

Southend PlastiCity Design Workshop: Part 1

Wednesday 16th February



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1. Intro to PlastiCity

Claire Williamson & Alicja Niedzwiedziuk

The PlastiCity Project

Resourcing plastics from our city



1.1 Introduction

The PlastiCity project aims to develop **strategies and solutions to increase plastic recycling rates** in urban environments by unlocking the use of **'lost plastics'** as secondary resources.

Four case study areas



Interreg 2 seas covers the coastal regions along the Southern North Sea and the Channel area and includes:

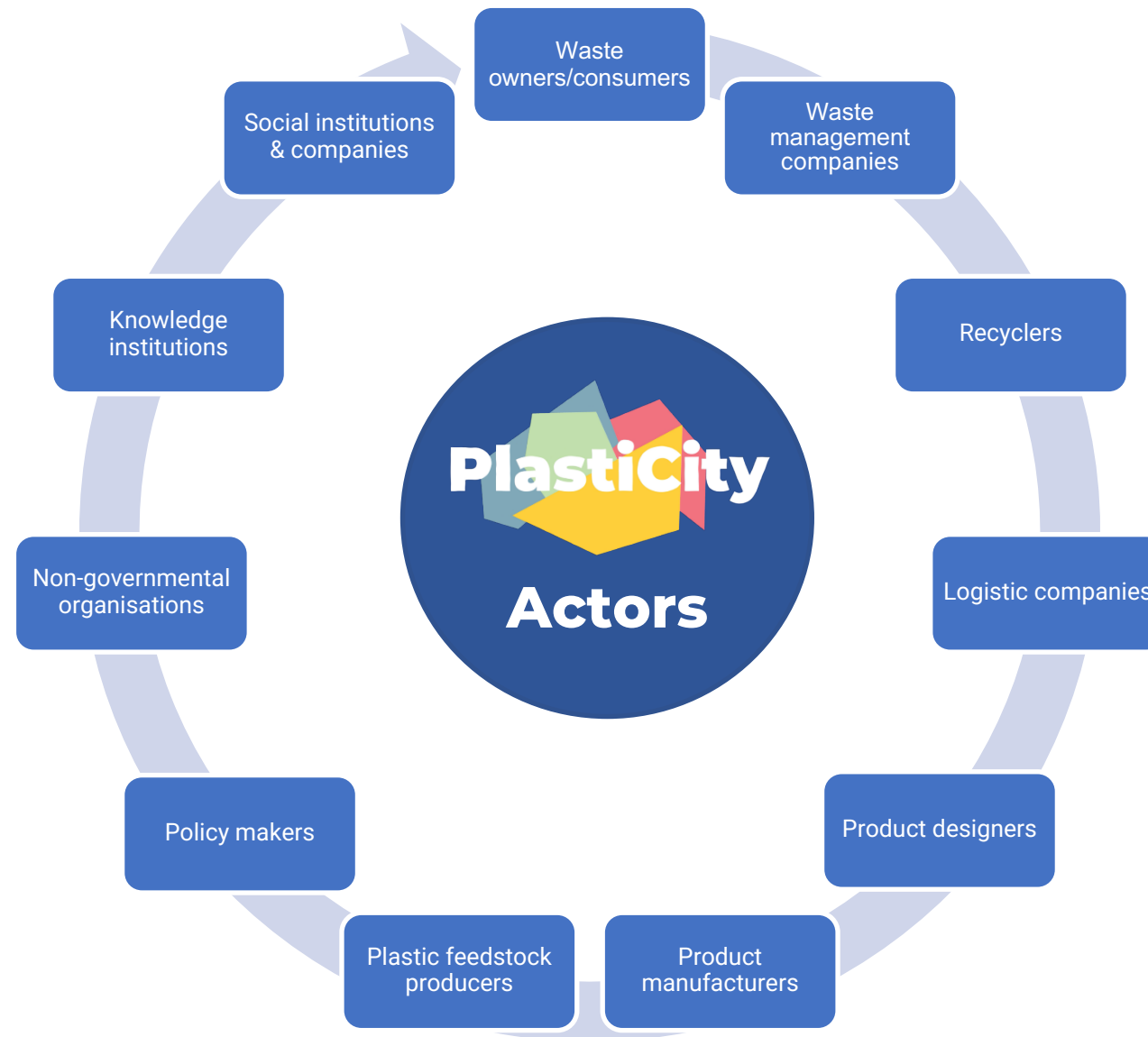
- Southend-on-Sea (UK)
- Ghent (BE)
- The Hague (NL)
- Douai region (FR)

PlastiCity project overview

PLASTICITY
GIVING LOST
PLASTICS A
DESTINATION



Actors in the plastic value chain



Resourcing plastics from the city



Southend PlastiCity timeline

Development of a methodology/tested strategy



Developing relationships in the value chain



Business waste audits



Identified lost plastics



Develop a business case



End of project roadshow



2019

2023



Mapping actors and assessing the landscape



Assessing recycling behaviour



Testing and identifying plastic samples



Launching lost plastic recycling hubs



New products from recycled plastics



1.2 Southend plastic landscape

PlastiCity aims to create a baseline of current waste management practices and waste flows across businesses in Southend-on-Sea with a focus on plastic waste.

