Inventory to best practices for Plastic Upcycling

Phase 2

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CONTENT

Executive Summary

This research is part of the Plasticity project (work package 3). The objective of this inventory is to learn from the successful business cases to apply this into Work package 3 of the PlastiCity project; creating viable local business cases of recycled plastic products from local plastic business waste. In the first phase an analysis was performed to identify best practices of products that contain recycled plastic considered. This resulted in a total of 123 selected examples of recycled plastic products. This report is presenting the results of phase 2, where an analysis was performed to determine the success and fail factors of these best practices.
Based on the inventory we can conclude that there are different successful best practices in the market of plastic product with high recycled content. In order to be successful there must be valid financial sustainable business model, and each of the aspects limiting that is a risk for success. Critical is the expectation of the end user on quality and pricing.

Approach phase 2

Interviews with the manufacturing and trading (or brand) company about the success and fail factors was the selected method to determine how to conduct interviews. For the interview line of questioning and analysing, the Sustainable Business Model Canvas (Cosenz, 2020) was used as the analytical framework.
The approach of phase 2 consists of 8 steps. The steps 1-5 are aimed on creating a blueprint for the interviews. In the consecutives steps 6-7 the team approached the companies and conducted the interviews. In the final chapter the interview results are analysed and a conclusion was drafted on the success and failure factors.
The 123 best practices were traded by 72 unique companies. At first, the team decided to approach a selection of the companies, however, the response rate was rather low. After several attempts, the team decided to actively approach all the trading companies of the 123 best practices. The period of approach started in September and ended end of December 2021. It resulted in 1 interview.

Results from the interview

Key success factors:	Key fail factor:
- The production technique of roto moulding is providing a low threshold to get started with recycled material. - Managing client's expectations on quality of the product containing recycled plastic in relation to the price, is considered a key condition to make it a success. By using recycled material, it is the perception that it is cheaper, which is not directly the case. Also, the quality is less as the material is less strong compared to virgin. - The company itself is very explorative on the subject to recycled plastics, has a clear philosophy and basis process already in place. - In addition, their business is not only driven by recycled material, a switch to virgin can easily be made, making the business proposition resilient.	- Managing the sourced re-cycled plastic material, as there are different streams to source the recycled plastic material from. It is not that transparent and also, the level of quality is fluctuating.

Recommendations

To enhance the chance of successful local business cases, a local infrastructure is required. The advantages of a local infrastructure, entailing all steps of the chain means:

- a better and easier control over the plastic quality
- a shorter and simpler end-to-end supply chain
- using techniques that can handle smaller volumes to get started
- creating local products with more recognizability / higher local involvement (this is my plastic):
- marking products unique (city, business or brand) and/or one-of-a-kind marketing)

In addition to the 5 recommendations above, a set of criteria is developed to navigate across product categories to provide a starting point of which product idea out of recycled plastic could be potentially be interesting for your local waste streams. This involves the following criteria: (1) Quantity needed of plastic material per piece; (2) Known quality of the plastics needed; (3) Required investment for production (4) Possibility to have a dedicated chain; (5) Product uniqueness (6) Branding opportunity - 'local plastic'.

1 Introduction

1.1 Project introduction

Plasticity is a European-wide project (EU Interreg 2 seas program) that aims to find a strategy to increase the recycling rate of plastic waste from businesses (so called lost plastics) within the urban areas. Such a challenge requires research and solutions that involve many partners in the urban areas, like waste owners, designers, plastic producers, knowledge institutes and governmental organizations. The project itself is running since 2019.For more information please refer to www.interreg2seas.eu/en/PlastiCity

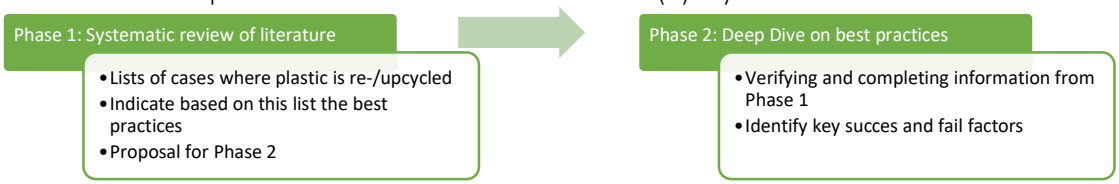
This inventory is part of the work package 3 of the total Plasticity project. One of the aims of the work package 3 is to create viable business cases for the re-use of plastic waste. The project team during this inventory was consisting out of 7 partners: City of The Hague, Universiteit Gent, University of Portsmouth Higher Education Corporation, Southend on Sea Borough Council, Van Werven België BVBA.

1.2 Objective of the inventory

In the past different products have been made from recycled plastics. Some with greater success than others. The aim of this inventory is to create both a list of products that have been made from recycled plastic (phase 1) and secondly create an overview of the success and fail factors that contributed to the success of these products in order to be able to apply them in the plasticity project (phase 2). The ultimate objective is to learn from these cases and apply this in Work package 3 to create viable local business cases for re-use of plastic waste.

The inventory is divided in two phases:

- Phase 1: A systematic review of literature to establish an overview of best practices.
- Phase 2: A deep dive on case studies to understand the(ir) key success and fail factors.



In Phase 2 the best practices are analysed on:

A. applicability on local level;
B. application of the found success and failure factors for possible cases in the PlastiCity project.

This report is the result of Phase 2. In the next chapters the approach, the data collection and analytical framework are further explained.

2 Outcome of phase 1

In Phase 1, a product list is composed out of products found via an internet search and via a search of business websites & annual reports from selected organizations. For the Google search 28 key words were defined leading to a total of 819 million google hits. These were filtered based on specific settings (such as a limited timeframe) to 5383 hits which were then screened for products. In addition, the public information of 90 organizations were screened. Both searches led to a total of 767 potential suitable products.

A set of selection criteria was defined to funnel the best practices out of this long list. When applying all criteria, 123 products were considered to be the best practices out of this list (see appendix A) The table provides an overview of the search flow. The search period started in November 2020 and was finalized in August 2021.

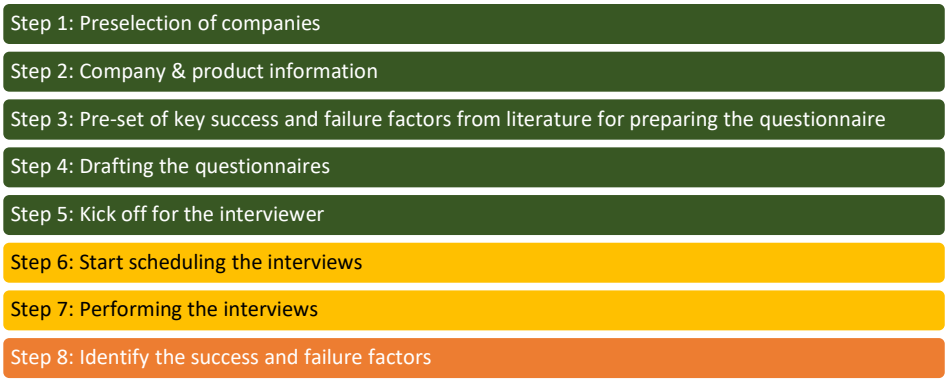
Sector	Start	Reason for exclusion				Included in Phase 2
		Doubling	Basic Starting Points	Scoping Criteria	Eligibility Criteria	
Agriculture	1	1		0	0	
Automotive	5			0	4	1
Construction	126	16	2	66	10	32
Electronics	11	4		2	5	
Fashion	154	24	11	80	35	4
Gardening, outdoors, public space, landscaping	136	21	2	83	5	25
Home	58	5	2	34	5	12
Other	13	1		5	3	4
Packaging	108	11	3	45	22	27
Technology	16	2		8	6	
Toys	11	4		2	3	2
Utensils	62	6		32	8	16
NOT LISTED IN A SECTOR	66		66			
	767	95	86	357	106	123

3 Approach of Phase 2

Interviewing the manufacturing and trading (or brand) companies was considered as the best method to determine the success and fail factors. Interviews are an effective method to verify, complete and confirm current information, and also gain insight in the background of developing the product and its' reasons for success. Another option was to use an online questionnaire, but rejected because from experience it was known that the response rate was low. In addition, we would lack contextual information and have limited insights and control of the information provided. It was preferred to be able to have a conversation and ask a question based on the answers given. Another important benefit for the team to conduct interviews was to extend its network for further relations in the PlastiCity project.

The approach of phase 2 consists of 8 steps. The steps 1-5 are aimed on creating a blueprint for the interviews. In the consecutives steps 6-7 the team approached the companies and conducted the interviews. In the final chapter the interview results are analysed and a conclusion was drafted on the success and failure factors. See the approach displayed in figure 1.

Figure 1: schematic approach for phase 2.



In Chapter 4 more details are given on the activities and results of step 1-5. In Chapter 5, the results of the execution of the performed interviews (step 6-7) are elaborated. In Chapter 6 the conclusion on the success and failure factors is presented (step 8). Chapter 7 provide additional recommendations.

4 Preparation data collection by interviews

The execution of the approach started in July and finalized end of August with the kick off of the interviews. During this period the team held meetings on the 12th of July and the 19th of August.

4.1 Step 1 – Preselection of the companies

The 123 products were traded by 72 unique companies. Because interviewing 72 companies about 123 product takes too much time a top 15 product list was made. In order to do so, a set of funnelling criteria was developed.

Funnelling criteria:

- Select an unique product, thus filter out similar products.
- Wide-spread across the product categories
- Exclude products with international character (not easy to apply locally),
- Exclude products for specific usage (limited impact),
- Spread across different type of plastics
- Local interesting initiatives

In figure 2 the list of trading companies when applying the proposed funnelling criteria on the current selected products.

Figure 2. Pre-selection of 14 companies and 2 back-up companies (in grey).

	Trading company (INTERVIEW)	Location	Manufacturing company	Products	Plastic type	Product Sector
1	Kohler & Co	USA	x	Engine Housing	PP	Automotive
2	Amari Plastic	Italy	Madreperla	Sheets	PMMA	Construction
	Plaskolite	*USA*		*Sheets*	*ABS*	*Construction*
3	Ecotile	UK		Floor Tiles	PVC	Construction
4	Hahn Group	UK		#18	Hanit (PE/PP)	Construction / gardening
5	Marmax	UK/NL/FR		#9	HDPE	Construction / gardening
6	YagoEco	UK		Jewellery	LDPE	Fashion
7	Yuma Labs	BE		Sunglasses	PET	Fashion
8	Ecobirdy	Italy	x	Furniture #5	Ecothylene	Home
9	Fredericia	Denmark		Chair	PP	Home
	Sellex	*Spain*		*Chair*	*PP*	*Home*
10	Sartoretto Verna	Italy		Displays	Plexiglass	Other
11	Starlinger & Co	BE/NL	*Louis Blockx*	Big Bags	PP	Packaging
12	Apollo-11	EU	Recyde-Coolrec	Toys	HIPS	Toys
13	Pilot Corporation	USA/FR	*x*	Pen	PET	Utinsels
14	Sistema	NZ		Food boxes	PP	Utinsels

4.2 Step 2 - Company & product information

In Phase I we already noted a lot of characteristics of the top 15 products, like the recycled content, origin and type of material. In this step we searched on the internet to get additional information. This includes: awards, impact measurements on social and environmental aspects, partnerships, etc.

Also, we listed general information on the trading companies in order to prepare ourselves for the interviews. We also tried to determine relevant contact persons by contacting the company via the general phone numbers or email addresses. However, in case it was needed to enclose more information on project or purpose of the interview to find the right contact, then further steps were not proceeded.

The company profile and product information were part of the work package of the interviewees, see further appendix B.

4.3 Step 3 - Pre-set of key success and failure factors from literature for preparing the questionnaire

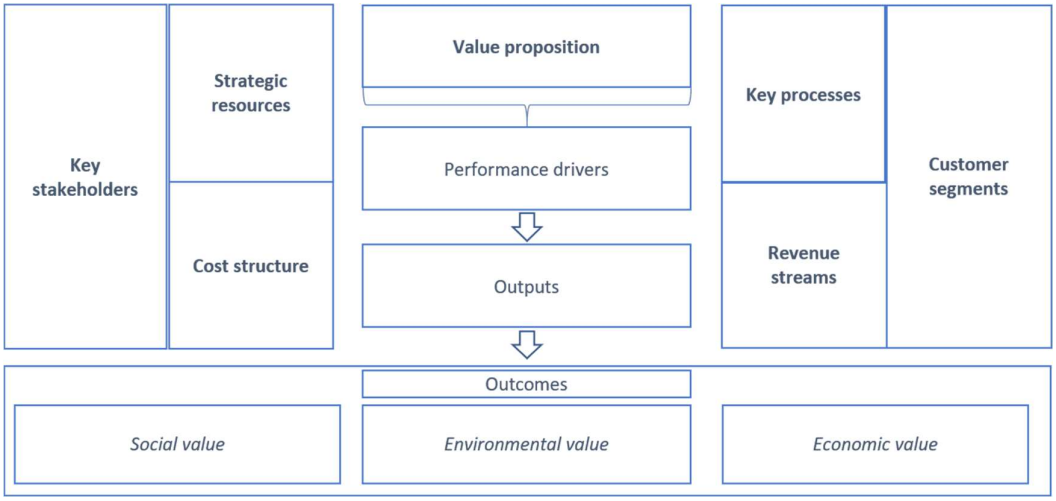
The datapoints for analysing success and fail factors are coming from qualitative interviews with the trading companies as selected in the previous step. To set up an effective line of questioning and analysing, a pre-set of known success and fail factors were defined out of literature into a scoring format. This format allowed the interviewee to analyses the interview in a practical way and ensured that the information was interpreted correctly to be used in the rest of the study. This chapter explains the reasoning behind the scoring format as well as the way to use it.

4.3.1. Development of the scoring form

For the development of the scoring form, studies and academic articles are the basis. A google search was performed in accordance with the same settings as phase 1, with key terms ‘Circular Business Case Plastic Product’ and ‘Successful Business Case Plastic Product’, referred to Google 27 and 28. This search resulted in numerous hits, which were then screened by the title, the source, and the introduction text as presented by google for relevance. In total 7 articles (see appendix C) were selected and completed with a study focusing on business models performed by a PhD candidate of Plasticity. These articles were considered as the initial start for setting up a scoring form.

Based on the articles, the sustainable business model canvas (SBMC) was considered as an already existing and proven model to use as an outline for the scoring format. Cosenz and colleagues (2020) have developed the SMBC as a framework that indicates how companies can achieve their sustainability and profitability goals. It is well known and used in businesses performance management as well as product development, as it pragmatically guides you to consider all business aspects. This SBMC has the following building blocks: key stakeholders, strategic resources, cost structure, key processes, revenue streams, customer segments and value proposition, see Figure 3. These building blocks are used as the main elements of the scoring form, and ultimately, they are used to determine the critical success and fail factors.

Figure 3. Sustainable business model canvas based on Cosenz and colleagues work (2020)



Limitations of the scoring format

The SBMC mainly focuses on the internal side of the business model. However, external factors or context driven factors are not included in the model. Factors that cannot be directly controlled by the company, like government regulations, laws, available facilities, and available techniques. These contextual factors are important and can be crucial for the success or failure of a product. For this reason, it was decided to extend the original SBMC by adding the contextual factors as a building block as well.

4.3.2. How does the scoring form work and how to get results?

The scoring form is used to process and analyse the quantitative information from the interviews. The interview consists of ten key questions which are set-up to get a better understanding of the business model of the product (see step 4).

During the interviews the companies explain their drivers, risks, reasons for success, etc. Factors that contribute to that will be placed in the different building blocks of the model by a match with key words or affiliates. From literature a pre-set of key words matching with the building blocks were defined (figure 4). This list is not complete, but is providing a guidance or set of words. By listing the factors in the SBMC building blocks, it provides a clear overview which building block is of great importance. This is underlined by scoring how often this factor is mentioned.

From the interviews it must be clear if the factor is either considered as a positive (success) or negative (fail) factor. By placing the factor in the SBMC in each building block and by indicating if it is a positive or negative attribute, we create an overview of success and fail factors. By highlighting the top 3 most important factors we attribute a certain weight to each factor.

For each interview the form is filled in, resulting in fourteen SBMC overviews. These will be combined to determine what the ultimate critical success and failure factors are. First, the three components that turned out to be the most significant for each company, are determined from the individual SBMC overview. From here we can count how often certain factors are mentioned across all the interviews. In

addition, we have the top 3 of all fourteen interviews, resulting in understanding the most important ones. Ultimately, it can be determined which components are the most relevant for the success of a company's sustainable product.

Figure 4. Keywords per building block of the SBMC model

<table>
<tr>
<td rowspan="2">Key stakeholders: relationships that the company has with other businesses, government, or other organisations that help the company to make their SBM work.

Example keywords: partners, relationships, contract management, collaborations/partnerships, suppliers.</td>
<td>Strategic resources: valuable, difficult to imitate, non-substitutable resources that the company uses to function effectively.

Example keywords: financial strength, competitive advantage, product differentiation, unique method, input material.</td>
<td rowspan="2">Value proposition: the value of the product or service that the company offers → does it offer a sustainable solution for customers' problems?

Example keywords: customer centricity, unique good, value co-creation, benefits for customer, functionality, newness, customization, innovation.</td>
<td>Key processes: how does the company communicate their sustainable product. → how do they reach their customer segments?

Example keywords: customer relationships, distribution channels, supply chains, marketing strategy, communication, value delivery.</td>
<td rowspan="2">Customer segments: customers can be divided in different, smaller segments based on their different needs and attributes. → does the company target a specific group of customers?

Example keywords: niche market, multi-sided platform, target group, customer branding.</td>
</tr>
<tr>
<td>Cost structure: the costs associated with delivering the SBM.

Example keywords: funding, financial investment, cost efficiency, sourcing, investment costs, labor costs, material/resource costs, variable and fixed costs.</td>
<td>Revenue streams: income that is generated from the customer segments.

Example keywords: asset sales, re-use, advertising, collecting resources, price, turnover, profit, subsidies, sales of products, donations, investors.</td>
</tr>
<tr>
<td colspan="2">Social value: in what positive and sustainable way does the BM add to society?

Example keywords: stewardship, equality, education (sustainable awareness), safety, social inclusion, well-being.</td>
<td colspan="2">Environmental value: in what positive and sustainable way does the BM contribute to the environment?

Example keywords: environmental objectives, recycling, Life Cycle Assessment (LCA), circular economy/sustainability, eco design, GHG emissions, secondary material.</td>
<td>Economic value: how does the company generate economic value in a sustainable way?

Example keywords: innovation, efficiency, profitable, high product quality, cost reduction, risk reduction, financial benefits, market benefits.</td>
</tr>
</table>

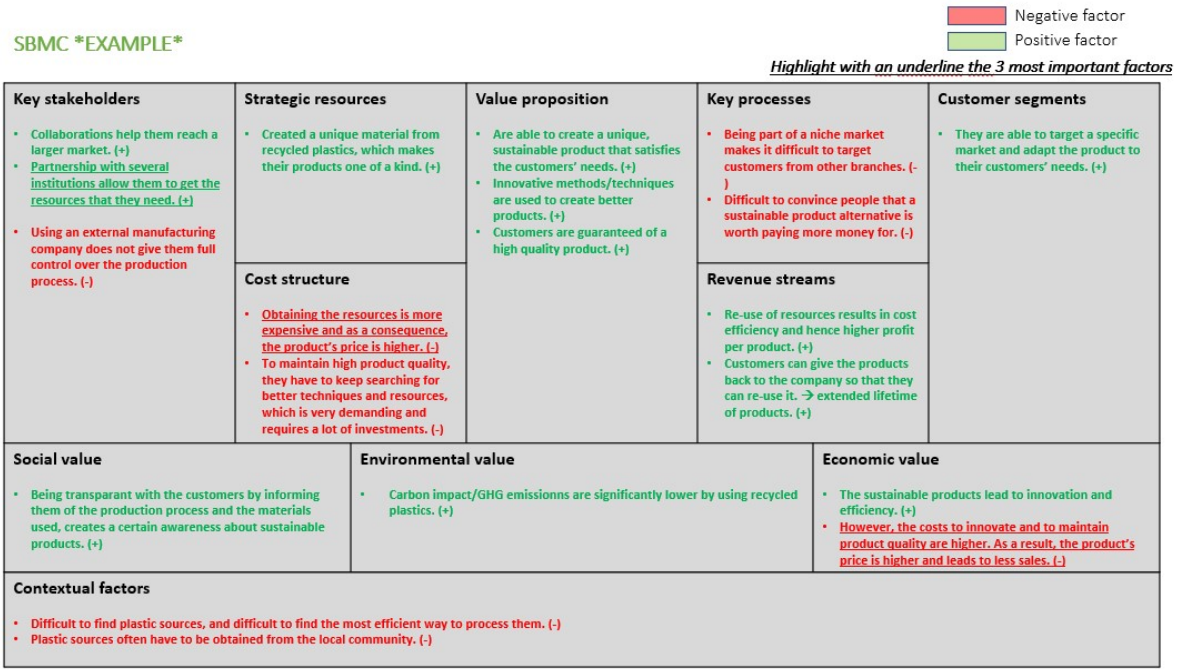
Example of how the scoring form works

Figure 5 shows an example of a filled in overview of the SBMC. Each building block contains positive and/or negative statements about the SBMC components, which were obtained from the quantitative content of the interviews. In addition, the component 'Contextual factors' is added below the original SBMC.

To give a clear and immediate overview of the components that are present in the business model and of the ones that are not, each building block is given a colour: green if the component is present as a (mostly) positive factor, red if the component is present as a (mostly) negative factor, and black if it is not clear whether the component is a positive or negative factor. From the quantitative information of the interviews, it is then decided by the interviewers which components were brought up the most or seemed the most important for the success of the product. Subsequently, a top three is formed by ranking these most relevant components.

Note that for each interview a filled in score form is expected. Combining them all, will show a red line in the top 3 success and fail factors.

Figure 5. Example of an SBMC overview as a result of each interview. Note that this example is completely made-up.



4.4 Step 4 - Developing the questionnaire

The questionnaire was limited to 10-questions, in order to retrieve the necessary information for the SBMC scoring form and facilitate, as much as possible, a regular conversation. The questions provide a guideline that, in combination with the scoring format, should be sufficient guidance to conduct the interview. In addition, with a set of maximum 10 questions, the team expected to lower the threshold for participating.

The first set of questions were mainly focused on the success of the product, and the second part of the failures. As failing was seen as a negative emphasis, and human individuals do not prefer talking about this in a direct matter, the line of questions were offering different perspectives and wordings.

1. What were the drivers to develop such a product?
2. How was the process and who was involved – from idea to market launch? Could you describe the process from the idea to the market launch?
3. Do you consider this product as a success? Why (not)?
4. What was the most important element of success in your opinion?
5. What was the biggest risk that could affect the success?
6. How did you mitigate this risk?
7. What is the Unique Selling Point (USP) of this product in the market with respect to the competition?
8. Did you or your company have a history in this kind of product development?
9. If you could develop or launch the product again, what would you do differently?
10. What do you recommend to other companies when they want to develop a product with a high recycled plastic content? Could you name top 3 do's and don'ts?

As part of the preparation the trading company did receive the questionnaire and the product information upfront. When the interview was finalized, also the notes were entered in this format and confirmation was requested from the trading company.

