



Packaging Waste – reforming UK policy, new skills & sustainable resource management opportunities

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I.M3 Institute of Materials, Minerals & Mining

Coventry & Warwickshire Materials Society (CWMS) | | 23rd May 2023



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Waste doesn't exist in nature



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A personal welcome

- External Affairs Director & Director of Sustainability @ SUEZ (6 years & counting!)
- 25+ years of sector experience
- Former Local Authority Officer, Academic, & Consultant (always evolving)
- Used to support local authorities with waste management strategies, community engagement, recycling service design, contamination campaigning and service & infrastructure procurement
- Have been supporting DEFRA & BEIS as they think longer term about the Resource & Waste landscape and their policy reforms....
- Spend a lot of time working with big brands on their longer term thinking (reacting to policy landscape) about materials & packaging design etc.
- The day job is lobbying / nudging government around policy reform, and working on cross sector working groups on sector best practice & delivery
- CIWM Member since '96 (various volunteer roles leading to Trustee & President)
- Author, Blogger, Tweeter & Social Media enthusiast..... #wearelive



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My career on 1 slide a tough ask!

- Sentenced to litter duty for bad behaviour in 1980s @school (got to start somewhere)
- Inherited a taste for waste - Mr Read Senior (Head of Waste @ RBKC)
- GCSEs were all the sciences, plus Geography, Languages and English
- A levels were Geography, Physics and Biology
- Graduated in Geography from Exeter University in 1995 (BA Hons)
- Appointed as Kensington's Recycling Officer in June 1995 (for 18 months) – my apprenticeship
- Awarded a 3 year PhD Scholarship @ Kingston University in Oct'96 (UK waste policy failure)
- Recruited as Research Fellow (@KU) in October 1999
- Successfully defended my PhD 'thesis' in October 2001
- Headhunted by ERM's International Consultancy Team in February 2002
- Honoured as Visiting Professor @ UCN in Dec'02
- Headhunted by Hyder (Arcadis) in Dec'04 as Head of Waste Management (built a team of 20)
- Headhunted to join AEA (Ricardo) in October 2008 (Director of Waste & Resources - team of 50)
- Headhunted to become SUEZ External Affairs Director in September 2017 (what next?)
- Elected to the CIWM Presidential Team (April 2018) & took on the 'presidency' in June 2021



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A great company to work for

THE SUNDAY TIMES

The Sunday Times 25 Best Big Companies to Work For

Research conducted by **best companies**



22 SUEZ RECYCLING AND RECOVERY
Recycling and waste management

Residents recycle their waste. Almost half of the 4,848-strong workforce have been here for more than five years. Staff agree that the company genuinely cares about the environment (78% positive, in fifth place on our list).



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SUEZ Recycling and Recovery UK | in numbers

OUR FACILITIES

- | | | |
|---|---|--|
| 9 operating landfill sites | 106 household waste recycling centres | 3 solid recovered fuel facilities |
| 66 transfer stations | 7 energy-from-waste facilities | 6 wood processing facilities |
| 6 composting sites | 1 mechanical biological treatment facilities | 2 street sweepings recycling facilities |
| 9 materials recycling facilities | 3 refuse derived fuel facilities | 1 end-of-life plastics to fuel facilities |