Plastic survey of businesses



●	Retail trade, except of motor ...	(95)
●	Food and beverage service a...	(52)
●	CONSTRUCTION	(42)
●	PROFESSIONAL, SCIENTIFIC...	(39)
●	EDUCATION	(31)
●	HUMAN HEALTH AND SOCIA...	(29)
●	OTHER SERVICE ACTIVITIES	(29)
●	REAL ESTATE ACTIVITIES	(29)
●	ADMINISTRATIVE AND SUP...	(24)
●	ARTS, ENTERTAINMENT AN...	(23)
●	FINANCIAL AND INSURANC...	(23)
●	Wholesale and retail trade a...	(21)
●	Wholesale trade, except of m...	(18)
●	INFORMATION AND COMMU...	(15)
●	#N/A	(9)
●	MANUFACTURING	(9)
●	Accommodation	(8)
●	TRANSPORTATION AND STO...	(8)
●	PUBLIC ADMINISTRATION A...	(1)
●	WATER SUPPLY; SEWERAGE...	(1)

Business survey results



- **52% businesses had mixed recycling collection in place (48% don't!)**
- **Only 12% had separate plastic recycling collections**
- **16% did not have any waste collections set up**

	Residual waste collection	Mixed recycling collection	Separate plastic recycling collection
Yes	84%	52%	12%
No	16%	48%	88%
Total	100%	100%	100%

* 212 businesses were surveyed in Southend in 2020

Plastic audit

- Analysis of the residual and recycling waste stream capacity
- Identification of common types of plastic waste
- Samples of the plastics being sent to our laboratory in Ghent, for testing



Plastics identified



Audit results

Southend businesses produce 4,500 tonnes of plastic each year. Of this, 28% is widely recyclable in a typical recycling service (approx. 1,200 tonnes per year)



Plastic breakdown

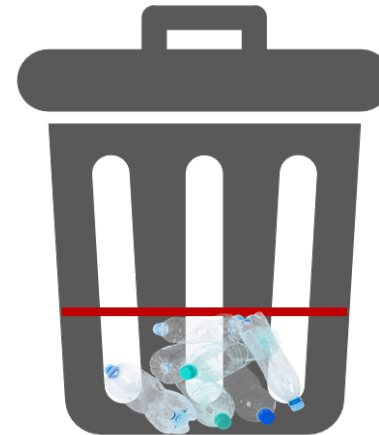
- Plastic bottles – 15% (collected in the standard collection)
- Plastic pots, tubs and trays – 17% (collected in the standard collection)
- Plastic mono films - 30% (not widely accepted)
- Rigid and flexible non-packaging items (Toys, games, storage containers, pipes, plastic furniture, other products) – 15% (not widely accepted)

Southend summary

Only **17%** (218 tonnes) of all bottles and pots, tubs and trays were correctly disposed of within the mixed recycling stream



1,050 tonnes per year of widely recyclable plastics are disposed of in the residual stream



This 'lost recycling' makes up **31.5%** of the composition of plastic waste in the residual waste stream.

1.3 Engagement

To bring about real change in the plastic landscape, the actors involved need to become engaged in the circular economy and develop processes that will harness the value of plastic waste as a resource

Communication and engagement



Circular economy workshops and training resources



Educational support and resources



Web platform for knowledge sharing and collaboration



Pledge to reuse, reduce and recycle more plastic waste



2. Draw the Present

Activity

10 mins + 5 mins feedback

Draw the Present

Explore the relationship your business/a chosen business has with plastic 'waste'.

For example...

- What plastic waste do you produce? What sort of quantities?
- How is plastic waste disposed of?
- Do you have a recycling collection? Mixed or separated?
- Do you **use** plastic waste in your business operations?
- What are the priorities for your business?

Draw the Present

Example - Commercial Kitchen

- Fresh food delivery trays
- Frozen food polystyrene cool-boxes
- Condiment bottles/tubs
- Plastic film/wrapping
- Food prep gloves
- Cleaning chemical bottles

Recycled? General Waste? Returned to distributor?

Reused for storing prepped food?

Priorities – keep food fresh/reduce waste, hygiene, quality of produce



Draw the Present - Feedback

Explore the relationship your business/a chosen business has with plastic 'waste'.

