VOICES for innovation

ecsite
EUROPEAN NETWORK
SCIENCE CENTRES & MUSEUMS

European Commission

COUNTRY REPORT AUSTRIA

www.voicesforinnovation.eu

VOICES THIRD PARTIES

- ScienceCenter-Netzwerk, Austria
- Royal Belgian Institute of Natural Sciences, Belgium
- Techmania Science Center, Czech Republic
- Experimentarium, Denmark
- Science Centre AHHAA, Estonia
- Heureka - The Finnish Science Centre, Finland
- Universcience, France
- CCSTI Grenoble, France
- Deutsches Museum, Germany
- Universum® Bremen, Germany
- Hellenic Physical Society, Greece
- Palace of Miracles - Budapest Science Center Foundation, Hungary
- Science Gallery, Ireland
- Museo Nazionale della Scienza e della Tecnologia "Leonardo da Vinci", Italy
- Fondazione IDIS - Città della Scienza, Italy
- formicablu srl, Italy
- Science Center "Z(in)oo", Latvia
- Lithuanian Sea Museum, Lithuania
- Science Center NEMO, Netherlands
- Copernicus Science Center, Poland
- Innovation Centre Mill of Knowledge, Poland
- Pavilion of Knowledge - Ciência Viva, Portugal
- Ustanova Hisa eksperimentov, Slovenia
- CosmoCaixa, Fundacio "la Caixa", Spain
- Parque de las Ciencias of Granada, Spain
- Tekniska Museet - Teknorama, Sweden
- The Natural History Museum, London, UK
- Centre for Life, UK

VOICES for innovation

ecsite
EUROPEAN NETWORK
SCIENCE CENTRES & MUSEUMS

European Commission

Views, Opinions and Ideas of Citizens in Europe on Science

COUNTRY REPORT AUSTRIA

www.voicesforinnovation.eu

PUBLISHER

Ecsite - the European network of science centres and museums
89/7, Avenue Louise
B-1050, Brussels
Belgium
info@ecsite.eu

AUTHORS

Broerse, J.E.W., Budge, F., Tielemans, B.M., Van der Ham, L. and Cummings, S. (Athena Institute, VU University Amsterdam)

RESEARCH TEAM

Prof.dr. Jacqueline E.W. Broerse (M.Sc.); Dr. Frank Kupper (M.Sc., M.A.); Dr. Janneke E. Elberse (M.Sc., M.A.); Lia van der Ham (M.Sc.); Barbara M. Tielemans (M.Sc.); Wanda S. Konijn (M.Sc.); Anna van Luijn (M.Sc.); Fiona Budge (M.Sc.); Tirza de Lange (M.Sc.); Durwin H.J. Lynch (M.Sc.); Marzia Mazzonetto (MAS); Willemijn M. den Oudendammer (M.Sc.); Inge Schalkers (M.Sc.); Samuel J.C. Schrevel (M.Sc.); Dr. ir. Rianne Hoopman (M.Sc.); Samuel Ho (M.Sc.); Sarah Cummings (M.Sc.); Rylan Coury (B.Sc.)

EDITORS

Marzia Mazzonetto and Luisa Marino, Ecsite
Francesca Conti, Tatiana Crisafulli and Elisabetta Tola, formicablu Srl
Michael Creek, free-lance

DESIGN/DTP

Teresa Burzigotti, formicablu Srl

Published in June 2013. The views expressed in this publication are those of the authors and not necessarily those of Ecsite Aisbl or the European Commission.

The VOICES project and the present publication have been funded with support from the European Commission (Grant Agreement No 612210), under the Science in Society Environment [Sis ENV] theme, Coordination and Support Action, of the Directorate-General for Research and Innovation (FP7-Adhoc-2007-13). This report reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

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

CONTENTS

1. Introduction

1.1 The VOICES project

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

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

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

1.2 Citizen participation in social innovation

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

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

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

1.3 The process

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

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

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

1.4 Structure of the report

In this country report on the VOICES outcomes from Austria, 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

AUSTRIA

3. Country relevant data - Austria

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, Austria is one of the smaller EU countries with approximately 8.4 million inhabitants. The population is spread over urban areas (35%), rural areas (39%) and intermediate areas (27%).

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

		2011	
Population at 1 January		8 404 252	
Population as percentage of EU27		1.7 %	
Gross Domestic Product (PPP)		32 400 Euro	
Population urban-rural typology	Urban	2 908 000	35%
	Intermediate	2 228 000	27%
	Rural	3 269 000	39%

3.2 Factsheet on waste

The amount of municipal waste generated and treated in Austria is higher than the average amount of waste treated in the EU27. Austria ranks 1st on the EU27 ranking list on Municipal Solid Waste Recycling (MSW). Austria has the highest level of recycling (material and organic recycling) in Europe and has already met the EU Waste Framework Directive's target to recycle 50% of MSW by 2020.[9]

Table 3.2 Municipal Waste[10,11]

		Austria		EU27 average	
Municipal waste generated (kg per person)		591 kg		502 kg	
Municipal waste treated (kg per person)		591 kg		486 kg	
	Landfilled	6 kg	1%	185 kg	38%
	Incinerated	177 kg	30%	107 kg	22%
	Recycled (material recycling)	177 kg	30%	122 kg	25%
	Composted (organic recycling)	230 kg	39%	73 kg	15%

3.3 Composition of the focus groups

In Austria, three focus groups (FGs) took place on the weekend of 16th March 2013. They were held in Vienna at the Wien Museum, moderated by Kathrin Unterleitner, Project Manager at the Austrian Association ScienceCenter-Netzwerk

In total, 29 people (13 male and 16 female) participated in the three FGs. The age of the participants ranged from 21 to 77 years: 9 participants were aged between 18 and 35; 10 between 36 and 50; and 10 were aged 51 or higher. Educational levels were diverse with 10 participants of a high level of education, 8 of a middle level and 11 of a low level of education. 17 participants were working, while 5 were unemployed, 4 were students and 3 were retired. 16 participants live in a house and 13 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	9	10	10	29
Gender	Male	5	3	5	13
	Female	4	7	5	16
Age	18 - 35	9	0	0	9
	36 - 50	0	10	0	10
	50+	0	0	10	10
Education	High	4	4	2	10
	Medium	3	3	2	8
	Low	2	3	6	11
Employment	Unemployed	0	3	2	5
	Employed	5	7	5	17
	Retired	0	0	3	3
	Student	4	0	0	4
Housing	Flat	4	3	6	13
	House	5	7	4	16

[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 Austria. The chapter includes three sections, which are structured according to the exercises of the focus groups. The first section provides insight into what people think and do with respect to waste management at the household level. The second section provides an overview of barriers and concerns of the participants about current urban waste prevention and management, and identifies underlying reasons for the reported barriers and concerns. The third section presents participants' ideas for research and innovation needed in order to achieve a 'zero waste society' including concrete information on the research category, the aim of the research, the proposed target group and the perceived priority of the research idea. Participants' ideas for policy, management and communication are included as well. Throughout the results, quotes of focus group participants are provided for illustrative purposes.[12]

