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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 Sweden, 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.

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.euro stat.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 - Sweden

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, Sweden is one of the smaller EU countries with almost 9.5 million inhabitants. More than half of the inhabitants live in intermediate areas (56%), while others live in urban areas (22%) and rural areas (22%).

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

		2011	
Population at 1 January		9 415 570	
Population as percentage of EU27		1.9%	
Gross Domestic Product (PPP)		31 900 Euro	
Population urban-rural typology	Urban	2 054 000	22%
	Intermediate	5 278 000	56%
	Rural	2 083 000	22%

3.2   Factsheet on waste

The amount of municipal waste generated and treated in Sweden is slightly below the average amount of waste treated in the EU27. Sweden ranks 5th on the EU27 ranking list on Municipal Solid Waste Recycling (MSW). The EU Waste Framework Directive's target to recycle 50% of MSW by 2020 has already been met by Sweden.[9]

Table 3.2   Municipal Waste[10,11]

		Sweden		EU27 average	
Municipal waste generated (kg per person)		465 kg		502 kg	
Municipal waste treated (kg per person)		460 kg		486 kg	
Municipal waste treated	Landfilled	5 kg	1%	185 kg	38%
	Incinerated	225 kg	49%	107 kg	22%
	Recycled (material recycling)	166 kg	36%	122 kg	25%
	Composted (organic recycling)	64 kg	14%	73 kg	15%

3.3 Composition of the focus groups

In Sweden, three focus groups (FGs) took place on the weekend of 23rd March 2013. They were held at the Swedish National Museum of Science and Technology in Stockholm, moderated by Tomas Ribba, Senior Curator of Educational Development.

In total, 30 people (15 male and 15 female) participated in the three FGs. The age of the participants ranged from 18 to 74: 10 participants were aged between 18 and 35; 10 between 36 and 50; and 10 were aged 51 or over. Most participants had a high (n = 15) or medium (n = 12) level of education, while 3 others had a low level of education. 18 participants had a job, while 2 were unemployed, 2 were students and 3 were retired. 13 participants live in a house and 17 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	5	5	15
	Female	5	5	5	15
Age	18 - 35	0	10	0	10
	36 - 50	10	0	0	10
	50+	0	0	10	10
Education	High	7	3	5	15
	Medium	3	6	3	12
	Low	0	1	2	3
Employment	Unemployed	1	0	1	2
	Employed	7	7	4	18
	Retired	0	0	3	3
	Student	0	2	0	2
Housing	Flat	3	8	6	17
	House	7	2	4	13

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 Sweden. 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

The participants of all focus groups generally have access to waste separation facilities. Participants described similar waste streams (a waste stream is defined as one type of waste that is collected separately, covering the majority of their household waste): tin cans, paper, metals, plastic and batteries are separated. Glass is also separated by colour. Almost all participants separate clothes. Food waste is separated three ways: sorting it for compost, putting it in special bins, and putting it together with other leftover household waste.

> "I sort biological waste […] I have ordinary waste to take care of and then I collect deposit bottles and aluminium cans and such things and then I have a container to collect batteries in, and then I have one for hazardous waste […] I have paper and cardboard." (Sweden FG 1, P 1)

Many participants sort their waste in bins that they have outside their home, in either the garden or the garage. People who live in apartments have general waste rooms downstairs, but others sort the waste within their own homes:

> "I have minimal space under the sink, so I can't fit everything. I refuse to have stuff in the bathroom, so I have household waste under the sink, batteries and things like that… and I have paper in two bags in the kitchen, and then cardboard in another." (Sweden FG 1, P 7)

However, a few participants do not bother to separate their waste and choose to mainly put all their waste together:

> "Ooh, I'm probably not so tidy, I throw away light bulbs with my potato peelings and batteries and

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[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.

everything like that there... I really don't give a damn; it takes time when I have to take the rubbish out despite it being in my courtyard... I find it a pain..." (Sweden FG3, P 1)

4.1.2   Waste collection

According to the participants, waste is mainly collected by the municipality. Most commonly, the municipality collects household waste that the participants have separated in their homes. The participants often put this waste in refuse bags or in a wheelie bin in front of their home:

"You collect waste in these plastic bags that you throw in a wheelie bin which they come and collect and take care of it." (Sweden FG 1, P 1)

Participants who live in apartment complexes with general waste rooms stated that their waste is collected by the municipality, directly from these waste rooms.

The second way that waste is collected, according to the participants, is again by the municipality. But in this case, participants have separated the waste and brought it to recycle bins in the area. Paper, glass, cardboard and plastics are generally collected in this way.