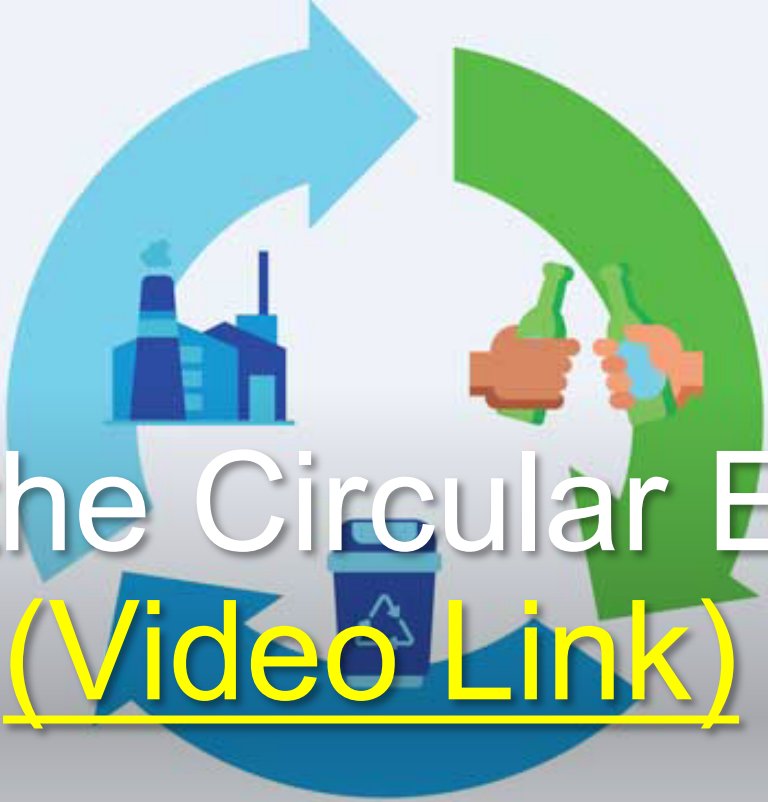
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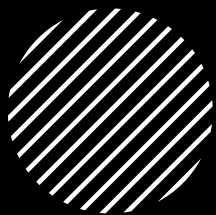


3. Linear vs Circular Economy for plastics

Dr David Greenfield

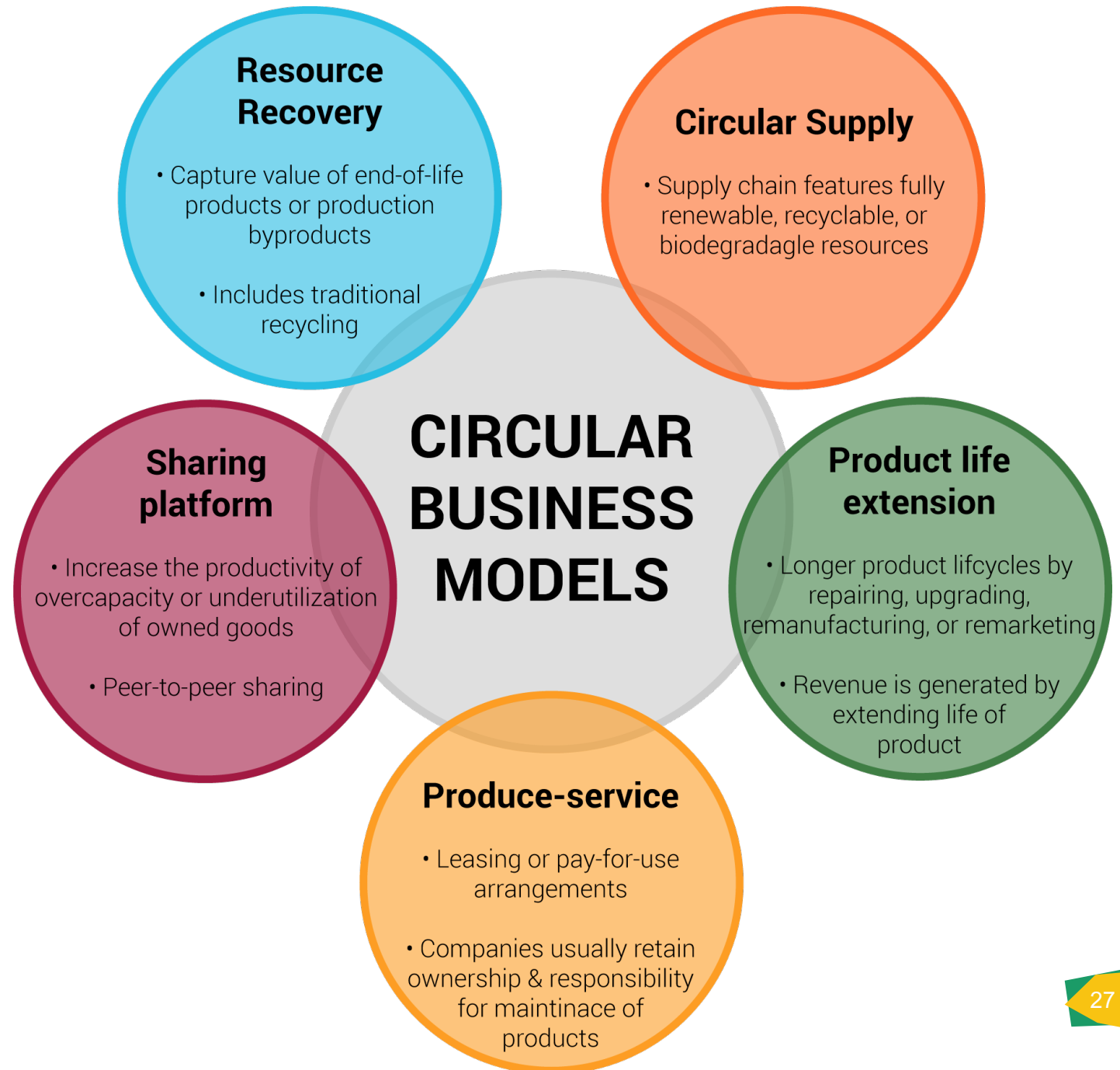
A circular diagram illustrating the circular economy. It features a blue arrow on the left pointing upwards and a green arrow on the right pointing downwards, forming a circle. Inside the circle, there is a blue factory icon at the top left, a blue recycling bin icon at the bottom, and two hands holding a green bottle and a blue bottle at the top right. The background is a light blue sky with two white clouds and a grey city skyline at the bottom.