4.1 How is waste managed at household level?

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

4.1.1 Waste separation

All focus groups reported a wide range of waste streams and descriptions were given of 'garbage islands' where it was reported there are as many as 15 different bins for separate waste. With only a few exceptions, nearly all participants reported being attentive to waste separation at household level. The most frequently mentioned waste streams were plastic, organic, paper and glass. Further distinctions were made within these categories: paper and cardboard; glass in terms of colour; and organic was separated into garden and food waste. Another distinction was made in regard to plastic, where a couple of participants mentioned that yoghurt containers are kept separate:

"In the past you used to be allowed to, to put yoghurt and all that in there as well, you can't do that anymore [...] Yoghurt goes in the residual waste bin." (Austria FG2, P3)

"I've heard that yoghurt pots should go in the residual waste bin, because they increase the incineration temperature." (Austria FG2, P1)

Other less frequently mentioned specific waste streams included hazardous waste, cans, used clothing, aluminium, old appliances, building material, and drinks cartons. In addition, there was mention of some more unusual streams, such as nappies, medicines, oil and cleaning materials, as well as PVT.

Separation of waste appeared to vary between rural and urban areas, as well as between those living in individual houses compared to apartment blocks. Urban residents reported that there is less separation in town

[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.

than there is in the countryside, and this was affirmed by the rural dwellers. Both urban and rural residents mentioned different coloured bags and bins: yellow bags are used for aluminium and plastic; and black for residual waste. In rural areas, there are more bins, but there was no mention of colour-coded bins.

4.1.2 Waste collection

Methods and frequency of collection were also quite varied according to waste type, with more frequent collections for residual, paper and organic waste. Other waste streams, however, such as bulky items, used clothing and old electrical appliances are either collected less frequently, or need to be taken to a collection centre. Mention was made of charitable organisations that manage some collection points and sort waste such as used clothing, books and furniture.

As with the separation of waste, there is also an apparent discrepancy between urban and rural areas with regard to collection and management methods. According to two participants, waste is sorted less in town than in the countryside; collection methods in rural areas are considered to be more efficiently organised. In town, participants felt that bins and collection points are too far away, whereas in the countryside, each community has bins in front of their houses. To further illustrate this point, participants living in Lower Austria said they sort organic waste and compost from general waste. However, participants from Vienna did not mention the separation of these streams. Most participants from Austria mentioned that there are paper and residual waste bins in apartment blocks and that drinks cartons are collected at the kerbside. Other waste collection points are reportedly more difficult to reach. There is a collection for bulky waste once a month. However, a phone call to a local authority can be made to request a collection.

One group of participants mentioned that, in their community, each household is provided with 12 bags per year for plastic waste. If they need more bags, they have to pay for them and they are not cheap. More participants living in their own houses (as opposed to apartment blocks) said they collect organic waste for compost in their gardens.

Finally, participants identified 'garbage tourists' who are not official waste collectors:

> *"What I noticed whilst driving through Vienna, is that the bulk waste collection no longer exists in our community. So you arrange with the farmyard to pick it up. So you get an appointment in order to avoid everything being put out on the streets and then these garbage tourists come around picking it up... That's easier right?" (Austria FG 1, P3)*

4.1.3 Knowledge about waste pathways

The majority of the participants had no knowledge about what happens to their waste after they dispose of it. Some hazarded a guess; most stating they believed general waste was taken to a landfill while other sorted waste was reused, recycled or burned. Notably, there was quite some critique of charitable organisations, and the belief that donated goods are not managed in the way the public are led to believe:

> *"Well I get that, but what I don't like is when, for example, they sort the clothes and it's small or there's a tiny hole in it, they chuck it away again." (Austria FG 1, P5)*
>
> *"I don't believe it even goes through Caritas, rather through other organisations somewhere [...] Well I can speak of my Grandma now for example. She's a bit older after all and it really shocked her [...] and now she definitely doesn't give her clothes there any more ..." (Austria FG 1, P6)*

There were some assertive statements from participants reporting that they had seen waste company trucks tipping sorted waste together into one container. Another participant said landfills were not well regulated, but that other more organised collection points might shred waste and use it for landscape conservation.

4.1.4 Waste management behaviour and convenience

The majority of participants reported that they were actively engaged in waste management. Others said they were either disillusioned by other people in their neighbourhoods not separating waste, or that they had seen waste trucks collect the separate bins and then dump all waste together. A few participants were frustrated at the requirement to sort so much waste into separate streams and complained that they felt this task should be undertaken by people paid to do so.

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

Participants in all focus groups raised barriers and concerns regarding excessive packaging, both by producers of products as well as retail outlets. Furthermore, the issue of complex packaging was raised, with some participants voicing concern about composite packaging that renders separation of waste difficult. This was expressed as follows:

"[P6] And even the combined packages, of paper and plastic, just like at the delicatessen.
[P9] Yeah right! Is there anybody who pulls them apart?
[P8] That doesn't work!
[P6] I don't think it works that way!
[P9] Yes it does! I do it, but I think I'm the only one around here that does! I give up on some, but...
[M] The combined packages plastic and paper? Is it harder to sort them out?
[P8] Yes." (Austria FG3)

Another participant said manufacturers use too much plastic, and that there should be more use of glass. However, it was acknowledged that the problem is exacerbated by the weight of glass, as plastic is lighter and therefore more easily transported, and crushed after use.

Participants were also concerned about the lack of sustainable products as well as the limited opportunity to have used products repaired easily:

"[P2] Of course. But, like, some products are really difficult to buy in a sustainable form.
[...]
[P2] Try and find a mobile phone that can be repaired...
[P1] I know that once appliances break down, and you need to have it repaired, it would be enormously expensive. Even if it was only a washing machine, once they come over to repair it I could buy a new washer from what they charge, and that annoys me, that is what's expensive. And that is a pile of waste I'd say. Because a lot of it would be thrown out anyway, and people could be able to repair it by themselves it if wasn't for their high charging rate." (Austria FG3)

An interesting comment was made about material that is used by the 'Meals on Wheels' service (a service taking warm meals to the elderly at home). One participant said that the polystyrene they bring into homes is

difficult to dispose of due to the excessive quantities used:

"[P4] Well what I, well I noticed recently with my father, an old lady lives in his building, she gets 'Meals on Wheels' [...] And she always gets them in these...

[P3] Polystyrene...

