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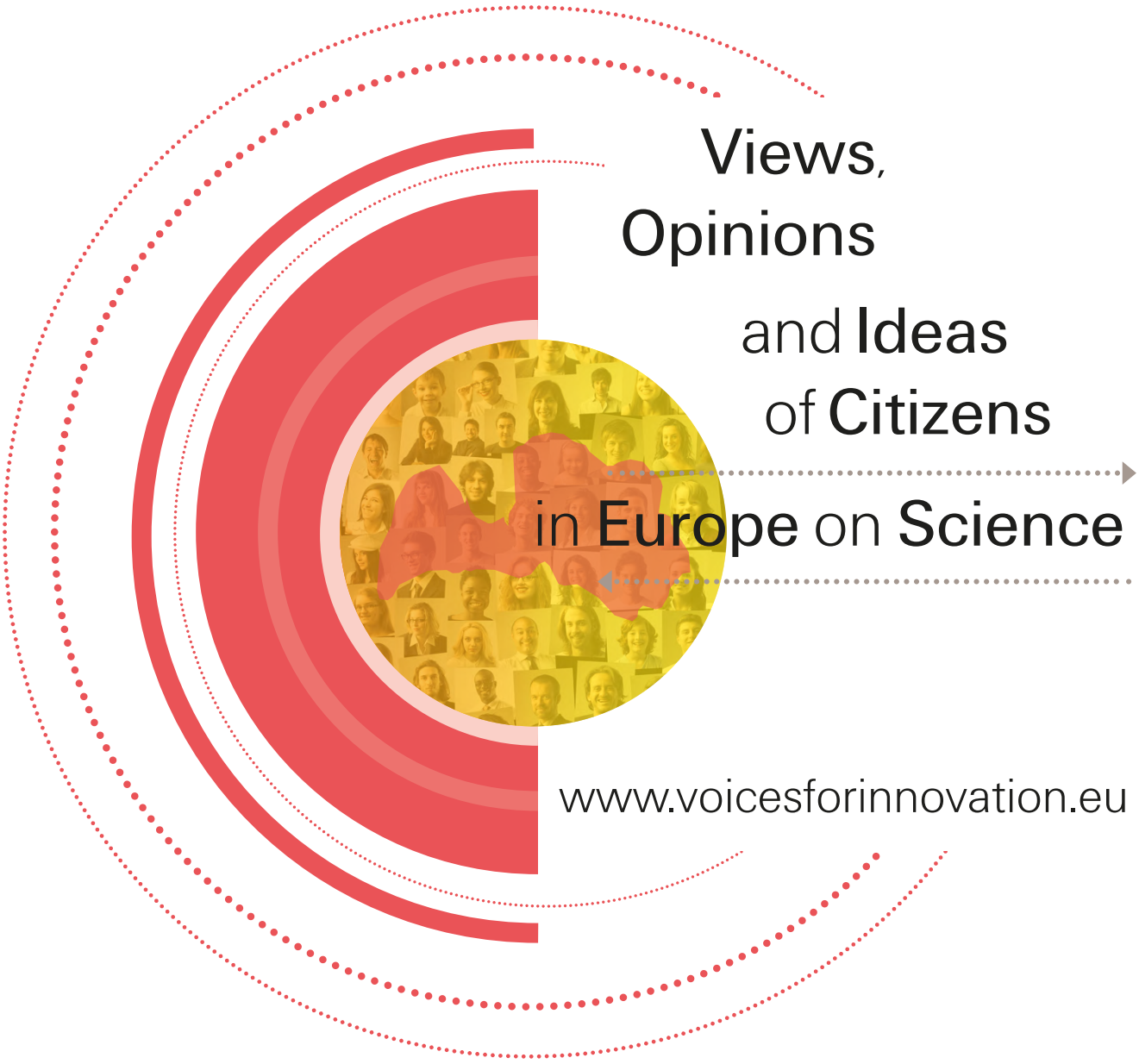

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Views, Opinions and Ideas of Citizens in Europe on Science

COUNTRY REPORT LATVIA

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

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1. Introduction

1.1 The VOICES project

VOICES (Views, Opinions and Ideas of Citizens in Europe on Science) is a year-long, Europe-wide citizen consultation exploring the concept of waste as a resource. It represents an innovative method of integrating public opinion into the 'Climate action, resource efficiency, raw materials' dimension of the Horizon 2020 Work Programmes beginning in 2014.

Funded by the European Commission and led by Ecsite, the European network of science centres and museums, the VOICES project is a response to the Science in Society 2013.1.2.1-1 call on citizen participation in science and technology policy. Citizens are invited to give input to the Consolidation Group that will define the priorities for the next work programme on 'Urban Waste' (call SiS.2013.1.2.1-2).

The main aim of VOICES is to yield valuable insight on methods and procedure for engaging citizen participation to help set the research agenda for Europe's Responsible Research and Innovation framework. The knowledge gained through VOICES will be put to use in similar participatory actions across Horizon 2020.

1.2 Citizen participation in social innovation

A national and European capacity-building initiative, VOICES unites science communication practitioners and academics, and, as such, will result in an effective method through which to consult the public on science and technology related issues.

Compared to many other consultation initiatives, VOICES represents a breakthrough because of its scale (covering all of Europe) and because of the methodological approach used on this wide scale: an approach which makes use of a qualitative methodology, which allows a harvesting and deep understanding of citizens' views, fostering real governance processes and social innovation.

VOICES is also very innovative in its commitment to formally include the results of the citizens' consultations in the main policy document that will shape the priorities of European research. Another unique element is that the knowledge gained with this pilot, in terms of methodology, infrastructure and results, can be used to organise similar participatory actions across Horizon 2020.

1.3 The process

One thousand European citizens participated in focus group discussions about 'Waste as a resource' using a structured VOICES methodology which spans training, implementation and analysis. The methods, infrastructure and results of VOICES are fully documented on an open access portal (www.voicesforinnovation.eu) designed for similar participatory actions occurring throughout Horizon 2020.

VOICES engaged citizens in 33 locations covering 27 EU countries. 28 Ecsite network institutions make up the Third Party task force which organised the 100 focus groups, with approximately ten citizens each, in their respective countries.