4.5 Step 5 - Kick off for the team

Based on the location and network of the companies of the top 15 products were divided amongst the team members. Each interviewer received a work package to prepare for the interviews. This package included the scoring form, the questionnaire and the company / product profiles of the companies/products assigned.

A kick off meeting (end of August 2021) was organized with all the interviewers to run them through the steps, procedures, questionnaire and expectations. From here they were contacting the trading companies to set up the interview.

5 Results

5.1 Step 6 – Scheduling the interviews

From the beginning of September 2021 the team started to approach the selected trading companies. The team held frequent progress meetings to keep up with the planning and to share how they approached the trading companies. After a range of progress meetings, it became clear that getting in touch with the companies was quite challenging.

Other data collection options, like online questionnaire, were discussed, but not considered as a solution as it still requires to connect with the companies. At the beginning of November, 2 important decisions we made:

- Contact all trading companies from the product list of phase 1 -> expand from 14 companies to 72 companies.
- Actively search in our network who can give us a warm introduction to the companies, via linked in or other networks.

In addition, the project team decided to extent the period for conducting the interviews till the end of December 2021.

In addition, it was decided to extent the period for conducting the interviews till the end of December 2021. At the same time, we also decide to review the 123 best practices on the opportunities to produce them locally for a suitable as a viable business case for the plasticity project, results are part of the recommendations in (chapter 7).

5.2 Step 7 – Results of the interviews

The strategy to get ourselves introduced lead to introduction at 3 companies. In 2 cases the interviews were cancelled on short notice due to time constraints and sickness of colleagues (around Christmas holiday period).

Only one online interview that could be conducted, was held in December 2021 with the CEO of Dragon Plastics Rotomoulding B.V. (See appendix E for the interview notes). Dragon Plastics Rotomoulding B.V. is producing the Alpha Seat, which is a colourful bench for the public outdoor spaces, out of recycled plastic.

The interview itself revealed a technique that is promising for local production method of plastics as it is requires low quantities of material for input, easy switch of moulds in the production and low quantities of end product.

6 Conclusion phase 2

The aim of phase 2 is to identify and analyse the success and fail factors of these best practices, identified in phase 1 of this research, in order to apply them in the plasticity project to improve the success rate of potential local business cases. The information to identify success and fail factors was based on performing a literature search and interviews with trading companies. Due to different circumstances, only one interview was performed. The outcome of this interview is presented below.

6.1 Step 8 – Identify the success and failure factors

The interview notes of the interview with Dragon Plastics Rotomoulding B.V. were analysed and incorporated into the Sustainable Business Model Canvas score format (figure 6).

Key success factors:	Key fail factor:
- The production technique of roto moulding is providing a low threshold to get started with recycled material. - Managing client's expectations on quality of the product containing recycled plastic in relation to the price, is considered a key condition to make it a success. By using recycled material, it is the perception that it is cheaper, which is not directly the case. Also, the quality is less as the material is less strong compared to virgin. - The company itself is very explorative on the subject to recycled plastics, has a clear philosophy and basis process already in place. - In addition, their business is not only driven by recycled material, a switch to virgin can easily be made, making the business proposition resilient.	- Managing the sourced re-cycled plastic material, as there are different streams to source the recycled plastic material from. It is not that transparent and also, the level of quality is fluctuating.

Figure 6: Filled in score format for Dragon Plastics Rotomoulding B.V.

Negative factor
Positive factor

Highlight with an underline the 3 most important factors

SBMC *DRAGON PLASTICS*

Key stakeholders

- We are very clear upfront on managing clients' expectations on quality and possibilities in the usage of recycled material. (+)
- We buy our recycled material from third parties, and we see fluctiations in quality. Post-Industrial Residue (PIR) is better but does not fit our vision. (-)
- We are experimenting now for 10 years, and within these years we gave created a network around us. (+)

Strategic resources

- Rotomoulding technique it only requires 1 kg of material, and 1 hour of experimenting. So, a low threshold to get started. (+)

Cost structure

- Using recycled material is not cheaper. Thus, the raw resource material of recycled plastics might be cheaper than virgin material but sorting and transportation is cost-adding. (-)

Value proposition

- We have recycled production as well as virgin production. If a client could not accept the quality loss due to usage of recycled material, we switch to virgin. So, we are never losing the potential client. (+)
- For our client colorful and a 'recycled' appearance are considered as an advantage. No product is the same, it is unique and 'authentic'. (+)
- Our client added the Alpha Seats to an existing range of outdoor materials. (+)
- Using recycled material leads to more leakages of fluid material in the plastic product.(-)
- More recycled plastic is needed to get the same strength as virgin material. (-)

Key processes

- We already sorted the shredded material in different colors, which is an advantage for our customers. (+)

Revenue streams

- The Alpha seats have a good production rate for us, also in terms of financials. We produce 3-4 times per year around 70 products. (+)

Customer segments

- We noticed that designers and producers of consumer products are more and more interested in recycled plastics. (+)

Social value

-

Environmental value

- In our vision post-industrial streams should be brought back in the producers proces. So we should aim to re-cycle consumer waste. (+)

Economic value

- We do not experience economical restraints at the moment. (+)

Contextual factors

-We noticed that buyers from public services do talk about using more recycled plastics but are – in our experience - not willing to accept lower qualities for the same price rates. It is not yet on top of mind of the engineers.

7 Recommendations

Currently a working infrastructure is available for the separation, collection and recycling of plastic waste from households. For plastic waste from companies, this is not the case. Mainly due to the small quantities of plastics per companies (especially at SMEs) and thus per single waste contract, it is not viable for waste collectors to separately collect these so-called lost plastics. Therefore, this structure is still immature and ineffective.

Together with the outcome of the interviews in phase II, 5 key recommendations have been developed that have a positive impact on realising local business case with lost plastics. These criteria, see below, have been used to select potentially successful products out of the 123 identified successful recycled plastic products

To enhance the chance of successful local business cases, a local infrastructure is required. The advantages of a local infrastructure, entailing all steps of the chain means:

- *a better and easier control over the plastic quality*
  In a dedicated end-to-end supply chain, the quality of the plastic is known and can therefore be used in the same product over and over. Products that are produced out of one single type are even simpler and even allow a dedicated supply chain.

- *a shorter and simpler end-to-end supply chain*
  In case the quality of plastic is known and preferably high, it requires less steps in sorting the material and managing the quality level of the material. This requires less investments and business cases are therefore easier to realize.

- *using techniques that can handle smaller volumes to get started*
  Realizing (a local) business cases requires investments in recycling and production equipment. Using high quality plastics or, at least, known quality plastics, less recycling efforts are needed. Using production equipment/techniques that do not require high investments, improve the chance on a successful business case.
  By combining product ideas with techniques that a capable of using smaller volumes an ideal setting can be created to start up local business cases.

- *creating local products with more recognizability / higher local involvement (this is my plastic):*
  If companies can relate to a product, that has been made by their plastic waste, it is easier to be proud of a product, which enhances the willingness to participate in the chain.

- *making products unique (city, business or brand) and/or one-of-a-kind marketing)*
  Based on learnings from the interview with Dragon Plastics Roto molding B.V., using recycled content nowadays is a Unique Selling Point (USP). It is a solution to a problem. In addition, flaws in the product could be used as a USP as well, claiming that it is a one-of-a-kind product. At the same time the product can be marketed as 'brand of uniqueness', for instance as part of (city, business or sector branding).

Get started by selecting the right product for your local waste streams

During the inventory we have identified 123 successful products that have proven track record in the market. When further analyzing this list, and we recognized that not all products are realistic on a local scale. It concerns products that are bounded to critical safety regulations, or high volumes at specific designed production sites (not directly locally available). This involves product categories as: food packaging, car parts, toys for smaller children, agricultural equipment. Apart from the products listed in the inventory, we added known new products entering the market as well as products mentioned in a Plasticity workshop (may 2021).

In addition to the 5 recommendations above, the table below is providing a starting point to determine by a selection of criteria which product idea out of recycled plastic could be potentially be interesting for your local waste streams. And with that it is a guide to a potentially successful business case on local scale.

In case you have high quality plastic waste streams in smaller volumes, and a partner that is keen on expressing that the product is made out of local waste, then products in the category sunglasses & accessories might be a good starting point. In case, the quality of the plastic is rather low, then you might want to start with products in the outdoor environment, like a flowerpot.

Figure 7. A starting point to determine by a selection of criteria which product idea out of recycled plastic could be potentially be interesting for your local waste streams.

Product categories	Quantity plastic material per piece	Known quality of the plastics needed	Required investment for production	Dedicated Chain possibility	Product uniqueness	Branding opportunity - 'local plastic'
Products out of the inventory						
Sunglasses and accessories (fashion, home)	Low	High	Medium	High	High	High
Indoor design furniture (unique items, tables, kitchen blades, chairs, lamps)	Medium	Medium-High	Medium	High	High	Medium
Utensils (storage boxes, bins, bait boxes, shopping bags, buckets, pencils)	Medium	Medium	Medium	Medium	Low	Medium
In store displays and shelf material	Medium	Medium	Low	Low	Medium	Low
Basic construction material (sheets, lumber, bollards, fences, floor grids)	Medium	Low-Medium	Low	Low	Low	Low
Toys for adults (board games)	Low	Medium	Low	Medium	Medium	Medium
Outdoor furniture (picnic tables, chairs)	High	Low	Low	Low	Low	High
Garden necessities (pots, planters, composters, rain pipes)	High-Medium	Low	Low	Low	Low	High
Outdoor playgrounds (sandboxes, mud kitchens, play hut)	High	Low	Low	Low	Low	High
Additional products						
Specific hospital utensils	Low	High	Low	High	High	Low
Face shields	Low	High	Low	High	High	Low

Plastic attributes, like: handles on the wall or on (kitchen)doors or kids playgrounds	Medium	Medium	Medium	Medium	Low	Medium
Parasols	Medium	Medium	Low	High	Low	High
Wax-combs (used in surfing scene)	Low	Medium	Low	High	High	High
Large sized menu boards and standards	Medium – High	Low	Low	Medium	Low	High
Marketing related attributes, like: pens, tailor made presentation material	Low - Medium	Medium	Low	Low	Low	High

APPENDICES

Appendix A – Product list included in Phase 2 (end of Phase 1)

Product Sector	Product Category	Name of the product	Trading / Selling company	Location Trading / Selling Company	Brand	Plastic Type used	Number of products
Automotive	**Other**	Engine housing - Kohler 7000 series	**Kohler & Co.**	**USA**	Kohler & Co.	PP	1
Totaal Automotive							**1**
Construction	**Construction**	Sound wall	**DeCeuninck**	**BE**	CycleFoam	PVC	1
	Construction material	Agricultural tools - pipe drains	**Soleno Recycling**	**Yamachiche, Canada**	Soleno	HDPE	1
		Decking	**Hahn Group**	**Rheinböllen, GE**	Hanit	Mix of LDPE, HDPE and PP (it is called Hanit)	1
			Plastiblocks	**Ontario, Canada**	Plastiblocks	HDPE	1
		Floor Tiles	**EcoTile**	**Luton, UK**	EcoTile	PVC - Ecotile	1
		Ground Grid	**Hahn Group**	**Rheinböllen, GE**	Hanit	Mix of LDPE, HDPE and PP (it is called Hanit)	1
		Groundmate Ground Protection	**Centriforce**	**Liverpool, UK**	Groundmate	Polyethylene	1
		Lumbur - plastic wood	**Centriforce**	**Herpetosure, UK**	Duraplas	HDPE	1
		Rain pipe (rigofill blocks)	**Fränkische**	**Germany**	Rigofill	PP	1
		Sheets	**Amari Plastic**	**UK**	Greencast®	PMMA	1
			Plaskolite	**Columbus, Ohio, USA**	Plaskolite	ABS	1

	Sheets Black & Blue Dapple	**Pyrasied**	**Leeuwarden, NL**	Plasticiet - Smile Plastics	HDPE	1
	Sheets Charcoal	**Pyrasied**	**Leeuwarden, NL**	Plasticiet - Smile Plastics	PET	1
	Sheets Kaleido	**Pyrasied**	**Leeuwarden, NL**	Plasticiet - Smile Plastics	PET	1
	Sheets Ocean (translucent)	**Pyrasied**	**Leeuwarden, NL**	Plasticiet - Smile Plastics	PET	1
	Sheets Smile Plastics	**Pyrasied**	**Leeuwarden, NL**	Plasticiet - Smile Plastics	PE - mix of LDPE, HPDE	1
	Synthetic Lumbur	**Hahn Group**	**Rheinböllen, GE**	Hanit	Mix of LDPE, HDPE and PP (it is called Hanit)	1
	Ultra Ecocrib Wall	**Hahn Group**	**Rheinböllen, GE**	Hanit	Mix of LDPE, HDPE and PP (it is called Hanit)	1
Construction material/ outdoor materials/ outdoor construction	Lumber (cladding, decking, planks and other)	**Kedel Ltd**	**UK**	Kedel Limited	HDPE or high density PS (not mixed)	1
Construction part	Blocks	**Plastiblocks**	**Ontario, Canada**	Plastiblocks	Mix of PVC/XPLE and nylon	1
					PE - Foamed	1
	Bollards	**Hahn Group**	**Rheinböllen, GE**	Hanit	Mix of LDPE, HDPE and PP (it is called Hanit)	1
	Cable reel and ducts	**Hahn Group**	**Rheinböllen, GE**	Hanit	Mix of LDPE, HDPE and PP (it is called Hanit)	1
	Decking	**Marmax**	**UK, IRE, NL, FR**	Marmax	HDPE	1
	Ecotile flooring - 2K range	**Ecotile Flooring Ltd**	**Luton, UK**	EcoTile	PVC	1

		Fencing	**Hahn Group**	**Rheinböllen, GE**	Hanit	Mix of LDPE, HDPE and PP (it is called Hanit)	1
			Marmax	**UK, IRE, NL, FR**	Marmax	HDPE	1
		Palisades	**Hahn Group**	**Rheinböllen, GE**	Hanit	Mix of LDPE, HDPE and PP (it is called Hanit)	1
		Pickets	**Hahn Group**	**Rheinböllen, GE**	Hanit	Mix of LDPE, HDPE and PP (it is called Hanit)	1
		Plasti-Block Pavers	**Plastiblocks**	**Ontario, Canada**	Plastiblocks	Mix of plastics, non-specified	1
		Plastic Cable Duct (MPO size I and II)	**Mulitport GmbH**	**Bernburg, Germany**	Mulitport GmbH	PP	1
		Plumbing products	**Plastiblocks**	**Ontario, Canada**	Plastiblocks	HDPE	1
Totaal Construction							**32**
Fashion	**Accesoires**	Accessoiries - jewellery	**YagoEco**	**UK**	YagoEco	LDPE	1
		Sunglasses (3D printed)	**Yuma Labs**	**BE**	YUMA	PET	1
		Sunglasses (Zennor, Fitzroy, Kynance)	**Waterhaul**	**Cornwall, UK**	Waterhaul	PP	1
		Sunglasses and optical	**Waterhaul**	**UK**	Waterhaul	PP	1
Totaal Fashion							**4**
Gardening, outdoors, public space, landscaping	**Buckets & Bins**	Kitchen caddies and storage boxes	**Coral Products PLC**	**UK**	Coral Products	PP	1

Construction material/ outdoor materials/ outdoor construction	Stokbord- recycled plastic sheets (green coated and black)	**Kedel Ltd**	**UK**	Kedel Limited	LDPE	1
Outdoor Construction	Garden educational toys (drone, bi-plane, jubo jet, train, play hut, raft, podium, boat, table tennisetc)	**Marmax**	**UK, IRE, NL, FR**	Marmax	HDPE	1
	Mud kitchen for kids	**Hahn Group**	**Rheinböllen, GE**	Hanit	Mix of LDPE, HDPE and PP (it is called Hanit)	1
	Outside dog items (bed, educational toys)	**Marmax**	**UK, IRE, NL, FR**	Marmax	HDPE	1
	Playground equipement	**The Hideout House Company Ltd.**	**Peterborough, UK**	The Hideout House	HDPE	1
	Sandboxes kids	**Hahn Group**	**Rheinböllen, GE**	Hanit	Mix of LDPE, HDPE and PP (it is called Hanit)	1
	Trail post / road sign	**Marmax**	**UK, IRE, NL, FR**	Marmax	HDPE	1
	Wildlife Habitat Fences	**Belgrade Polymer Products**	**Northamptonshire, UK**	Belgrade	HDPE	1
Outdoor containers	Composters	**Hahn Group**	**Rheinböllen, GE**	Hanit	Mix of LDPE, HDPE and PP (it is called Hanit)	1
	Litter bins	**Hahn Group**	**Rheinböllen, GE**	Hanit	Mix of LDPE, HDPE and PP (it is called Hanit)	1
	uBIN 70L	**Green Warehouse Ltd.**	**Bristol, UK**	Green Warehouse	PP	1
	Waste bin	**Marmax**	**UK, IRE, NL, FR**	Marmax	HDPE	1

Outdoor furniture	Alfa Seats	**Dragon Plastics Rotomoulding B.V.**	**Sint Maartensdijk, NL**	Alfa Seats	PE	1
	Benches	**Hahn Group**	**Rheinböllen, GE**	Hanit	Mix of LDPE, HDPE and PP (it is called Hanit)	1
	Chair	**Kedel Ltd**	**UK**	Kedel Limited	HDPE	1
	Garden table and chairs	**Marmax**	**UK, IRE, NL, FR**	Marmax	HDPE	1
	Picnic Table	**Hahn Group**	**Rheinböllen, GE**	Hanit	Mix of LDPE, HDPE and PP (it is called Hanit)	1
	Planters	**Hahn Group**	**Rheinböllen, GE**	Hanit	Mix of LDPE, HDPE and PP (it is called Hanit)	1
		Marmax	**UK, IRE, NL, FR**	Marmax	HDPE	1
	Quicksit - fold up chair	**ECO Arcade**	**UK**	QuickSit	PP	1
	Raised beds	**Hahn Group**	**Rheinböllen, GE**	Hanit	Mix of LDPE, HDPE and PP (it is called Hanit)	1
	Seat benches	**Marmax**	**UK, IRE, NL, FR**	Marmax	HDPE	1
	Tables	**Hahn Group**	**Rheinböllen, GE**	Hanit	Mix of LDPE, HDPE and PP (it is called Hanit)	1
Outdoor furniture/ construction	A range of outdoor furniture, decking, fencing, gates, playground equipment, bollards	**Reformed Plastics**	**UK**	Reformed Plastics	HDPE	1

Totaal Gardening, outdoors, public space, landscaping							**25**
Home	**Furniture**	Bell Chair	**Magis furniture SPA**	**Italy**	Konstantin Grcic	PP	1
		Chair (9 types)	**Fredericia**	**Denmark**	Pato	PP	1
		Chais - 100/100 collection	**Selle**	**Spain**	Sellex	PP	1
		Charlie Ocean Chair - Kids (5colours)	**Ecobirdy**	**Antwerpen, BE**	Ecobirdy	Ecothylene (patented)	1
		Flat pack chair	**Tom Robinson**	**EU**	Evolve	PS	1
		Kids set table and 2 chairs	**Ecobirdy**	**Antwerpen, BE**	Ecobirdy	Ecothylene (patented)	1
		Kiwi containers storage - kids (2colours)	**Ecobirdy**	**Antwerpen, BE**	Ecobirdy	Ecothylene (patented)	1
		Luisa Table - kids (3colours)	**Ecobirdy**	**Antwerpen, BE**	Ecobirdy	Ecothylene (patented)	1
		The Nobody Chair	**Komplot Design**	**Denmark**	Komplot Design	PET (thermo pressed PET felt)	1
	Lightning	Rhino lamp disco light (3colours)	**Ecobirdy**	**Antwerpen, BE**	Ecobirdy	Ecothylene (patented)	1
		Rhino lamp white light (3colours)	**Ecobirdy**	**Antwerpen, BE**	Ecobirdy	Ecothylene (patented)	1
	Office Chair	Office Chair	**Scandinavian Business Seating**	**Oslo, Sweden**	HAG Capsico	PP	1
Totaal Home							**12**
Other	**Display**	Gondolas (presentation shelfs pharmacy)	**Sartoretto Verna**	**Rome, Italy**	Go-Plexi	Plexiglass	1

		Pharmacy shelves	**Sartoretto Verna**	**Rome, Italy**	Go-You	Plexiglass	1
	Other	Parts for a guitar	**TLC Guitar Goods**	**Soes, NL**	TLC Guitar Goods	Plexiglass	1
	Pest control	Bait Box for rats, mice, insects	**1env Solutions**	**Essex, UK**	Rotech	PP - Axpoly PP51	1
Totaal Other							**4**
Packaging	**Body care packaging**	Packaging Care products - black pots	**Lush Cosmetics North America**	**USA**	Lush	PP	1
		Packaging care products - bottles	**Soaper Duper**	**London, UK**	Soaper Duper	HDPE	1
	Bulk packaging	rPP Big Bags	**Starlinger & Co**	**Austria (and China)**	Starlinger	PP	1
	Detergent packaging	Packages cleaning products - Delphis	**Delphis Eco Limited**	**UK**	Delphis Eco Limited	HDPE	1
		Packaging cleaning detergent - Persil 4in1 disc	**Henkel**	**Kremsmünster, Austria**	Persil	PP	1
		Packaging household cleaning agent - dish washer	**Ecover**	**BE**	Ecover	PP (cap) PET (bottle)	1
	Food packaging	Detecta Black Tray	**Mannok Packaging (old: Quinn Packaging)**	**Cavan, Ireland**	Mannok	PET	1
		Flat wine bottle (mail box)	**Garcon Wines**	**London, UK**	Garcon Wines	PET	1
		Flexible food packaging	**Roplast Industry**	**USA**	Rotexx	PE	1
		Food Package - Foam Tray	**Holfeld Plastics Ltd**	**Ireland**	Detecta	PET	1
		Food packaging - bottles	**Stäger Clear packaging & Co**	**Coventry, UK**	Stäger	PET	1
		Food packaging - juice	**Riedel**	**Nederland**	Coolbest	PE - pack PP - caps	1

Food packaging - pouch	**Berry BPI Group (produceren of flexible packagings)**	**Spouth Wales, UK**	BPI Berry	HDPE	1
Food Packaging - powder stock	**Unilever**	**Rotterdam, the Netherlands**	Knorr	PP	1
Packages - food / non-food / covers / film / sheets	**LUCOZADE RIBENA SUNTORY LIMITED**	**UK**	Ribena 500ml	PET	1
Packagings for the Flower sector 2 types of foil	**Fresca Flowers**	**NL**	Recy-bloemenhoes	PP and PE (not mixed)	1
Rigid Food Tray Collection	**Bonson**	**Auckland, New Zealand**	Replay Range	PET	1
Rigid transaparent food tray (8 sizes/shapes)	**Placon**	**USA**	Every ReFresh package from EcoStar Food-grade rPET	EcoStar PET from bottles and thermoforms - PCR	1
Rigid transaparent food tray (bakery)	**Placon**	**USA**	Bakery Line	EcoStar PET from bottles and thermoforms - PCR	1
Rigid transaparent food tray easy open/close (5 sizes/shapes)	**Placon**	**USA**	Evolutions deli	PETE	1
Rigid transparent food tray	**Wipak Group**	**EU**	Wipak	PET	1
Rigid transparent food trays	**Paccor International**	**Zell, Germany**	Deligreen	PET	1
	Plus Pack AS	**Odense, Denmark**	Bistro Cold	PET	1

