Workshop on the Environmentally Sound Management of Plastic Wastes and the prevention of marine litter and plastic pollution
Barcelona, Spain
3 – 5 April 2019

Report of the Workshop

Introduction

1. This was the first workshop of a series organized by the BRS Secretariat to raise awareness of marine litter pollution caused by plastics. At the event, participants shared knowledge and tools available for the Environmentally Sound Management (ESM) of plastic wastes and they received training on the effects of plastic waste pollution in the sea and the effects caused by micro and nano plastics accumulation in the marine trophic chain. Experts and countries shared solutions such as replacement options and other prevention strategies. The workshop provided opportunities to share experiences on alternative solutions to single-use plastics, learning from countries that have already put in place a ban in single use plastic. The participating Basel and Stockholm regional centres shared their current efforts towards reducing plastic pollution, marine litter plastic and microplastics through policy solutions, awareness raising campaigns and marine environment monitoring programmes.

3rd April 2019, Day 1

Opening ceremony

2. The regional workshop on the ESM of Plastic Wastes and the prevention of marine litter and plastic pollution was opened by Mr Josep Maria Tost, Director of the Catalan Waste Agency where he welcomed all the participants and speakers to Barcelona and thanked the government of Sweden for financing the event and the BRS Secretariat for trusting the organisation of this event to SCP/RAC, a Stockholm convention regional centre that is part of the Catalan Waste Agency. To fight against marine litter, he stressed, it is essential to establish environmentally sound management strategies for plastic waste since the vast majority of the plastic that ends up in the seas and oceans originates in land. Plastic pollution and marine litter are global problems that need answers at all levels: Global, national, regional, local, and that involve a multitude of actors. Cooperation and exchange of information between countries is key. Finally, he wished a productive workshop; hoping participants would learn all the aspects related to the environmentally sound management of plastic wastes - inventories, public policies, prevention, recycling and alternatives - and come out of this workshop with concrete proposals to improve the situation in their countries and change the global trends.

3. Ms Magali Outters, Team Leader of the Policy Area at Regional Activity Centre for Sustainable Consumption and Production in Spain (SCP/RAC) welcomed participants in her opening speech and thanked the BRS Secretariat for the collaboration on the organization of this workshop, a milestone in a path that the Basel and Stockholm Conventions have begun hand in hand with the Centres.

4. Ms Francesca Cenni, Programme Officer, Secretariat of the Basel, Rotterdam and Stockholm Conventions, expressed her gratitude towards the Catalan Waste Agency for hosting the Stockholm Regional Centre and for having cooperated with the Secretariat to allow this workshop to take place and thanked Spain-SCRC as hosts to this meeting in Barcelona. Ms Cenni welcomed the Basel and Stockholm Convention focal point for Spain, representatives of the different governments as well as all experts and participants. In her remarks, she highlighted the importance of the 2016 initiative of the Spain-SCRC in Barcelona, a topic group on marine litter that was established between interested Regional Centres, experts and organisations to propose recommendations for further work under BRS Conventions on marine litter. Responding to the recommendations from the topic group, the Parties to the Basel Convention introduced this theme in the work programme of the Open Ended Working Group for the first time during the last Conference of the Parties to the Basel Convention (Decision BC13/17 on the Work programme and operations of the Open-ended Working Group for the biennium 2018–2019). The OEWG, is the largest group of experts on hazardous wastes and other wastes, in the world, open to industry, NGOs and other stakeholders.

5. In addition, Ms Cenni explained how the two decisions under the Basel and Stockholm Conventions on Technical Assistance, including Regional Centres (BC-13/11 part II and SC-8/15 part II) encouraged Basel and Stockholm Regional Centres to work on the impact of plastic waste, marine plastic litter, microplastics and measures for prevention and environmentally sound management. The OEWG 11 adopted decision OEWG-11/8 on marine plastic litter and microplastics where it considered possible further action on the ESM of plastic wastes to address the marine litter problem under the Basel Convention by the Parties and the Secretariat, in particular the OEWG welcomed the proposal of Norway to establish a partnership on plastic wastes addressing the problem of marine plastic litter and microplastics.

6. Ms Cenni described some of the draft decisions for the coming BRS COPs such as the establishment of a partnership on plastic wastes or the Norwegian proposal for amending Annexes II, VIII and IX of the Basel Convention

7. Finally Ms Cenni mentioned how the decision at the COP invited the Basel and Stockholm Centres to continue to work on marine litter plastics and microplastics engaging with the new initiatives that the COP may adopt at BRS COPs. Ms Cenni concluded her speech by wishing all a successful workshop and hoped that this workshop could contribute to protect human health and the environment from the adverse impact of hazardous and other wastes and POPs and to protecting the health of Oceans from land based sources of pollution.

Objectives of the workshop

8. Ms Outters outlined the objectives of the workshop and subtitles of proposed agenda. The aim of the workshop was to raise awareness on the damage caused by marine litter and plastic pollution among participating countries and stakeholders, enhancing the Environmentally Sound Management (ESM) of plastic wastes as one of the solutions to reduce marine plastic litter and microplastics at the national and regional levels and exchanging experience on ESM of plastic wastes and action to prevent and reduce marine litter following the waste hierarchy. Finally, she pointed out how this would be a good opportunity to discuss project proposals and the way forward through concrete activities aimed at preventing and reducing marine litter plastics and microplastics, to disseminate the Technical Guidelines on the ESM of plastic wastes, to learn about POPs and other toxic substances included in plastics and bioplastics.

9. Ms Outters concluded by describing the structure of the workshop, which was divided into 7 sessions during the course of the three days and detailed the schedule, logistics and link to the presentations and background documents online (https://brsbox.brsmeas.org). Prior to the group photo and coffee break, a round of presentations was carried out from all the participants present at the meeting, describing their name and role.

Proceedings of the workshop

Session 1: Introduction to the global marine litter challenge and the role of environmentally sound management of plastic wastes to prevent marine litter plastics and microplastics

10. The first session was initiated by Mr David Lerpiniere, head of the Waste and Resources Division Resource Futures at ISWA presenting on the global plastics pollution issues and policy responses. Mr Lerpiniere highlighted how an estimated 3 billion people do not have access to controlled waste treatment and disposal globally and how the quantities of waste are growing globally, indicating how markets for recycled plastics are not functioning due to the high costs of collection, sorting and processing: The widely distributed and diverse nature of sources of plastics waste, the combination of polymers of different types makes their separation for recycling difficult and costly and post-consumer plastics commonly contain non-recyclable and non-target materials.

11. Mr Lerpiniere also described the issue on current market resilience such as the different size in primary and secondary producers, the confusion over terminology and the recent change in China's legislation, which is no longer importing waste. In his remarks, he also mentioned the challenges with additives: Some additives are hazardous and the uncertainty over the presence of additives compounds is currently a big issue. He explained the policy responses and highlighted the importance of thinking of the life cycle approach of management of plastics. Finally, he introduced a new way of thinking: the 'use phase' approach, consisting on looking at the way that the product is typically discarded and potential actions you might take to reduce the negative impacts across the whole lifecycle. Participants from the World Plastic Council, Mr Ralph Schneider, Ms Noha Sami from Egypt, Ms Rokhaya Ndiaye from BSCRC Senegal and Ivory Coast representative Mr Djedji Onamoun intervened in a brief round of questions.