[P4] [...] polystyrene things, and that. My grandparents had 'Meals on Wheels' [...] but they always got it delivered in a kind of plastic with like a cover over it, so after they'd eaten it, it was washed out and could be used again [...] In my father's building there used to be three of those residual waste bins and then the residents said, oh we just need two, because one [is] nearly always empty. But now the thing is, since this lady's been getting 'Meals on Wheels' [...] she nearly always needs her own black bin just for her polystyrene containers. Well, I think 'Meals on Wheels' need to rethink this." (Austria FG2)

All groups complained about the excessive use of and dependence on plastic, and particularly plastic wrapping. Participants felt that people's expectations and mind sets limit the options for alternatives:

"Well [...] I have to consume despite how I see it [...] I can't avoid it. Well, I could completely change my diet in that I only eat fruit which falls from a tree. But then I don't do that. I need packaging [...] I sometimes enjoy going to Burger King. I like to buy crisps which are packed 7 times in 7 little bags. Then there are these [...] things which are extra packed [...] 20 of them in such a big bag and then 20 bags inside." (Austria FG 1, P8)

An interesting observation was made in regard to the negative impact of 'special offers':

"[P 10] I believe that ads such as 'the cheaper the better' have a strong influence, those large quantities, those bulk discounts. I once saw a man who had 100 toilet paper rolls, these, what are they called, these ten pieces, right? Well that was cheap. [...]

[P4] Once there's pork on sale, people will drive from god knows where [...]

[M] I also added 'more is cheaper' as a problem.

[P9] Or buy two bunches of radishes, it's cheaper, right? So I would take one bunch to the check out and the cashier would tell me, 'well, get a second bunch, it's cheaper!' I'd say, 'no, I don't need it!'" (Austria FG3)

In a similar vein, participants expressed concern about the way producers target children when advertising products, and the pressure this puts on parents when shopping.

Another interesting remark criticised supposed 'hygiene' measures and the requirement to buy everything in plastic as opposed to customers being able to bring their own containers to fill with unpackaged goods. This preoccupation with hygiene measures was most poignantly illustrated when a participant told the following story:

"Once I had a school class in my garden and one of the children said, 'I won't eat this apple.' I said, 'Why not?' 'Because it's not wrapped up!'" (Austria FG2, P8)

Finally, in regard to production and prevention of waste, it was noted by some participants that there is too much waste generated by paper advertising and that no-advertising stickers on the mailbox are often ignored.

4.2.2 Waste management in the household

Relatively few concerns were expressed about domestic management of waste, and most related to the barrier imposed by the design of products, such as complexity of designs and lack of standardisation. In terms of complexity, the hassle involved in dismantling products reduced the incentive to separate and store waste:

"What I really notice is that the whole thing is so much work. To sort everything out, transferring it and fiddling around until I rip out the battery. And then [...] I get annoyed half way through that so much work is left for us consumers. In fact it's doing things you can't stand, or don't want to do, it just gets too much, right?" (Austria FG 1, P9)

Another design-related concern that created problems was poor design of plastic bio-bags that participants considered to be too thin and easily torn.

Participants considered that the fact that products are not standardised acts as a barrier because it limits opportunities to stack and store waste:

"[P2] Yes, I've got another one: different sized packaging, it's just, since we don't have that packaging [...] any more, everything's a different size, you can't stack them, it all falls over. That's impractical.
[M] So, it's impractical with regard to...?
[P2] Well, storage." (Austria FG2)

Additional concerns were expressed about the lack of space in homes, particularly apartments in housing estates:

"In apartments [...] it's small there [...] Short on space. Where should I put these 3 types of rubbish and bins? Well, in my case, at home there are bottles and general waste and that's [...] because there's no space. With houses, it's different. If you've got a house, it's right outside and one can go in and out with it as well." (Austria FG2, P4)

4.2.3 Waste disposal and pathways

Participants discussed a variety of barriers, including over-filled bins, distance, transport issues, limited opening hours and the limitations that the EU places on various sectors. Some participants were also discouraged by others not separating waste, or when they saw a waste collection vehicle collecting separated waste and then tipping it all together into the truck.

Another source of discouragement was the lack of standardised bins. Participants expressed confusion and frustration when they went to another place or town because they were unsure where to place certain waste streams.

The infrequency of collection, resulting in bins becoming too full, was also discussed:

"[P7] Maybe another thing, where we live in Vienna, is the frequency. Where we live the bins are overflowing. There's so much rubbish being produced and then when the lorry comes [...] They overflow really badly where we live.
[P3] So, collection cycles.
[P1] Logistics.
[P7] Yes." (Austria FG2)

Distance to disposal points and frequency of collection are sources of frustration. Many participants from all three focus groups were concerned that many waste disposal methods pose a barrier to the elderly and disabled:

"[P4] [...] For older people living alone, I don't think they would go 500 metres to throw away their cans and glass, not to mention that a lot of them live off glass jars and cans, well they wouldn't dispose of it. They would have to come up with something else.
[M] What you meant by difficult is walking long distances?
[P4] The long distances, dragging it around, the glass, right?
[P3] It's the same with our parents-in-law.
[P4] Well, an older lady in her 80s wouldn't be able to even if she wanted to. And I think, there needs to be a solution.
[P9] Exactly! For elderly or even people that have a problem.
[P4] Or even disabled!
[P9] Yes!
[P3] Yeah, my mother-in-law is partially blind and unable to walk. It doesn't work." (Austria FG 1)
"If you're disabled you can't separate any waste, try and even get these bins open nowadays, these, these big bottle banks, it's just... I work with disabled people, I mean, it's just not possible." (Austria FG2, P6)

Lack of means of transport, especially for larger bulky waste, was also cited as a major barrier. For example, one participant had gone to great lengths to take a fridge-freezer to a recycling centre but felt even more frus-

trated when told by a worker at the centre that the freezer should have been dismantled first. Inconvenient opening times of waste centres was another concern that was raised and it was felt to be most problematic for people who have regular working hours. One participant sarcastically implied that to be able to use the centres within the opening times, people need to be either a 'housewife or unemployed'.

Participants were demotivated and clearly exasperated when seeing waste trucks throwing all the rubbish together after it had been separated at household level:

"[P7] Separating waste in general, where we live. There isn't really any point to it, is there? Because it's all thrown together and taken to one place anyway, isn't it?
[P5] That's very demotivating then, too if you know about that, isn't it?
[P7] So in Vienna, then, you don't actually separate it any more.
[P3] Or it provides an, an excuse then, for people who don't want to separate their waste, doesn't it?
[P5] Yes, precisely.
[P3] I mean, it's very de-motivating, bad for morale, because they should just say they don't do it and that's that, shouldn't they?
[P7] Because you do it for a while and then you see that actually, it's all being disposed of together. Then you can't be bothered anymore." (Austria FG2)

Another concern was the abuse of existing waste disposal facilities whereby some people reportedly randomly dump waste at night at other people's disposal points. The behaviour of such people has apparently resulted in some 'garbage islands' being locked and only accessible with house keys.

Finally, a barrier of a completely different nature to those mentioned above concerns current EU laws that are perceptibly imposing regulations and laws that prohibit the engagement of various sectors in waste management. The participant who voiced this issue had collected food from catering companies and taken it to animal farms in a previous job. However, current EU regulations prohibit this, and the food that previously had been put to effective use is now wasted.