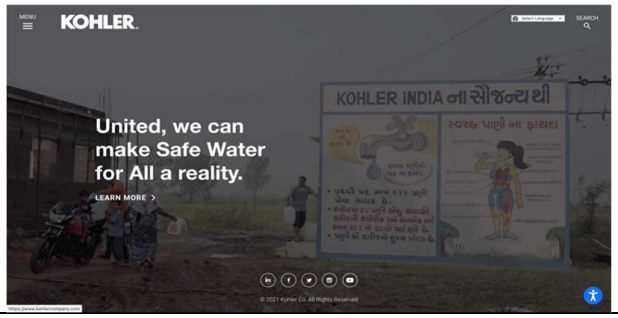
	Packaging	Beverage shrink wrap - Ranicollationshrink EcoL	**Raniplast**	**Terjäv, Finland**	Raniplast	PE	1
		Mailing bags (envelops)	**Papier Mettler**	**Morback, Germany**	Ecoloop	LDPE	1
		Packaging - glue bottle	**Henkel**	**Germany**	Pattex	PE	1
		Rigid tray packaging	**Tilton company**	**Canada**	RePost	PETE	1
Totaal Packaging							**27**
Toys	**Toys**	Green Toys (differen toy sets)	**Green Toys Inc.**	**Sausalito, CE, USA**	GreenToys	Mix of HPDE, LDPE and PP	1
		Rockeees Toys	**Apollo-11**	**NL**	Rockees	HIPS	1
Totaal Toys							**2**
Utinsels	**Buckets & Bins**	Refuse Sacks - Garbage Bag	**BPI Recycled Products**	**Northamptonshire, UK**	Visqueen	PE	1
		Secure Box (data sensitive information)	**Schoeller Allibert**	**NL**	Secure Box	PP	1
	Cutlery	Enjoy Kitchen Tools Range (#5)	**Tefal (part of Groupe SEB)**	**Rumilly, France**	Tefal	PET	1
	Food containers	Gripper bottle 800 ml	**Sistema**	**New Zealand**	Sistema Renew	PP	1
		Lunch container 1.1L salad	**Sistema**	**New Zealand**	Sistema Renew	PP	1
		Lunch container 1.2L Lunch plus	**Sistema**	**New Zealand**	Sistema Renew	PP	1
		Lunch container 1.65L Bento Lunch	**Sistema**	**New Zealand**	Sistema Renew	PP	1
		Lunch container 450 ml sandwich	**Sistema**	**New Zealand**	Sistema Renew	PP	1
		Lunch container 975 ml snack attack duo	**Sistema**	**New Zealand**	Sistema Renew	PP	1

		Snack container 350 ml small split	**Sistema**	**New Zealand**	Sistema Renew	PP	1
		Snack container 400 ml snacks (square)	**Sistema**	**New Zealand**	Sistema Renew	PP	1
		Snack container 410 ml snack attack (long)	**Sistema**	**New Zealand**	Sistema Renew	PP	1
		Snack container 515 ml snack capsule	**Sistema**	**New Zealand**	Sistema Renew	PP	1
	Shopper bags	Shopping Bags	**Papier Mettler**	**Morback, Germany**	Ecoloop - The Blue Angel	LDPE	1
	Storage containers	Re-usable storage containers for detergents and cosmetics (set of 10 pieces)	**MENSHEN**	**France**	MENSHEN	PP	1
	Utinsels	Ball Point Pens - B2P (=Bottle2Pen) - 3 types	**Pilot Corporatation**	**France**	B2P - Bottle 2 Pen	PET	1
Totaal Utinsels							**16**
Total							**123**

Appendix B – Company and product profiles

1. Kohler Co.

1.1. Company profile

General information	
Company	Kohler Co. 
Company description	Kohler Co. is one of the oldest and largest privately held companies in the US. Known for its bold look, Kohler is a global leader in kitchen and bath products, cabinetry, tile, and lighting. They are also a global manufacturer of engines and power generation systems. To round out its diverse portfolio, Kohler operates award-winning hospitality and world-class golf at Destination Kohler and Destination St. Andrews. They have been improving the level of gracious living by providing exceptional products and services for customers' homes and their lifestyles. Kohler Co. believes that better business and a better world go hand in hand. They are passionate about making a change in the world and are involved in many projects with the goal to create a better world. Like clean drinking water for victims of natural disaster, tiles created from industrial waste, sanitation systems for underdeveloped communities, and more. They believe in: - A diverse and inclusive workplace - Learning and development as a way of life - Meaningful career growth - Promoting a healthy life - Fusion between work, family, and fun - Opportunities to contribute to the greater good In 2017 Kohler Co. was recognized as a 2017 Green Master by the Wisconsin Sustainable Business Council and the Green Master Program. And in 2018, Kohler Co. received the 2018 Corporate LCA (lifetime cycle assessment) Leadership Award. They have also received numerous awards and recognition in the field of equality, innovation, and water conservation.
Goal/vision	To enhance the quality of life for current and future generations through design, craftsmanship and innovation. To contribute to a higher level of gracious living for those who are touched by the company's products and services.
Founded in	1873
CEO	David Kohler

Location(s)	Headquarters: Kohler, Wisconsin 800+ distributions worldwide across the Americas, Europe, Middle East, Africa, and Asia Pacific.			
Manufacturing company	Not specified, 13,000 dealers.			
Location(s)	18 locations across the globe, specific locations not specified.			
# employees	36,000+			
Financials (#turnover and possible margins)	Sales from environmental favourable products: $1+ billion (2020)			
Brands	*Kitchen & Bath*	*Decorative products*	*Power*	*Golf & Resort destinations*
	Englefield, Fiori, Hytec, Jacob Delefon, Karat, KOHLER, Mira, Novita, Rada, Sanijura, STERLING	Ann Sacks, Kallista, Robern	KOHLER Engines, KOHLER, Generators, Clarke Energy, KOHLER-SDMO, UPS (Uninterruptible Power Supplies)	Some of the brands are: Bold Cycle, Blackwolf Run, Craverie Chocolatier Café, Destination Kohler, Kohler Collection, Kohler Waters Spa
Person interesting to contact for interview	KOHLER Engines European sales offices Lombardini Motoren GmbH - Kohler Phone: +49-(0)69-9508160 Lombardini U.K. Ltd - Kohler Phone: +44-(0)1865-863858 Lombardini France S.a.s. - Kohler Phone: +33-(0)474-626500 Lombardini ESPAÑA, S.L. - Kohler Phone: +34-(0)9358-62111 https://kohlerpower.com/en/engines/contact			
Sustainability/environmental and social impact				
Footprint reduction/social impact & important concepts used	Reduction greenhouse gas emission: 48% since 2008 Reduction operational energy: 22% since 2008 Reduction waste landfill: 47% in 2020 Reduction water intake: 46% since 2008 Gallons of water saved: 388B gallons Electricity from renewable resources: 53% in 2020 Since 2016, Kohler Co has been deepening commitment through **Design for Environment (DfE)** program by carefully considering the full life cycle impacts of their products and processes. The detailed step-by-step DfE model enables Kohler to make many improvements: - Rethink design aspects, including materials, longevity, and disposal at the end of a product's useful life. - Focus on how consumers use Kohler products.			

	- Look for opportunities to minimize a product's manufacturing, packaging, and transportation footprint. **Stewardship** is how they refer to the social impact initiatives at Kohler. As stewards, they are passionate about helping the world solve its water and sanitation needs; about enhancing the quality of life for current and future generations. Using their philanthropic and social impact resources in a responsible and sustainable manner with the aim of creating positive change in the communities where they live and work. Currently they are taking a customised approach to support at a local level 55 communities around the world. → e.g., $600K in scholarships, 3.5K showers to the unhoused, safe water projects etc.
Footprint reduction goals	Net zero greenhouse gas across operations and zero waste to landfill by 2035.
Waste management	Kohler Co. measures carbon dioxide, methane, and nitrous oxide emissions using the Greenhouse Gas emission (GHG) protocol and consider the following: - Scope 1: fuel that they consume in manufacturing - Scope 2: fuel used by their energy providers to produce the energy that they consume KOHLER WasteLAB, here Kohler designers and sustainability experts are using waste materials such as foundry dust, pottery cult, and enamel powder to create actual products, like tiles and coasters.
Transparency products (how they are made, what materials used, certifications etc.)	Uses Environmental Product Declaration (EPD) → the declare labels contain details about the chemical makeup of a product, the life expectancy, and lists any materials that could harm our health or pollute the environment → verified by third party.
Sources	https://www.kohlercompany.com/

1.2 Products

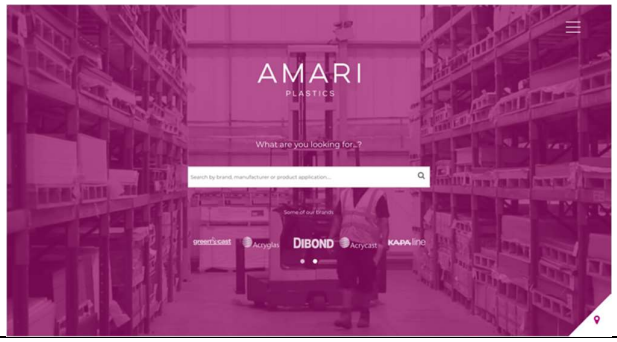
1.2.1. Engine housing - Kohler 7000 series

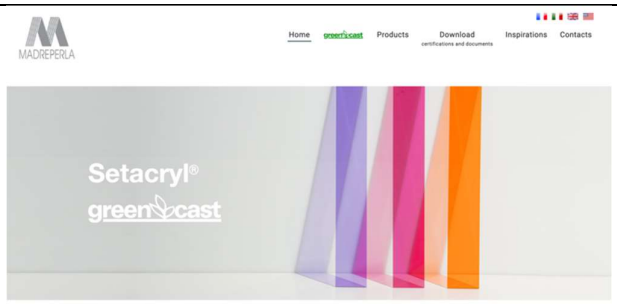
General information		
Product name	Engine housing - Kohler 7000 series	
Product category	Other	
Product sector	Automotive	
Brand	KOHLER Engines	
Since year	1920	
Trading company	Kohler Co.	
Location trading company	International	
Manufacturing company	Not specified	

Location manufacturing company	Evansville, Indiana
Product specifics	
Since when product launched	Unclear
Price of product (EUR)	1300 (estimate)
Sales channel	Unclear, most probably online
Country of sales	International
Sales volume	Unclear
Sales impact	Unclear
Awards	None found for specific product, however, see company profile
Plastic type used	PP
PIR/ PCR / used	PIR
Plastic source	Carpet waste
Assembled product (Yes/No)	Yes
% of recycled content (overall)	
% of recycled content (plastic part)	100%
Afterlife of the product	Unclear
Mechanical process (Yes/No)	Unclear
Sustainability impact	Kohler 7000 series engine housings are now made of PP resin, which is 100% PIR, saving hundreds of thousands of gallons of oil. Instead of using PCR, the lifetime of the products is now longer. DfE impact: replace virgin materials, reduce landfill.
Other remarks	
Sources	https://kohlerpower.com/en/engines http://resources.kohler.com/power/kohler/enginesUS/pdf/E-2200-C%20Kohler%207000%20Series%2020-26%20HP.pdf?_ga=2.253484609.993394601.1627412805-850058915.1627412805 https://www.uschamberfoundation.org/best-practices/creating-circular-economy-great-lakes-region https://www.kohlercompany.com/who-we-are/awards-recognition/

2. Amari Plastics

2.1 Company profile

General information	
Company	Amari Plastics 
Company description	Amari Plastics is the UK's leading supplier of plastics and related materials for industry. Serving four main sectors – Signs, Display & Graphics, Industrial & Engineering, Building & Construction and Retail & Commercial Interiors. With the broadest range of products in the industry, they ensure that their customers can stand apart from their competitors.
Goal/vision	Helping customers to grow by providing them with brand leading, locally stocked, high-quality products.
Founded in	1975
CEO	David Williams – not certain
Location(s)	Headquarters: Weybridge, UK 15 locations distributed across UK Amari Plastics is supported by 12 individual specialist businesses
Manufacturing company	Not specified (assumably different for each product) → Madreperla S.p.A. is manufacturing company for the relevant product. Madreperla S.p.A has been producing cast acrylic sheets for 70 years. Over time they enlarged and diversified their range of products, adding colours and different surface textures in order to meet the demand of an increasingly sophisticated market. Through the years the company has strived for innovation, enhancing its quality and service, making it Italy's leading acrylic manufacturer and the only company producing 100% recycled cast acrylic sheets. Their PMMA sheets can be recycled to its original raw material countless times, without losing its peculiar characteristics, and therefore making it the perfect material for a circular economy and for waste reduction.

	
Location(s)	See above, Madreperla S.p.A. is located in Italy
# employees	Not specified, according to LinkedIn between 201-500 employees.
Financials (#turnover and possible margins)	Not specified
Brands	Some of the brands: Makrolon®, Green Cast®, KAPA®Mount, Acryglas, DiDIBOND®, Acrycast, KAPA®Line
Person interesting to contact for interview	Contact form on website Recycled Plastics: John Brooks (General Manager) 01245 426 666 sales@recycledplastics.org.uk recycledplastics.org.uk
Sustainability/environmental and social impact	
Footprint reduction/social impact & important concepts used	Amari Plastics supplies their customers the tools to make more ecological choices. They do this in two ways: by providing a specialist range of sustainable materials, and by practicing the safe disposal of industry plastics, thanks to Recycled Plastics (part of the Amari Plastics family of specialists). → circular economy
Footprint reduction goals	Not specified for Amari Plastics, however, Madreperla S.p.A. has goals for 2023: - Further 15% reduction of water consumption for product output - Further 12% reduction net energy reduction consumption - Further reduction of CO2 and greenhouse gas emissions by 20%
Waste management	Recycled Plastics (one of the twelve specialist businesses)
Transparency products (how they are made, what materials used, certifications etc.)	Madreperla S.p.A. has added a certified EPD (Environmental Product Declaration) for their Green Cast® range, 100% recycled cast acrylic sheets → complying with ISO 7823.1
Sources	https://amariplastics.com/2018/08/28/amari-sustainability/ http://www.madreperlaspa.com/UK/sustainability.html https://amariplastics.com/our-locations/

2.2. Products

2.2.1. Sheets

General information		
Product name	Sheets	
Product category	Construction material	
Product sector	Construction	
Brand	Green Cast®	
Since year	2012	
Trading company	Amari Plastics	
Location trading company	UK	
Manufacturing company	Madreperla S.p.A.	
Location manufacturing company	Cinisello Balsamo, Italy	
Product specifics		
Since when product launched	2018	
Price of product (EUR)	Not specified	
Sales channel	Via sales department	
Country of sales	EU	
Sales volume	Unclear	
Sales impact	Unclear	
Awards	LEED (Leadership in Energy and Environmental Design) credits for Green Cast®	

Plastic type used	PMMA
PIR/ PCR / used	Not specified
Plastic source	Unclear
Assembled product (Yes/No)	No
% of recycled content (overall)	100%
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable
Mechanical process (Yes/No)	Yes
Sustainability impact	Carbon impact: 60% value of the material Water consumption: 0,0 m3/ton of produced MMA (water is totally re-used) Madreperla S.p.A. is engaged in a system to regenerate the energy and water used in their production Cardboard packaging is made with recycled and recyclable products
Other remarks	Advantages of product compared to less sustainable options: - It uses 100% raw material recovered from scraps - It uses less energy as the process burns its own waste products to produce the necessary heat - It requires no energy for storage (immediate local use instead of refrigerated transport) - It needs no fuel consumption for transportation of virgin MMA (recycled monomer is used locally)
Sources	http://www.madreperlaspa.com/UK/greencast.html https://www.ashplastics.co.uk/wp-content/uploads/2020/05/greencast-techbrochure.pdf http://www.madreperlaspa.com/UK/leed-credits.html https://amariplastics.com/product/green-cast/

3. Ecotile

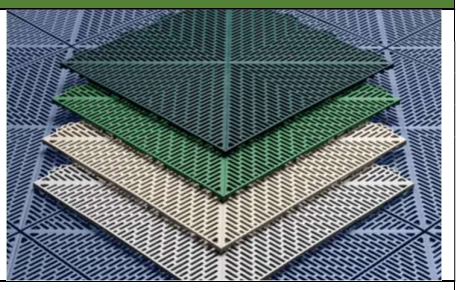
3.1. Company profile

General information	
Company	Ecotile 
Company description	Ecotile produces high quality, durable PVC interlocking floor tiles designed for industrial use. They are based in Luton, Bedfordshire, where their Ecotile factory adheres to ISO9001 standards. Their customers are at the heart of everything they do. They pride themselves on a transparent partnership approach to business. This ensures they always provide the highest levels of service, quality, safety and technical expertise and advice.
Goal/vision	To produce quality products for industry, whilst being as green as possible. The goal is to prevent harm to the environment that they cause by their actions.
Founded in	1996
CEO	James Gedye
Location(s)	Headquarters: Luton, UK Multiple sales offices in Europe and The Americas, no specific number given.
Manufacturing company	Ecotile
Location(s)	Luton, UK
# employees	<100 (estimation)
Financials (#turnover and possible margins)	Not specified
Brands	Ecotile
Person interesting to contact for interview	Contact form on website Other enquiries for UK & Ireland: 01582 297283 W: www.ecotileflooring.com E: enquiries@ecotileflooring.com
Sustainability/environmental and social impact	
Footprint reduction/social impact & important concepts used	At the end of its service life the tile can be granulated and re-used to manufacture a new floor (unlike most floor coverings which only have a limited life span due to wear or are scrapped for refurbishment). As well as the option to recycle, there is also a strong market for pre-owned tiles, ensuring Ecotile is the sustainable flooring option.

Footprint reduction goals	Not specified
Waste management	As an environmentally responsible company they can arrange to collect any excess material or off-cuts completely free of charge.
Transparency products (how they are made, what materials used, certifications etc.)	ISO14001 Environmental Management System
Sources	https://www.ecotileflooring.com/about-us/ https://www.ecotileflooring.com/why-us/environmental-recycled-flooring/ https://www.ecotileflooring.com/news/ecotile-sustainable-flooring/

3.2. Products

3.2.1. Floor Tiles

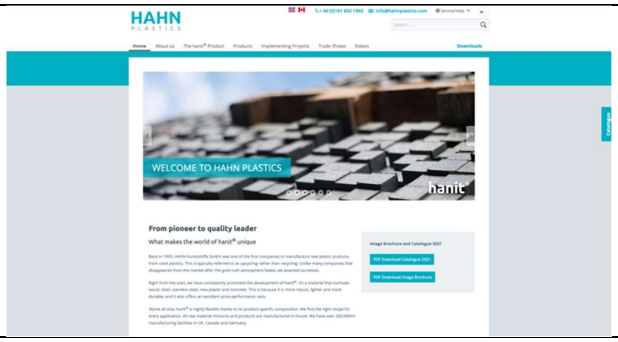
General information		
Product name	Floor Tiles	
Product category	Construction material	
Product sector	Construction	
Brand	Ecotile	
Since year	1996	
Trading company	Ecotile	
Location trading company	Luton, UK	
Manufacturing company	Ecotile	
Location manufacturing company	Luton, UK	
Product specifics		
Since when product launched	1994 (2015 launched in GE, since 1994 in UK - https://www.ifm.eng.cam.ac.uk/news/ecotile-boosting-growth-through-innovation-and-efficiency/)	
Price of product (EUR)	60 per sqm (estimation), however, depends on thickness tile, format, etc.	
Sales channel	Via sales department	
Country of sales	UK	
Sales volume	Unclear	
Sales impact	Not specified	

Awards	None found
Plastic type used	PVC - Ecotile
PIR/ PCR / used	Not specified
Plastic source	Unclear
Assembled product (Yes/No)	No
% of recycled content (overall)	
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable
Mechanical process (Yes/No)	Yes
Sustainability impact	Ecotile wants to purchase the flooring back from you at the end of its life, for the very simple fact that the PVC has an inherent value and recycling the tiles makes excellent economic sense. They do not only want to buy the flooring back from you, but they are also saving you the money you would have had to pay if the flooring had to be sent to landfill. Ecotile believes the most important factor is that your floor will be reprocessed into a brand-new floor that will give a future customer many more years of excellent service and the impact on the environment will be nominal.
Other remarks	The use of Ecotile interlocking floor tiles, eliminates the need for surface preparation, floor screed and adhesives resulting in approximately one third the amount of energy, emissions, carbon miles and disruption when compared with resin or vinyl sheet or tile alternatives.
Sources	https://www.buildwithrise.com/stories/recycled-plastic-home-products

4. Hahn Group

4.1. Company profile

General information	
Company	Hahn Group 
Company description	The HAHN Group unites a network of specialized companies for industrial automation and robot solutions. At its production and service sites, the group employs approximately 1,600 people in 14 countries. Well-known customers in the automotive, consumer goods, electronics and healthcare industries benefit from skills that have grown over the past 30 years. This expertise in the field of automation technology ensures that resources are used efficiently and robots, as well as digital technologies are deployed in a targeted manner. For their customers, the HAHN Group companies are able to implement any automation according to individual needs and specifications: starting with the smallest projects for individual grippers or robot arms, through the expansion of existing systems with flexible and standardized modules or test and inspection systems. With the planning, implementation and commissioning of complex production lines, the HAHN Group supports its customers worldwide and accompanies them on their way to the Smart Factory. First company in Germany to receive Green Angel recycling award. In 2005 they received the award of the eco-label "THE BLUE ANGEL" In 2018 they received the British RISE award for Sustainable Development.
Goal/vision	To develop, build and integrate custom-engineered, high-performance automation and robot solutions for manufacturing companies.
Founded in	Hähn Engineering founded in 1992, this is the foundation for Hahn Group which became an official company in 2017.
CEO	Philipp Unterhalt
Location(s)	30 locations across the Americas, Europe, and Asia
Manufacturing company	Hahn Plastics

	
Location(s)	Plants in (Manchester) UK, Canada, Germany
# employees	1600+
Financials (#turnover and possible margins)	Not specified
Brands	Hanit Companies part of Hahn Group: DFT, Walther Systemtechnik, HAHN Ruhrbotics and REI Automation, HAHN Digital, Invotec, HAHN Automation, GeKu, Waldorf Technik, WEMO, Rethink Robotics, RobShare.
Person interesting to contact for interview	Hahn plasticts: info@hahnplastics.com Hahn Group: info@hahn.group Both have contact form on their websites
Sustainability/environmental and social impact	
Footprint reduction/social impact & important concepts used	Hahn Plastics: - Production of 56,000 ton recycled plastic products yearly. - Regardless of which used material used, they implement the idea of environmental protection, even during the production. They keep emissions low, even and especially during recycling.