12. The session was summarized with the intervention of Ms Francesca Cenni, on the obligations and developments related to plastic wastes under the Basel Convention in synergies with the Stockholm Convention. The definitions and obligations under the Basel Convention in relation to waste, hazardous wastes and other wastes were briefly explained followed by the classification of plastic wastes. Ms Cenni also reminded the obligations on POPs wastes under the Stockholm Convention and the definition of ESM under article 2 of the BC: 'Environmentally sound management of hazardous wastes or other wastes' means taking all practicable steps to ensure that hazardous wastes or other wastes are managed in a manner which will protect human health and the environment against the adverse effects which may result from such wastes.

13. Finally, Ms Cenni introduced the Norwegian proposal to amend the BC on including all wastes that aren't easily classified under other entries, to classify the plastic waste under this new code Y48 in Annex II (subject to PIC procedure). Further information can be found in documents: UNEP/CHW.14/27 (proposal), UNEP/CHW.14/INF/18 (explanatory note from Norway) and UNEP/CHW.14/INF/17 (comments received on the proposal).

Session 2: Environmentally Sound Management (ESM) of plastic wastes: Inventories and national surveys

14. Ms Sofie Bruun, from UN Environment, Ecosystem Division briefly presented UNEA 4 resolution on source inventories remotely (4/7: Marine plastic litter and microplastics (UNEP/EA.4/L7) and 4/10: Addressing single-use plastic products pollution (UNEP/EA.4/L10)) which reference the regional action plans, relevant for all participants. Ms Bruun, informed on the set up of a pilot knowledge hub, a national source inventory taking place in two pilot countries: Kenya and Mauritius and potential scale up to 10 additional countries in a second phase. The work will feed into the National Action Plans and scale up with a focus on production, import and exports of plastic in order to understand where plastic is coming from and in what quantities.

Experiences and tools for inventories at the national level

15. Mr Julien Boucher, senior consultant at Shaping Environmental Action (EA), who presented the inventories of plastic inputs and outputs, introduced the following session with a draft methodology for data collection and plastic leakage assessment. Shaping action requires being more specific on sources, he stressed how there is currently a yearly plastic leakage of 3%, representing 12MT yearly at a global level in the form of microplastics, lost fishing gear, coastal and inland mismanaged waste which is creating problems in sediments such as found fractions of PP that cannot be traced to a particular type of packaging. The job carried out at EA is to forecast which source of leakage is generating this issue with PP. The methodology consists in assessing the plastic footprint. Methods are more accountable as they measure the quantities and environmental impact. Mr Boucher informed about this report that would be available online in the following weeks, with the purpose of providing guidance: help countries and local authorities and NGOs to identify key hotspots, as well as prioritize and support governments. This consists in 4 main stages: Data collection, diagnostic (calculating the sources macro and micro plastics and assess the impacts for the country), planning interventions and the implementation.

16. An economy wide material flow analysis (MFA) scheme for plastic accounting is necessary concluded Mr Boucher, highlighting the need to include data on the import and export of plastic waste: It is key to identify how much of the primary plastic is domestic versus imported and in which sectors, to understand the plastic value chain. Finally he exemplified with a matrix for case study in Indonesia. This intervention was summarized with questions from Mr Pedro Fernández from SCPRAC and Mr Ralph Schneider from WAC.

17. Achievements on plastic inventories and 'STAN' tool on material and substance flow analysis in Austria were presented by Mr Johann Fellner, Associate Professor at Institute for Water Quality and Resource Management at the Vienna University of Technology. Mr Fellner spoke about the material flow analysis for the plastics in Austria, with the data sources such as production statistics, trade flows, manufacturing, consumption and waste management with both sectorial reports and national statistics have achieved a summary of the plastics management in Austria. He then introduced the software for substance flow analysis (STAN) including the user interface, modelling and calculation, layers and periods and the statistics.

18. Mr Joshua Babayemi, who presented remotely from the Bells University of Technology in Nigeria, concluded this topic. An initial inventory of plastics imports in Nigeria as a basis for more sustainable management policies was carried out in 2018. The objective of the Nigerian polymer study was to develop an initial inventory of plastics as a basis for the development of an effective plastics management framework. The main products considered to contain considerable amounts of polymers were EEE/WEEE (refrigerators, washing machines, air conditioning units, electronics, IT and telecommunications equipment, motor vehicles and toys). The study included a Material Flow Analysis or Substance Flow Analysis of WEEE plastic and PBDE, it was found that the major plastic import to Nigeria is in primary polymer imports (PP, PE) used e.g. for packaging. The second and third largest imports were plastic in vehicles and in electronics. To conclude his presentation Mr Babayemi explained how the connection of international trade and inventory data and related pollution potential is a powerful tool that can be used to develop strategies, counter measures and to improve prevention and management programs. The inventory of plastic import, use and flows is a prerequisite for the development of National Strategies and related National Action Plans for the environmentally sound management of plastic waste.

Experiences and tools for inventories at the local level

19. Mr David Lerpiniere introduced the second topic of this session by presented the Plastics Pollution Calculator tool for assisting municipalities in tackling plastics pollution. He explained a map with the flows of materials information, a tool that is currently in the process of being tested. The MFA approach indicates the mass of materials moving through a city (local level) and remarked how the levels of rainfall in geography, the demographics and land use can generate different types of waste (industrial,

commercial, residential). Mr Lerpiniere finalised his intervention with two case studies that exemplified this.

20. Ms Elena Rabbow, junior advisor at GIZ, presented a tool for assessing plastic waste leakage into waterways and the ocean, that takes a 'waste management & circular economy' perspective by estimating what goes into the environment instead of measuring what can be found in the environment. This is done by using existing data on waste management and additional field visits with local experts. The work examines a combination of quantitative estimates with qualitative description of the waste management situation, existing activities on plastics and marine litter, pathways of unmanaged plastic waste and the elaboration of recommendations to reduce plastic waste leakage. Finally she presented examples of work carried out in Indonesia and Algeria. The project consists of three phases: Tool development, plastic waste flow diagram and the application & dissemination.

21. Ms Claudia Lamparelli from the SCRC in Brazil presented the ESM of plastic wastes initiatives in São Paulo State in Brazil as an inventory case study. She introduced the marine litter initiatives such as their participation on the Oceans Conference, Clean Seas Campaign, and elaboration of the national plan. Ms Lamparelli gave a brief description of the coastal municipalities and socio-economical characteristics and described the work of CETESB - the Environmental Agency of Sao Paulo State - on Solid Waste management. She concluded with the description of the 2018 beach clean-up and litter inventory and highlighted how it can be challenging to make nationwide policies since the geographical and demographical differences need to be taken into account.

22. Ms Dina Abdelhakim from the Special Programme Secretariat, Chemicals and Health Branch at UN Environment gave an overview on submitting applications for funding for the Special Programme. Projects need to be country driven - from national governments - and include institutional strengthening, have multi-sectorial involvement, cross-sector or involving several ministries to ensure a holistic approach. Furthermore, Ms Abdelhakim expressed the need to integrate gender issues, focus on chemicals and waste, and enable an environment for the implementation of BRS and Minamata Conventions and SAICM. All countries were invited to apply, as there are funds to address the Marine Litter issue, with a deadline for submitting applications in Nov/Dec 2019.

23. Participants engaged in a series of practical exercises aiming at assisting with the ESM of Plastic Wastes for the Prevention of marine litter and plastic pollution at the national level. The moderator helped identify a chair and a rapporteur; the latter will report the outcomes of the groups' work during the following plenary session. Participants were divided in four working groups; discussions were facilitated by representative from BRS Secretariat, Francesca Cenni. Ms Abdelhakim gave tips and examples on how to approach this exercise, more specifically on developing a problem statement to determine which aspects of plastic need to be focussed on and figure out what national priorities are. A Logical Framework was provided and is available on the cloud.

