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Views, Opinions and Ideas of Citizens in Europe on Science

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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 Malta, 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

MALTA

3. Country relevant data - Malta

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

Malta is one of the smallest EU countries with more than 400,000 inhabitants. All participants reside in predominantly urban areas.

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

		2011	
Population at 1 January		415 832	
Population as percentage of EU27		0.1%	
Gross Domestic Product (PPP)		21500 Euro	
Population urban-rural typology	Urban	418 000	100%
	Intermediate		
	Rural		

3.2 Factsheet on waste

The amount of municipal waste generated and treated in Malta is above the average amount of waste treated in the EU27. Malta ranks 22nd in the EU27 ranking list on Municipal Solid Waste Recycling (MSW). With total MSW recycling as low as 13% of the generated amount in 2010 and a very unstable recycling performance the previous years, Malta would need to make an exceptional effort in order to fulfil the EU recycling MSW target of 50% by 2020.[9]

Table 3.2 Municipal Waste[10,11]

		Malta		EU27 average	
Municipal waste generated (kg per person)		591 kg		502 kg	
Municipal waste treated (kg per person)		562 kg		486 kg	
	Landfilled	489 kg	87%	185 kg	38%
	Incinerated	0 kg	0%	107 kg	22%
	Recycled (material recycling)	39 kg	7%	122 kg	25%
	Composted (organic recycling)	34 kg	6%	73 kg	15%

3.3 Composition of the focus groups

The three focus groups (FGs) in Malta were held at the Allied Consultants social research agency, in the weekend of the 23rd March 2013. The FGs were moderated by Christine Caruana, Training Programmes Manager of the company.

In total 30 individuals (15 male and 15 female) participated in the three FGs. With regard to the age of the participants: 10 participants were aged between 18 and 35, 10 were between 36 and 50 and 10 were aged 51 or over. Most participants (n=14) had a medium level of education, while 9 participants had a high education level and 6 others had a low level. Of all participants, 14 were employed, 15 were unemployed and 6 were retired. The large majority of the participants live in a house (n=21), while 8 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	5	4	6	15
	Female	5	6	4	15
Age	18 - 35	0	0	10	10
	36 - 50	0	10	0	10
	50+	10	0	0	10
Education*	High	1	4	4	9
	Medium	2	6	6	14
	Low	6	0	0	6
Employment*	Unemployed	2	1	2	5
	Employed	1	8	5	14
	Retired	6	0	0	6
	Student	0	0	2	2
Housing*	Flat	3	3	2	8
	House	6	7	8	21

*Missing data for one participant

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

4.1 How is waste managed at household level?

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

4.1.1 Waste separation

The majority of participants were aware of separation used in waste disposal as was evident in references to various categories of waste, as well as reference to black and grey bags. Black bags are usually used for organic waste and the grey bags for recyclable waste. The most frequently described waste streams (a waste stream is defined as "one type of waste that is collected separately covering the majority of household waste") included: paper and plastic, glass, cans and organic. Some participants reported that local councils provided them with labelled boxes for glass.

In addition to references to waste in terms of 'type' it was sometimes referred to in terms of 'size'. Bulky waste included household appliances such as washing machines, fridges, electrical equipment and furniture.

Less frequent waste streams, but nevertheless mentioned by a few participants, were clothes and toys, batteries and medicines. A distinction was made between clothes that were considered recyclable and those that were no longer fit to be worn.

There was only one group where it was stated that participants did not separate waste. This was a predominantly younger group, and most lived with their parents and left the separation of waste up to them.

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

4.1.2 Waste collection

Organisation and management of waste differs in various households, however, most participants were aware of existing municipal collection schedules. Bring-in sites were mentioned a lot and others said they brought their waste to a landfill. Description of the ways waste is organised and managed included references to bags of various colours, boxes and unused baskets. Most mentioned days and times of the week for regular waste collection. Additionally, one participant reported that a specific local council sends a van once a year for the collection of unused clothing.

Non-residual bulky waste, including white goods such as fridges, TVs or cookers, as well as furniture and building debris, was reportedly taken to a designated site for either recycling or donated to a charitable organisation. Additionally, it was mentioned that local councils could be phoned to collect waste. At least three participants talked about the fact that they do not like throwing things away and will often dismantle certain goods for 'parts' that can be reused. It was also stated that furniture is recycled from one house to another.

The most frequent categories of residual waste taken somewhere for recycling or reuse purposes, respectively were, paper, glass, plastic, clothes and batteries. Batteries were most often reported to be taken to a shop, given to a school for fundraising purposes and one participant mentioned giving old batteries to a photographer that lived close by. It was explicitly mentioned that the box in which they can throw glass is placed on their doorstep and collected every Monday.

Not only do organisation and management of waste differ from house to house, but discrepancies among different municipalities and areas were also reported.

4.1.3 Knowledge about waste pathways

The majority of participants were unaware of what happens with waste managed by the local council, with the exception of one who believed waste such as glass and plastic is crushed and sold abroad. The same participant believed local councils sell old clothes to mechanics to use as swabs to clean oil. In contrast to this, participants in all three focus groups shared information about the way waste was managed when the local council was not involved. The following pathways of waste disposal were mentioned specifically: at least seven participants said they gave old clothes to garages or used old clothes themselves as rags, others talked about what happens to old paper, including newspapers, stating that it is shredded and used as bedding for animals. Another participant has a greengrocer asking for old papers to place under fruit crates. Others made reference to organic rubbish with many describing how they either use it for their own composting purposes or use it as pet food.