	
Footprint reduction goals	Not specified
Waste management	See below
Transparency products (how they are made, what materials used, certifications etc.)	Due to its individual composition, hanit® can be adapted to any application. **Durability** » Weather-resistant » Rot-resistant » Splinter-free, therefore low risk of injuryCan be used year round » Moisture-repellent, does not absorb water, therefore dries fast **LIGHT-WEIGHT** » Installation does not require heavy equipment » Higher load capacity » Transport cost savings » Faster installation » Reduced workload

	 **ECONOMICAL** » Long service life » Resistant to oils, brines, acids, and salt water » Low maintenance and service costs » Made of high-quality processed secondary plastics (polyolefins) » Excellent price-quality ratio » Perfect construction material, especially for robust profiles and finished parts  **ECO-FRIENDLY** » Produced without preservatives » Reduces the strain on landfills, is sustainably environmentally friendly » Recyclable in the material cycle » Awarded the "BLUE ANGEL" eco-label » Water neutral » Non-toxic (safe according to DIN 71, Section 3 Playground Regulation)  **SIMPLE PROCESSING** » Easy to process mechanically (drilling, sawing, screwing, nailing) » Simple adjustments can be made on the spot
Sources	https://www.hahn.group/en/about-the-hahn-group/ https://www.hahnplastics.com/en/about-us/our-story/

4.2. Products

4.2.1. Sandboxes for kids

General information		
Product name	Sandboxes kids	
Product category	Outdoor Construction	
Product sector	Gardening, outdoors, public space, landscaping	
Brand	Hanit	
Since year	1998	
Trading company	Hahn Group	
Location trading company	Rheinböllen, GE	
Manufacturing company	Hahn Plastics	
Location manufacturing company	Plants in (Manchester) UK, Canada, Germany	
Product specifics		
Since when product launched	2014 - https://news.cision.com/dakota-digitalltd/r/plastics-manufacturer-launches-campaign-to-get-specially-designed-house-to-typhoon-haiyan-victims,c9517281	
Price of product (EUR)	Not specified	
Sales channel	Via sales department	
Country of sales	International	
Sales volume	Unclear	
Sales impact	Unclear	
Awards	None found for specific product, however, see company profile	
Plastic type used	Mix of LDPE, HDPE, and PP (it is called Hanit)	
PIR/ PCR / used	Not specified	
Plastic source	Unclear	
Assembled product (Yes/No)	Yes	
% of recycled content (overall)		
% of recycled content (plastic part)	100%	
Afterlife of the product	Recyclable as raw material (claimed).	
Mechanical process (Yes/No)	Yes	

Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	www.hahnplastics.com/cms/files/downloads/en_CA/catalogues/catalogues/Imagekatalog_NA_2020.pdf https://www.hahnplastics.com/en/search?sSearch=sandbox+kids

4.2.2. Composters

General information		
Product name	Composters	
Product category	Outdoor containers	
Product sector	Gardening, outdoors, public space, landscaping	
Brand	Hanit	
Since year	1998	
Trading company	Hahn Group	
Location trading company	Rheinböllen, GE	
Manufacturing company	Hahn Plastics	
Location manufacturing company	Plants in (Manchester) UK, Canada, Germany	
Product specifics		
Since when product launched	2014 - https://news.cision.com/dakota-digitalltd/r/plastics-manufacturer-launches-campaign-to-get-specially-designed-house-to-typhoon-haiyan-victims,c9517281	
Price of product (EUR)	Not specified	
Sales channel	Via sales department	
Country of sales	International	
Sales volume	Unclear	
Sales impact	Unclear	
Awards	None found for specific product, however, see company profile	
Plastic type used	Mix of LDPE, HDPE, and PP (it is called Hanit)	
PIR/ PCR / used	Not specified	
Plastic source	Unclear	

Assembled product (Yes/No)	Yes
% of recycled content (overall)	
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable as raw material (claimed).
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://www.hahnplastics.com/en/search?sSearch=composter www.hahnplastics.com/cms/files/downloads/en_CA/catalogues/catalogues/Imagekatalog_NA_2020.pdf

4.2.3. Litter bins

General information		
Product name	Litter bins	
Product category	Outdoor containers	
Product sector	Gardening, outdoors, public space, landscaping	
Brand	Hanit	
Since year	1998	
Trading company	Hahn Group	
Location trading company	Rheinböllen, GE	
Manufacturing company	Hahn Plastics	
Location manufacturing company	Plants in (Manchester) UK, Canada, Germany	
Product specifics		

Since when product launched	2014 - https://news.cision.com/dakota-digitalltd/r/plastics-manufacturer-launches-campaign-to-get-specially-designed-house-to-typhoon-haiyan-victims,c9517281
Price of product (EUR)	Not specified
Sales channel	Via sales department
Country of sales	International
Sales volume	Unclear
Sales impact	Unclear
Awards	None found for specific product, however, see company profile
Plastic type used	Mix of LDPE, HDPE, and PP (it is called Hanit)
PIR/ PCR / used	Not specified
Plastic source	Unclear
Assembled product (Yes/No)	Yes
% of recycled content (overall)	
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable as raw material (claimed).
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	www.hahnplastics.com/cms/files/downloads/en_CA/catalogues/catalogues/Imagekatalog_NA_2020.pdf https://www.hahnplastics.com/en/products/furniture-and-outdoor-spaces/rubbish-bins/

4.2.4. Benches

General information		
Product name	Benches	
Product category	Outdoor furniture	
Product sector	Gardening, outdoors, public space, landscaping	
Brand	Hanit	
Since year	1998	
Trading company	Hahn Group	
Location trading company	Rheinböllen, GE	
Manufacturing company	Hahn Plastics	
Location manufacturing company	Plants in (Manchester) UK, Canada, Germany	
Product specifics		
Since when product launched	2014 - https://news.cision.com/dakota-digitalltd/r/plastics-manufacturer-launches-campaign-to-get-specially-designed-house-to-typhoon-haiyan-victims,c9517281	
Price of product (EUR)	Not specified	
Sales channel	Via sales department	
Country of sales	International	
Sales volume	Production capacity increased to 66.000T/yr. Of this 56.000T recycled plastic into Hanit.	
Sales impact	Unclear	
Awards	None found for specific product, however, see company profile	
Plastic type used	Mix of LDPE, HDPE, and PP (it is called Hanit)	
PIR/ PCR / used	Not specified	
Plastic source	Unclear	
Assembled product (Yes/No)	Yes	
% of recycled		

content (overall)	
% of recycled content (plastic part)	95-100%
Afterlife of the product	Recyclable as raw material (claimed).
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	www.hahnplastics.com/cms/files/downloads/en_CA/catalogues/catalogues/Imagekatalog_NA_2020.pdf https://www.hahnplastics.com/en/products/furniture-and-outdoor-spaces/benches/

4.2.5. Picnic Table

General information		
Product name	Picnic Table	
Product category	Outdoor furniture	
Product sector	Gardening, outdoors, public space, landscaping	
Brand	Hanit	
Since year	1998	
Trading company	Hahn Group	
Location trading company	Rheinböllen, GE	
Manufacturing company	Hahn Plastics	
Location manufacturing company	Plants in (Manchester) UK, Canada, Germany	
Product specifics		
Since when product launched	2014 - https://news.cision.com/dakota-digitalltd/r/plastics-manufacturer-launches-campaign-to-get-specially-designed-house-to-typhoon-haiyan-victims,c9517281	

Price of product (EUR)	Not specified
Sales channel	Via sales department
Country of sales	International
Sales volume	Unclear
Sales impact	Unclear
Awards	None found for specific product, however, see company profile
Plastic type used	Mix of LDPE, HDPE, and PP (it is called Hanit)
PIR/ PCR / used	Not specified
Plastic source	Unclear
Assembled product (Yes/No)	Yes
% of recycled content (overall)	
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable as raw material (claimed).
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	www.hahnplastics.com/cms/files/downloads/en_CA/catalogues/catalogues/Imagekatalog_NA_2020.pdf https://www.hahnplastics.com/en/products/furniture-and-outdoor-spaces/sets/

4.2.6. Planters

General information		
Product name	Planters	
Product category	Outdoor furniture	
Product sector	Gardening, outdoors, public space, landscaping	
Brand	Hanit	
Since year	1998	
Trading company	Hahn Group	
Location trading company	Rheinböllen, GE	
Manufacturing company	Hahn Plastics	

Location manufacturing company	Plants in (Manchester) UK, Canada, Germany
Product specifics	
Since when product launched	2014 - https://news.cision.com/dakota-digitalltd/r/plastics-manufacturer-launches-campaign-to-get-specially-designed-house-to-typhoon-haiyan-victims,c9517281
Price of product (EUR)	Not specified
Sales channel	Via sales department
Country of sales	International
Sales volume	Production capacity increased to 66.000T/yr. Of this 56.000T recycled plastic into Hanit.
Sales impact	Unclear
Awards	None found for specific product, however, see company profile
Plastic type used	Mix of LDPE, HDPE, and PP (it is called Hanit)
PIR/ PCR / used	Not specified
Plastic source	Unclear
Assembled product (Yes/No)	Yes
% of recycled content (overall)	
% of recycled content (plastic part)	100%
Afterlife of the product	Recycable as raw material (claimed).
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://www.hahnplastics.com/en/search?sSearch=planter www.hahnplastics.com/cms/files/downloads/en_CA/catalogues/catalogues/Imagekatalog_NA_2020.pdf

4.2.7. Raised beds

General information		
Product name	Raised beds	
Product category	Outdoor furniture	
Product sector	Gardening, outdoors, public space, landscaping	
Brand	Hanit	

Since year	1998	
Trading company	Hahn Group	
Location trading company	Rheinböllen, GE	
Manufacturing company	Hahn Plastics	
Location manufacturing company	Plants in (Manchester) UK, Canada, Germany	
Product specifics		
Since when product launched	2014 - https://news.cision.com/dakota-digitalltd/r/plastics-manufacturer-launches-campaign-to-get-specially-designed-house-to-typhoon-haiyan-victims,c9517281	
Price of product (EUR)	Not specified	
Sales channel	Via sales department	
Country of sales	International	
Sales channel	Via sales department	
Sales impact	Unclear	
Awards	None found for specific product, however, see company profile	
Plastic type used	Mix of LDPE, HDPE, and PP (it is called Hanit)	
PIR/ PCR / used	Not specified	
Plastic source	Unclear	
Assembled product (Yes/No)	Yes	
% of recycled content (overall)		
% of recycled content (plastic part)	100%	
Afterlife of the product	Recyclable as raw material (claimed).	
Mechanical process (Yes/No)	Yes	
Sustainability impact	Not specified for specific product, see company profile for more info	
Other remarks		

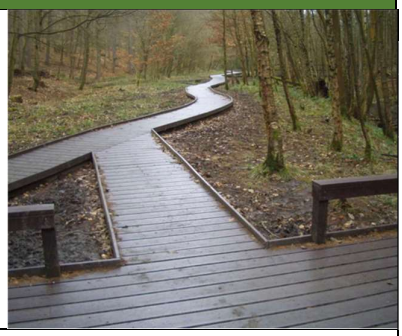
Sources	www.hahnplastics.com/cms/files/downloads/en_CA/catalogues/catalogues/Imagekatalog_NA_2020.pdf https://www.hahnplastics.com/en/search?sSearch=raised+bed

4.2.8. Tables

General information	
Product name	Tables
Product category	Outdoor furniture
Product sector	Gardening, outdoors, public space, landscaping
Brand	Hanit
Since year	1998
Trading company	Hahn Group
Location trading company	Rheinböllen, GE
Manufacturing company	Hahn Plastics
Location manufacturing company	Plants in (Manchester) UK, Canada, Germany
Product specifics	
Since when product launched	2014 - https://news.cision.com/dakota-digitalltd/r/plastics-manufacturer-launches-campaign-to-get-specially-designed-house-to-typhoon-haiyan-victims,c9517281
Price of product (EUR)	Not specified
Sales channel	Via sales department
Country of sales	International
Sales volume	Unclear
Sales impact	Unclear
Awards	None found for specific product, however, see company profile
Plastic type used	Mix of LDPE, HDPE, and PP (it is called Hanit)
PIR/ PCR / used	Not specified
Plastic source	Unclear
Assembled product (Yes/No)	Yes
% of recycled content (overall)	
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable as raw material (claimed).

Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	www.hahnplastics.com/cms/files/downloads/en_CA/catalogues/catalogues/Imagekatalog_NA_2020.pdf https://www.hahnplastics.com/en/products/furniture-and-outdoor-spaces/tables/

4.2.9. Decking

General information		
Product name	Decking	
Product category	Construction material	
Product sector	Construction	
Brand	Hanit	
Since year	1998	
Trading company	Hahn Group	
Location trading company	Rheinböllen, GE	
Manufacturing company	Hahn Plastics	
Location manufacturing company	Plants in (Manchester) UK, Canada, Germany	
Product specifics		
Since when product launched	2014 - https://news.cision.com/dakota-digitalltd/r/plastics-manufacturer-launches-campaign-to-get-specially-designed-house-to-typhoon-haiyan-victims,c9517281	
Price of product (EUR)	Not specified	
Sales channel	Via sales department	
Country of sales	International	
Sales volume	Unclear	
Sales impact	Unclear	
Awards	None found for specific product, however, see company profile	
Plastic type used	Mix of LDPE, HDPE, and PP (it is called Hanit)	
PIR/ PCR / used	Not specified	
Plastic source	Unclear	
Assembled product (Yes/No)	No	

% of recycled content (overall)	100%
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable as raw material (claimed).
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	www.hahnplastics.com/cms/files/downloads/en_CA/catalogues/catalogues/Imagekatalog_NA_2020.pdf https://www.hahnplastics.com/en/products/ground-reinforcement-and-surfaces/decking/

4.2.10. Ground Grid

General information		
Product name	Ground Grid	
Product category	Construction material	
Product sector	Construction	
Brand	Hanit	
Since year	1998	
Trading company	Hahn Group	
Location trading company	Rheinböllen, GE	
Manufacturing company	Hahn Plastics	
Location manufacturing company	Plants in (Manchester) UK, Canada, Germany	
Product specifics		
Since when product launched	2014 - https://news.cision.com/dakota-digitalltd/r/plastics-manufacturer-launches-campaign-to-get-specially-designed-house-to-typhoon-haiyan-victims,c9517281	
Price of product (EUR)	Not specified	
Sales channel	Via sales department	
Country of sales	International	
Sales volume	Unclear	
Sales impact	Unclear	
Awards	None found for specific product, however, see company profile	

Plastic type used	Mix of LDPE, HDPE, and PP (it is called Hanit)
PIR/ PCR / used	Not specified
Plastic source	Unclear
Assembled product (Yes/No)	No
% of recycled content (overall)	100%
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable as raw material (claimed).
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	www.hahnplastics.com/cms/files/downloads/en_CA/catalogues/catalogues/Imagekatalog_NA_2020.pdf https://www.hahnplastics.com/en/products/ground-reinforcement-and-surfaces/heavy-duty-ground-grid/315/heavy-duty-ground-grid?c=34

4.2.11. Synthetic Lumbur

General information		
Product name	Synthetic Lumbur	
Product category	Construction material	
Product sector	Construction	
Brand	Hanit	
Since year	1998	
Trading company	Hahn Group	
Location trading company	Rheinböllen, GE	
Manufacturing company	Hahn Plastics	
Location manufacturing company	Plants in (Manchester) UK, Canada, Germany	
Product specifics		
Since when product launched	2014 - https://news.cision.com/dakota-digitalltd/r/plastics-manufacturer-launches-campaign-to-get-specially-designed-house-to-typhoon-haiyan-victims,c9517281	

Price of product (EUR)	Not specified
Sales channel	Via sales department
Country of sales	International
Sales volume	Unclear
Sales impact	Unclear
Awards	None found for specific product, however, see company profile
Plastic type used	Mix of LDPE, HDPE, and PP (it is called Hanit)
PIR/ PCR / used	Not specified
Plastic source	Unclear
Assembled product (Yes/No)	No
% of recycled content (overall)	100%
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable as raw material (claimed).
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	www.hahnplastics.com/cms/files/downloads/en_CA/catalogues/catalogues/Imagekatalog_NA_2020.pdf

4.2.12. Ultra Ecocrib Wall

General information		
Product name	Ultra Ecocrib Wall	
Product category	Construction material	
Product sector	Construction	
Brand	Hanit	
Since year	1998	
Trading company	Hahn Group	
Location trading company	Rheinböllen, GE	

Manufacturing company	Hahn Plastics
Location manufacturing company	Plants in (Manchester) UK, Canada, Germany
Product specifics	
Since when product launched	2014 - https://news.cision.com/dakota-digitalltd/r/plastics-manufacturer-launches-campaign-to-get-specially-designed-house-to-typhoon-haiyan-victims,c9517281
Price of product (EUR)	Not specified
Sales channel	Via sales department
Country of sales	International
Sales volume	Production capacity increased to 66.000T/yr. Of this 56.000T recycled plastic into Hanit.
Sales impact	Unclear
Awards	None found for specific product, however, see company profile
Plastic type used	Mix of LDPE, HDPE, and PP (it is called Hanit)
PIR/ PCR / used	Not specified
Plastic source	Unclear
Assembled product (Yes/No)	Yes
% of recycled content (overall)	
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable as raw material (claimed).
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	www.hahnplastics.com/cms/files/downloads/en_CA/catalogues/catalogues/Imagekatalog_NA_2020.pdf https://www.recoup.org/products-made-from-recycled-plastics/category/7/building-construction

4.2.13. Bollards

General information		
Product name	Bollards	

Product category	Construction part	
Product sector	Construction	
Brand	Hanit	
Since year	1998	
Trading company	Hahn Group	
Location trading company	Rheinböllen, GE	
Manufacturing company	Hahn Plastics	
Location manufacturing company	Plants in (Manchester) UK, Canada, Germany	
Product specifics		
Since when product launched	2014 - https://news.cision.com/dakota-digitalltd/r/plastics-manufacturer-launches-campaign-to-get-specially-designed-house-to-typhoon-haiyan-victims,c9517281	
Price of product (EUR)	Not specified	
Sales channel	Via sales department	
Country of sales	International	
Sales volume	Unclear	
Sales impact	Unclear	
Awards	None found for specific product, however, see company profile	
Plastic type used	Mix of LDPE, HDPE, and PP (it is called Hanit)	
PIR/ PCR / used	Not specified	
Plastic source	Unclear	
Assembled product (Yes/No)	No	
% of recycled content (overall)	100%	
% of recycled content (plastic part)	100%	
Afterlife of the product	Recyclable as raw material (claimed).	
Mechanical process (Yes/No)	Yes	
Sustainability impact	Not specified for specific product, see company profile for more info	
Other remarks		

Sources	www.hahnplastics.com/cms/files/downloads/en_CA/catalogues/catalogues/Imagekatalog_NA_2020.pdf https://www.hahnplastics.com/en/products/fencing-and-barriers/bollards/

4.2.14. Cable reel and ducts

General information		
Product name	Cable reel and ducts	
Product category	Construction part	
Product sector	Construction	
Brand	Hanit	
Since year	1998	
Trading company	Hahn Group	
Location trading company	Rheinböllen, GE	
Manufacturing company	Hahn Plastics	
Location manufacturing company	Plants in (Manchester) UK, Canada, Germany	
Product specifics		
Since when product launched	2014 - https://news.cision.com/dakota-digitalltd/r/plastics-manufacturer-launches-campaign-to-get-specially-designed-house-to-typhoon-haiyan-victims,c9517281	
Price of product (EUR)	Not specified	
Sales channel	Via sales department	
Country of sales	International	
Sales volume	Unclear	
Sales impact	Unclear	
Awards	None found for specific product, however, see company profile	
Plastic type used	Mix of LDPE, HDPE, and PP (it is called Hanit)	
PIR/ PCR / used	Not specified	
Plastic source	Unclear	
Assembled product (Yes/No)	No	
% of recycled content (overall)	100%	
% of recycled content (plastic part)	100%	
Afterlife of the product	Recyclable as raw material (claimed).	

Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	www.hahnplastics.com/cms/files/downloads/en_CA/catalogues/catalogues/Imagekatalog_NA_2020.pdf https://www.hahnplastics.com/en/search?sSearch=cable

4.2.15. Fencing

General information	
Product name	Fencing
Product category	Construction part
Product sector	Construction
Brand	Hanit
Since year	1998
Trading company	Hahn Group
Location trading company	Rheinböllen, GE
Manufacturing company	Hahn Plastics
Location manufacturing company	Plants in (Manchester) UK, Canada, Germany
Product specifics	
Since when product launched	2014 - https://news.cision.com/dakota-digitalltd/r/plastics-manufacturer-launches-campaign-to-get-specially-designed-house-to-typhoon-haiyan-victims,c9517281
Price of product (EUR)	Not specified
Sales channel	Via sales department
Country of sales	International
Sales volume	Unclear
Sales impact	Unclear
Awards	None found for specific product, however, see company profile
Plastic type used	Mix of LDPE, HDPE, and PP (it is called Hanit)
PIR/ PCR / used	Not specified
Plastic source	Unclear

Assembled product (Yes/No)	No
% of recycled content (overall)	100%
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable as raw material (claimed).
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	www.hahnplastics.com/cms/files/downloads/en_CA/catalogues/catalogues/Imagekatalog_NA_2020.pdf https://www.hahnplastics.com/en/products/fencing-and-barriers/fences/

4.2.16. Palisades

General information		
Product name	Palisades	
Product category	Construction part	
Product sector	Construction	
Brand	Hanit	
Since year	1998	
Trading company	Hahn Group	
Location trading company	Rheinböllen, GE	
Manufacturing company	Hahn Plastics	
Location manufacturing company	Plants in (Manchester) UK, Canada, Germany	
Product specifics		
Since when product launched	2014 - https://news.cision.com/dakota-digitalltd/r/plastics-manufacturer-launches-campaign-to-get-specially-designed-house-to-typhoon-haiyan-victims,c9517281	
Price of product (EUR)	Not specified	
Sales channel	Via sales department	
Country of sales	International	

Sales volume	Unclear
Sales impact	Unclear
Awards	None found for specific product, however, see company profile
Mix of LDPE, HDPE, and PP (it is called Hanit)	Mix of LDPE, HDPE, and PP (it is called Hanit)
Not specified	Not specified
Unclear	Unclear
No	No
100%	100%
100%	100%
Recyclable as raw material (claimed).	Recyclable as raw material (claimed).
Yes	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	www.hahnplastics.com/cms/files/downloads/en_CA/catalogues/catalogues/Imagekatalog_NA_2020.pdf https://www.hahnplastics.com/en/search?sSearch=palisades

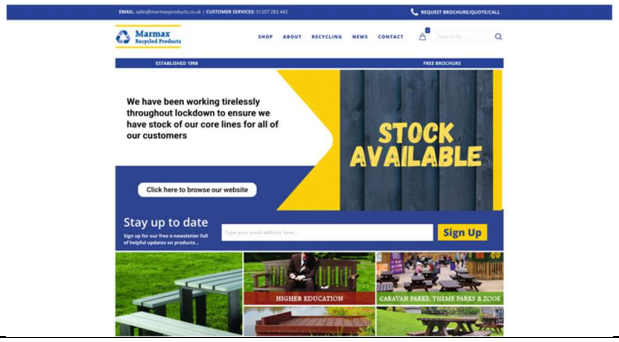
4.2.17. Pickets

General information		
Product name	Pickets	
Product category	Construction part	
Product sector	Construction	
Brand	Hanit	
Since year	1998	
Trading company	Hahn Group	
Location trading company	Rheinböllen, GE	
Manufacturing company	Hahn Plastics	
Location manufacturing company	Plants in (Manchester) UK, Canada, Germany	
Product specifics		