24. The first part of the exercise consisted on describing the characteristics of a methodology to guide the development of plastic wastes inventories at the national level, based on the national situation. The main goal was to estimate the total quantity of Plastic wastes hazardous and non-hazardous generated per year and the potential sources of these (Pre-consumer such as production or transformation from raw materials to products or Post consumer). Participants were also asked to identify types of waste (categories such as Household wastes: packaging, appliances, toys, food consumption, etc. Agriculture, distribution and large industry, agriculture, construction and demolition, automotive, electronic and electric wastes) and main sectors.

25. The second part of the exercise was designed so that the working groups could develop project proposals for the development of plastic wastes inventories at the national level. Ms Abdelhakim gave some guidelines on how to develop project proposals, starting with formulating the problem statement of the project proposal, identifying relevant stakeholders involved in an inventory of plastic wastes and the target group of the project proposal, and identifying the overall outcomes, the project objectives and project results of the project proposal using a logical framework.

4th April 2019, Day 2

Session 3: Environmentally sound management of plastic wastes: Policies and financial mechanisms for waste prevention and waste management

26. Mr Francesc Giró, Director of Strategic planning at the Catalan Waste Agency that presented innovative approaches to increase the collection and recycling of packaging waste, carried out the opening intervention of the second day. He raised the question on whether plastic pollution is a visual problem; the ethical impact and environmental problems are affecting human and wild life. Mr Giró highlighted the impact of plastic pollution in the food chain and linked it to the outcomes of the IPPC climate change report and GHG emissions, and the Paris agreement to hold warming below a 2ºC increase. Mr Giró gave some data on the regional context in Catalunya, explaining how the increase in waste management schemes had increased the creation of high quality job opportunities. Waste is a resource, he stressed, an opportunity that is however tied to some challenges. The success of the regional implementation of waste management through the waste agency was mainly due to the political will, standardization instruments, budget and the existence of the Catalan Waste Agency, a structure with over 200 employees.

27. Mr Ignasi Puig from ENT environment and management, presented on EPR schemes: exploring different options through lessons learned from existing initiatives. The alternatives to materialize EPR consist on collective EPR (via producers or the administration), individual EPR and taxation. Mr Puig also defined the deposit refund systems either through collective systems for single use packaging or reusable packaging, achieving 80-90% recovery of materials in very high quality. He exemplified the EPR schemes with case studies in Spain, Chile, Tunisia and Morocco. In his concluding remarks he explained how in the above mentioned countries the application of EPR is under development but has produced insufficient results to date: Producers Responsibility Organisations (PROs) often do not assume the total cost of managing the corresponding waste, tariffs should encourage recycling and eco-design and there is a lack of transparency with respect to quantities put in the market, which makes it difficult for public administrations to assess compliance with recycling objectives.

28. A practical exercise on EPR schemes was facilitated and moderated by Mr Pedro Fernández and consisted of 12 participants volunteering for a role game where, in groups of two ('interlocutor' and 'technical advisor') they would represent the following six roles:

- **National Public Administration**, interested in drafting a policy proposal to improve waste management and boost circular economy, which needs to be simple, without ambiguities and which delivers the desired targets. Their proposal was associated to the increase of the PET plastic bottles cost so to increase the recycling and invest in alternatives to bioplastics. They were in favour of implementing deposit return schemes where the collector could get some benefits in exchange. They highlighted the importance of investing in innovation in order to move to a better future, investing in better and newer materials.

- **Municipalities** need additional financial contributions to deal with waste management, for which they are responsible. This financial contribution may come from the EPR system. Their response was that they needed further financial resources to implement this scheme in the municipality, stating that producers should take responsibility for the packaging that the consumers are throwing away. The municipality should finance only mixed waste/residual waste that is left. They requested NGOs to do awareness rising to make sure that separation was as efficient as possible. They also requested funding to increase the collection of waste at the municipal beaches and parks and were in favour of EPR schemes.

- **Producers** are concerned with excessive economic or administrative burden and they demand clear rules. They agreed that waste management and littering are challenges that need to be addressed but they expressed concern with how the funding would be used, they would want to have a greater role in identifying the final use of the funds. They agreed to increase awareness among consumers and were in favour of EPR schemes where PROs have greater input into how the material is

managed, as opposed to that where is managed by the national public administration, to avoid funds being diverted into other purposes, not in supporting the EPR. They agreed that resources should be dedicated to taking steps towards the future, and that tax incentive type program would encourage other policies to incentivise a research centre.

- **The distribution sector** is not pleased about sharing the cost of EPR, and is concerned about certain forms of EPR that can demand the use of their premises. They stated that supermarkets should not pay a fee but have an important role to play so they would have a storage place. However, they claimed they should receive a fee in exchange in order to invest in improving technology or as additional income to the supermarket. They expressed a preference for EPR collective systems.

- **Recyclers** are in favour of systems that deliver high quality materials to their facilities. The position taken by the representatives was flexibility towards a PRO to maximise the quality of the recycled material: Working with private operators, collecting system with financial control. They highlighted the importance of public support and the need for consumer behaviour change to acquire quality material. Hence the need for campaigns, enforcement from public administration and establishing collection targets.

- **Environmental NGOs** demand for systems that deliver high quantity and quality of materials. They are also concerned about littering and representatives highlighted the issue of marine litter, assured they would work with associations and recyclers to support them and work together in one field, particularly on awareness raising campaigns. They would engage with EPR, since it is important to work with governmental policies, both national and regional. Their preferred EPR scheme was taxation and also deposit return systems.

29. Following the group exercise, Mr Miquel Roset, Director at Retorna foundation spoke about Deposit-refund systems (DRS) for plastic packaging: theory and practice to achieve seas and oceans without cans and bottles. Mr Roset remarked the importance of understanding the challenge (single-use plastics represent 49% of marine litter) and the importance of making data more tangible (for example 150 million tonnes of plastic exist in the oceans today, the equivalent of every one of us on the planet throwing a full bag of plastic every week during a year). He explained the single-use plastics directive issued by the European Commission: 90% separate collection target for plastic bottles by 2029 as well as a target to incorporate 25% of recycled plastic in PET bottles as from 2025 and 30% in all plastic bottles as from 2030. Mr Roset exemplified how the deposit return systems were piloted at festivals in Spain achieving great results. DRS have no cost for the administration, save costs to the municipalities and benefits for retailers. He explained its success around the world with return averages of 92% in Europe and 80%in Canada, 71% USA and 81% Australia.

30. Mr Pedro Fernandez, from Spain-SCRC gave an overview of policy options to ban single-use plastic bags (SUPB). Firstly, he described the pros and cons of voluntary agreements, regulatory economic instruments, and command and control instruments. He stressed the need to firstly assess current situation of SUPB, assess different policy options, given the national context. After this, alternatives should be promoted and developed followed by the need to identify the life cycle impact for the best alternative for a national context. Mr Fernandez explained how the adoption and implementation of a policy option could have different implementation periods, but that the main challenge remains the enforcement of these, particularly in Northern Africa, where there is often a rise of an illegal market, since there are no alternatives available. Some countries have tackled the issue by controlling the imports of PE. Another option is giving incentives to the industry or upgrading the waste management system. He concluded that communication is key and that whichever measures are taken they should be reviewed and adapted to the current context. The morning session was finalised with the round of questions and answers to Mr Fernández from Ms Constance Iißbrücker, and Ms Noha Sami from Egypt.