"It's collected from a common dustbin that we share in the area. [...] A truck comes once a week and collects it." (Sweden FG3, P5)

The participants stated that bulky waste has to be brought to recycle centres by the participants themselves. The distance to recycle centres varies among municipalities but, generally, a car is needed:

"Oh yes, then I must have a car, drive further away - furniture, clothes, white goods go to an environmental centre that's a driving distance away." (Sweden FG2, P7)

These recycle centres are often also used for batteries, paint and other chemical waste. However, a few participants stated that they can also bring this type of waste to stores that have special bins for this. When participants separate clothing, they generally take it to local charities, or these charities come and collect old clothes on a scheduled day.

4.1.3   Knowledge about waste pathways

Some participants know or have heard of the incineration of waste for district heating. However, the vast majority of the participants do not know what happens to their waste after the municipality has come to collect it. They mainly assume it gets incinerated, or otherwise they hope it is either reused or recycled but they are not sure:

"No idea... they burn it? I would hope that maybe there are people that reuse it..." (Sweden FG 1, P 7)

Some participants have no interest in where the waste ends up after they have done their job of separating waste because they do not feel it is their responsibility:

"I have no idea about that... I dump what I'm supposed to dump so then so... I hope it's taken care of in a good way. [...] What happens after that is that I trust the system to work. [...] In today's society you have to keep track of so many things, so I trust that the system works." (Sweden FG 1, P4)

4.1.4   Waste management behaviour and convenience

Many of the participants stated that they are used to separating their waste, and therefore do it without thinking about it. Since they are used to the manner of waste separation and collection in their neighbourhood, they find it convenient enough and do it according to plan:

"For me personally I think it works great, I don't think it's complicated." (Sweden FG 1, P 1)

However, a few participants said there could be improvements to make waste separation even more convenient for people. One participant said changes are going to be made in the local area that will improve the possibilities for waste separation:

"It works fine… but there is going to be a change so we'll get more bins… so we can sort a bit more [waste types], so we will not have to drive somewhere as we do now. […] I look forward to that because I think it's too much travelling and storing now. […] I think it will get better, when we'll maybe get four bins instead of two." (Sweden FG 1, P8)

Some participants stated that they find it inconvenient that they have to drive somewhere to get rid of their bulky waste. One participant chooses, therefore, not to separate the waste that should be brought to these centres:

"We have to drive quite far to leave packaging and that's why we throw it all among ordinary waste." (Sweden FG 1, P 1)

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 of.

4.2.1 Waste prevention and production

Two concerns emerged from the focus groups regarding waste prevention and production before goods enter the household. The first concern was discussed in detail, in all three focus groups. This concern focussed on the amount of packaging used for all kinds of products. According to the participants, too much packaging is used which produces more waste than is necessary. The participants discussed the fact that every small part of a product is packaged itself.

"Like the last time I bought a home computer there was first a big package and inside that there was large Styrofoam and in there, there was this little computer. […] Then the delivery guy had yet another package with rubber foam inside." (Sweden FG 1, P4)

The second concern was raised in two out of three focus groups. Participants stated that too much unnecessary paper is being used. Two examples bothered the participants: letters of notification from schools and banks which they do not need, or could be sent via the internet; and the amount of unnecessary advertisements from companies for which they are unable to unsubscribe. Participants argued that most of these advertisements go straight into the waste bin without being read and that the public cannot choose if they want these advertisements or not. The majority of the participants considered that they would rather have digital advertisements or no advertisements at all. As stated by one of the participants:

"[…] The newspapers come… and on top of it all…. masses of stuff that I don't even want!" (Sweden FG 1, P6)

4.2.2 Waste management in the household

Participants mentioned several barriers and concerns they are faced with while dealing with waste within the household. An important barrier that was mentioned in all focus groups by the majority of the participants

concerned the combination of a lack of motivation of citizens to sort waste, and a lack of awareness about recycling amongst citizens. Participants considered that citizens are not motivated to separate waste for recycling because they do not care enough. Lack of awareness about waste separation contributes to this lack of motivation and indifference. As one participant stated:

> "You and I don't think about it so much, about how you can reduce your waste [...] I believe if one had another consciousness... yes if you knew more about what's happening [with your waste] then maybe one would think differently..." (Sweden FG2, P3)

Furthermore, several participants in all focus groups considered that people do not know enough about where a specific type of waste should go and what happens with it after it is collected. For this reason, people either do not use recycle bins, or use them wrongly:

> "So the obstacle for me is that I don't know what happens [with the waste], and so I think: 'ah what the hell, I'll throw this here...'" (Sweden FG 1, P 10)

One participant mentioned that lack of knowledge is particularly the case for immigrants; many immigrants in the city have no idea about waste management. It was argued that a language barrier exists which makes it impossible to reach immigrants with knowledge about waste management. The participant considered this problematic because even if a lot of people separate waste, immigrant residents will not separate waste and therefore separation will not be complete.

