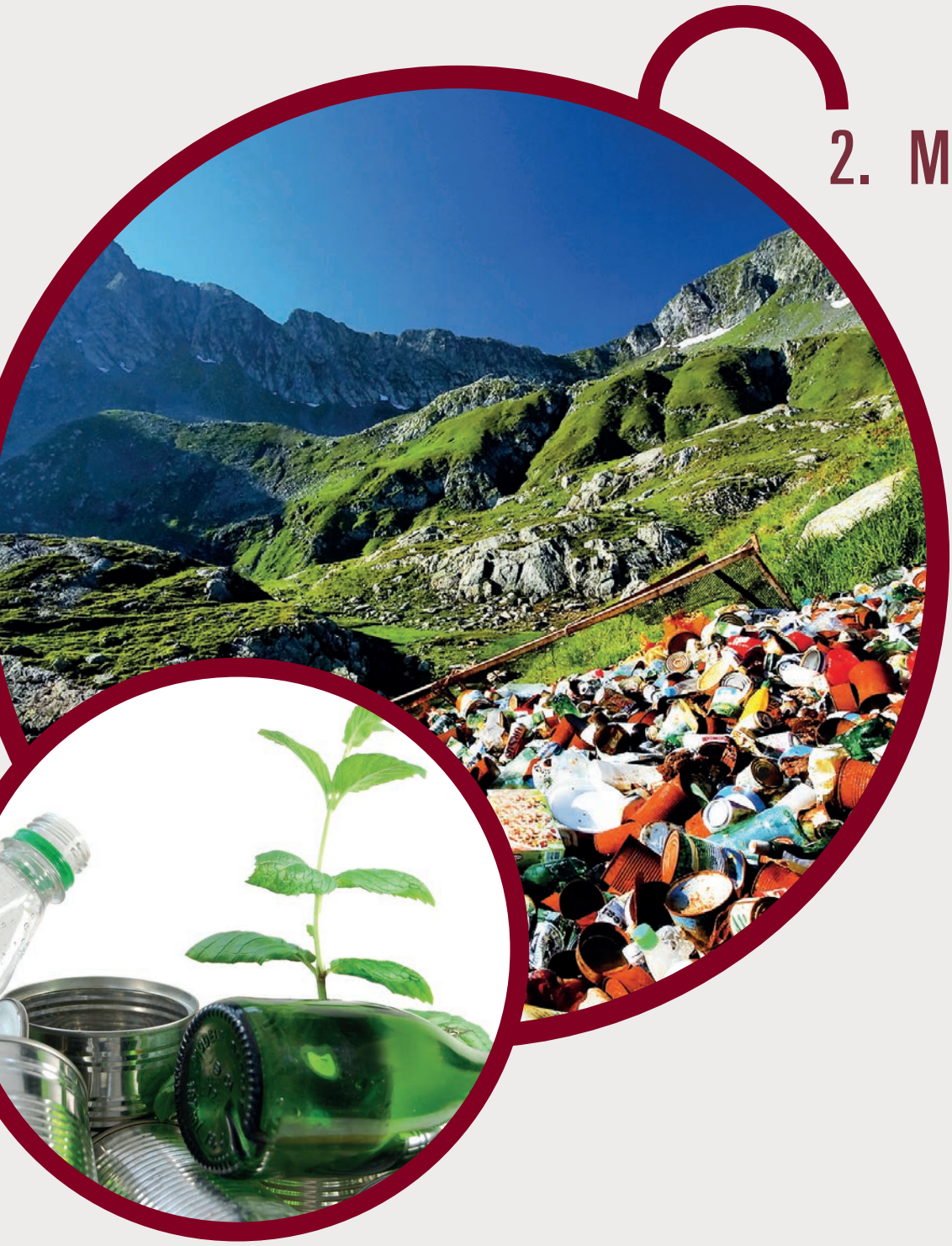
One thousand European citizens participated in focus group discussions about 'Waste as a resource' using a structured VOICES methodology which spans training, implementation and analysis. The methods, infrastructure and results of VOICES are fully documented on an open access portal (www.voicesforinnovation.eu) 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, analysing 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 Belgium, the VOICES research methodology is further detailed in the following chapter. In Chapter 3, some specific data is provided on the country's population, on national urban waste figures and on specificities of the participants of the focus groups. Chapter 4 presents the results of the citizens' consultation on waste management at household level, barriers and concerns experienced in prevention and management of waste, and ideas for research and innovation, policy, management and communication. The report ends with a summary and discussion of the findings.



2. Methodology

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

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

2.1 The VOICES focus group approach

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

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

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

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

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

BOX 2.1 SUMMARY OF VOICES FOCUS GROUP SCRIPT

INTRODUCTION

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

EXERCISE 1

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

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

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

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

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

2.2 The VOICES approach to urban waste

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

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

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

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

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

2.3 Analysis of the focus groups

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

2.4 Ethical issues

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

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

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

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

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

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

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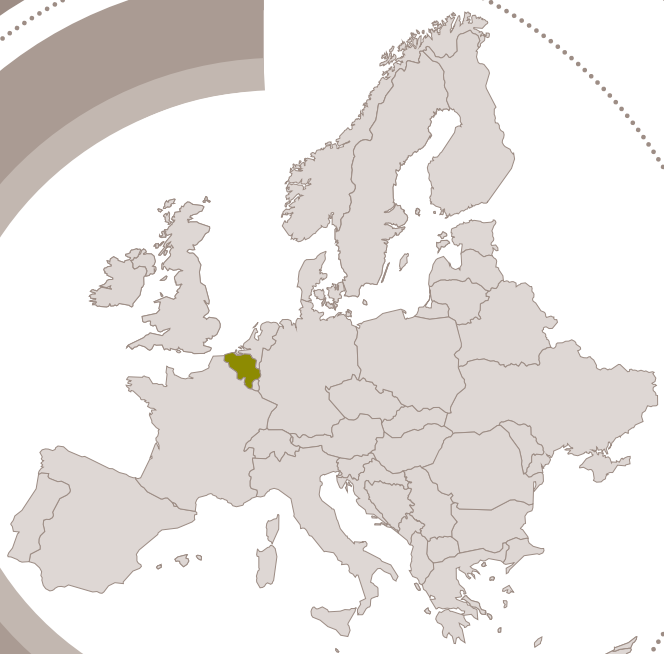


3. Country relevant data - Belgium

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, Belgium is one of the smaller EU countries with approximately 11 million inhabitants. Most inhabitants live in urban areas (68%), while others live in intermediate areas (24%) and rural areas (9%).