Session 4: Emerging topic: Bioplastics, opportunities and challenges ahead

31. At the beginning of the afternoon session Mr Francesc Giró explained challenges and opportunities related to bioplastics for the public administration, in the particular case of the Catalan Waste Agency. He firstly described the circular bioeconomy, the need to close the loop but also the constant circularity of bioresources and described the difference between biological materials and technical materials and the main sectors involved in the bioeconomy. Mr Giró continued defining plastic materials, bioplastics and the differences between biodegradable and compostable materials including their advantages and disadvantages. Finally he described the legal framework in the EU, Spain and Catalunya to give the regional, national and local context of decisions and legislations that are applied. To end his presentation, Mr Giró gave some practical examples on case studies on compostable bags for selective collection and spoke about the challenges encountered in agriculture with PE and coffee capsules among others.

32. Ms Constance Ißbrücker, head of environmental Affairs at European Bioplastics presented the topic of Bioplastics: Opportunities and challenges ahead, and the latest developments from the industry. European Bioplastics represents the interest of the bioplastics industry along the entire value chain in Europe and has 70 members networking on EU and member state level. Ms Ißbrücker began by clarifying the meaning of bioplastics with a material coordinate system: Bioplastics can be bio-based, biodegradable or both, making a clear distinction with additive mediated plastics like oxo-degradable plastics, a threat to the current system. The biodegradable plastics industry have seen an increase in their production capacities and is forecast to reach 1,288 tonnes by 2023 with 44% of it going to flexible packaging. Ms Ißbrücker also defined the feedstock options for bioplastics and the challenges for better recycling. She concluded by defining biodegradation, when microorganisms metabolise material into water, CO2 and biomass, highlighting how biodegradable plastics are not the solution to marine littering. Biodegradability can make sense for certain applications that are prone to end up in the sea, standardisation necessary, but difficult due to versatile conditions in the marine environments, communication to consumers challenging, proper waste infrastructure and education measured key to prevent littering

33. Dr Marinel·la Farré Urgell from the Spanish National Research Council explained the Challenges related to bioplastics from a research perspective. She explained how the analytical methods to quantify and identify microplastics and nanoplastics in the environment are required to understand their potential impact and deal with the current problem. The pros of bioplastics being: Bioplastics are made from renewable biomass resources, plant raw materials or even of organic wastes instead of petroleum oil, which are more sustainable feedstocks. Ms Farré highlighted a variety of zero waste end of life options of bioplastics and the additional benefit of composting: lower environmental persistency. From a residues management point of view the disadvantages are: Not all are biodegradable, composting may only be possible in industrial composting reactors and under certain conditions (as defined on EN 13432 standard), not all are recyclable and some can interfere with or damage standard plastic recycling processes. Ms Farré added that there are limitations and uncertainties at the environmental level, since they require new biodegradation schemes, not all bioplastics are completely biodegradable and shelf life should be studied under environmentally relevant conditions as well as the toxicological effects at low concentrations.

Session 5: Developing ESM strategies for plastic waste

34. Ms Francesca Cenni from the BRS Secretariat presented on the main steps for the development of Strategies for the ESM of plastic waste at the national and municipal levels.

35. Participants were divided into four working groups to discuss the development of project proposals to address marine litter plastics and microplastics. Participants were invited to prepare a project proposal on a selected thematic area to address the ESM of plastic wastes and marine litter plastics and microplastics, the suggested topics were:
    - Proposal to develop strategies, policies, laws on prevention, recycling, recovery and final disposal of plastic wastes in an ESM manner

- Proposal to establish an EPR system for the ESM of plastic wastes
- Proposal to raise awareness of the ESM of plastic wastes and marine litter issue among different stakeholders (municipalities, building a marine litter social pact, schools, etc.
- Proposal to monitor POPs in plastic products or in marine litter (including plastic litter and microplastics in rivers).

The group exercise was not completed and to be terminated on the following day when the outcomes would be reported to plenary, and discussed jointly.

5th April 2019, Day 3

Session 6: Environmentally sound management of plastic waste: material recovery, recycling and final disposal

36. Introducing the third day, Ms Clarissa Morawski from Reloop Platform explained the company vision on the circular economy and defined the current challenges for the recycling of plastic waste and EU approaches to overcome them. Ms Morawski highlighted the importance of the waste imports ban in China and its impact in the global recycling industry. She explained the importance of being realistic about recycling, since in the best case scenario the maximum amount of material that can be recycled is 69% and emphasized the need to increase the quality and quantity. Similarly to other speakers, she spoke about keeping the priorities present: Prevention, minimization, reuse, recycling, recovery, landfill in order of most to least preferred waste management approach. Ms Morawski gave an update on the EU legislation with respect to the plastic bag bans and EU plastic strategy and remarked how single-use plastic products are to be banned from the market place as of 2021. Finally, she explained the latest trends in deposit systems implemented in Europe and voluntary commitments in different industrial sectors.

37. Ms Kim de Miguel presented the latest work at Spain-SCRC on an information document on additives in plastics and the circular economy (Document UNEP/CH.14/INF/29/Add.1 and UNEP/POPS/COP.9/INF/28/Add.1). Ms De Miguel explained how marine plastic pollution has received much attention and how additives in plastics need to be considered: Additives are very widely used – e.g. flame retardants, or plasticizers. Many are potentially toxic – in particular, POPs or Endocrine disrupters and pose a risk to human health and to the marine. She highlighted that the presence of additives is a potential barrier to a circular economy and briefly explained how the problem presents challenges at different stages of the life cycle management of plastics: Design and production phase, at the 'use phase' such as the migration and release potential of various additives present in plastic and at the 'end of life phase' where it is difficult to make exposure-based assessments for recycling, because of a lack of information and emission and leaching of potentially toxic substance is a risk. Ms De Miguel concluded with opportunities where the issues of additives should be further considered under the Basel Convention and Stockholm Convention.

38. Mr Jindrich Petrlik, Executive Director and Co-chair at Arnika on Toxics and Waste Programme, also working on Dioxin, PCBs and Waste WG at IPEN, presented on the Hazardous substances in recycling, contamination of the plastics recycle stream into new products. He described the current state of toxic chemicals as additives in plastic, with 906 chemicals associated with plastic packaging, different additives in plastics like plasticizers, fillings, adhesives, biocides, colour additives, flame retardants etc. were found to be toxic. When replaced, some of their alternatives were found to be toxic as well – e.g. PCBs used as plasticizers in the past were replaced by phthalates, found to be toxic later on.

39. Mr Petrlik highlighted the 2017 global survey of PBDEs in toys in 26 countries had found that 90% of toys contained OctaBDE and DecaBDE. Banned brominated flame retardants get into new products where they were not present historically, and, moreover, that are intended for the sensitive part of the population because of the recycling exemptions and high thresholds for waste to be considered toxic. Mr Petrlik explained the possible solutions to this issue such as POP limits in wastes since it is the concentration that defines wastes as POPs wastes.

40. Mr Roland Weber, POPs Environmental Consulting for Spain-SCRC introduced the topic of incineration of plastic wastes: Emission and leaching of potentially toxic substances. He began by explaining how pollutants in plastic challenge recycling, particularly but not limited to the packaging, building and construction, automotive, electrical and electronic sectors. Some recycling of plastic has started in African countries. Even if ABS, HIPS and PP without BFRs would be recycled, a large share of WEEE (and other plastic fractions), still do not have a potential market. He described the major differences in waste composition of developing and industrial countries, waste management cost in different societies and the change in cost and performance by waste management technologies. Incineration reduces the amount and volume of waste, destroys hazardous components, harmful biological components and allows the production of energy. However, incineration generates bottom ash and fly ash and releases to air (and sometimes to water), these residues and releases need to be controlled, managed and disposed in an environmentally sound manner.