Clothes and shoes, as well as toys and books, are frequently collected and given to various charitable organisations. It was clear among participants that there was a strong sense of willingness to recycle as much waste as possible. Explicit mention was made of clothing and toys being given to an organisation assisting battered women, and another stated that clothes are given to black immigrants. A number of participants said they gave old clothes and toys to family and friends. Two participants reported that old medicines went down the drain. Another category was old magazines, and it was reported that these are given to a charity that give them to sick people.

4.1.4 Waste management behaviour and convenience

Whether participants separate and recycle waste correctly differs in various areas of Malta. In some areas, there is a well-established system whereby the local councils just need to be phoned and they will promptly

come and collect waste, especially bulky waste, such as old furniture and white goods. In one focus group, most participants described how they separate waste in accordance with the facilities provided by the councils, either in terms of coloured bags or separate bins. Some participants, however, admitted that even if they do have the facilities, they do not recycle or that they know people who do not recycle. In these cases waste generally goes into the grey plastic bag, even though this is not correct.

A number of participants described feelings of discouragement or frustration when discovering other people do not make the effort to manage their waste correctly that as a result renders their own efforts of compliance useless. Local councils neither emptying bins nor cleaning them frequently enough was also discouraging.

The focus group with the youngest participants was notable for the least effort made to comply with existing council plans and schemes and interestingly they attributed this to the behaviour of their parents, stating that it was not their 'culture'. They asserted, however, that if they lived on their own, there was no doubt they would behave differently.

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

Discussions around preventing waste brought into homes centred on a couple of issues, namely, the lack of opportunity to purchase biodegradable packaging as well as the compulsion to buy pre-packaged plastic bags of fruit or vegetables as opposed to being able to buy them as single items. Additionally, a number of participants mentioned that they felt shops and supermarkets were still using too many plastic carrier bags. The following quotes reflect some of these issues:

"The use of bags at the grocer because they still give out plastic bags although they don't have handles..." (Malta FG2, P7)

"This idea about us collecting too many things [...] for example I went to the supermarket and I need four potatoes, I bought them in a bag instead and then threw it away." (Malta FG 1, P8)

Another concern related to the variety of materials or non-recyclable material used for packing many products. The example cited was that when buying a jar of something, you first have the glass and then it is covered with cardboard. Some participants expressed concern that there was a lack of opportunity to buy certain products in anything other than plastic: the example cited was soda. Additionally, some participants voiced concern that manufacturers and advertisers use excessive and inappropriate packaging to enhance the presentation and attractiveness of products. In contrast, others felt the packaging was important for extending the lifespan of food products. The following quotes illustrate these concerns:

"Many people, me included, think that when something is packed neatly it looks much prettier and we end up buying them instead of buying something off the shelf which is open." (Malta FG2, P8)

"[... We] expect a [...] longer shelf life than people expected before, so food has to be treated or processed with certain chemicals or else packed in a certain way that gives it a longer shelf life, it will taste better.

I think this is modern life." (Malta FG2, P7)

Other concerns related to the lack of opportunity to use 'refillable' containers. This was a dominant topic and elicited several comments. A number of participants talked of witnessing the system in other countries where people could bring their own containers to supermarkets and fill them with a variety of products, but this was not possible in Malta.

Another issue believed to generate waste, which bothered some participants, had to do with the amount of 'junk mail' they receive, especially paper advertisements.

A final concern, with regard to prevention, relates to the short lifespan of products and was noted particularly in regard to white goods, where it is felt that products are not made to last. It was felt that this resulted in the purchase of more and more products and generated additional waste due to all the packaging of these purchases.

4.2.2 Waste management in the household

Discussions around preventing waste within the home focused on lack of space. It was apparent that some participants found waste collection times too infrequent, resulting in the stored waste taking up too much space. The lack of space, they felt, was also related to the complexity of the separation system that required the use of numerous different bags. This was raised in all three focus groups and was expressed in a variety of ways:

"[...] the problem is I live in a flat and so lack space." (Malta FG2, P2)

"The only thing that annoys me is because yes you need more space. It's like a bag for this, a bag for that." (Malta FG2, P3)

"[...] my worry is that I get mixed up which Thursday, sometimes they come, sometimes they don't. I lose my patience and throw everything out." (Malta FG2, P9)

Another interesting point was raised concerning the practice of buying food in bulk, and then dividing it into smaller portions for freezing purposes. The observation was that although people attempted to buy in bulk as a conservation measure, it backfired, resulting in occupying a lot of space in freezers as well as excessive use of small plastic freezer bags.

One participant expressed dislike of the container supplied by the local council for the collection of glass describing it as ugly and was reluctant to have it in the kitchen.

The perceived hassle involved in sorting waste into separate bags or containers was frequently mentioned by participants as a source of irritation. This related to the time involved in organising rubbish, but also the time and energy involved in having to wash waste before placing it in a recycling bag. Another participant raised concern about the Maltese practice of barbecues, and explained the concern in terms of a cultural habit of being 'spendthrifts' and buying in excess of what is needed and the hassle of separating all the leftovers including the packaging material. The person described these occasions in the following way:

"I think you know what I'm thinking, sort of, you go to a barbecue, look how many bags you have to take for glass, for plastic, for paper, for this, for that and that is [...] if you want to do everything perfectly, that is what you have to do, I imagine. I can't imagine it, so everyone puts everything in one bag." (Malta FG3, P3)

Another concern about waste in households related to the lack of knowledge about how to deal with certain waste, for example shaving blades and broken glass. Other waste that some participants were not sure how to manage in the home, was fat or cooking oil, with one saying it was usually flushed down the toilet, while another chose to throw it in with the compost. Both participants expressed concern that they were doing the

'wrong thing'. Another participant added:

"[…] the sprays, there are many sprays, there are those against insects or those for food or even for example toothpaste tubes, I don't know what to do with them." (Malta FG2, P9)

Finally, some participants made mention of the fact that they give leftover foodstuffs to pets and others mentioned using vegetable leaves and potato peel as well, for their own composting purposes. It was obvious that disposal of organic waste was more of a problem for participants without gardens, as they did not have the opportunity to use it for compost.