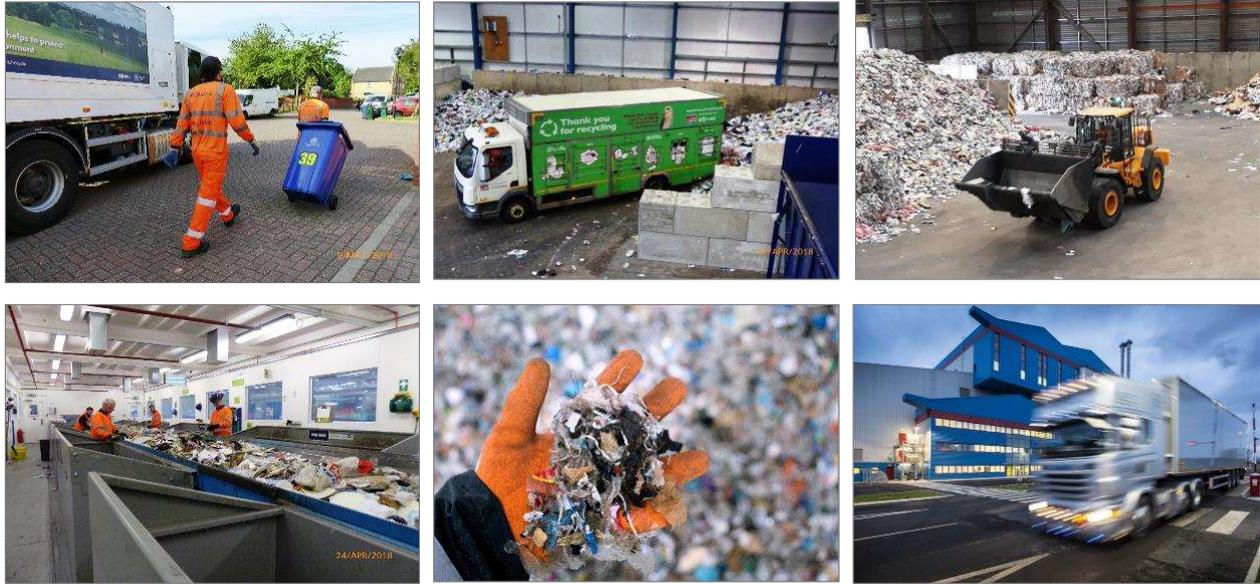


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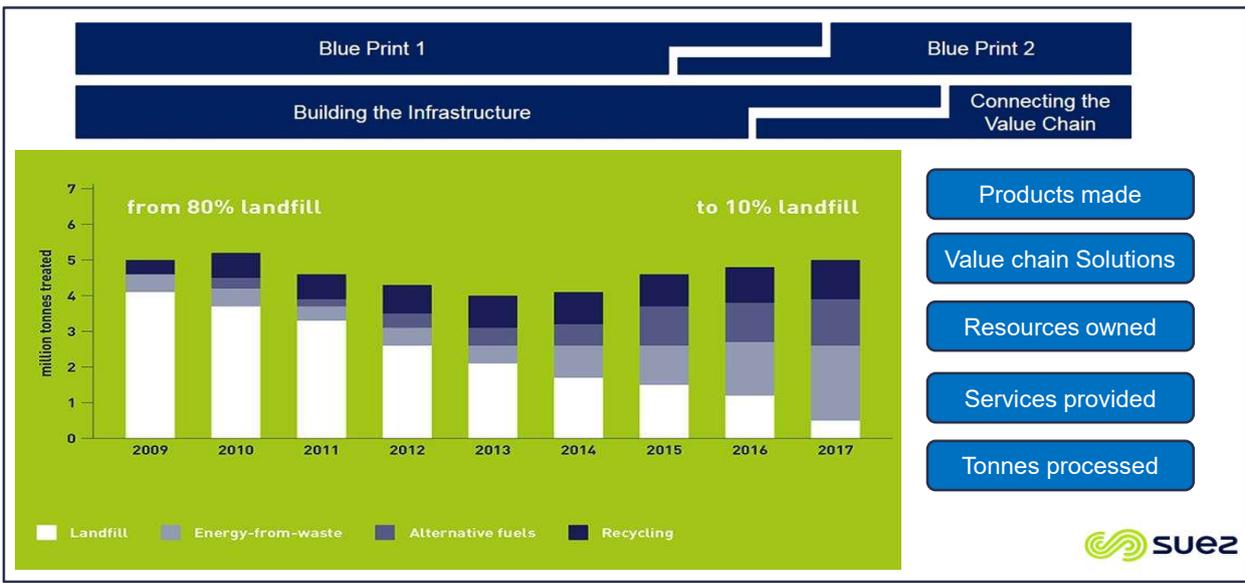
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what we do in 2023 | manage 'post consumer resources' ...



9

Our £Billion transition.... in under 10 years ...