Furthermore, participants stated that people distrust the recycling system because they do not know where the separated waste ends up. This means that some people consider that, even if they make the effort to sort their waste in their home or in the neighbourhood, it will end up in the same waste pile after collection. Participants concluded that some people might not bother to separate waste:

> "[People separate their waste at home] yet still the trash van comes and puts everything in the same [container]... and that feels like... that it's unnecessary that I take up space at home to sort... it might not be like that but it looks that way." (Sweden FG 1, P 10)

The other obstacle for waste separation that was mentioned is the fact that there are too many rules for recycling, according to participants. The participants mentioned that rules for separation of waste are too specific and complicated; people are not sure where to put which waste type. Therefore, it takes a lot of time and people will tend not to bother:

> "I'm thinking of all the rules: clear glass and tinted glass... coloured and clear, such things... [...] corrugated there and regular there... There's too much of that, it means that you don't give a shit about it... [...] it's too much management. If it was all glass, perhaps I would separate more glass." (Sweden FG2, P6)

A final obstacle mentioned by the participants is the rule that packaging has to be clean before it is put in the recycle bin. This is a barrier to recycling because cleaning packaging takes time and wastes water:

> "No, so I was thinking of for example a plastic pack of butter... I feel like, it annoys me that I have to clean it when I'm going to throw it away... [...] And so I will have to waste water. And then I am in a quandary [to recycle or not]." (Sweden FG 1, P7)

4.2.3   Waste disposal and pathways

Participants mentioned several barriers, which concern waste disposal after waste leaves the household. First, participants said the municipality does not empty the waste bins frequently enough in some areas. As a result, people put their waste next to bins, which makes the surrounding area dirty. According to the participants, people see this as a barrier to taking their waste to the bins because people would rather put their waste, even separated waste, all together in another bin where there is no waste on the ground next to it.

Participants also mentioned a problem with bins for paper recycling. These bins have a small opening, which

makes it impossible for people to put in a whole pile of papers at the same time. Participants stated that this is a barrier because it is annoying and time-consuming.

Furthermore, several participants mentioned the effort required to take waste to disposal points, like recycle centres. It bothers them that a car is needed, and that it takes time and money for petrol. This requires a particular effort from elderly people and is sometimes even impossible for them:

"Yes, it takes loads of my time, which I could have spent doing something fun…" (Sweden FG3, P1)

Other problems mentioned regarding recycle centres are the limited opening hours and the fact that it costs money when you hand in larger appliances. This is also stopping people from going to the recycle centres. Participants said some people decide to dump these appliances in the countryside instead where they do not belong and cause environmental hazards.

This impact of waste on the environment, such as pollution, worried many participants from the different focus groups. The effects of waste dumped in the countryside, waste incineration and landfills were mentioned in combination with the participants' concerns for the ozone layer and the greenhouse effect. Participants were particularly concerned about waste from electrical appliances, such as refrigerators and light bulbs containing mercury, representing an environmental hazard. Furthermore, the gases emitted by incineration plants were an additional concern. Participants considered that sometimes the wrong materials are burned because they end up at the wrong waste site:

"When you burn rubbish and if someone's thrown in some packaging and packaging today contains plastics which contain PVC [Polyvinyl chloride, a common plastic] and that gives off toxic gases and it's… I'm worried because they don't check it and people go to the tip with things that should be recycled with heavy metals that you find in electronics and this isn't taken care of." (Sweden FG3, P10)

Several participants are especially worried for the next generation and wonder if Europe will find another healthier way to take care of waste:

"You think of your grandchildren and what sort of air they'll breathe… how will it be?" (Sweden FG3, P2)

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

The first category related to the domain of 'environmental sciences and technology' involves ideas that focus on the 'technical, physical, chemical, engineering' dimension. These ideas generally involve machines and devices that are targeted at consumers, although the aims of these ideas vary greatly.

One priority idea in this category concerns the construction of a transport system of pipes that goes into people's homes. In these pipes, several products could be transported, for instance soap could be transported to

sinks. This would mean that these products would not have to be packaged anymore, ensuring less waste production. It would be convenient for citizens to have these products come directly to their homes.

The second idea that got prioritised is to build a robot that could dismantle large household appliances. The robot would also be able to separate the dismantled parts and sort them for reuse. In this way, fewer resources would be used for new products. Furthermore, the robot would know which parts can be used and where. For example, some parts might even be exported to other countries for reuse:

> *"Then you can look on a world level to see if you can get together a partnership… the parts that we have and generally throw away in Sweden might be really important in other countries, if you begin to start thinking in this way then you would find new uses […] If you know which parts can be used for what and how, maybe it's worthwhile to do so, especially if you can look at exporting it and make money on it." (Sweden FG2, P3)*

The next idea that was assigned priority concerns the practical use of waste by using the heat of waste incineration. In this idea, a hole in the ground should be connected to geothermal heating, which incinerates waste. The residual heat could be used in every home as an individual source of biogas or as energy for heating.