41. Mr Weber also described the challenges of developing countries with waste incineration and requirements for operating MWI in low-income countries, co-processing of waste in cement kilns, power plants, blast furnace are alternative forms of waste treatment that are part of the waste hierarchy. He finally exemplified some of the acceptance criteria for co-processing wastes for chlorine and bromine, mercury and thalium emitted to air, phosphorus and water.

42. Mr Lee Bell, Mercury and POPs Policy Advisor at IPEN explained the non-combustion destruction technologies for POPs waste by explaining the criteria for POPs destruction. Many proven non-combustion technologies are available for a wide range of POPs wastes. They meet the criteria for appropriate technologies for the destruction of POPs wastes and enable the containment of all process streams to allow for further processing in cases of system upsets or less than expected destruction. Non-combustion technologies are not inherently a source of POPs pollution due to their higher destruction efficiencies and ability to contain all waste streams for further processing and are more acceptable to local communities for the destruction of POPs stockpiles and contaminated sites remediation, than incineration. Finally Mr Bell focussed on some of the highly commercialised methods for POPs destruction: Gas Phase Chemical Reduction, Sodium Reduction, Ball milling with reagents and Base Catalyzed Decomposition.

43. To conclude the day Mr Harris Stewart, Director of the Marine and Environmental Stewardship, at the American Chemistry Council explained the plastics industry efforts to reduce marine debris through the Alliance to End Plastic Waste (AEPW) and explained the Declaration of the Global Plastics Association and its contents, including their strategy for industry action (more info on www.marinelittersolutions.com). Mr Stewart spoke about the ACC Sustainability Goals such as the targets of 100% of plastic packaging being recycled or recovered by 2040 and how to achieve this goal: Designing and inventing new circular business models, educating consumers to change behaviour, expanding access, investing in new infrastructure. Mr Stewart also described some of the best practices to contain pellets, flakes and powder from loss.

Session 7: Developing proposals for further action to prevent marine litter and plastic pollution

44. Participants were divided in the same working groups as the day before to continue discussing the proposals and logical frameworks for the special programme (the template log frame can be found in Annex IV). Ms Francesca Cenni introduced the activity and moderated the interventions of the rapporteurs representing each one of the four working groups. Ms Dina Abdelhakim evaluated the proposals presented. Among the issues to be considered for the project proposals were: Background situation of plastics pollution in the coastal areas located near the plastic gyres in the southern pacific which focussed on microplastics, the monitoring of POPs in plastics, awareness raising for school children and proposals to raise awareness among the different stakeholders involved in the management of plastic wastes.
45. Ms Abdelhakim recognized the each group's efforts given the short time to develop this work. She mentioned the importance of thinking beyond the baseline and considering the sustainability of a project in the future, meaning that the results of the projects should be though to last as long as possible. She

mentioned the need to add more detail, for example being specific on the type of training for stakeholders and the importance of mainstreaming elements. Activities such as a national development strategy are very positive to bring relevant industries together and across sectors. Finally she mentioned the importance of including gender considerations, one of the topics which is important to the special programme.

46. All participants completed the evaluation sheets during the closing of the workshop and facilitator Ms Francesca Cenni handed out the certificates of attendance. Ms Outters thanked the Swedish government and the BRS Secretariat for making this workshop possible and congratulated the team at Spain-SCRC for the hard work. Ms Outters thanked the active participation of all the experts, speakers, focal points and government representatives who attended the workshop and wished for fruitful work in the future.

Evaluation comments and recommendations

47. The following questions were included in the evaluation sheets that participants filled in:

- **On a scale of 1 to 10, what is your level of satisfaction?**

The participants responded to be very satisfied with 8 – 10 mark on average, stating that there was a great amount of useful information provided and speakers were appropriate.

- **Did the training activity meet your expectations?**

The overall answer was very positive, stating that this workshop would help them deal with problems locally and nationally, with many potential measures and activities that are feasible to implement. Some were more than satisfied, stating the workshop had surpassed their expectations.

- **What did you like about the training?**

Participants were particularly satisfied with the high-level speakers and quality of presentations, the organization and useful exercises. Many others were greatly satisfied on the location and facilities. Some were particularly satisfied with seeing different points of view and possible solutions, mentioning that they had learnt that whichever ESM systems are in place it is always subject to improvement and innovation.

- **What did you dislike about the training? And therefore, what would you improve?**

The overall feeling gathered from the comments was that there was a great amount of information for the length of the workshop and a maybe challenging to take it all in and digest, some added they would have liked further time for discussion and exercise. The need for more information on regulations and best practices, and greater insights into developing countries, their challenges and different approaches was also mentioned. Finally, some would have liked a field visit to recycling companies.

- **How useful did you find the structure of the training and methodology? Was there an appropriate balance between lectures, discussion, work sessions and interactive tools?**

The general response was that the structure was excellent however; the group exercises were difficult to conclude in the short time available.

- **Are you satisfied with the logistical aspects?**

Most participants found the logistics very convenient and well explained to them and were thankful for the hospitality. They found that the technical support was excellent, meals and coffee breaks were satisfactory.

- **Do you have any recommendations to the Secretariat and the trainers for future training activities on the Basel and the Stockholm Conventions?**

Some attendants reflected their interest for training on reporting activities, and stated that four days would be more appropriate to allow for better group work. Additionally, some participants lacked information on the countries experience in applying for the special programme, other funding mechanisms and hands on training on waste inventories. The need for further training of the focal points and further support to implement the national plans was also expressed. Finally, it was mentioned that it would be interesting to replicate this workshop in other regions.

- **Would you like to add any comment?**

Some participants added that they expected the continuation of these activities and some would find interesting to have more information on lost fishing gears and methodology for plastic litter in the marine environment and microplastics. Some mentioned the need for DSA payment to be made ahead, prior to the start of the workshop and the need for further support to the focal points to implement the conventions in the countries. This was a rewarding experience.

Interactive quiz with real time visualization

48. An interactive presentation software (www.mentimeter.com) was used to carry out a quiz at the closure of the event, asking participants on their acquired knowledge on some of the highlights of the workshop. Ms Outters led the activity by reading out the questions, engaging with the audience in an entertaining activity that could evaluate then training effectiveness. The questions presented were the following (the results can be found in Annex V):
    - Which sectors are known for producing the greatest quantity of polymers?
    - Could you rank the additives according to their global use?
    - Which contaminants would you expect to find in recycled plastic products?
    - What is waste prevention?
    - What is waste minimization?
    - In your opinion, which is the best alternative to single use plastic bags for the Latin America and African context?
    - Can you sort the waste hierarchy categories from the most to the least preferable?
    - To which of this product category can we implement an EPR Scheme?
    - DRS system could achieve beverage container collection rates of?
    - How many new polymers are listed in the Norwegian proposal under the code B3010?
    - Are you planning to apply to the Special Programme?
    - What will be your priority action in your country with knowledge acquired in this workshop?

Main conclusions and recommendations of the Workshop

49. The main takeaways from the first day were the variety of software and tools to carry out inventorying of plastic wastes, including material flow analysis and substance flow analysis, experts described the feasibility, challenges and lessons learnt in the process of carrying out inventories in different countries, both in developing economies and developed countries. The first day was equally useful to set the scene with regards to the countries obligations under the Basel and Stockholm conventions and learn about upcoming opportunities to participate in trainings, collaborate under on going projects and apply for funding under the Special Programme. The closing exercise gave an opportunity for participants to network, meet each other and discuss personal and country experiences.