Ecsite Project Managers and researchers from the Athena Institute, VU University Amsterdam, were responsible for conducting the focus groups, analyzing public consultations, writing the country and synthesis reports and disseminating their outcomes at public events.

1.4 Structure of the report

In this country report on the VOICES outcomes from Latvia, 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

LATVIA

3. Country relevant data - Latvia

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

Latvia is one of the smaller EU countries with approximately 2 million inhabitants. Almost 50% of them live in urban areas, while almost 40% live in rural areas and others reside in intermediate areas.

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

		2011	
Population at 1 January		2 074 605	
Population as percentage of EU27		0.4%	
Gross Domestic Product (PPP)		14 700 Euro	
Population urban-rural typology	Urban	1 090 000	49%
	Intermediate	297 000	13%
	Rural	843 000	38%

3.2 Factsheet on waste

The amount of municipal waste generated and treated in Latvia is lower than the average amount of waste treated in the EU27. Latvia ranks 23rd on the EU27 ranking list on Municipal Solid Waste Recycling (MSW). Of all waste treated in Latvia, 90% goes to landfills. Although the total amount of waste that is recycled has increased since 2002, it is still 9% of all treated waste. There is no infrastructure for waste incineration in Latvia. An extraordinary effort is needed for Latvia to be able to reach the 50% MSW recycling target for 2020 which has been set by the EU.[9]

Table 3.2 Municipal Waste[10,11]

		Latvia		EU27 average	
Municipal waste generated (kg per person)		410 kg		502 kg	
Municipal waste treated (kg per person)	Total	304 kg		486 kg	
	Landfilled	274 kg	90%	185 kg	38%
	Incinerated	0 kg	0%	107 kg	22%
	Recycled (material recycling)	27 kg	9%	122 kg	25%
	Composted (organic recycling)	3 kg	1%	73 kg	15%

3.3 Composition of the focus groups

The three focus groups (FGs) in Latvia took place in the weekend of 23rd March 2013 in the city of Cesis, at the Z(in)oo science centre. They were moderated by Pauls Irbins, Chairman of the Board of the science centre, and assisted by Kitija Irbina, a freelancer who collaborates with the science centre.

In total, 30 individuals (14 male and 16 female) participated in the three FGs. With regard to the age of the participants: 11 participants were aged between 18 and 35; 9 between 36 and 50; and 10 were aged 51 or over. Educational levels were diverse with 7 participants holding a high level of education, 14 with a medium education level and 9 participants with a low education level. 15 participants were employed, while 8 were unemployed, 3 were retired and 4 were students. 14 of the participants live in a house, while 16 others 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	4	5	5	14
	Female	6	5	5	16
Age	18 - 35	4	3	4	11
	36 - 50	3	3	3	9
	50+	3	4	3	10
Education	High	3	1	3	7
	Medium	5	5	4	14
	Low	2	4	3	9
Employment	Unemployed	4	2	2	8
	Employed	3	5	7	15
	Retired	0	2	1	3
	Student	3	1	0	4
Housing	Flat	3	5	8	16
	House	7	5	2	14

[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 Latvia. 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 with respect to 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 realise a 'zero waste society' including concrete information on 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

In Latvia, much waste is incinerated at home or in the garden, sometimes to heat the house, for example. Other times people just want to get rid of it. Some participants only burn paper, but others burn whatever burns. Most households seem to have at least two bins, so separation does occur, but not everywhere and only for paper, plastic and/or glass. Some participants mentioned that glass is kept to pickle vegetables. Organic waste is generally composted and used in the garden or allotment, if people have one. Clothing is often handed down to other people or given to charity. One person mentioned that homeless people come to collect it. Larger items are burned, brought to a municipal or commercial facility or picked up from the home. Some participants mentioned that a skip is brought at regular intervals (varying from twice a year to once every two years) and all households in the neighborhood can dump their large waste in there. It was not mentioned explicitly if this service is provided by the municipality or a waste management company.

4.1.2 Waste collection

According to the focus group participants, in Latvia the waste management sector is organised by several big companies, which are often explicitly known by name. Some of the mentioned names are ZAAO[13] and

[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.
[13] http://www.zaao.lv/public/
[14] http://www.alba.lv/

Alba.[14] Collection of bins (residual or sorted) from home is generally done by one of these companies at regular intervals, varying from every day to once a month. Collection by individuals is also mentioned, for example for electronic appliances or for different kinds of sorted materials (glass, tin, etc.).

In many areas, possibilities for sorting are offered in the form of communal containers where people need to take their waste themselves. These containers are often specifically assigned to certain households by contract or arranged as a public recycling centre offering several containers for different types of waste. Some participants mention containers for sorted waste at a distance of 5 to 15 kilometres from their home. In these cases, the waste is taken by car or on foot to these containers, or simply not separated. There seems to be a difference between housing estates and private housing areas with regard to the facilities (e.g. separate containers) provided for waste separation. However, this was not further elaborated upon in the focus groups.

Batteries can generally be deposited in a shop and electronic appliances can often be brought somewhere as well. In some cases, paper is taken to a school for competitive collection between classes, after which it is taken to a recycling plant. Other, individually arranged, options are also mentioned for various kinds of waste. Some participants have arrangements in the family for glass or know of a special person for paper or electronics. Schools and charity are also quite often involved, for example for clothing, paper or cardboard. If people bring their waste to such a place, they usually do not get paid for it, but are happy to get rid of it in a convenient way.

4.1.3 Knowledge about waste pathways

Most participants said they did not know where the waste goes after a garbage truck comes to pick it up or after they dispose of it in a container. Some participants know for certain it goes to a landfill and some even knew exactly which landfill. Sorted waste is commonly assumed to be processed and recycled, but some participants doubt the veracity of this claim. Others claimed to know that waste gets sorted after collection by the waste management company, but what happens after the sorting remains unclear. Yet others have very specific knowledge, for example about paper going to a specific paper mill and being recycled, or electronic appliances getting repaired and sold again.

4.1.4 Waste management behaviour and convenience

A lot of waste is reported to end up in places where it should not be, mostly in the woods or other areas in the natural environment. The participants generally explained this behaviour by the fact that the proper ways to dispose of waste cost money and people do not care too much. Participants mentioned that when people are not provided with a container, either from a company or the municipality, they are further inclined to bypass the system and use the woods as a public waste dump. Furthermore, many cases of misuse are mentioned, meaning that the wrong kind of waste is put in a public sorting container.