4.2.3 Waste disposal and pathways

Barriers and concerns about effective management of waste leaving homes were relatively diverse. Several participants reported barriers in terms of lack of facilities or lack of easy access to facilities; some sites being either too far away or on roads that were too narrow and therefore difficult to reach, as the following citation reflects:

"Now I see a difference between Malta and Gozo, the same because in Gozo the bring-in sites, I don't know where they are, they are far away…" (Malta FG 1, P3)

The unreliability or inadequate times and days of collection were also cited by a significant number of participants. Some participants indicated that they find it easier to get rid of rubbish earlier than the scheduled collection time, for example, one participant had the following to say:

"For example, today I have a lot of papers, I go in the afternoon, get the grey bag which will already […] full up and instead of taking it out I go and throw it there and that's it …" (Malta FG 1, P 1)

Another barrier related to the condition of the bins was that they were considered by some participants as being too dirty or too full. Furthermore, if they are too full and the rubbish is placed somewhere else, this has sometimes led to people being fined. The following comments confirm this:

"[…] they are sometimes so full that people end up throwing garbage on the ground around them, and I can't stand it." (Malta FG2, P 7)

"The problem of the skips for plastic, which are always full, […] you break your hands pushing down." (Malta FG 1, P 7)

"The skips need to be cleaned more often and they should also be emptied more often because you […] throw things near it and the warden gives you a ticket." (Malta FG 1, P9)

Seasonal variations and the influx of tourists were also described as concerns and these were felt to be particularly relevant for Malta. Two participants raised these concerns, and described the difficulties incurred when tourists or people visiting from outside of the council area were unaware of collection times. It was clear that in summer this was more of a problem due to the stench caused when waste is left too long in the sun. Other participants voiced concern about 'outsiders' often leaving waste in the wrong place. Participants phrased these concerns as follows:

"For the bag to be collected frequently not only four times a week. It's not possible especially now that summer is coming …" (Malta FG 1, P6)

"[…] and I am afraid certain products will smell if you keep them until a certain time and I am afraid that certain large local council things will not come […]." (Malta FG3, P2)

"So the tourists, for example, if he comes in the morning, they won't be awake, they take it out in the evening near us till it is collected in the morning." (Malta FG 1, P2)

A few participants were obviously discouraged by what they saw happening to waste, suggesting that they had seen trucks dumping all the separated waste all into one pile. Moreover, there was some discussion in regard to the unreliability of collection times and confusion was reported in regard to 'what' would be collected and 'when'. Some admitted to giving up their efforts to separate waste and put it out for collection, as they ei-

ther had the wrong waste 'type' or missed an early or later truck.

In addition, some participants expressed concerns about the dumping of waste in the countryside or in vacant lots.

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

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

4.3.1 Environmental sciences and technology

TECHNICAL, PHYSICAL, CHEMICAL, ENGINEERING

The first category related to the field of 'environmental science and technology' is that of technical, physical, chemical and engineering ideas. Two ideas within this category that generated the highest priority points involved the development of a machine, but for quite different purposes. The first idea was clearly related to management and effective use of urban waste, the other was more concerned with production of alternative sources of energy. The first idea was for a machine that would 'literally disintegrate' waste. This was challenged by another group that proposed a machine that would rather convert it into energy and this idea received the highest priority points. The challenge went as indicated in the conversation below:

"[P8] Our two main ideas from our imagination [...] that there will be machines at home that literally disintegrate waste meaning bringing it to nothing.
[M] Good and this is a machine in the house
[P8] Machine in the house ...
[P5] A bit better... A machine in the house that changes waste into something." (Malta FG3)

This suggestion was elaborated on as participants began to envision something futuristic and in some ways equivalent to a 3D printer using waste material to create items of use, the way this was imagined is evident in the comments below:

"With that same dust you produce, let's say, products, with a machine that converts plastic products for example into these raw materials for this machine to work." (Malta FG3, P8)
"First you kind of produce the raw materials for the machine to work then with 3D printing for example you can [...] Toys, cutlery." (Malta FG3, P1)

Another idea focused on increasing use of alternative forms of energy that could be combined with waste management in the home. The idea was that solar energy be harnessed to charge small electrical appliances, to run cars as well as being used to charge the aforementioned recycling machine. In relation to alternative methods for charging small electrical appliances, it was proposed that energy from 'moonlight' be tapped into. It was also suggested that electricity and pedal power be used for cars, but these ideas were not elaborated further.

Another proposal in terms of machinery was to have a machine that could untangle wool or process material and convert it to reusable material. See the comment below:

"There will be someone you know who knits ... we give him the jersey and they will have a machine into which you put the jersey and wool comes out of it ..." (Malta FG3, P4)

Another, more explicitly described idea was for a machine, similar to a food processor, that would change organic waste into pellets or tablets that could then be used as animal feed. This idea also received a priority sticker.

Table 4.3.1 Ideas within the category 'technical, physics, chemical, engineering' that received priority, ranked accordingly

Category	Idea	Aim	Target Group	Priority
Technical/ Physics/ Chemical/ Engineering	A machine in the house that changes waste into energy	Less waste production/Less use of resources	Consumers	☆☆☆☆☆☆
	Small electronic items e.g. laptops, mobiles, chargers, tablets which work with solar energy	Less use of resources	Consumers	☆☆☆
	A machine in the house in which you put differentiated recycled waste and it in turn produces a new product which you can exchange with someone else	Less waste production/Less use of resources	Consumers	☆
	A food processor which produces pellets from leftovers for animals or humans	Less waste production	Producers	☆

MATERIALS

The second category related to the field of 'environmental science and technology' is 'material' which focuses on ideas about the development or management of materials believed to either make effective use of or reduce waste (see Table 4.3.2). The common thread running through the ideas mentioned in this category primarily concerned reducing the amount of packaging material and making effective use of waste. Although the participants spoke a lot about these ideas, they generated few priority points. The only prioritised solution related to the excess of packaging material concerned the use of biodegradable bags. Other ideas elaborated on materials being biodegradable and emphasised that the alternative packaging material should be fully recyclable in particular nappies, wipes and toilet paper.