What is the Circular Economy ([Video Link](#))



“A circular economy is one in which stuff is kept in use for as long as possible, delivering the highest value it can, for as long as it can. So rather than making, using and then throwing stuff away (a linear system), a circular economy means looking at each of those stages for new ways of cycling materials and value back into the system – using materials and products again and again, in many different forms.”

The five Circular Economy Business Models



4. PlastiCity Hubs

Natalie Ibbott

School mini recycling hubs trial

Four month trial starting in February 2022.

Six schools from across Southend.

Trial includes:

- Recycling collection
- Communications
- Education



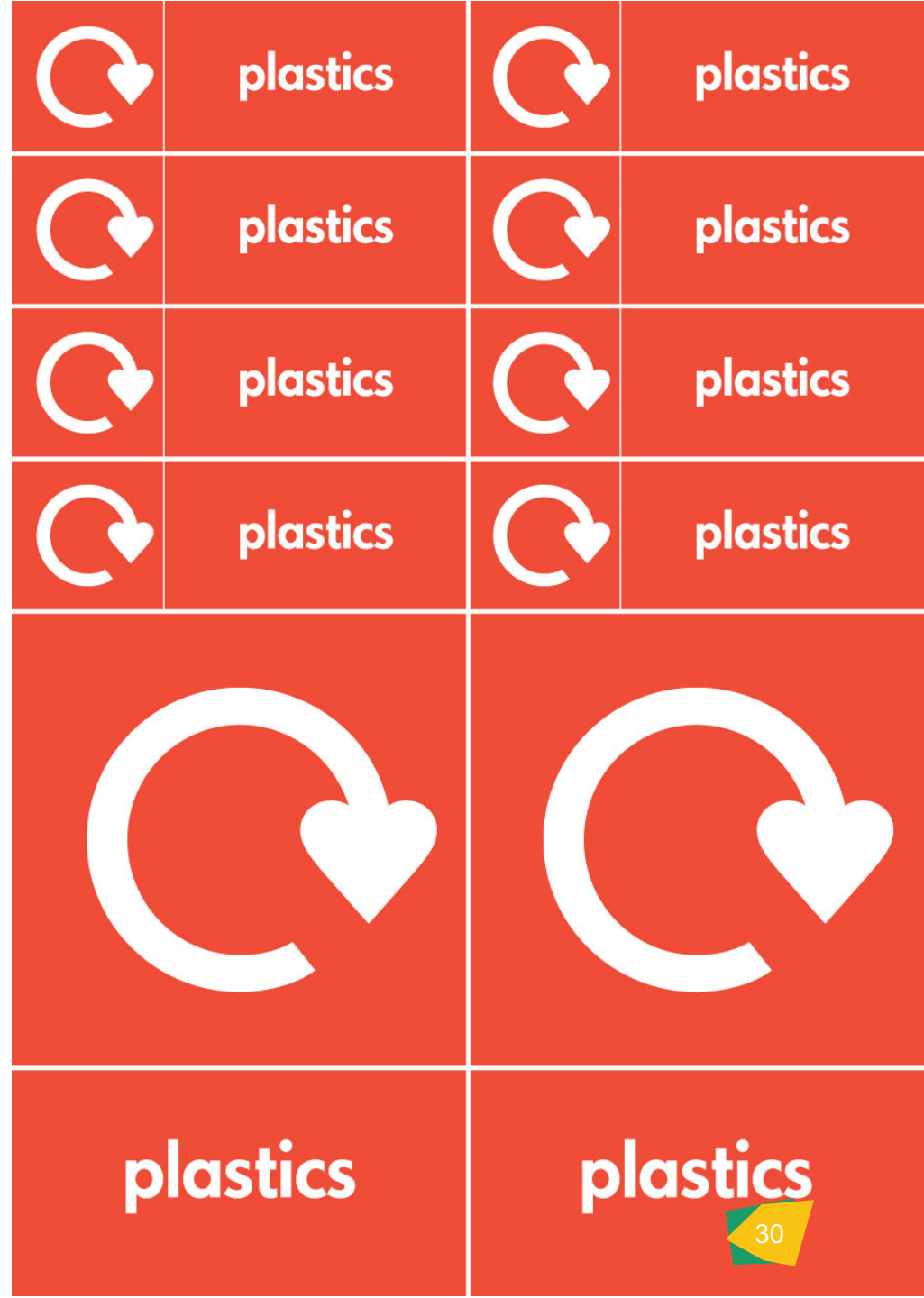
School mini recycling hubs trial

Hard to recycle and not currently collected plastics.

Most schools have an existing plastics recycling collection for:

- Plastic bottles
- Pots, tubs and trays
- Plastic bags
- Tetra Paks
- Some have films

Where they don't have plastics collected – encourage them to add to their current collection.



School mini recycling hubs trial

ProCycle collection





Sweet wrappers

- ✓ Plastic sweet and chocolate wrappers only.
- ✗ No wrappers with aluminium foil
- ✗ No crisp packets or any other types of packaging



Crisp packets

- ✓ Empty crisp packets only
- ✗ No sweet wrappers or other types of packaging

School mini recycling hubs trial

Rigid plastics collection – sent to Van Werven



School mini recycling hubs trial

Rigid plastics
accepted –
school specific





5. Draw the Future

Activity

10 mins + 5 mins feedback

Draw the Future

Explore how the hubs might change your business relationship with plastic waste

For example...

- Can you think of plastics within your operations that could be recycled through the hubs?
- Are these items you dispose of regularly or infrequently?
- Does participation/use of the hubs aid your business priorities?

Draw the Future

Example - Commercial Kitchen

- Delivery trays
- Condiment tubs
- Chopping boards
- Cleaning chemical bottles

High turnover of some items – others have longer usable life

Key operations remain the same but allow for reduced waste to landfill.

Indirectly supply plastic feedstock for local remanufacture.



Draw the Future - Feedback

Explore how the hubs might change your business relationship with plastic waste

For example...

- Can you think of plastics within your operations that could be recycled through the hubs?
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6. Plastic Feedstock

Working with Van Werven



(Video Link)