50. The second day highlighted the importance of prevention schemes, with a variety of opportunities such as Extended Producer Responsibility and Deposit-refund systems being the focus of the presentations. Attendants were also able to learn about innovative approaches to increase collection and recycling, the policy options with a practical and entertaining exercise on the roles of different actors and stakeholders, participants were invited to take part and debate with colleagues. The greatest achievement of the second day however was the deep look at alternatives to plastic products such as the rise in bioplastics and compostable bags, erasing some of the most dangerous misconceptions in relation to the ESM of plastic materials.

51. The third day, although lighter in presentations was full of highly technical material, debating on the challenges of implementing a circular economy with the presence of toxic additives in plastic products and an overview of incineration and non-combustion technologies as disposal systems for waste. The day concluded with some insights from private sector association and the conclusion and presentation of the project proposals by the participants.

Annex I
Workshop Agenda

DAY 1 – WEDNESDAY 3th April 2019		
8:30 – 9:00	Registration	
9:00 – 9:10	Welcome	*Mr. Josep Maria Tost,* Director, Waste Agency of Catalunya
Morning session 09:10 – 10.15	Opening remarks	*Ms. Magali Outters*, Team Leader Policy Area, Stockholm Regional Centre in Spain and SCP-RAC Barcelona Convention – UN Environment Programme - Mediterranean Action Plan (SCRC-SCP/RAC), *Ms. Francesca Cenni,* BRS Secretariat
	Objectives of the workshop and participants' introduction	*Ms. Magali Outters*, SCRC – SCP/RAC
10:15 – 10:45	***Group Photo & Coffee Break***	
Session 1: Introduction the global marine litter challenge and the role of environmentally sound management of plastic wastes to prevent marine litter plastics and microplastics		
Morning session 10:45 – 11:45	Global plastics pollution issues and policy responses (30 min.)	*Mr. David Lerpiniere , ISWA*
	Obligations and developments related to plastic wastes under the Basel Convention in synergies with the Stockholm Convention (20 min.)	*Ms. Francesca Cenni,* BRS Secretariat
Session 2: Environmentally Sound Management (ESM) of plastic wastes: Inventories and national surveys		
11:45-12:00	UNEA 4 resolution on source inventories	*Ms. Sofie Bruun,* UN Environment, Ecosystem Division
12:00-12:30	<u>Experiences and tools for inventories at the national level</u> Inventories of plastic inputs and outputs: draft methodology for data collection and plastic leakage assessment (20 min.)	*Mr. Julien Boucher*, EA
12:30 – 14:00	***Lunch***	

Afternoon session 14:00 – 15:00	Plastic inventory Austria and STAN tool on material and substance flow analysis (20 min) Initial Inventory of plastics imports in Nigeria as a basis for more sustainable management policies (2018) (20 min.)	*Prof. Johann Fellner*, Waste and Resource Management Group of the Technical University Vienna *Mr. Joshua Babayemi,* Bells University of Technology, Nigeria
15:00-16:00	<u>Experiences and tools for inventories at the local level</u> ISWA Plastics Pollution Calculator tool for assisting municipalities in tackling plastics pollution (15min) Plastic Flow Diagram Tool to evaluate plastic leakage into waterways and the ocean, case studies of Indonesia and Algeria (20 min) Case studies on inventories of plastic wastes in the State of Sao Paulo, Brazil (20 min.)	*Mr. David Lerpiniere , ISWA* *Ms. Elena Rabbow*, GIZ *Ms. Claudia Lamparelli*, SCRC Brazil
16:00 – 16:30	***Coffee Break***	
16:30 – 17:50	Overview of the Special Programme and submitting an application for funding (20 min.) Exercise: Development of project proposals for the collection and compilation of a national inventory of plastic wastes	*Ms. Dina Abdelhakim,* Special Programme Secretariat, Chemicals and Health Branch, UN Environment *All participants*
17:50 – 18:00	Wrap up of day 1	
END OF DAY 1		
18:15 – 19:30	**Welcome Cocktail**	

DAY 2 – THURSDAY 4TH April 2019		
Session 3: Environmentally sound management of plastic wastes: Policies and financial mechanisms for waste prevention and waste management		
Morning session 09:00-09:30	EPR schemes: exploring different options through lessons learned from existing initiatives (30 min)	*Mr. Ignasi Puig*, ENT
9:30-10:15	Practical exercise on EPR schemes	*All participants*
10:15 – 10:45	***Coffee Break***	
10:45 – 12:15	Innovative approaches to increase the collection and recycling of packaging waste (45 min)	*Mr. Francesc Giró,* Catalan Waste Agency
12:15-13:00	Deposit-refund systems (DRS) for plastic packaging: theory and practice (20 min)	*Mr. Miquel Roset,* Retorna foundation
13:00 – 14:30	***Lunch***	
Afternoon session 14:30-15:00	Overview of policy options to ban single use plastic bags (20 min)	*Mr. Pedro Fernandez*, SCRC – SCP/RAC
Session 4: Emerging topic: Bioplastics, opportunities and challenges ahead		
15:00 – 16:00	Challenges and opportunities related to bioplastics for the public administration (15 min) Latest developments from the industry (15 min) Challenges related to bioplastics from a research perspective (15 min)	*Mr. Francesc Giró,* Catalan Waste Agency *Ms. Constance Iβbrücker*, European Bioplastics Association *Dr. Marinel·la Farré Urgell*, Spanish National Research Council
16:00 – 16:20	**Coffee break**	
Session 5: Developing ESM strategies for plastic waste		
16:20 – 16:40	Main steps for the development of Strategies for the ESM of plastic waste at the national and municipal levels (20 min)	*Ms. Francesca Cenni,* BRS Secretariat
16:40 - 17:45	Group work	*All participants*
17:45 – 18:00	Wrap up of day 2	
END OF DAY 2		

DAY 3 – Friday 5th April 2019		
Session 6: Environmentally sound management of plastic waste: material recovery, recycling and final disposal		
Morning session 09:00 – 10:00	Current challenges for the recycling of plastic waste and EU approaches to overcome them (30 min)	*Ms. Clarissa Morawski,* Reloop Platform
10:00-10:30	Additives in plastics, and the circular economy (20 min)	*SCRC-SCP/RAC*
10:30 – 11:00	***Coffee break***	
11:00 – 11:30	Hazardous substances in recycling, contamination of the plastics recycle stream into new products (20 min)	*Mr. Jindrich Petrlik*, IPEN - ARNIKA
11:30-12:30	Incineration of plastic wastes: Emission and leaching of potentially toxic substances (20 min) Non-combustion technology (20 min)	*Mr. Roland Weber*, SCRC - SCP/RAC expert *Mr. Lee Bell*, IPEN
12:30-13:00	Plastic Industry Efforts to Reduce Marine Debris (20 min)	*Mr. Harris Stewart,* American Chemistry Council, Marine and Environmental Stewardship, Plastics Division
13:00 – 14:30	***Lunch***	
Session 7: Developing proposals for further action to prevent marine litter and plastic pollution		
Afternoon session 14:30 – 15:30	Group work on developing project proposals	*All participants*
15:30 – 16:00	***Coffee break***	
16:00 – 16:30	Wrap up of day 3, quiz and conclusions	
16:30 – 17:00	Evaluation and certificates	All participants
END OF THE WORKSHOP		

Annex II
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Annex IV
Exercise template used for the working groups

Table 1: Stakeholders Analysis

Selected topic:

Relevant Institutions and Stakeholders	Mandate and/or Interests

<u>Appendix II</u>: Relevant Outline and Tables for Exercise on the development of project proposals

Problem statement:
Stakeholders and Target group:
Overall objective:
Project objectives:
Project results including indicators:
Project activities:

