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Views, Opinions and Ideas of Citizens in Europe on Science

COUNTRY REPORT BULGARIA

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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 Bulgaria, 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 - Bulgaria

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

Bulgaria is one of the smaller EU countries with approximately 7.5 million inhabitants. Almost half of them live in intermediate areas, while others reside in urban or rural areas.

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

		2011	
Population at 1 January		7 369 431	
Population as percentage of EU27		1.5%	
Gross Domestic Product (PPP)		11 600 Euro	
Population urban-rural typology	Urban	1 259 000	17%
	Intermediate	3 371 000	45%
	Rural	2 875 000	28%

3.2 Factsheet on waste

The amount of municipal waste generated and treated in Bulgaria is lower than the average amount of waste treated in the EU27. Bulgaria ranks lowest (27th) on the EU27 ranking list on Municipal Solid Waste Recycling (MSW). All waste treated in Bulgaria goes to landfills, which is the highest percentage of all EU member states. Considering the amount of landfilled waste, substantial efforts will have to be undertaken for Bulgaria to fulfil the 50% and 35% targets of the EU Landfill Directive for diverting biodegradable municipal waste from landfill by respectively 2013 and 2020.[9]

Table 3.2 Municipal Waste[10,11]

		Bulgaria		EU27 average	
Municipal waste generated (kg per person)		410 kg		502 kg	
Municipal waste treated (kg per person)	Total	404 kg		486 kg	
	Landfilled	404 kg	100%	185 kg	38%
	Incinerated	0 kg	0%	107 kg	22%
	Recycled (material recycling)	0 kg	0%	122 kg	25%
	Composted (organic recycling)	0 kg	0%	73 kg	15%

3.3 Composition of the focus groups

The three focus groups in Bulgaria took place on the weekend of 23rd March 2013 in Sofia at the office of the Market LINKS social research agency. The focus groups were moderated by Stanislava Tchipova, Client Service Director, Market LINKS, Sofia.

In total 30 persons (15 males and 15 females) participated in the three FGs. With regard to the age of the participants: 10 participants were aged between 18 and 35 years, 10 between 36 and 50 years and 10 were aged 51 or higher. Most participants (n=22) had a high level of education, while there were 6 participants with medium education level and 2 with a low education level. Of all participants, 15 were employed, 10 were unemployed and five were retired. 14 of the participants live in a house, while 16 reside 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	8	7	22
	Medium	2	2	2	6
	Low	1	0	1	2
Employment	Unemployed	4	3	3	10
	Employed	6	7	2	15
	Retired	0	0	5	5
	Student	0	0	0	0
Housing	Flat	5	5	6	16
	House	5	5	4	14
Area	Urban	6	6	6	18
	Intermediate	4	4	4	12

[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 Bulgaria. 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

All participants mentioned that they separate some waste. However there is a difference between the way participants from urban areas (referred to here as 'cities') experience waste separation compared to participants from more rural areas (referred to here as 'villages'). In general, participants from cities said they separate waste in their households according to four or five waste streams: paper, glass, metal, plastic and residual/organic. Participants who separate waste stated that they either have special bins in their houses to collect the waste separately, or they have one bin for general mixed waste and separate rubbish bags for paper, glass, and plastic. Although participants coming from villages also described their waste in different categories, most of them do not separate their household waste according to these categories. They mentioned that, in general, there are no facilities (containers) for separate collection in the villages, and for this reason they do not separate waste in their household. None of these participants talked about using different waste bins for separate waste collection in their house. Most participants who separate their household waste said that this waste is disposed of in special containers placed in front of the home or nearby. General waste is put in a bin for general waste, usually placed next to the containers for separate collection. Two people mentioned that they separate their food scraps to feed their animals.

Overall, both participants from urban as well as rural areas mentioned that they keep glass separate in their house, as in most cases these are collected separately by the municipality. When it comes to paper, the participants indicated that they do keep it separate, but not all participants dispose of it in the same manner. They mentioned several ways of disposing of waste, including: disposal in the indicated containers, bringing it to a collection point, incinerating it in their own stove or fireplace, or disposing of it together with the general mixed waste. Participants also mentioned that they collect and separate batteries and fluorescent lamps.

[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.

4.1.2 Waste collection

In general most participants said it was quite clear and straightforward how waste was collected in their area. However, some participants stated that for construction waste and animal waste, this is not always the case. For construction waste, only large amounts can be collected at once, but you have to dial a special number and collection is not for free. For small quantities, it is unclear what to do with it. The participants mentioned that animal waste (waste coming from cleaning and maintaining animals) can be quite large and heavy, and so does not fit in the ordinary 'small' bins. It is also unclear how to dispose of it.

Even though most participants collect and keep their batteries separate, the way that they dispose of these differs between participants. Some mentioned that they bring them to a shop, while others initially keep them separate but later dispose of them in the general bin or have no idea about how to dispose of them and just keep them at home. In larger cities, electronic goods can be returned to specialised shops when purchasing new equipment.