Since when product launched	2014 - https://news.cision.com/dakota-digitalltd/r/plastics-manufacturer-launches-campaign-to-get-specially-designed-house-to-typhoon-haiyan-victims,c9517281
Price of product (EUR)	Not specified
Sales channel	Via sales department
Country of sales	International
Sales volume	Unclear
Sales impact	Unclear
Awards	None found for specific product, however, see company profile
Plastic type used	Mix of LDPE, HDPE, and PP (it is called Hanit)
PIR/ PCR / used	Not specified
Plastic source	Unclear
Assembled product (Yes/No)	No
% of recycled content (overall)	100%
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable as raw material (claimed).
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	www.hahnplastics.com/cms/files/downloads/en_CA/catalogues/catalogues/Imagekatalog_NA_2020.pdf https://www.hahnplastics.com/en/products/fencing-and-barriers/posts/

5. Marmax

5.1. Company profile

General information	
Company	Marmax 
Company description	Marmax Products is seen as one of the market leaders in the manufacturing of 100% recycled plastic which does not rot, corrode, or splinter and is guaranteed for a minimum of 25 years. They cater for all sectors of industry, from schools and councils, theme parks and pubs, parish councils and hospitals to fisheries, sporting clubs and re-homing centres. Their vast range of products means they have something for everyone. Because all their products are handmade in their factory in County Durham, they are able to offer a bespoke service. Over the years, the company has gone from strength to strength; adding huge amounts of products to their ever-growing ranges – from playboats, cars and pirate ships, to their award-winning SEN (Special Educational Needs) range which promotes social inclusion for all. Marmax Products has won numerous awards such as the prestigious Green Apple Awards, Green World Awards and also Green World Ambassador status for 5 consecutive years. They have also been finalists in the Plastic Industry Awards and they have been finalists in local awards such as Northeast Employee of the Year Awards and Durham Environment Awards.
Goal/vision	Marmax Products Mission Statement is, “To be the market leader in the manufacture of high quality recycled plastic products, including outdoor furniture, play equipment, fencing and boardwalk and to offer a quality bespoke solution to meet all of our customers’ needs”.
Founded in	1998
CEO	Unclear
Location(s)	UK, IRE, NL, FR How many not specified
Manufacturing company	Marmax Recycled Products
Location(s)	Durham, UK
# employees	<100 (estimation)

Financials (#turnover and possible margins)	Not specified
Brands	Marmax
Person interesting to contact for interview	If you require further information on our products, please contact Marga, Harold or Aniek at: DeckX Products Snekerweg 3, 8701 PZ Bolsward, The Netherlands Tel: +31 (0) 515 743300 info@deckx-products.nl / www.deckx-products.nl sales@marmaxproducts.co.uk
Sustainability/environmental and social impact	
Footprint reduction/social impact & important concepts used	They sponsor their chosen charity, the NSPCC, and donate a percentage of every sale of the Buddy Benches back to them. Buddy Benches provide a place for people to make friends and engage in conversation outside their usual friendship group, no matter of age, gender, race, or special educational needs.
Footprint reduction goals	Not specified
Waste management	Once a product has come to the end of its life, they are able to recycle this back into the extrusion process and create more products for future generations.
Transparency products (how they are made, what materials used, certifications etc.)	All products are manufactured to our Environmental Standard ISO 14001 registered facility in Durham, England.
Sources	https://marmaxproducts.co.uk/recycling/ https://www.recoup.org/p/5/introduction-

5.2. Products

5.2.1. Garden educational toys (drone, biplane, jubo jet, train, play hut, raft, podium, boat, table tennis etc.)

General information		
Product name	Garden educational toys (drone, biplane, jubo jet, train, play hut, raft, podium, boat, table tennis etc.)	
Product category	Outdoor Construction	
Product sector	Gardening, outdoors, public space, landscaping	
Brand	Marmax	
Since year	1998	
Trading company	Marmax	

Location trading company	UK, IRE, NL, FR
Manufacturing company	Marmax Recycled Products
Location manufacturing company	UK, IRE, NL, FR
Product specifics	
Since when product launched	Unclear
Price of product (EUR)	Multiple products ranging from £549.00 to £3,499.00
Sales channel	Online webshop and stores
Country of sales	EU
Sales volume	Unclear
Sales impact	Unclear
Awards	None found for specific product, however, see company profile
Plastic type used	HDPE
PIR/ PCR / used	Used
Plastic source	Milk containers
Assembled product (Yes/No)	Yes
% of recycled content (overall)	
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://www.recoup.org/products-made-from-recycled-plastics/category/28/leisure-recreational-educational-products https://marmaxproducts.co.uk/products/recycled-plastic-outdoor-table-tennis-table/ https://marmaxproducts.co.uk/products/recycled-plastic-boat/

5.2.2. Outside dog items (bed, educational toys)

General information		
Product name	Outside dog items (bed, educational toys)	
Product category	Outdoor Construction	
Product sector	Gardening, outdoors, public space, landscaping	
Brand	Marmax	

Since year	1998	
Trading company	Marmax	
Location trading company	UK, IRE, NL, FR	
Manufacturing company	Marmax Recycled Products	
Location manufacturing company	UK, IRE, NL, FR	
Product specifics		
Since when product launched	Unclear	
Price of product (EUR)	Multiple products ranging from £70.00 to £2,275.00	
Sales channel	Online webshop and stores	
Country of sales	EU	
Sales volume	Unclear	
Sales impact	Unclear	
Awards	None found for specific product, however, see company profile	
Plastic type used	HDPE	
PIR/ PCR / used	Used	
Plastic source	Milk containers	
Assembled product (Yes/No)	Yes	
% of recycled content (overall)		
% of recycled content (plastic part)	100%	
Afterlife of the product	Recyclable	
Mechanical process (Yes/No)	Yes	
Sustainability impact	Not specified for specific product, see company profile for more info	
Other remarks		

Sources	https://marmaxproducts.co.uk/page/1/?s=recycle+plastic+dog&post_type=product

5.2.3. Trial post / road sign

General information		
Product name	Trail post / road sign	
Product category	Outdoor Construction	
Product sector	Gardening, outdoors, public space, landscaping	
Brand	Marmax	
Since year	1998	
Trading company	Marmax	
Location trading company	UK, IRE, NL, FR	
Manufacturing company	Marmax Recycled Products	
Location manufacturing company	UK, IRE, NL, FR	
Product specifics		
Since when product launched	Unclear	
Price of product (EUR)	£39.92	
Sales channel	Online webshop and stores	
Country of sales	EU	
Sales volume	Unclear	
Sales impact	Unclear	
Awards	None found for specific product, however, see company profile	
Plastic type used	HDPE	
PIR/ PCR / used	Used	
Plastic source	Milk containers	
Assembled product (Yes/No)	No	
% of recycled content (overall)	100%	
% of recycled content (plastic part)	100%	
Afterlife of the product	Recyclable	

Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://marmaxproducts.co.uk/products/recycled-plastic-trail-post/

5.2.4. Waste bin

General information		
Product name	Waste bin	
Product category	Outdoor containers	
Product sector	Gardening, outdoors, public space, landscaping	
Brand	Marmax	
Since year	1998	
Trading company	Marmax	
Location trading company	UK, IRE, NL, FR	
Manufacturing company	Marmax Recycled Products	
Location manufacturing company	UK, IRE, NL, FR	
Product specifics		
Since when product launched	Unclear	
Price of product (EUR)	Multiple products ranging from £249.00 to £314.00	
Sales channel	Online webshop and stores	
Country of sales	EU	
Sales volume	Unclear	
Sales impact	Unclear	
Awards	None found for specific product, however, see company profile	
Plastic type used	HDPE	
PIR/ PCR / used	Used	
Plastic source	Milk containers	
Assembled product (Yes/No)	Yes	
% of recycled content (overall)		

% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://marmaxproducts.co.uk/?s=recycle+plastic+bin&post_type=product

5.2.5. Garden table and chairs

General information		
Product name	Garden table and chairs	
Product category	Outdoor furniture	
Product sector	Gardening, outdoors, public space, landscaping	
Brand	Marmax	
Since year	1998	
Trading company	Marmax	
Location trading company	UK, IRE, NL, FR	
Manufacturing company	Marmax Recycled Products	
Location manufacturing company	UK, IRE, NL, FR	
Product specifics		
Since when product launched	Unclear	
Price of product (EUR)	£679.00 – £699.00	
Sales channel	Online webshop and stores	
Country of sales	EU	
Sales volume	Unclear	
Sales impact	Unclear	
Awards	None found for specific product, however, see company profile	
Plastic type used	HDPE	
PIR/ PCR / used	Used	

Plastic source	Milk containers
Assembled product (Yes/No)	Yes
% of recycled content (overall)	
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://marmaxproducts.co.uk/products/recycled-plastic-a-table-4-recycled-plastic-sloper-chairs/

5.2.6. Planters

General information		
Product name	Planters	
Product category	Outdoor furniture	
Product sector	Gardening, outdoors, public space, landscaping	
Brand	Marmax	
Since year	1998	
Trading company	Marmax	
Location trading company	UK, IRE, NL, FR	
Manufacturing company	Marmax Recycled Products	
Location manufacturing company	UK, IRE, NL, FR	
Product specifics		
Since when product launched	Unclear	

Price of product (EUR)	Multiple products ranging from £69.00 to £549.00
Sales channel	Online webshop and stores
Country of sales	EU
Sales volume	Unclear
Sales impact	
Awards	
Plastic type used	HDPE
PIR/ PCR / used	Used
Plastic source	Milk containers
Assembled product (Yes/No)	Yes
% of recycled content (overall)	
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://marmaxproducts.co.uk/?s=recycle+plastic+planters&post_type=product

5.2.7. Seat benches

General information		
Product name	Seat benches	
Product category	Outdoor furniture	
Product sector	Gardening, outdoors, public space, landscaping	
Brand	Marmax	
Since year	1998	
Trading company	Marmax	
Location trading company	UK, IRE, NL, FR	
Manufacturing company	Marmax Recycled Products	

Location manufacturing company	UK, IRE, NL, FR
Product specifics	
Since when product launched	Unclear
Price of product (EUR)	Multiple products ranging from £89.00 to £589.00
Sales channel	Online webshop and stores
Country of sales	EU
Sales volume	Unclear
Sales impact	One bench uses more than the equivalent of 2000 plastic bottles
Awards	None found for specific product, however, see company profile
Plastic type used	HDPE
PIR/ PCR / used	Used
Plastic source	Milk containers
Assembled product (Yes/No)	Yes
% of recycled content (overall)	
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://marmaxproducts.co.uk/?s=recycle+plastic+bench&post_type=product

5.2.8. Decking

General information		
Product name	Decking	
Product category	Construction part	
Product sector	Construction	
Brand	Marmax	
Since year	1998	

Trading company	Marmax
Location trading company	UK, IRE, NL, FR
Manufacturing company	Marmax Recycled Products
Location manufacturing company	UK, IRE, NL, FR
Product specifics	
Since when product launched	Unclear
Price of product (EUR)	Not specified
Sales channel	Online webshop and stores
Country of sales	EU
Sales volume	Unclear
Sales impact	Unclear
Awards	None found for specific product, however, see company profile
Plastic type used	HDPE
PIR/ PCR / used	Used
Plastic source	Milk containers
Assembled product (Yes/No)	No
% of recycled content (overall)	100%
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://marmaxproducts.co.uk/?s=recycle+plastic+boardwalk&post_type=product

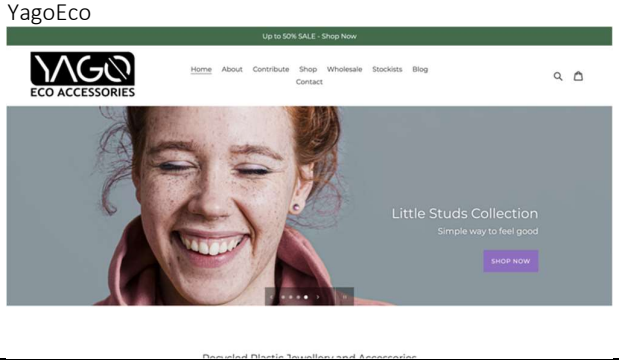
5.2.9. Fencing

General information		
Product name	Fencing	
Product category	Construction part	
Product sector	Construction	
Brand	Marmax	

Since year	1998	
Trading company	Marmax	
Location trading company	UK, IRE, NL, FR	
Manufacturing company	Marmax Recycled Products	
Location manufacturing company	UK, IRE, NL, FR	
Product specifics		
Since when product launched	Unclear	
Price of product (EUR)	Not specified	
Sales channel	Online webshop and stores	
Country of sales	EU	
Sales volume	Unclear	
Sales impact	Unclear	
Awards	None found for specific product, however, see company profile	
Plastic type used	HDPE	
PIR/ PCR / used	Used	
Plastic source	Milk containers	
Assembled product (Yes/No)	No	
% of recycled content (overall)	100%	
% of recycled content (plastic part)	100%	
Afterlife of the product	Recyclable	
Mechanical process (Yes/No)	Yes	
Sustainability impact	Not specified for specific product, see company profile for more info	
Other remarks		
Sources	https://marmaxproducts.co.uk/?s=recycle+plastic+fenc&post_type=product	

6. YagoEco

6.1. Company profile

General information	
Company	YagoEco 
Company description	YagoEco is eco-friendly, sustainable and ethical jewellery and accessories brand created in London, UK. Products are hand made from single-used plastic carrier bags collected from East of London (LDPE waste, mostly plastic bottle tops). Waste is collected, cut by hand and then melted and the plastic sheet is then cut into jewellery - Founded in Feb 2019, art studio, small scale company but aim to grow - Asks local community for contribution to collection
Goal/vision	YagoEco aims to increase public awareness by providing unique and eco-friendly handmade jewellery from single-use carrier bags collected from the local community.
Founded in	2019
CEO	Jagoda Jay Keshani
Location(s)	UK, the jewellery can be found in three independent gifts shops and boutiques.
Manufacturing company	YagoEco
Location(s)	UK
# employees	<50 (estimation)
Financials (#turnover and possible margins)	Not specified
Brands	YagoEco
Person interesting to contact for interview	Contact form on the website info@yagoeco.com
Sustainability/environmental and social impact	
Footprint reduction/social impact & important concepts used	The jewellery is used to increase public awareness about sustainability and the owner, Jay, herself uses it to create new habits, such as using reusable products like water bottles, lunch containers, fabric shopping bags. Packaging: jewellery boxes made of 100% recycled paper and eco-friendly postage envelopes.

	Jay is currently looking into using recycled silver as well.
Footprint reduction goals	Not specified
Waste management	The carrier bags are collected from the local community. Jay hopes that once the production grows, she is able to organise an ongoing exchange program for everyone who would like to swap their unwanted plastic bags for a piece of jewellery.
Transparency products (how they are made, what materials used, certifications etc.)	Once the bags get into Jay's hand, she washes and cuts them into little pieces and mixes them to achieve the desired colour. They melt into plastic sheets and are cut and polished by hand. Once the process is completed, she adds locally sourced sterling silver.
Sources	https://yagoeco.com/pages/about

6.2. Products

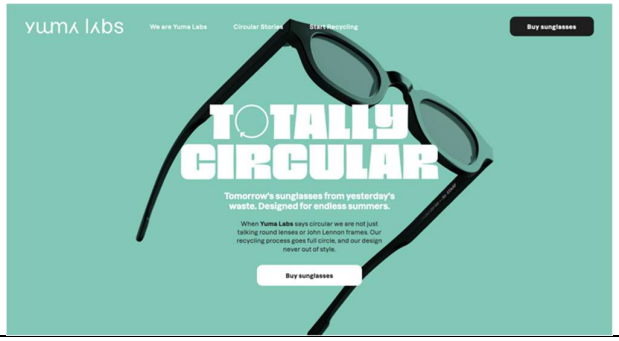
6.2.1. Accessories - jewellery

General information		
Product name	Accessories - jewellery	
Product category	Accessories	
Product sector	Fashion	
Brand	YagoEco	
Since year	2019	
Trading company	YagoEco	
Location trading company	UK	
Manufacturing company	YagoEco	
Location manufacturing company	UK	
Product specifics		
Since when product launched	2019	
Price of product (EUR)	Multiple products ranging from £21 to £100.	
Sales channel	Online and studio	
Country of sales	International	
Sales volume	Unclear	
Sales impact	Unclear	
Awards	None found	
Plastic type used	LDPE	

PIR/ PCR / used	From local
Plastic source	Carrier bags, bottle tops
Assembled product (Yes/No)	Yes
% of recycled content (overall)	100%
% of recycled content (plastic part)	
Afterlife of the product	Recyclable
Mechanical process (Yes/No)	Yes
Sustainability impact	Reducing plastic footprint by buying and using this product.
Other remarks	
Sources	https://yagoeco.com/collections

7. Yuma Labs

7.1. Company profile

General information	
Company	Yuma Labs 
Company description	High quality eyewear from recycled materials to make a positive statement to move towards a circular economy Operator of an online eyewear store intended to offer 3D printed sunglasses out of recycled plastic. The company's store offers sunglasses made out of recycled car dashboards, soda bottles and fridges. - Fully transparent chain - as a customer you can trace back your plastic parts. - recyclable by sending back your sunglasses, that can be part of your next sunglasses. - 10 different models of sunglasses
Goal/vision	At Yuma Labs we have made a pledge to work against the stream, come up with disruptive business models and demonstrate that there are ways to build an economy without the need for planned obsolescence or continuous depletion of natural resources. We wish to offer a positive alternative to fast-consumption and slow down ever the accelerating mill of product disposal.
Founded in	2016
CEO	Sebastiaan De Neubourg (founder) and was joined by Lenja Doms and Roald Duchateau since 2019.
Location(s)	BE
Manufacturing company	Yuma Labs
Location(s)	BE
# employees	<100 (estimation)
Financials (#turnover and possible margins)	Not specified
Brands	YUMA
Person interesting to contact for interview	love@yuma-labs.com Sebastiaan De Neubourg +32494667093
Sustainability/environmental and social impact	
Footprint reduction/social	Together Yuma Labs wants to sustain a circular economy and keep plastic away from landfills forever. Recycling is the first step, but if this recycled plastic is not recycled

impact & important concepts used	again and again, then we are simply delaying the problem. Their sunglasses are "designed for disassembly". This means they came up with ways to easily recycle every pair upon its return. Yuma Labs' production process honors the natural cycle and mimics it as closely as possible. All their raw material is traceable through batch control and rigorous production follow-up. They let it reach a maximum number of recycling loops, giving it momentary second (and third, and fourth…) lives of good-looking sunglasses until it can go back into a larger recycling stream. All the while this continuous cycle gives them the opportunity to keep innovating our designs and adapt to —or even set— the latest trends. They produce sunglasses on demand to minimize waste. In spring 2019, Yuma Labs collaborated with Stormkop — an experimental playground for adventurers of all ages — to 3D print sunglasses from river plastic at Stormkop Using only recycled materials, exclusive Tomorrowland x Yuma Labs sunglasses are crafted from 100% recycled plastic of which 50% recycled plastic bottles and cups collected at Tomorrowland 2019. This limited edition was sold exclusively during the 2020 Tomorrowland digital edition 'Around the World'.
Footprint reduction goals	Not Specified
Waste management	When your sunglasses reach their end of life, you can send them back to start a new lifecycle. Furthermore, you will receive a discount or cash back your new pair.
Transparency products (how they are made, what materials used, certifications etc.)	Every pair of sunglasses has its unique code on the inside. You can use the code to Discover the story behind your Yuma Labs sunglasses and read about the journey that the materials have made before they ended up in your unique pair.
Sources	https://www.yuma-labs.com/circular-stories/stormkop https://ubuntoo.com/solutions/yuma-labs-1

7.2. Products

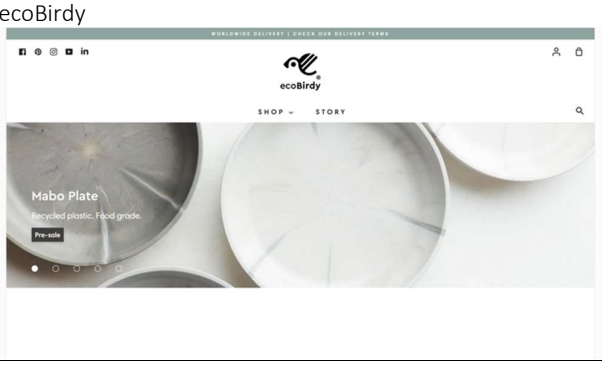
7.2.1. Sunglasses (3D printed)

General information		
Product name	Sunglasses (3D printed)	
Product category	Accessories	
Product sector	Fashion	
Brand	YUMA	
Since year	2016	
Trading company	Yuma Labs	

Location trading company	BE
Manufacturing company	Yuma Labs
Location manufacturing company	BE
Product specifics	
Since when product launched	Before 2018 - https://www.instagram.com/p/BjRQMXPA7GK/
Price of product (EUR)	Various models, ranging from 139 to 154.
Sales channel	Online, via sales
Country of sales	Europe
Sales volume	Unclear
Sales impact	Unclear
Awards	None found
Plastic type used	PET
PIR/ PCR / used	PCR
Plastic source	Bottles, fridges, car dashboards
Assembled product (Yes/No)	Yes
% of recycled content (overall)	100%
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable (by sending it back to them)
Mechanical process (Yes/No)	No
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://shop.yuma-labs.com/collections/collection-21

8. ecoBirdy

8.1. Company profile

General information	
Company	ecoBirdy 
Company description	ecoBirdy recycles discarded plastic toys and turns them into colourful, kid-sized design furniture that is comfortable to use and easy to clean. They created a system that starts with the collection of old, unused plastic toys, passes through the recycling phase, and ends with the design and production of pieces of furniture. The collection of kids' furniture is entirely made of recycled plastic from European waste. Each step is based on social and environmental responsibility. ecoBirdy awards: - German Design Award 2019, Category Product Design, Winner - Good Design Award Australia 2018, Category Outstanding Design and Innovation, Winner - Henry van de Velde Award 2019, Category Ecodesign, Winner - Play It Green Award 2018 by afilii.com, Winner - Blickfang Design Preis 2018, Designmesse 2018 Bern, Winner - Innovation Award 2018 by Kind & Jugend Fair, Nominated Solar Impulse Efficient Solution Label: ecoBirdy was awarded the label as one of the 1000 profitable solutions that have a positive impact on Climate Change by the Solar Impulse Foundation.
Goal/vision	To create solutions for environmental problems using innovative technologies. ecoBirdy not only presents a new product, but also research and new solutions. They want to be a role model for the application of the circular economy and at the same time a source of inspiration for it.
Founded in	2016
CEO	Vanessa Yuan and Joris Vanbriel
Location(s)	Antwerpen, BE
Manufacturing company	Not specified
Location(s)	Italy
# employees	<50 (estimation)

