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Final report

Dialogues on the waste prevention programme II

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Final report – Summary in English

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Abstract: Dialogues on the Waste Prevention Programme II

The Waste Prevention Programme of the federal government with the participation of the states, which was first adopted in 2013, has been updated in 2021. Dialogue with various actors plays a decisive role in the implementation of the programme. To this end, the dialogues on the Waste Prevention Programme II took place in 2021 and 2022. In a total of eight dialogues with different thematic focuses, concrete approaches to the implementation of waste prevention measures were discussed. Dialogues one and two dealt with waste prevention in the area of textiles. Dialogues three and four dealt with disposable articles. The topic of waste prevention in event management was examined in dialogues five and six. Dialogues seven and eight concluded with discussions on educational measures for waste prevention and intercultural communication. About 30 people took part in each dialogue who have points of contact with the topic of waste prevention through their work or other commitments. Participants included representatives of the economy, politics and administration, research, civil society and associations. The dialogues were preceded by a situation analysis in which existing approaches and obstacles to waste prevention in the topic area were examined. At the end of each situation analysis, there were several theses that summarised the contents of the analysis. The dialogues always consisted of a webinar and a subsequent workshop. During the webinar, the findings of the situation analysis were explained and the participants had the opportunity to vote on the focus of the workshop with the help of the theses derived from the situation analysis. At the beginning of the workshops, there were always two to four short talks by people with a background in the according thematic field who gave the participants an initial stimulus. In the second phase of the workshop, participants had the opportunity to actively participate and share their thoughts using an online collaboration tool. A protocol and thematic support material, which was discussed with the participants during the dialogue, were published for each dialogue. The following report summarises all eight dialogues and ends with a conclusion.

The Appendix consisting of the protocols and the situation analyses of the eight dialogues can be found in the German version of the final report.

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List of abbreviations

BMUV	Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection
CO₂	Carbon dioxide
e.g.	exempli gratia (for example)
SUP	EU Single-Use Plastics Directive
ESD	Education for Sustainable Development
EWKVerbotsV	Directive on the reduction of certain plastic products on the environment (Einwegkunststoffverbotsverordnung)
NGO	Non-Governmental Organisation
UBA	German Environment Agency, Dessau
VerpackG	German Packaging Act (Verpackungsgesetz)
WRAP	The Waste and Resources Action Programme

1 Summary of the Individual Dialogue Formats

1.1 Dialogue 1: Durable and recyclable clothing: A contradiction or key to the circular economy?

1.1.1 State of the art

The textile industry is one of the largest global industries, that has almost tripled since 1975. The number of garments produced worldwide more than doubled between 2000 and 2014, with almost 14 garments produced per person in 2014. As a result, garments with a shortened lifespan have been and continue to be produced, while their use patterns become similar to a "disposable product" (Remy et al., 2016). Although the exact volume of textile waste remains unclear, it is estimated that 5.8 million tonnes of textiles are disposed annually by European households, which corresponds to 11.3 kg per person (Beasley and Georgeson, 2014).

Product design plays a key role in this context: to ensure the reuse and recycling of textiles but also to reduce waste generation by extending the useful life of textiles, particular focus must be put on the durability of textiles. The EU textile strategy published in March 2022, which aims to strengthen the European market with a view to sustainable and circular textiles, underlines the need for action in the industry.

1.1.2 Aim of the dialogue

The thematic focus of the first dialogue was on the durability and recyclability of clothing. Accordingly, the product design and high quality of the clothing (with regard to the use phase and the waste regime) was ought to be discussed in more detail. In the context of this dialogue, high quality was understood as clothing that can be worn for as long as possible (e.g., repairable, pill-resistant and colourfast during washing processes) and that can also be recycled after its use-phase (Kleinhüeckelkotten et al., 2017).

The quality of a garment in terms of its durability and recyclability is determined along the entire value chain. However, it should be noted that the increase in quality with regard to the durability or longevity of the clothing can have a reverse effect on its recyclability. An increase in quality with regard to the durability of the clothing must therefore be made under consideration of recyclability aspects.

Against this background, the following questions were elaborated within the dialogue:

1. Improvement of product design through interface optimization along the value chain
 - a. How to ensure successful implementation of a product design along the value chain?
 - b. What does it take to align product design and recovery?
2. Consideration of durability and reparability in product design and product policy
 - a. How can clothing longevity be factored into product design?
 - b. What are prerequisites for integrating clothing reparability into product policy (policy and business)?

1.1.3 Results of the dialogue

Based on the webinar and workshop contributions, a list of possible action measures was developed. The action measures reflect suggestions derived and interpreted on the basis of post-it's, chat and verbal contributions. They can be used as valuable signposts for the future development of the waste prevention programme.