Plastic Feedstock



It's our mission
to close the loop
by **recycling**
plastics.eu

1. Polyethylene / Polypropylene regrind mix
2. Polyethylene regrind
3. Polypropylene regrind

Properties

- Strong
- Shatter-resistant
- High chemical resistance
- Electrical insulation



Plastic Feedstock

Considerations

Less 'refined' than plastic pellets

- Mixed grade
- Granule size less consistent

Mixed colours

- Opaque
- Black/Brown

May require a percentage of virgin material to reach desired properties



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plastics.eu



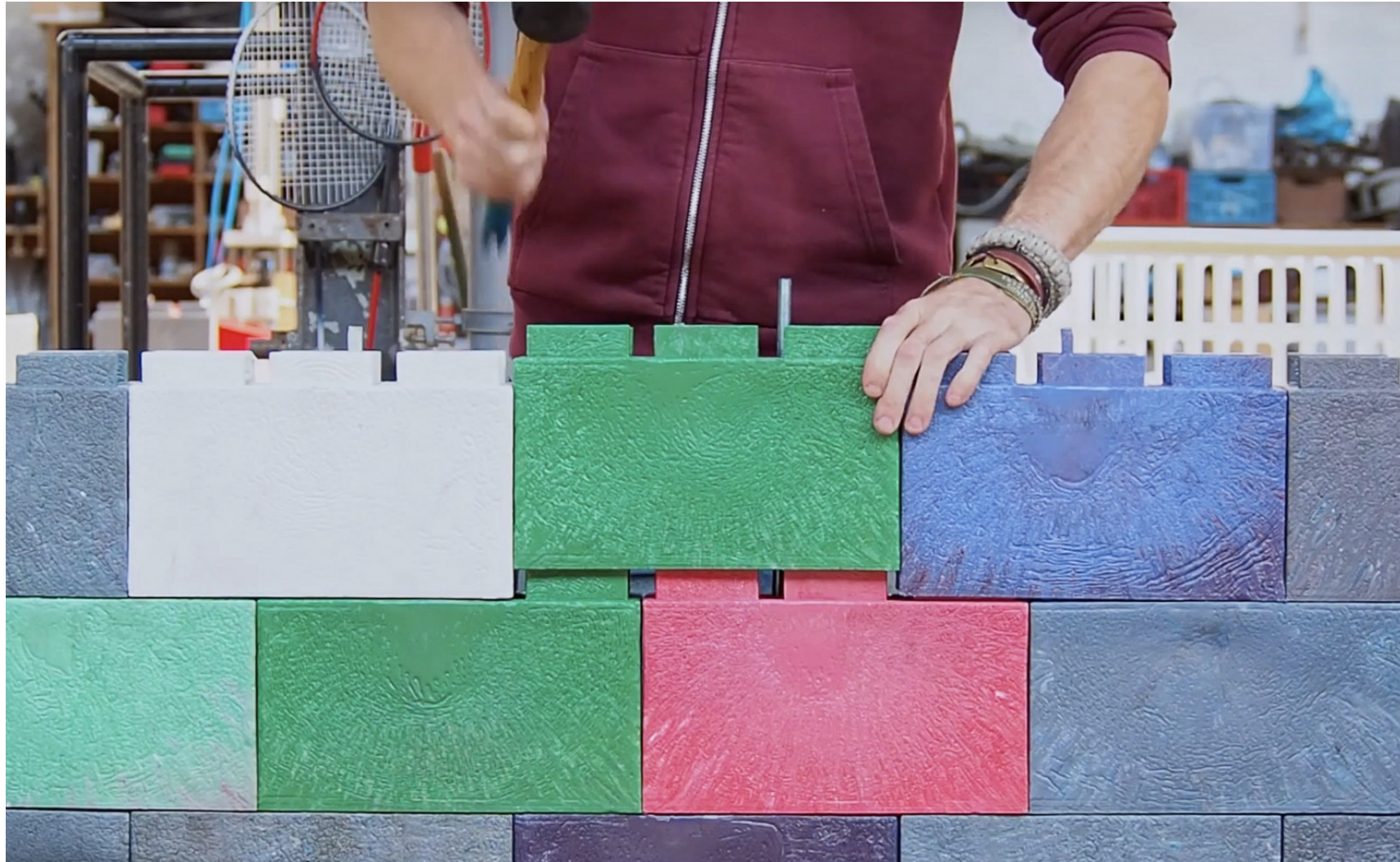


7. Example Products

Products on the market, made from recycled plastics









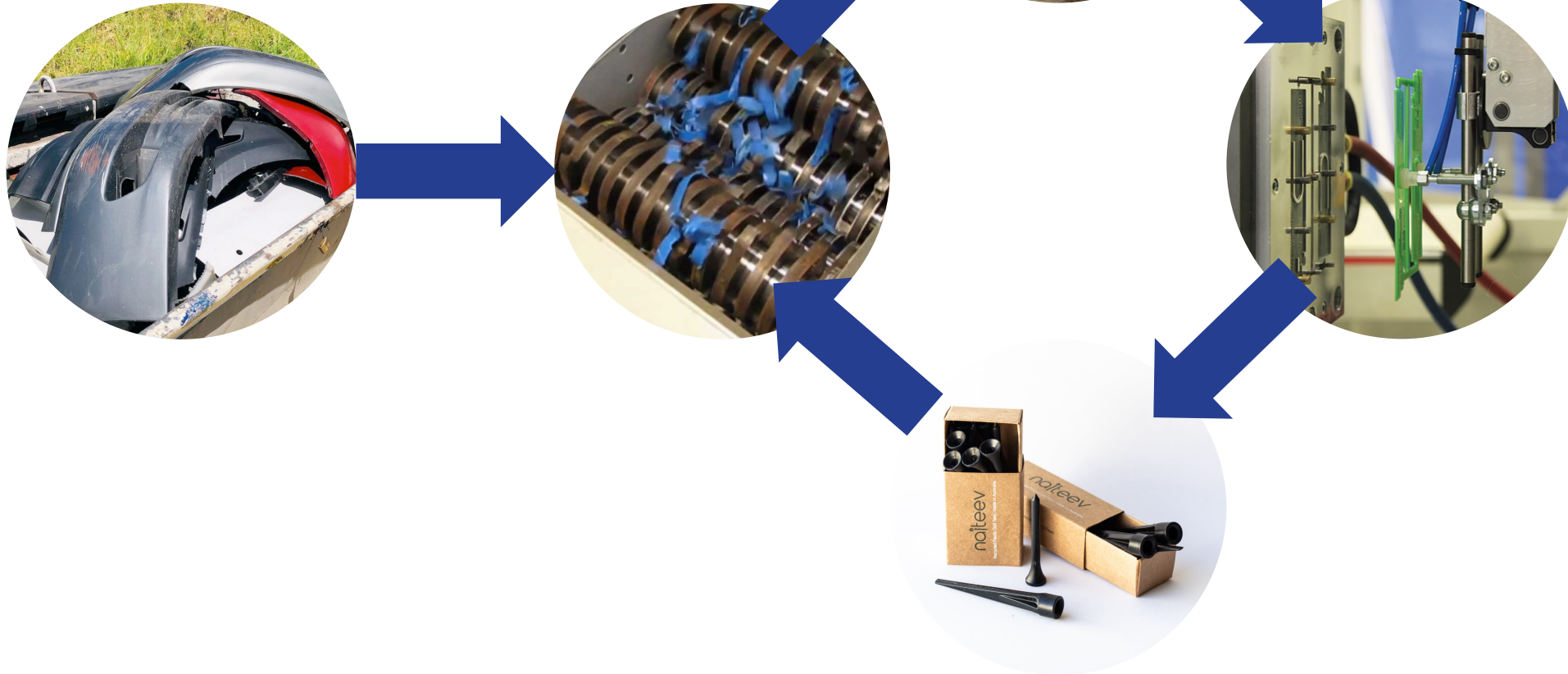












8. Design Briefs

Themes, design drivers and guidance

Design Briefs

DESIGN BRIEF 1:

Products from PE/PP regrind (forming)

Considering different manufacturing processes, design and develop a product that could be manufactured from PE/PP regrind (mix or separated).

- Extrusion
- Injection moulding
- Compression moulding
- ...