Financials (#turnover and possible margins)	Not specified ecoBirdy is co-funded by the COSME programme of the European Union (not sure if this is still the case).
Brands	ecoBirdy
Person interesting to contact for interview	vanessa@ecobirdy.com joris@ecobirdy.com
Sustainability/environmental and social impact	
Footprint reduction/social impact & important concepts used	ecoBirdy created a special production process that gives the characteristic look to its products. The material resulting from this unique production process is named ecothylene®. ecoBirdy has created a school programme to raise awareness among kids. A storybook - designed by ecoBirdy for children - tells an appropriate story to draw attention to plastic waste and recycling. By throwing broken or unused plastic toys into the collection container the kids are supported and inspired to contribute to more sustainable future. With **upcycling**, ecoBirdy not only extends the life of plastic but also increases its durability. This reduces the consumption of raw materials, turning a problem into a creative solution. Through the upcycling process, plastic is not broken down but properly sorted to increase the value of its properties in a highly desirable way. For ecoBirdy, upcycling means delivering intentionally designed products that are always: 1. High quality: The end product is more durable, ergonomic, and aesthetically pleasing than other products with the same function. 2. High value: The material is re-designed and assembled in an intentional way so that the end product has a higher value. 3. Highly desirable: The product is strongly positioned in the market and has a defined clientele. It is recommended by leaders in its specific sector.
Footprint reduction goals	Not specified
Waste management	The recycled plastic used to produce ecothylene® is 100% recyclable, meaning that ecothylene® can easily be recycled again.
Transparency products (how they are made, what materials used, certifications etc.)	-
Sources	https://www.ecobirdy.com/blogs/news/plastic-toys https://www.ecobirdy.com/blogs/news/school-programme https://www.ecobirdy.com/blogs/news/upcycling-defined https://www.hausvoneden.com/urban-living/innovation-meets-design-vanessa-yuan-and-joris-vanbriel-about-their-designer-furniture-for-children/ https://www.lifegate.com/plastics-reuse-recycling-design https://www.stylus.com/recycled-plastic-toys-transformed-into-kids-furniture

1.3 8.2. Products

8.2.1. Charlie Ocean Chair - Kids (5 colours)

General information	
Product name	Charlie Ocean Chair - Kids (5 colours)
Product category	Furniture
Product sector	Home
Brand	ecoBirdy
Since year	2016
Trading company	ecoBirdy
Location trading company	Antwerpen, BE
Manufacturing company	Not specified
Location manufacturing company	Italy
Product specifics	
Since when product launched	01/02/2018
Price of product (EUR)	159
Sales channel	Online webshop
Country of sales	EU
Sales volume	Unclear
Sales impact	Unclear
Awards	Charlie Chair is the winner of various design awards: • German Design Award 2019, Category Product Design, Winner • Good Design Award Australia 2018, Category Outstanding Design and Innovation, Winner • Henry van de Velde Award 2019, Category Ecodesign, Winner • Play It Green Award 2018 by afilii.com, Winner • Blickfang Design Preis 2018, Designmesse 2018 Bern, Winner • Innovation Award 2018 by Kind & Jugend Fair, Nominated
Plastic type used	Ecothylene (patented)
PIR/ PCR / used	PCR
Plastic source	Old toys
Assembled product (Yes/No)	No
% of recycled content (overall)	100%

% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable (claimed)
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://www.ecobirdy.com/collections/charlie-chair https://www.ecobirdy.com/blogs/news/five-features-that-make-charlie-chair-the-best-chair-for-children

8.2.2. Kids set table and 2 chairs

General information		
Product name	Kids set table and 2 chairs	
Product category	Furniture	
Product sector	Home	
Brand	ecoBirdy	
Since year	2016	
Trading company	ecoBirdy	
Location trading company	Antwerpen, BE	
Manufacturing company	Not specified	
Location manufacturing company	Italy	
Product specifics		
Since when product launched	01/02/2018	
Price of product (EUR)	586	
Sales channel	Online webshop	
Country of sales	EU	
Sales volume	Unclear	
Sales impact	Unclear	
Awards	None found for specific product, however, see company profile	

Plastic type used	Ecothylene (patented)
PIR/ PCR / used	PCR
Plastic source	Old toys
Assembled product (Yes/No)	No
% of recycled content (overall)	100%
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable (claimed)
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://www.ecobirdy.com/collections/furniture-set

8.2.3. Kiwi containers storage - kids (2 colours)

General information		
Product name	Kiwi containers storage - kids (2colours)	
Product category	Furniture	
Product sector	Home	
Brand	ecoBirdy	
Since year	2016	
Trading company	ecoBirdy	
Location trading company	Antwerpen, BE	
Manufacturing company	Not specified	
Location manufacturing company	Italy	
Product specifics		
Since when product launched	01/02/2018	
Price of product (EUR)	320	
Sales channel	Online webshop	
Country of sales	EU	

Sales volume	Unclear
Sales impact	Unclear
Awards	None found for specific product, however, see company profile
Plastic type used	Ecothylene (patented)
PIR/ PCR / used	PCR
Plastic source	Old toys
Assembled product (Yes/No)	No
% of recycled content (overall)	100%
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable (claimed)
Mechanical process (Yes/No)	Yes
Sustainability impact	It was designed to raise awareness about the endangered kiwi bird species.
Other remarks	
Sources	https://www.ecobirdy.com/collections/kiwi-container

8.2.4. Luisa Table - kids (3 colours)

General information		
Product name	Luisa Table - kids (3 colours)	
Product category	Furniture	
Product sector	Home	
Brand	ecoBirdy	
Since year	2016	
Trading company	ecoBirdy	
Location trading company	Antwerpen, BE	
Manufacturing company	Not specified	
Location manufacturing company	Italy	
Product specifics		
Since when product launched	01/02/2018	

Price of product (EUR)	268
Sales channel	Online webshop
Country of sales	EU
Sales volume	Unclear
Sales impact	Unclear
Awards	None found for specific product, however, see company profile
Plastic type used	Ecothylene (patented)
PIR/ PCR / used	PCR
Plastic source	Old toys
Assembled product (Yes/No)	No
% of recycled content (overall)	100%
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable (claimed)
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://www.ecobirdy.com/collections/luisa-table

8.2.5. Rhino lamp disco light (3 colours)

General information		
Product name	Rhino lamp disco light (3 colours)	
Product category	Lightning	
Product sector	Home	
Brand	ecoBirdy	
Since year	2016	
Trading company	ecoBirdy	
Location trading company	Antwerpen, BE	
Manufacturing company	Not specified	
Location manufacturing company	Italy	

Product specifics	
Since when product launched	01/02/2018
Price of product (EUR)	189
Sales channel	Online webshop
Country of sales	EU
Sales volume	Unclear
Sales impact	Unclear
Awards	None found for specific product, however, see company profile
Plastic type used	Ecothylene (patented)
PIR/ PCR / used	PCR
Plastic source	Old toys
Assembled product (Yes/No)	Yes
% of recycled content (overall)	
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable (claimed)
Mechanical process (Yes/No)	Yes
Sustainability impact	Taking its inspiration from rhinos, this piece aims to raise awareness, not only of sustainability, but also of this endangered species.
Other remarks	
Sources	https://www.ecobirdy.com/collections/rhino-lamp

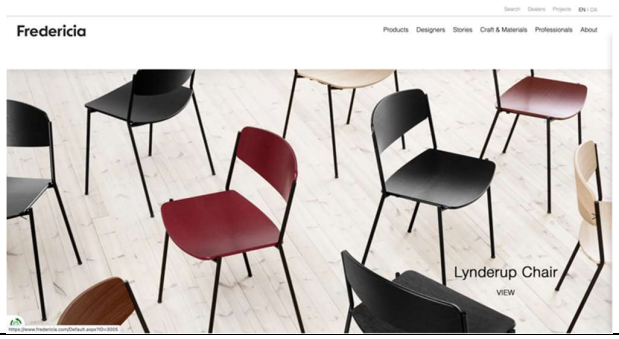
8.2.6. Rhino lamp white light (3 colours)

General information		
Product name	Rhino lamp white light (3 colours)	
Product category	Lightning	
Product sector	Home	
Brand	ecoBirdy	
Since year	2016	
Trading company	ecoBirdy	
Location trading company	Antwerpen, BE	

Manufacturing company	Not specified
Location manufacturing company	Italy
Product specifics	
Since when product launched	01/02/2018
Price of product (EUR)	120
Sales channel	Online webshop
Country of sales	EU
Sales volume	Unclear
Sales impact	Unclear
Awards	None found for specific product, however, see company profile
Plastic type used	Ecothylene (patented)
PIR/ PCR / used	PCR
Plastic source	Old toys
Assembled product (Yes/No)	Yes
% of recycled content (overall)	
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable (claimed)
Mechanical process (Yes/No)	Yes
Sustainability impact	Taking its inspiration from rhinos, this piece aims to raise awareness, not only of sustainability, but also of this endangered species.
Other remarks	
Sources	https://www.ecobirdy.com/collections/rhino-lamp

9. Fredericia

9.1. Company profile

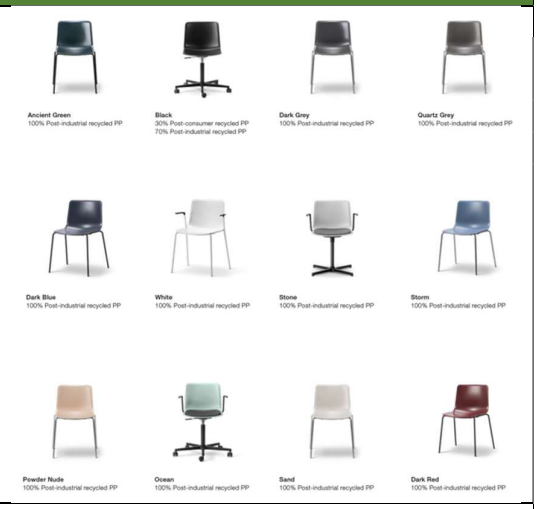
General information	
Company	Fredericia 
Company description	Fredericia Furniture began as a thoroughly Danish design house, born of a proud heritage. A heritage of unfaltering dedication to the perfection and progression of the design craft. Simple principles guide them along in their ambition to create and deliver a collection that they believe will be the modern originals of tomorrow. Simple principles that honour outstanding quality through a careful selection of materials, functionality, and attention to detail. With a carefully chosen circle of international designers, they create contemporary designs that are always beautifully crafted, relevant, and aesthetically intriguing. Products include chairs, (coffee) tables, sofas, benches, lamps and more.
Goal/vision	Encouraging customers to buy fewer but better products has been at the core of Fredericia's company ethics, ever since they began in 1911.
Founded in	1911
CEO	Thomas Graversen
Location(s)	Denmark, however, there are multiple dealers across the globe (most of them in Europe)
Manufacturing company	Fredericia
Location(s)	Denmark
# employees	50 (estimation)
Financials (#turnover and possible margins)	Not specified
Brands	Fredericia
Person interesting to contact for interview	Henriette Deleuran Global Sales Director hd@fredericia.com +45 2427 4247

	Netherlands: Joost Van Ede Sales Agent (Showroom) joost@fredericia.com MARKETING: marketing@fredericia.com +45 7592 3344
Sustainability/environmental and social impact	
Footprint reduction/social impact & important concepts used	At Fredericia, they take their legacy and responsibility seriously when developing and producing furniture, utilising a modern chain of production geared towards today's global market. Respect for nature and its materials is at the heart of their company. All wood from Fredericia comes from responsibly managed forests, where replanting is required. Polypropylene is 100% recyclable due to the purity of the material. Pato has always been made from recyclable PP, which is pure and free from any additives. By adding **upcycled plastic waste** while keeping the design recyclable in the future, we follow our CSR strategy to minimise our environmental footprint and contribute to the circular economy.
Footprint reduction goals	Not specified
Waste management	The Fredericia plant is managed with an internal environmental management system, which is in compliance with ISO standards. Waste is sorted according to their recycling system into combustible, cardboard, iron and metal, plastic, and landfill. Waste timber is chopped into chips and used to heat the plant. They ensure the utmost use of their leather and textiles to minimise any waste. As part of their approach to re-cycling and waste management, excess leather from furniture production has been sold off to third parties for the production of small leather goods, such as gloves, shoes, handbags and boxes. It's a practice that they have had in place at Fredericia for over 30 years. Additionally, a portion of the leather is also donated to local schools. In the neighbourhood around their factory, children have crafted wallets and the like out of leftovers from our premium leather collections.
Transparency products (how they are made, what materials used, certifications etc.)	All wood from Fredericia comes from responsibly managed forests, where replanting is required. • The FSC® Forest Management Certification confirms that a forest is being managed in an environmentally responsible manner that preserves biodiversity and benefits the lives of local people and workers. The FSC® standard is gradually being applied to all their products throughout 2021. • The European Union Timber Regulation (EUTR) is a trade mechanism imposed by the EU Parliament and Council to reduce illegal logging by ensuring that no illegal timber or timber products can be harvested or sold in the EU. Most of their upholstery options are eco-labelled – both their fabrics (EU Flower / EcoTex / Greenguard) and their leather (Blue Angel). Most of the products are tested for hard public use - and some through generations of use in everyday life.

	All parts and raw materials are produced and sourced in Europe (except American walnut and Jatoba wood). And they use the most environmentally friendly options in the industry when it comes to hard foam (MDI-foam) and chrome plating (Chrome III).
Sources	https://www.fredericia.com/about/sustainability.aspx

9.2. Products

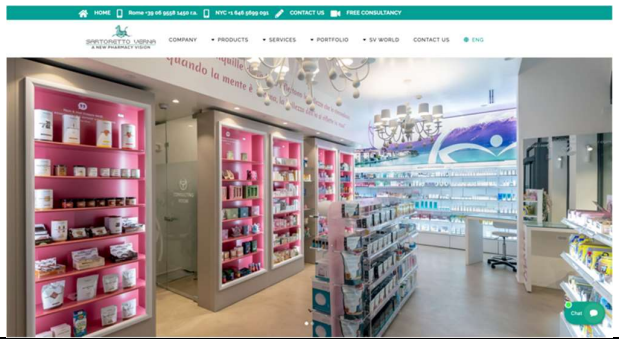
9.2.1. Chair (9 types)

General information		
Product name	Chair (9 types)	
Product category	Furniture	
Product sector	Home	
Brand	Pato	
Since year	2013	
Trading company	Fredericia	
Location trading company	Denmark	
Manufacturing company	Fredericia	
Location manufacturing company	Denmark	
Product specifics		
Since when product launched	2013	
Price of product (EUR)	Not specified	
Sales channel	Different dealers	
Country of sales	EU	
Sales volume	Unclear	
Sales impact	Unclear	

Awards	None found
Plastic type used	PP
PIR/ PCR / used	PCR + PIR
Plastic source	Zero produce plants in combination with sorted household waste such as yogurt container and medicine bottles or from other sources such as discarded fishing nets. Between 0-30% PCR, rest is PIR.
Assembled product (Yes/No)	Yes
% of recycled content (overall)	
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable, parts can be separated.
Mechanical process (Yes/No)	Yes
Sustainability impact	Pato is designed for disassembly on site to take part in circular economy. Fredericia offers all spare parts for maintenance on site.
Other remarks	
Sources	https://www.fredericia.com/stories/pato-100-recycled-100-recyclable.aspx https://www.fredericia.com/Admin/Public/DWSDownload.aspx?File=Files%2fFiles%2f_Pato-Catalogue-2021.pdf

10. Sartoretto Verna

10.1. Company profile

General information	
Company	Sartoretto Verna 
Company description	Sartoretto Verna is an Italian family company that is dedicated exclusively to the study of tools and methods for making pharmacists stronger and more recognized since 1965, all around the World. They are the only company in the industry with pharmacies in 35 countries spanning 4 continents. Their forward thinking has often created trends in the pharmacy design field. Sartoretto Verna boasts concrete and reliable experience, certified over the years by substantial increases in sales, in parallel with our customers'. Sartoretto Verna™ designs matchless pharmacies as they believe that every single project, whether big or small, is a new business adventure to be lived with passion and commitment coping with client's needs. Awards: - Easy Chain® won first prize for innovation and research at Cosmofarma in 2015. - Ral® 8 won first prize for innovation and research at Cosmofarma in 2016.
Goal/vision	
Founded in	1965
CEO	Luca Sartoretto Verna
Location(s)	International, locations in 35 different countries
Manufacturing company	Sartoretto Verna
Location(s)	Rome, Italy
# employees	100+
Financials (#turnover and possible margins)	Not specified
Brands	Some of the brands are: RAL SYSTEM ®, Easy Chain®, Go-Plexi®, Go-You®, Go-Round®, Promocube® and many more.

Person interesting to contact for interview	Fiona Sartoretto Verna, owner fiona@sartorettoverna.it → asked if the interview could be at the beginning of September
Sustainability/environmental and social impact	
Footprint reduction/social impact & important concepts used	Sartoretto Verna feels responsible of their products' impact throughout all their lifecycle. For this very reason they constantly strive for innovating within an eco-friendly attitude. And their customers value their policy by choosing their "green" products made of sustainable materials. When Sartoretto Verna produces sustainable materials, their architects and engineers sit down before the production phase takes place by selecting the most valuable materials and testing them with some 15-year simulation processes. Every single piece must be easy to be replaced and recycled. For example, products from the Easy Chain® and the Go-Plexi® gondolas are totally built with recyclable materials.
Footprint reduction goals	Not specified
Waste management	
Transparency products (how they are made, what materials used, certifications etc.)	Not much transparency about their products or about sustainability on the website.
Sources	https://www.sartorettoverna.com/style-and-trends/our-green-commitment

10.2. Products

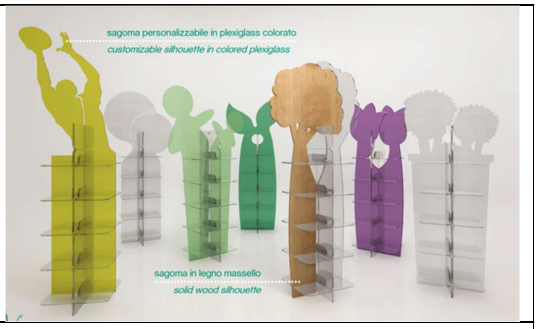
10.2.1. Gondolas (presentation shelfs pharmacy)

General information		
Product name	Gondolas (presentation shelfs pharmacy)	
Product category	Display	
Product sector	Other	
Brand	Go-Plexi®	
Since year	Unclear	
Trading company	Sartoretto Verna	
Location trading company	Rome, Italy	

Manufacturing company	Sartoretto Verna
Location manufacturing company	Rome, Italy
Product specifics	
Since when product launched	Unclear
Price of product (EUR)	Not specified
Sales channel	Via sales department
Country of sales	EU
Sales volume	Unclear
Sales impact	Unclear
Awards	None found for specific product, however, see company profile
Plastic type used	Plexiglass
PIR/ PCR / used	Not specified
Plastic source	Unclear
Assembled product (Yes/No)	Yes
% of recycled content (overall)	
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable
Mechanical process (Yes/No)	Yes
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://www.sartorettoverna.com/ Catalogue

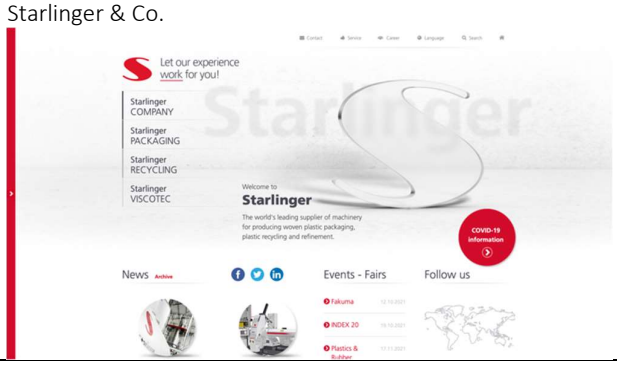
10.2.2. Pharmacy shelves

General information		
Product name	Pharmacy shelves	
Product category	Display	
Product sector	Other	
Brand	Go-You®	

Since year	Unclear	
Trading company	Sartoretto Verna	
Location trading company	Rome, Italy	
Manufacturing company	Sartoretto Verna	
Location manufacturing company	Rome, Italy	
Product specifics		
Since when product launched	Unclear	
Price of product (EUR)	Not specified	
Sales channel	Via sales department	
Country of sales	EU	
Sales volume	Unclear	
Sales impact	Unclear	
Awards	None found for specific product, however, see company profile	
Plastic type used	Plexiglass	
PIR/ PCR / used	Not specified	
Plastic source	Unclear	
Assembled product (Yes/No)	Yes	
% of recycled content (overall)		
% of recycled content (plastic part)	100%	
Afterlife of the product	Recyclable	
Mechanical process (Yes/No)	Yes	
Sustainability impact	Not specified for specific product, see company profile for more info	
Other remarks		
Sources	https://www.sartorettoverna.com/ Catalogue	

11. Starlinger & Co.

11.1. Company profile

General information	
Company	Starlinger & Co. 
Company description	Starlinger is a globally active innovative European industrial company specializing in machinery and process technology. In the field of application-oriented flexible packaging solutions from woven plastic and in PET recycling and refinement, Starlinger leads the world market and sets new standards. This means they offer - the widest range of woven sack plant machinery, - the most comprehensive scope of processes in connection with woven sack production, - and worldwide presence. In recent years, they have achieved pioneer status in another field as well: plastics recycling. Today, Starlinger is one of the top suppliers worldwide in the PET recycling field, leading the way with new technological developments and advancements in plastic recycling. Starlinger received the Austrian National Export Award in 2007 and 2012.
Goal/vision	Continuing to be the world market leader in the fields of flexible woven plastic packaging, PET recycling and PET refinement by setting the standards with our application-oriented solutions.
Founded in	1835
CEO	Angelika Huemer (managing partner)
Location(s)	Sales and service centres in Brazil, China, India, Indonesia, Mexico, Russia, South Africa, Thailand, Uzbekistan, and the US
Manufacturing company	Louis Blockx and LC Packaging is manufacturer of the relevant product The company Louis Blockx nv was founded in 1923 by Louis Blockx. Since then, the company grew and, Louis Blockx is now part of Blockx Group. Together with four other companies, Blockx Group forms a complete partner for the production, printing, and sale of industrial bags: small bags, big bags, and liner bags. The group strives to develop productive long-term partnerships with each of its clients and suppliers. We do this by delivering high-quality custom-made products with a concrete, tangible added value.

Location(s)	Belgium, The Netherlands & has a production unit in Serbia
# employees	750
Financials (#turnover and possible margins)	Latest numbers found on the website are: 210 million euros in 2013/2014. & annual turnover of more than EUR 250 million
Brands	Starlinger
Person interesting to contact for interview	Andreas Pechhacker General manager recycling technology T: +43 2674 800-3101 E: recycling[at]starlinger.com Hermann Adrigan Director, head of sales T: +43 1 59955-0 F: +43 1 59955-180 E: sales[at]starlinger.com Paul Niedl Head of sales recycling technology T: +43 2674 800-3101 F: +43 2674 800-125 E: recycling[at]starlinger.com Herbert Fürst Director engineering and development T: +43 2674 800 F: +43 2674 800-221
Sustainability/environmental and social impact	
Footprint reduction/social impact & important concepts used	Starlinger recycling technology enhances the ecological and economical sustainability of our customers, by developing and marketing recycling lines. Together with Starlinger viscotec, they offer a spectrum of innovative machinery solutions for the efficient recycling of a variety of plastics, such as PE and PP, PET, PA, PS, PLA, PMMA, and many more. Leading in the field of PET recycling and refinement, Starlinger recycling systems and solid state polycondensation (SSP) reactors produce food-safe recycled PET and HDPE which is approved for use in food applications by many brand owners as well as various national and international authorities. Starlinger's Recycling Division, founded in 2002, is the company's second eldest field of endeavour. Yet thanks to entirely new recycling technologies and proven machine concepts, Starlinger's product line recoSTAR quickly asserted its place in the market and has become a global and leading player in the field of plastics recycling. → recoSTAR: initiative that has solutions for recycling all sorts of materials. New developments and state-of-the-art technology in packaging and recycling pays off. → Cement producers, for example, could significantly reduce breakage rates of cement sacks all along the logistic chain due to the introduction of AD*STAR® woven polypropylene sacks, developed and internationally patented by Starlinger. →Other innovative packaging product developments include pinch bottom bags, reusable shopping bags, or FFS (Form, Fill & Seal) sacks made of woven polypropylene fabric.

