





COUNTRY REPORT POLAND



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Views, Opinions and Ideas of Citizens in Europe on Science

COUNTRY REPORT POLAND

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



| 1. | Introduction | 4 |
|-------|--|----|
| 1.1 | The VOICES project | |
| 1.2 | Citizen participation in social innovation | |
| 1.3 | The process | |
| 1.4 | Structure of the report | |
| 2. | Methodology | 6 |
| 2.1 | The VOICES focus group approach | U |
| 2.2 | The VOICES approach to urban waste | |
| 2.3 | Analysis of the focus groups | |
| 2.4 | Ethical issues | |
| ۷. ۱ | Et noar 199409 | |
| 3. | Country relevant data - Poland | 11 |
| 3.1 | Demographic country data | |
| 3.2 | Factsheet on waste | |
| 3.3 | Composition of the focus groups | |
| 4. | Results | 15 |
| 4.1 | How is waste managed at household level? | 10 |
| 4.1.1 | Waste separation | |
| 4.1.2 | Waste collection | |
| 4.1.3 | Knowledge about waste pathways | |
| 4.1.4 | Waste management behaviour and convenience | |
| 4.2 | Barriers and concerns regarding urban waste | |
| 4.2.1 | Waste prevention and production | |
| 4.2.2 | Waste management in the household | |
| 4.2.3 | Waste disposal and pathways | |
| 4.3 | Citizens' ideas on how to realise a 'zero waste society' | |
| 4.3.1 | Environmental sciences and technology | |
| 4.3.2 | Policy, management and communication | |
| 5. | Conclusion, discussion and evaluation | 27 |
| 5.1 | Waste management, barriers and concerns | _, |
| 5.2 | Ideas for achieving a 'zero waste society' | |
| 5.3 | Reflection | |
| | | |

Annex 1: Full list of ideas for research and innovation, policy, management and communication Annex 2: Attitudes of citizens from Poland towards resource efficiency



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 Poland, 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". 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 areas³, 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. 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.

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



3. Country relevant data - Poland

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, Poland is one of the bigger EU countries with approximately 38.5 million inhabitants. Inhabitants are spread over urban areas (28%), rural areas (34%) and intermediate areas (38%).

Table. 3.1 Population Data^{6,7,8}

| | | 2011 | | |
|----------------------------------|--------------|-------------|-----|--|
| Population at 1 January | | 38 529 866 | | |
| Population as percentage of EU27 | | 7.7% | | |
| Gross Domestic Product (PPP) | | 16 200 Euro | | |
| | Urban | 10 814 000 | 28% | |
| Population urban-rural typology | Intermediate | 12 965 000 | 34% | |
| | Rural | 14 421 000 | 38% | |

3.2 Factsheet on waste

The amount of municipal waste generated and treated in Poland is considerably lower than the average amount of waste treated in the EU27. Poland ranks 16th on the EU27 ranking list on Municipal Solid Waste Recycling (MSW). Recycling has increased from 5% of MSW generated in 2004 to 21% in 2010. An extraordinary effort will be required to meet the EU Waste Framework Directive's target to recycle 50% of MSW by 2020.⁹

Table 3.2 Municipal Waste 10,11

| | | Pol | and | EU27 a | verage |
|---|-------------------------------|--------|------|--------|--------|
| Municipal waste generated (kg per person) | | 315 kg | | 502 kg | |
| Municipal waste treated (kg per person) | | 263 | 3 kg | 486 | kg |
| Municipal waste treated | Landfilled | 192 kg | 73% | 185 kg | 38% |
| | Incinerated | 3 kg | 1% | 107 kg | 22% |
| | Recycled (material recycling) | 47 kg | 18% | 122 kg | 25% |
| | Composted (organic recycling) | 21 kg | 8% | 73 kg | 15% |

3.3 Composition of the focus groups

In Poland, six focus groups (FGs) took place on the weekend of 16th March 2013 and the weekend of 23rd March 2013. Three FGs were held at the Innovation Centre Mill of Knowledge in Toruń, moderated by Maria Tuchowska, Project Specialist. Three more FGs were held in Warsaw at Copernicus Science Centre, moderated by Julia Nowicka, Head of the Evaluation and Analysis Department.

In total, 60 people (30 male and 30 female) participated in the six FGs. The age of the participants ranged from 20 to 67 years. 20 participants were aged between 18 and 35, 21 between 36 and 50 and 19 were aged 51 or older. Educational levels were diverse with 24 participants of a high level of education, 24 medium level and 12 of a low level. 37 participants were working, while 15 were unemployed, 4 were students and 4 were retired. 35 participants live in a house and 25 in a flat. Details of the composition of these focus groups are presented in the table below.

Table 3.3 Composition of the Focus Groups¹²

| | | T FG1 | T FG2 | T FG3 | W FG1 | W FG2 | W FG3 | TOTAL |
|--------------|------------|-------|-------|-------|-------|-------|-------|-------|
| Participants | Total | 10 | 10 | 10 | 10 | 10 | 10 | 60 |
| Gender | Male | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
| dender | Female | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
| | 18-35 | 0 | 0 | 10 | 0 | 10 | 0 | 20 |
| Age | 36-50 | 0 | 10 | 0 | 1 | 0 | 10 | 21 |
| | 50+ | 10 | 0 | 0 | 9 | 0 | 0 | 19 |
| | High | 4 | 4 | 4 | 4 | 5 | 3 | 24 |
| Education | Medium | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
| | Low | 2 | 2 | 2 | 2 | 1 | 3 | 12 |
| | Unemployed | 1 | 4 | 2 | 3 | 2 | 3 | 15 |
| Employment | Employed | 6 | 6 | 6 | 6 | 6 | 7 | 37 |
| Employment | Retired | 3 | 0 | 0 | 1 | 0 | 0 | 4 |
| | Student | 0 | О | 2 | 0 | 2 | 0 | 4 |
| Housing | Flat | 4 | 4 | 3 | 5 | 4 | 5 | 25 |
| riousing | House | 6 | 6 | 7 | 5 | 6 | 5 | 35 |

⁶ Eurostat Statistics Database Online (http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database)

⁷ Eurostat Newsrelease (http://europa.eu/rapid/press-release_STAT-12-51_en.pdf)

⁸ The urban-rural typology is based on the new urban/rural typology developed by the European Commission (http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Urban-rural_typology)