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

Category	Idea	Aim	Target Group	Priority
Material	Degradable bags and cloth bags	Less plastic	Producers	☆

BIO(TECHNO)LOGY

The third category in the field of 'environmental science and technology' is concerned with bio(techno)logical ideas (see Table 4.3.3). These ideas focus on biologically related technology. There were few ideas from all focus groups and even fewer from the group with the youngest participants. The idea to convert organic waste into biofuel came up in two of the focus groups, and there were a few ideas with regard to composting purposes, perhaps reflecting the status of these participants as home owners.

Ideas that were mentioned related to management of food waste, one that food waste is indeed kept separate and used for biogas, another more specific idea pertained to cooking oil, as described in the excerpts below:

"Regarding food there should be a system whereby foodstuffs which generate gas should be set apart as compost to produce gas." (Malta FG2, P2)

"[P7] With cooking oil they can do something with it for cars instead of throwing it off the cliffs. [P4] They collect mainly oil from chips. [M] Cooking oils are also collected separately for biofuel." (Malta FG2)

One idea for the home was that 'magic dustbins' be designed that immediately create compost out of organic waste.

"We came up with three ideas [...] one of them is a magic dustbin. You put food leftovers ... organic and from them you get compost" (Malta FG3, P4)

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	Creation of bio-fuel from cooking oil - to be used in cars	Effective use of waste/ Less use of resources	Consumers	☆☆☆☆☆
	Organic boiler especially for those who live in flats	Less waste production	Consumers	☆☆☆

4.3.2 Policy, management and communication

POLICY

Ideas related to regulations and incentives provided by governments were prevalent and among the most highly prioritised of all ideas in the three focus groups. Many of the ideas build on ideas that belong to other categories but are relevant here as they promote the idea of governments providing incentives. These are grouped in the category 'policy' (see Table 4.3.4). In general, ideas were about creating regulations that would both incentivise as well as deter producers with regard to production and management of waste. Most ideas focused on plans that could help reduce the use of raw materials, reducing packaging material as well as ensuring the material is biodegradable.

Participants brought up the idea of putting in place law enforcement on the separation of waste and production of packaging materials, as illustrated by the following discussion and quote:

"[PX] Whoever doesn't separate will have to pay a fine. [M] Fines ... OK, was there anybody else who had this idea? [P4] To it we added the times, for example you should not take it out in the evening to be collected in the morning ... if someone takes out the garbage they are fined. [M] A fine. So specifically, law enforcement." (Malta FG3)

"About law enforcement we wrote that laws are to be put in place whereby manufacturers should pro-

duce packaging that can either be recycled or reused." (Malta FG3, P6)

Several participants complained that products made out of recycled products are more expensive. Therefore the idea to reduce the price of recycled products received some priority.

"When I bought something which was recycled it cost me much more. It was with recycled paper." (Malta FG2, P2)

"We have recycled items cheaper. We took the example of paper and also recycled toilet paper and the normal white toilet paper most often in Malta the recycled is more expensive." (Malta FG3, P4)

The idea that governments support local initiatives that would encourage people to bring their own containers to supermarkets was put forward. Lastly, it was emphatically suggested that governments should place a ban on all junk mail in an effort to reduce paper waste.

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

Category	Idea	Aim	Target Group	Priority
Policy	Law enforcement to reduce the amount of packaging by manufacturers	Less packaging/Less plastic	Producers	☆☆☆☆
	Government driven incentives for the use of refillable containers	Less packaging/Less plastic	Producers	☆☆☆
	Law enforcement on the separation of waste, which includes fines for those who do not respect the collection of recycled waste	Less waste production	Consumers	☆☆
	A limit on junk mail or its complete elimination	Less use of resources	Producers	☆
	A reduction in the price of recycled products	Improve recycling	Producers	☆

MANAGEMENT AND LOGISTICS

'Management and logistics' is another category in the field of 'policy, management and communication' (see Table 4.3.5). Many of the previously mentioned ideas need managerial and/or logistical changes to facilitate implementation of the idea. Many proposals are variations of the same basic idea, namely a change in people's behaviour, either in relation to purchasing practices or in the way they organise their waste.

The idea receiving the highest priority points was that glass should be used much more and especially as opposed to plastic, with the aim of ensuring it is recycled.

Following this, a number of ideas emerged in relation to people being given the opportunity to buy items as single purchases as opposed to being compelled to buy pre-packaged bulk quantities, usually packed in plastic. These thoughts are evident in the following discussion excerpts:

"[P7] I think that you can purchase by weight and single items rather than having to buy four packaged items.

[P8] Otherwise you will have to package them yourself at home.

