

Newsletter

Dear readers,

In this sixth edition of the FORCE newsletter we bring news on the Hamburg pilot project wiedergeBORN which focuses on eco-innovative solutions in the context of waste separation and avoidance. Working together with regional housing associations, the project has established a lodge in Osdorfer Born where citizens can meet and engage in local sustainability issues to reduce their waste generation. Among other things, the project has so far involved tenants through a large-scale door-to-door survey, the distribution of bio bags and bins and it has increased communication efforts in the context of a housing area with many non-native German speakers.

FORCE activities on wood and wood waste have focused on citizen involvement and communication, as Genoa has involved citizens in the sustainable management of urban forests to decrease forest degradation. Hamburg has involved citizens in the collection of wood waste and is now marketing it as firewood on recycling stations.

You can further read about Copenhagen's production of ten new products based on post-consumer plastic which demonstrates that flexible plastics can find its way back into recycling and new products. In their efforts to increase biowaste collection, the City of Copenhagen has initiated a new partnership with local libraries to make access to biowaste separation bags and bins easier and more convenient for citizens.

The May newsletter reflects that the FORCE activities are not unaffected by the COVID-19 pandemic that has put a hold on many public activities across Europe. While activities in some waste streams have seen a drastic decline, activities such as donation of surplus food gain new relevance in Portugal. Lisbon and the FORCE partner Dariatcordar has contributed to this newsletter with a Best Practice Guide on food donations which you are very welcome to circulate within your organizations and to relevant partners.

Enjoy the reading and stay safe,
The FORCE Team

1 FORCE ACTIVITIES IN THE CONTEXT OF COVID-19

1.1 LISBON - BEST PRACTICES IN CONTEXT OF COVID-19

Portuguese society is reacting to adverse conditions under COVID-19 and the FORCE partners are no exception. Dariacordar, together with the food safety authorities, has developed new food safety procedures for the donation of food during the epidemic phase. Some social organisations have temporarily closed their doors due to the alert period constraints. At the same time, the organisations we usually support need our support now more than ever as they have seen their salary decrease or have even lost their jobs. The Zero Desperdício Team never slows down, and step by step the donations network is adjusting to this new challenge. In order for our network to continue its daily activities while reducing the COVID-19 contamination risk, Zero Desperdício has updated its Best Practices Guide in collaboration with Portuguese Authorities.

The guide has been validated by national authorities in accordance with EC regulations. [You can access it here](#). You are welcome to replicate it and adjust it to your reality. Together and by helping each other we are stronger. Food waste must decrease, and we must go on supporting people in need.

FIGURE 1: PHOTOS FROM CAMPOLIDE PARISH COUNCIL ON 17 APRIL 2020



2 PLASTICS

2.1 COPENHAGEN - PRODUCTION OF 10 NEW PLASTIC APPLICATIONS

In order to close the plastics resource stream and minimise CO₂ emissions, the City of Copenhagen has partnered up with the Danish Technological Institute and leading private partners to test innovative uses of post-consumer flexible plastics. The aim is to create ten new applications where flexible post-consumer plastics is used as a raw material.

Ten new and diverse test products based on different production methods have been created. These include a ground mat, a cable cover, tubes, a beer shelf, a gap closing profile, a waste bin, a chair, a rainwater container, a vase and a large piece of outdoor furniture. While some of the products still need further refinement in order to obtain the desired quality, the results show that post-consumer flexible plastics can be used as input in a variety of products.

Since 2017 the citizens of Copenhagen have had the opportunity to collect and sort not only rigid but also flexible plastics. And the benefits from recycling flexible plastics are large. While flexible plastics can be more difficult to recycle because of its highly composed nature, its light weight often makes it a more environmentally friendly choice than the heavier rigid plastics. The use of flexible plastics is on the rise and with 4 million tonnes of flexible food packaging used within the EU every year, solutions for a circular economy of flexible plastics is much needed.

The products tested and produced in this project represent a total market demand of 400-1,750 tonnes of annual uptake of post-consumer plastics and hold potential for both business and private customers. The new production methods also hold potential for a wealth of other products as they are based on both rotational moulding, injection melding and sheet extrusion. The partners Aage Vestergaard Larsen A/S, Letbæk Plast A/S and Dansk Rotations Plastic ApS have been responsible for testing new ways of sorting, cleaning and pre-processing the plastic. The next step is to develop business cases for the 3-4 most promising products in order to assess their cost-effectiveness in relation to product quality.