Table 1: Overview of action measures developed in dialogue 1

Group	Action measures
Research	<ul style="list-style-type: none"> • Creating an overview of product groups, for which production with (recycled) monofibers is feasible • Examining mechanical and chemical recycling of mixed fibers
Pilot projects	<ul style="list-style-type: none"> • Collaborating with companies and initiatives to pilot recyclable textiles with life cycle assessments, including Design for Recycling-Principles
Dialogue	<ul style="list-style-type: none"> • Conducting dialogues, expert discussions and/or workshops to develop a joint transformation scenario • Developing a round table of recyclers and designers
Communication	<ul style="list-style-type: none"> • Providing an overview of existing research and pilot projects • Providing user-friendly information on upcoming legislative and regulatory measures in coordination with the "Partnership for Sustainable Textiles" • Examining the implementation possibilities (if necessary, with actors from business, civil society and research) of • consumer information campaigns • communication campaigns to raise the profile of the tailoring profession • reparability
Label	<ul style="list-style-type: none"> • Conducting a feasibility study on the integration of longevity and recyclability into existing labels

In addition, an overview of legal regulations, guidelines, strategies, eco-labels and seals was published as supporting material. The document can be viewed on the webpage of the German Environment Agency.

1.2 Dialogue 2: Ways out of the fast-fashion trap: What works for consumers and companies?

1.2.1 State of the art

The consumption of textiles with regard to its sustainability has already been addressed in various national and international surveys. For example, the Waste and Resources Action Programme (WRAP) initiative conducted a survey in Denmark, Germany, Italy and the Netherlands on clothing consumption behavior and came to the conclusion that on average, one in five consumers buys new clothing every 14 days. This accounts particularly for people within the age group 18-34, who are also those who report the lowest lifespan for their garments (in Germany, the average lifespan is 4.4 years and 5.2 years in Denmark) (WRAP, 2019). Furthermore, according to Eurobarometer 2020, 27% of more than 1.500 Germans surveyed believe that clothing should be available as cheap as possible, regardless of environment or social aspects. At the same time, 85% agreed that clothing should be made to last longer (European Commission, 2020).

Enjoyment of shopping is considered a key driver of clothing purchases, which is primarily determined by the price-performance ratio: preferably comfortable, practical, appropriate, and cheap. (Kleinhüchelkotten et al., 2017). At the same time, the concept of "slow fashion" has gained popularity in recent years. It aims to voluntarily slow down and thus limit clothing consumption through an extended use phase. Slow fashion goes hand in hand with a change in the view of consumers who are willing to buy rather a small number of high-quality garments and use those for a longer period of time (Kohlhase and Freundenreich, 2018). Here, the attention is directed from the purchase more to the use phase.

1.2.2 Aim of the dialogue

Since consumers' purchasing decisions are influenced by a number of indicators, awareness-raising measures alone usually do not lead to the desired change in behavior. Product labels, which serve to educate, are also often seen as confusing without leading to the desired result of longevity, durability or reparability. Overall, the possibility of repairing garments is little communicated and often relies on consumers' own initiative. At the same time, online markets increasingly offer an easy and fast access to new fashion garments with a gap towards awareness raising measures. Alternative business models such as "leasing instead of owning" have so far tended to be offered by start-ups instead of major brand suppliers.

Based on this background, the following questions were addressed in the second dialogue:

1. Instruments for awareness raising
 - a. How can instruments such as labeling help in addressing aspects of longevity better among consumers?
 - b. How can textile companies in the fast fashion sector be reached more successfully with aspects regarding to longevity?
2. Upscaling of slow fashion
 - a. How do we convince consumers to use alternative/sustainable consumption models (second hand, sharing, repair, renting, etc.)?
 - b. What are prerequisites for alternative business models to be scaled up by companies (rental clothing, second hand, repair services, etc.)?

1.2.3 Results of the dialogue

Based on the webinar and workshop contributions, a list of possible action measures was developed. The action measures reflect suggestions derived and interpreted on the basis of post-it's, chat and verbal contributions. They can be used as valuable signposts for the future development of the waste prevention programme.

Table 2: Overview of action measures developed in dialogue 2

Group	Action measures
Research	<ul style="list-style-type: none"> • Examining durability and sustainability - definition of terms and balance in the manufacturing process • Examining aspects of durability for different types of materials • Examining sustainable business models: Which models have been successful, why have others failed?
Dialogue	<ul style="list-style-type: none"> • Promoting open discussion and mediation between companies and the media • Developing a round table with all relevant stakeholder groups in order to initiate a broad-based communication campaign on sustainable fashion
Information provision	<ul style="list-style-type: none"> • Providing easily accessible information for authors and journalists • Creating directories on repair and upcycling for companies that offer second-hand clothing
Communication	<ul style="list-style-type: none"> • Carrying out awareness campaigns on harmful impacts occurring through the production of cheap garments (CO₂, waste water, use of chemicals, etc.) • Carrying out communication campaigns with influencers and celebrities with a wide reach.
Education	<ul style="list-style-type: none"> • Providing school lessons on global supply chains and occurring costs
Label	<ul style="list-style-type: none"> • Developing a superordinate label or merging already existing labels

In addition, Top 10 key messages on textiles were published as supporting material.

1.3 Dialogue 3: "Unpackaged Future": What course must companies and politics set for consumers today?

1.3.1 State of the art

The increase in packaging waste in Germany has been steadily rising for years: from 15.3 million tons in 2000 to 18.9 million tons in 2018 (UBA, 2020). This means that packaging consumption reached a new peak in 2018. About half of the packaging waste is generated by private end consumers, the other half in industry, trade and other economic sectors. In 2018, this meant that private end consumers generated over 8.9 million tons of packaging waste which are 107.7 kilograms per capita. This is 1.0 percent more than in the previous year 2017 and 20.6 percent more than in 2010.