Another priority idea in this category is to only have rechargeable batteries. This means that for every type of product, batteries have to be made available that can be recharged. The aim of this idea is to produce less chemical waste because the participants considered that this type of waste is an important problem:

> *"It's completely mad that we don't have rechargeable batteries. […] If we go around chucking batteries we'll have enormous piles of batteries, which we could very nearly get rid of. If we have rechargeables, we would reduce it to a thousandth of the size: a modern battery can be used 1000 times!" (Sweden FG3, P10)*

In line with the first idea, the last idea in this category aims to reduce packaging waste and, simultaneously, improve convenience in the home. The idea is to build a teleporting machine for companies to teleport food and other products from the manufacturer or the store, directly into people's homes. In this way, products would not need packaging and so less waste would be produced.

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	Building a transport system for products via pipelines directly to consumers	Convenience in the home/ Less packaging	Consumers	☆☆
	Create a robot that dismantles larger appliances and sorts the different parts for reuse	Less use of resources	Producers/ Waste management companies	☆☆
	Individual biogas production/individual source of energy for each home, generated by waste incineration	Effective use of waste	Consumers	☆
	Development of rechargeable batteries for all products	Less (chemical) waste production	Producers/ Consumers	☆

	Create a teleporting machine, which sends products from the manufacturer to the consumer	Less packaging/ Convenience in the home	Consumers/ Producers	☆

MATERIALS

Another category within the domain of 'environmental sciences and technology' brings together ideas that focus on the 'material' dimension. These ideas generally involve development of new materials with certain characteristics that are thought to reduce the amount of packaging required and thus reduce the production of waste. These ideas were prioritised because participants considered that it would be much easier to manage waste with materials that can decompose easily.

The idea that was ranked highest by the participants in two of the three focus groups concerns the development or improvement of packaging material. Packaging material should be degradable in some way; several ideas were mentioned for this. First, participants argued that there are already some substances that are degradable and, if technology continues developing, this could eventually result in degradable packaging:

> "There are chemicals now that you can wash your house with and which you can use in your garden that are degradable and which aren't poisonous. I think that products that use this technological development that could be developed." (Sweden FG3, P2)

The second part of this idea is to make the packaging not only degradable but also to harvest energy from it:

> "The packaging should be made of degradable material; the bacteria can break down the packaging and possibly these bacteria can produce energy." (Sweden FG3, P 1)

The second idea within the category 'material' that received many stickers by the participants in one focus group also aimed to reduce waste production by changing the packaging of products. This idea is targeted at consumers and involves edible or 'drinkable' packaging of food, such as water or something that will turn into a sauce when heated.

The last idea within this category is also concerned with a new type of packaging for food. However, this idea concerns packaging that has a double purpose: food can also be heated by the packaging material after pressing a button. This would mean that ovens or stoves would not have to be used.

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

Category	Idea	Aim	Target Group	Priority
Material	Create new/improved packaging material, which is reusable or biodegradable. Or material that can be eaten by energy producing bacteria or dissolves in water	Less packaging/ Less waste production	Producers/ Consumers	☆☆☆☆☆☆☆☆☆☆☆☆☆☆
	Create biological material for food packaging; packaging with edible or 'drinkable' material	Less packaging/ Less waste production	Consumers	☆☆☆☆☆☆☆
	Create reusable packaging material which can heat the inside product, and thus replace ovens	Less packaging/ Less waste production	Producers/ Consumers	☆☆

A third category of prioritised ideas related to the domain of 'environmental sciences and technology' is 'bio(techno)logical'. In this category, one idea was prioritised by the participants of one focus group. The idea aims to produce less food waste and use less packaging. To ensure this, there needs to be genetically modified food which enables transport and storage of this food without extra packaging.

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	Create genetically modified food that does not need packaging	Less waste production/ Less packaging	Producers/ Consumers	☆☆

4.3.2 Policy, management and communication

POLICY

The first category related to the domain of 'policy, management and communication' involve ideas that focus on the 'policy' dimension.

The first idea, which was proposed in all three focus groups and ranked as priority in two of them, involves a financial incentive to encourage recycling. This could be done by a deposit system, for example for glass bottles and jars, similar to the deposit system that is already in place for PET [polyethylene terephthalate, a type of plastic] bottles. Another financial incentive would involve a refund system that pays people per kilogram of recycled waste . Participants felt that behaviour change can be brought about by a monetary incentive:
"Everyone wants something in order to do something... So we've got to give that financial incentive." (Sweden FG 1, P 7)

The second idea that received many stickers during prioritisation aims to make producers use fewer resources while, simultaneously, having a positive effect on the planet. The idea is to introduce legislation that forces producers to use and manufacture only products that are biodegradable, recyclable, or reusable. The participants argued that many resources are finite and that producers should take responsibility for this because the burden should not only be on consumers.