In some households, certain types of bottles (plastic and glass), food and clothes might be given away to charity organisations or are left next to the containers to be taken by people in need. The participants also collect paper and metal scraps and bring this to a metal collection centre.

4.1.3 Knowledge about waste pathways

Most participants were not able to say with certainty what would happen to their waste after they disposed of it. Most of them guessed that all waste, whether it was collected separately or disposed of in a general bin, would go to a landfill. Overall the participants had no clue if some of their waste would be used for recycling, or if absolutely everything is processed as landfill. A few participants thought that after waste was collected from a general bin it would be taken to a processing place where the waste would be manually separated.

One of the participants mentioned that it has become very common for poor people to earn a living by taking certain waste from common garbage belts and containers to special collection points. They collect bottles and paper, for instance, which they bring to a special collecting point and receive money for this.

4.1.4 Waste management behaviour and convenience

From the focus groups it became clear that some participants respect the system when dealing with waste, while others do not. The participants that separated waste according to plan mentioned that they do this because they do not want to break the rules set by the municipality, or because otherwise the municipality would not collect their waste. They said they separated waste in their households, and were able to dispose of it quite conveniently in a container or bin for separate collection close to their home. However, there were also participants who stated that they do have a desire to separate waste, but that there are no containers/bins for separate waste collection available near their house. Some of these participants indicated that despite this, they still separate their household waste in separate bags, and put these next to the general waste bin. They mentioned that other people pick up these bags (containing paper, glass and/or cardboard) and bring them to specialised collection points to earn money. There were also participants who said that they do not separate waste on purpose, because they feel that possibilities for waste separation are not well organised where they live, and that it would take too much of an effort to find the containers for separate collection.

A few participants talked about how they perceive the general behaviour of people in their municipality with respect to waste separation. They indicated that even though there are containers for separate collection in their area, people generally do not use them and often do not pay attention when disposing of their waste. This can result in people disposing of glass in a container/bin meant for paper.

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

When talking about waste prevention and production a couple of barriers and concerns were mentioned by the participants. One of the things they commented on was the fact that various shopping bags are now being made without handles (paper biodegradable bags), which makes them unsuitable for reuse. However, some participants expressed that the entire concept of having plastic bags should be abolished, as these bags are not biodegradable, and thus pose a threat to the environment.

"It is obvious that the production of plastic bags should be stopped, because they are not easy to get rid of when they come in the nature." (Bulgaria FG3, P3)

Finally, some participants also talked about the fact that nowadays people are forced to buy their products in unnecessary packaging. According to some of the participants, in the past, products were bought in jars and reusable bottles, and people could go to the shop and refill the same jars and bottles over and over to buy milk and yoghurt, for instance.

4.2.2 Waste management in the household

The participants mentioned several barriers and concerns regarding waste management in their household. First, the participants talked about barriers and concerns related to a lack of knowledge and awareness. The participants mentioned that they believe that a significant part of modern society does not have enough knowledge and/or awareness about the importance of recycling and separating waste. Some participants mentioned that young people in particular are not motivated enough to separate waste. They argued that the younger generation has less love for the environment and they believe this has to do with their upbringing. They also indicated that in schools little is mentioned about environmental protection or waste separation, which leads to an attitude of not separating waste.

"I do not know what their tutors instruct them in their classes, but I suppose little is mentioned about environmental protection or waste separation." (Bulgaria FG3, P4)

A few participants argued that Bulgarian culture can be considered a barrier to separating waste. They stated that Bulgarians in general are not in the habit of separating waste, and this is why they do not think about sorting waste.

"We throw out everything, without thinking if certain things can be re-used or recycled. People don't think of organisations that might collect clothes, shoes, old furniture etc.." (Bulgaria FG 1, P3)

Furthermore, the participants talked about the extra effort it takes to separate waste in their household and the inconvenience it causes. Several participants mentioned that their homes are too small for separate waste collection. One of the participants also explained that having three separate collection bins at home would be inconvenient, as this takes up too much space.

"For me there is only one container and it is not a container, it is simply a small waste bin. And even

if I have my best desire to collect waste separately, to sort the waste, I have nowhere to dump it in house". (Bulgaria FG 1, P 7)

Some participants also talked about the physical and financial effort it would take to recycle waste from their household, especially because it would be necessary to clean the materials such as bottles of milk and oil in order for these to be collected separately. They argued that this would require more time, and would cost extra detergent and water.

4.2.3 Waste disposal and pathways

When it comes to waste disposal and pathways, the participants voiced a number of barriers and concerns. Various participants mentioned as a barrier the fact that there are not enough bins/containers for separate collection. Some of them even mentioned that there were no bins/containers available at all. Others thought that there are enough containers for separate collection, but that these are not always conveniently located, since they are too far from their homes.

"In our neighbourhood, we do not have what is necessary for separate waste collection, because if we could have enough containers, that would contribute to separate collection." (Bulgaria FG3, P8)

Another frequently mentioned barrier had to do with *how* and *when* the disposed waste was collected by garbage trucks. Some of the participants said even when they do sort and dispose of their waste correctly, the garbage trucks still collect all the waste together. Two participants explained that this does not motivate people to separate waste.