There are many reasons for the high consumption of packaging. On the one hand, it is a side effect of the modern consumer society, because as the level of prosperity rises, so do the quantities of waste (UBA, 2020). Consumer habits, such as the trend toward more elaborate closures and dispensing aids, and changing lifestyles, for example more one- and two-person households, are responsible for more packaging waste. Likewise, increasing online and mail-order sales (including returns), the "to go" culture and immediate consumption when consuming on the go are also to be named as causes of more waste from disposable packaging. The growing use of packaging is also due to the fact that it increasingly fulfils other functions in addition to pure protection of the contents, for example the placement of marketing messages and information on dosage or further information, for example on the storage life or ingredients of the product.

Dialogue 3 therefore focused on "low-packaging shopping" as a solution approach for avoiding packaging waste. This placed the focus on the relationship between supply and demand between consumers or private households on the one hand and (organic) supermarkets, discounters, stores (such as zero waste shops) and drugstores as companies with stationary shopping locations on the other. Consumers can use their demand behaviour to influence offers of low-packaging shopping in the retail sector and on manufacturers. However, this demand also requires corresponding offers from retail companies that are suitable for everyday use and enable and facilitate low-packaging shopping for consumers.

As the most important reasons for buying packaged fruit and vegetables, one third of consumers said that they were practical and 15 percent of them said it was too much effort to pay attention to less packaging when shopping. At the same time, with regard to supply structures, one-third of consumers said that only packaged fruits and vegetables were available in the stores where they shopped and that they were cheaper than unpackaged products (Rückert-John et al., 2021a). Various studies (e.g., Splendid Research, 2018; Marken et al., 2020; IZT, 2018; Kröger et al., 2018; Rückert-John et al., 2021b) have shown that from the perspective of different consumers, low-packaging shopping is mostly associated with the following benefits: Avoidance of packaging waste and thus conservation of resources and reduction of environmental impacts through the use of reusable packaging; possibility of individual portioning, especially small portion sizes for the increasing single households; avoidance of food waste through needs-based purchasing.

Promoting diversification of shopping patterns by offering alternatives to supermarkets; avoiding oversized packaging; promoting regionally and organically produced goods; reducing advertising that encourages the purchase of non-essential products; and promoting the use of sustainable materials (in sales as well as in retail).

The following aspects were identified by the studies as disadvantages and barriers to low-packaging shopping: often higher prices of unpackaged goods; unsuitability of certain goods (such as meat) to be offered as loose goods or packaging-reducing alternatives; aspects of storage and hygiene; lack of product information, such as ingredients, best-before date; limited practicability in everyday life, such as transport, storage, shelf life; limited choice due to limited assortment; additional expense, e.g., containers, deposits as well as accessibility, store density, timing.

1.3.2 Aim of the dialogue

Dialogue 3 therefore aimed to discuss how, on the one hand, consumers can be encouraged to change their shopping routines (changes in demand behaviour) and, on the other hand, companies can be prompted to make their sales more sustainable and still suitable for everyday use (changes in supply). It was also discussed which political and economic approaches are promising to promote low-packaging concepts.

1.3.3 Results of the dialogue

Based on the webinar and workshop contributions, a list of possible action measures was developed. The action measures reflect suggestions derived and interpreted on the basis of post-it's, chat and verbal contributions. They can be used as valuable signposts for the future development of the waste prevention programme.

Table 3: Overview of action measures developed in dialogue 3

Group	Action measures
Consumer communication	<ul style="list-style-type: none"> • Carry out campaigns on ecological advantage, hygiene, use of reusable/own containers • Advertise actively (e.g. through discounts) • Promote exchange, e.g. via social media campaigns • Develop and disseminate educational material • Support certified seal/label unpacked
Studies	<ul style="list-style-type: none"> • Overview of reusable/deposit systems with information on their ecological benefits • Overview of different life cycle assessments and other consideration of the ecological input of packaging, development of an "independent" life cycle assessment. • Life cycle assessments - comparison of reusable vs. disposable; by product group, quantity
Promote reusables	<ul style="list-style-type: none"> • Emphasise fun factor of refilling, facilitate operation • Promote standardisation/certification of containers • Put up signs indicating what is on offer • Introduce a uniform reusable deposit sales packaging system (pool solution, "dispense everywhere") • Provide funding for the development of reusable systems • Make cargo bikes available • Promote cleaning service systems
Regulation	<ul style="list-style-type: none"> • Create price/tax advantages for reusable versus single-use containers • Develop binding reduction targets with food retailers
Hygiene	<ul style="list-style-type: none"> • Create legal certainty for unpacked food at the fresh food counter and To-Go packaging

Group	Action measures
	<ul style="list-style-type: none">• Train staff and employees
Innovation	<ul style="list-style-type: none">• Develop new materials, e.g. for reusable lids for deposit jars• Advance digitalisation in the unpacked shop (identification system, weighing process)• Set up pilot projects for (digitalised) refilling stations• Develop machines or apps for the easy return of reusable containers (e.g. with gamification).
Dialogue	<ul style="list-style-type: none">• Round table on packaging avoidance in the food retail sector• Creation of a neutral platform for discourse• Interdisciplinary think tank for the development of solutions

In addition, an article on the topic of reusable packaging and reusable packaging systems, which also focusses on regulations, was published as supporting material on the UBA website.