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

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

4.3.1 Environmental sciences and technology

TECHNICAL, PHYSICAL, CHEMICAL, ENGINEERING

The category 'technical, physical, chemical, engineering' concerns ideas that require research or development in these fields. In this category, nineteen ideas were put forward, of which eleven were prioritised (see table 4.3.1). The first two ideas were ranked as high priority, while the other nine received three stickers or fewer.

The first idea in this category is that of developing products with fewer components, to make them easy to take apart. The participant who proposed this idea imagined products as construction kits. Separate elements

should be self-contained and suitable to use in another product. This newly designed product would be made up of several parts of different appliances. It was not clear if the idea involved consumers assembling new products at home or producers using parts of waste products in their production process. The fact that resources could be recovered more easily when products are designed this way appealed to the participants. They also liked the economic aspect of this idea: it would allow them to fix their broken appliances instead of buying new ones. One participant suggested that the business model of this idea also requires some research to consider whether a manufacturer would want to invest in such a kind of product design.

"[M] Do I get this clearly: do you mean like a construction kit?
[P10] Yes, a construction kit!
[M] That you could simply deconstruct and uninstall and as it is... like raw materials as they are?
[P10] Yes.
[P7] Recover the resources.
[P8] For example, a wind turbine could be made out of a car's fan and generator.
[P2] Like Matador, you stick them together.
[P9] Or Lego." (Austria FG3)

The second idea is a car made from and fuelled by waste. This idea was proposed in two focus groups in a similar fashion. If waste could be thrown directly into a car for use as fuel, there would be no littering. The participants liked the win-win aspect of this idea. It provides financial benefits and offers an effective way to get rid of waste. One participant mentioned the car in the film 'Back to the Future' and how a stock of waste is kept to use as fuel for when fuel runs out. The car itself could also be made of waste according to the participants. A car is also composed of various materials that can be obtained as recyclables. Moreover, one participant argued that cars are not reused enough.

"[P9] Cars make cars.
[M] Ok what would that be?
[P9] Well that would mean if a car is now broken or I drive into a garage and 2 weeks later I get a new car out of my old one.
[P5] Quasi 'Pimp my Car'.
[P9] 'Pimp my Car', exactly. No, I mean rather that I reckon that the cars, well, they're not being reused." (Austria FG1)

Another idea in this category is private waste incineration to generate energy for heating. An incineration machine should be built into every house or apartment building to dispose of waste in a convenient way and generate heat. The idea was not discussed at length but, in one focus group, the participants discussed some aspects and worked towards an integrated concept of self-sufficiency.

"[P3] There's incinerators too, right? Incinerators for households or for municipal buildings, whatever. They should develop such an incinerator where you can easily throw the trash.
[P3] That'd harm the environment though, right?
[P9] But it could use it!
[P3] Yeah, and utility panels and solar power on the house.
[P9] Yeah, self-sufficient!" (Austria FG3)

The next four ideas are all machines that would transform waste into something else and each received two priority stickers. The ideas were barely elaborated on in the focus groups. The first one is actually a more general version of the previous idea. It suggests a device to transform waste products into energy. This idea was not elaborated on in more detail but it is clear that the participants valued the idea of using waste in an efficient way as an energy source.
The second technology should transform PET (polyethylene terephthalate) bottles back into crude oil, a solution for the depletion of oil resources.
The next is a machine that would produce food from waste, either at home to eat directly or at the supermarket to buy and prepare at home.
Another idea is a machine that would not only produce food from waste, but also dispose of food. This last

machine was called an 'atomiser' by the participant who proposed it and it could also be used to produce and dispose of other items besides food, influencing the atoms of any item.

The final four ideas all received one priority sticker each. The first is furniture made of waste. The idea was well received by at least one other participant but not explained any further.

"[P2] [...] furniture from waste, that's also a possibility.
[P1] And that would be great, of course." (Austria FG1)

The next is to take waste to outer space or to Mars. However, one participant worried about losing valuable resources and another also realised that this is not a definitive solution.

"[P3] No, personally a clear future vision for me would be, maybe we can achieve space transportation and shoot all that crap to Mars. [But] what will bring the energy back?
[P10] At least the crap is out of sight, but it's not gone." (Austria FG3)

The next idea involves a 3D printer using recyclable, biodegradable material as input, according to the participants who forwarded this idea. These participants considered various applications for such a machine.

"[M] Just give me a bit more time, the 3D printer... I'm noting that down. What does it do exactly?
[P2] With the 3D printer, I can print out whatever three-dimensional objects I want. And then in the future I could do that with material that's recyclable, for example in developing countries they print out three-dimensional houses... Pilot projects... As far as organ transplants and so on, well..." (Austria FG2)

The last idea in this category is that of a robotic waste sorter. It should be located in the garbage room, for one or several households to use. This idea was not explained further.

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	Develop appliances with fewer components and these should be easy to take apart and/or uninstall for disposal or reconstruction/reconstitution and possibly decompose by themselves when discarded	Improve recycling/ Less use of resources	Producers	☆☆☆☆☆ ☆☆☆☆☆
	A car made from and fuelled by waste	Effective use of waste	Consumers	☆☆☆☆☆ ☆☆☆☆
	Private waste incineration for every house or apartment building, using the energy for heating	Effective use of waste/ Convenience in the home	Consumers	☆☆☆
	A device to transform waste products into energy	Effective use of waste	Consumers/ Producers	☆☆
	Develop technology to recycle raw material PET bottles into crude oil	Effective use of waste	Producers	☆☆
	A machine that produces food from waste, either at home or in the supermarket	Effective use of waste	Consumers	☆☆
	An 'atomiser' to both produce and dispose of food (complete meals) and possibly other items	Convenience in the home	Consumers	☆☆
	Furniture made of waste	Effective use of waste	Consumers/ Producers	☆
	Space shuttle taking trash to outer space or to Mars	Eliminate waste	Waste management companies	☆
	3D printer at home that uses recyclable material	Improve recycling	Consumers	☆
	Robotic waste sorter at home	Convenience in the home/ Improve recycling	Consumers	☆

MATERIALS

The category 'material' groups ideas that are concerned with research and development focused on materials. In this category, nine ideas were mentioned and five of them were ranked as priority (see table 4.3.2). These ideas concern both producers and consumers because they require changes in the production system and some change in behaviour from consumers once these new materials are introduced. These ideas are focused on environmental concerns, substituting plastic for materials that are thought to cause less harm to the environment.

The idea that received the highest priority is to use natural materials, like hemp and bamboo, instead of synthetic ones. One participant preferred this because:

"[It] replaces resources that need to be produced with ones that are already available." (Austria FG2, P3)

Another liked the fact that these materials are naturally biodegradable. Yet another noted that nature has more of such materials and there is money to be made from them. Animals can possibly also help to produce materials, according to the participants, like spiders and silkworms. Another participant mentioned that natural materials are better than the best synthetic materials, in terms of basic technical and physical requirements.