⁹ European Environment Agency (2013). "Managing municipal solid waste - a review of achievements in 32 European countries" EEA Report No 2/2013 (http://www.eea.europa.eu/publications/managing-municipal-solid-waste)

¹⁰ Eurostat Newsrelease (http://europa.eu/rapid/press-release_STAT-12-48_en.pdf)

¹¹ The reported quantities of waste *generated* and *treated* do not always match exactly due to one (or more) of the following reasons: Estimates for the population not covered by collection schemes; Weight losses due to dehydration; Double counts of waste undergoing two or more treatment steps; Exports and imports of waste; Time lags between generation and treatment (temporary storage)

¹² T = Toruń, W = Warsaw





4. Results

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

4.1 How is waste managed at household level?

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

4.1.1 Waste separation

All participants explained they separate waste to a certain extent, although there are differences between municipalities. The most commonly separated materials are glass, plastic, paper, clothing, batteries and medicines. Some participants explained they do not separate glass at all, while others have to separate glass by colour. Comparable situations were described for scrap metal and for plastics.

There are regional differences in the number of waste bins owned by participants or that were available on the streets. Some participants indicated they have to buy bags for plastics or cans while others get them free from the council. Others do not have the option to separate waste. A minority explained they only hired one container from the council and do not separate much waste but the waste is separated later. In Toruń, participants also explained that there are separate bins for plastics, either at home or on the streets, whereas in Warsaw participants are generally provided with bags to separate plastics.

Food waste is often separated for household use. Many participants explained that they separate food waste to give to their animals or the animals of others. Some participants have composters at home for food waste. A small minority deposits food waste in the general waste bin. Furniture and paper is either disposed of as waste or brought to recycle centres, or is burnt in fireplaces or stoves.

4.1.2 Waste collection

Most of the participants have bins in front of their houses for general waste, glass and clothing. Plastics and cans, if separated, are in bags and put next to those bins and are collected at specified times. The dates for

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

collection are known by most participants, because, as one participant explained, waste collection companies have provided flyers with the dates and locations of collection. Clothes are usually placed in bins for collection by the Red Cross. Some participants explained they swap clothes with neighbours or take their clothes to charity shops. Batteries and old medicines are mostly taken to shops with separate containers for those types of waste. Some types of waste are brought to schools: mainly bottle caps, batteries and paper.

Furniture and old appliances are either placed next to the waste collection points or brought to collection points. Some participants mentioned that scrap metal collectors come to those waste sites or even to homes. One participant explained that he usually calls a private company to collect and salvage household appliances for money.

A few participants described charity campaigns where waste and returns were collected for charity purposes. Two participants mentioned that they separate the plastic caps of bottles for schools to generate income for children in wheelchairs. Another participant explained that he takes his paper to a monastery, which generates income to help children in Africa.

4.1.3 Knowledge about waste pathways

In general, participants had limited knowledge about what happens with waste after collection. Some participants explained that waste is either recycled, ends up at the tip or is incinerated. Some participants had observed that separated waste is collected by only one lorry, which suggests that it all ends up together somewhere, most likely at the tip. Residual waste from building sites is thought to end up at the tip as well. Other participants, however, saw that specialised lorries come for separated waste.

4.1.4 Waste management behaviour and convenience

The vast majority of participants explained that they separate waste according to regulations and voiced no concerns or difficulties regarding waste management. Only one participant mentioned that he finds it hard to decide where to put waste consisting of multiple materials. In Toruń, several participants explained they do not separate waste because there is no possibility to dispose of separately sorted waste, so they are obliged to put it all in the general waste bin. In Warsaw, one participant explained that cans are no longer separated because scrap metal dealers go through all the waste for metal. Additionally, some participants explained they are now less careful about waste separation after noticing that separated waste was collected by one lorry, meaning it would be brought to the tip.

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

Two major barriers and concerns emerged during focus groups, which will be addressed before a number of

unrelated topics will be mentioned.

The first topic was the distribution of plastic carrier bags. Some participants explained that it is difficult not to be given a carrier bag in shops when products are purchased. In addition, one participant added that carrier bags also cost money and wondered why they do not make these bags biodegradable.

Secondly, in two focus groups, some topics were discussed relating to the packaging of goods. One participant explained that many products come in multiple layers of packaging, which are unnecessary. Another participant wondered why plastic wrappers are used instead of biodegradable or recyclable paper ones. Participants also mentioned that special edition packaging, for example beer bottles, cannot be reused and that some products are sold in different sorts of packaging, for example milk comes in plastic, paper mixed with plastic and glass containers:

"This calls for another discussion because if we have a beverage in a plastic container and we have a beverage in a glass one, why mix glass with plastic, let there be one beverage so we can tell it apart and then let's not mix glass or any other plastics." (Toruń FG 1, P9)

Some other topics emerged that concerned waste prevention and production. In two focus groups, participants briefly discussed the number of unnecessary commercial flyers that are distributed and produce a lot of paper waste. One participant complained that, in the supermarket, instead of using tongs, people use disposable plastic gloves to pick up bread rolls, which are thrown away afterwards. Another participant explained that consumers simply buy more than is needed and the rest is just thrown away. Finally, one participant explained that goods are produced to be disposable, and therefore people throw old but repairable goods away.

4.2.2 Waste management in the household

Two topics were discussed relating to waste management in the household. In four out of six focus groups, participants explained that much space is needed in the home to separate waste. Although this was stated frequently, it was not extensively discussed during focus groups.

The second topic concerned the costs of separation and was discussed more thoroughly. Two mechanisms were discussed in which people have to pay for separation. Firstly, consumers pay waste companies rent per bin so that if one has to separate four types of waste, one has to pay for four bins. In other municipalities, citizens have to buy special bags for waste separation, one for plastic, one for glass and such, and leave it near the general waste bin on designated dates and times. However, in some municipalities, these bags are distributed for free:

"Yeah, but I think that it's the same with these costs as with the [rubbish] bags... you can put everything together in a single container without separating, but if you want to do the right thing, you need to buy your own bags, one zloty [1 PLN, approximately Euro 0.20] for four bags." (Warsaw FG3, P5)

According to the participants, these policies encourage illegal dumping or just piling all waste in the general waste bin. One participant explained that this is a problem caused by recycling companies:

"Recycling companies which don't give you bags are just creating a problem not just for people but also for ecology and everything, because people can't go to buy the bags for PLN 5 or PLN 10 or PLN 20, if someone lives near the woods, they'll bury it or throw it into the woods." (Toruń FG 1, P 10)

4.2.3 Waste disposal and pathways

Issues related to waste disposal and waste pathways made up the majority of barriers and concerns discussed during focus groups. Four topics were identified, which were present in both Warsaw and Toruń, and one additional topic mainly emerged in Toruń. After discussing these, some other barriers and concerns will be addressed.