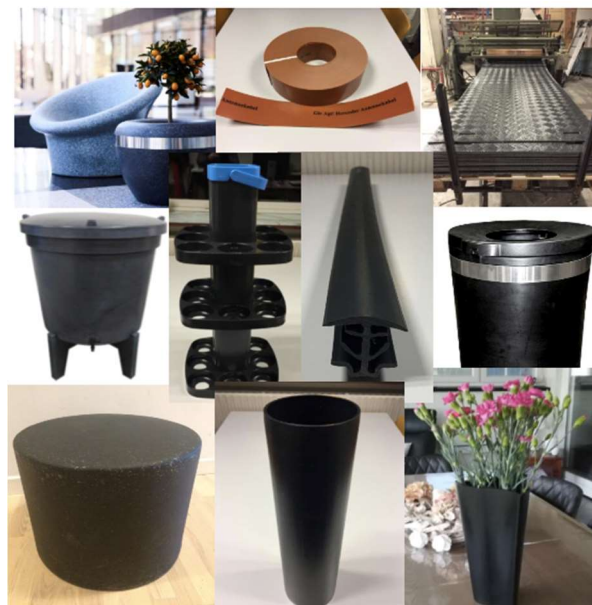


FIGURE 3: THE TEN SELECTED APPLICATIONS

2.2 GENOA – A NEW MASTER THESIS ON PET FOR 3D PRINTING SPOOLS PRODUCTION AT GENOA UNIVERSITY

Genoa University students' engagement within the FORCE project goes on: in March 2020 two master-theses were developed and successfully defended. The first thesis has been developed by dr. Lusardi in collaboration with AMIU, Ticass and Micocca Design and is a "Study on the feasibility of recycling polyethylene terephthalate in the production of filaments for 3D printing". The total number of theses developed in the frame of FORCE project thus rises to 4.

METALS (WEEE)

2.3 HAMBURG - NEW SIGNS AND NEW DEPOT CONTAINER FOR WEEE

New stickers were designed for the 113 WEEE depot containers in Hamburg, in order to inform the citizens and call their attention to the correct inputs of the containers in a simple and illustrative way. The stickers aim at avoiding misthrow and thus reducing the fire hazard. The new signs visually show what was before only written in text: batteries, lamps and monitors are not allowed in the container, due to their potential fire hazard. In an iterative process, all containers will now be marked with these new stickers.



FIGURE 6: CLEAR SIGN FOR DANGER OF FIRE



FIGURE 5: MONTAGE OF NEW SIGNS

2.4 COPENHAGEN - INCREASE IN RE-USE OF LARGE HOUSEHOLD APPLIANCES

In December 2018, the City of Copenhagen started a cooperation with the company Recirk, who is specialised in collecting, repairing and reselling large household appliances such as washing machines, tumblers, refrigerators, dishwashers etc. We also work together with Elretur, who is a partner in the Danish Collective Scheme. According to Danish legislation, the producers and importers of EEE are responsible for organising and financing the take-back and management of end-of-life products. This is done through the Danish Collective Scheme so they are an important and necessary partner when we want to upcycle WEEE to EEE.

The collection of large household appliances started at the Borgervænget Recycling Station but during 2019 it was expanded to take place at all recycling stations in the city. Recirk is collecting the appliances three times a week. Sundays are the best collection day, as Copenhageners mostly have time to install new large household appliances on Saturdays.

29 tonnes were collected for repair and reuse during 2019 which correspond to be 6 % of the total amount of large household appliances at the recycling stations and to be 3 % of the total amount of WEEE at the recycling stations. This FORCE activity has also been replicated by other cities in the Greater Copenhagen Area which gives a further collection of large household appliances of 10 tonnes in 2019.