"[P9] Use hemp instead of plastics. You wouldn't believe what that stuff can do. It can be stronger and more flexible than wood. Hemp is actually called the million-dollar plant. It has a lot of functional properties that you could use instead of plastics.
[P 1] What about bamboo? That's, it's a similar situation, isn't it?
[P9] I would've thought bamboo would be too inflexible. Hemp is more flexible.
[P 1] I've got lots of bamboo things at home, from clothes, to wooden boards, to furniture, I've got them made out of bamboo at home." (Austria FG2)

The second idea in this category, edible packaging material, received almost as many priority stickers as the first one. It was mentioned in two of the three focus groups. In one group, the participants provided examples of edible packaging materials related to direct consumption but they considered that this concept could be further developed for broader use. In the other group, participants mentioned that if one did not want to eat the packaging, at least it should be compostable. One participant suggested edible packaging would be very practical because not everything would have to be unpacked. However, in that case, one would need to wash the packaging first. This seemed rather silly to other participants and led to a discussion about the concept of packaging.

"[P4] ...and apples are also not packed. You must certainly also wash them.
[P9] Yes, rather but for those you don't need edible packaging right?
[P4] Well rather not and just remains so, but in my opinion [the idea is] meant for the things which are packed or belong packed.
[P9] What do I pack?
[P5] For example, [...] a hamburger. The bread which you eat is the packaging for the meat.
[P6] Yes, so you don't actually need the packaging.
[P5] Well, or you buy only the meat, or you buy it with packaging, they're packaged.
[P4] Exactly. Then you buy packaging
[P9] Rather the bread is not packaging.
[P5] It is! It's certainly. Just basically that it's [not] called packaging perhaps, right?" (Austria FG 1)

The third idea also received several priority stickers and focuses on improving existing technology of packaging material. In two focus groups, the use of starch, either potato or maize, as packaging material was proposed. The benefit of using this kind of material is that it decomposes after a while, as one participant explained. Another participant mentioned that there are even bottles made out of potato starch. These cannot hold 'bubbles' however, and this is a drawback for widespread use as a substitute for plastic.

"Because we can't retain bubbles. And one has to research that these bottles can hold bubbles. Then in Austria we could, in one of the few countries which has bubbles in the water at all, ah, also drink mineral water." (Austria FG 1, P9)

The last two ideas got one priority sticker each. The first is a broadly defined idea which was not described in detail, namely the development of compostable plastics. It might be inspired by the previous idea of using starch, but this is not completely clear from the data. The second idea is the use of banana skins for underwear and other material (probably meaning textiles).

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

Category	Idea	Aim	Target Group	Priority
Material	Natural materials (e.g. hemp, bamboo) instead of synthetic materials	Less plastic	Producers	☆☆☆☆☆ ☆☆☆☆
	Edible packaging	Less waste production	Consumers/ Producers	☆☆☆☆☆ ☆☆
	Develop potato starch bottles which can hold bubbles	Less plastic	Producers	☆☆☆☆
	Compostable plastic	Effective use of waste	Producers	☆
	Underwear and material made of bananas	Effective use of waste	Producers	☆

BIO(TECHNO)LOGY

The category of 'bio(techno)logical' groups ideas that would require some research or development in the fields of biology or biotechnology. In this category, only one idea was mentioned and it was also assigned priority (see table 4.3.3). The idea was put forward in two out of three focus groups and was called the 'turbo pill' in one of them. This was explained as a pill that allows the individual to go without proper meals and possibly even drinks. This idea raised some discussion as some participants mentioned that meals are also taken for enjoyment of flavours and social interaction. The other participants recognised this but mentioned that the pill does not necessarily have to provide a substitute for all meals but offers an alternative source of nutrition. Participants also pointed out that items like the turbo pill are already being researched for use in hospitals and spacecrafts, for example. However, research is needed to adapt a pill like this for use in daily life. Smell and taste are especially important to the participants.

"Maybe it also tastes nice of vanilla, chocolate then you can have what you want." (Austria FG 1, P8)

"The pills should smell like real food!" (Austria FG3, P5)

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	A turbo pill, artificial food that smells and tastes good	Less packaging/ Behaviour change	Consumers/ Producers	☆☆

4.3.2 Policy, management and communication

POLICY

The category of 'policy' deals mainly with ideas that involve providing (financial) incentives and disincentives or installing mandatory procedures for certain practices. In this category, fourteen ideas were proposed, of which four were assigned priority (see table 4.3.4). The idea that was ranked as highest priority is that of increasing the durability of products by regulation. For example, a minimum 10-year warranty was suggested. The participants also all agreed on abolishing 'breaking points' in the design because products would last

much longer if they did not become worthless after a certain element breaks down.

"I bought a mixer shortly after the Wall fell [reunification of East and West Germany in 1990] and it still hasn't broken! I've been waiting to buy some nice new kitchen appliances, to buy a food processor. That thing never breaks! But a new hand mixer would break after using it twice! Right? [...] I watched a documentary on ARD [German public broadcasting service] where they put cheaply-built plastic cog wheels inside the devices, after a while it breaks and is too expensive to repair. It's then good for nothing and you have to buy a new one. That's the breaking point!" (Austria FG3, P9)

The idea that was ranked second highest priority is very much related to the previous idea. Only products that can be repaired with spare parts should be allowed on the market. These spare parts should be easily obtainable and not overly expensive. Manufacturers should be obliged to produce according to these rules. However, one participant mentioned that this would be difficult to change because the current economic system depends on appliances not lasting very long and not being repaired:

"Yes, and the next thing is like, how can I avoid reduce waste now in the present? I can kind of oblige manufacturers to not make things that can't be repaired, so potential for repairs. Then... I like repairing TVs, so... And for lots of different appliances there aren't any spare parts anymore." (Austria FG2, P2)

The last two ideas received two stickers each. The first idea is to introduce certificates for manufacturers that conserve resources in one way or the other, which would be good for their image. These certificates also present certain problems, according to one participant, but another had strong faith in the legislative and executive powers of the EU.

"[P3] [Manufacturers could] portray themselves as saving resources.
[P1] That exists already anyway, but just not enough.
[P10] But then there are problems again, like, the certificates can't be compared.
[P3] Well if it's regulated by the EU, then it'll work." (Austria FG2)

The last idea in this category is that of a bonus system of financial incentives. This idea was proposed in several variations, but mostly involves some sort of refund when disposing of a certain waste item properly. It was not elaborated upon in detail as most participants seemed to be familiar with it.