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

		2011	
Population at 1 January		11 000 638	
Population as percentage of EU27		2.2%	
Gross Domestic Product (PPP)		299 000 Euro	
Population urban-rural typology	Urban	7 322 000	68%
	Intermediate	2 581 000	24%
	Rural	938 000	9%

3.2 Factsheet on waste

The amount of municipal waste generated and treated in Belgium is lower than the average amount of waste treated in the EU27. Belgium ranks 3rd on the EU27 ranking list on Municipal Solid Waste Recycling (MSW). Belgium has already met the EU Waste Framework Directive's target to recycle 50% of MSW by 2020.[9]

Table 3.2 Municipal Waste[10,11]

		Belgium		EU27 average	
Municipal waste generated (kg per person)		466 kg		502 kg	
Municipal waste treated (kg per person)		434 kg		486 kg	
Municipal waste treated	Landfilled	4 kg	1%	185 kg	38%
	Incinerated	161 kg	37%	107 kg	22%
	Recycled (material recycling)	174 kg	40%	122 kg	25%
	Composted (organic recycling)	95 kg	22%	73 kg	15%

3.3 Composition of the focus groups

In Belgium, three focus groups (FGs) took place on the weekend of 16rd March 2013. They were held at the Royal Belgian Institute of Natural Sciences in Brussels, moderated by Geertrui De Cock, Participation Process Expert.

In total, 30 people (14 male and 16 female) participated in the three FGs. 9 participants were aged between 18 and 35 years, 10 between 36 and 50 years and 11 were aged 51 or higher. There were 13 participants with a high level of education, while 12 participants had a medium level and 5 others a low level of education. 27 participants were working or unemployed, while 3 others were retired.[12] 18 participants live in a house and 12 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	9	11	30
Gender	Male	5	4	5	14
	Female	5	5	6	16
Age	18 - 35	0	9	0	9
	36 - 50	10	0	0	10
	50+	0	0	11	11
Education	High	4	4	5	13
	Medium	5	4	3	12
	Low	1	1	3	5
Employment	Unemployed / Employed	10	9	8	27
	Retired	0	0	3	3
	Student	0	0	0	0
Housing	Flat	3	4	5	12
	House	7	5	6	18

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

4. Results

This chapter describes the overall results of all focus groups held in Belgium. 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.[13]

4.1 How is waste managed at household level?

This section describes what people know and do with respect to household waste. It includes four parts. First, an overview is given of the types of waste that are generally collected separately and those that 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

Nearly all participants indicated they sort their waste at household level. The waste streams they typically describe (a waste stream is defined as one type of waste that is collected separately, covering the majority of their household waste) often include: plastic, metal, paper, glass, chemical waste, organic waste, bulky waste and residual waste. Some participants further explain how they separate different colours of glass. In all focus groups, it was pointed out that coloured bags are used to sort different waste types; a different coloured bag is used for each waste type. However, the colour codes vary from municipality to municipality. Also, these bags are not used for every waste type, as some participants noted. For instance, to sort paper waste, not bags but cardboard boxes are used. The coloured bags are not used for separating chemical waste, either. With respect to chemical waste, a distinction is often made between oil, batteries and paint jars, for example. Some participants however, explained that they do not separate chemical waste, which then ends up with their residual waste.

Of the many participants that separate their organic waste, some use this as compost to fertilise their own gardens. On the contrary, many participants living in Brussels city said they just throw away their organic waste together with their residual waste. Participants from various focus groups also mentioned that they donate their old clothing or furniture to charity organisations or thrift shops. Construction waste and electronic waste were barely mentioned as waste streams.

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

4.1.2 Waste collection

Though a number of Brussels participants noted that waste disposal is free of charge for them, many participants explained that they have to pay for (some of) their waste disposal. Examples included fees for dumping building and bulky waste at the tip, and fees for house-to-house pick up service of plastic and residual waste. One participant gets rewards for bringing paper waste separately to the waste centre:

> *"To encourage people to go to the container we have a small card and this is unusual because I have not heard of it yet. We have one small card per resident and they put stamps every time we go to the collection centre and we have to do 10 trips over 12 months and at the end of the year we get 15 euros." (Belgium FG3, P1)*

The main similarity among the waste management strategies reported seems to be that many participants have to pay for disposing of waste. Many participants pay through having to buy a certain type of rubbish bags at a regulated price, and some participants pay for waste disposal by weight. These bags often have a certain colour, specifying the waste type that it should be filled with. Some participants explained that collection services check to see if the colour of the bag matches the waste type that is in it, and one participant explained that his collection services also weigh the bags:

> *"The black bin is all the plastics, packaging. For example, we get newspapers wrapped in plastic, we have to remove the plastic and put it in the black bin. Uh, everything that is really plastic packaging must go into the black container, which is also weighed. We pay per pickup and per kilo." (Belgium FG3, P2)*

The types of waste that are collected at the door and the types of waste that need to be brought somewhere vary a lot among participants. For instance, some participants need to bring their paper waste to a collection centre or what they call a container park, while for others it is picked up right in front of their house. Some participants have a communal container nearby, but many need a car in order to bring waste to the nearest container park. Many participants talked about having to bring many different types of waste to a designated collection point. Chemical waste, medicines, electronic waste and clothes seem to be the waste types that are never picked up separately at the place of residence, and thus need to be brought somewhere. Many participants mentioned how they can bring their old clothes to thrift shops, or collection points of charity organisations.

Organic waste, glass, metals and drink containers were among the waste types that participants said are sometimes picked up in front of the house. Most of the time, however, only residual waste is picked up from the house, or else at a nearby collection point. Bulky waste such as old furniture is often collected nearby, though participants need to make appointments for this. Furthermore, a couple of participants mentioned they have the opportunity to hand in their glass, sorted by colour.