"[P 1] But when they come [...] to pick up the rubbish, and they pick up all three containers together, in one truck... I wonder why are we collecting it separately....
[P 7] This is completely not motivating people to collect waste separately." (Bulgaria F 1)

Furthermore, the participants stated that one of the things that bothers them is that waste is not collected on time, or it is not collected frequently enough. Many participants experienced this and they explained that if the garbage trucks do not collect waste on time, from separate containers, the containers/bins get full and people start to throw waste in other bins. Food, for example, is then thrown in containers/bins meant for bottles or for paper. Many participants also mentioned that when waste is not collected regularly, it causes unbearable smells, and the waste containers get overly full, and attract animals.

"...waste is not always thrown exactly in the containers on the designated spots, but rather out of the containers, and various animals go there... the minorities also play a part in spreading the mess. They turn up before the garbage truck comes, collect the discarded plastic bottles, and throw out of the containers whatever is in their way, and create a real mess there. If the garbage truck doesn't come on time to get it removed, it becomes an unsightly view, and a horrible smell." (Bulgaria FG3, P8)

A few participants expressed their concerns regarding other people not disposing of their waste in the designated containers/bins. One of the participants mentioned that in his/her village the general waste containers are located near a river, and since these containers are often full, people dump their waste in the river, thereby causing pollution. First, the fish and plants in the river die because of pollution and chemicals that are released into the water. Second, the polluted water is used for crops and gardens which will also be affected by it. Other participants expressed their concerns about places where people dump their waste illegally.

"I have concerns regarding what happens to the waste [...] at the unregulated landfills, which are already made by... the people. When you have no place to throw it out, you make use of the night and just throw it someplace." (Bulgaria FG2, P 10)

Some participants indicated that they, and perhaps others, do not have a clear idea of how to dispose of certain types of waste, such as construction waste, electrical appliances and animal waste. They explained that al-

though in certain areas the waste disposal system is clear and well organised, this is not the case in other areas.

"[P5] Well, in my opinion, the obstacle is the lack of organisation.
[M] The lack of organisation for what?
[P5] The woman mentioned clothes and electrical appliances - but where should we throw them? Again, in Sofia, they collect them, here they don't." (Bulgaria FG 1)

Furthermore, the participants expressed their concerns regarding waste treatment at landfills and incineration points. One of these concerns was related to the pollution of soil and air and the overall hygiene at landfills and some participants worried about possible health risks resulting from this.

"The other concern that I have is that landfills and the places where waste is collected spread a lot of disease." (Bulgaria FG3, P7)

Lastly, there were quite a number of participants that thought that waste would not be treated separately at landfills and incineration points. They believed that everything would get mixed again, despite citizens' efforts to separate all waste. A few participants also argued that they think that too much waste is being incinerated, and much more waste could be recycled.

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

When it comes to the domain 'environmental sciences and technology' the participants mostly mentioned ideas in the 'technical, physics, chemical, engineering' research category. Generally, these ideas involve the development of a machine or device, which would facilitate effective use of waste and/or improve recycling.

TECHNICAL, PHYSICAL, CHEMICAL, ENGINEERING

One of the most highly prioritised ideas was a machine that can be placed in the home and which would be able to convert waste into something more useful. The participants stated that this machine would resemble a modern version of the existing 'composter', which not only converts organic waste into fertiliser, but also non-organic waste. In another focus group, the participants referred to this idea as a 'mini-container', which would chemically dissolve waste into compost and/or raw materials. The idea received a high priority among participants for different reasons. They mentioned that this machine would help to: decrease the amount of waste generated, lead to less imported vegetables and fruits, contribute to more fertile soil, and contribute to agriculture by stimulating people to plant their own vegetables and fruits so they can live a healthy lifestyle.

"This machine will help the processing of vegetables and fruits etc. We are going to produce much more delicious and high-quality vegetables and fruits. Everything will be healthy... Tomatoes without chemicals." (Bulgaria FG2, P8)

Another idea that was mentioned and well received among the participants concerned the development of a so called 'smart container'. A 'smart container' is a disposal container, controlled by a computer, which would

use a voice system to indicate when users dispose of their waste incorrectly. Some participants mentioned that it could also be manufactured in such a way that it would throw back the waste right back at the user. This idea was appealing to participants because it was quite technologically innovative.

"The waste will then indeed be collected separately, and I think that our society should be a lot more advanced in order for us not to throw our products everywhere, and such a container is advanced." (Bulgaria FG2, P7)

Yet another idea that was brought up involved manufacturers installing a special chip in electrical devices/appliances, such as a washing machine or a refrigerator. Such a chip could then warn the user in case of a technological problem, and the chip would then also instruct the user where the nearest repairing point is situated. The following quote illustrates how this may contribute to less waste production:

"This way we will not throw out the appliances when something is wrong with them." (Bulgaria FG2, P8)

The participants also came up with technical ideas for waste disposal. They proposed a more ecological way to incinerate waste, by developing a technology where the energy of waste incineration would be used for heating or energy, without polluting the air. This idea was targeted for waste management companies.