"[M] What kind of incentive would it be? Like a bonus system?
[P10] I would like a reward system. For example, I'd give a 10-year-old child the responsibility of waste management at home, and he/she could earn three euros a week or so. Eventually you create a real incentive that the child would report back to its parents what is or isn't right..." (Austria FG3)

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

Category	Idea	Aim	Target Group	Priority
Policy	Increase durability - minimum ten-year warranty expiry date printed on products, no predetermined breaking points	Less waste production/ Less use of resources	Producers	☆☆☆☆☆ ☆
	Allow only products that can be repaired - appliances with spare parts	Less use of resources/ Less waste production	Producers	☆☆☆☆☆
	Certificates for manufacturers about saving resources (playing on image)	Awareness	Producers/ Consumers	☆☆
	Bonus system, financial incentives, refunds	Improve recycling	Consumers	☆☆

MANAGEMENT AND LOGISTICS

The category of 'management and logistics' deals with ideas focused on networks, transport, process management and so forth. In this category, seven ideas were mentioned and three were assigned priority (see

table 4.3.5). The first idea is that of bulk sales in supermarkets so that people can bring their own packaging, be it a container, a bag or otherwise, and buy directly from a large stock. This would save on packaging material, but some participants also foresaw problems. At home, the containers would need to be emptied and washed, and this would require some effort and measuring the amounts would also need to be monitored. Other participants had solutions for these challenges: the containers could be taken by others as well, who might earn something for their services; and measurement could be done by smart technology.

"[P 10] I imagine it's like this in the supermarket: you have a huge 200 litre milk container or whatever, something like that, and when you want, you could go and fill up three litres to take home with you.
[P5] Who's going to measure that?
[P 10] Well, vending machines!" (Austria FG3)

The next two ideas received one priority sticker each. The first is the consumption of seasonal products without packaging, or purchased in glass bottles, for example, that are returned after use.

"[M] Seasonal products, well, without packaging like you say
[P6] Yes, and also fetch more in that I say. I buy from neighbours, buy apple juice in glass bottles and bring the glass bottles back again." (Austria FG 1)

The last idea in this category was not further described but did receive a priority sticker. It was written down on the flip chart as "waste bins at supermarket" but details are unclear.

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

Category	Idea	Aim	Target Group	Priority
Management/ Logistics	Selling from bulk (e.g. milk) at supermarkets and bringing your own container/packaging	Less packaging/ Less plastic	Producers/ Consumers	☆☆
	Consumption of seasonal products without packaging, apple juice in glass bottles	Less plastic/ Less packaging	Consumers/ Producers	☆
	Waste bins at supermarkets	Undefined	Undefined	☆

COMMUNICATION AND EDUCATION

The category of 'communication and education' deals with ideas that relate to informing the public, educating people and raising awareness. In this category, two ideas were put forward and both received priority stickers (see table 4.3.6).

The first is a cluster of ideas around the theme of education of the public, focusing on both children and parents through different channels. The participants agreed that members of the public should be taught about waste management and environmental matters from an early age.

"[P4] Waste prevention starts as early as kindergarten.
[P5] They started coming up to me years ago saying 'no, that belongs here and that belongs there!', my grandchildren." (Austria FG3)

The second idea is that of a cookery book for food waste. This would possibly reduce the amount of food that is thrown away. It is suggested that it could also contain 'tricks', such as how to remove mould from bread if researchers could find out how this can be done.

"[...] so rather now, I found the idea really nice, so much cooking waste or food waste gets thrown away. Much better to use it because, before, many people did that on a large scale. So then, maybe, bring out cookery books which I say one can for example re-cook this whole food waste like bread, the old bread." (Austria FG 1, P 1)

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	Widespread education (schools, parents, TV-commercials, etc.)	Behaviour change/ Awareness	Consumers	☆☆☆☆☆
	Cookery book for food waste, e.g. how to remove mould from bread	Effective use of waste	Consumers	☆

LOCAL INITIATIVES

The category of 'local initiatives' groups ideas that focus on possibilities for a certain community, neighbourhood or region, and most often involve some sharing of knowledge, resources or produce. In this category, four ideas were proposed and three were prioritised (see table 4.3.7).

The first idea is to organise regional supply and delivery chains. This assumes that food would be increasingly produced regionally.

"[P5] Hey, we're just catching on to a dismal idea. [This would probably also foster] more awareness, to consume via seasonal products almost. Thereby we'd abolish packaging as well and cocktail tomatoes from Spain etc.
[P4] That means only buying domestic products." (Austria FG 1)

The last two ideas received one priority sticker each. The first is slightly related to the previous idea and suggests vegetable cultivation in cities. Several options are proposed, for example the use of roofs for gardening, vertical gardens or a vegetable garden instead of a swimming pool. The idea of self-sufficiency appealed to most participants and some would extend the idea with a natural pond and other ecological elements, creating a complete biotope.

"Well, what I'd like is just for cities to be a lot greener. Well, there's already a lot of talk about this urban gardening and growing vegetables in the city too, making spaces available for it. And also permaculture, the idea that you can grow things vertically, things that are edible, and the idea that you also produce some of your food yourself, so to say." (Austria FG2, P5)

The last idea is related to communication and education, but has a clear local character as well. The participants are enthusiastic about initiatives like Freecycle, a website where you can post items that others can collect for free. They would welcome initiatives like this in their own neighbourhood and think this would boost local recycling and reuse.

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

Category	Idea	Aim	Target Group	Priority
Local initiatives	Regional supply and delivery channels	Less packaging	Consumers/ Producers	☆☆
	Vegetable cultivation in cities, e.g. use roofs, wall plants/climbing plants, vegetable gardens instead of swimming pools	Local production/ Less packaging	Consumers	☆
	Promote second hand shops and initiatives like Freecycle (www.freecycle.org)	Less use of resources	Consumers	☆

5. Conclusion, discussion and evaluation

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

Austria ranks 1st on the EU27 ranking list for Municipal Solid Waste recycling (MSW) and can boast a recycling rate of approximately 63%, the highest level in Europe. Furthermore, the amount of organic waste generated has increased from 33% in 2010 to 39% in 2013, once again the highest rate in Europe. These figures are reflected in a Eurostat news release where it is reported that despite Austria having a higher average of generated municipal waste than the rest of Europe, they also have a higher rate of treated waste per person than the rest of Europe.

Results from the focus groups indicate that nearly all participants separate their waste and take active steps in managing their waste in terms of taking waste to collection points. Moreover, it was reported by participants living in rural areas that they have well established 'garbage islands' and these places have well developed separation systems with some having as many as 15 different bins. Another participant reported having up to eight bins in his/her apartment block. These accounts are also reflected in the Flash Eurobarometer survey which established that 97% of Austrians separate their waste for either composting or recycling purposes. Results of the Flash Eurobarometer also confirm the impression from the focus groups that the majority of Austrians are satisfied with current waste initiatives. Citizens in Austria are more satisfied with waste services than elsewhere in Europe. There was, however, a general perception amongst participants that financial incentives should be used to limit the amount of waste generated at household level and this too was confirmed in the Flash Eurobarometer results. On the whole, results of the Austrian focus groups were very much in line with the rest of Europe.

Discussion in the focus groups demonstrated enthusiasm for recycled products and especially the idea that 'freecycling' [free exchange of unwanted items among citizens] should be promoted. This, again, was consistent with findings of the Flash Eurobarometer in which it was evident that Austria has a higher level of willingness than the rest of Europe to purchase and donate used goods.