4.1.3 Knowledge about waste pathways

When asked about whether they know what happens with their waste after disposal, many participants replied with basic concepts such as incineration, recycling or landfill. Some participants thought that most waste was incinerated; others presumed that it was mainly recycled. Most participants assumed that paper, metal, plastic and glass is recycled. In each focus group, participants brought up the issue of the general community being ignorant and lacking awareness about waste pathways. One participant used to have a holiday job in waste processing and was able to tell the group that residual waste is incinerated, paper is reused, plastic bottles, metals and drinks containers are sorted and as many metals as possible are extracted from electronic waste before it gets deposited in the rubbish dump.

Participants brought up cases of waste collectors indifferently throwing separated waste together, mixing up the waste that people had sorted:

"[P7] There may be something that I didn't write down, but it is something that I noticed when I lived in Brussels, paper separate too, packaging separate and blue bag separate. And you set all of it out and the waste truck came and what did I see, they just threw it all in the same. [The group recognizes this problem and agrees with P7.]" (Belgium FG 1)

The same issue was brought up in another focus group:

"[P3] We also have the blue bags and there was a scandal. People who filmed some collectors who mixed all of it. So you go to the trouble at home to do proper sorting, and then well the collectors then mix it all...
[P4] Those two bins? Actually those who pick up the garbage?
[P3] Yes, absolutely.
[P4] Oh yes they mixed the bags all in one truck!
[P3] Yes it was filmed! That is outrageous! It makes me so angry because we say to ourselves we did all that and then..." (Belgium FG3)

In both these cases, participants indicated that such scandals made them even more uncertain about what really happens to most of the waste.

4.1.4 Waste management behaviour and convenience

Overall, participants seem to try to deal with their waste correctly. Many participants indicate that this is not always easy, because the waste management system is complicated, costs money, and often requires having a car. Despite these inconveniences, it seems as if participants in Belgium are somewhat pressured to work with the system. Several examples were given of collectors refusing to take inappropriately sorted waste with them:

"Because the other day I experienced that my containers, my regular containers stayed because they weighed more than 15 kg. And then the weight was there with, and with a small label, and yes, then you have to start transferring things. So I didn't know that that was 15 kilos maximum, so always fill up that one completely and I set that one outside. And apparently one was 16 kilos and the other 17 kilos and so that was not allowed." (Belgium FG 1, P4)
"[...] But sometimes, those bags stay because of the fact that if you put something wrong in it, you don't know what's wrong. With that red sticker to say, yes, you have made a mistake." (Belgium FG 1, P6)
"In terms of newspapers, it's also once every 15 days at the same time as the blue bags. Then they should be wrapped in a box or taped, but definitely without plastic. Because if there is plastic, we get a label and it stays there." (Belgium FG3, P2)

Thus, although participants are obliged to sort their waste, they also note that it can be difficult or inconvenient. Many participants described the waste management as complicated, partly because of the inconsistency of regulations among municipalities and the many different waste types to be sorted.

Some participants do not know where to keep them bins, which can be inconvenient, because when they are left out on the street, other people can use their bins:

"But now they've given us containers too. But where I live just across the way I don't even know how to bring it in, it stays in the street. I put in screws so that people don't put anything inside. So that, that's a big problem, this kind of thing, because not everyone knows how to go in and out, because it's still quite big, and the old people in the houses opposite that don't even have entryways because their houses are where you enter directly into the living room, you put organic waste..." (Belgium FG3, P5)

Lastly, the infrequency of waste collections also proved to be inconvenient, although less problematic.

4.2 Barriers and concerns regarding urban waste

This section provides an overview of the participants' barriers and concerns with respect to current urban waste and identifies underlying reasons for the reported barriers and concerns. The section consists of three parts. The first part, 'Waste prevention and production', focuses on barriers and concerns related to goods in the phase before they enter the household including both waste prevention and production. The second part, 'Waste management in the household', addresses goods and waste in the phase while they are in the household. The third part, 'Waste disposal and pathways', describes barriers and concerns related to the phase in which waste is disposed.

4.2.1 Waste prevention and production

In all the focus groups, participants spent a great deal of time discussing barriers and concerns regarding how products are generally over-packaged. Many examples of unnecessary packaging were given, including food and drink products, electronics and cosmetics:

> *"I have an example of this. For instance, at Colruyt [Belgian supermarket chain], they package shampoo for instance. They package it twice in a very thin plastic sheet. You don't get a discount if you buy two of them, so why do you have to buy them in twos? And then you have to go home with that plastic sheet. I don't get it. I don't understand why they put a plastic sheet around that. That is complete senseless plastic pollution." (Belgium FG2, P 10)*
>
> *"Yes, I have the same, because I think so too, hey, when you go to the store. Waffles for my daughter. Then you have a waffle and a, uh, a package around it and another package around that and eventually you will have seven packages for one waffle." (Belgium FG 1, P 7)*

Participants gave a variety of examples like this of unnecessary waste production and potential prevention. They felt that excess packaging is often purely created as a marketing strategy: to make products look more attractive, or to label products. One participant claimed that packaging is often used to give buyers the feeling that they are getting more for their money. Another participant expressed concern about the contradiction that packaging might be necessary to indicate organic products:

> *"I also buy, I also buy, er, a lot of organic products and I know that it's a problem. It breaks down in a composter, but carrier bag for instance at Delhaize [Belgian supermarket chain] they use them for the logo to be sure that it is organic. If you compare it with another similar product and they also plan to stop using packaging, how will we know which avocado is organic and which isn't?" (Belgium FG2, P 1)*

Furthermore, another participant claimed that avoiding excessive packaging by buying in bulk is sometimes more expensive, and that this should be the other way round:

> *"[P5] One thing I would like add to what the lady said, for example in Colruyt near me, buying in bulk is more expensive than packaged!*
>
> *[P4] Really?*
>
> *[P5] Yes. While it should be the opposite since bulk, well, doesn't have packaging... it's more expensive so you'll buy pears pre-packaged rather than buy them in bulk!" (Belgium FG3)*

Other barriers and concerns related to the marketing of products focused on advertising. Firstly, participants explained how advertising always tempts them into buying the newest electronics, such as phones, and how this is an on-going process. Secondly, advertisement creates waste too, because people's mailboxes are filled up with leaflets, leaving them with an excessive amount of paper waste.