	Recycling allows to turn plastic production scrap and post-consumer waste into a valuable secondary resource, helping plastic producers or authorities concerned with waste disposal to cut down raw material costs and to improve waste management. Both technical and product development at Starlinger are aimed to achieve the highest quality standards for the respective applications while being cost-efficient and environmentally sustainable. - 45,000 circular looms have been installed worldwide - more than 10 billion AD*STAR® sacks per year are produced worldwide on Starlinger machines - 22 billion 2 litre bottles installed recycling capacity on recoSTAR PET - A sack weighing 2 kgs (FIBC) holds 2000 kgs of goods - Energy requirement is only 0.7 kWh per sack
Footprint reduction goals	Not specified
Waste management	Waste created during production can be reprocessed with the recycling line recoSTAR universal. At the FIBC manufacturer, the used big bags are shredded, washed, and processed into rPP on the Starlinger recycling line recoSTAR dynamic, thereby yielding secondary raw materials for the production of new big bags.
Transparency products (how they are made, what materials used, certifications etc.)	
Sources	https://www.starlinger.com/en/company/history/

11.2. Products

11.2.1. rPP Big Bags

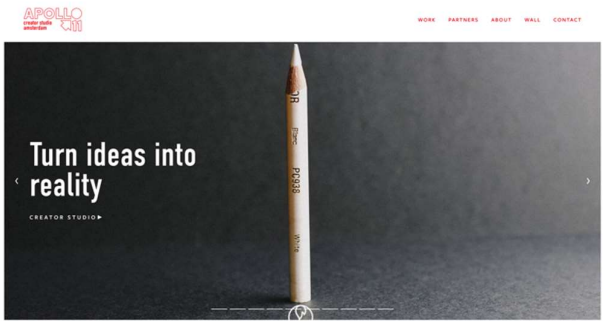
General information		
Product name	rPP Big Bags	
Product category	Bulk packaging	
Product sector	Packaging	
Brand	Starlinger	
Since year	Unclear	
Trading company	Starlinger & Co	

Location trading company	Sales and service centres in Brazil, China, India, Indonesia, Mexico, Russia, South Africa, Thailand, Uzbekistan, and the US
Manufacturing company	Louis Blockx and LC Packaging
Location manufacturing company	Belgium, The Netherlands
Product specifics	
Since when product launched	02/2020
Price of product (EUR)	Not specified
Sales channel	Via sales department
Country of sales	EU
Sales volume	Unclear
Sales impact	Unclear
Awards	None found
Plastic type used	PP
PIR/ PCR / used	Used
Plastic source	Reused big bags
Assembled product (Yes/No)	Yes
% of recycled content (overall)	
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable
Mechanical process (Yes/No)	Yes
Sustainability impact	Starlinger offers the production technology for various types and sizes of single-use and reusable FIBC's, as well as testing equipment for tear and compression testing of the finished big bags.

	The PP woven sacks are stronger, cheaper than the conventional multi-layer paper sacks and completely recyclable. Even without recycling options, the carbon footprint of flexible big bags is far below that of rigid FIBC containers such as drums or octabins because of their lower weight and space-saving transport.
Other remarks	
Sources	https://www.starlinger.com/en/packaging/applications/fibc/ https://www.starlinger.com/fileadmin/user_upload/01_Packaging/11_Applications/FB_en/10/index.html https://packagingeurope.com/starlinger-circular-packaging-at-k-2019/

12. Apollo 11

12.1. Company profile

General information	
Company	Apollo 11 
Company description	Apollo 11 helps companies to create new ideas and make them happen. Some of their work includes: - Foooty, which is a unique patented 2D construction element that enables you to create 3D shapes. With this product, they want to stimulate more playtime for kids. - Collaboration with Pure Waste, the Finnish textile pioneer that up-cycles textile waste into 100% recycled high quality apparel with a minimal environmental impact. Together they create sustainable merchandise. One t-shirt saves 2700 liters of water, one sweater 6200 liters, and one hoodie saves 8700 liters of water. They offer innovation workshops for individuals of teams that are looking for a unique product idea/range or simply for some inspiration. Through challenges and by using the power of play and the structure of design thinking, they hope to spark some new ideas.
Goal/vision	Create new ideas and realize them.
Founded in	Unclear
CEO	Jean-Pierre Raes
Location(s)	Creator studio in Amsterdam, NL
Manufacturing company	Coolrec is the plastic supplier for the relevant product. Coolrec, a subsidiary of Renewi and the largest recycler of waste plastics in Europe, processes electrical and electronic equipment, plastics, and non-ferrous metals into high-quality raw materials. This is done with attention for you as a customer as well as attention for: innovation, quality, and sustainability. They are an active player in the circular economy, the system dedicated to reuse instead of destroying raw materials.
Location(s)	Coolrec has 7 specialised factory sites (of which 3 high-tech production plants) in 4 countries.
# employees	<50 (estimation)
Financials (#turnover and possible margins)	Not specified

Brands	Not really a brand
Person interesting to contact for interview	info@apollo-11.nl Jean-Pierre Raes Business development jp@apollo-11.nl Lian Rynja Product development lian@apollo-11.nl
Sustainability/environmental and social impact	
Footprint reduction/social impact & important concepts used	Apollo 11 supports the Right to Play, which uses the power of play to empower children around the world to overcome the effects of poverty, conflict, and disease. → most of their designs are inspired by this.
Footprint reduction goals	-
Waste management	-
Transparency products (how they are made, what materials used, certifications etc.)	-
Sources	https://www.apollo-11.nl/ https://www.coolrec.com/en/waste-no-more/about-coolrec

12.2. Products

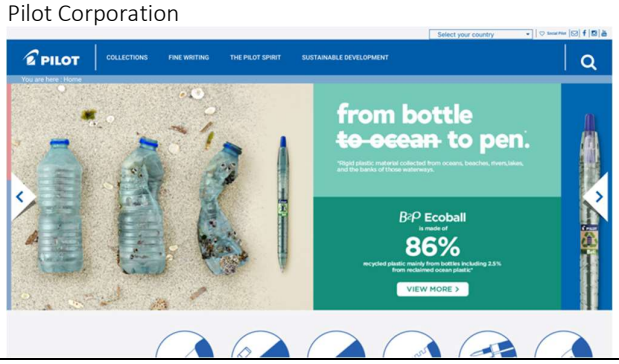
12.2.1. Rockeees Toys

General information		
Product name	Rockeees Toys	
Product category	Toys	
Product sector	Toys	
Brand	Rockees	
Since year	2020	
Trading company	Apollo-11	
Location trading company	NL	

Manufacturing company	Coolrec to provide the plastic and Injection Point to create the toys
Location manufacturing company	EU
Product specifics	
Since when product launched	30/11/2020
Price of product (EUR)	12.95 (bol.com)
Sales channel	Bol.com or online webstore
Country of sales	NL
Sales volume	Not specified
Sales impact	Annually, Coolrec recycles approximately 50 million kg of plastics into valuable secondary raw materials. → In 2019, Recupel collected 20,381 tonnes from 462,246 wasted refrigerating appliances.
Awards	WEEE-recycler Coolrec, a subsidiary of Renewi, has been nominated for the prestigious Plastics Recycling Awards Europe 2021 with ROCKEEES
Plastic type used	HIPS (High Impact Polystyrene Granule)
PIR/ PCR / used	Used
Plastic source	Refrigerating appliances
Assembled product (Yes/No)	Yes
% of recycled content (overall)	
% of recycled content (plastic part)	100%
Afterlife of the product	Recyclable
Mechanical process (Yes/No)	Yes
Sustainability impact	
Other remarks	
Sources	https://www.renewi.com/en/investors/newsroom/from-waste-to-sustainable-toys https://www.rockeees.com/

13. Pilot Corporation

13.1. Company profile

General information	
Company	Pilot Corporation 
Company description	Pilot Corporation is the largest pen manufacturer in Japan, based in Tokyo. They produce all sorts of writing instruments, stationary, and even jewellery. But the company is best known for its pens. They are the world's number two brand in writing instruments. Preserving the environment is a major challenge that has long guided their acts and thinking. At Pilot, they constantly innovate while sustainably involving themselves to limit the impact we have on the planet. Transforming their pens to make them ever more eco-friendly is a genuine technological and human feat.
Goal/vision	More than a philosophy, the DO BETTER WITH LESS principle represents Pilot's approach aimed at reducing the ecological impact of their production while preserving their standards of quality and innovation. Today, Pilot Corporation is committed to meeting the major challenges of this new millennium such as protecting the environment and they continue to innovate to improve the quality and comfort of their products even further.
Founded in	1918
CEO	Hiromoto Watanabe
Location(s)	Headquarters in Tokyo, Japan, Subsidiaries in United Kingdom, France, Germany, Hong Kong, Indonesia, Israel, Italy, Malaysia, Russia, Singapore, Sweden, United States, Australia
Manufacturing company	Not specified, assumably Pilot Corporation themselves.
Location(s)	Japan (3 locations), France (1 location)
# employees	2604
Financials (#turnover and possible margins)	87,096 million yen
Brands	Several different brands, some of them are: Frixion, B2P, Acroball, V5/V7, and G-2.
Person interesting to contact for interview	Contact form on the website
Sustainability/environmental and social impact	

Footprint reduction/social impact & important concepts used	The company has settled on a **guideline for their environmental conservation efforts** in all aspects of business activities such as the planning, design, manufacture, and sales of products at all of its business locations. The guideline is as follows: 1. Pilot Corporation will manufacture environmentally friendly products. 2. Pilot Corporation will comply with environmental laws and regulations and any other requirements that it deems acceptable. 3. Pilot Corporation will strive for efficient and conservative energy use. 4. Pilot Corporation will advance the reduction of waste generated. 5. Pilot Corporation will promote re-use and recycling and use limited resources effectively. 6. Pilot Corporation will promote environmental education and communication within the company and strive to increase its employees' environmental awareness. At Pilot, they do whatever it takes to prevent industrial risk and to limit all forms of pollution linked to their activities. Studies are constantly being undertaken to ensure that their factories consume the least possible resources: whether water, gas, or electricity. All products distributed in Europe come from Pilot factories. This **enables them to control every stage in the manufacture of products**, taking into account their environmental impact. Aware that the future depends on us all, using its expertise, the company decided to create the first range of pens made at least of 70% recycled plastic: the BEGREEN range. They are further pursuing their efforts through an action plan based on 4 essential pillars, the 4R's: - **Recycle**: *Limiting use of plastic to the strict minimum.* The extraction of raw materials needed to produce plastic represents 77.8% of a pen's carbon footprint. That's why, since 2006, they have preferred to use recycled plastic to make our pens. → This optimisation of the production tool allows them to reduce the CO2 impact of the writing instruments concerned by between 19% and 57%. - **Refill**: *Change the refill, not the pen.* Over 60 % of our products are refillable. This has also enabled their end users to rethink how they consume. Using the same product several times instead of throwing it away is a gesture that's simple, economical, and ecological. → In this way by refilling, for example, a B2P roller 3 times, you can cut CO2 impact by 37 to 71% compared to the single use of 4 pens. → 80% of Pilot's pens (ballpoints, gel ink pens, rollerballs) are refillable. - **Reduce**: *We're all wrapped up in using less plastic.* Current marketing practices oblige them to sell their pens with packaging. Since 2010, they have reduced quantities of virgin plastic by over 80% by using recycled plastic and FSC-certified cardboard. → BEGREEN range is available with 100% recyclable cardboard packaging. All their e-commerce range is offered in 100% recyclable paper flowpacks. All formats of their logistical packaging are adapted to reduce empty space and are FSC certified. - **Reclaim**: *Less plastic in our oceans to reduce pollution.*

	Between 8 - 12 million metric tons of plastic enter oceans annually, and 70% of such waste actually sinks to the seabed, where we are unlikely to be able to clean it up. It is key to collect plastic before it enters the oceans. → In 2021, PILOT is taking a leading step in the fight against this worldwide pollution by adding an element of reclaimed ocean plastic to the recycled PET material used in the manufacture of the iconic B2P range (Gel and Ecoball). → This material is recuperated from oceans, beaches, rivers, lakes, and the banks of those waterways, by our partner TerraCycle, the world's leader in the collection and re-use of non-recyclable postconsumer waste. The Pilot Pen Company (UK) Ltd has committed to being a Climate neutral company. This means that they have calculated their greenhouse gas emissions, and they are continuously looking to reduce them and offset unavoidable emissions through carbon offset projects. 67,200 kg CO2 has been offset. → https://fpm.climatepartner.com/tracking/15655-2102-1001/en?utm_source=(direct)&utm_medium=climatepartner.com
Footprint reduction goals	Not specified
Waste management	TerraCycle
Transparency products (how they are made, what materials used, certifications etc.)	The very selective EMAS certification as well as the ISO 14001 norm. Pilot's environmental vision is only meaningful if it is shared by everyone, and they are very proud to say that 100% of their employees are involved in their environmental approach. They also make sure that their external partners share their values and convictions. Their distributors and consumers are always informed of their environmental goals and results via an environmental declaration.
Sources	https://www.pilot.co.jp/company/english/corporate/philosophy/ https://www.pilotpen.eu/en/the-pilot-spirit-about-pilot-company-profile/about-pilot/key-figures.html https://www.pilotpen.eu/en/catalog/category/view/s/sustainable-development/id/501/ https://en.wikipedia.org/wiki/Pilot_(pen_company)

13.2. Products

13.2.1. Ball Point Pens - B2P (=Bottle2Pen) - 3 types

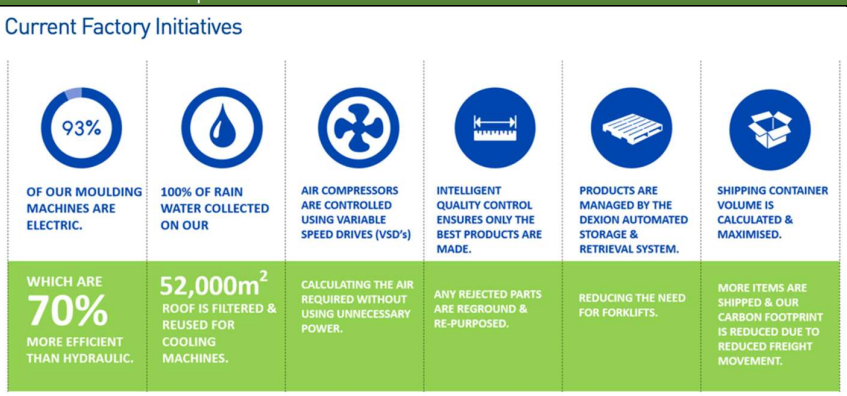
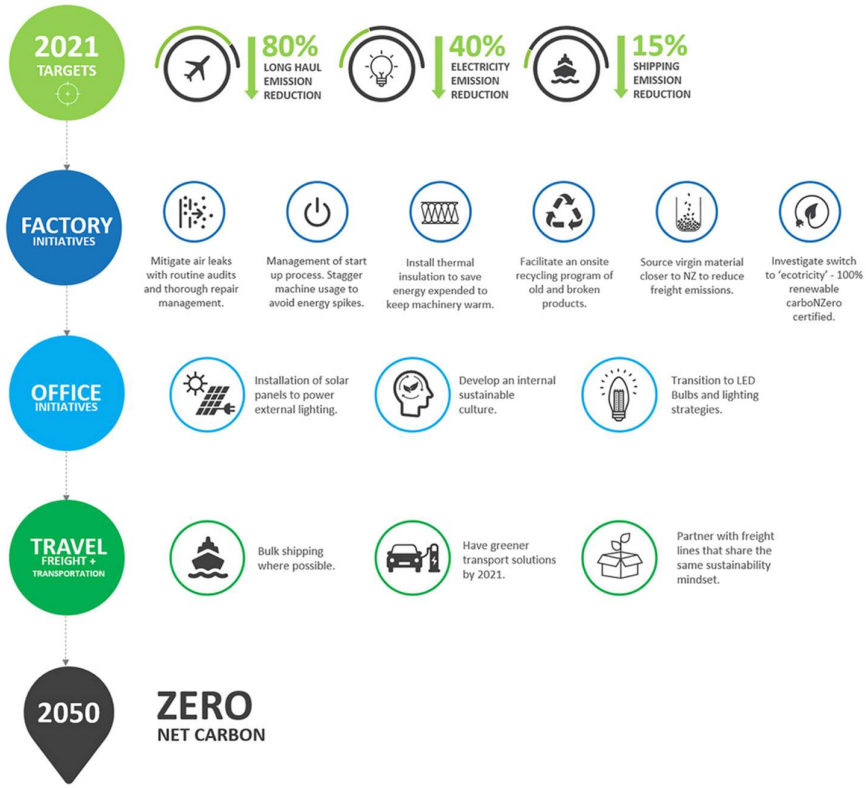
General information	
Product name	Ball Point Pens - B2P (=Bottle2Pen) - 3 types
Product category	Utensils
Product sector	Utensils
Brand	B2P - Bottle 2 Pen
Since year	2006

Trading company	Pilot Corporation
Location trading company	International, based in Japan
Manufacturing company	Not specified
Location manufacturing company	USA, Japan, and France
Product specifics	
Since when product launched	Unclear
Price of product	16.79 USD for 12 pens (1.40 per pen) https://www.amazon.com/Pilot-B2P-Retractable-Recycled-Bottles/dp/B003VNMQFA
Sales channel	Online retail, regular retail
Country of sales	International
Sales volume	Since the launch of B2P, over 7 million plastic bottles have been recycled to make B2P pens.
Sales impact	5 pens can be made from recycling one 1500 ml water bottle
Awards	None found
Plastic type used	PET
PIR/ PCR / used	PCR
Plastic source	Bottles
Assembled product (Yes/No)	Yes
% of recycled content (overall)	Total of 89% recycled content (-> with 83% PCR = 0.89*0.83=74%). Minimum is 70% of recycled plastic.
% of recycled content (plastic part)	
Afterlife of the product	Unclear
Mechanical process (Yes/No)	Yes
Sustainability impact	By producing a Begreen B2P Gel rollerball pen with recycled plastic, Pilot is reducing the carbon footprint of the pen compared to the same pen produced without recycled plastic. But it does not stop there, by refilling it at least 3 times, you would be offsetting the carbon dioxide emissions too. From the manufacturing through to the end of the product life, it is estimated that buying this Begreen pen and refilling it 3 times reduces the total environmental impact of the pen by -69% compared to buying an additional 3 new pens.
Other remarks	
Sources	https://www.recoup.org/products-made-from-recycled-plastics/category/40/office-supply https://www.pilotpenuk.com/b2p

14. Sistema

14.1. Company profile

General information	
Company	Sistema 
Company description	Millions of customers in over 110 countries around the world use Sistema® products to help make their life a little easier. From drink bottles and lunch boxes to microwave products and storage containers; everywhere Sistema® products are used, people find a purpose that suits their lifestyle. Sistema® was built on one man's dream in his garage in a small town in New Zealand. From those humble beginnings, Sistema® is now supported by a global team of over 700 employees. The vision to manufacture beautifully designed products in New Zealand and ship them to customers around the world has been realised. The dream continues with a passionate focus on innovation, design, and an ever-increasing range of desired products.
Goal/vision	To manufacture beautifully designed containers for daily use inside home, bottles, lunch boxes and microwave containers which made of plastic that is BPA and Phthalate free.
Founded in	1987
CEO	Drew Muirhead
Location(s)	Headquarters: Auckland, New Zealand 45 locations across the globe: Australia, UK, Taiwan, Spain, Canada, Paraguay, and more.
Manufacturing company	Sistema – but not certain
Location(s)	New Zealand
# employees	700+
Financials (#turnover and possible margins)	Not specified
Brands	Sistema Renew → Sistema® Renew™ is a range of reusable lunch products that are made using a percentage of recycled plastic. Our goal with Renew™ is to use a minimum of 30% recycled plastic which is post-industrial material (Sistema's production off-cuts). Sistema® Renew™ is a project focusing on offering eco-friendly sustainable lunch solutions. Each product has different overall weight which determines the percentage of recycled content that goes into the product.