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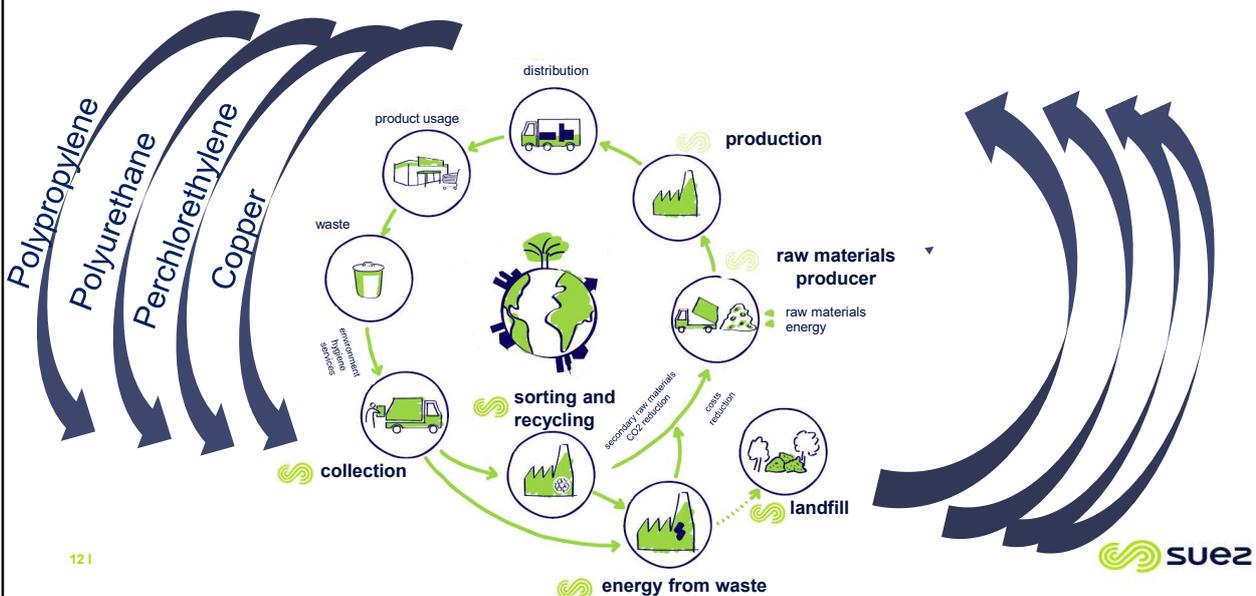
for the last decade we have been widening our role in the circular economy | it's all about materials and market demand