Several participants also indicated that it is sometimes difficult to determine what the intended plan is. The system for collection and separation is said to change quite often and seemingly arbitrarily. For example, containers are emptied by a company and suddenly this stops happening or a container is provided to collect plastic and suddenly the same container is re-assigned for paper and there is no alternative for plastic. When people have facilities in their neighbourhood where they can dispose of their waste free of charge, they are generally happy to do so and small inconveniences are not experienced as a big barrier.

4.2 Barriers and concerns regarding urban waste

This section provides an overview of the participants' barriers and concerns with respect to current urban waste and identifies underlying reasons for the reported barriers and concerns. The section consists of four parts. The first part, 'Waste prevention and production', focuses on barriers and concerns related to goods in the phase before they enter the household including both waste prevention and production. The second part, 'Waste management in the household', addresses goods and waste in the phase while they are in the household. The third part, 'Waste disposal and pathways', describes barriers and concerns related to the phase in which waste is disposed. Relevant issues related to urban waste management that could not specifically be related to the three parts mentioned before are described in the fourth section, 'Other urban waste issues'.

4.2.1 Waste prevention and production

Regarding waste prevention and production, packaging material is the main subject of barriers and concerns mentioned by the participants. Various aspects of packaging and the production process were put forward. For one, consumer goods are generally offered in very pretty, colourful packaging, especially designed to attract the customer. This packaging itself generates a lot of waste when discarded and customers are prone to buying more than they actually need. Indeed, bad shopping habits, explained as buying things regardless of one's needs or the packaging involved, were also mentioned as a big problem in relation to waste.

"Children have turned into such waste producers [...]. They do sort that waste, but they buy so much..." (Latvia FG 1, P9)

Participants generally agreed that packaging is not only tempting, it is also oversized and misleading; the contents hardly justify the amounts of packaging material involved. They also pointed out that virtually all goods are offered in packaging that harms the environment when not properly disposed of and consumers are not offered an alternative. Plastic packaging material in particular was named as a major concern in all focus groups. Some participants referred to times when their country was still part of the Soviet Union and the same products were provided in glass, which was refundable and consequently was reused. Current (plastic) packaging is hardly suitable for reuse and is discarded.

Plastic carrier bags are generally offered in shops to carry purchases. The fact that these are readily available for people to grab and use is thought to greatly contribute to the problem of plastic in the environment.

"Just look how many bags there are lying around, even just outside the shop, so people go outside and throw away these bags - polythene ones, I mean." (Latvia FG3, P2)

4.2.2 Waste management in the household

Although the participants are familiar with the concepts of sorting and recycling, these are not a self-evident part of waste management in their households. Several barriers and concerns were mentioned that relate directly to the practical organisation of sorting waste at home. There are no sorting standards for private houses, no bins provided to sort at home and when one does want to arrange for separating waste, this takes up quite some space. Two participants mentioned that their building is assigned only one container for waste, even if it contains two households. A second bin needs to be paid for. According to them, this poses quite a barrier to efficient waste management in general, and in particular to separating household waste.

Participants generally agreed that it takes quite some effort to separate waste properly. This concerns not only the issue of putting certain types of waste together, but also the extra work involved, like cleaning certain types of plastic packaging before they can be disposed of.

"In regards to this plastic packaging that I might return to the waste separation plant, or for example,

cream or margarine packs... As far as I'm informed, I have to wash it all before I put them there, don't I? Now, see, being tired and all that, I'd rather just throw everything into the common container [Laughs]." (Latvia FG 1, P3)

It is also mentioned often that many people feel that the waste management companies earn money, while consumers need to do the work and often even pay for separate collection or disposal. This situation is said to discourage the public from putting efforts into proper waste management.

Another important issue in this category concerns knowledge and awareness. Participants in all focus groups agree that the general public has little knowledge about the importance of sorting their waste. There seems to be little awareness of the environmental consequences and therefore people do not really seem to care about sorting and recycling. According to some participants, education about waste separation is lacking entirely, others said it is scattered and incomplete and yet others thought it is available, but not readily accessible for a larger part of the public.

Lack of information is also considered to be related to the widespread practice of incineration of garbage at home. Several participants think that most people are not aware of the harmful substances in the products they burn. Information campaigns clearly and effectively indicated certain items, for example tyres, as harmful, while other items still end up being burned in the back yard.

4.2.3 Waste disposal and pathways

When discussing the disposal of waste and the waste pathways of landfill, incineration, recycling and reuse it became apparent that the system as it is currently organised raises many barriers and concerns among the focus group participants. Landfills and their effect on the environment are a major public concern to virtually all participants. Everything is simply piled up and pollutes the landscape and the atmosphere. Several participants pointed out that there are still places with Soviet waste that has been there for a long time and nothing happens with this. Apart from organised dumping in landfills, the participants said that people illegally dump waste almost everywhere. Roadsides are littered with garbage that just gets thrown out of the car. Even if there are containers and refunds, waste is still dumped illegally in the natural environment. The participants generally felt that this is due to a lack of conscience and feeling of responsibility. Also, consumers are expected to dispose of their waste properly, but one participant mentioned that it seems quite silly seeing as the processing and incineration of waste also produces waste in turn.

The results from all three focus groups clearly indicate that the current system is not convenient enough for proper disposal of waste by the public at large. Issues hampering the system can be clustered as effort, information and costs. Regarding effort, the distance to the locations designated for separated waste collection is deemed a big barrier, combined with the limited amount of available containers and the low frequency of collection. For example, the contents of a big container for organic waste that gets collected once a week start to rot in summer. When it gets collected, the juices leak onto the pavement and give off a foul smell. Moreover, containers or collection bins or boxes are often full and there are no alternatives provided.