Some participants also experienced concerns about the overall mentality of the general public, and noted that education and upbringing of children could play a major role in this. For instance, one participant explained

how in her children's school, children were not even allowed to bring reusable drinking bottles, because of the risk of leakage. This participant explained that this regulation is not only a barrier for her to producing as little waste as possible, but that she had concerns about the school not setting a good example for children.

Lastly, a participant expressed concerns about the production of products that are not environmentally friendly, and can contain or consist of hazardous substances.

4.2.2 Waste management in the household

Although many participants indicated that they do separate their waste in their household, many of them also mentioned barriers and concerns that keep them from separating specific waste types. Generally, quite a number of participants felt that too much sorting is expected from citizens.

Each of the three focus groups brought up a very common barrier concerning lack of space in the household. Participants who live in flats with no gardens and limited space to manage all the different bins, have particular trouble sorting their waste accordingly:

"[P 10] To separate, you're going to need a space for this too. You should be able to do it somewhere in your house. So you're going to need quite a decent house then.
[M] Yes. So space for your sacks and for separation and your, yes. OK.
[P 10] Yes and those sacks, sometimes they smell and so you wouldn't want that all the time in your house." (Belgium FG2)

Another common barrier that relates to the management of waste in the household is that participants do not always know what waste goes in what bag or where it should go. The difficulty of this was pointed out for things like diapers, chemical waste and plastic bottles of hazardous products. Again, the many different methods of collection in the various municipalities further complicates this issue.

4.2.3 Waste disposal and pathways

Several barriers and concerns seem to be caused by the alleged complexity of the waste collection system, with the use of colour-coded bags. Participants point out that many complications in this system arise from a general lack of information and the inconsistency of the system between municipalities.

"[P6] What I do hear, it's one municipality to the next. One time it is the blue bag for that...
[P 7] Yes!
[P 1] Yes!
[P6] Another municipality, blue bag for plastic.
[P2] I think so too, yes.
[P6] Another municipality, a blue bag for something. In fact this is not-
[P 10] No.
[P6] -not clear for people and, and all municipalities separate their regulations to say, here you are you have to use that colour and at another municipality is a different colour. I don't think that that is logical." (Belgium FG2)

The participants also indicated that there is a lack of follow-up information about waste management. They felt uninformed about what happens to the waste. They think this is quite neglectful, and could very well contribute to citizens' lack of cooperation. Participants often do not know where to bring certain waste types such as chemical waste, medicines and printer cartridges. As previously mentioned, lack of information also causes people to make mistakes in sorting their waste, which in turn results in collectors refusing to take waste away.

Participants were concerned about the lack of professionalism on the part of the refuse collectors. Participants also indicated that there is a lack of available public bins and that collections should be more frequent. Many participants stated that public bins and containers often end up overflowing, leading to people inappropriately dumping their waste elsewhere.

Again concerning the colour-coded bag system, some participants stated that having to buy the necessary bags is expensive, and that this can be a barrier. Other ways of paying for refuse disposal, such as at container parks, are also perceived as barriers. Moreover, travel is required to reach container parks, and their opening hours can also be inconvenient.

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

Though this category ended up with the greatest number of ideas assigned as priority, many of these ideas were not ranked highly (see Table 4.3.1). Only one idea with the aim of 'using waste effectively' was highly prioritised. This idea was about incinerating waste at home, and thereby generating energy for the house. This idea was thought of in only one focus group, but as illustrated by the allocated priority level, participants were quite enthusiastic about it. Interestingly, the foundations of this idea were independently created by two subgroups in the same focus group:

> *"[P8] A whole processing system to incinerate your waste, but maybe you can use your heater with that.*
> *[P7] Yes, that's right.*
> *M: Yes, yes, yes that is one, who has something in it that...*
> *[P8] We had that too. So its own processing system, that you don't have to put in bags anymore and then..." (Belgium FG 1)*

From here on, the ideas merged completely, and shaped into a concept where ideally, all the energy released from burning waste should be captured and used to power the house. This way, waste would be effectively used to supply the house with energy, and consumers would no longer have to be burdened with all the inconveniences of appropriately dealing with waste.

Other ideas were not given a great deal of priority, and were often aimed at using fewer resources. These ideas included having holograms to replace conventional furniture, generation of energy from human movement, and other natural forces (instead of using batteries). Two somewhat similar ideas were to develop products so that they can be more easily disassembled in order to reuse the parts and to create appliances with parts that are replaceable by the user. However, these ideas differ in that the second idea aims to have the users or consumers replace the parts themselves. Nonetheless, both ideas are aimed at using fewer resources.

Two more ideas with a low priority level were 'to develop a teleportation machine for food', and 'recycling waste into other products'. One idea, developing domestic machines that can teleport food, was designed to make packaging obsolete and for more convenience in the home. The idea of recycling waste into other products aims to use waste more effectively.

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	Incinerating all waste at home and thereby generate energy for the house	Effective use of waste/ Convenience in the home	Consumers	☆☆☆☆☆☆☆
	Holograms as furniture	Less use of resources	Consumers	☆☆
	Develop products in ways so that they can be more easily disassembled in order to reuse the parts	Less use of resources	Producers/ Consumers	☆☆
	Generation of energy from human movement, and other natural forces (instead of using batteries)	Less use of resources	Consumers	☆☆
	Teleportation machine for food	Less packaging/ Convenience in the home	Consumers	☆☆
	Creating appliances with parts that are replaceable by the user	Less use of resources	Producers/ Consumers	☆
	Recycle waste into other products	Effective use of waste	Waste management companies/ Producers	☆

MATERIALS

Only two prioritised ideas were categorised under the research category 'material' (Table 4.3.2). One group of participants came up with the idea of creating packaging that self-disintegrates once it is no longer of use:

> *"[...] But then what I had thought for packaging, that's another thing, I say why not create packaging that once it's empty, it disintegrates?" (Belgium FG3, P4)*

Participants could visualise this as having a package with a chip in it that would take care of the disintegration.