1.4 Dialogue 4: Reusable instead of waste: How can the reusable offer in gastronomy be optimised?

1.4.1 State of the art

Out-of-home consumption includes drinks (to-go) and ready-to-eat meals (takeaway). Both are sold almost exclusively in disposable packaging. In 2017 out-of-home consumption in Germany generated around 281,000 tonnes of waste from disposable tableware and packaging (GVM, 2018). Research has shown that disposable takeaway and to-go containers alone are responsible for more than 20% of the waste generated in public waste bins (Kauertz et al., 2019). According to Belke et al. (2020), takeaway and to-go packaging is the largest littering group in urban areas in terms of volume and mass.

In a life cycle assessment prepared for the Federal Environment Agency, reusable cups performed better than average disposable cups after about 25 usage cycles (Kauertz et al., 2019). The majority of reusable cups are designed for more than 200 cycles of use. The most ecologically promising variant of reusable systems are pool systems, in which a central service operator maintains reusable containers and makes them available to participating companies. The operators set a uniform deposit level, are responsible for balancing the quantities and deposits between the businesses and for exchanging containers. Alternatively, there are systems in which no deposit is made. Instead, personal data is linked to the container data in an app and the purchase price of the container is collected if it is not returned (Kleinhüchelkotten, 2020). The cleaning is usually done by the collection points. At the same time, the systems publish in their own apps or online cards which businesses are participating and often provide them with further marketing material and training on hygiene. Pool systems offer the opportunity to develop a high density of sales and return points and to achieve high visibility and acceptance among consumers through their uniform appearance.

There are more than twenty pool systems for returnable cups in Germany. Most of them are regional stand-alone solutions, with the largest systems operating supraregionally. These systems are operated either by private-sector companies, public waste management authorities or local initiatives (Kauertz et al., 2019). Furthermore, there are at least six supraregional pool systems for takeaway containers.

Due to the amendment of the German Packaging Act, at least medium-sized and larger companies will be obliged to offer reusable containers from 2023. This will make pool systems very widespread, which could also make it easier for smaller companies to get started. However, smaller companies can also fill private containers instead. Small outlets and vending machines, which are exempt from the obligation to offer reusable containers, are a major source of disposable cups and containers. Many of the small outlets lack the necessary dishwashing and storage facilities. Participation in pool systems is only possible if these services are provided by a reusable system operator, for example.

1.4.2 Aim of the dialogue

The implementation of the EU Single-Use Plastics (SUP) Directive will put great pressure on stakeholders in the to-go and takeaway sector. If the SUP packaging that is eliminated by the Directive on the reduction of certain plastic products on the environment (EWKVerbotsV) is substituted by reusable solutions instead of other disposable products, a reduction in waste generation and littering can be expected.

The acceptance of reusable solutions by consumers is largely dependent on their user-friendliness. This requires a dense, clearly visible network of participating sales outlets and return facilities.

The aim of the dialogue was to develop suitable measures to make reusable systems in out-of-home consumption from a niche solution to the standard. To this end, the scaling of deposit systems and raising awareness of customers and sales outlets were identified as key topics during the webinar.

1.4.3 Results of the dialogue

Based on the webinar and workshop contributions, a list of possible action measures was developed. The action measures reflect suggestions derived and interpreted on the basis of post-it's, chat and verbal contributions. They can be used as valuable signposts for the future development of the waste prevention programme.

Table 4: Overview of action measures developed in dialogue 4

Group	Action measures
Consumer communication	<ul style="list-style-type: none"> • Active promotion of reusable alternatives e.g. visible placement in the shop, direct reference to reusable alternatives in sales talk to customers, signs, stickers or similar in the catering business to draw customers' attention to the use of reusable systems. • Discount promotions for customers for choosing reusable options or charging an additional fee for using disposable products
Legal requirements	<ul style="list-style-type: none"> • Ban on (free) disposable cups and containers • Supporting catering businesses in the introduction of reusable containers through subsidies • Introduce concrete targets for the reduction of disposables
Networking and support	<ul style="list-style-type: none"> • Organise networking opportunities for groups involved to promote regular exchange (e.g. round table, networking event)
Awareness raising and education	<ul style="list-style-type: none"> • Make hygiene guidelines for reusable systems available online and also distribute them to catering establishments. • Train catering staff in the use of reusable systems • Raise awareness for reusable packaging in schools
Reusable systems	<ul style="list-style-type: none"> • Creation of a uniform coding system for products certified by the Blue Angel. • Introduction of a reusable pool system • Introduction of additional return points such as deposit machines at hubs for reusable products • Introduction of dishwashing facilities for small sales outlets • Produce reusable products from recyclable material that does not become discoloured when filled with food • Expand the range of reusable containers to allow the sale of a wider variety of food for which there are currently no available containers (e.g. pizza)

In addition, an overview of funding opportunities for packaging waste prevention and reusable offers was published as supporting material.