"Well I can't dispose of the batteries, for instance, I come to the shop and that box is already full, there's nowhere to put them. So consider where you'll put these, they don't accept these in the shop." (Latvia FG 1, P6)

As for the costs, according to the participants, people in general need to pay the waste management company a certain fee for their services. These costs and/or the way they are arranged through contracts cause frustration and result in illegal dumping or misuse of the containers for separated waste. Waste is reported to be dumped illegally in the woods and residual waste is secretly disposed of in the wrong container, leaving the collectors at a loss for what to do with it. Contracts that stipulate costs to be paid are sometimes signed collectively by several households, but these do not take into account that the amounts of waste can vary greatly between different households. Another participant reported that they used to have a system of bags that were stored

when full and collected at a certain date. Now they have a new system with a container that needs to be emptied for a fixed price. But this container cannot be stored when full because then there is nowhere to put the other waste. Therefore it needs to be emptied every time, full or not, which in the end costs more money.

A lack of information about waste disposal is mentioned as another barrier by many participants. Information about waste pathways is said to be lacking almost entirely. According to the participants, people just do not care and are not interested in what happens with waste after it has left their household. A related aspect is that the public is not informed about changes in the system, which are said to happen quite frequently. It was for example reported that a container designated for paper appeared near the general waste container and people started using it. All of a sudden, without notice or explanation, this container was re-assigned to collect PET bottles and people had no place to put their paper anymore.

A remark that returned in all focus groups is the fact that only a very limited amount of items are assigned to be collected separately. Even when, for example, glass is in principle refundable, the infrastructure to do so is lacking. Also, when certain items are newly introduced to be collected separately, this information is hardly communicated to the public and there is no indication on the products themselves marking them as refundable.

Another conclusion that participants drew is that the system does not work when only some people are educated and behave correctly. Misbehaviour of others combined with a lack of monitoring creates disincentives for people to continue to use the system properly. For example, containers for separated waste were removed after all kinds of waste were dumped in them. In another case, people in a certain area need to pay for communal containers, but people from other areas put their garbage in there as well. They are supposed to be fined, but in reality this never happens.

4.2.4 Other urban waste issues

A general concern underlying all the aforementioned issues is related to the lack of efforts and resources invested in improving the (recycling) system. This hardly seems to happen. It is suggested by the participants that investments might be low due to recyclables having little or no value in Latvia (there is no market), making it financially non-viable to invest in sorting and recycling in the Latvian system. Apart from this, politics and monopoly are thought to greatly hamper the system. Focus groups describe these dynamics in various ways. When ZAAO (a big commercial waste management company) wanted to enter the market, it invested a lot of money in information about sorting etcetera, but now they have a monopoly and no need to compete any longer. Prices are reported to have gone up, structural improvements are absent, the system seems to change arbitrarily and there is hardly any information sent out anymore. According to the participants, small companies cannot enter the market because ZAAO keeps them out.

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

In the domain of the 'environmental sciences and technology', the waste management companies are the main target group in relation to the ideas of the participants. However, looking at the ideas that were prioritised, the producers rank high, receiving more than half of the total amount allocated in this domain. The aims of the ideas are quite evenly distributed between convenience, environmental concerns, effective use of waste and new ways to get rid of it.

TECHNICAL, PHYSICAL, CHEMICAL, ENGINEERING

The category 'technical, physics, chemical, engineering' had most ideas prioritised. The ideas of technically improving existing recycling facilities ranked highest. It is generally felt that more resources should be invested into this cause. This was mentioned directly and indirectly during various discussions in all three focus groups.

"Technically, there are recycling factories, but the technology needs to be improved. Everything is moving forward. Packaging is getting better, it's all happening, but factories are going backwards somehow." (Latvia FG3, P7)

Two ideas that are relatively similar, but with different emphases, relate to the effective use of waste as an energy source. Grouped together, these ideas received the highest priority in this category. Developing technology to use waste as fuel in general was proposed by all focus groups. Waste as fuel could be interesting for both consumers and producers and was not always further explained in detail. A more concrete version of the same idea stayed close to home. Incineration at home is a widespread practice in Latvia and people are very enthusiastic about technology to use the energy, for example for heating, because they would both gain direct benefits from all their waste and get rid of it in a very convenient way.

"I'd like to incinerate everything and that would keep the house warm, yeah. Absolutely everything." (Latvia FG2, P6)

Another idea that was forwarded, but not explained in detail, is the development of pipeline transport. This idea did receive some priority, although from the conversation it does not become very clear if the transport would concern waste, consumer products or possibly both.

"In a word, a pipe, a capsule. Then throw [it] in and it goes somewhere there [Laughter]." (Latvia FG2, P9)

Two ideas were proposed that focus on new ways of getting rid of waste. One of them was to develop technology to dissolve waste at a molecular level.

"[P2] One must invent an apparatus that would simply dissolve it at molecular level. [Laughs]
[M] OK... the dissolution, and what next?
[P2] It's no more." (Latvia FG 1)

Another was the idea of transporting waste into space. This was forwarded a few times in different focus groups. Once it was suggested that the waste could be used to create a new planet, to make sure the waste stays put.

"As they currently develop space technologies quite seriously, well, the space, flying in the outer space, then, perhaps, one option would be to dump it somewhere, let's say, in the outer space. Take it out there and make it stay there by some means. Like building a new planet." (Latvia FG 1, P7)

A last idea that received priority in this category was developing efficient bins for separating waste at household level. Small households have many difficulties managing their waste separation and smart technology might reduce this barrier for sorting and recycling. The best option according to the participants would be an integrated system with several compartments, making it easy to take out to the designated container.

"[P3] People would be more eager to sort their waste, as some people just don't have this thing.
[P 1] Or are too lazy.
[P4] If there would initially be such a trashcan, then there would be no need to sort it once more, you just take the respective bag, which is full, and you dump it into the respective container." (Latvia FG 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	Technically improve existing recycling facilities	Improve recycling	Waste management companies	☆☆☆☆
	Develop technology to use waste as fuel	Effective use of waste	Consumers/Producers	☆☆☆
	Develop technology so that everything can be incinerated in the house to generate energy, e.g. for heating (water, food, room temperature, all heating)	Effective use of waste/Convenience in the home	Consumers	☆☆☆
	Develop pipeline transportation	Effect on planet	Waste management companies	☆☆
	Develop a machine to dissolve waste at a molecular level	Disposal of waste	Waste management companies	☆
	Take waste into space (and create a new planet)	Disposal of waste	Waste management companies	☆
	Efficiently designed bins to separate waste in a (small) household	Convenience in the home	Consumers	☆

MATERIALS

The category 'material' received highest priority ranking of all categories. This is mainly due to the fact that many very similar ideas were proposed in the three focus groups. The first suggestion is to develop materials that disintegrate or decompose in a quick and environmentally friendly way after use. This can concern packaging materials, but also products themselves. In Latvia, a lot of waste still ends up dumped in the natural environment. If items disintegrated quickly, this practice would be less harmful to the environment. Furthermore, if the residue had nutritional value, people could use it for their gardens/allotments.