The idea that scored the second highest priority in this category, was to develop products in such a way that they can be broken down by nature. This idea was described briefly:

> *"And also, that you don't make things which cannot be broken down by nature, that you only make things which can also be broken down by nature." (Belgium FG2, P 10)*

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

Category	Idea	Aim	Target Group	Priority
Material	Create packaging that self-disintegrates	Effect on planet	Producers	☆☆☆☆☆☆☆☆
	Develop products in such a way that they can be broken down by nature	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. In this research category, only one idea was given priority, namely the idea to create nutrition in the form of pills or capsules. Though this idea had come up within two focus groups, it was only prioritised by one focus group. With this idea, the participants clearly had the intention of reducing packaging. The idea was prioritised at a low level.

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	Creation of nutrition in the form of pills or food capsules	Less packaging	Consumers	☆☆

ICT

The research category 'ICT' is another category with but one prioritised idea. The participant that thought of the idea explained it as follows:

> *"I still have one, if you make purchases then you do that automatically with your mobile phone or whatever. That you actually automatically create a database of purchases you've made including also that you can, for example, sort by expiry date and such and at home you then, for example, check, like, aha, like, what is the expiration, oh, that I have to eat and that is how it actually is going to reduce your pile." (Belgium FG 1, P3)*

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

Category	Idea	Aim	Target Group	Priority
ICT	Food database: get a warning before food in the house perishes	Less waste production	Consumers	☆

4.3.2 Policy, management and communication

POLICY

Ideas related to regulations and incentives were abundant in all focus groups. These are grouped in the category 'policy' (see Table 4.3.5). Often, ideas were related to regulations in the form of incentives or sanctions to motivate consumers and producers to change their behaviour. Many ideas in this category were ranked as high priority.

The idea ranked as highest priority was the idea of 'zero waste marketing' and requiring producers throughout the EU to only use packaging that is 100% recyclable. This idea was formulated as follows:

"[P7] One of the things we found again, is just, everybody, make the products mandatory to have their things 100% reusable or recyclable.
[P10] So mainly adjust legislation.
[P7] They want to bring something to the market, that is fine, but then it has to be completely 100%, but not 99, because then you will always have a little waste. [light laughter in the group] Or reusable or recyclable." (Belgium FG1)

Despite the legislative basis of this idea, as the idea evolved, the concept of marketing became somewhat more integrated, and the term 'zero waste marketing' was added to point out that essentially the whole marketing system would have to adapt to such legislation.

The same focus group (FG1) also came up with the idea of rewarding 'zero waste behaviour' in general. This idea focuses on rewarding people that put in the effort of being environmentally friendly, thereby reinforcing their motivation. Many examples were given of how incentives could be used to reward consumers for separating and handing in their waste, but also about how consumers should have to pay less for environmentally friendly products. Though examples of rewarding producers or companies were not explicitly made, with the way the idea was formulated, this could just as well be part of the idea.

Another idea ranked as reasonably high priority was to investigate what the best ways of dealing with waste really are, in order to make consistent regulations, as effective as possible. The group of participants that thought of this idea felt there was still a lot of uncertainty about which methods of dealing with waste are the best, hence the first part of the idea: using comparative research to determine what methods are best. For instance, is it better for the environment to recycle glass, or is it better to reuse it? The second part of the idea is about using the results of these comparative studies as a consistent guideline upon which to base legislation. This idea was mainly about tackling waste stream problems by improving the cooperation between research studies and legislation.

Lastly, a fourth prioritised idea concerned enforcing European policy to prevent products packaged abroad from flooding the European market:

"Again, one last word about European policy, since we're making a... so like, really block borders since the Americans refuse certain European products, we discussed them, like cheeses etc.. Well uh, a European policy, we say then everything that... I'm exaggerating obviously, I'm neither anti nor pro, but anything that isn't European doesn't come in here! There!" (Belgium FG3, P3)

The aim of this idea was mainly to limit the variety and quantity of packaging that enters the European market.

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

Category	Idea	Aim	Target Group	Priority
Policy	Zero waste marketing that requires producers throughout the EU to only make products that are 100% recyclable	Improve recycling/ Less use of resources	Producers	☆☆☆☆☆☆☆☆
	Reward 'zero waste behaviour' (e.g. bring your household oil waste to a gas station and get fuel in return)	Improve recycling/ Behaviour change	Producers	☆☆☆☆☆☆

Policy	Investigate what the best ways to deal with waste really are, in order to make consistent regulations as effective as possible	Effect on planet	Government	☆☆☆☆☆
	Enforce European policy to prevent foreign packaged products flooding the market	Less packaging	Producers	☆☆☆☆☆

MANAGEMENT AND LOGISTICS

'Management and logistics' is another category in the domain of 'policy, management and communication'. Many of the aforementioned ideas require a certain number of managerial or logistical changes, but only some ideas have this as their primary focus. Hence, only two prioritised ideas were categorised under 'management and logistics'. Both of these ideas were ranked high priority.

The first idea is to move towards a more sustainable economy with reusable and refillable packaging. This idea was prioritised by two of the three focus groups. Both focus groups had come up with the idea of using research to make our economy more sustainable, and both ideas focussed on what we can do, with regards to reuse and packaging.

The second idea was about living more socially and closer to each other, which would stimulate people to share their goods. This idea was prioritised by two different focus groups, as well. In both focus groups, the idea had the aim of reducing consumption and changing behaviour.

> *"So you start to live in living spaces, the same for everybody, dependent on the number of people you live with and so, yes. There are places where you can relax, outside and so on, but so you stay, not everybody has a garden, a private swimming pool and I don't know what, and so substantially reduce your needs. […]." (Belgium FG 1, P8)*

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

Category	Idea	Aim	Target Group	Priority
Management/ Logistics	Move towards a more sustainable economy with reusable and refillable packaging	Less packaging	Producers/ Consumers	☆☆☆☆☆☆☆☆
	Live together in smaller, compacter, and more social communities so people can share and exchange their goods	Less use of resources/ Behaviour change	Consumers	☆☆☆☆☆☆☆

LOCAL INITIATIVES

Some ideas that were forwarded in the focus groups do not need much research, but merely some organisation and someone to start it. The category 'local initiatives' captures these ideas. Typically, these ideas focus on less waste production, local production, raising awareness and less packaging.