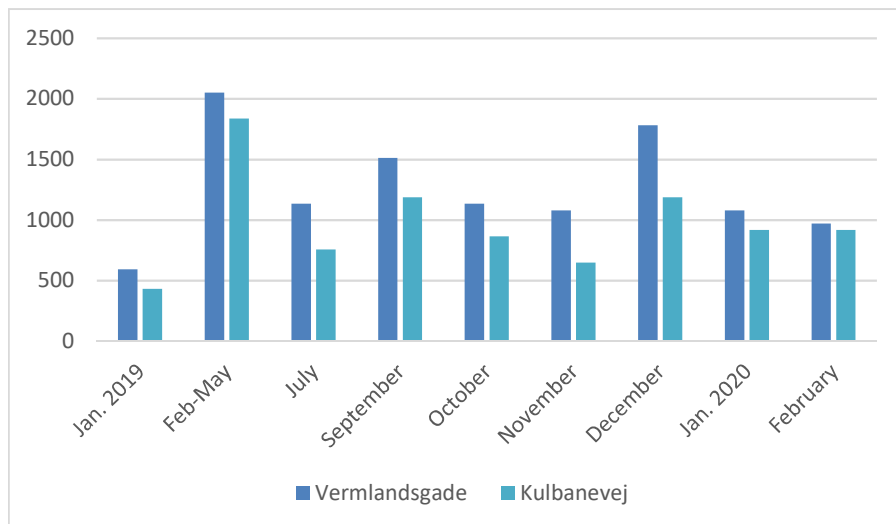


FIGURE 7: THE GRAPH SHOWS THE COLLECTION OF LARGE HOUSEHOLD APPLIANCES FROM TWO DIFFERENT RECYCLING STATIONS IN COPENHAGEN

Recirk has trained staff to collect the appliances, and they are quickly able to estimate which appliances are suitable for repair and resell. It is important that the items have a green energy label, to make sure that only items in the lower end of energy and water consumption are reused.

Around 20 % of the collected large household appliances are sold either online on Den Blå Avis (Danish eBay) or at the shop in Glostrup in the Greater Copenhagen Area. The rest of the appliances are shipped to Norway/Oslo where the company has existed for several years. 90 % of the Danish buyers are visiting the shop in Glostrup to see the appliances. A visual check has proven to be important for the buyers when it comes to used appliances. All appliances are sold with 2 years of warranty, according to national legislation. This provides some safety for customers who want to purchase used goods.

FIGURE 7: RECIRK PICKING UP HOUSEHOLD APPLIANCES AT RECYCLING STATIONS



3 SURPLUS FOOD AND BIOWASTE

3.1 COPENHAGEN - THE CITY JOINS EFFORTS WITH LIBRARIES TO INCREASE COLLECTION OF BIOWASTE

City of Copenhagen started collecting and sorting biowaste in 2017 and is continuing its effort to make it easier for citizens to sort their biowaste. Green bins and green biodegradable bags are given to the citizens for free for the collection of biowaste. In order to make access to the bags easier, City of Copenhagen started an experiment handing out bags and small bins for biowaste at municipal libraries in December 2019. 5,000 buckets and 16,000 packages each containing 100 bags were picked up by citizens during the first three months.

The citizens have met the new initiative with a positive attitude. A number of interviews with citizens at the libraries have documented that citizens according to their own statements have started sorting biowaste after having collected bags and bins at the libraries. Besides the new pick-up stations at libraries, bags can be ordered online and are sent directly to citizens' mailbox. Citizens living in villas tie one of the last bags on the bin outside the house and the waste collector provides new bags. All households can order bags online or pick them up at the recycling stations in the city. While libraries have been closed during the COVID-19 pandemic, citizens can still order bags online.

The green biodegradable plastic bags were chosen by City of Copenhagen since it was proven that citizens sort the biowaste better, if the bag has the colour green and is biodegradable. Also, if a piece of biodegradable plastic ends up in farmland it can degrade over time, compared to conventional plastic which will stay there forever.

In 2019 the collection of biowaste from households reached 13,600 tonnes in City of Copenhagen. Given that the sorting is relatively new the collected amount - corresponding to 23% of the potential amount of collected biowaste – is satisfactory even though there is still a large potential for collecting more. The city is now awaiting the evaluation of the new bag distribution efforts to see whether citizens sort a larger percentage of their biowaste which will feed into a larger evaluation of the experiment.



FIGURE 7: DISTRIBUTION OF GREEN BIOWASTE BINS AND BAGS AT VALBY LIBRARY

4 WOOD WASTE

4.1 GENOA - FIRST REUSE CENTRE READY TO OPEN IN GENOA AFTER COVID-19

The first Reuse Centre in Genoa, which is part of network of dispersed reuse and repair centres designed by AMIU and the local partnership to promote reuse and prevent wood waste, is ready to open. The premises hosting Reuse Centre, a property of AMIU, have been completely renovated and equipped with furniture produced using wood pieces from municipal collection of bulky waste remanufactured by young people under working training in a local social carpentry.

Further, the governance process to run the Centre was completed. The citizens' associations will manage the Centre to develop the first example of a three-party collaboration agreement in Genoa. This shared administration tool allows equal collaboration between active citizens and

public administration for the management of common goods. The Reuse Centre opening was planned in April and will be rescheduled after the virus crisis.