"[P9] To develop a new paper technology. And you could wrap in this paper, let's say, meat. It would not disintegrate, but when I unwrap it, it could quickly break down somewhere. The new technology paper.
[M] Paper that breaks down quick, right?
[P9] Yes, but it is not harmful." (Latvia FG2)

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

Category	Idea	Aim	Target Group	Priority
Material	Develop material that disintegrates in the most quick and environmentally friendly way after use (decompose in the sun)	Effect on planet/ Convenience in the home	Producers	☆☆☆☆☆☆☆☆☆☆

BIO(TECHNO)LOGY

The category 'bio(techno)logical' yielded one group of ideas. The core element of all these ideas was the use of bacteria to destroy waste in a biological way. Possibly these bacteria would produce a useful substance, otherwise they would just get rid of the waste. The bacteria could be kept at household level somehow or on a large scale at a facility of the waste management company.

"[P9] Or the ones that eat plastic, it's just that these must not be let loose. [laughs].
[M] And what would be the result?
[P9] Hmm, in fact, what could there possibly be. Nothing. Everything's eaten.
[M] OK, well, something always remains, we eat, something also remains after us.
[P9] This material, we might presume, could be fed to some algae, the algae would produce oxygen or something." (Latvia FG 1)

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	Destroy waste biologically, using bacteria	Eliminate waste	Consumers/Waste management companies	☆

4.3.2 Policy, management and communication

The domain of 'policy, management and communication' generated a larger variety of ideas than the domain of environmental sciences and technology. The main target group is consumers, with producers and waste management companies coming second. Almost half of the ideas aim to increase recycling, other important aims being awareness, environmental concerns and effective use of waste.

POLICY

The suggestion that received the highest priority in this category was for Latvia to adopt best practices related to waste from other European countries (See Table 4.3.5). This includes refunds for more items than currently are refundable, automatic pay-out machines, smart waste bins for the household, waste as construction materials, etcetera. Latvia should take a pro-active stance in knowledge sharing, according to some participants.

"It is said that we need to obtain experience from the developed European countries. For example, using glass and building debris for building new roads." (Latvia FG2, P6)

Another group of ideas in this category centres on systems to stimulate customers to hand in old items. This can be of the formula 'hand in so many, get one for free' or a general discount voucher for the shop. These ideas are not always explained in detail, but seem not to discriminate between shops; the item would not necessarily have been bought in the same shop as it is handed in.

"Whoever returns old, discarded items, could be given a discount for new ones. Let's say, return five old bulbs and get a new one for free." (Latvia FG 1, P7)

Most ideas in the category 'policy' are concerned with incentives to increase sorting and recycling (see table 4.3.4). Subsidies for producers that use environmental packaging material were mentioned in all three groups and given a high priority as well in this category. Producers operate in a competitive environment and might be financially compromised by such a transition as opposed to others who do not use the environmentally friendly material. Subsidies would compensate and stimulate them.

"[...] those who use these good packaging materials, they receive special subsidies to get them interested. Supported. In essence, supported. So that this would be, like, sort of an incentive for the others, OK?" (Latvia FG 1, P9)

Another suggestion was to introduce a price difference between sorted and unsorted waste. This price difference should benefit the consumers who need to pay the waste management company for their service. Services related to sorted waste should be cheaper than services related to unsorted waste.

> *"So as far as I know there is a notion in Europe that the pay for household waste, unsorted waste, should be increased so to make people to do this. Yes, to use the price difference as a tool to make people sort." (Latvia FG2, P8)*

Another idea also addresses financial aspects, but in this case it concerns the consumer product. The price should be explicitly composed of the several aspects of a product. This might be original resources, packaging material, transport, etcetera. Refunds could be installed for various aspects of the product, related to recycling packaging or returning an old item to a designated facility. The refund could be claimed by the original customer or by someone else, making the measure extra effective.

> *"There really aren't enough opportunities. If, let's say, you were to buy some lemonade worth 50 cents, you could buy it for 60 then get 10 cents back when you hand it in. Well, you might not hand it in, but you have the opportunity to get 10 cents. Or someone will have the opportunity to get those 10 cents instead of you. That would be people with more motivation." (Latvia FG3, P7)*

An additional group of ideas suggests incentivising private businesses (both producers and waste management companies) in relation to recycling. For waste management companies, this could mean incentives to introduce more containers for separated waste or improve their recycling technology. For producers this could involve incentives to use materials that are suitable for recycling or introducing a service to hand in used items. A closely related idea is to offer incentives for shops to replace plastic carrier bags with canvas or paper bags.

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

Category	Idea	Aim	Target Group	Priority
Policy	Adopt proven recycling practices and technologies from other countries, e.g. automatic pay-out machines for various packaging materials, like bottles, glass jars and cardboard	Improve recycling	Producers/Consumers/ Waste management companies	☆☆☆☆☆☆☆☆☆☆
	Organise a system for separate waste collection at shops/ supermarkets that gives you a voucher or an item for free in that same store	Improve recycling	Consumers/Producers	☆☆☆☆☆☆☆☆
	Subsidies for producers that use environmental friendly packaging material	Effect on planet	Producers	☆☆☆☆☆☆☆☆
	Introduce a price difference between sorted and unsorted waste, favouring the first	Increased recycling	Consumers	☆☆☆☆☆☆
	Break up the price of products in separate aspects, for example packaging, and allowing refunds for some of them	Increased recycling	Producers	☆☆

Policy	Discount on new items when handing in old, discarded ones	Effective use of waste	Producers/Consumers	☆
	Incentivise private businesses in relation to recycling, for example by introducing standards or a bonus	Improve recycling	Producers/Waste management companies	☆
	Incentives to change polythene bags for paper or canvas bags	Less plastic	Producers	☆

MANAGEMENT AND LOGISTICS

A big group of ideas can be summarised as using waste as construction material. As the above idea, this one surfaced in all three focus group in various forms. Waste could be used for new buildings or other structures or to fix buildings or the infrastructure. Participants are very enthusiastic about these ideas. It would create a win-win situation; getting rid of waste and improving the conditions of roads, buildings, etcetera.