1.5 Dialogue 5: Clean business: Low-waste consumption of food and beverages at large-scale events

1.5.1 State of the art

In 2015 there were around 495 music festivals with more than 10,000 visitors in Germany (Destatis, 2017). There are also major municipal events such as Christmas markets and other seasonal market events, folk festivals and fairs, city and district festivals. According to the Deutscher Schaustellerbund e.V. (2018), there were around 160 large folk festivals, 26 of which had more than 1 million visitors in 2018. The number of Christmas markets in 2018 was estimated at around 3,000 with a total of 159.7 million visitors (Rast and Seyedewitz, 2018).

At large-scale events a significant part of the waste is generated by the gastronomic offer. The use of disposable cups and dishes for on-site consumption causes the majority of waste generated at large-scale events. According to Kopytziok and Pinn (2011), in a study of 19 events in the 1990s, it was observed that by switching from disposable to reusable catering, the amount of waste per person per day could be reduced from 363g to 39g.

Some of the disposable tableware usually used at events may no longer be placed on the market as of 03.07.2021 due to the EWKVerbotsV. This applies in particular to disposable plates, cutlery, drinking straws and stirrers made of plastic.

Due to the amendment of the Packaging Act (VerpackG) in 2021 a reusable option has to be offered if drinks are also sold in disposable cups and food in disposable plastic containers for immediate consumption from 01.01.2023 onwards. Pursuant to Section 2 (5) of the Packaging Act, municipalities can issue binding requirements for third parties when using their facilities or properties in order to achieve a reduction in the volume of waste (BMU, 2013). These may include an obligation to use reusable tableware, optionally with a deposit, a ban on the use of disposable cans and bottles or portion packaging.

While reusable cups are already used at a wide range of events, this is only rarely the case in food sales. For the use of reusable dishes, either washing facilities have to be created on site or service providers with their own washing centres have to be contracted for the collection, transport and cleaning of the dishes. The costs of a reusable system with on-site dishwashing facilities represent a significant financial burden for event organisers and stand operators. In order for the reusable system not to have negative economic consequences, a high number of participating catering stands is necessary. Often, organisers are additionally dependent on sponsoring or subsidies to cover the costs. For food sales, there is a risk that organisers and stand operators will switch to disposable tableware made of materials other than plastic in order to circumvent the reusable offer obligation of the Packaging Act.

Municipalities can provide their own reusable systems with their own tableware and cups for events. For this purpose, contracts are concluded with partner companies for storage and washing logistics by the municipality, through which the event organisers receive discounted access to the municipal system. The use of the system can be part of the municipal requirements for events on public land.

Catering at events with and without camping causes large amounts of waste beyond the disposable products problem. After residual waste, food waste is the largest separately collected waste fraction at large events. On the one hand, food waste is generated by the catering industry and on the other hand, unused food is generated by visitors in the camping area. Current solutions include local supply through festival supermarkets on the one hand and cooperation with non-profit organisations on the other hand to pass on surplus food and groceries.

1.5.2 Aim of the dialogue

As part of the dialogue, the participants in the workshop were to develop measures in two working groups which, on the one hand, contribute to the successful establishment of reusable systems at large-scale events and, on the other hand, help to reduce food and catering waste.

1.5.3 Results of the dialogue

Based on the webinar and workshop contributions, a list of possible action measures was developed. The action measures reflect suggestions derived and interpreted on the basis of post-it's, chat and verbal contributions. They can be used as valuable signposts for the future development of the waste prevention programme.

Table 5: Overview of action measures developed in dialogue 5

Group	Action measures
Event concepts	<ul style="list-style-type: none"> • Development of an overall concept for large-scale events for reusable products to counteract individual branding and the associated one-off use of reusable products. • Planning of an infrastructure for large-scale events that favours easy return of reusable products
Standards and regulations	<ul style="list-style-type: none"> • Mandatory reuse or single-use ban at large-scale events • Lifting the ban on dumpster diving for food • Concrete requirements for the safety, hygiene and sustainability of reusable products
Networking and support	<ul style="list-style-type: none"> • Procurement of reusable systems and rinsing units by municipalities which can be used for all events • Municipalities conclude contracts with e.g. rinsing logistics providers so that their services can be used at a lower price for local events • Provide platforms for interested stakeholders to exchange information • Provide financial support for the introduction of reusable systems and rinsing logistics
Awareness raising and education	<ul style="list-style-type: none"> • Raise awareness among visitors about the need to buy food in moderation. • Make visitors aware of the environmental benefits of having less food available in the catering at the end of the event. • Educate visitors about the use of disposable vs. reusable products

In addition, an overview of examples of best practice large-scale events with regard to reusable materials was published as supporting material.

1.6 Dialogue 6: Large-scale events without any waste at all? Innovative solutions for effective waste management

1.6.1 State of the art

The schedule of large-scale events is made up of the planning, construction, operation and dismantling phases. During the construction and dismantling phases, decoration and equipment materials, building materials, problematic materials, various recyclable materials and residual waste are produced. In the operational phase of the event, mainly recyclable materials and mixed residual waste are generated (Abel-Lorenz, 2000).