The last idea in the category of policy also entails new legislation for producers with the aim of using fewer resources and producing less waste, by producing fewer products. As one participant explained:
"We should have a manufacturing quality that means that something should last for a certain amount of time. If it doesn't last for this time then you get your money back." (Sweden FG 3, P 10)

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

Category	Idea	Aim	Target Group	Priority
Policy	Refund/deposit system where people receive money for recycling	Improve recycling/ Behaviour change	Consumers	☆☆☆☆☆☆☆☆☆☆☆
	Legislation that requires producers to be responsible and force them to only manufacture materials and products that are recyclable and reusable	Less use of resources/ Effect on planet	Producers	☆☆☆☆☆☆☆☆☆

	Legislation that forces manufacturers to produce products which last at least ten years	Less waste production/ Less use of resources	Producers	☆☆☆☆

MANAGEMENT AND LOGISTICS

The second category related to the domain of 'policy, management and communication' that contains prioritised ideas is 'management/logistics'. In this category, two ideas were prioritised by the participants.

The first idea aims to produce less waste by reducing the need for packaging and is targeted at the consumer. It would involve the consumer taking reusable boxes and cans to the supermarket to be filled with food products. In this way, packaging is not needed and therefore less waste is produced.

The second idea is targeted at producers and aims to reduce waste production. The participants mentioned that the majority of paper advertisements are not needed. The idea is to change these paper advertisements into digital advertisements, thus wasting less paper.

Table 4.3.5   **Ideas within the category 'management and logistics' that received priority, ranked accordingly**

Category	Idea	Aim	Target Group	Priority
Management/ Logistics	People bring boxes to the store, where they fill it with products	Less packaging/ Less waste production	Producers/ Retailers/ Consumers	☆☆☆☆☆☆☆
	Paper advertisements should be replaced by digital ones	Less waste production	Producers	☆☆☆☆

COMMUNICATION AND EDUCATION

Another category within the domain of 'policy, management and communication' is 'communication and education'. In this category, one idea was assigned priority and was mentioned in two focus groups.
The participants considered that to get more people to separate their waste, behaviour change is needed. The next generation should be separating waste from a young age to ensure a future where waste is managed well and the environment is protected. Therefore, the idea is to incorporate knowledge on waste management into the education system:

> "I also think that we should get children interested from an early age about what happens with the environment, that we should protect our environment… that they become aware, that they understand that you don't just get lots of things and then just throw it away." (Sweden FG3, P2)

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

Category	Idea	Aim	Target Group	Priority
Communication and education	Mandatory education in schools on waste	Behaviour change/ Awareness	Consumers	☆

LOCAL INITIATIVES

In the category of local initiatives, one idea was prioritised and proposed in all three focus groups. The idea is directed at consumers and aims to increase local production and reduce packaging. An additional aim of this idea is to have a positive effect on the environment. The idea proposes that all areas of Sweden should become more self-sufficient in terms of food. The participants consider that when food is locally cultivated, less packaging will be needed for transport since products would not have to be transported very far. This would also have a positive effect on the environment because trucks and ships would have to travel less far and because less packaging leads to less waste. The participants proposed not only farms for local cultivation in rural areas, but also that cities should become more self-sufficient:

"[P10] Locally produced food; then you don't need packaging, shipping.
[M] How do you solve the problems with locally produced food?
[P10] You place the farm in the inner city.
[M] How do you do that?
[P3] You grow on rooftops in the city and in parks." (Sweden FG2)

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

Category	Idea	Aim	Target Group	Priority
Local initiatives	Own production of food, locally cultivated in and around cities	Less packaging/ Local production/ Effect on planet	Consumers	☆☆☆☆☆

OTHER

The last prioritised idea does not fit in any of the aforementioned categories. This idea is an extension of the idea that is mentioned in the previous category of local initiatives: local production and cultivation of food. The participants in one focus group saw a problem with the previous idea, namely that not all crops can be cultivated all year round due to a lack of sunlight in wintertime. To enable cultivation of crops year-round, the idea involves diamond mirrors in outer space, capturing sunlight and transmitting it to the cultivated land. This would be profitable for Sweden and would save money if food did not need to be imported, but this would only work if crops could be grown all year.