"[P5] Yes. Here's another idea. Use the waste as a replenishing material.
[P8] Piece of cake. Crush it up and you could use it in road surfaces, tyres or glass, for example.
[PX] Or even roll it into pavements." (Latvia FG3)

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

Category	Idea	Aim	Target Group	Priority
Management/ Logistics	Use waste as construction material/to fix roads surfaces and pavements	Effective use of waste	Producers	☆☆☆☆☆☆☆☆☆☆

COMMUNICATION AND EDUCATION

Many ideas focused on education, information and marketing. These ideas have been grouped in the category 'communication and education' (see Table 4.3.6). Raising awareness and realising behavioural change (mostly increased recycling) are the most common aims in this category. Significant change is expected when the public at large is better informed and educated about different issues related to the topic of waste management.

In all three focus groups, education for children is put forward as a very important means to improve both awareness and behaviour regarding waste. When children are taught at an early age to properly dispose of waste, this becomes habit. It is assumed that the parents will also be influenced by targeting the children. Moreover, when children are taught the importance of the environment, they will care about it and take waste management seriously. Apart from children, it is also suggested to target specific groups of adults, such as mothers or retired people, based on their specific characteristics and offered at a location where they already gather in their daily routines.

"We suggested precisely as an aim for groups, the audiences. [...] What characteristics fit with this particular group, what sort of rubbish exactly they are producing, what are their everyday habits, that ought to be researched. And following the data and where does it come from and what do they do with it, and where they should put it and what would be the best." (Latvia FG2, P8)

In several different ideas related to communication and education, supermarkets are suggested as an effective

location to organise some kind of educational/information campaign. People could be handing out leaflets with information about recycling possibilities of the items customers just bought, or they might confront the customer directly by asking questions about their waste disposal.

> *"Talking about the supermarkets, they need to arrange activities for when people get there straight away. So supermarkets should inform, like, ... it's not nice to inquire ... what are you going to do with that next, why did you take the plastic bags, why did you choose the paper bags?" (Latvia FG2, P4)*

One last point regarding communication that was prioritised is to make information about possibilities for reuse more easily available. The reasoning for this was that as long as people do not know, they will not act.

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	Educational programs for children about "grading" waste and waste collection	Awareness/Behaviour change	Consumers	☆☆☆☆☆☆☆
	Educational campaigns at supermarkets to confront people directly with the effects of their purchases, for example handing out leaflets about recycling	Awareness	Consumers	☆☆
	Education targeted at specified groups, tailored to their specific habits and delivered at locations that are convenient for them	Behaviour change	Consumers	☆
	Make information about possibilities for reuse more readily available	Awareness of possibilities	Consumers	☆

LOCAL INITIATIVES

The category 'local initiatives' is concerned mainly with ideas that simply require some organisation. Several ideas were put forward, but only one got prioritised: schools should actively organise waste collection and separation activities with the children. Teachers or the school management should not only talk about it, but actually practise what they preach and help the children to do the same. This is considered the best way to educate children about how to deal with waste appropriately.

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

Category	Idea	Aim	Target Group	Priority
Local initiatives	Organise waste collection activities for school children	Behaviour change	Consumers	☆☆

5. Conclusion, discussion and evaluation

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

Latvia ranks 23rd on the EU27 ranking list for Municipal Solid Waste Recycling (MSW). Recycling of MSW has increased since 2002, mainly driven by material recycling, but the total recycling rate of MSW is still very low: 9% of all treated MSW, compared to the EU average of 25%. If the trends of MSW recycling of the last ten years are projected into the future, it is predicted that it will require an extraordinary effort to fulfil the EU recycling target of 50% by 2020.[15] These figures are reflected in the barriers and concerns that were voiced by the participants during the focus groups. Many concerns relate first and foremost to the environmental pollution caused by landfills and illegal dumping, seeing these practices are most prominent in their daily lives. Indeed, findings from the Flash Eurobarometer survey 'Attitudes of Europeans towards resource efficiency'[16] indicate that 60% of all respondents from Latvia said they sort at least some waste (see Annex 2), while the EU27 average as a whole is 89%.

During the focus groups, some large clusters of barriers and concerns for dealing with waste appropriately could be distinguished. Related to production and prevention, concerns about the amount of (plastic) packaging, the lack of alternatives for over-packaged items and bad shopping habits of people in modern society were voiced in all focus groups. Concerning management of waste in the home, the practicalities involved pose some barriers. Separating waste is perceived as quite a challenge due to a lack of space, the effort involved in cleaning and sorting, and the lack of arrangements, both practical and legal, by the municipality to support waste separation at home.

Related to waste disposal and pathways, environmental pollution related to landfills and illegal dumping is mentioned as a very prominent issue. According to the participants, the current system does not support proper waste disposal or recycling and reuse. The effort involved, a lack of information and costs related to correct disposal summarise the main barriers that were put forward. Issues revolve around availability of containers, collection schedules, payments to the company and information and education provided to the public about how and why to dispose of waste properly.

Some concerns of a more general nature were mentioned as well. The Latvian public is thought to have limited knowledge about the importance of proper waste management and does not feel a sense of urgency to make an effort and handle waste appropriately both in the household and for disposal. Furthermore, participants mentioned absence of structural improvements by the government or waste management companies as a general concern for the future. Currently, participants mistrust the system, especially doubting if their sorting efforts are worthwhile or whether it all ends up on a big heap in the end anyway.

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'. From the overall results, the three ideas that received highest priority were all given the same number of stickers (10) from participants. These ideas were: the development of materials that decompose in a quick and environmentally friendly way after use; adopting proven recycling practices and technologies from other countries, such as automatic pay-out machines for various packaging materials; using waste as construction material, or to fix roads surfaces and pavements, a system that gives you a voucher or free item when you hand in one or more items, and financial incentives for producers to use environmental packaging.