[P7] The idea you mentioned for example, you would like one fruit and you cannot, you have to buy four packaged fruits.
[P8] And I won't eat them.
[P7] If there will be the facility as in years gone by where you can buy by weight or single items you will reduce packaging and everything." (Malta FG2)

Perhaps not surprisingly ideas from the eldest group of participants, most of whom were over 50 years of age, had ideas that were tinged with nostalgia. Participants expressed a desire to revert back to the way purchasing practices were earlier:

"[P6] I'm not ashamed to say that I am 67 and I remember and everyone here is almost my age and we remember the time when we used to buy tomato paste by weight. It used to be in one large tin and I don't know how many families would go and buy by weight.
[P10] Even tuna fish.
[P6] Everything, lard, oil, tuna fish.
[P10] Pasta in the pillow case." (Malta FG1)

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

Category	Idea	Aim	Target Group	Priority
Management/ Logistics	We should use glass more, it should be recycled	Less plastic/Behaviour change	Consumers/Producers	☆☆
	Food products in smaller packets (for people living alone or couples)	Behaviour change	Consumers/Producers	☆☆
	Different systems of waste collection (not elaborated)	Behaviour change	Waste Management Companies	☆

COMMUNICATION AND EDUCATION

A number of ideas focused on education, information and marketing, most ideas came from the group with the youngest participants, perhaps reflecting their ready engagement with social media. These ideas have been grouped in the category 'communication and education' (see Table 4.3.6). Strategic awareness raising campaigns for the general public as well as a focus on schools were popular ideas. There seemed to be some consensus in all the groups that targeting children with the aim of engendering a new mind set would be effective for realising ambitions for waste management.

"[M] I think first we'd better put down the Educational Campaign, but specifically in schools, you are saying.
[P10] Especially they start from primary so that...
[M] Ok [...] specifically in schools.
[P3] But, I think I would tie it in with the mentality then because if you are nurturing the children [...] in the sense that the children are being nurtured in one way then they go home.
[M] And they find another method...
[P3] And there is the different culture, then it kind of would not be put into to practice [...] so I think before the schools have to change things of value to us." (Malta FG3)

There were lively discussions on what media to use for the awareness raising. It was quite apparent amongst the younger participants that they believed efforts to reach people needed to involve social media:

"[...] and use any type of means to increase National Awareness. I know nowadays with Facebook you can reach a lot of people ..." (Malta FG3, P4)

In one of the focus groups, not all participants were literate, and this idea was challenged and the value of face-to-face communication was addressed:

"But I think, respectfully, [...] not everyone can read, there are illiterate people and one to one has a bigger impact ..." (Malta FG2, P 1)

A very concrete idea in relation to communication efforts was the suggestion that lessons could be learned from communication strategies employed by cigarette companies. Integral to the suggestion is the idea that eliciting disgust could have an impact in efforts to improve waste management practices:

"There is something else we can add [...] these adverts [...] similar to what they do about cigarettes for example they show what happens to the lungs they can do something similar, such as what can happen to the world with all this waste that we produce." (Malta FG2, P8)

Finally, an idea from one group was proposed in relation to knowledge sharing and with the suggestion that there should be more collaboration between local councils to exchange and pool ideas and encourage closer cooperation.

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	An education campaign by the Government so that people will become aware of health-related risks	Behaviour change	Consumers	☆☆☆☆☆☆☆☆
	Communication among the local councils to generate ideas about waste management	Behaviour change	Government/Waste Management companies	☆

LOCAL INITIATIVES

Some ideas that were forwarded in the focus groups require more effort in terms of organisation and initiative to get the ball rolling. These ideas fall under the category 'local initiatives'. Generally, these ideas focus on mobilising people to take part in recycling or reusing.

It was clear from the ideas put forward that participants believe efforts need to not only be focused on people in the role of consumer but also they need to be directed at retailers. Participants felt that individual, local retailers should create incentives for consumers to bring their own container, meaning that if consumers bring a container for refilling purposes they will be rewarded by the retailer. This idea is reflected in the excerpt below:

"We would like to add [...] about the containers for eggs there should [...] be incentives. If you don't give people incentives you they won't be interested." (Malta FG 1, P9)

One idea that was prioritised was about using the lids of tin cans as coasters, others were as follows:

"We get together as two families and buy in bulk." (Malta FG2, P 7)

"If only the schools would make the lunch box compulsory, well not compulsory but they advertise the lunch box, it would be much better." (Malta FG2, P2)

"A system where there is a location in each village where people can meet and take things that they don't need, not to sell however but an exchange system. Because in your rubbish I will find something which I need and in my rubbish you will find something that you need as well. So there will be a system of exchange." (Malta FG2, P 7)

There was quite some discussion about the need for people to try and revive old cultural habits, in particular, the habit of mending goods, rather than constantly buying new products:

"[P7] A culture where we start keeping things again instead of throwing them away because before they use to mend, mend, mend, and mend yet again, now we throw away and buy new…
[P2] They have even removed needlework from schools.
[P7] I think it could be as it was previously … if you need to mend a pair of shoes you take it to the cobbler and he mends it …" (Malta FG 1)

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

Category	Idea	Aim	Target Group	Priority
Local initiatives	Incentive schemes for both retailers and customers to use containers	Behaviour change	Consumers	☆☆☆☆☆
	The lids of tin to be reused as coasters	Effective use of waste	Consumers	☆
	Buy using your in our own container	Behaviour change	Consumers	☆
	Certain products can be used more than once	Behaviour change	Consumers	☆
	Buy products in bulk (larger) especially where families are concerned	Behaviour change	Consumers	☆

OTHER

The category 'other' includes ideas that could not be placed in one of the previous categories, because they are not specifically related to urban waste, but concern more general issues of environmental sustainability. The highest priority in the category 'other' was given to government incentives for every home to have a filtering and reverse osmosis system with the further suggestion that water that is generated be used to flush toilets. As this idea does not concern municipal solid waste, it is placed in this category instead of the category 'policy' of this study.