"Incineration should not be only causing pollution, rather, some kind of benefit should be extracted from it." (Bulgaria FG3, P7)

Another idea that was mentioned is to have micro-recycling plants in every tower/building. This practical idea would make it more convenient for people to bring their waste to a recycling point. This system could be stimulated by giving participants a token which they can exchange for a recycled product or cash.

"The idea is that in every tower block there should be a micro-version of a recycling plant for the waste of all the households in that tower." (Bulgaria FG3, P6)

The participants also came up with the idea to construct a system of pipes, connecting households to recycling plants. Consumers could then dispose of certain waste, which would directly be transferred to recycling plants.

"There should be a system of pipes from our homes to the recycling plants, similar to the waste water drainage system." (Bulgaria FG3, P9)

Finally, the participants also introduced some ideas on which they did not elaborate much. These ideas involved shooting waste into space, burning waste deep in the earth's crust, moving people to another planet instead of shooting waste to space, and sending waste to be burned in the sun. Most of these ideas targeted waste management companies. Although these ideas seemed less feasible on a short term, the participants were quite excited to talk about them.

"A crazy idea... one option is to go up, the other is to go down. Just break down the earth's crust, deep enough, and burn waste there." (Bulgaria FG 1, P 1)

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	Create innovative machines, which (chemically) convert organic waste into fertiliser and non-organic waste into new products or into biodegradable products	Improve recycling/ Effective use of waste	Consumers	☆☆☆☆☆☆☆☆☆

Develop smart containers: Control systems on waste containers, which will have voice control to signal consumers if they are not disposing waste correctly	Behaviour change/ Improve recycling	Consumers	☆☆☆☆☆
Build an ecological incineration system - a state of the art technology where the energy of waste incineration is used for heating or energy, without polluting the air	Effective use of waste/ Effect on planet	Waste management companies	☆☆☆☆
Electrical appliances with warning chips implanted	Less waste production/Less use of resources	Consumers	☆☆☆
Every tower should have its own micro-recycling plant	Improve recycling	Consumers	☆☆
Burn waste deep in the earth's crust, with the heat coming from the earth's core heat coming from the earth's core	Eliminate waste	Waste management companies	☆☆
People should move to another planet or to a pristine place that is not contaminated		Consumers	☆
Waste should be sent to the sun which will burn it with its heat	Eliminate waste	Waste management companies	☆
A system of pipes for waste, connecting households with recycling plants	Improve recycling	Consumers	☆

BIO(TECHNO)LOGY

A second category related to the domain of 'environmental sciences and technology' groups ideas that focus especially on the 'bio(techno)logical' dimension. These ideas generally involve research that focuses on biological processes and animals. All of these ideas targeted consumers.

One of the ideas that was mentioned and well received among the participants involves micro-organisms that destroy rubbish by eating it. In addition, these micro-organisms can then be consumed by humans or animals themselves.

"Our idea concerns micro-organisms which would feed on rubbish, and they could be used for their proteins, like those little worms... you pop them in your mouth and eat them." (Bulgaria FG3, P2)

Participants who prioritised this mentioned that they liked this idea because it seemed at the same time weird and innovative, but also practical and feasible.

Another idea that came out of the focus groups was that of producing food pills, which people can buy and consume, instead of having to eat an entire meal. These pills might come in a broad variety of tastes, such as sausage and cheese. The participants mentioned that this idea is appealing because it stimulates a waste-free society and it is quite convenient.

"I have given it a sticker too [...], it leads to convenience in the household. It facilitates women, with regards to cooking. Furthermore there is no waste. No organic or inorganic waste..." (Bulgaria FG 1, P3)

The participants also talked about the usage of organic waste composters which convert organic food into compost for fertiliser. However the participants specifically mentioned that these should be created in such a way that they would not cause a bad smell in their house. Therefore, some research is necessary to minimise the stink of the composter, so it could be used in-house.

"They should be cleaner, and should not stink and bother people." (Bulgaria FG2, P8)

Table 4.3.2 Ideas within the category 'bio(techno)logical' that received priority, ranked accordingly

Category	Idea	Aim	Target Group	Priority
Bio(techno)-logical	Micro-organism which destroy rubbish by eating it, and then these micro-organisms can be consumed by humans or animals	Effective use of waste	Consumers	☆☆☆☆☆☆☆
	Food can be offered in the form of pills	Less waste production/ Less packaging	Consumers	☆☆☆☆
	Usage of special containers that covert organic waste into compost. These already exist but they should be made in such a way that they don't stink in the houses	Effective use of waste	Consumers	☆

4.3.2 Policy, management and communication

POLICY

Ideas related to regulations and incentives came forward in all focus groups. These ideas are grouped in the category 'policy'. In general, these ideas aimed to increase recycling, make more effective use of waste and to trigger a behaviour change.

Several ideas aim to create incentives for recycling instead of imposing fines for those who do not separate their waste correctly. According to the participants some ways of stimulating people to recycle would be to provide free public transport to recycling places, provide free concert tickets if people recycle correctly, and provide free tokens which can be exchanged for cash or a recycled product. People would receive money when they bring these bottles back. Another option is to reward producers and consumers with the option of paying less tax when they recycle correctly. This idea targeted both consumers and producers.