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

[16] Flash Eurobarometer No. 316 – The Gallup Organisation (2011)

In the domain of 'environmental sciences and technology', ideas focus mainly on technology (machines and processes) to use waste in an effective way or to get rid of it more effectively and to reduce the impact on the environment. Reducing the negative effects of landfill and illegal dumping of waste in the natural environment are the main aims behind the majority of ideas. Waste management companies are the main target group, with producers and consumers following quite close behind.
In this domain, many ideas relate to waste management directly. The envisioned technologies help to sort, process, disintegrate/decompose or reconstitute waste with an emphasis on increasing recycling, reuse and/or generating energy. Other ideas relate to the original product (before it becomes waste) and aim to reduce waste by making the (packaging) material recyclable and/or (bio)degradable or introducing new products that reduce waste by replacing others.

Ideas in the domain of 'policy, management and communication' circled mainly around regulations, incentives and communication to reduce (packaging) waste, foster awareness and change behaviour. Concerns related to the environmental impact and increasing the practice of recycling surface as dominant drivers for these ideas. Consumers are the main target group, with producers and waste management companies approximately sharing a second place.

Central regulation through diverse mechanisms seems to be a core feature of most solutions in this domain. It is generally felt that both waste management companies and producers should be better monitored, regulated and incentivised to improve their services, technology and products. Apart from this, the consumer should develop into a more conscious citizen, recognising waste management as an important aspect of society and acting accordingly. Educational programs, public campaigns and more readily available information on local practices related to recycling and/or reuse are thought to improve consumer behaviour in this respect.

Although only rarely mentioned explicitly by the participants, in the domain of 'policy, management and communication' an important role for research is to determine which regulation, incentives or communicative measures would be cost-effective in accomplishing a certain aim.

5.3 Reflection

The focus groups were effective in eliciting citizen's preferences, values, needs and expectations concerning urban waste and innovation. The participants enjoyed the exercises that they were given and the reciprocal exchange of experiences. The participants appreciated the fact that the event made them think about future prospects and about developing new ideas to reduce waste and the use of natural resources. Some participants expressed that they would have liked more time to discuss things, exchange views and debate the issues. Almost everyone expressed their increased interest towards waste management and their intention to pay more attention to waste separation in everyday life after attending this focus group. On the whole, the participants were positive about this opportunity provided by the EU to influence research into how environmental and waste issues can be resolved, despite the occasional demonstrations of disbelief that the suggestions are going to be taken seriously and implemented in practice.

Annex

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

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

ENVIRONMENTAL SCIENCES AND TECHNOLOGY

Category	Idea	Aim	Target Group	Priority
Technical/ Physics/ Chemical/ Engineering	Technically improve existing recycling facilities	Improve recycling	Waste management companies	☆☆☆☆
	Develop technology so that everything can be incinerated in the house to generate energy, e.g. for heating (water, food, room temperature, all heating)	Effective use of waste/ Convenience in the home	Consumers	☆☆☆
	Develop technology to use waste as fuel (unspecified)	Effective use of waste	Consumers/ Producers	☆☆☆
	Develop pipeline transportation (unspecified)	Unspecified	Waste management companies	☆☆
	Efficiently designed bins to separate waste in a (small) household	Convenience in the home	Consumers	☆
	Develop a machine to dissolve waste at a molecular level	Eliminate waste	Waste management companies	☆
	Take waste into space (and create a new planet)	Eliminate waste	Waste management companies	☆
	Develop a facility, located in the city, with technology to sort waste by components	Improve recycling	Waste management companies	
	Develop technology to decompose everything in a cistern in the house	Eliminate waste/ Convenience in the home	Consumers	
	Develop technology for plastic carrier bags to be used directly as fuel in cars	Effective use of waste	Consumers	
	Develop technology (vanishing powder) that would make non-recyclable waste disappear	Eliminate waste	Other (possibly all)	
	Develop a process to sort and compress waste before landfill (possibly integrate into a garbage truck)	Effect on planet	Waste management companies	
	Develop technology for production on the moon and leave all the waste there	Eliminate waste	Producers/Waste management companies	
	Develop technology to (reduce waste to small particles and) use it as construction material (buildings, roads, etcetera)	Effective use of waste	Producers	
	Develop a general charger for all electric appliances	Less use of resources	Producers/ Consumers	
	Research the effect on the environment when waste would be used as building material	Effect on planet	Producers	

Material	Develop material that disintegrates in the most quick and environmental friendly way after use (decompose in the sun)	Effect on planet/ Convenience in the home	Producers	☆☆☆☆☆ ☆☆☆☆☆
	Develop packaging material that is easily recyclable	Improve recycling	Producers/ Consumers	
	Develop edible packaging material	Effective use of waste/Eliminate waste	Producers/ Consumers	
Bio(techno)-logical	Destroy waste biologically, using bacteria	Eliminate waste	Consumers/ Waste management companies	☆
	Develop a tablet on which humans can live	Less waste production	Consumers	

POLICY, MANAGEMENT AND COMMUNICATION

Category	Idea	Aim	Target Group	Priority
Policy	Adopt proven recycling practices and technologies from other countries, e.g. automatic pay-out machines for various packaging materials, like bottles, glass jars and cardboard	Improve recycling	Producers/ Consumers/ Waste management companies	☆☆☆☆☆ ☆☆☆☆☆
	Subsidies for producers that use environmental friendly packaging material	Effect on planet	Producers	☆☆☆☆☆ ☆☆☆
	Introduce a price difference between "graded" and "ungraded" waste, favouring the first	Improve recycling	Consumers	☆☆☆☆☆ ☆
	Organise a system for separate waste collection at shops/ supermarkets that gives you a voucher or an item for free in that same store	Improve recycling	Consumers/ Producers	☆☆☆☆☆
	Break up the price of products in separate aspects, for example packaging, and allowing refunds for some of them	Improve recycling	Producers	☆☆
	Incentives to change polythene bags for paper or canvas bags	Less plastic	Producers	☆
	Incentivise private businesses in relation to recycling, for example by introducing standards or a bonus	Improve recycling	Producers/Waste management companies	☆
	Legislation to remove certain food items from the market so people will produce them themselves	Local production	Consumers	
	Political willingness to assign funds to improve the waste management system	Less waste production/Effect on planet/Improve recycling	Government	
	Uniform, standardised legislation about types of packaging environmentally friendly/decomposable	Effect on planet	Producers	
	Increased monitoring and control over waste management companies	Improve recycling/ Effect on planet	Waste management companies	