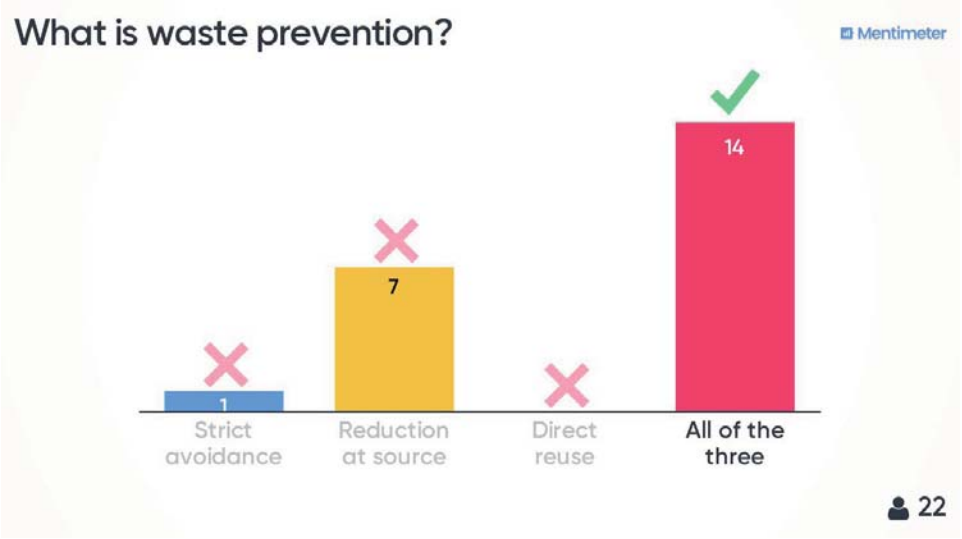
PROJECT DESCRIPTION (LOG FRAME)		
Overall project outcome	**Indicators**	**Means of verification**
Insert the overall project outcome	*[All indicators should have a measurable Baseline and Target listed in brackets]*	*Insert both data source and method for measuring progress against indicator target*
Performance targets (project milestones that show progress towards completing the project outputs and achieving the overall project outcome)		**Expected Milestone for each reporting period (annual)**
Milestone[1] *Insert*		*Insert* **Month/Year**
M2 *Insert*		*Insert* **Month/Year**
M3 *Insert*		*Insert* **Month/Year**
… *Insert*		*Insert* **Month/Year …**
1. Project Activity/Output	**Indicators**	**Means of verification**
Insert first project activity/output	*Insert Indicator (plus measurable baseline and target in brackets)*	*Insert both data source and method for measuring progress against indicator target*
Project activity/output Milestones:		**Expected Milestone for each reporting period (annual)**
M1 *Insert one milestone for the first six-month period for the first project activity/output*		*Insert* **Month/Year**
M2 *Insert one milestone for the second six-month period for the first project activity/output*		*Insert* **Month/Year**
M3 *Insert one milestone for the third six-month period for the first project activity/output*		*Insert* **Month/Year**
… *Insert*		*Insert* **Month/Year …**
2. Project Activity/Output	**Indicators**	**Means of verification**
Insert second project activity/output	*Insert Indicator (plus measurable baseline and target in brackets)*	*Insert both data source and method for measuring progress against indicator target*

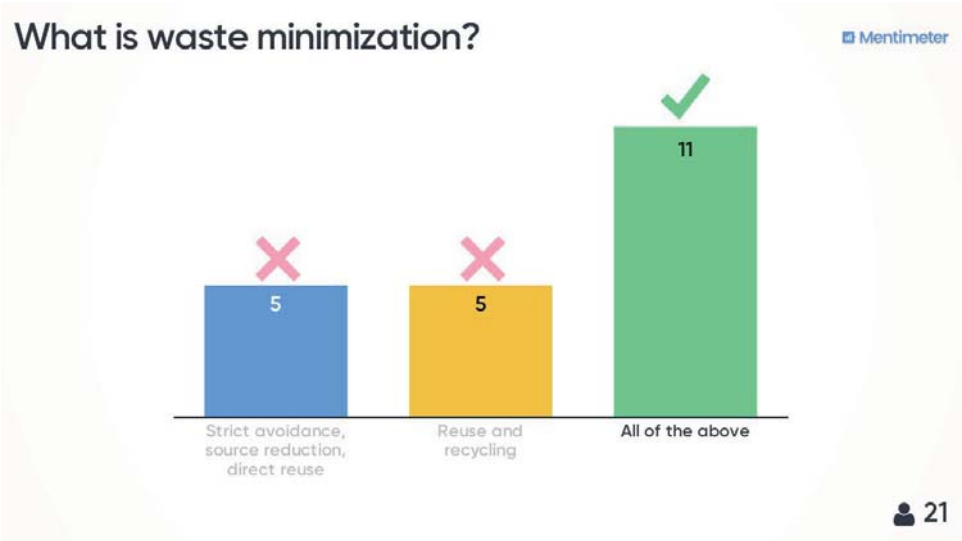
[1] ***Performance Targets / Milestones:*** *Are benchmarks (not activities) that represent attainment of a project stage or project achievement that show progress towards project outcomes and outputs. Milestone attainment should be strictly answerable with a "yes" or "No" answer.*
Outcome milestone will often show progress on a particular outcome indicator target, but can also be a major significance benchmark , believed to lead to the outcome

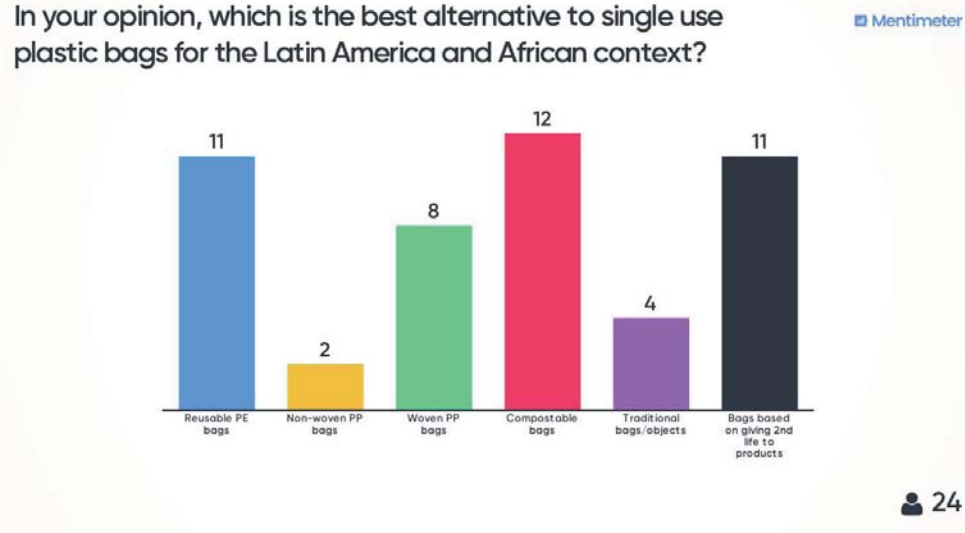
	Project activity/output Milestones:	Expected Milestone for each reporting period (annual)
	M1 *Insert one milestone for the first six-month period for the first project activity/output*	*Insert* **Month/Year**
	M2 *Insert one milestone for the second six-month period for the first project activity/output*	*Insert* **Month/Year**
	M3 *Insert one milestone for the third six-month period for the first project activity/output*	*Insert* **Month/Year**
	… *Insert*	*Insert***Month/Year …**

Annex V

Results of the interactive online quiz (Mentimeter)