"The first idea we had was that water will become a government incentive so that every family will have an osmosis and filtering system in their home so that way everyone will benefit and there won't be any plastic." (Malta FG2, P2)
"[P7] I'm no expert on reverse osmosis but if there is any water wastage as this lady is saying, that one third of it is thrown away, there might be a system where that one third is used for flushing the toilets.
[P3] Apart from this, the water that is thrown away has a pipe and goes into the well.
[P4] You have to have a well.
[M] An incentive to use a reverse osmosis system at home." (Malta FG2)

A popular idea related to subsidisation of solar panels, with the suggestion that this should enable full distribution of the panels, but also a financial scheme that would generate down payments of the panels:

"Solar panels on the roofs … obviously all paid by the government but then the units you use are shared I mean. They won't all be for you because there are places which don't have a roof like me. We have a shared roof and I can't put them up so for example this lady has a roof big enough to take solar panels,

so I can also use the electricy which she is generating ok and instead of paying for the units in cash the money will be used against the payment of those solar panels." (Malta FG 1, P2)

There was also support for the idea to improve public transportation systems with the aim that this would ensure reduction in the use of raw materials:

"Public transport should be more efficient so that people won't use private transport and save a lot of petrol, diesel and pollution. But transport has to improve." (Malta FG 1, P8)

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

Category	Idea	Aim	Target Group	Priority
Other	Government incentives to use reverse osmosis at home (where the water which is generated as a by-product is used to flush toilets or water garden)	Less use of resources	Consumers	☆☆☆☆☆☆
	Full distribution of government subsidised solar roof panels	Less use of resources	Consumers	☆☆☆☆
	More organised and cheaper public transport - to reduce amount of fuel consumption	Less use of resources	Consumers	☆☆☆☆

5. Conclusion, discussion and evaluation

This country report presents country-specific findings from citizen focus groups in Malta. 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 held a total of six focus groups: three in each of two different locations. In Malta, as one of the smaller member states, three focus groups were held in total.

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 Malta. 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

Malta ranks 22nd on the EU27 ranking list on Municipal Solid Waste Recycling (MSW). Material recycling has increased steadily from none in 2001 to reach 7% of the generated MSW in 2010. With total MSW recycling as low as 13% of the generated amount in 2010 and a very unstable recycling performance the previous years, Malta would need to make an exceptional effort in order to fulfil the target of 50% set out for 2020 in the Waste Framework Directive. An encouraging level of enthusiasm, however, for recycling efforts to improve, was evident in the VOICES focus groups and may make some difference. 'Bring-in' sites were introduced in multiple locations in Malta in 2005, in an effort to improve the source separation of recyclable waste. Awareness of these sites was fairly high among the participants and yet it is clear some attention needs to be given to the current management practices at the sites in terms of more frequent emptying and cleaning of bins. There was some disillusionment expressed by participants about fines that can be incurred when people dispose of waste incorrectly, and yet the general feeling was that due to the poor maintenance of some 'bring-in' sites, this was unavoidable.

Findings of the Flash Eurobarometer 'Attitudes of Europeans towards resource efficiency' survey support this, as Maltese people indicated that there should be minimal costs for citizens in waste management, and stated a preference that waste management companies should bear the brunt of costs. Furthermore, the Flash Eurobarometer, with affirmative responses of close to 80%, confirmed ideas that waste management systems should be more efficient with more and better drop-off points for recyclable and compostable waste. Additionally, it was noted by some that there is quite some discrepancy among local councils, with some being better organised and easier to access than others. Despite the level of dissatisfaction with management at 'bring-in' sites, focus groups results show that most participants know what is expected from them on the household level. However, knowledge about what happens to waste after collection is limited to some ideas about particular streams of waste being exported overseas.

Barriers and concerns for handling waste that emerged during the focus groups tended to centre on a few issues. Most concerns about waste coming into the home were to do with excessive packaging, in particular about the amount of plastic. Participants were quite vocal about the lack of opportunity to vary their purchasing practices, expressing frustration at having to buy most products in pre-packaged bulk quantities, with little opportunity to buy according to weight or single item purchases. Despite this concern being voiced, findings in the Flash Eurobarometer do not really reflect this, as compared to other Europeans it seems that the Maltese do not waste so much food after purchase, however, and also comparatively they report buying food more in proportion to needs of the household than others in Europe.

As regards convenience in the home, it was clearly evident that the majority of participants were well aware of the various waste streams, and two groups adhered to the separation requirements as best they could. The group with the youngest participants, the majority of whom still live at home with their parents, admitted they seldom separated waste and neither did their parents. The reason given was that it was not part of their 'culture' to do so. For those who did separate waste, there was a divided response in terms of satisfaction with collection schedules. The group with the eldest participants was the most satisfied with services, the other two groups less so reporting that schedules were often not adhered to, or the system was too complex and required too much space in the home for all the separate bags.

Discussions in the focus groups indicated a fairly high level of enthusiasm towards recycling, and suggestions for incentives such as lower prices to facilitate the buying of more recycled products were forthcoming. Findings in the Flash Eurobarometer for Malta, however, contradict this, as more than other countries Maltese reported less willingness to purchase recycled products as well as reporting a low level of concern for the 'recyclability' of products.

5.2 Ideas for achieving a 'zero waste society'

The results were divided into two main research fields, 'environmental sciences and technology' and 'policy, management and communication', and each was further divided into four categories. In the first category, the most important ideas aimed to use fewer raw materials and to use waste more effectively. The two most significant ideas were an in-house machine that would convert waste into energy and for small electronic items such as computers and phones to be charged with solar energy. Other ideas also related to the conversion of waste, but not so much with the intent to use fewer resources, but rather to produce other useful products. Consumers and producers were the most prominent target groups in this category. Some emergent ideas in the groups clearly related to the desire to decrease workloads in the house and to increase usefulness of waste for other purposes. Those with homes, for example, favoured the idea of technology that would facilitate the process of composting.