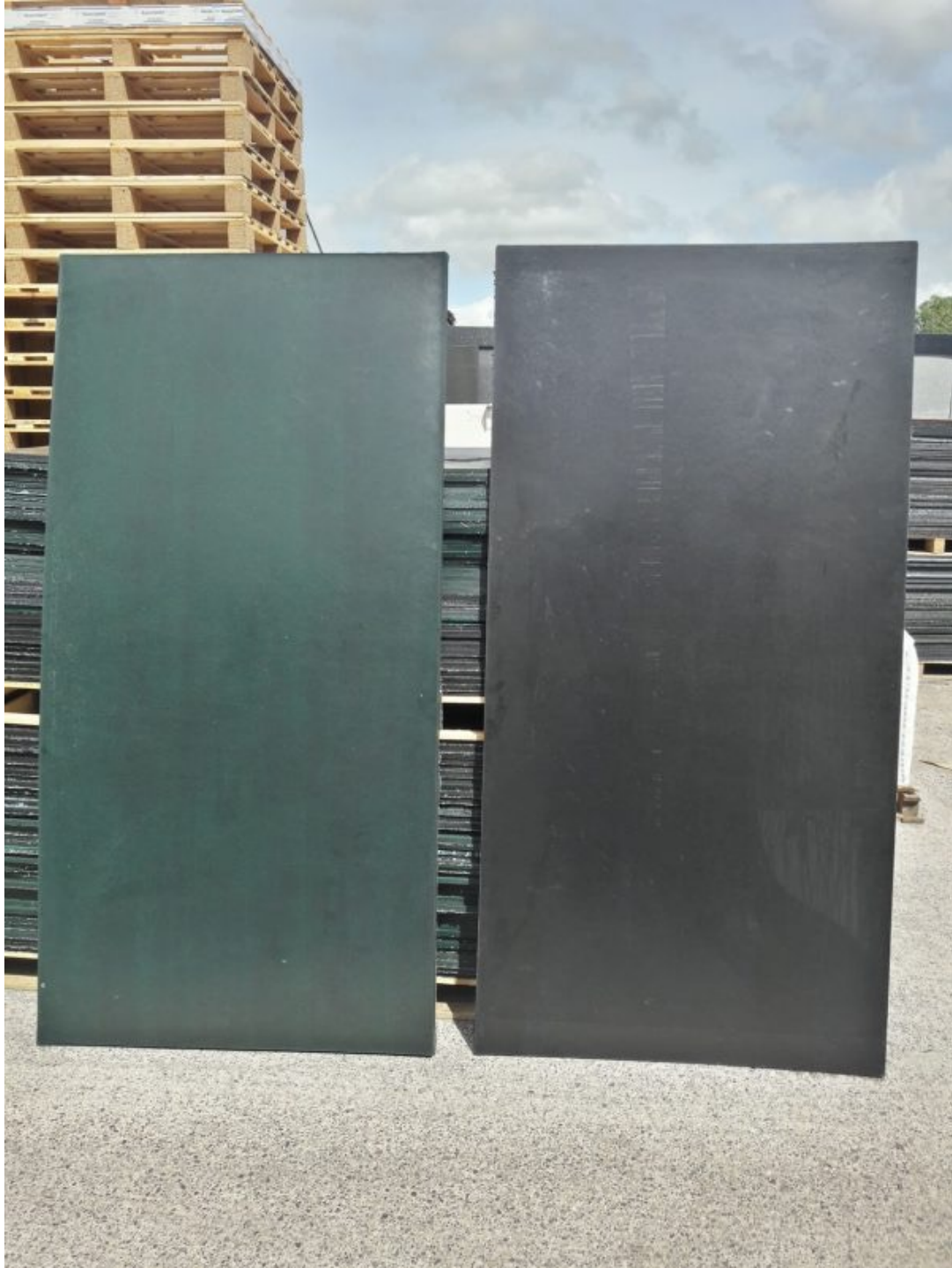
Design Briefs

DESIGN BRIEF 2:

Products from PE/PP boards (subtractive)

Design and develop a product/range of products that can be locally produced and assembled from PE/PP boards using subtractive manufacturing methods

- CNC machining
- Hand/Manual working



DESIGN BRIEF 1:



DESIGN BRIEF 2:



Design Themes

Concepts should link to one or more of these themes:

- Specific/Unique to Southend
- Public installations/street furniture
- Educational
- Long usable life
- Supporting environmentally conscious activities
- Waste/litter
- Nature/urban greening
- Circular economy

Concept products should not be single-use or disposable

Design Drivers

- Sustainability
- Circular value chains
- Added social value
- Added economic value (locally)

Bonus - consider the end-of-life processes for the product...

- Can they be collected, disassembled and recycled at their end-of-life

Design Briefs - discussion

DESIGN BRIEF 1:

Products from PE/PP regrind (forming)

Considering different manufacturing processes, design and develop a product that could be manufactured from PE/PP regrind (mix or separated).

DESIGN BRIEF 2:

Products from PE/PP boards (subtractive)

Design and develop a product/range of products that can be locally produced and assembled from PE/PP boards using subtractive manufacturing methods

9. 3D FilaPrint

Ben Anderson, Product Consultant

Who we are!

- With over 8 years experience in the 3D printing industry we can work with a wide array of materials and machines.
- We are the largest UK supplier of 3D Printing supplies and accessories in the UK
- We supply Education from primary to universities. Medical, from nursing homes to hospitals, Business from one person operations all the way up to large multi national corporations.