Firstly, in three of the six focus groups, participants explained that shops do not take back bottles that were bought in other shops. When a bottle is returned, a receipt showing purchase at the same shop is needed to get the deposit back:

"I don't know; when I try and take bottles back to the supermarket, I always get did you buy that here? Have you got a receipt?" (Toruń FG2, P2)

Secondly, in five of the focus groups, participants elaborated on the lack of separation possibilities. Bins used for separation are not always available in every municipality. Participants explained that pharmacies do not take back unused medication and there is nowhere to return old batteries. Moreover, some of the participants explained that there is no information on where to bring certain waste. This was explained as a reason why people put waste that could be separated in the general waste bin:

"Where I live, the council doesn't have a properly developed system for separating rubbish, there's just glass and plastic and there's no... like it was divided up here, chemical waste and tablets, or whatever. Generally if we don't look for ourselves, we don't have a bag and we have to chuck everything into the bin." (Warsaw FG2, PX)

Another topic that was frequently discussed was the idea that waste separated by citizens would, eventually, end up together on the tip or being incinerated. This, in turn, reduced the motivation to separate waste. As one participant explained:

"[All this] separation we do all ends up in a general landfill, and in reality our work doesn't mean anything." (Warsaw FG3, P2)

In addition, participants also discussed their doubts about how well other people sort their waste. Some of the participants explained that they see a lot of waste that has not been separated at disposal sites. Others explained that people just cannot be bothered to separate waste. Moreover, some participants thought that this might also be due to the general lack of information surrounding waste, waste separation and waste collection.

Lastly, participants looked at the topic of people who do not follow the rules when disposing of waste. Many participants talked about the illegal dumping of waste in the woods or in isolated places. Some participants explained the probable causes of this behaviour. One participant considered the financial benefits of illegally dumping waste because it costs money to hire a skip or to bring things to the tip. Another participant explained that people misuse initiatives that attempt to clean up the illegally dumped waste:

"Yes, but unfortunately at my school, which is on the edge of a forest, after a year of the tidying up campaign, it reached the stage where the children could barely lift the rubbish, or couldn't even lift it at all because people living nearby, when they heard there was going to be a tidying up day, dumped their rubbish in carrier bags or even in sacks." (Toruń FG2, P3)

In Toruń, a topic frequently discussed was related to the costs of waste disposal. On the one hand, participants were concerned that the costs for changes in waste management are forced upon them. On the other hand, participants complained that efforts required of them for waste management, especially for separated waste, have become very high and people still have to make a lot of effort for waste separation and collection themselves. Moreover, some of the participants worry about differences between municipalities. In some municipalities citizens have to pay double the amount paid in others.

In addition to the more frequently discussed topics, some other less closely related topics emerged during focus groups. A small number of participants are concerned that waste management capacity in Poland is insufficient to process the amount of waste produced. One participant explained that recycling is no longer profitable and, therefore, many recycling companies have gone bankrupt due to the low level of recycling in Poland.

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

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

4.3.1 Environmental sciences and technology

TECHNICAL, PHYSICAL, CHEMICAL, ENGINEERING

In general, most of the ideas in this cluster related to the effective disposal of waste. Waste could be either destroyed safely and harmlessly or waste could be turned into usable goods or products.

The idea given highest priority was a machine to separate and process waste that could be placed on every street corner. People could dispose of all their waste and it would automatically sort and distribute the waste. Building on this idea, one participant considered that the machine should break down waste into particles or atoms. A second participant added that the waste particles should then be transported elsewhere by means of teleportation [an idea from science fiction involving the transfer of matter from one point to another without traversing the physical space between them], which was, according to him, already possible:

"And since apparently you can move things by what's called teleportation, it's been physically proven, it can be done, it just hasn't been done successfully yet, so why not arrange things so that, straight away..." (Toruń FG2, P5)

In addition to this idea, another participant in the same focus group stated that on every street corner, there should be a machine that could turn old used products into new ones. For example, an old mug could be changed into new socks. For some reason, this idea was seen as different to the one described above and was attributed far lower priority.

The next two equally highly-prioritised ideas concerned the incineration of waste. Some of the participants in focus groups talked about the energy produced by incinerators, which could be used, for example, to heat homes. In addition to this idea, participants explained that this incineration should emit no harmful compounds. One of these technologies was called the 'clean-air factory' in which waste would be decomposed into pure compounds:

"A special device will be developed to create the explosion but it won't be that the rubbish is reduced immediately but it will undergo gradual biodegradation, and then be released through filters and converted into pure compounds. Because it's like if you burn rubbish you release various toxins and so on. And here we want to convert a hundred per cent of everything into pure compounds." (Warsaw FG2, P6)

The most thoroughly discussed topic was the usage of waste for the production of goods and fuels. Highest priority was given to the idea of a factory that could turn waste into materials used for construction or into textiles. However, the idea was only mentioned and not further elaborated on. The second notion, turning waste into fuels, was discussed in the majority of focus group discussions, but was given slightly lower priority. For example, one group came up with the idea to invent a chemical liquid to decompose waste into liquid fuels for cars:

"And now we had, yes, recycling of waste into new energy sources, I don't know, for example, engines

Finally, one idea was proposed and prioritised by participants but was not further developed. In one focus group, it was proposed that modern 'state-of-the-art' facilities for waste disposal should be built, incorporating technologies like lasers and biodegradation to effectively dispose of waste.