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

Category	Idea	Aim	Target Group	Priority
Other	A diamond mirror in space which captures sunlight and transmits the light on to cultivated land	Less energy consumption	Producers	☆☆☆☆☆

5.   Conclusion, discussion and evaluation

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

Sweden ranks 5th on the EU27 ranking list on MSW (Municipal Solid Waste) recycling. Recycling rates in Sweden were already high in 2001 at 40% and by 2010 Sweden had reached 49%. This is just 1% below the 50% target set out in the Waste Framework Directive.[13] Recent data shows that Sweden has now reached this target. These findings are consistent with the discussions of the Swedish focus groups in which it was evident that the majority of the Swedes separate their waste correctly. Findings from the Flash Eurobarometer survey "Attitudes of Europeans towards resource efficiency"[14] also show that 95% of the Swedes claim to separate at least some of their waste for recycling or composting. The focus groups in Sweden demonstrated that plastics, glass, paper and cardboard are generally separated.

However, the participants also mentioned certain barriers and concerns that they perceive during waste separation that may keep them from separating their waste. There were two concerns mentioned within the category of waste prevention and production. One of these concerns was mentioned in all three focus groups: too much packaging is used for products and, as a consequence, too much waste is generated by producers. The participants also stated that too much paper is used, for instance in advertising.

The majority of the perceived barriers that were mentioned by the participants occur within the household. One significant barrier, agreed on by most participants, is that people are not motivated enough to separate their waste due to a lack of knowledge on waste pathways. This is consistent with the findings of the Flash Eurobarometer survey, which established that 46% of Swedes could be convinced to separate more waste if they had more information on how and where to separate waste. Another barrier that was mentioned by the participants concerns the rules about waste separation. Participants find it difficult to cope with so many rules for separation, for instance having to separate types of glass.

Several barriers and concerns were also mentioned in the category of waste disposal and waste pathways. One of these barriers concerns the distance to recycle centres and the need for a car when people want to take their bulky waste there. This was evident in the Flash Eurobarometer survey, which established that 69% of Swedes would separate waste more if there were more and better drop-off points for recyclable and compostable waste.

Another barrier concerns the frequency of municipal waste collection. According to several participants, this is too infrequent, leading to foul smells and people dumping rubbish next to bins. This is also consistent with the findings of the Flash Eurobarometer survey in which 57% of Swedes stated that better waste collection services would improve waste management in their living area. In addition to these barriers, the participants have some concerns regarding waste disposal and waste pathways related to the effect of waste incineration and the existence of landfills on the environment and the ozone layer. The participants stated that they are worried about the cleanness of the air they breathe, but most of all, the air that future generations will breathe.

5.2 Ideas for achieving a 'zero waste society'

The ideas were divided into two main research domains, 'environmental sciences and technology' and 'policy, management and communication', each of which was further divided into four categories. However, ideas were not prioritised within all of these categories.

In the first domain, the majority of the ideas belong to the category of technology (machines and processes). The aims of the ideas vary, as do the target groups. None of these ideas received more than one or two priority

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[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)

points. However, in the second category of this domain, material, there are two ideas that were ranked as high priority, and a third one with lower priority. All three of these ideas aim to develop packaging material that is reusable and biodegradable thereby reducing waste production. The last category that was ranked as priority within this domain concerns a bio(techno)logical idea which also aims to reduce the amount of waste that is produced by creating genetically modified food that does not need packaging.

In the second domain, many ideas were ranked as high priority. In the category of policy, three ideas were mentioned and assigned high priority by the participants. The first idea aims to improve recycling and change behaviour by giving people a financial incentive to recycle. The second idea is targeted at producers and aims to have a positive effect on the planet by reducing use of resources. The last idea within this category also aims to reduce use of resources and is targeted at producers.

The second category of this domain is management and logistics. Here only two ideas were assigned priority: firstly consumers should be allowed and encouraged to bring their own packaging to stores; and secondly, there should be less advertising on paper. The ideas aim to reduce waste production. The third category is focussed on communication and education. Here, one idea was prioritised by the participants, with the aim of improving the next generation's knowledge and awareness on waste management and changing behaviour with respect to separation of waste. The last category concerns local initiatives. This category consists of one idea that was proposed in all three focus groups. The idea mentioned here is targeted at consumers. It involves the stimulation of local production of food in cities, which will result in less packaging and have a positive effect on the planet.

When looking at the three highest prioritised ideas, the first priority is to create new/improved packaging material, which is reusable or biodegradable; or material that can be eaten by energy producing bacteria or dissolves in water (14 stickers). The second priority involves a refund/deposit system where people receive money for recycling (11 stickers), followed by legislation that requires producers to be responsible and force them to only manufacture materials and products that are recyclable and reusable (10 stickers).