"[P3] The best one is the financial incentive. There is no better incentive in today's society than the financial dimension. It must be positive, you must gain from it.

[P 10] At the moment there is unemployment and we are wondering where to work. We Bulgarians are financially in trouble. Funding is an important incentive for us.
[P9] For a poor man, to collect some money, he might walk some kilometres.
[P 7] You would rather provide incentives for Bulgarians, rather than fine them. A fine has a negative effect." (Bulgaria FG 1)

The participants also mentioned that producers should create packaging for multi-use and re-use. Producers should, for example, create reusable glass bottles with corks, which could be re-used to refill with cooking oil and soda. When consumers brought these bottles back, they would receive some money for it too.

Another idea that was prioritised by the participants was to have the government giving away free composters for organic waste to all households. The participants mentioned that these containers already exist, so it was only a matter of providing them for free. They believed that this idea would be quite effective.

"I think that it will reduce waste by one third for sure, because half of the waste is biodegradable." (Bulgaria FG 1, P 7)

The participants also came up with the idea of specific legislation that would ensure that waste would be effectively recycled and/or reused by recycling plants. This idea also involved the construction of more recycling plants, as this would increase recycling and it would also lead to more job opportunities. This idea targeted waste management companies.

"[P2] In my opinion there should be more recycling plants, more of these... this is the most realistic idea if we are to reduce the amount of waste. Jobs will be created too. I agree that it probably won't be the nicest working environment, it would not be nice to work there, because it would be smelly, but at the end of the day, pay is pay.
[P 7] As it was mentioned, this is the most realistic idea. And as the gentleman also said, this would lead to growth in the economy.... New plants, new jobs, more plants, more jobs... people would benefit from this." (Bulgaria FG3)

The participants furthermore suggested appointing state/municipal officials who would be responsible for separate collection of waste in their area. These people should be held responsible for having enough separate waste collection points for citizens, and to develop clear timetables indicating when, where and which types of waste are collected.
In addition, the participants came up with the idea of having state workers standing next to the waste collection containers, similar to a police officer, to give fines if people don't separate waste correctly. The participants mentioned that this would create more job opportunities for society, and people would be encouraged to separate waste.

"...we must put emphasis on legislation and enforcement throughout the full cycle, so that collection and re-use are effective, there should be an administrative and penal liability on both sides - the person disposing of waste and the officials responsible for the enforcement of these activities. [...] And those who fail to do the enforcement in their capacity as public officials should get a sanction too." (Bulgaria FG3, P9)

Another idea referred to a general policy stating that people would not be allowed to throw out their garbage. Instead they should find a way to re-use it, for instance for heating their stove.

"I have chosen this option because there is some waste, green stuff, paper, and similar things which I can use to light my stove with." (Bulgaria FG 1, P 10)

The final idea that was prioritised within the category of policy was the idea of extending guarantees for household appliances. This would stimulate people to repair their appliances when something is wrong with them, instead of throwing them away.

"... in this way, more or less, when you use the appliances longer, not that I won't get sick of watching them at home, but at least you are decreasing the throwing out of them. And you save on unnecessary expenses." (Bulgaria FG 2, P 10)

Table 4.3.3 Ideas within the category 'policy' that received priority, ranked accordingly

Category	Idea	Aim	Target Group	Priority
Policy	Instead of creating fines, incentives should be created for the society to stimulate people to recycle	Behaviour change/ Improve recycling	Consumers/Producers	☆☆☆☆☆☆☆☆☆☆☆
	Give away free composters for degradation of organic waste	Effective use of waste	Consumers	☆☆☆☆☆☆☆☆☆
	Legislation that ensures that waste is effectively recycled and reused by specific recycling plants	Effective use of waste/ Improve recycling	Waste management companies	☆☆☆☆☆☆
	Appointment of state or municipal officials who should be responsible for separate collection/waste separation	Improve recycling	Government	☆☆☆☆
	Create multi-use packaging for which people receive money when they return them back	Improve recycling/ Less packaging	Consumers	☆☆☆
	Longer guarantees for household appliances	Less use of resources	Producers	☆☆
	Policy stating that nobody should throw away their garbage. It should be re-used for heating for instance	Effective use of waste	Consumers	☆☆
	There should be fines, given by policemen standing next to every container. This will create also more employment	Behaviour change	Government	☆☆

MANAGEMENT AND LOGISTICS

'Management and logistics' is the last category in the domain of 'policy, management and communication'. During the focus groups there were quite a number of ideas that belonged in this category, but most of them were not prioritised (see Table 4.3.4).

The first idea is to replace all plastic bags with paper bags. According to the participants paper bags are more environmentally friendly as they can rot faster in nature.

> *"The paper bag, even if you don't incinerate it and throw it on the ground, just because of the climate conditions, for example if it starts to rain, in two or three months the paper bag will dissolve and disappear in the ground." (Bulgaria FG3, P2)*

Another idea that was mentioned by the participants concerned construction waste. The participants proposed that there should be better collection, disposal and usage of construction waste and organisation of its processing. The participants mainly agreed on that more containers should be available for collecting construction waste.