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 | A machine at every street corner to dispose of waste which automatically separates and distributes waste | Improve recycling | Consumers | **** |
| | Burning waste as heat supply or for thermal energy | Effective use of waste | Consumers | ☆☆☆☆☆ |
| | Clean air factory: a sealed building in which waste is blown up and special filters are used so that only eco-compounds are released into the atmosphere | Effects on planet | Waste management companies | ☆☆☆☆☆ |
| | A factory or machine that converts waste into textiles, building materials or fuels | Improve recycling/ Effective use of waste | Producers | ដែដដដ |
| | In every province a state-of-the-art waste processing factory should be built with new technologies to handle waste | Other | Waste management companies | ☆ ☆ ☆ |
| | Use various methods to transform waste into fuel | Effective use of waste | Producers | |
| | A machine on every corner of the street where you can put in old things, which degrades them to atoms and makes new things of them | Effective use of waste | Consumers | ☆☆ |
| | Using glass waste as a material to produce solar energy in homes and greenhouses | Effective use of waste | Producers/ Consumers | ☆☆ |
| | Invent technologies that use the ashes of incinerated waste to produce asphalt or walls | Effective use of waste | Producers | ជ |

MATERIALS

Most of the ideas in the category 'materials' were concerned with making packaging materials either reusable or making them easier to process as waste. Three ideas in particular were prioritised.

Firstly, although it was not further elaborated on, participants explained that packaging material should be developed that reduces in volume after usage. The next two ideas concerned materials that could be reused many times. In one focus group, the participants called it 'Material X', which is harmless to the environment and is made entirely out of biological materials and can be used for many purposes. In the other focus group, participants explained the material should be made at very low production costs, and eventually be turned into water and used to water trees, for example.

The following three ideas were not given such high priority. The first idea, not described in more detail, was that cans should be made of other materials that can be reused. The second idea emerged in two focus groups and concerned edible packaging. This idea was not further developed, although participants of one focus group wondered how this would work because other people would also touch the goods in edible packaging. Thirdly, one participant stated that new materials should be made out of waste, such as building materials.

Other prioritised ideas also involved more sustainable packaging materials. Two ideas revolved around degradable packaging. In one focus group, it was stated that materials should be biodegradable. In another group, one participant explained that the material should decompose after a fixed time:

"We think that as well. We've gone for biodegradable packaging that decays after a predetermined time, three months, six months, a year or a week. A small cheese, for example, is OK for a week and after a week, 'ping' the wrapping disappears. The box disintegrates and leaves the cheese." (Toruń FG2, P10)

Finally, there were two unrelated ideas that were prioritised but were not discussed substantially in the focus groups. One participant proposed that bottles should no longer be labelled but that the information should be stamped in the glass. Secondly, in another focus group, a participant explained that glass should be made light and indestructible.

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

| Category | Idea | Aim | Target Group | Priority |
|----------|---|------------------------|----------------------|--------------------------|
| Material | Packaging material that reduces in volume after usage | Other | Producers | \$\$\$\$\$\$\$\$\$ |
| | Reusable materials, that will in the end turn into water, with low production and disposal costs | Effective use of waste | Consumers/ Producers | ជំជំជំជំជំជំជំ ជំ |
| | Create Material X that is infinitely reusable and harmless to the environment and human health | Effect on planet | Producers | ដដដដដដដ |
| | Reusable cans | Less use of resources | Consumers | ☆☆☆ |
| | Make usable objects or building materials out of waste | Effective use of waste | Producers | _ά ጵ ά |

Material

| Produce edible packaging | Less packaging | Producers/ Consumers | 拉拉拉 |
|---|-----------------------|----------------------|------------|
| Make new sorts of bottles without labels | Less use of resources | Producers | 拉拉 |
| Produce materials that disappear after a set time | Less waste production | Producers | ☆☆ |
| Produce biodegradable packaging | Less waste production | Producers | ☆ |
| Make products from indestructible materials such as glass | Less use of resources | Producers | ☆ |

BIO(TECHNO)LOGY

In this category, only one idea received priority. In one focus group, it was proposed that genetically modified organisms could break down waste. In addition to breaking down waste, a participant suggested that it might be possible to produce genetically modified organisms that can make biodegradable materials:

"Good! We're in favour of GM [genetically modified] organisms. Or we would produce organisms that would break everything down. Or we would produce organisms that produce biodegradable packaging." (Warsaw FG2, P2)

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 | Genetically modified organisms that would break down all waste or produce biodegradable materials | Other | Other | ☆☆ |

4.3.2 Policy, management and communication

POLICY

The majority of suggested policies in this category aimed to increase recycling and sorting by citizens or to motivate producers to produce sustainable products. The idea given highest priority concerned the decrease in usage of non-recyclable materials. According to the participants, laws should be introduced which oblige producers to use only recyclable materials. In this way, the market would be saturated with sustainable materials only.

One idea which was discussed for longer, but ranked second in terms of priority, proposes financial incentives for citizens to separate waste. As discussed in the barriers and concerns section, separation in Poland can cost money since participants have to buy bags for waste disposal or have to hire bins from waste management companies. According to many participants in multiple focus groups, waste separation behaviour of consumers could be improved by reimbursing money for waste separation instead of making consumers pay for it:

"You could introduce reimbursement for separating rubbish, so that it wasn't like, some bags you pay for and other bags are free. [...] So that people don't do things according to what costs money

and what's dearer and what's cheaper. So as not to discourage people, so that they want to separate their rubbish." (Warsaw FG2, P6)

The other ideas, although ranked as lower priority, also revolved around the waste separation issues in Poland. In one focus group, participants discussed a reward system for citizens that separate their waste. For example, every time someone returns a bag of separated waste, a discount for a shop will be provided. Participants in another focus group discussed that the costs to the consumer of separating waste should be lifted. Moreover, some participants suggested that other reward systems should be devised to reduce the costs people have for waste separation:

"They could then lower the bills for, I don't know, for energy, for water, for these... And then people would have the motivation to do this [...]." (Warsaw FG3, P10)

Furthermore, two other topics were mentioned during focus groups. Firstly, one participant proposed that waste management companies should be subsidised so that they will not go bankrupt or so that they will not swindle. Secondly, in one focus group it was stated that Poland should restrict imports from China. The participant stated that China is the biggest producer of waste because it produces things that are unnecessary:

"Limit imports from China because they're the main producers of rubbish. That's right though, there are loads of those silly little things that you don't need but you buy because they're cheap." (Warsaw FG2, P1)