5.3   Reflection

The participants generally enjoyed the focus groups. They found it interesting to hear each others' thoughts and ideas. The discussions that were held were interesting and were considered an eye-opener by some participants. A number of participants stated that they would actively change their behaviour regarding recycling and separating waste as a result of their participation in the study. However, there were also some difficulties according to the participants: the assignments regarding the ideas to achieve a 'zero waste society' were rather difficult. A small number of participants also considered that the effect of individual efforts of waste disposal is very small within the greater scheme of things, and that they are not sure it actually does any good.
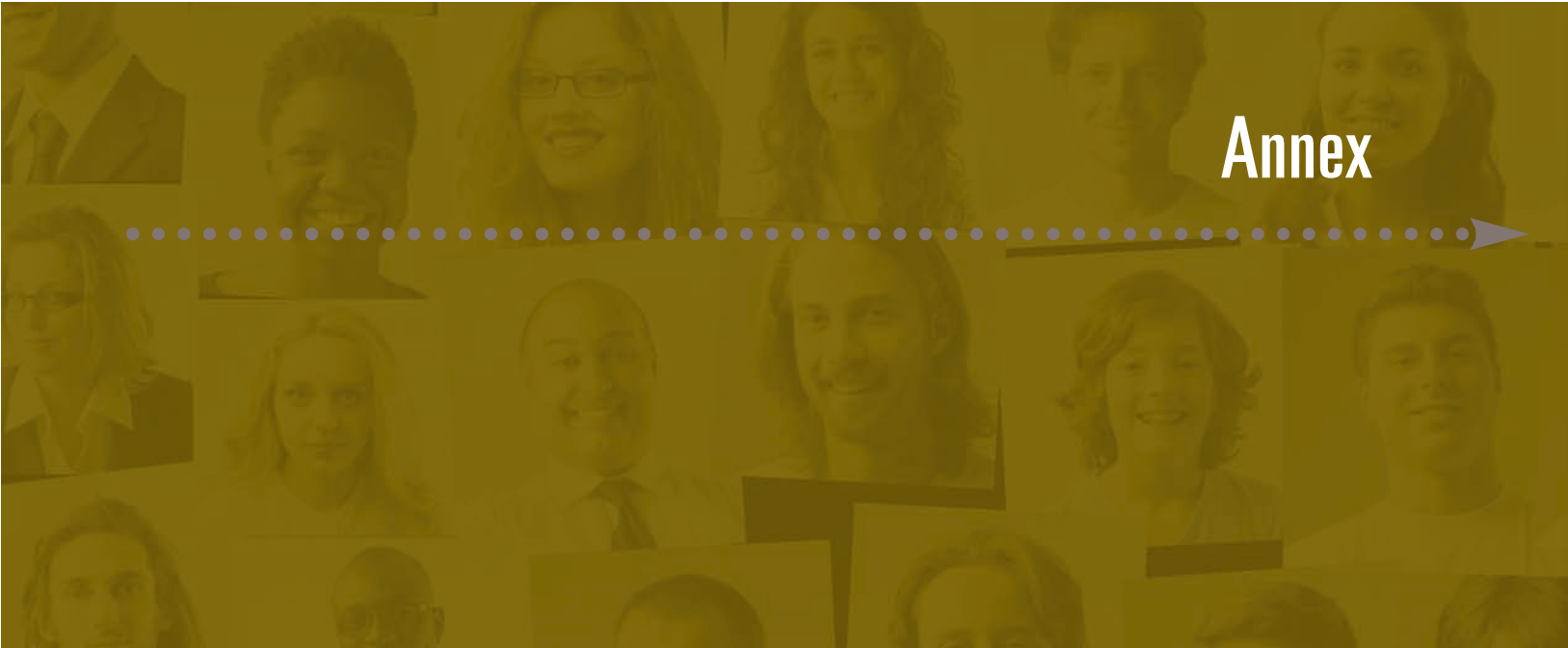
Annex

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	Building a transport system for products via pipelines directly to consumers	Convenience in the home/ Less packaging	Consumers	☆☆
	Create a robot that dismantles larger appliances and sorts the different parts for reuse	Less use of resources	Producers/ Waste management companies	☆☆
	Individual biogas production/ individual source of energy for each home, generated by waste incineration	Effective use of waste	Consumers	☆
	Development of rechargeable batteries for all products	Less (chemical) waste production	Producers/ Consumers	☆
	Create a teleporting machine, which sends products from the manufacturer to the consumer	Less packaging/ Convenience in the home	Consumers/ Producers	☆
	A system where in every home a chute is built where all waste can be thrown in and gets sorted automatically	Convenience in the home/ Improve recycling	Consumers	
	Create a rocket which works on solar power and can send our waste to another planet, or which can incinerate itself in space	Eliminate waste	Waste management companies	
	Create a machine which can make new products out of waste by resorting atoms	Effective use of waste	Consumers	
Material	Create new/improved packaging material, which is reusable or biodegradable. Or material that can be eaten by energy producing bacteria or dissolves in water	Less packaging/ Less waste production	Producers/ Consumers	☆☆☆☆☆ ☆☆☆☆☆ ☆☆☆☆
	Create biological material for food packaging; packaging with edible or 'drinkable' material	Less packaging/ Less waste production	Consumers	☆☆☆☆☆ ☆☆
	Create reusable packaging material which can heat the inside product, and thus replace ovens	Less packaging/ Less waste production	Producers/ Consumers	☆☆
Bio(techno)- logical	Create genetically modified food that does not need packaging	Less waste production/ Less packaging	Producers/ Consumers	☆☆
	A pill that can replace meals	Less waste production/ Less packaging	Consumers	