Another interesting point of attention in the focus groups related to perceptions about waste management by what were referred to as 'foreigners'. There appeared to be some level of frustration and perceptions that this group needed to be targeted more effectively. Although this was phrased somewhat negatively, a number of participants considered that some 'foreigners' are highly efficient at clearing some waste streams, particularly used clothing. Paradoxically, and in spite of the negative reference to 'foreigners', there were a number of suggestions that indicate that Europe can learn from countries with fewer resources.

Focus groups identified barriers to waste disposal for the elderly and disabled. This concern was voiced in all three focus groups where it was stated that many waste facilities are either inaccessible or not user friendly for people with physical limitations.

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 five ideas that received highest priority were: appliances with fewer components that are easy to take apart for disposal, reconstruction or reconstitution; a car made from and fuelled by waste; the use of natural materials instead of synthetic ones for products and packaging; edible packaging; and increasing the durability of products by removing predetermined breaking points.

In the domain of 'environmental sciences and technology', ideas focus mainly on technology (machines and processes) to make waste management more convenient, to improve recycling and to put waste to good use. Most suggestions are concerned with a more effective way of dealing with waste and gaining extra benefits

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

from it. Producers and consumers were the main target groups, with some ideas for waste management companies. In this domain, many ideas relate directly to waste management. The proposed technologies help to sort, process, disintegrate, decompose or reconstitute waste with an emphasis on increasing recycling and reuse and generating energy. Other ideas, related to the original product before it becomes waste, aim to reduce waste by making it possible to recycle or biodegrade materials or by introducing new products that reduce waste.

Ideas in the domain of 'policy, management and communication' were mainly concerned with regulations, incentives and communication to reduce packaging waste, to reduce the use of natural resources and to foster awareness and behavioural change. These ideas are motivated by the desire to reduce the environmental impact and increase the practice of recycling. Consumers and producers are the only target groups involved. In this domain, the ideas focus most on product requirements and systems changes. The latter refers primarily to production and distribution systems, related to prevention of waste, and less to waste management. In addition, ideas in the category of communication and education focus on educating the consumer to become a waste-conscious citizen who recognises that waste management is an important aspect of society and acts accordingly.

When looking at the three highest prioritised ideas, the first priority is to develop appliances with fewer components and these should be easy to take apart and/or uninstall for disposal or reconstruction/ reconstitution and possibly decompose by themselves when discarded (ten stickers). The second priority is shared between two ideas that received the same number of priority stickers: a car made from and fuelled by waste; natural materials (e.g. hemp, bamboo) instead of synthetic materials (nine stickers).

5.3 Reflection

The participants emphasised the positive experience they had within the focus groups. They put this down to the "laid back mood", thanks to the use of informal and friendly language. They also made positive comments about the size of the group; the exercises; and the structured and well-prepared process with input and direction from the moderator. Many participants mentioned that they were favourably surprised that everyone was so positive about the idea of separating waste. All in all, they thought it had been a "refreshing exchange of ideas" and one participant would have liked more time to discuss the fundamental reasons for separating waste as well. Three participants explicitly voiced their appreciation for being sent the summary report and wished the project well. One participant provided some useful feedback on the report.

Annex

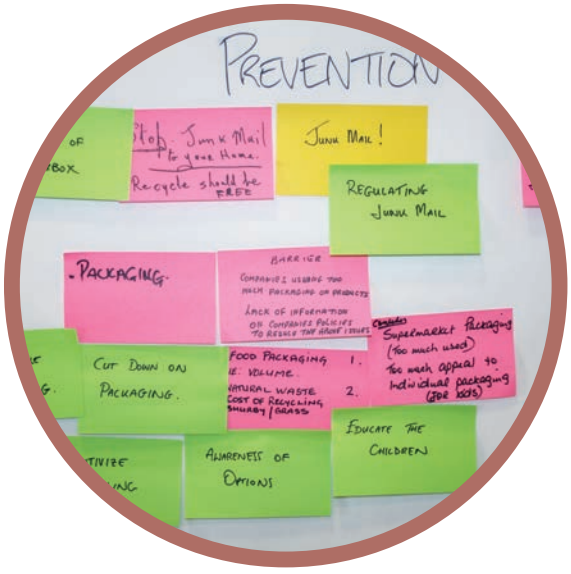
Annex 1: Full list of ideas for research and innovation, policy, management and communication

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	Develop appliances with fewer components and these should be easy to take apart and/or uninstall for disposal or reconstruction/ reconstitution and possibly decompose by themselves when discarded	Improve recycling/ Less use of resources	Producers	☆☆☆☆☆ ☆☆☆☆☆
	A car made from and fuelled by waste	Effective use of waste	Consumers	☆☆☆☆☆ ☆☆☆☆
	Private waste incineration for every house or apartment building, using the energy for heating	Effective use of waste/ Convenience in the home	Consumers	☆☆☆
	A device to transform waste products into energy	Effective use of waste	Consumers/ Producers	☆☆
	Develop technology to recycle raw material PET bottles into crude oil	Effective use of waste	Producers	☆☆
	A machine that produces food from waste, either at home or in the supermarket	Effective use of waste	Consumers	☆☆
	An 'atomiser' to both produce and dispose of food (complete meals) and possibly other items	Convenience in the home	Consumers	☆☆
	Furniture made of waste	Effective use of waste	Consumers/ Producers	☆
	Space shuttle taking trash to outer space or to Mars	Eliminate waste	Waste management companies	☆
	3D printer at home that uses recyclable material	Improve recycling	Consumers	☆
	Robotic waste sorter at home	Convenience in the home/ Improve recycling	Consumers	☆
	Heating with waste without CO2	Effective use of waste	Consumers/ Producers	
	Develop technology to break down materials via chemical processes into their basic components which can be completely reused again	Improve recycling	Waste management companies/ Producers	
	Producing cars from (old) cars	Effective use of waste/ Less use of resources	Producers	
	Develop technology to keep organic waste at home so that it does not smell or is unhealthy	Convenience in the home	Consumers	

	Waste-swallower with scales at home or in an apartment building that charges you according to the amount of waste you dispose of	Convenience in the home/ Behaviour change	Consumers	
	Waste shredders (like they have in the States in sinks) for different types of waste, paper, metal, organic	Improve recycling	Consumers	
	One shredder for everything with integrated technology to separate the various types out all the small parts	Improve recycling	Consumers/ Waste management companies	
	Quick - 2 minute - composting device	Convenience in the home/ Effective use of waste	Consumers	
Material	Natural materials (e.g. hemp, bamboo) instead of synthetic materials	Less plastic	Producers	☆☆☆☆☆ ☆☆☆☆
	Edible packaging	Less waste production	Consumers/ Producers	☆☆☆☆☆ ☆☆
	Develop potato starch bottles which can hold bubbles	Less plastic	Producers	☆☆☆☆
	Compostable plastic	Effective use of waste	Producers	☆
	Underwear and material made of bananas	Effective use of waste	Producers	☆
	Car tyres made from banana skins	Effective use of waste	Producers	
	Animal food in edible packaging	Less packaging/ Convenience in the home	Consumers	
	Fuel made of waste oils or other recycled materials	Effective use of waste	Producers	
	Recyclable diapers (nappies) for both babies and elderly people	Improve recycling	Producers/ Consumers	
Bio(techno)-logical	A turbo pill, artificial food that smells and tastes good	Less packaging/ Behaviour change	Consumers/ Producers	☆☆