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

| Category | Idea | Aim | Target Group | Priority |
|----------|---|---|----------------------------|--------------|
| Policy | Use returnable packaging or recyclable materials only and ban non-recyclable goods | Less waste production/ Improve recycling | Consumers | *********** |
| | Restrict expenses for separation or install reimbursements for separation or incentives to bring stuff back to the shops | Behaviour change | Consumers | *** |
| | A discount system for citizens who separate their waste | Behaviour change/ Improve recycling | Consumers | な ጵ ጵ |
| | Abolish the costs for separated waste disposal, or give discounts on energy bills | Behaviour change | Consumers | ☆☆ |
| | Subsidies for disposal companies in order to prevent them from swindling | Other | Waste management companies | ☆ |
| | Restrict imports from China because they produce the most waste | Less waste production | Producers | ☆ |

MANAGEMENT AND LOGISTICS

The vast majority of topics discussed in this cluster relate to increasing the national waste processing capacity. The idea receiving the highest priority is to increase the number of incinerators, and thereby decrease the number of landfills. In addition to this idea, one participant stated that more recycling centres should be put in place and that the incinerators should be used to generate energy. The second priority was discussed a few times in two focus groups, and concerned the specialisation of waste management plants to increase their production:

"We cannot organise a bigger number of these workplaces because this is not environmentally friendly. I think we should head more towards specialisation and increasing the productivity of these workplaces." (Warsaw FG 1, PX)

In another focus group, participants mentioned that companies should specialise in different waste streams and that more containers should be put in place. This can also be related to the stories of participants who had seen that separated waste was often collected by only one lorry, leaving the impression that this waste would all end up in the same place, later in the waste pathway.

A third idea emerged in one focus group concerning the usage of natural materials in production processes or as packaging. Participants proposed modern ways to use materials that people used in the past. According to the participants, modern technology can result in products that are bad for the environment because they are hard to decompose. Modern technology, however, should be employed more to make modern goods out of natural materials:

"[...] to reduce the pile of rubbish, make use of natural things which we are able to manufacture, which we stopped producing, which we can do, which will 100% replace the plastic, which are durable. Using today's technology, can't we do all of that? Reduce this pile of rubbish and it won't be harmful to all of us and to Earth in general." (Toruń FG1, P10)

Another idea given priority was that tips should be excluded from the process. Consumers would no longer need to separate waste because it would be brought to waste processing plants immediately, after which it would be fit for recycling:

"[...] it could look like this: there are no rubbish tips on Earth at all. Instead, rubbish is collected from containers, say, if the rubbish is not sorted, all of it would be taken by car to some factory such as Elana [a synthetic fibres manufacturer in Toruń], for example, chucked onto a production line and then sorted using sensors, glass, glass, plastic and clothes and then they would manufacture things from that." (Toruń FG 1, P6)

A final idea given priority involved local shops rewarding people for using reusable bags. They should distribute cloth bags and, every time a consumer returns with that bag, he or she would get a discount at the counter.

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

| Category | Idea | Aim | Target Group | Priority |
|--------------------------|--|-------|----------------------------|----------|
| Management/ Logistics | More incinerators to reduce the number of landfill sites | Other | Waste management companies | <u></u> |
| | Increasing the productivity of waste processing plants by specialising them further | Other | Waste management companies | *** |

| More containers and better and more specialised collection of waste | Convenience/Improve recycling | Waste management companies | ጵ ጵ ቱ |
|---|--|----------------------------|--------------|
| More waste management facilities such as recycle centres and incinerators for energy | Effective use of waste/ Improve recycling | Waste management companies | ☆☆ |
| Make a system for refilling bottles instead of selling new ones | Less packaging | Consumers | ☆☆ |
| An initiative wherein customers get a reusable bag and get accumulated discounts every time they return with that bag | Behaviour change/ Less plastic | Consumers | ☆ |
| Use only natural materials for the production of goods in order to conserve the environment | Effect on planet | Producers | ☆ |
| No more landfills, take waste to processing factories immediately, that can also separate the waste | Improve recycling | Waste management companies | ☆ |

COMMUNICATION AND EDUCATION

The two ideas in the category 'communication and education' that received the highest priority and were most discussed revolved around increasing awareness of waste processing and the consequences of waste and waste management. According to the participants, many people are unaware of the consequences of not separating and recycling waste:

"[P6] I think that education from a very young age would be helpful here but also showing people on television, there are lots of films but showing people what our Earth really looks like, what a dustbin it is, there's very little shown on that subject. There's very little shown from a given shelf.

[P8] Many wonderful journalists lost their lives in action [...] they showed that wonderfully.

[P6] Exactly, showing how it's getting ruined, that everything is poisoned." (Toruń FG1)

Various strategies were suggested to raise awareness. Most participants highlighted the importance of starting with early education, for example at nursery school. Additionally, TV programmes should pay more attention to waste issues. Other suggestions that were mentioned included social campaigns to raise awareness, or excursions to rubbish tips and recycle centres. Some participants had another comparable idea that more incentives should be given for green, sustainable and ecological education so that this becomes a new part of students' work in school:

"We have grants for developing new green sciences and maybe, as part of them, green education at each stage of education, that is to introduce a separate school subject." (Toruń FG3, P2)

Finally, one idea, which was prioritised, concerned social campaigns to increase awareness of consumerism and overconsumption in particular. According to the participants, consumption should be decreased by, for example, not buying more food than necessary. These ideas were not elaborated on more thoroughly.

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 | Education, also in school, about waste separation and recycling | Awareness | Consumers | *** |
| | Raise awareness, through social campaigns, from a young age, for example by TV shows showing how the earth is destroyed | Awareness of negative effects | Consumers | ជ់ជ់ជ់ ជ់ |
| | New grants for green sciences and ecology as a compulsory course in schools | Awareness | Consumers | ☆☆☆ |
| | Social campaign for less consumption, also to buy the amount of food one needs | Behaviour change | Consumers | \$ \$ |

LOCAL INITIATIVES

The only idea given priority was to organise waste collection initiatives for charity purposes. It was not further considered how these campaigns could contribute to waste management problems.

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

| Category | Idea | Aim | Target Group | Priority |
|-------------------|---|------------------|--------------|----------|
| Local initiatives | Motivate people to collect waste for charity purposes | Behaviour change | Consumers | ☆ |

OTHER

Finally there were a few prioritised ideas that are not related to household waste. The first one concerns the development of cars and conveyor belts that run on solar power. The second idea is related to nuclear waste. Sending nuclear waste into space using a rocket was suggested.