The idea that received the highest priority level in this category (see Table 4.3.7), was about revaluing 'old trades', by using modern repair cafes:

"[P 1] In Brussels, there are repair shops. So if you have a problem or you can't repair your printer or mobile phone, you go to a cafe, drink a beer with some friends or friendly people, who help you to repair your printer or your computer.
[M] Yes. But that exists already?
[P 1] Yes.
[M] A repair cafe.
[P 1] But, now, we spread that.
[M] Yes, so repair cafes on a large scale.
[P 1] Exactly.
[P 7] With re-evaluation of what they call old trades that actually do a lot of recycling, because it's just like an old blacksmith who can reshape metal for you that we currently just throw away instead of doing something with it." (Belgium FG2)

The aim of this idea was, that eventually fewer things will be disregarded as waste.

Another idea, ascribed intermediate priority, was to replace the great variety of trivial products with the basic and less harmful products that people used in the past:

"But that's not futuristic, but it's true that for example instead of using all of these products on the market to clean for here or there ... I use a lot of vinegar, just vinegar and I don't have any waste! But people buy for everything, deodorizing, for this and that, they have a dozen bottles at home, it makes waste! It pollutes too! But just white vinegar, two or three things, baking soda, and there are processes, grandmother's remedies but that are very effective and don't produce waste. This isn't futuristic, it's simplicity, yes. It returns to the old ways." (Belgium FG3, P4)

Lastly, there was the idea of 'urban gardening'. This idea savours the notion that by having the general public cultivate their own food, they would become more autonomous in terms of daily basic goods. More organic waste will be used for compost, and less packaged food will be bought. Also, participants felt that this would help to raise general awareness of the environment around us.

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

Category	Idea	Aim	Target Group	Priority
Local initiatives	Re-evaluate old trades using modern repair cafes	Less waste production	Consumers	☆☆☆☆☆☆
	Replace the great variety of trivial products with the basic and less harmful products we once used (e.g. cleaning with vinegar and baking soda)	Less waste production	Producers/ Consumers	☆☆☆
	Urban gardens making consumers more autonomous in terms of daily basic goods: more organic waste will be used for compost, and less packaged food will be bought	Local production/ Awareness/ Less packaging	Consumers	☆☆

5. Conclusion, discussion and evaluation

This country report presents country-specific findings from citizen focus groups in Belgium. 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 Belgium 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 Belgium. 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

Belgium ranks 3rd on the EU27 ranking list on Municipal Solid Waste (MSW) recycling and has already reached the EU recycling MSW target of 50% recycling. Belgium has one of the highest landfill taxes and landfill tax increases in Europe. Since 2010, Belgium has a mandatory waste separation for households, with fines up to €625 for non-compliance.[14]

Almost all focus group participants mentioned that they separate waste, although some admitted that they sometimes did not separate everything exactly as they should. This is in concurrence with findings from the Flash Eurobarometer survey 'Attitudes of Europeans towards resource efficiency'[15] in which as many as 96% of the Belgian respondents indicated to separate at least some waste (see Annex 2).

Overall, participants in the focus groups were willing to put some effort into separating waste at household level, but they mentioned that their good intentions were not always met with the facilities to do so. Despite Belgium's high ranking on the MSW recycling's EU27 ranking list, many participants expressed frustration with a variety of aspects of how waste is collected. Another common source of frustration seemed to be the variety of ways (other than taxes) mentioned by the Belgian participants that they pay money for disposing of their waste. This is in line with the fact that Belgium has one of the highest landfill taxes in Europe. Furthermore, the focus groups indicated that most participants are generally unaware of what happens with waste after it is collected or how this might affect the environment.

Barriers and concerns for dealing with waste properly have been classified in three main categories. The first of these categories was concerned with production and prevention of waste. In this category, participants were generally concerned with the unnecessary amount of waste with which consumers have to cope. Many participants complained about excess packaging across a wide range of products. This is at odds with the Flash Eurobarometer survey, which shows that a product's environmental impact is of relatively low importance for Belgians, when making a decision about which products to buy.

The second category of barriers and concerns is related to domestic convenience. Most of these barriers and concerns were related to the inconvenience of having to separate and save waste at home. The issue of lack of space to keep everything separated was commonly addressed. Another barrier seemed to be that participants don't always understand exactly how they should sort their waste. On the one hand, they feel compelled to separate their waste, while on the other hand they feel unaware of the correct process. This ignorance seems to be caused by the complexity of the system, and a lack of information.

Lastly, there were barriers and concerns that have to do with the disposal of waste. Many remarks were made about the inconvenience of waste collection. A commonly mentioned barrier was the inconvenient distance to collection points for separated waste. Participants also mentioned inconvenient aspects of collections at home, and again the complexity of the whole system. These findings are all consistent with findings from the Flash Eurobarometer survey in which the majority of Belgian respondents think that more and better drop-off points for recyclable and compostable waste, but also improved separate waste collection at home, would help people to separate more and better.

5.2 Ideas for achieving a 'zero waste society'

The results of this sections are divided into two main research domains, 'environmental sciences and tech-

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

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

nology' and 'policy, management and communication', each further divided into four categories. Within the research fields of environmental sciences and technology, the ideas ranked highest priority by far were categorized under the research directions of 'technical, physical, chemical, engineering'. The highest ranking was given to the idea of incineration at home that simultaneously generates energy for the house. Both the categories 'material', and 'bio(techno)logical', ended up having few prioritised ideas. Though the variety of ideas was quite diverse in this domain, most ideas had the intention of using fewer resources and reducing the waste burden of excessive packaging.