"The simplest thing you can do is to put containers in more places in the villages and towns, for general construction waste, to be broken up and transported to the cement plants. After processing they can fill road holes with it." (Bulgaria FG 1, P 7)

A final idea in this category concerned a timetable with specific dates for waste collection by waste management companies. The participants mentioned that each type of waste should be collected on a specific date.

Table 4.3.4 Ideas within the category 'management and logistics' that received priority, ranked accordingly

Category	Idea	Aim	Target Group	Priority
Management/ Logistics	Replace all plastic bags with paper bags	Less plastic	Producers	☆☆☆
	Better collection and disposal/usage of construction waste and organisation of their processing. This can be done by for instance putting more containers for construction waste	Effective use of waste/Eliminate waste	Waste companies	☆☆
	There should be a timetable with specific dates for waste collection. Each type of waste should be picked up on a specific date	Improve recycling	Waste management companies	☆

COMMUNICATION AND EDUCATION

There were also a few ideas focusing on education, information and marketing. These ideas have been clustered in the category 'communication and education' (see Table 4.3.5). Only two of these ideas were prioritised by the focus group participants. The prioritised ideas aimed to create awareness of negative effects and trigger a behaviour change.

First, the participants find it important to educate society on the consequences of pollution. The participants mentioned that creating this awareness would make people more conscious on how to deal with waste.

"[P5] Educate society. To let them know what happens in fact when you for example throw your bag outside instead of in the container.
[P8] Participants should know the consequences, like on a pack of cigarettes." (Bulgaria FG2)

A second idea related to communication and education involved the suggestion that we should not aim for a 'zero waste society', but for a 'less waste society'. According to the participants this would be more realistic and achievable, and people would have a more optimistic attitude in achieving this goal.

"For me personally, I have to believe in it, and be motivated to have such a society. I live alone in an apartment, and I have tried to accomplish a household without waste, but I was not able to do it. I reformulated my idea to a household with less waste... I changed the philosophical aspect and it worked." (Bulgaria FG 1, P 1).

Table 4.3.5 Ideas within the category 'communication and education' that received priority, ranked accordingly

Category	Idea	Aim	Target Group	Priority
Communication and education	Educate society on the consequences of pollution	Awareness of negative effects	Consumers	☆☆☆
	Not to aim for a 'zero waste society', but for a 'less waste society'	Behaviour change	Consumers	☆

5. Conclusion, discussion and evaluation

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

Bulgaria ranks 27th on the EU27 ranking list on Municipal Solid Waste Recycling. In 2010 almost all of Bulgaria's waste was landfilled. The percentage of waste landfilled in Bulgaria, estimated at nearly 100%, is the greatest in all of Europe. A couple of years ago, the EU set a target for all EU27 countries to reduce their amount of waste treated at landfills and bring it down to 50% by 2013 and 35% in 2020. Considering the trends in development of the amounts of waste landfilled, substantial efforts will have to be undertaken for Bulgaria to fulfil these targets.[13] These facts are in line with the findings from the focus groups, as almost all participants stated that they believed that waste goes to the landfill. However most participants were not able to say with certainty what would happen to their waste after it had reached the landfill.

According to the participants in the VOICES focus groups, not everybody separates waste in their household. Generally, participants from urban areas do separate waste, and participants from more rural towns do not. This is in line with the findings from the Flash Eurobarometer survey 'Attitudes of Europeans towards resource efficiency',[14] in which it is presented that around 57% of the respondents do separate at least some waste for recycling, while 42% do not. The survey furthermore indicates that the majority of the respondents do not think that their household is producing too much waste.

During the focus groups, some large clusters of barriers and concerns for disposing of waste appropriately were distinguished. When it comes to waste prevention and production, the participants expressed their concerns regarding the usage of plastic bags, as these are not biodegradable. The participants also mentioned that nowadays, lots of unnecessary packaging is used, while most of these packaging cannot be reused.

Concerning waste management in the home, the participants mentioned that people lack proper knowledge to separate waste correctly and recycle the necessary things. The participants also stated that separating waste is not always convenient and takes extra efforts to dispose of it more correctly.

Furthermore, some challenges emerged regarding waste disposal and pathways. Most participants mentioned that there are not enough containers for separate waste collection. This is in line with the Flash Eurobarometer survey where respondents were asked to state which initiatives would convince them to separate

(more) waste, and 91% mentioned that more and better drop-off points for recyclable and compostable waste would do so. During the VOICES focus groups the participants mentioned that when their waste is collected by the garbage truck, it gets dumped in one general container, even when they made an effort to separate their waste. Participants also expressed their concern regarding other people who do not dispose of their waste in the designated containers, which they consider a threat to the environment. Finally, many participants wondered whether the treatment of waste at landfills was being done in a right manner and expressed their concerns regarding soil pollution and overall hygiene.