Person interesting to contact for interview	Location Belgium, Luxembourg, The Netherlands info@livwise.be
Sustainability/environmental and social impact	
Footprint reduction/social impact & important concepts used	
Footprint reduction goals	 Sistema Plastics Ltd has committed to reducing its carbon emissions by achieving Certified Emissions Measurement And Reduction Scheme (CEMARS®) certification. CEMARS certification is a recognized greenhouse gas (GHG) emissions measurement and reduction scheme administered by Enviro-Mark Solutions (a subsidiary of Manaaki Whenua - Landcare Research). It is the first of a two-step process towards achieving carboNZeroCert™ certification in New Zealand.
Waste management	-

Transparency products (how they are made, what materials used, certifications etc.)	-
Sources	https://sistemaplastics.com/renew https://sistemaplastics.com/news/entry/sistema-plastics-committed-to-reducing-its-carbon-footprint

14.2. Products

14.2.1. Gripper bottle 800 ml

General information	
Product name	Gripper bottle 800 ml
Product category	Food containers
Product sector	Utensils
Brand	Sistema Renew
Since year	2020
Trading company	Sistema
Location trading company	New Zealand
Manufacturing company	Sistema – but not certain
Location manufacturing company	New Zealand
Product specifics	
Since when product launched	Unclear
Price of product (EUR)	8.95
Sales channel	Online as well as retail
Country of sales	International (also available in NL)
Sales volume	Unclear
Sales impact	Unclear
Awards	None found
Plastic type used	PP
PIR/ PCR / used	PIR
Plastic source	Leftovers own production

Assembled product (Yes/No)	No
% of recycled content (overall)	69%
% of recycled content (plastic part)	69%
Afterlife of the product	Recyclable
Mechanical process (Yes/No)	Unclear
Sustainability impact	Carbon impact Water consumption
Other remarks	
Sources	https://sistemaplastics.com/products/hydrate/800ml-gripper https://www.facebook.com/sistemaplasticslimited/posts/introducing-sistema-renew-a-range-of-reusable-lunch-products-that-are-made-using/804380033651852/

14.2.2. Lunch container 1.1L salad

General information		
Product name	Lunch container 1.1L salad	
Product category	Food containers	
Product sector	Utensils	
Brand	Sistema Renew	
Since year	2020	
Trading company	Sistema	
Location trading company	New Zealand	
Manufacturing company	Sistema – but not certain	
Location manufacturing company	New Zealand	
Product specifics		
Since when product launched	Unclear	
Price of product (EUR)	10.95	
Sales channel	Online as well as retail	
Country of sales	International (also available in NL)	
Sales volume	Unclear	
Sales impact	Unclear	

Awards	None found
Plastic type used	PP
PIR/ PCR / used	PIR
Plastic source	Leftovers own production
Assembled product (Yes/No)	No
% of recycled content (overall)	71%
% of recycled content (plastic part)	71%
Afterlife of the product	Recyclable
Mechanical process (Yes/No)	Unclear
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://sistemaplastics.com/products/to-go/1.1l-salad-to-go https://www.facebook.com/sistemaplasticslimited/posts/introducing-sistema-renew-a-range-of-reusable-lunch-products-that-are-made-using/804380033651852/

14.2.3. Lunch container 1.2L Lunch plus

General information		
Product name	Lunch container 1.2L Lunch plus	
Product category	Food containers	
Product sector	Utensils	
Brand	Sistema Renew	
Since year	2020	
Trading company	Sistema	
Location trading company	New Zealand	
Manufacturing company	Sistema – but not certain	
Location manufacturing company	New Zealand	
Product specifics		
Since when product launched	Unclear	
Price of product (EUR)	7.95	

Sales channel	Online as well as retail
Country of sales	International (also available in NL)
Sales volume	Unclear
Sales impact	Unclear
Awards	None found
Plastic type used	PP
PIR/ PCR / used	PIR
Plastic source	Leftovers own production
Assembled product (Yes/No)	No
% of recycled content (overall)	60%
% of recycled content (plastic part)	60%
Afterlife of the product	Recyclable
Mechanical process (Yes/No)	Unclear
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://sistemaplastics.com/products/lunch/1.2l-lunch-plus-lunch https://www.facebook.com/sistemaplasticslimited/posts/introducing-sistema-renew-a-range-of-reusable-lunch-products-that-are-made-using/804380033651852/

14.2.4. Lunch container 1.65L Bento Lunch

General information		
Product name	Lunch container 1.65L Bento Lunch	
Product category	Food containers	
Product sector	Utensils	
Brand	Sistema Renew	
Since year	2020	
Trading company	Sistema	
Location trading company	New Zealand	
Manufacturing company	Sistema – but not certain	
Location manufacturing company	New Zealand	

Product specifics	
Since when product launched	2017
Price of product (EUR)	13.95
Sales channel	Online as well as retail
Country of sales	International (also available in NL)
Sales volume	Unclear
Sales impact	Unclear
Awards	None found
Plastic type used	PP
PIR/ PCR / used	PIR
Plastic source	Leftovers own production
Assembled product (Yes/No)	No
% of recycled content (overall)	72%
% of recycled content (plastic part)	72%
Afterlife of the product	Recyclable
Mechanical process (Yes/No)	Unclear
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://sistemaplastics.com/products/lunch/1.65l-bento-lunch https://www.facebook.com/sistemaplasticslimited/posts/introducing-sistema-renew-a-range-of-reusable-lunch-products-that-are-made-using/804380033651852/

14.2.5. Lunch container 450 ml sandwich

General information		
Product name	Lunch container 450 ml sandwich	
Product category	Food containers	
Product sector	Utensils	
Brand	Sistema Renew	
Since year	2020	
Trading company	Sistema	
Location trading company	New Zealand	

Manufacturing company	Sistema – but not certain
Location manufacturing company	New Zealand
Product specifics	
Since when product launched	Unclear
Price of product (EUR)	5.95
Sales channel	Online as well as retail
Country of sales	International (also available in NL)
Sales volume	Unclear
Sales impact	Unclear
Awards	None found
Plastic type used	PP
PIR/ PCR / used	PIR
Plastic source	Leftovers own production
Assembled product (Yes/No)	No
% of recycled content (overall)	51%
% of recycled content (plastic part)	51%
Afterlife of the product	Recyclable
Mechanical process (Yes/No)	Unclear
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://sistemaplastics.com/products/lunch/450ml-sandwich-box-lunch https://www.facebook.com/sistemaplasticslimited/posts/introducing-sistema-renew-a-range-of-reusable-lunch-products-that-are-made-using/804380033651852/

14.2.6. Lunch container 975 ml snack attack duo

General information		
Product name	Lunch container 975 ml snack attack duo	
Product category	Food containers	
Product sector	Utensils	
Brand	Sistema Renew	
Since year	2020 h	

Trading company	Sistema
Location trading company	New Zealand
Manufacturing company	Sistema – but not certain
Location manufacturing company	New Zealand
Product specifics	
Since when product launched	Unclear
Price of product (EUR)	9.95
Sales channel	Online as well as retail
Country of sales	International (also available in NL)
Sales volume	Unclear
Sales impact	Unclear
Awards	None found
Plastic type used	PP
PIR/ PCR / used	PIR
Plastic source	Leftovers own production
Assembled product (Yes/No)	No
% of recycled content (overall)	64%
% of recycled content (plastic part)	64%
Afterlife of the product	Recyclable
Mechanical process (Yes/No)	Unclear
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://sistemaplastics.com/products/lunch/410ml-Snack-Attack https://www.facebook.com/sistemaplasticslimited/posts/introducing-sistema-renew-a-range-of-reusable-lunch-products-that-are-made-using/804380033651852/

14.2.7. Snack container 350 ml small split

General information		
Product name	Snack container 350 ml small split	
Product category	Food containers	
Product sector	Utensils	
Brand	Sistema Renew	

Since year	2020	
Trading company	Sistema	
Location trading company	New Zealand	
Manufacturing company	Sistema – but not certain	
Location manufacturing company	New Zealand	
Product specifics		
Since when product launched	Unclear	
Price of product (EUR)	4	
Sales channel	Online as well as retail	
Country of sales	International (also available in NL)	
Sales volume	Unclear	
Sales impact	Unclear	
Awards	None found	
Plastic type used	PP	
PIR/ PCR / used	PIR	
Plastic source	Leftovers own production	
Assembled product (Yes/No)	No	
% of recycled content (overall)	51%	
% of recycled content (plastic part)	51%	
Afterlife of the product	Recyclable	
Mechanical process (Yes/No)	Unclear	
Sustainability impact	Not specified for specific product, see company profile for more info	
Other remarks		
Sources	https://sistemaplastics.com/products/to-go/small-split-to-go https://www.facebook.com/sistemaplasticslimited/posts/introducing-sistema-renew-a-range-of-reusable-lunch-products-that-are-made-using/804380033651852/	

14.2.8. Snack container 400 ml snacks (square)

General information		
Product name	Snack container 400 ml snacks (square)	
Product category	Food containers	
Product sector	Utensils	
Brand	Sistema Renew	
Since year	2020	
Trading company	Sistema	
Location trading company	New Zealand	
Manufacturing company	Sistema – but not certain	
Location manufacturing company	New Zealand	
Product specifics		
Since when product launched	Unclear	
Price of product (EUR)	5.95	
Sales channel	Online as well as retail	
Country of sales	International (also available in NL)	
Sales volume	Unclear	
Sales impact	Unclear	
Awards	None found	
Plastic type used	PP	
PIR/ PCR / used	PIR	
Plastic source	Leftovers own production	
Assembled product (Yes/No)	No	
% of recycled content (overall)	72%	
% of recycled content (plastic part)	72%	
Afterlife of the product	Recyclable	
Mechanical process (Yes/No)	Unclear	
Sustainability impact	Not specified for specific product, see company profile for more info	
Other remarks		

Sources	https://sistemaplastics.com/products/to-go/400ml-snacks-to-go https://www.facebook.com/sistemaplasticslimited/posts/introducing-sistema-renew-a-range-of-reusable-lunch-products-that-are-made-using/804380033651852/

14.2.9. Snack container 410 ml snack attack (long)

General information		
Product name	Snack container 410 ml snack attack (long)	
Product category	Food containers	
Product sector	Utensils	
Brand	Sistema Renew	
Since year	2020	
Trading company	Sistema	
Location trading company	New Zealand	
Manufacturing company	Sistema – but not certain	
Location manufacturing company	New Zealand	
Product specifics		
Since when product launched	Unclear	
Price of product (EUR)	8.95	
Sales channel	Online as well as retail	
Country of sales	International (also available in NL)	
Sales volume	Unclear	
Sales impact	Unclear	
Awards	None found	
Plastic type used	PP	
PIR/ PCR / used	PIR	
Plastic source	Leftovers own production	
Assembled product (Yes/No)	No	
% of recycled content (overall)	67%	
% of recycled content (plastic part)	67%	
Afterlife of the product	Recyclable	

Mechanical process (Yes/No)	Unclear
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://sistemaplastics.com/products/lunch/410ml-Snack-Attack https://www.facebook.com/sistemaplasticslimited/posts/introducing-sistema-renew-a-range-of-reusable-lunch-products-that-are-made-using/804380033651852/

14.2.10. Snack container 515 ml snack capsule

General information		
Product name	Snack container 515 ml snack capsule	
Product category	Food containers	
Product sector	Utensils	
Brand	Sistema Renew	
Since year	2020	
Trading company	Sistema	
Location trading company	New Zealand	
Manufacturing company	Sistema – but not certain	
Location manufacturing company	New Zealand	
Product specifics		
Since when product launched	Unclear	
Price of product (EUR)	8	
Sales channel	Online as well as retail	
Country of sales	International (also available in NL)	
Sales volume	Unclear	
Sales impact	Unclear	
Awards	None found	
Plastic type used	PP	
PIR/ PCR / used	PIR	
Plastic source	Leftovers own production	

Assembled product (Yes/No)	No
% of recycled content (overall)	72%
% of recycled content (plastic part)	72%
Afterlife of the product	Recyclable
Mechanical process (Yes/No)	Unclear
Sustainability impact	Not specified for specific product, see company profile for more info
Other remarks	
Sources	https://sistemaplastics.com/products/to-go/515ml-snack-capsule-to-go https://www.facebook.com/sistemaplasticslimited/posts/introducing-sistema-renew-a-range-of-reusable-lunch-products-that-are-made-using/804380033651852/

Appendix C – Literature references

Cited literature used to develop the scoring format.

- Adesina, A., & Awoyera, P. O. (2020). Plastic wastes to construction products: Statis, limitations and future perspective. *Case Studies in Construction Materials, 12.* https://doi.org/10.1016/j.cscm.2020.e00330
- Arponen, J., Juvonen, L., & Vanne, P. Circular economy business models for the manufacturing history.
- Brouwer, R., van Beukering, P., & Dijkstra, H. (2020). Business models and sustainable plastic management: A systematic review of the literature. *Journal of Cleaner Production, 258.* https://doi.org/10.1016/j.jclepro.2020.120967
- Cascadia Consulting Group, Full Cycle Environmental & MORE Recycling (2020). Recycled Content Use in Washington.
- Edwards, S., Grushac, S., Kelleher, M., Love, G., & Valiante, U. (2020). Successful Plastic Packaging Management Programs and Innovations.
- Hoogendoorn, S., Jansema-Hoekstra, K., Romijn, G., & Verrips, A. (2019). Chapter 4: The Circular Economy of Plastics in the Netherlands. *Environmental Sustainability and Education for Waste Management, 43-56.* DOI:10.1007/978-981-13-9173-6_4
- de Jong, A. M., & Mellquist, A.-C. (2021). The Potential of Plastic Reuse for Manufacturing: A Case Study into Circular Business Models for an On-Line Marketplace. *Sustainability, 13(4).* https://doi.org/10.3390/su13042007

Appendix D – Interview Questionnaires

Guidance and interview questions were provided to the interviewee, but also to the trading company as part of the preparation. For this reason, more information was provided on the project, objective and other background information.

BACKGROUND

The Plasticity Project

Plasticity is an European-wide project that aims to find strategies to increase the recyclability rate of plastic company waste (so called lost plastics) within the urban areas. Such a challenge requires research and solutions that involve many partners in urban areas, like waste owners, designers, plastic producers, knowledge institutes and governmental organizations. The project itself is running since 2019. See for more information; www.interreg2seas.eu/en/PlastiCity
Recently, we have been conducting a literature study to identify plastic products containing high percentages of recycled content. Some of these products are more successful than others. Out of roughly 700 identified products we have selected your product as one of the best practices. We would be interested to learn more about the success factors of your recycled plastic product.

Objective of the interviews

The objective of the interview is to determine the critical success and fail factors of products that contain high percentages of recycled plastic.

The interview set-up

The interview is consisting out of 3 building blocks, with a focus on the last one where we have 10 questions to ask you.

1. INTRODUCTION. As part of the introduction, we will provide you an introduction of the Plasticity Project and why we are interested in learning more about your plastic products.

2. VERIFYING CURRENT INFORMATION. During the literature review we already collected and listed information that is available on your company website, business reports and other sources provided online. We would like to verify if we have the correct information and fill in the blank gaps to complete them. Current information listed are shared.

3. UNDERSTANDING YOUR SUCCESS. We would like to understand what makes your product a success and learn from your experience in creating products made from recycled plastic. Such insights will contribute to the PlastiCity project which aims at creating new products made from recycled plastic. The questions below are just a guideline to support the conversation.

What will we do with the information that you provided?

During the interview we will take notes and we will share this with you in order to verify the information and to provide you full transparency. The information will be saved on a drive where only team members have access to, and it will solely be used on behalf of the Plasticity Project. When publications are expected, your company and product will be publicly shared, but all other information will only be part of the general results. In case more details are disclosed, the Plasticity Team will contact you.

We would like to keep in touch!

Thank you very much for participating in the interview. Now we would like to keep in touch and consider you as a friend of the Plasticity Project. This means that for other research, networking, or other activities, we will contact you whenever we consider it to be relevant. If you do not appreciate this, please let us know.

Questions – Understanding your success

General information

Interviewer of Plasticity	
Date	
Location	
Company	
Interviewee(s) of the company	
Function	
Role in relation to the products	
Contact details (phone and email)	

Key questions

11. What were the drivers to develop such a product?

12. How was the process and who was involved – from idea to market launch? Could you describe the process from the idea to the market launch?

13. Do you consider this product as a success? Why (not)?

14. What was the most important element of success in your opinion?

15. What was the biggest risk that could affect the success?

16. How did you mitigate this risk?

17. What is the Unique Selling Point (USP) of this product in the market with respect to the competition?

18. Did you or your company have a history in this kind of product development?

19. If you could develop or launch the product again, what would you do differently?

20. What do you recommend to other companies when they want to develop a product with a high recycled plastic content? Could you name top 3 do's and don'ts?

BACK-UP: GUIDELINE for the INTERVIEWEE DURING THE INTERVIEWS

Deep Dive on topics in the Sustainable Business Model Canvas and the contextual factors.

Key stakeholders

1. Who are the company's key partners and suppliers in becoming more sustainable?

2. What resources are required from them? And what activities do they perform?
3. What kind of benefits are acquired from these partnerships?
4. If the company does not have any partners or equivalent, then why not? And is the company able to cooperate with other organizations to improve their sustainability?

Strategic resources

5. In what way does the company distinguish itself from competitors? And how is their product different from similar products?
6. Which resources does the company need for their product? Have they been able to substitute any resources for more sustainable resources?
7. How is the company able to create a unique advantage due to sustainable elements?

Cost structure

8. What are the required costs and investments for sustainable products?
9. Which activities/resources are the least sustainable? Are there sustainable substitutes?

Key processes

10. How is the company able to make current relationships more sustainable?
11. How is the company able to make their distribution channel more sustainable and circular?
12. How does the company best communicate the sustainable aspect of their product?
13. Which processes work the best? Are they sustainable?

Revenue streams

14. What are the company's existing and possible revenue sources?
15. Are customers willing to pay more for sustainable products?
16. How much does each revenue stream contribute to the overall revenues?

Customer segments

17. What kind of customers is the company targeting with their sustainable product?
18. How are they able to reach the customers? And how are they able to enable them to act sustainably?

Value proposition

19. What value does the company deliver to the customer?
20. Which customer needs is the company satisfying? Which customers' problem is being solved?
21. How is the company able to solve the customers' needs in a more sustainable way?
22. Is the company able to extend the product life cycle? And how?

Social value

23. How is the company able to create more sustainable awareness?
24. What is the company doing to create a better society/world?
25. How does the company raise sustainable awareness among their employees?

Economic value

26. Can the product be profitably recycled, reused, etc.? How?
27. Is the company able to maintain high quality of the recycled plastics?
28. Is the company able to be more cost-efficient by offering sustainable products? How?

Environmental value

29. Does the company have any environmental goals? If yes, then which goals do they have and how are they planning to reach these goals?
30. What is the company doing to reduce their ecological footprint?
31. How did they transition from a linear economy?
32. What ecological costs is the company's business model causing?

Contextual factors

33. Are there any laws & regulations that limited or stimulated the product development and/or launch?
34. Was the technique to develop or produce the product already (widely) available?
35. Are the recycling facilities in place?
36. Is the recycled plastic easy available to purchase / distribute?

Appendix E – Interview notes from company Dragon Plastics Rotomoulding (CONFIDENTIAL)

General information

Interviewer of Plasticity	Gerko Brouwer
Date	15 December 2021
Location	Online via Teams
Company	Dragon Plastics Rotomoulding B.V. (DPR) Since 1995, located in Maasdijk, 15 employees. Custom made production company of plastic products. Only products made via rotation moulding with a matrix of max 2mx2m.
Interviewee(s) of the company	Rick van Gils
Function	CEO
Role in relation to the product	DRP developed and is producing the product 'Alfa Seats' for its' customer Speelplaatmeubel.be
Contact details (phone and email)	06 48 17 91 02 rick@dragonplastics.nl

Answers to the key-questions

1. What were the drivers to develop such a product?

Speelplaatmeubel.be already had an assortment of plastic attributes for public spaces and school / play areas. They wanted to develop one from recycled plastics. For 10 years DPR is already experimenting with recycled plastics. Resulting in a flexible (non foldable) material of minimum 3mm with low density. First they bought a shredder and later a powdering machine to turn this into finer powders for better processing. They were buying different waste streams from 2 purchase channels: (1) SUEZ – Roosendaal 100% PE; (2) BE – rigid consumer waste PP/PE 40-60%. The 40-60% is just an indication, it remains unclear how much is exact PP or PE in the mix received. In addition, they are testing the recycled waste in small batches determining the possibilities for clients. Based on all the experience they have gained they know that with their Rotomoulding technique it only requires 1 kg of material, and 1 hour of experimenting to know whether a clients wish it is possible or not. Based on that experience they are working with the customer to determine what, within the production opportunities, is

possible and how this can be achieved. By being active in the network, many organisations know this and know how to find him.

2. How was the process and who was involved – from idea to market launch? Could you describe the process from the idea to the market launch?

The whole development process took a few months. The advantage was that DPR already had shredded recycled material available, and also segmented in colors. Main streams were red and yellow and due to his product development, the sorting grade became even better.
The color of the final product played an important role for the client; important for attractivity of the product. The client even collected feedback from the market. Currently there are 2 different types: red-yellow (75% of the sales) and confetti (25%).
The rough mixed color appearance in the product already provides a client/consumer expectation meeting up with 'recycled', and thus does not require any difficult explanations in the 'selling story'.

3. Do you consider this product as a success? Why (not)?

Yes, as it has a good production rate. We are now making them for 3-4 years, and each year we receive multiple orders of 70 products per batch.

4. What was the most important element of success in your opinion?

Our clients have a good way of selling and already a good product range where this product could be added.
During the development process, we both had the right expectations of the quality characteristics of the product.

5. What was the biggest risk that could affect the success?

Using recycled material leads to: more leakages of water/fluids, and the usage of more material. Currently the recycled content is just under 50%, and the rest is filled up with virgin product. It is 100% PE (single) material.

Normally a product is produced by rotomoulding by plastic fine powder (500micron), leading to absolutely closed surfaces. The plastic waste is shredded into pieces (4-5mm), it is possible to further powder this, but is remains a different type of powdered product than virgin. The rotomoulding this into a shape, it leads to small holes in the plastic, thus it is not

completely leakage free. When it does not need to be leakage free, a higher content of recycled material with higher particle sizes could be achieved.

When using recycled material, more plastic material is needed to have a strong wall of the product. Just about 20% more. Note, that the virgin material is needed to bind the recycled components.

6. How did you mitigate this risk?

We are very clear, upfront, on the possibilities of using recycled material, and the impact on the quality (which is according to Rick; lower than with virgin material). Our (potential) client needs to lower their expectations on this level, we discuss at the start of the project their ambitions in relation to product characteristics. This risk is being mitigated because of the use of recycled content. For a barrier this has grown to become a driver.

7. What is the Unique Selling Point (USP) of this product in the market with respect to the competition?

About the alfa seats, I am not quite certain – focus colours and recycled content.
But about our business I can say that: by using a rotomoulding technique, it allows small batches. That is very different from other techniques. The matrices are relatively cheap, free in form and are especially interesting for low volumes. Together with a specific market we are able to make good prices.

8. Did you or your company have a history in this kind of product development?

About the alfa seats, I am not quite certain.
But about our business I can say that: by using a rotomoulding technique, it allows small batches. That is quite unique compared to other techniques.

9. If you could develop or launch the product again, what would you do differently?

See answer on question 1

10. What do you recommend to other companies when they want to develop a product with a high recycled plastic content? Could you name top 3 do's and don'ts?

- Just try and be eager to test and experiment.

- Very important to manage the expectations of your client, do not overpromise.
- This includes direct to customers. We have developed a lamp from recycled content and we sell them by saying 'congratulations, you have a very unique lamp.' Avoiding that customers see spots and think that the product is not good or low quality… but this is unique, one of a kind..

OTHER NOTES

- Economical restraints: they are not relevant to us. If clients ask, we immediately tell them it is not 'cheaper' to re-use plastics. But we have to put this in a perspective: recycled plastics might be cheaper to buy, but more handling costs come with it (transport, labour) compared to virgin. In addition, rotation moulding is a low volume business. So I use for instance 1 big bag of material for 6 months. For a supplier not highly interesting money wise, but they all will make it happen as they consider it important to re-use it.
- In the past years we see an increase in using recycling content in client request. This is mainly coming from 'designers', and less from 'engineers in the industry' or from 'government' purchasing departments.
- When purchasing plastic waste – the monostreams coming from producers are better to process. However, in our vision, these are streams that the producer must bring back in his own process. Understandable that for the food industry this is a challenge, but for other industries this should not be the case. DRP preferes to integrate consumer waste (on top of his own waste).
- Successtory Eromes Marco with the product Wiebelt. DRP developed this product. Wiebelt is 4kg, non-leakage free, 100% recycled material, of which 50% consumer waste, the rest is PIR waste of DRP. Mix of PE/PP. Sales is approx 1000 pieces/yr.
- DRP is involved in another Interreg project called 'Crossroads' to create a trailer for a bike for for instance food deliveries.

Product information

General information		
Product name	Alfa Seats (Donut)	
Product category	Outdoor Furniture	
Product sector	Gardening, Outdoors, Public Space, Landscaping	
Brand	Alfa Seats	
Since year	2017	
Trading company	Dragon Plastics Rotomoulding B.V.	

Location trading company	Sint Maartensdijk, NL
Manufacturing company	Dragon Plastics Rotomoulding B.V.
Location manufacturing company	Sint Maartensdijk, NL
Product specifics	
Since when product launched	2017
Price of product (EUR)	Not specified
Sales channel	Speelplaatsmeubel.be
Country of sales	EU
Sales volume	Unclear
Sales impact	Unclear
Awards	
Plastic type used	PE
PIR/ PCR / used	Used (PIR + PCR)
Plastic source	Production waste and Fishing Nets
Assembled product (Yes/No)	No
% of recycled content (overall)	Just under 50%
% of recycled content (plastic part)	Just under 50%
Afterlife of the product	Recyclable
Mechanical process (Yes/No)	Yes
Sustainability impact	Not mentioned
Other remarks	
Sources	https://dragonplastics.nl/en/nieuws/recycling-with-rotational-moulding