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

| Category | Idea | Aim | Target Group | Priority |
|----------|--|-----------------|----------------------------|-----------|
| Other | Withdraw cars with engines and replace by cars or conveyor belts that are driven by solar power | Other | Consumers | ☆☆ |
| | Send nuclear waste into space with a rocket | Eliminate waste | Waste management companies | ☆☆ |



5. Conclusion, discussion and evaluation

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

27

5.1 Waste management, barriers and concerns

Poland ranks 16th on the EU27 ranking list for Municipal Solid Waste (MSW) recycling. Although they increased recycling from 5% in 2004 to 21% in 2010, substantial effort is needed to reach the 50% MSW recycling goal in 2020. Increased land fill tax and decentralised responsibility for MSW management are mentioned as key policies in increasing MSW recycling rates. Interestingly, most of the perceived barriers and concerns mentioned in focus groups related to these topics. Several participants addressed the increasing costs for waste management at the household level and stressed the municipal differences in these costs. Moreover, many of the participants complained that it is difficult or costly to separate waste and to dispose of waste at landfills. Although the majority of participants separate their waste, some of them explained that separated waste will end up on the landfill anyway, discouraging citizens from separating waste. These barriers and concerns highlight the difficulties of further increasing MSW recycling rates in Poland.

Another concern that was stressed by a minority of participants was the limited MSW management capacity of Poland. This is reflected by the 73% of MSW that is processed at landfills compared to a European average of 35%. Additionally, these numbers reflect the notion of some participants that separated and recyclable MSW is brought to landfills instead of being recycled.

A final concern that is remarkable in this regard is the frequently mentioned illegal dumping of waste in woods or gardens. Various participants speculated that this is due to the high costs for waste separation and waste disposal. Additionally, limited possibilities to separate waste are mentioned as a cause for this, which is reflected by the desire for more and better drop-off points for recyclable waste, noted by 87% of the Polish population in the Flash Eurobarometer.

5.2 Ideas for achieving a 'zero waste society'

The results are distributed over two research domains: 'environmental sciences and technology' and 'policy, management and communication'. These domains have been separated further into specific categories. The main findings of the focus groups will be discussed in this section.

In the domain 'environmental sciences and technology', ideas were mainly related to technological and material innovations. Technological innovations generally aimed to increase the ease and capacity of waste separation and waste management. For example, machines were proposed that would automatically separate waste and transport it to the desired location. Participants frequently discussed new innovations that could turn waste into usable goods such as materials and fuels. In the 'material' categories, ideas mainly concerned packaging materials. Participants discussed indestructible materials that can be used infinitely and also materials that would either decompose automatically after set times or that could be easily transformed into other materials or products.

In the domain 'policy, management and communication', ideas were more diverse. In the category of 'policy', many ideas relate to a reduction in the use of non-recyclable materials. The majority of participants also discussed measures to alleviate costs for waste separation and disposal. These findings are reflected in the Flash Eurobarometer where 76% of the Polish respondents considered that producers should pay for the collection and recycling of waste.

In the category 'management and logistics', the majority of ideas related not only to increasing Poland's waste processing capacity, but also to making it easier for citizens to separate and dispose of waste. Waste processing capacity could be increased by installing more incinerators to avoid waste being sent to landfills. Additionally, further specialisation of waste management companies was proposed, with a focus on increasing the number of recycle centres. For convenient sorting, participants explained that there should be more col-

lection points for separated waste. These discussions are strongly related to the expressed desires of more and better drop off points (87%) and better waste collection services (86%) in the Flash Eurobarometer.

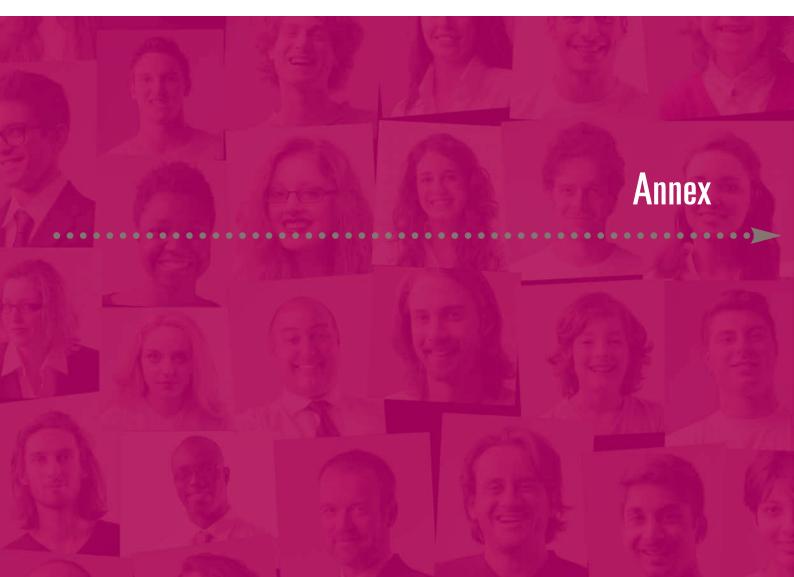
Lastly, in the category of 'communication and education', the majority of discussions focused on raising public awareness of the importance of waste separation and the future effects of waste production. The majority of ideas stressed the importance of social campaigns on TV, for example, and special programmes in schools regarding waste and waste management.

In sum, the results of the focus groups put forward a general desire for improved and more convenient waste recycling and management facilities and services. These findings seem to be in line with findings from the Flash Eurobarometer survey.

Of the most highly prioritised ideas, the first is shared between two that received the same number of stickers (12): ban non-recyclable goods and use only returnable packaging or recyclable materials, and a machine at every street corner to dispose of waste which automatically separates and distributes waste. The second priority is shared between three ideas (8 stickers): packaging material that reduces in volume after usage; reusable materials that will in the end turn into water, with low production and disposal costs; create 'Material X' that is infinitely reusable and harmless to the environment and human health.

5.3 Reflection

Most of the participants acknowledged the importance of the subject during the evaluation of the focus groups. In focus groups, a great variety of ideas were discussed and many of the participants stated they would like to be involved in the future.