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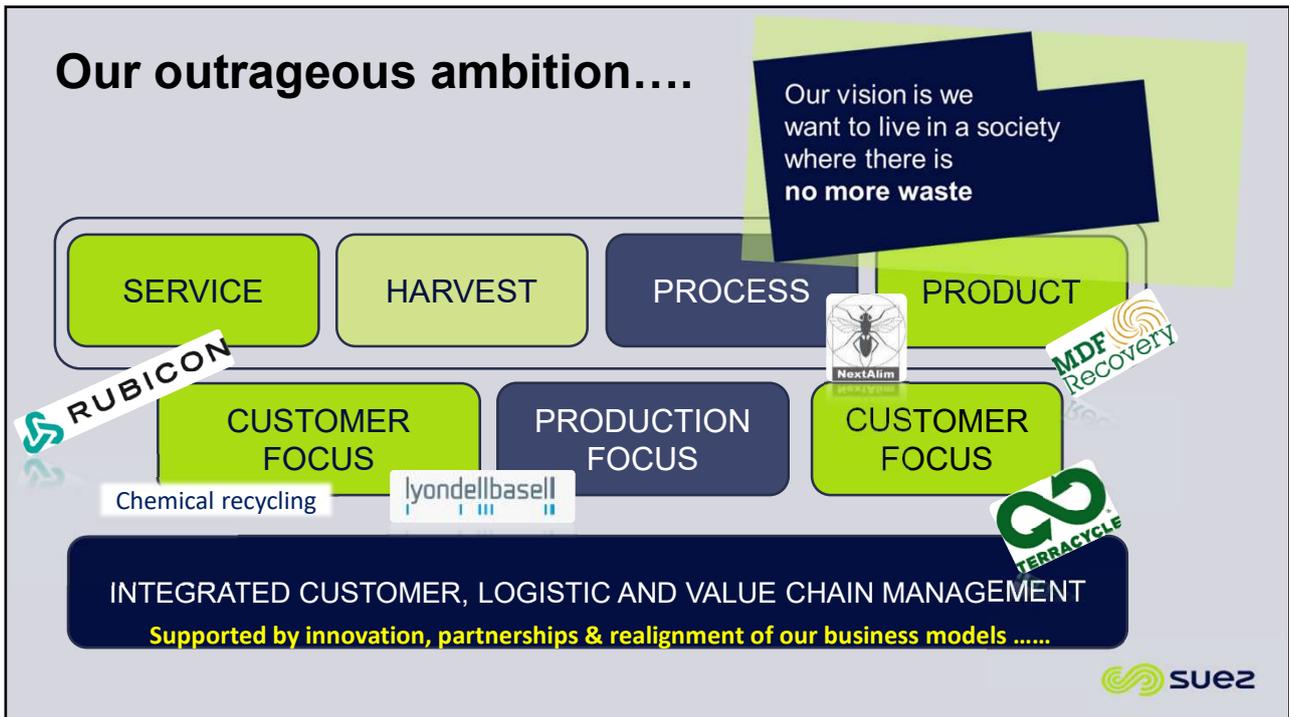
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multiple circular systems | working together to 'close loops'