FIGURE 2: REDESIGNED AND REMANUFACTURED WOOD WASTE FOR THE EQUIPMENT OF THE REUSE CENTRE – DESIGN BY UNIVERSITY OF GENOA AND REALISED BY THE SOCIAL CARPENTRY LAB 85



4.2 GENOA - NEW MASTER THESIS ON LIGNOCELLULOSIC BIOMASS FROM PARKS AND GARDEN WOOD WASTE AT GENOA UNIVERISTY

Genoa University students' engagement within the FORCE project goes on: in March 2020 two new master-theses were developed and successfully defended. The master-thesis developed by dr. Barbieri in collaboration between the University of Genova and the University of Bologna, is on "Pre-treatments and chemical, physical and microbiological treatments of lignocellulosic biomass, aimed at the production of carbohydrates". The total number of theses developed in the frame of FORCE projects thus rises to 4.

4.2 GENOA - WOOD WASTE PREVENTION STARTS FROM FOREST MANAGEMENT. A WORKSHOP ON GENOA

Genoa is focusing activities on the resource stream of brushwood, which risks becoming waste when forests degrades and wood collapses in river basins, arrives to the sea and is washed back ashore. The Genoa partnership, in cooperation with the association Amici del Chiaravagna, organised a workshop which took place on 12 December 2019 and was attended by some 40 representatives of local associations and citizens organisations engaged in environmental issues. The aim of the workshop was to discuss how citizens' work can contribute to stopping forest degradation and preventing hydrogeological risk and flood events.

At the event, the responsible for Public Green Office of the City of Genoa, explained the city plan for the urban forests and how citizen volunteers can contribute to keeping urban woodlands clean and how they can communicate with other citizens who are unaware of the need of correct forest management. Finally, an agronomist explained the hydrogeological risks related to the abandonment of urban forests. The workshop will be replicated in autumn.



Un'iniziativa nell'ambito del progetto europeo



FIGURE 11: WORKSHOP ON URBAN FORESTS IN DEC 2019: INVITATION AND ONE OF THE INTERVENTION

4.3 HAMBURG - SELLING FIREWOOD AT RECYCLING YARDS

Since October 2018, SRH has been collecting trunk wood from citizens at its recycling yards, in order to transform wood waste into carbon-neutral energy.

From the 90 tonnes of wood collected so far, about 60% had the required quality for further processing. Thus, in December 2019, a horticulturist transformed the high-quality wood into firewood which took about two weeks. Due to the inhomogeneous sizes and forms of the trunks, the firewood production was mainly done by hand with a chainsaw and an axe. Despite first assumptions, the wood did not need further drying and was suitable for direct sale. In total 80 grid boxes with stacked mixed wood logs were produced and are being sold on four recycling yards since March 2020 at a price of 60 €/grid box (0,75m³). However, after sales had been low, the price was reduced to 45€, with positive feedback from the customers.



Until mid of April about 30 boxes were sold. The number of sold boxes differed a lot according to the size of the recycling yard and the catchment area. Whereas one big recycling yard, that mostly attracts clients with gardens and family houses, sold 15 grid boxes, another recycling yard with a catchment area of apartments but also one family house sold only one box. Customers often asked for information about the type of wood and the method of drying. Some were concerned about the fact, that they had to load the wood from the grid boxes to their cars/trailers by their own.

FIGURE 8 AND 9: FINAL PRODUCT IN GRID BOXES AND POSTER FOR MARKETING FIREWOOD BOXES



5 HAMBURG - WIEDERGEBOREN



Since October 2019 SRH, together with the regional housing association and further local partners, is promoting improved waste separation, cleanliness and sustainability in Hamburg's district Osdorfer Born. The pilot-project "wiedergeBOREN" focuses on the implementation of eco-innovative solutions and their replicability to comparable housing districts in Hamburg as well as abroad.

The activities shall take place until the end of June 2020 covering the waste streams plastic, (W)EEE, bio and wood. Since the project is designed to inform and engage tenants, children and pupils in an interactive and creative way, COVID-19 has a big impact on it, and many originally planned activities had to be put on hold for an indefinite period. Alternative activities, in order to keep the project running in less contact-intense ways, are being developed.

5.1 HAMBURG - THE LODGE

One of the main features of wiedergeBOREN is the establishment of a lodge in the focal area of the district. Twice a week SRH staff is present and available. Besides serving as an on-site

consultation on waste-related topics for the residents, the lodge is also a reference point for many happenings of the pilot-project: residents can come for coffee, get informed on different wiedergeBORN activities, receive information materials and the equipment necessary to start separating their waste.