During the operating phase at large-scale events without camping, the waste volume mainly consists of disposable packaging and tableware for food and beverages, food waste, beverage bottles and promotional items such as give-aways and flyers. At large-scale events without admission controls, additional waste is brought in by the public. In a study by the GEOMAR Institute, this accounted for around 12% of littering in the fjord during Kiel Week 2018 (Villwock, 2018). At large-scale events with camping, significant amounts of bulky waste such as refrigerators, sofas and especially tents left behind are added.

The amount of waste generated and its separate collection is significantly influenced by the waste management of the organisers. At large-scale events without camping, an average of 0.36 kg was observed in other studies (Kopytziok and Pinn, 2011). Through extensive waste prevention measures, the Oktoberfest and Kieler Woche have succeeded in reducing the amount of waste generated to 0.01-0.02 kg per person per day (Wehrmann, 2019; Landeshauptstadt Kiel, 2018).

Waste concepts for large-scale events are rarely required in municipal bylaws in Germany. In Austria and Switzerland, several municipalities require the preparation of waste concepts for the approval of an event.

In most cases, the organisers only require the stand operators to set up a minimum number of waste bins per stand for waste from visitors and to organise their emptying. Some event organisers, in turn, organise their own waste management infrastructure, the use of which is obligatory for stand operators. These can include temporary recycling centres and collection services for separately collected waste. Environmental deposits encourage stand operators to leave their stands clean after dismantling and to comply with the environmental terms of participation (Grüne Liga, 2019 and 2014; Kaute, 2019).

Event organisers reduce waste by using digital information products and multi-year, timelessly designed banners and other promotional materials (e.g. by providing QR codes). There are reusable options for infrastructure, decoration, stages and other set-ups that can either be rented or purchased for events (Grüne Liga, 2021). With appropriate planning, these can be used by event organisers over several years. However, it is crucial that appropriate storage space is available regionally. Reusable products and materials suitable for preparation for reuse from the set-up and dismantling phases can also be made available to non-profit organisations after the event.

Separate collection is difficult to implement in the public area, as visitors are often rather inattentive when disposing of their waste. The number of fractions to be collected separately, the positioning of the containers and their labelling play an important role in the success of separate collection. If a sufficiently large share of visitors lack the motivation to participate, the success of waste prevention measures is limited. Events that already tend to attract a more

environmentally aware audience have advantages here over events that are attended by a broader segment of the population.

1.6.2 Aim of the dialogue

As part of the workshop, the participants were to develop measures in two working groups which, on the one hand, contribute to raising visitors' awareness of waste prevention and separation and, on the other hand, to increasing reuse through organisational measures.

1.6.3 Results of the dialogue

Based on the webinar and workshop contributions, a list of possible action measures was developed. The action measures reflect suggestions derived and interpreted on the basis of post-it's, chat and verbal contributions. They can be used as valuable signposts for the future development of the waste prevention programme.

Table 6: Overview of action measures developed in dialogue 6

Group	Action measures
Role models	<ul style="list-style-type: none"> • Role models (e.g. artists) are involved in the run-up to large-scale events in order to sensitise participants and visitors to waste avoidance and separation • During a large-scale event, trash heroes and/or trash scouts draw the attention of visitors and participants to waste avoidance and separation
Networking	<ul style="list-style-type: none"> • By connecting organisers, materials can be shared and knowledge exchanged • Multiplier effects (e.g. through associations) are used to collect best practice examples, checklists, information and key messages and pass them on to as many stakeholders as possible
Infrastructure	<ul style="list-style-type: none"> • Organisers need to be able to store their materials so that they can use them for several years. Municipalities could provide storage facilities • Special drop-off points (e.g. at central locations on the event site) and half-open waste bins should be used to make waste separation and prevention as easy and low-threshold as possible
Regulations	<ul style="list-style-type: none"> • Clear (legal) requirements for the use of sustainable and reusable materials are created for stakeholders involved in large-scale events
Materials	<ul style="list-style-type: none"> • For materials used at large-scale events, multi-year use is considered from the outset, e.g. through neutral branding or the use of durable materials

Following the workshop, an overview of networking opportunities for the realisation of sustainable large-scale events was published as support material.

1.7 Dialogue 7: Waste prevention must be learned: Educational measures for waste avoidance in secondary schools I and II

1.7.1 State of the art

The concept of Education for Sustainable Development aims to enable present and future generations to live well in socially, economically and ecologically just conditions (Arnold et al., 2016: 4). It is designed to ensure that knowledge about sustainable development can be put into practice and that learners acquire design skills such as anticipatory thinking, autonomous action and interdisciplinary knowledge (BMU, 2019: 26). The topics of waste prevention and the impact of waste on the environment play a central role for children and young people, as they are closely linked to their everyday actions.