Policy	Financial incentives for waste redemption, for example plastic bottles or glass jars	Improve recycling/ Effect on planet	Consumers	
	Make general/national regulation more concrete: assign definite responsibilities and practices at a regional/municipal level	Improve recycling	Producers/ Consumers/Waste management companies	
	Increase fines for misusing bins, i.e. putting the wrong waste into a bin	Improve recycling	Consumers	
	Introduce funding to put the unemployed to work at the landfills sorting waste	Improve recycling/ Effect on planet	Waste management companies	
	Introduce funds to clean up the (neglected) landfills	Effect on planet	Waste management companies	
Management/ Logistics	Use waste as construction material / to fix roads surfaces and pavements	Effective use of waste	Producers	☆☆☆☆☆ ☆☆☆☆☆
	Introduce a card to collect stamps for good behaviour and get a reward in the end	Behaviour change	Consumers	
	Make tap water drinkable and install drinking water machines in public places	Less plastic	Consumers	
	Organise a pickup service for large household appliances, attempt to restore, if not possible, recycle, if not possible, turn into fuel	Less use of resources/Improve recycling	Waste management companies	
	Organise a system to reuse, recycle or otherwise use old clothes or footwear	Less use of resources/Improve recycling/Effective use of waste	Consumers	
	Make one big landfill instead of many smaller ones	Effect on planet	Waste management companies	
	Standardise the waste collection system (the bins)	Other	Waste management companies/ Consumers	
	Waste free production, a closed chain	Less waste production	Producers	
	Develop smart, digital, solutions so that less information is spread using paper	Less waste production	Consumers/ Producers	
Communication and education	Educational programs for children about "grading" waste and waste collection	Awareness/Behaviour change	Consumers	☆☆☆☆☆ ☆☆
	Educational campaigns at supermarkets to confront people directly with the effects of their purchases, for example handing out leaflets about recycling	Awareness of negative effects	Consumers	☆☆
	Education targeted at specified groups, tailored to their specific habits and delivered at locations that are convenient for them	Behaviour change	Consumers	☆

	Make information about possibilities for reuse more readily available	Awareness of possibilities	Consumers	☆
	Education on the worst kinds of waste and the effect on the environment	Awareness of negative effects	Consumers	
	Campaigns on the negative effects of waste on what happens when waste is not handled properly	Awareness of negative effects	Consumers	
Local initiatives	Organise waste collection activities for school children	Behaviour change	Consumers	☆☆
	Organise for waste to be used by artists	Other	Consumers/Waste management companies	
	Take school children on outings to waste processing facilities or invite managers to talk about it at school	Awareness	Consumers	
	Set up more (old) clothes collection points and make this known to people	Less use of resources	Consumers	
	Organise more campaigns to clean up the environment	Effect on planet	Consumers	
	Introduce soda machines again	Less plastic	Consumers	
	Buy directly from farm or from farm vendor coming by the house	Local production	Consumers	

Annex 2: Attitudes of citizens from Latvia 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 Latvia.

Question	Answer	%	EU27 Average
Do you think Europe could be more efficient in its use of natural resources?	Yes	76%	87%
	No	10%	5%
	DK/NA*	14%	8%
Do you think that your household is producing too much waste or not?	Yes	27%	41%
	No	73%	58%
	DK/NA*	0%	1%
Do you separate at least some of your waste for recycling or composting?	Yes	60%	89%
	No	40%	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	76%	76%
	Improve separate waste collection at your home	73%	67%
	More information on how and where to separate waste	57%	65%
	Legal obligation to separate waste	48%	59%
	Taxes for waste management	34%	39%
What initiatives would improve waste management in your community?	Better waste collection services	80%	70%
	Stronger law enforcement on waste management	57%	65%
	Make producers pay for collection and recycling of waste	56%	63%
	Make households pay for the waste they produce	34%	38%
Which one would you prefer: to pay taxes for waste management or to pay an amount related to the quantity of waste your household generates?	To pay taxes for waste management	19%	14%
	To pay proportionally to the quantity of waste you generate	62%	75%
	DK/NA*	19%	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	32%	25%
	Include the cost of waste management in the price of the products you buy	45%	59%
	DK/NA*	23%	16%
Can you estimate what percentage of the food you buy goes to waste?	None	12%	11%
	15% or less	64%	71%
	16% to 30%	17%	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	49%	62%
	Better information on food product labels, e.g. how to interpret "best before" dates, information on storage and preparation	63%	61%
	Better shopping planning by my household	54%	58%
	Smaller portion sizes available in shops	51%	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	21%	39%
	Rather important	39%	41%
	Rather not important	20%	12%
	Not at all important	16%	6%
	DK/NA*	4%	2%
Are you willing to buy second-hand products?	Yes	67%	68%
Base: all respondents, % of yes			
Would you buy the following products second hand?	Furniture	42%	56%
Base: all respondents, % of yes	Electronic equipment	39%	45%
	Textiles (clothing, bedding, curtains, etc)	51%	36%
What reasons prevent you from buying second-hand products?	Quality/usability of the product	48%	58%
	Health and safety concerns	41%	50%
	Less appealing look of the product	16%	25%
	Afraid of what others might think	3%	5%
Would you buy products made of recycled materials?	Yes	63%	86%
	No	30%	11%
	DK/NA*	7%	3%
What would be the most important factors in your decision to buy products made of recycled materials?	Quality/usability of the product	61%	51%
	Environmental impact of the product	16%	26%
	Price of the product	18%	18%
	Brand/brand name of the product	1%	2%
	DK/NA*	4%	3%
What prevents you from buying recycled products or products containing recycled materials?	Health and safety concerns	48%	44%
	Quality/usability of the product	39%	42%
	No clear consumer information on the recycled product	29%	32%
	Less appealing look of the product	9%	17%
	Afraid of what others might think	2%	5%

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

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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