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 | A machine at every street corner to dispose of waste which automatically separates and distributes waste | Improve recycling | Consumers | ☆☆☆☆☆ ☆☆☆☆☆ ☆☆ |
| | Burning waste as heat supply or for thermal energy | Effective use of waste | Consumers | ******* * |
| | Clean air factory: a sealed building in which waste is blown up and special filters are used so that only eco-compounds are released into the atmosphere | Effects on planet | Waste management companies | ជជជជជ ជ |
| | A factory or machine that converts waste into textiles, building materials or fuels | Improve recycling/ Effective use of waste | Producers | ជជជជជជ |
| | In every province a state-of-the-art waste processing factory should be built with new technologies to handle waste | Other | Waste management companies | ተተተ |
| | Use various methods to transform waste into fuel | Effective use of waste | Waste management companies | ជជជ ជ |
| | A machine on every street corner where you can put in old things, which degrades them to atoms and makes new things of them | Effective use of waste | Consumers | ☆☆ |
| | Using glass waste as a material to produce solar energy in homes and greenhouses | Effective use of waste | Consumers/ Producers | 公 公 |
| | Invent a technology that can use the ashes of incinerated waste to produce asphalt or walls | Effective use of waste | Producers | ☆ |
| | A shredder in house that makes waste disappear | Eliminate waste | Consumers | |
| | With the use of magic, teleportation or time travel make waste disappear somewhere | Eliminate waste | Other | |
| | Install bio containers that also can reduce the volume of waste | Other | Other | |
| | Build facilities that can make usable objects out of plastic and foils | | Producers | |
| | Produce in house furnaces that burn waste and have filters for the exhaust | Convenience in the home | Consumers | |
| | Produce fuels from chemical waste and sell it for low prices | Effective use of waste | Producers | |
| | Reuse glass shards for the production of ice rinks where children can skate all year round | Effective use of waste | Consumers | |
| | A car that uses bio waste as fuel | Effective use of waste | Consumers | |
| | Machines doing the separation and sorting for us | Convenience in the home | Consumers | |

| | Dig a canal into the earth's centrospheres to burn waste and use the produced heat | Effective use of waste | Waste management companies | |
|-------------------------|---|--|----------------------------|-------------------|
| | A laser that makes waste vanish | Eliminate waste | Waste management companies | |
| | A home machine in the cellar that will make waste vanish | Eliminate waste | Consumers | |
| | A robot that eats waste and produces soil | Effective use of waste | Consumers | |
| | An all in one household appliance | Other | Consumers | |
| | A cupboard where you throw in old clothes and obtain new ones | Effective use of waste | Consumers | |
| | Use old clothes to make new materials that can be reused | Improve recycling/ Less use of resources | Producers | |
| | Shoot waste to the sun | Eliminate waste | Other | |
| | A hole to the core of the planet where waste can burn up | Eliminate waste | Waste management companies | |
| Material | Packaging material that reduces in volume after usage | Other | Producers | ****** *** |
| | Reusable materials, that will in the end turn into water, with low production and disposal costs | Effective use of waste | Consumers/ Producers | ☆ |
| | Create Material X that is infinitely reusable and harmless to the environment and human health | Effect on planet | Producers | ***** |
| | Reusable cans | Less use of resources | Consumers | ** |
| | Make usable objects or building materials out of waste | Effective use of waste | Producers | ជ ់ ជជ់ |
| | Produce edible packaging | Less packaging | Producers/ Consumers | <mark>ተ</mark> ተተ |
| | Make new sorts of bottles without labels | Less use of resources | Producers | 公 公 |
| | Produce materials that disappear after a set time | Less waste production | Producers | 公公 |
| | Produce biodegradable packaging | Less waste production | Producers | ☆ |
| | Make products from indestructible materials, such as glass | Less use of resources | Producers | ☆ |
| | Intelligent materials that separate themselves and disintegrate when needed | Convenience in the home | Consumers | |
| | Produce harmless materials that are resistant to damage | Less use of resources | Producers | |
| | Self-decomposing nappies | Less waste production | Consumers | |
| | Invent reusable packaging of all sorts | Less packaging/ Less use of resources | Producers | |
| Bio(techno)- logical | Genetically modified organisms that would break down all waste or produce biodegradable materials | Other | Other | ☆☆ |
| | Breed a worm that eats waste and leaves fuel briquettes | Effective use of waste | Other | |
| | Tanks with bacteria that process waste | Other | Waste management companies | |

POLICY, MANAGEMENT AND COMMUNICATION

| Category | Idea | Aim | Target Group | Priority |
|--------------------------|---|--|----------------------------|---|
| Policy | Ban non-recyclable goods and use only returnable packaging or recyclable materials | Less waste production/ Improve recycling | Consumers | ☆☆☆☆☆ ☆☆☆☆☆ ☆☆ |
| | Restrict expenses for separation or install reimbursements for separation or incentives to bring stuff back to the shops | Behaviour change | Consumers | ជជជជជ |
| | A discount system for citizens who separate their waste | Behaviour change/ Improve recycling | Consumers | ** |
| | Abolish the costs for separated waste disposal, or give discounts on energy bills | Behaviour change | Consumers | ☆☆ |
| | Subsidies for disposal companies in order to prevent them from swindling | Other | Waste management companies | ☆ |
| | Restrict imports from China because they produce the most waste | Less waste production | Producers | ☆ |
| | Ban laminate because it is plastic while people put it in paper bins | Improve recycling | Consumers | |
| | Global system to manage waste | Other | Government | |
| | Reduce the number of bureaucrats and senators in order to produce less waste of paper and forward info electronically | Less waste production | Government | |
| | Drinks should only come in glass bottles | Less packaging/ Less plastic | Consumers/ Producers | |
| | Fines for not separating waste | Behaviour change/ Improve recycling | Consumers | |
| | Ban the production of utensils made of non-degradable materials | Less plastics | Producers | |
| | 100% reimbursement for waste segregation costs | Other | Consumers | |
| | Install a supervisory body for waste management | Other | Government | |
| Management/ Logistics | More incinerators to reduce the number of landfills | Other | Waste management companies | *** |
| | Increasing the productivity of waste processing plants by specialising them further | Other | Waste management companies | *** |
| | More containers and better and more specialised collection of waste | Convenience/Improve recycling | Waste management companies | ជ ជ ជ ជ ជ ជ ជ ជ ជ ជ ជ ជ ជ ជ ជ ជ ជ ជ ជ |
| | More waste management facilities such as recycle centres and incinerators for energy | Effective use of waste/ Improve recycling | Waste management companies | ☆☆ |