5.2 Ideas for achieving a 'zero waste society'

The results are divided into two main research domains, 'environmental sciences and technology' and 'policy, management and communication'. Both domains are further divided into more categories.

Ideas in the first domain focused mainly on technology (machines) which would facilitate effective use of waste and/or improve recycling. Consumers are the most prominent target group, followed by waste management companies. The ideas in this category ranged from developing innovative machines that could turn all kind of waste into biodegradable compost or raw materials, to a system of pipes connecting households with recycling plants. The second category focused on biological and biotechnical ideas, aiming mostly to make more effective use of waste. Consumers were the main target group in this category as well. In this category, creative ideas such as rubbish-eating microorganisms and offering food in the forms of pills were presented. Ideas that received high priority from the participants of the focus groups included the creation of innovative machines for households that would convert waste into something useful, research into rubbish-eating organisms which could then be consumed by users, and the introduction of 'smart containers' which can warn users when they dispose of their waste in the wrong container at a waste collection point.

The second domain included ideas focusing on regulations, incentives and communication to increase recycling, trigger behavioural change and/or contribute to more effective usage of waste. Consumers and producers were the most prominent target group, followed by government. The ideas in the category 'policy' indicated that the government should take lots of responsibility to implement these ideas. In general, the ideas in this category were received quite well by the participants, although most of these ideas will be in the hands of policy makers to be enforced. Ideas that received high priority from the participants of the focus groups included the formulation of policies that aim to create incentives for consumers to separate waste, ensure effective use of waste by waste management companies, and introduce a policy which stated that free composters should be provided for all households.

Of the three most highly prioritised ideas, the first is that instead of creating fines, incentives should be created for the society to stimulate people to recycle. The second was shared between two ideas that received the same number of priority stickers: creating innovative machines, which (chemically) convert organic waste into fertiliser and non-organic waste into new products or into biodegradable products; giving away free composters for degradation of organic waste.

[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)

5.3 Reflection

In general, the participants were pleased to take part in the VOICES focus groups, and they stated that it was quite interesting and useful for them. They said they learned many things regarding waste which they did not know before. Some of the participants said they felt guilty, since they are not separating waste, either because of lack of knowledge and awareness and/or possibilities to separate waste. The participants appreciated the fact that they were able to share their views and hear the views of others. Some participants indicated that the part with ideas for bringing about a 'zero waste society' was the hardest part. Nevertheless, they hope that their ideas will be taken into consideration. Finally, many of the participants were impressed by the fact that the focus group and the topic made them think about problems they had not considered before.

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	Create innovative machines, which (chemically) convert organic waste into fertiliser and non-organic waste into new products or into biodegradable products	Improve recycling/ Effective use of waste	Producers	☆☆☆☆☆ ☆☆☆☆
	Develop smart containers: Control systems on waste containers, which will have voice control to signal consumers if they are not disposing waste correctly	Behaviour change/ Improve recycling	Consumers	☆☆☆☆☆
	Build an ecological incineration system - a state of the art technology where the energy of waste incineration is used for heating or energy, without polluting the air	Effective use of waste/ Effect on planet	Waste management companies	☆☆☆☆
	Electrical appliances with warning chips implanted	Less waste production/ Less use of resources	Consumers	☆☆☆
	Every tower should have its own micro-recycling plant	Improve recycling	Consumers	☆☆
	Burn waste deep in the earth's crust, with the heat coming from the earth's core	Eliminate waste	Waste management companies	☆☆
	People should move to another planet or to a pristine place that is not contaminated		Consumers	☆
	Waste should be sent to the sun which will burn it with its heat	Eliminate waste	Waste management companies	☆
	A system of pipes for waste, connecting households with recycling plants	Improve recycling	Consumers	☆
	Export waste to another planet	Eliminate waste	Waste management companies	
	Throw garbage in volcanoes	Eliminate waste	Waste management companies	
	A robot in each household that would help to take care of waste separation	Convenience the home	Consumers	
Material	Self destroying packaging for products	Eliminate waste/Less packaging	Consumers	
Bio(techno)-logical	Micro-organism which destroy rubbish by eating it, and then these micro-organisms can be consumed by humans or animals	Effective use of waste	Consumers	☆☆☆☆☆ ☆☆
	Food can be offered in the form of pills	Less waste production/ Less packaging	Consumers	☆☆☆☆
	Usage of special containers that covert organic waste into compost. These already exist but they should be made in such a way that they don't stink in the houses	Effective use of waste	Consumers	☆