Ideas in the second domain 'policy, management and communication' predominantly focussed on enforcement by law to facilitate the management of waste. Enforcement was perceived not only negatively but also in terms of providing incentives to promote positive attitudes toward reduction of waste as well as management of waste. The main target groups in this category were both producers and consumers. It was clear the main concern in this category was a desire to facilitate effective waste management practices as well as the aim to foster positive mind sets towards reduction and management of waste. Most participants felt there was a lack of distribution of responsibility in terms of production of waste, as most current initiatives place responsibility at the feet of consumers rather than manufacturers and retailers. It was clearly expressed that regulations should ensure a more equitable distribution of responsibility through targeting producers, retailers, educational institutions as well as waste management companies. Strategically designed public campaigns and in particular educational programmes targeting schools were believed to be important for the development of new cultural values in terms of waste production and management.

Of the three most highly prioritised ideas, the first is an education campaign by the Government so that people will become aware of health-related risks. The second involves a machine in the house that changes waste into energy, followed by the creation of bio-fuel from cooking oil - to be used in cars.

5.3 Reflection

Participation in the focus groups was fairly mixed, with the first two groups comprising of older participants, being more active in waste management practices and the third admitting to being less active, citing the culture in which they lived as not being conducive to sorting waste. All participants were active in discussions and were reportedly satisfied with the opportunity to share and generate new ideas. Some participants commented that they would be bringing new ideas home with them, with the intention to implement some of the ideas. The group with the youngest participants was more divided in their behaviour regarding management of waste than the groups with older participants. Some clearly were reliant on their parents and others demonstrated more initiative and willingness to practice more efficient and effective waste management practices. In all groups there was active participation and quite some enthusiasm to generate innovative ideas.

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	A machine in the house that changes waste into energy	Less waste production/Less use of resources	Consumers	☆☆☆☆☆ ☆
	Small electronic items e.g. laptops, mobiles, chargers, tablets which work with solar energy	Less use of resources	Consumers	☆☆☆
	A machine in the house in which you put differentiated recycled waste and it in turn produces a new product which you can exchange with someone else	Less waste production/Less use of resources	Consumers	☆
	A food processor which produces pellets from leftovers for animals or humans	Less waste production	Producers	☆
	A roller that irons and flattens empty rolls (like for example toilet paper rolls, paper kitchen towels etc.) and so you can reuse the rolls for something else	Less waste production/Less use of resources/ Convenience in the home	Consumers	
	Dehumidifiers which produce potable water - this water can be used for drinking, watering plants	Less use of resources	Consumers	
	White goods technology which is more refined and standardised to increase mending rather than throwing away	Less waste production	Producers	
	A machine in the house to disintegrate waste	Less waste production/Less use of resources	Consumers	
	Generate energy from moonlight - i.e. lunar energy	Less use of resources	Consumers	
	More use is to be made from energy generated by the wind	Less use of resources	Consumers	
	A machine that unties wool and turns it back to resources	Less waste production/Less use of resources	Consumers	
	Make products so that they are easier to recycle than to dispose of	Improve recycling	Producers	
	A magic dustbin that creates compost made from organic waste	Less waste production	Consumers	

Material	Degradable bags and cloth bags	Less plastic	Producers	☆
	Plastic will be recycled as synthetic turf	Less use of resources	Waste management companies	
	Tyres to be frozen and shredded by means of the liquid nitrogen system	Less waste production/Effective use of waste	Waste management companies	
	All packaging to be bio-degradable	Less waste production	Producers	
	Design products with materials that ensure easy separation of the materials to be disposed of as waste	Less waste production/Improve recycling	Producers	
	Multipurpose packing, so when original product is finished packaging can be used for something else	Less waste/Improve recycling	Producers	
	Nappies, wipes etc, everything bio-degradable	Effect on planet	Producers	
Bio(techno)-logical	Creation of bio-fuel from cooking oil - to be used in cars	Effective use of waste/Less use of resources	Consumers	☆☆☆☆☆
	Organic boiler especially for those who live in flats	Less waste production	Consumers	☆☆☆
	Refinement and better use of bio-fuel	Less use of resources	Consumers	

POLICY, MANAGEMENT AND COMMUNICATION

Category	Idea	Aim	Target Group	Priority
Policy	Law enforcement to reduce the amount of packaging by manufacturers	Less packaging/Less plastic	Producers	☆☆☆☆
	Government driven incentives for the use of refillable containers	Less packaging/Less plastic	Producers	☆☆☆
	Law enforcement on the separation of waste, which includes fines for those who do not respect the collection of recycled waste	Less waste production	Consumers	☆☆
	A limit on junk mail or its complete elimination	Less use of resources	Producers	☆
	A reduction in the price of recycled products	Improve recycling	Producers	☆
	More subsidies to encourage installation of water filters in houses	Less plastic	Governments/ Producers	
	Provide incentives for people to use bio diesel	Less use of resources	Government	
	We should use glass more, it should be recycled	Less plastic/Behaviour change	Consumers/ Producers	☆☆
	Food products in smaller packets (for people living alone or couples)	Behaviour change	Consumers/ Producers	☆