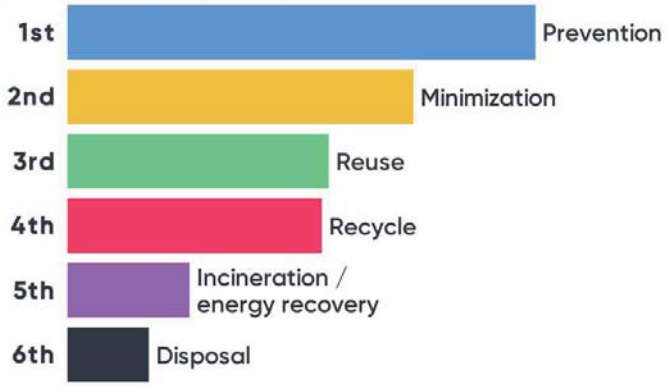

What is waste prevention?
Mentimeter
14
7
1
Strict avoidance
Reduction at source
Direct reuse
All of the three
22


What is waste minimization?
Mentimeter
11
5
5
Strict avoidance, source reduction, direct reuse
Reuse and recycling
All of the above
21


In your opinion, which is the best alternative to single use plastic bags for the Latin America and African context?
Mentimeter
11
2
8
12
4
11
Reusable PE bags
Non-woven PP bags
Woven PP bags
Compostable bags
Traditional bags/objects
Bags based on giving 2nd life to products
24

Can you sort the waste hierarchy categories from the most to the least preferable?

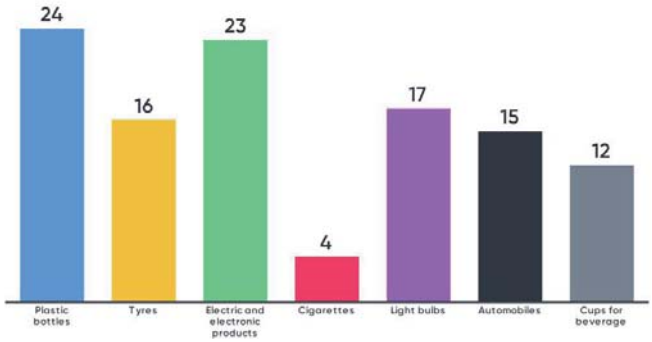
Mentimeter



23

To which of this product category can we implement an EPR Scheme?

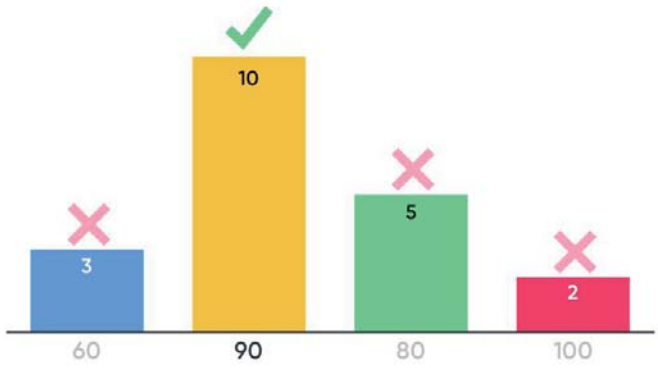
Mentimeter



25

DRS system could achieve beverage container collection rates of?

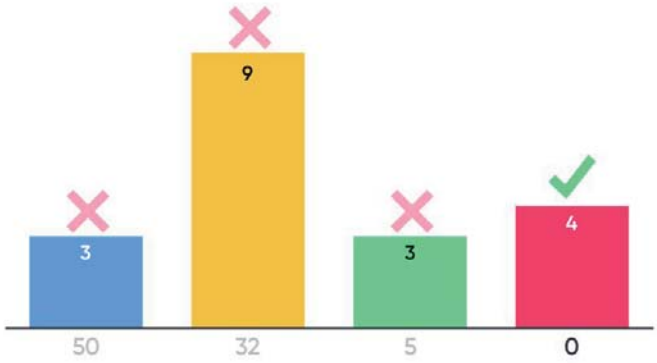
Mentimeter



20

How many new polymers are listed in the Norwegian proposal under the code B3010?

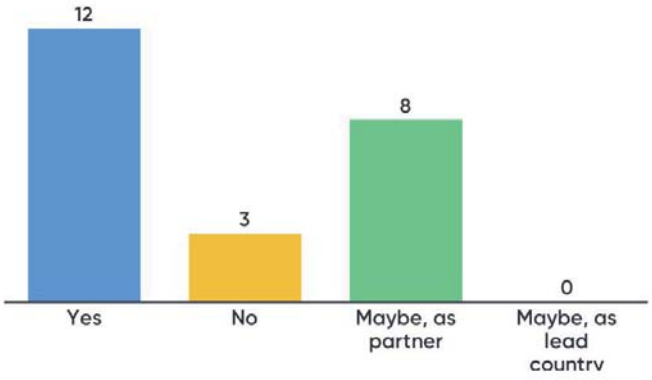
Mentimeter



19

Are you planning to apply to the Special Programme?

Mentimeter



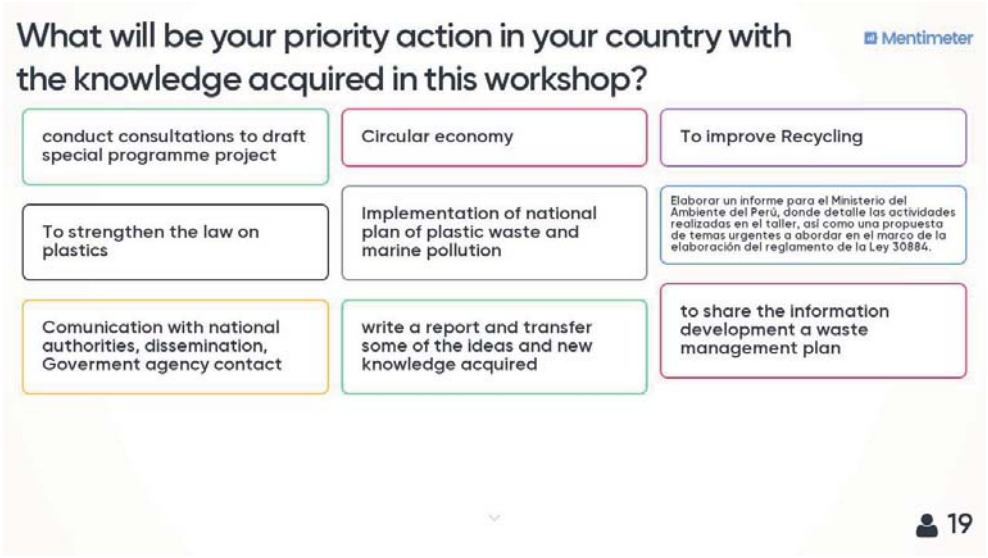
23

What will be your priority action in your country with the knowledge acquired in this workshop?

Mentimeter

To share the information	Circular economy	Share
Deposit return system	Promote projects	Deposit-refund
Development a waste management plan	Programme funding	Improve regulation and aweness

19


What will be your priority action in your country with the knowledge acquired in this workshop?
Mentimeter
conduct consultations to draft special programme project
Circular economy
To improve Recycling
To strengthen the law on plastics
Implementation of national plan of plastic waste and marine pollution
Elaborar un informe para el Ministerio del Ambiente del Perú, donde detalle las actividades realizadas en el taller, así como una propuesta de temas urgentes a abordar en el marco de la elaboración del reglamento de la Ley 30884.
Comunication with national authorities, dissemination, Goverment agency contact
write a report and transfer some of the ideas and new knowledge acquired
to share the information development a waste management plan
19