POLICY, MANAGEMENT AND COMMUNICATION

Category	Idea	Aim	Target Group	Priority
Policy	Instead of creating fines, incentives should be created for the society to stimulate people to recycle	Behaviour change/ Improve recycling	Consumers/ Producers	☆☆☆☆☆ ☆☆☆☆☆ ☆☆
	Give away free composters for degradation of organic waste	Effective use of waste	Consumers	☆☆☆☆☆ ☆☆☆☆
	Legislation that ensures that waste is effectively recycled and reused by specific recycling plants	Effective use of waste/Improve recycling	Waste management companies	☆☆☆☆☆ ☆
	Appointment of state or municipal officials who should be responsible for separate collection/waste separation	Improve recycling	Government	☆☆☆☆
	Create multi-use packaging for which people receive money when they return them back	More recycling/Less packaging	Consumers	☆☆☆
	Longer guarantees for household appliances	Less use of resources	Producers	☆☆
	Policy stating that nobody should throw away their garbage. It should be re-used for heating for instance	Effective use of waste	Consumers	☆☆
	There should be fines,given by policemen standing next to every container.This will create also more employment	Behaviour change	Government	☆☆
	There should be separate landfills for glass, paper, etc.		Waste management companies	
	Learn from effective ideas of other countries and implement them in Bulgaria	Other	Government/ Waste management companies/ Producers	
	Impose fines when people do not dispose their waste correctly	Behaviour change	Consumers	
Management/ Logistics	Replace all plastic bags with paper bags	Less plastic	Producers	☆☆☆
	Better collection and disposal/usage of construction waste and organisation of their processing. This can be done by for instance putting more containers for construction waste	Effective use of waste/Eliminate waste	Waste companies	☆☆
	There should be a timetable with specific dates for waste collection. Each type of waste should be picked up on a specific date	Improve recycling/ Convenience	Waste management companies	☆
	Convert waste into art	Other	Consumers/Waste management companies	
	Unused eatable food should be given to other people who don't have food, or animals	Effective use of waste	Consumers	
	Make more collection points for separate waste collection	Improve recycling	Consumers	
	Install cameras at waste collection points to see when a person throws waste in a wrong container	Improve recycling	Consumers	

Communication and education	Educate society on the consequences of pollution	Awareness of negative effects	Consumers	☆☆☆
	Not to aim for a 'zero waste society', but for a 'less waste' society	Behaviour change	Consumers	☆
	Provide more education/information to change the mindset of people to consume less	Behaviour change/ Awareness	Consumers	
	Teach the youth in school and at home about waste separation	Awareness	Consumers	
	Stimulate society to recycle by organising campaigns or education activities	Behaviour change/ Improve recycling	Consumers	

Annex 2: Attitudes of citizens from Bulgaria 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 Bulgaria.

Question	Answer	%	EU27 Average
Do you think Europe could be more efficient in its use of natural resources?	Yes	91%	87%
	No	6%	5%
	DK/NA*	3%	8%
Do you think that your household is producing too much waste or not?	Yes	25%	41%
	No	74%	58%
	DK/NA*	1%	1%
Do you separate at least some of your waste for recycling or composting?	Yes	57%	89%
	No	42%	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	91%	76%
	Improve separate waste collection at your home	87%	67%

What initiatives would convince you to separate (more) waste?	More information on how and where to separate waste	78%	65%
	Legal obligation to separate waste	71%	59%
	Taxes for waste management	56%	39%
What initiatives would improve waste management in your community?	Better waste collection services	91%	70%
	Stronger law enforcement on waste management	88%	65%
	Make producers pay for collection and recycling of waste	76%	63%
	Make households pay for the waste they produce	47%	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	30%	14%
	To pay proportionally to the quantity of waste you generate	64%	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	39%	25%
	Include the cost of waste management in the price of the products you buy	49%	59%
	DK/NA*	12%	16%
Can you estimate what percentage of the food you buy goes to waste?	None	16%	11%
	15% or less	63%	71%
	16% to 30%	14%	13%
	More than 30%	6%	4%
	DK/NA*	1%	1%
What would help you to waste less food?	Better estimate portion sizes (how much food you cook) to avoid excess food	75%	62%
	Better information on food product labels, e.g. how to interpret "best before" dates, information on storage and preparation	88%	61%
	Better shopping planning by my household	87%	58%
	Smaller portion sizes available in shops	75%	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	38%	39%
	Rather important	35%	41%
	Rather not important	12%	12%
	Not at all important	10%	6%
	DK/NA*	5%	2%
Are you willing to buy second-hand products?	Yes	56%	68%
Base: all respondents, % of yes			
Would you buy the following products second hand?	Furniture	32%	56%
Base: all respondents, % of yes	Electronic equipment	34%	45%
	Textiles (clothing, bedding, curtains, etc)	34%	36%
What reasons prevent you from buying second-hand products?	Quality/usability of the product	53%	58%
	Health and safety concerns	43%	50%
	Less appealing look of the product	17%	25%
	Afraid of what others might think	3%	5%

Would you buy products made of recycled materials?	Yes	64%	86%
	No	31%	11%
	DK/NA*	5%	3%
What would be the most important factors in your decision to buy products made of recycled materials?	Quality/usability of the product	53%	51%
	Environmental impact of the product	26%	26%
	Price of the product	15%	18%
	Brand/brand name of the product	2%	2%
	DK/NA*	4%	3%
What prevents you from buying recycled products or products containing recycled materials?	Health and safety concerns	47%	44%
	Quality/usability of the product	31%	42%
	No clear consumer information on the recycled product	36%	32%
	Less appealing look of the product	11%	17%
	Afraid of what others might think	2%	5%

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

NOTES

MARKET LINKS
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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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