Management/ Logistics	Different systems of waste collection	Behaviour change	Waste Management Companies	☆
	Cut out the 'middle man' so more is brought directly from the producer	Less waste production/Less use of packaging	Consumers/ Producers	
	Buying Maltese and local products (for example directly from the farmer - buying at source)	Behaviour change/Local production	Consumers	
	Water filters in houses to reduce the purchase of plastic bottled water	Less packaging/Less plastic	Consumers	
	Collection of food and organic waste separately, to be used as bio gas	Less waste production	Waste management companies	
Communication and education	An education campaign by the Government so that people will become aware of health-related risks	Behavior change	Consumers	☆☆☆☆☆ ☆☆☆
	Communication between the Local Councils to generate ideas about waste management	Behaviour change	Government/Waste Management companies	☆
	More promotion by means of the television, social media, door to door consultations and the telephone	Awareness	Consumers	
	Advertisers of many products could generate more awareness of damaging effects of excess waste	Awareness of negative effect	Consumers	
	Increase and diversify communication channels - social media, TV, door to door, radio, phones, etc.	Behaviour change	Consumers	
	Increase the use of social media for waste education	Awareness	Consumers	
	A machine which tells you how to change for the better to remind people what to do with waste or how to reduce it	Behaviour change	Consumers	
Local Initiatives	Incentive schemes for both retailers and customers to use containers	Behaviour change	Consumers	☆☆☆☆☆
	The lids of tin to be reused as coasters	Effective use of waste	Consumers	☆
	Buy using your own container	Behaviour change	Consumers	☆
	Certain products can be used more than once	Behaviour change	Consumers	☆
	Buy products in bulk (larger) especially where families are concerned	Behaviour change	Consumers	☆
	Exchange and swap shops	Behaviour change	Consumers	
	Waste separation bins which are more accessible in towns and villages (like those found at the airport)	Behaviour change	Waste Management Companies	

	Redesign unwanted clothes to make new clothes	Less use of resources	Consumers	
	Improve opportunities for bulk waste to benefit more people, not only charities/ waste management companies	Less use of resources/Improve recycling	Consumers/Others	
	Recycling of clothes for other purposes	Improve recycling/ Less waste production	Consumers	
Other	Government incentives to use reverse osmosis at home (where the water which is generated as a by-product is used to flush toilets or water garden)	Less use of resources	Consumers	☆☆☆☆☆
	Full distribution of government subsidised solar roof panels	Less use of resources	Consumers	☆☆☆☆
	More organised and cheaper public transport - to reduce amount of fuel consumption	Less use of resources	Consumers	☆☆☆☆
	Self-powered pump reuses water for other purposes, i.e. to flush toilets. A form of reverse osmosis	Less use of resources	Consumers	

Annex 2: Attitudes of citizens from Malta 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 Malta.

Question	Answer	%	EU27 Average
Do you think Europe could be more efficient in its use of natural resources?	Yes	78%	87%
	No	5%	5%
	DK/NA*	17%	8%
Do you think that your household is producing too much waste or not?	Yes	36%	41%
	No	62%	58%
	DK/NA*	2%	1%
Do you separate at least some of your waste for recycling or composting?	Yes	90%	89%
	No	10%	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	69%	67%
	More information on how and where to separate waste	68%	65%
	Legal obligation to separate waste	57%	59%
	Taxes for waste management	23%	39%
What initiatives would improve waste management in your community?	Better waste collection services	70%	70%
	Stronger law enforcement on waste management	74%	65%
	Make producers pay for collection and recycling of waste	35%	63%
	Make households pay for the waste they produce	14%	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	12%	14%
	To pay proportionally to the quantity of waste you generate	65%	75%
	DK/NA*	23%	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	17%	25%
	Include the cost of waste management in the price of the products you buy	56%	59%
	DK/NA*	27%	16%
Can you estimate what percentage of the food you buy goes to waste?	None	22%	11%
	15% or less	66%	71%
	16% to 30%	8%	13%
	More than 30%	3%	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	81%	62%
	Better information on food product labels, e.g. how to interpret "best before" dates, information on storage and preparation	70%	61%
	Better shopping planning by my household	78%	58%
	Smaller portion sizes available in shops	56%	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	46%	39%
	Rather important	26%	41%
	Rather not important	17%	12%
	Not at all important	9%	6%
	DK/NA*	2%	2%
Are you willing to buy second-hand products?	Yes	48%	68%
Base: all respondents, % of yes			
Would you buy the following products second hand?	Furniture	40%	56%
Base: all respondents, % of yes	Electronic equipment	27%	45%
	Textiles (clothing, bedding, curtains, etc)	15%	36%
What reasons prevent you from buying second-hand products?	Quality/usability of the product	60%	58%
	Health and safety concerns	47%	50%
	Less appealing look of the product	18%	25%
	Afraid of what others might think	3%	5%
Would you buy products made of recycled materials?	Yes	83%	86%
	No	11%	11%
	DK/NA*	6%	3%
What would be the most important factors in your decision to buy products made of recycled materials?	Quality/usability of the product	51%	51%
	Environmental impact of the product	27%	26%
	Price of the product	17%	18%
	Brand/brand name of the product	3%	2%
	DK/NA*	2%	3%
What prevents you from buying recycled products or products containing recycled materials?	Health and safety concerns	31%	44%
	Quality/usability of the product	39%	42%
	No clear consumer information on the recycled product	25%	32%
	Less appealing look of the product	7%	17%
	Afraid of what others might think	1%	5%

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

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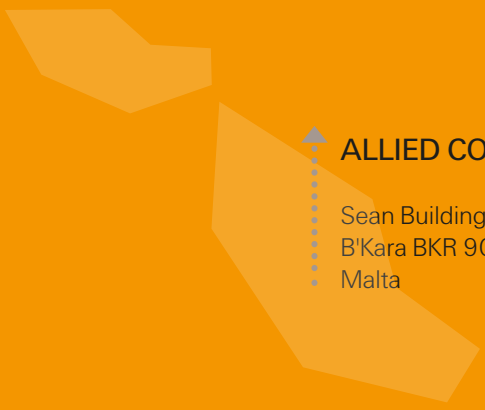

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VOICES, CITIZEN PARTICIPATION IN SOCIAL INNOVATION

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

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

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

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

VOICES for innovation

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