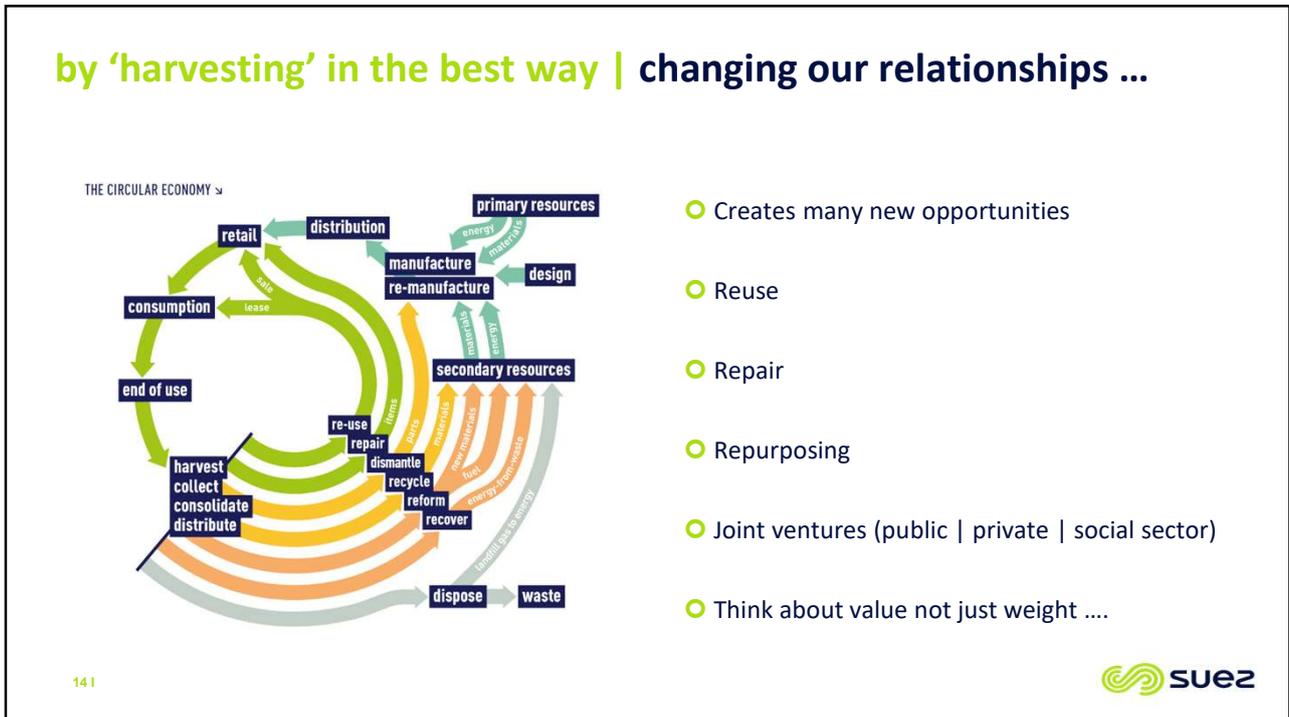


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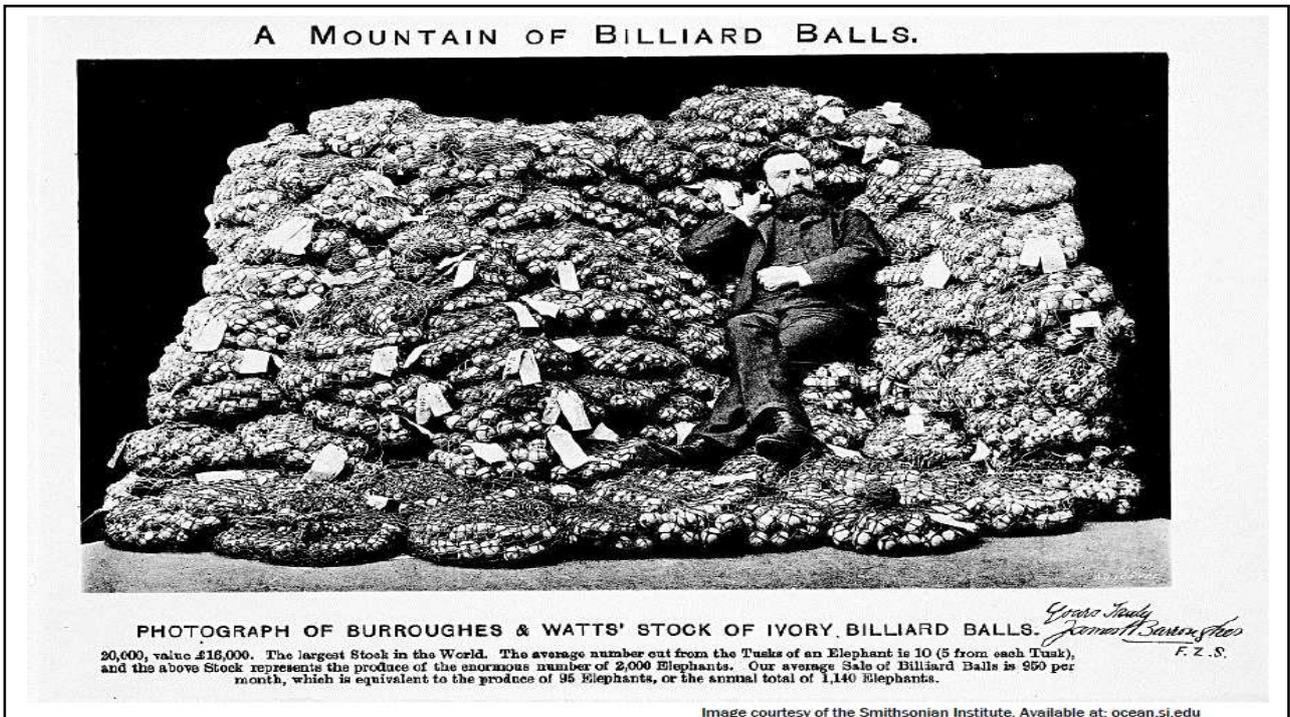
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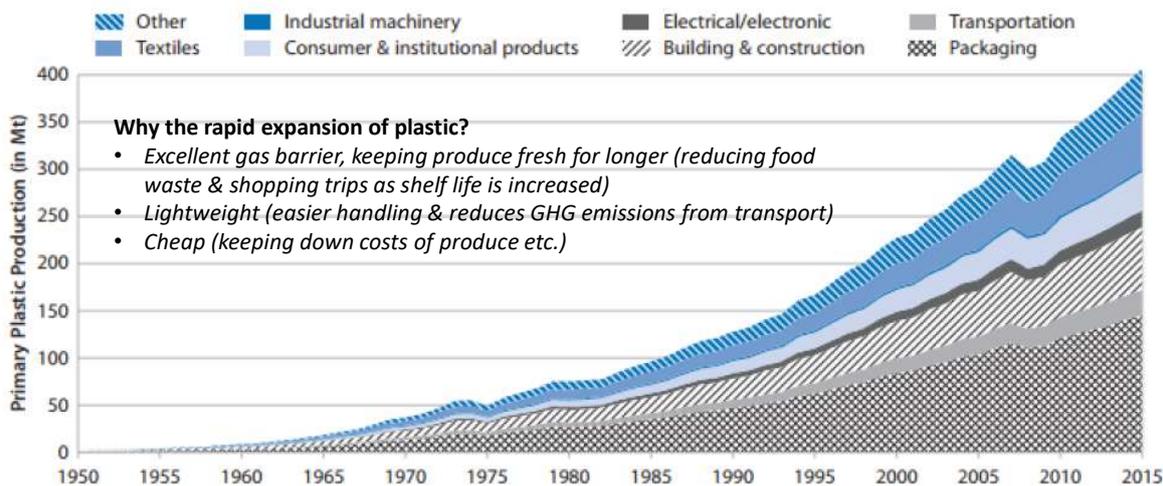