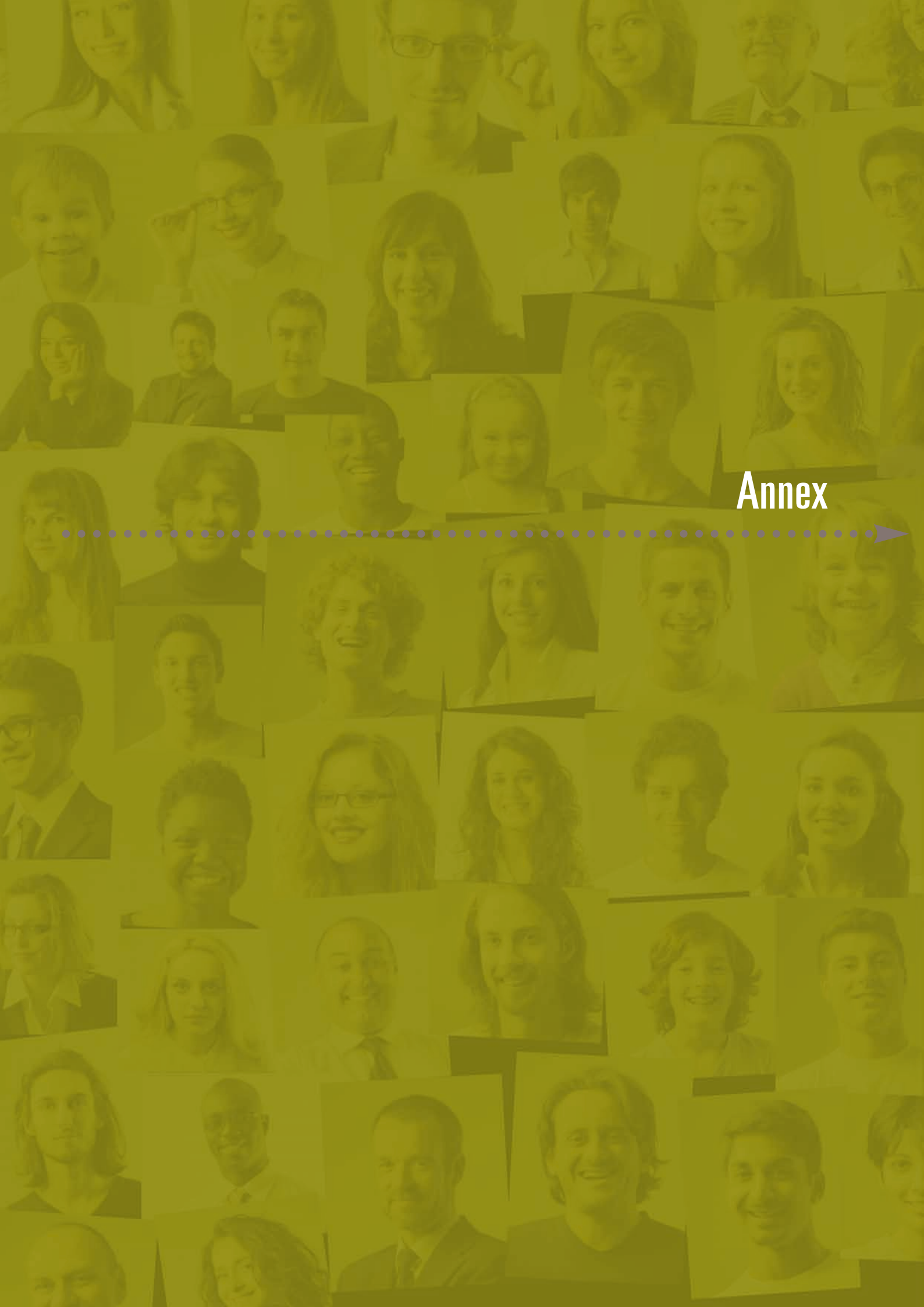
The majority of prioritised ideas in the second domain, 'policy, management and communication', were categorized in the subcategory 'policy'. These ideas focused mainly on regulation and enforcement, by incentives and fines for the general public and consumers (promoting 'zero waste behaviour') as well as producers and manufacturers (promoting 'zero waste' product marketing), established at international, national, or local level. The ideas that were prioritised at all were all ranked as high priority. There were also some diverse ideas raised under the category 'management and logistics', and the category of 'local initiatives', such as the re-evaluation of old trades, repair practices and ways of living.

Of the three most highly prioritised ideas, the first is shared between three that received the same number of priority stickers: move towards a more sustainable economy with reusable and refillable packaging; creating packaging that self-disintegrates; 'zero waste marketing' and requiring producers throughout the EU to only make products that are 100% recyclable.

5.3 Reflection

The participants said they enjoyed taking part in the focus group. The participants were interested in the topic and discussing the ideas and findings of other people. The group dynamics often allowed participants to learn something new, and it was also positive for many to see that other people were also thinking about these issues. Some participants had not really thought about this and found it very interesting to talk about a subject of this nature.

Participants were enthusiastic about the European Union trying to tackle waste problems, and that it is involving its citizens. However, most participants were doubtful that they might one day see one of their ideas put in place by the EU.



Annex

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

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

ENVIRONMENTAL SCIENCES AND TECHNOLOGY

Category	Idea	Aim	Target Group	Priority
Technical/ Physics/ Chemical/ Engineering	Incinerating all waste at home and thereby generate energy for the house	Effective use of waste/ Convenience in the home	Consumers	☆☆☆☆☆ ☆☆
	Holograms as furniture	Less use of resources	Consumers	☆☆
	Develop products in ways so that they can be more easily disassembled in order to reuse the parts	Less use of resources	Producers/ Consumers	☆☆
	Generation of energy from human movement, and other natural forces (instead of using batteries)	Less use of resources	Consumers	☆☆
	Teleportation machine for food	Less packaging/ Convenience in the home	Consumers	☆☆
	Creating appliances with parts that are replaceable by the user	Less use of resources	Producers/ Consumers	☆
	Recycle waste into other products	Effective use of waste	Waste management companies/ Producers	☆
	Printing of food at home with a 3D printer	Less packaging/ Convenience in the home	Consumers	
	Self-purifying water (instead of buying bottles)	Less packaging	Consumers	
	Virtual paper	Less use of resources	Consumers	
	Domestic taps dispensing a variety of drinks	Less packaging/ Convenience in the home	Consumers	
	Machine that re-whitens paper for re-use	Less waste production	Consumers	
	Domestic assistant robots that use waste as fuel	Convenience in the home/ Effective use of waste	Consumers	
	Machine that turns waste into energy for the house	Effective use of waste	Consumers	
	Change chemical compositions of waste to make useful industrial products out of it (e.g. bricks, or asphalt)	Effective use of waste	Producers	
	One (repairable) machine that replaces all other machines in the household	Less use of resources	Consumers	
	Machine to compact waste	Convenience in the home	Consumers	