| | Make a system for refilling bottles instead of selling new ones | Less packaging | Consumers | ☆☆ |
|-----------------------------|--|-------------------------------|----------------------------|-------------|
| | An initiative wherein customers get a reusable bag and get accumulated discounts every time they return with that bag | Behaviour change/Less plastic | Consumers | ☆ |
| | Use only natural materials for the production of goods in order to conserve the environment | Effect on planet | Producers | ₩ |
| | No more landfills, take waste to processing factories immediately, that can also separate the waste | Improve recycling | Waste management companies | \$ |
| | Shifting the legal system towards electronic communication instead of paper communication | Less waste production | Other | |
| | Buying up all natural resources | Less use of resources | Other | |
| | Use cotton products/bags instead of plastic ones | Less plastic | Consumers | |
| | Well maintained green areas to stop people from dumping waste illegally | Behaviour change | Consumers | |
| | Only small refrigerators should be produced, forcing people to buy less and, thereby, throw less foods away | Less waste production | Consumers | |
| Communication and education | Education, also in school, about waste separation and recycling | Awareness | Consumers | ជជជជជជ ជ |
| | Raise awareness through social campaigns, from a young age, for example by TV shows showing how the earth is destroyed | Awareness of negative effects | Consumers | *** |
| | New grants for green sciences and ecology as a compulsory course in schools | Awareness | Consumers | ☆☆☆ |
| | Social campaign for less consumption, also to buy the amount of food one needs | Behaviour change | Consumers | ** |
| Local initiatives | Motivate people to collect waste for charity purposes | Behaviour change | Consumers | ₩ |
| | Organise a "tidy the world" day, for both children and adults | Awareness of values | Consumers | |
| | Organise awards for school children for collecting and separating waste | Behaviour change | Consumers | |
| | Organise a fair to raise awareness about separating waste | Awareness | Consumers | |
| Other | Withdraw cars with engines and replace by cars or conveyor belts that are driven by solar power | Other | Consumers | ** |
| | Send nuclear waste into space with a rocket | Eliminate waste | Waste management companies | 公公 |
| | | | | |

Annex 2: Attitudes of citizens from Poland 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 Poland.

| Question | Answer | % | EU27 Average |
|---|--|-----|-----------------|
| Do you think Europe could be more efficient in its use of natural resources? | Yes | 94% | 87% |
| | No | 2% | 5% |
| | DK/NA* | 4% | 8% |
| Do you think that your household is producing | Yes | 43% | 41% |
| too much waste or not? | No | 56% | 58% |
| | DK/NA* | 1% | 1% |
| Do you separate at least some of your waste | Yes | 85% | 89% |
| for recycling or composting? | No | 15% | 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 | 87% | 76% |
| | Improve separate waste collection at your home | 82% | 67% |
| | More information on how and where to separate waste | 77% | 65% |
| | Legal obligation to separate waste | 71% | 59% |
| | Taxes for waste management | 48% | 39% |
| What initiatives would improve waste | Better waste collection services | 86% | 70% |
| management in your community? | Stronger law enforcement on waste management | 77% | 65% |
| | Make producers pay for collection and recycling of waste | 76% | 63% |
| | Make households pay for the waste they produce | 44% | 38% |
| Which one would you prefer: to pay taxes for waste management or to pay an amount | To pay taxes for waste management | 10% | 14% |
| related to the quantity of waste your household generates? | To pay proportionally to the quantity of waste you generate | 80% | 75% |
| | DK/NA* | 10% | 11% |

| Which one would you prefer: to pay taxes | To pay taxes for waste management | 30% | 25% |
|---|--|------------|------------|
| for waste management or to include the cost of waste management in the price of the products you buy? | Include the cost of waste management in the price of the products you buy | 53% | 59% |
| | DK/NA* | 17% | 16% |
| Can you estimate what percentage of the | None | 21% | 11% |
| food you buy goes to waste? | 15% or less | 67% | 71% |
| | 16% to 30% | 11% | 13% |
| | More than 30% | 1% | 4% |
| | DK/NA* | 0% | 1% |
| What would help you to waste less food? | Better estimate portion sizes (how much food you cook) to avoid excess food | 73% | 62% |
| | Better information on food product labels, e.g. how to interpret "best before" dates, information on storage and preparation | 73% | 61% |
| | Better shopping planning by my household | 72% | 58% |
| | Smaller portion sizes available in shops | 66% | 58% |
| How important for you is a product's | Very important | 38% | 39% |
| environmental impact - e.g. whether | Rather important | 47% | 41% |
| the product is reusable or recyclable - when making a decision on what | Rather not important | 9% | 12% |
| products to buy? | Not at all important | 3% | 6% |
| | DK/NA* | 3% | 2% |
| Are you willing to buy second-hand products? | Yes | 70% | 68% |
| Base: all respondents, % of yes | | | |
| Would you buy the following products second hand? | Furniture | 52% | 56% |
| Base: all respondents, % of yes | Electronic equipment | 47% | 45% |
| | Textiles (clothing, bedding, curtains, etc) | 41% | 36% |
| What reasons prevent you from buying | Quality/usability of the product | 48% | 58% |
| second-hand products? | Health and safety concerns | 54% | 50% |
| | Less appealing look of the product | 28% | 25% |
| | Afraid of what others might think | 5% | 5% |
| Would you buy products made of recycled materials? | Yes | 67% | 86% |
| materials! | No | 26% | 11% |
| Mile characteristics of the control | DK/NA* | 7% | 3% |
| What would be the most important factors in your decision to buy products made | Quality/usability of the product Environmental impact of the product | 51% 24% | 51% 26% |
| of recycled materials? | Price of the product | 24% | 18% |
| | | 3% | 2% |
| | Brand/brand name of the product DK/NA* | 1% | 3% |
| What provents you from huning recorded | · · | | |
| What prevents you from buying recycled products or products containing recycled | Health and safety concerns Ouglity (usability of the product | 54% | 44% |
| materials? | Quality/usability of the product | 29% | 42% |
| | No clear consumer information on the recycled product | 46% | 32% |
| | Less appealing look of the product | 22% | 17% |
| Abbreviation DK/NA = Don't know / No Answer | Afraid of what others might think | 4% | 5% |

NOTES

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VOICES, CITIZEN PARTICIPATION IN SOCIAL INNOVATION

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

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

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

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







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