- Based in Southend-On-Sea

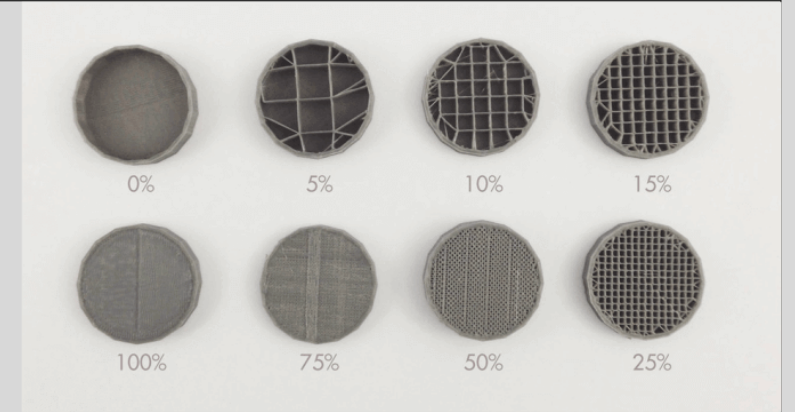
What can we do?

- Create low volume parts production reducing waste. For maintaining and replacing parts that increases the life span of machinery.
- We provide a cost effective Design and Print service. Whereby we can design 3D models and print them based on anything from detail sketches to loose description depending on the item.
- We can supply you with a 3D printer as well as replacement parts and upgrades for your needs.
- We can print your models and deliver them to you in a wide array of materials and printing technologies.

What recycled materials do we offer

- PLA – Biodegradable - 8 Different recycled types and over 17 different colours from various manufacturers
- PETG – Higher Strength - 2 Different recycled types and over 19 different colours from several different brands.
with us being able to offer post industrial and regular recycled variants

How 3D Printing can reduce waste



- By creating replacement parts for equipment that would otherwise be thrown away.
- Using techniques made available by 3D Printing such as lowering infills to reduce amount of materials used.
- Recycling failed, old, and support materials back into 3D printing material in a circular economy

What will we be doing at Plasticity Design Workshop Part 2

- Showing 3D printers in action!
- Creating 3D printing material from waste plastic using 3Devo.
- Doing a presentation about 3D printing with recycled, recyclable and Biodegradable materials.
- Bringing along practical demos to show quality and strength.



Thank you!



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PlastiCity Project

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