Material	Create packaging that self-disintegrates	Effect on planet	Producers	☆☆☆☆☆ ☆☆☆
	Develop products in such a way that they can be broken down by nature	Effect on planet	Producers	☆☆☆
	Chemical research into particular substances in materials that lose their toxicity over time	Effect on planet	Producers	
Bio(techno)-logical	Creation of nutrition in the form of pills or food capsules	Less packaging	Consumers	☆☆
ICT	Food database: get a warning before food in the house perishes	Less waste production	Consumers	☆

POLICY, MANAGEMENT AND COMMUNICATION

Category	Idea	Aim	Target Group	Priority
Policy	Zero waste marketing that requires producers throughout the EU to only make products that are 100% recyclable	Improve recycling/ Less use of resources	Producers	☆☆☆☆☆ ☆☆☆
	Reward 'zero waste behaviour' (e.g. bring your household oil waste to a gas station and get fuel in return)	Improved recycling/ Behaviour change	Producers	☆☆☆☆☆ ☆
	Investigate what the best ways to deal with waste really are, in order to make consistent regulations as effective as possible	Effect on planet	Government	☆☆☆☆☆
	Enforce European policy to prevent foreign packaged products flooding the market	Less packaging	Producers	☆☆☆☆☆
Management/ Logistics	Move towards a more sustainable economy with reusable and refillable packaging	Less packaging	Producers/ Consumers	☆☆☆☆☆ ☆☆☆
	Live together in smaller, compacter, and more social communities so people can share and exchange their goods	Less use of resources/ Behaviour change	Consumers	☆☆☆☆☆ ☆☆
	Reintroducing old environmentally friendly habits in a modern version	Effect on planet	Producers/ Consumers	
	Uniformity for all products	Less waste production	Producers	
Communication and education	Campaigns to raise awareness on what people can/should do, and what the benefits of that would be	Awareness of possibilities	Consumers	
Local initiatives	Re-evaluate old trades using modern repair cafes	Less waste production	Consumers	☆☆☆☆☆ ☆
	Replace the great variety of trivial products with the basic and less harmful products we once used (e.g. cleaning with vinegar and baking soda)	Less waste production	Producers/ Consumers	☆☆☆
	Urban gardens making consumers more autonomous in terms of daily basic goods more organic waste will be used for compost, and less packaged food will be bought	Local production/ Awareness/ Less packaging	Consumers	☆☆

Annex 2: Attitudes of citizens from Belgium 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 Belgium.

Question	Answer	%	EU27 Average
Do you think Europe could be more efficient in its use of natural resources?	Yes	80%	87%
	No	4%	5%
	DK/NA*	16%	8%
Do you think that your household is producing too much waste or not?	Yes	42%	41%
	No	57%	58%
	DK/NA*	1%	1%
Do you separate at least some of your waste for recycling or composting?	Yes	96%	89%
	No	4%	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	65%	76%
	Improve separate waste collection at your home	63%	67%
	More information on how and where to separate waste	61%	65%
	Legal obligation to separate waste	62%	59%
	Taxes for waste management	37%	39%
What initiatives would improve waste management in your community?	Better waste collection services	59%	70%
	Stronger law enforcement on waste management	56%	65%
	Make producers pay for collection and recycling of waste	53%	63%
	Make households pay for the waste they produce	32%	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	14%	14%
	To pay proportionally to the quantity of waste you generate	80%	75%
	DK/NA*	6%	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	21%	25%
	Include the cost of waste management in the price of the products you buy	65%	59%
	DK/NA*	14%	16%
Can you estimate what percentage of the food you buy goes to waste?	None	15%	11%
	15% or less	68%	71%
	16% to 30%	13%	13%
	More than 30%	2%	4%
	DK/NA*	2%	1%
What would help you to waste less food?	Better estimate portion sizes (how much food you cook) to avoid excess food	56%	62%
	Better information on food product labels, e.g. how to interpret "best before" dates, information on storage and preparation	51%	61%
	Better shopping planning by my household	59%	58%
	Smaller portion sizes available in shops	60%	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	31%	39%
	Rather important	44%	41%
	Rather not important	13%	12%
	Not at all important	10%	6%
	DK/NA*	2%	2%
Are you willing to buy second-hand products?	Yes	61%	68%
Base: all respondents, % of yes			
Would you buy the following products second hand?	Furniture	52%	56%
Base: all respondents, % of yes	Electronic equipment	31%	45%
	Textiles (clothing, bedding, curtains, etc)	34%	36%
What reasons prevent you from buying second-hand products?	Quality/usability of the product	65%	58%
	Health and safety concerns	22%	50%
	Less appealing look of the product	9%	25%
	Afraid of what others might think	2%	5%
Would you buy products made of recycled materials?	Yes	92%	86%
	No	6%	11%
	DK/NA*	2%	3%
What would be the most important factors in your decision to buy products made of recycled materials?	Quality/usability of the product	42%	51%
	Environmental impact of the product	24%	26%
	Price of the product	21%	18%
	Brand/brand name of the product	2%	2%
	DK/NA*	11%	3%
What prevents you from buying recycled products or products containing recycled materials?	Health and safety concerns	25%	44%
	Quality/usability of the product	28%	42%
	No clear consumer information on the recycled product	18%	32%
	Less appealing look of the product	13%	17%
	Afraid of what others might think	4%	5%

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

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VOICES, CITIZEN PARTICIPATION IN SOCIAL INNOVATION

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

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

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

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

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