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Plastic Production since the 1950 spirals!



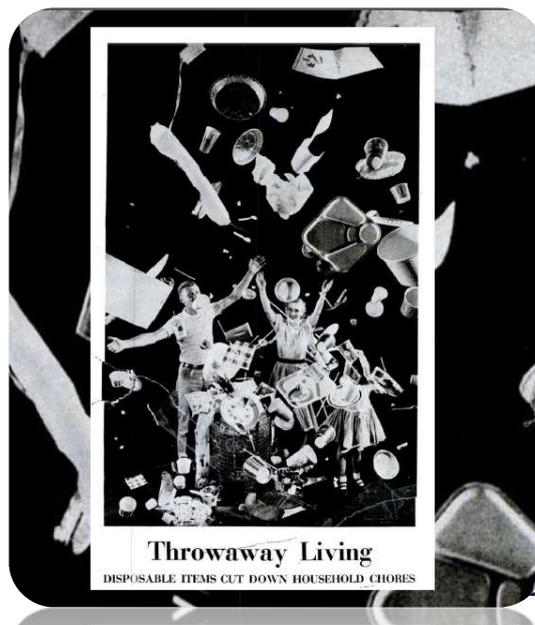
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The advent of the consumer society

- Post WWII
- To grow the economy in the USA
- New materials developed from war-time R&D
- Built in obsolescence to drive consumption
- Plastics popularised by media influence
 - *Time Magazine et al*
- No more washing, no wasted time!
- Plastic is fantastic!



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A truckload of plastic is dumped into our oceans every minute

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Scale of the issue | the UK

- There are 2.26 million tonnes of plastics packaging placed on the UK market each year
- 1,119,000 tonnes of rigid plastics packaging consumed by households
 - 594,000 tonnes of plastic bottles and 525,000 tonnes of plastic pots, tubs and trays
- 527,010 tonnes collected for recycling - an overall 2.8% increase on 2016
 - 351,907 tonnes of plastic bottles