POLICY, MANAGEMENT AND COMMUNICATION

Category	Idea	Aim	Target Group	Priority
Policy	Increase durability - minimum ten-year guaranty expiry date printed on products, no predetermined breaking points	Less waste production/ Less use of resources	Producers	☆☆☆☆☆
	Allow only products that can be repaired - appliances with spare parts	Less use of resources/ Less waste production	Producers	☆☆☆☆☆
	Certificates for manufacturers about saving resources (playing on image)	Awareness	Producers/ Consumers	☆☆
	Bonus system, financial incentives, refunds	Improve recycling	Consumers	☆☆
	Resource Based Economy: work in exchange for products, money no longer exists. [Education: information and sustainability (the approach of Jacque Fresco www.thevenusproject.com/en/the-venus-project/resource-based-economy)]	Less waste production	Consumers/ Producers	
	Qualitatively high value shopping, enforced by law (e.g.: go shopping twice a year)	Less waste production/ Less use of resources	Consumers/ Producers	
	Legal restriction on paper advertisements	Less waste production	Consumers/ Producers	
	Make harmful raw materials more expensive	Less use of resources	Producers	
	Guarantee for goods must no longer be related to returning it with the packaging material	Less packaging	Consumers/ Producers	
	Ban packaging of mixed materials that cannot be taken apart easily for recycling	Improve recycling	Producers	
	Profit-based collection systems, possibly related to social projects	Improve recycling	Consumers/ Other	
	Uniform packaging: standardised size and biodegradable	Improve recycling	Producers	
	Mandatory design of future buildings so that everyone has the same integrated waste separation system	Convenience in the home/ Improve recycling	Consumers/ Waste management companies	
	Change the financial system and the impulse to buy more and more	Less use of resources/ Less waste production	Producers/ Consumers	
Management/ Logistics	Selling from bulk (e.g. milk) at supermarkets and bringing your own container/packaging	Less packaging/ Less plastic	Producers/ Consumers	☆☆
	Consumption of seasonal products without packaging, apple juice in glass bottles	Less plastic/ Less packaging	Consumers/ Producers	☆
	Waste bins at supermarkets	Undefined	Undefined	☆
	Products should be made in such a way that cheap repairs are possible	Less waste production	Consumers/ Producers	

	Individual standardised packaging to bring and use at supermarkets	Less packaging	Consumers	
	Create jobs by increasing the recovery of raw materials, e.g. "second-hand tailors"	Effective use of waste	Producers	
	Reuse/recycling by manufacturers	Improve recycling	Producers	
Communication and education	Widespread education (schools, parents, TV-commercials...)	Behaviour change/ Awareness	Consumers	☆☆☆☆☆
	Cookery book for food waste, e.g. how to remove mould from bread	Effective use of waste	Consumers	☆
Local initiatives	Regional supply and delivery channels	Less packaging	Consumers/ Producers	☆☆
	Vegetable cultivation in cities, e.g. use roofs, wall plants/climbing plants, vegetable gardens instead of swimming pools	Local production/ Less packaging	Consumers	☆
	Promote second hand shops and initiatives like Freecycle (www.freecycle.org)	Less use of resources	Consumers	☆
	Lifestyle change, back to basic (e.g. self-sufficiency) via rediscovery and revival of old wisdom, leveraged by advertisement and social movements	Less waste production/ Local production	Consumers	

Annex 2: Attitudes of citizens from Austria 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 Austria.

Question	Answer	%	EU27 Average
Do you think Europe could be more efficient in its use of natural resources?	Yes	87%	87%
	No	7%	5%
	DK/NA*	6%	8%
Do you think that your household is producing too much waste or not?	Yes	51%	41%
	No	48%	58%
	DK/NA*	1%	1%
Do you separate at least some of your waste for recycling or composting?	Yes	97%	89%
	No	3%	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	58%	76%
	Improve separate waste collection at your home	37%	67%
	More information on how and where to separate waste	50%	65%
	Legal obligation to separate waste	47%	59%
	Taxes for waste management	27%	39%
What initiatives would improve waste management in your community?	Better waste collection services	31%	70%
	Stronger law enforcement on waste management	51%	65%
	Make producers pay for collection and recycling of waste	61%	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	14%	14%
	To pay proportionally to the quantity of waste you generate	77%	75%
	DK/NA*	9%	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	28%	25%
	Include the cost of waste management in the price of the products you buy	57%	59%
	DK/NA*	15%	16%
Can you estimate what percentage of the food you buy goes to waste?	None	9%	11%
	15% or less	74%	71%
	16% to 30%	12%	13%
	More than 30%	4%	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	44%	62%
	Better information on food product labels, e.g. how to interpret "best before" dates, information on storage and preparation	42%	61%
	Better shopping planning by my household	48%	58%
	Smaller portion sizes available in shops	49%	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	54%	39%
	Rather important	32%	41%
	Rather not important	10%	12%
	Not at all important	3%	6%
	DK/NA*	1%	2%
Are you willing to buy second-hand products?	Yes	72%	68%
Base: all respondents, % of yes			
Would you buy the following products second hand?	Furniture	55%	56%
Base: all respondents, % of yes	Electronic equipment	50%	45%
	Textiles (clothing, bedding, curtains, etc)	35%	36%
What reasons prevent you from buying second-hand products?	Quality/usability of the product	60%	58%
	Health and safety concerns	50%	50%
	Less appealing look of the product	28%	25%
	Afraid of what others might think	3%	5%
Would you buy products made of recycled materials?	Yes	91%	86%
	No	7%	11%
	DK/NA*	2%	3%
What would be the most important factors in your decision to buy products made of recycled materials?	Quality/usability of the product	54%	51%
	Environmental impact of the product	31%	26%
	Price of the product	14%	18%
	Brand/brand name of the product	1%	2%
	DK/NA*	0%	3%
What prevents you from buying recycled products or products containing recycled materials?	Health and safety concerns	66%	44%
	Quality/usability of the product	39%	42%
	No clear consumer information on the recycled product	61%	32%
	Less appealing look of the product	10%	17%
	Afraid of what others might think	18%	5%

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

NOTES

NOTES

SCIENCECENTER-NETZWERK
AUSTRIA

Landstraßer Hauptstraße 71
1030 Wien, Österreich
science-center-net.at

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

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

VOICES for innovation

ecsite
EUROPEAN NETWORK
SCIENCE CENTRES & MUSEUMS

European Commission

Printed on FSC mix paper from responsible sources