Every month the lodge focuses on a different waste stream, offering a program to keep the place and residents active throughout the weeks. Activities in the lodge include gatherings such as breakfast and afterwork hours with the community, repair sessions and exchange meetings. The large exhibition window of the lodge displays informative and attractive decoration all-day, changing each month according to the current waste stream. Moreover, articles in the local newspaper “Westwind” complement the campaign with further information on the corresponding waste stream.

The lodge is a great opportunity to get in touch with the residents and an insight into their concerns regarding waste management.

FIGURE 12: LODGE EXHIBITION WINDOW DECORATED WITH PLASTIC WASTE STREAM THEME AND LODGE PREPARED FOR AN EVENT – SWAPPING OF TOYS AND SPORTS GOODS



5.2 HAMBURG - SURVEY WITH TENANTS OF OSDORFER BORN

In mid-January, a total of 13 employees of SRH and ProQuartier, the local district developer, conducted a survey among the residents of Osdorfer Born about their waste separation behaviour, with a special focus on biowaste.

The aim of the interviews was to understand the current situation, and to hear from the residents about their concerns and suggestions for improving the local waste management: how many different waste streams are currently being separated in the household, what would be the acceptance of a separate bio-waste collection, and what suggestions are there for optimising the waste disposal locations?

The survey was conducted in the streets Immenbusch and Achtern Born, the focus area of "wiedergeBORN". Within two days, the team knocked on more than 350 apartment doors in over 6 multi-storey buildings. Approximately one third of the residents agreed to an interview, while 25% had no interest. The majority of the interviewees were open and interested. Results showed that many residents separate paper and glass



FIGURE 14: PART OF SRH AND PROQUARTIER TEAM AT THE WIEDERGEBORN LODGE PREPARING FOR SURVEY

from residual waste. However, very few separate their bio-waste, mainly due to a lack of knowledge and information. In addition, tenants gave important remarks regarding the improvement of the staging area where the waste containers are placed (in front of the building). For instance, residual waste bins should alternate with plastic and paper bins, keeping walking distances as short as possible and encouraging separation. Another important finding is that the willingness and motivation to change one's own separation behaviour is heavily dependent on the visible engagement of the whole neighbourhood. Overall, the survey was very successful and provided essential inputs for subsequent project work.

5.3 HAMBURG - COMPOSTING PROJECTS FOR KINDERGARTENS

In the beginning of 2020 SRH has started a composting project in a kindergarten at Osdorfer Born: together with their teachers, children collect compostable waste produced during their breakfast and dispose it in a composter that is set up in the kindergarten's backyard. Children will use the resulting compost material as natural fertilizer for flowers or vegetables growing in the gardens of the kindergarten.

The program comprises several project days, and the activities planned include short workshop sessions, suitable for kids to understand the biowaste cycle, as well as additional playful and hands-on activities. Project days are mainly conducted by SRH employees, whereas the daily biowaste collection and compost handling is carried out by teachers and children. Currently, the project is on hold, as the kindergarten is closed due to COVID-19 protection measures.



FIGURE 15 AND 16: WASTE SEPARATION EDUCATION IN A KINDERGARTEN AND BIOWASTE POSTER FOR BINS

The aim of the composting project is to raise the awareness for biowaste as useful and valuable resource, place additional biowaste bins and composters and thus increase the collected amount of biowaste. The intention of addressing the young is both shaping their own views and behaviour while they are still very open for it, as well as making them multipliers that carry a waste-sensitive attitude into their homes.

5.4 HAMBURG - DESIGN OF NEW WASTE SEPARATION STICKERS AND POSTERS FOR OSDORFER BORN

One of the challenges faced in the district Osdorfer Born concerns the residents' poor waste separation behaviour. Due to the high rates of non-native German speakers in the district, finding a common understandable language to deliver informative messages can be difficult. For this reason, SRH decided to test new visual forms of communication and information about the correct waste separation.



FIGURE 17: BIOWASTE, RECYCLABLE MATERIALS (PLASTIC WASTE), PAPER AND CARDBOARD AND RESIDUAL WASTE

Special stickers and posters for the waste containers in the focus area were developed: The new designs deliver the messages without using many words, but with the aid of bright colours and simple illustrations. Thereby the act of waste separation shall become more intuitive regardless of any language barrier. Also, the idea was to have one consistent language of design and colours from the waste bin in the apartment to the waste staging areas outside. The goal is to increase the waste separation quotas by more inclusive messages.