Waste prevention comes before preparation for reuse, recycling, energy recovery and landfilling in the waste hierarchy according to the Recycling Law. Nevertheless, the general public often associates recycling with waste prevention (Cox/Giorgi, 2010; Thomas/Sharp, 2013; Tucker/Douglas, 2007). This is reflected in the continuous growth of the amount of household-typical municipal waste over the last 20 years from 458 kilograms per inhabitant in 2000 to 543 kilograms per inhabitant in 2019 (UBA, 2021). Raising awareness of the issue at an early age can counteract this trend, as it is precisely in younger years of life that people are more open to trying out new consumption and waste practices than in later ones (Rückert-John et al., 2021b: 45).

Education in schools plays a central role in this context (BMU, 2020: 56), because schools as providers of education for sustainable development (ESD) can, on the one hand, adapt their own processes and structures to sustainability criteria and thus, in the sense of the "whole institutional approach", focus on the school as a holistic place of learning (cf. Bänniger et al., 2007). On the other hand, ESD is anchored in the school context through curricula. Curricula concretize for teaching staff the educational goals specified in the individual federal states by school law and serve as an orientation in terms of content and methodology (Arnold et al., 2016: 5).

In the curricula of secondary schools I and II, the topic of waste prevention has so far only been explicitly mentioned in a few federal states (Bavaria, North Rhine-Westphalia, Hamburg, Schleswig-Holstein). In the curricula of other federal states, the topic is not directly addressed, but it can be linked to existing requirements and topics. Likewise, there are already school projects, project days and teaching materials that deal with the topic of waste prevention or with topics that go hand in hand with it (food waste, fast fashion, zero waste).

1.7.2 Aim of the dialogue

In dialogue 7 it was therefore discussed with the participants what supporting conditions are necessary for teachers and schools to successfully integrate the topic of waste prevention into the classroom. In this context, it was also discussed how the existing range of teaching materials can be made more visible. In addition, the topic of waste prevention was addressed as a cross-curricular approach in environmental education and education for sustainable development.

1.7.3 Results of the dialogue

Based on the webinar and workshop contributions, a list of possible action measures was developed. The action measures reflect suggestions derived and interpreted on the basis of post-it's, chat and verbal contributions. They can be used as valuable signposts for the future development of the waste prevention programme.

Table 7: Overview of action measures developed in dialogue 7

Group	Action measures
Networking	<ul style="list-style-type: none"> • The different stakeholders must be integrated. Existing networks should be expanded and communicated more strongly to the outside world. By setting up a digital platform, stakeholders can network, exchange and inform each other • In addition to schools, teachers, waste advisors and school authorities, youth centres, extracurricular educational institutions, local ESD networks, student companies, regional companies and libraries can also be involved in actions and projects and provide valuable impulses
Practical orientation	<ul style="list-style-type: none"> • New concepts and materials should be developed in a participatory way, e.g. by involving teachers and students in their development • Incentives should be created to motivate students to participate. It is also advisable to adapt waste prevention programmes to the reality of pupils' lives
Funding and staff	<ul style="list-style-type: none"> • Often, approaches to waste prevention fail due to overworked staff and/or lack of funding. Further training and functional positions can create the framework conditions for establishing and promoting waste prevention in schools
Role models and responsibility	<ul style="list-style-type: none"> • Best-practice schools, teachers as well as pupils or external persons (e.g. influencers) should act as role models and support other schools in the implementation of actions and measures • Pupils, but also other stakeholders involved in everyday school life, should be enabled to take responsibility for their own projects and ideas, e.g. by establishing 'waste scouts'. This creates identification and enables learning effects

In addition, an overview of educational materials on waste prevention was published as supporting material.

1.8 Dialogue 8: Learning from each other and acting together: Committed and intercultural for waste prevention

1.8.1 State of the art

Waste prevention concerns everybody in society. Today, 83 million people with very diverse lifestyles live in Germany. Their attitudes and actions are shaped, among other things, by their economic and social situation as well as cultural or religious backgrounds. Within the diversity of people and their different talents, skills and experiences lies an important potential for the development of sustainable economies and lifestyles. Also immigration has had an influence on diversity. Statistically, a quarter (26.7 per cent) of Germanys population, i.e. 21.9 million people have a so-called migration background (immigrants and their descendants) (Statistisches Bundesamt, 2022).

For people with a migration background, commitment to waste prevention is predominantly linked to the same idealistic or economic interests as for people without a migration background. However, there are barriers to engagement and participation in educational events such as information deficits, language problems and experiences of discrimination. This does not apply equally to all people with a migration background. Addressing people on the basis of the category "migration background" is therefore problematic and can be perceived as stigmatising. The identified concepts and examples for raising awareness of the topic can be assigned to the following specific approaches to immigrants and their descendants:

- Outreach activities in neighbourhoods with a high proportion of people with a migration background: The waste prevention programme offers content-related reference points with activity-based guidance in personal or communal everyday life, such as the use of reusable materials or the avoidance of plastic at neighbourhood festivals, second-hand markets or repair cafés.
- Activities that are initiated and implemented by migrant self-organisations or take place in cooperation of these organisations with educational institutions. Migrant organisations reach their target groups, for example Turkish- or Russian-speaking people, on the basis of trust and by knowing how to approach them.
- New refugees can be reached in asylum shelters, through language or integration courses and via social media.