POLICY, MANAGEMENT AND COMMUNICATION

Category	Idea	Aim	Target Group	Priority
Policy	Refund/deposit system where people receive money for recycling	Improve recycling/ Behaviour change	Consumers	☆☆☆☆☆ ☆☆☆☆☆ ☆
	Legislation that requires producers to be responsible and force them to only manufacture materials and products that are recyclable and reusable	Less use of resources/ Effect on planet	Producers	☆☆☆☆☆ ☆☆☆☆☆
	Legislation that forces manufacturers to produce products which last at least ten years	Less waste production/ Less use of resources	Producers	☆☆☆☆
Management/ Logistics	People bring boxes to the store, where they fill it with food products	Less packaging/ Less waste production	Producers/ Retailers/ Consumers	☆☆☆☆☆ ☆☆
	Paper advertisements should be replaced with digital ones	Less waste production	Producers	☆☆☆☆
	Pre-order food, central delivery in area	Other	Consumers	
Communication and education	Mandatory education in schools on waste	Behaviour change/ Awareness	Consumers	☆
Local initiatives	Own production of food, locally cultivated in and around cities	Less packaging/ Local production/ Effect on planet	Consumers	☆☆☆☆☆
Other	A diamond mirror in space which captures sunlight and transmits the light on to cultivated land	Less energy consumption	Producers	☆☆☆☆☆

Annex 2: Attitudes of citizens from Sweden 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 Sweden.

Question	Answer	%	EU27 Average
Do you think Europe could be more efficient in its use of natural resources?	Yes	84%	87%
	No	5%	5%
	DK/NA*	11%	8%
Do you think that your household is producing too much waste or not?	Yes	45%	41%
	No	52%	58%
	DK/NA*	3%	1%
Do you separate at least some of your waste for recycling or composting?	Yes	95%	89%
	No	5%	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	69%	76%
	Improve separate waste collection at your home	57%	67%
	More information on how and where to separate waste	46%	65%
	Legal obligation to separate waste	42%	59%
	Taxes for waste management	26%	39%
What initiatives would improve waste management in your community?	Better waste collection services	57%	70%
	Stronger law enforcement on waste management	50%	65%
	Make producers pay for collection and recycling of waste	54%	63%
	Make households pay for the waste they produce	33%	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	19%	14%
	To pay proportionally to the quantity of waste you generate	75%	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	23%	25%
	Include the cost of waste management in the price of the products you buy	62%	59%
	DK/NA*	15%	16%
Can you estimate what percentage of the food you buy goes to waste?	None	5%	11%
	15% or less	77%	71%
	16% to 30%	14%	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	46%	62%
	Better information on food product labels, e.g. how to interpret "best before" dates, information on storage and preparation	42%	61%
	Better shopping planning by my household	48%	58%
	Smaller portion sizes available in shops	35%	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	24%	39%
	Rather important	52%	41%
	Rather not important	16%	12%
	Not at all important	6%	6%
	DK/NA*	2%	2%
Are you willing to buy second-hand products? Base: all respondents, % of yes	Yes	87%	68%
Would you buy the following products second hand? Base: all respondents, % of yes	Furniture	82%	56%
	Electronic equipment	55%	45%
	Textiles (clothing, bedding, curtains, etc)	54%	36%
What reasons prevent you from buying second-hand products?	Quality/usability of the product	51%	58%
	Health and safety concerns	36%	50%
	Less appealing look of the product	16%	25%
	Afraid of what others might think	1%	5%
Would you buy products made of recycled materials?	Yes	96%	86%
	No	2%	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	43%	51%
	Environmental impact of the product	30%	26%
	Price of the product	20%	18%
	Brand/brand name of the product	1%	2%
	DK/NA*	6%	3%
What prevents you from buying recycled products or products containing recycled materials?	Health and safety concerns	43%	44%
	Quality/usability of the product	25%	42%
	No clear consumer information on the recycled product	3%	32%
	Less appealing look of the product	13%	17%
	Afraid of what others might think	0%	5%

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

NOTES

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TEKNORAMA, SWEDEN**

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VOICES, CITIZEN PARTICIPATION IN SOCIAL INNOVATION

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

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

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

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

VOICES for innovation

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SCIENCE CENTRES & MUSEUMS

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