1.8.2 Aim of the dialogue

The aim of Dialogue 8 was to discuss, based on examples, which approaches to strengthen waste prevention and waste management in intercultural settings exist and which concepts are suitable to be applied in other municipalities. Challenges were described and supporting framework conditions discussed.

For this purpose, stakeholders with experience in intercultural communication and education for sustainable development were invited. Amongst them were nationwide active environmental associations, migrant self-organisations, foundations and networks. On a local scale attended waste advisors from municipalities or waste management companies, adult education centres, environmental centres, consumer centres and initiatives of migrants.

1.8.3 Results of the dialogue

Based on the webinar and workshop contributions, a list of possible action measures was developed. The action measures reflect suggestions derived and interpreted on the basis of post-it's, chat and verbal contributions. They can be used as valuable signposts for the future development of the waste prevention programme.

Table 8: Overview of action measures developed in dialogue 8

Group	Action measures
Materials	<ul style="list-style-type: none"> Many of the materials available are not very appealing to some of the people with migration biographies. Therefore, more multilingual and low-threshold materials should be created that make do with short and concise text modules Visual communication, in particular, is an important lever for appropriately addressing target groups with little knowledge of German Ideally, materials should also be freely available as multilingual "open source" publications. Working with interactive PDF documents should also be made possible Materials should also be produced in close consultation with migrant organisations or organisations that have experience in the work and knowledge of the realities and needs of migrant target groups
Multipliers and key persons	<ul style="list-style-type: none"> Through the stronger involvement of migrant self-organisations, the target group can be addressed more directly. Migrant self-organisations also often have local and cultural knowledge, which is indispensable for the successful implementation of actions and events Key persons as well as multipliers should also be specifically addressed in religious communities In addition, multipliers and key persons must be approached at eye level in order to disseminate best-practice examples. NGOs should be compensated for their work In addition, the strengthening of networks and the organisation of exchange meetings involving different institutions and associations is recommended. Relevant existing networks should be identified and made public
Continuity and funding	<ul style="list-style-type: none"> A major problem is that many projects cannot be continued due to a lack of financial resources. As a consequence, results "fizzle out" quickly and cannot be carried forward Stronger and longer financial support for organisations involved in intercultural education projects on waste prevention and separation is therefore recommended The human and time resources in municipalities and other public institutions are often insufficient

In addition, an overview of graphic materials on waste prevention was published as supporting material.

2 Conclusion

The dialogues on the Waste Prevention Programme II were able to generate interesting insights through the inclusion of various stakeholder groups. Due to the different focal points of the eight dialogues, the topic of waste prevention was considered in varying contexts. The following section consists of a summary of the results of the eight dialogues and a reflection on the dialogue format.

In the recommendations for action measures that were developed during the dialogues and presented in the previous sections, patterns can be identified. The following paragraph summarises recurring approaches. The aspect of communication played an important role in all the dialogues. Not only the promotion of communication between different involved stakeholders, e.g. through network meetings or round tables but also the communication of ministries with interested stakeholders was considered important. For the general public, communication campaigns were suggested to raise awareness and provide information. Furthermore, the role of role models/influencers, who could play an important part in disseminating information, was addressed in several dialogues. Role models can not only be persons, but also organisations or initiatives. Another point was the provision of free publications that pass on background information and expert knowledge and thus offer orientation for interested stakeholders. Stakeholder groups should be involved in the production process of the publications so that the documents meet the needs of the stakeholders. Communication of the publication to interested stakeholders was also considered relevant so that the documents reach their target audience. Commissioning and publishing scientific research that could fill current knowledge gaps was another aspect mentioned by participants in several dialogues. Also important was the aspect of stakeholder promotion. This promotion can be done through funding or other resources, such as the provision of free materials or space, and can be relevant for new projects as well as established projects. Finally, the issue of introducing regulations and legal requirements was also mentioned in several dialogues. Some of the participants wished for clearer regulations that would provide orientation or support in establishing desirable behaviour.

The format of the dialogues, which consisted of the three elements situation analysis, webinar and workshop, contributed to the fact that the participants had a common knowledge base after the webinar, which could be built upon in the workshop. The knowledge base was created through the situation analysis and the presentation of its contents during the webinar. During the workshops, participants were given practical insights through short presentations and then had the opportunity to contribute their own suggestions, ideas and experiences using an online collaboration tool. Each workshop offered the participants two thematic focuses, which were discussed in small groups. The participants mostly rated both the webinars and the workshops as good to very good. The successful involvement of stakeholders is also reflected in the results. The collaboration tool gave everyone the opportunity to share their experiences and expectations with the group and the possibility to participate was ensured. The two thematic focal points also enabled participants to exchange ideas based on their own expertise. The participation of representatives of the BMUV and the UBA gave external stakeholders the opportunity to enter into a dialogue and raise questions. After each dialogue, a protocol and a support material were published. The aim of the support material was to meet the wishes and information needs expressed by the participants during the workshop. However, the scope of the support material did not allow for a comprehensive discussion of all the issues raised. This leaves some gaps that could be addressed in subsequent dialogues. The focus of the support material was discussed with the participants, reflected on by the project team and is intended to

close gaps in knowledge and information identified by the participants and the actors active in the thematic field.

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