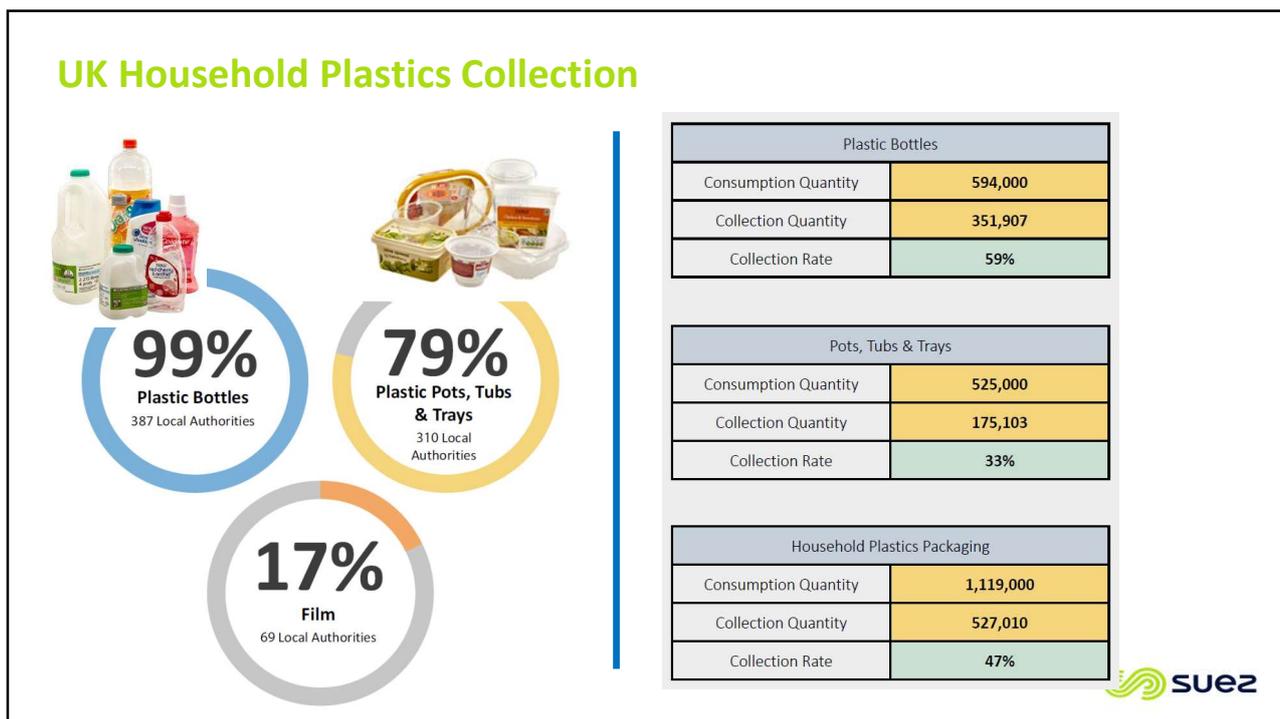
Plastic bottles are **highly recyclable** and common materials - yet around **40%** of them aren't reaching recycling centres

UK recycling tonnages



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Carbon benefits | must not be under-estimated!

- Recycling 1 tonne of plastic bottles saves $\frac{3}{4}$ of a tonne of Carbon
 - *the equivalent of travelling nearly 2,500 miles in car/taxi/motorcycle*
- 351,907 tonnes of plastic bottles collected for recycling in 2017
 - *equivalent of travelling around the world over 40,000 times*
- **Need to remember what is most important**





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Collections & Harvesting ...



- Plastics are light, voluminous, and mixed
- Not a priority material for many Local Authorities

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Source segregation or commingled?

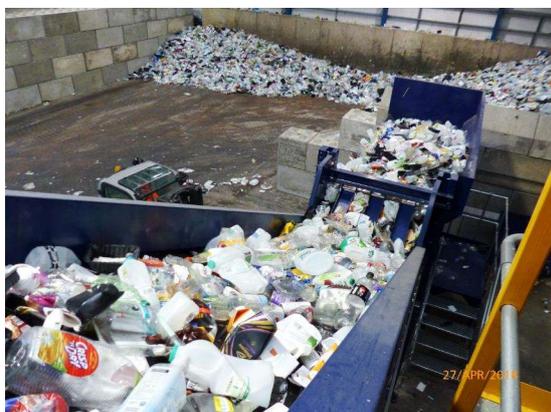


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MRFs can work miracles (almost!)

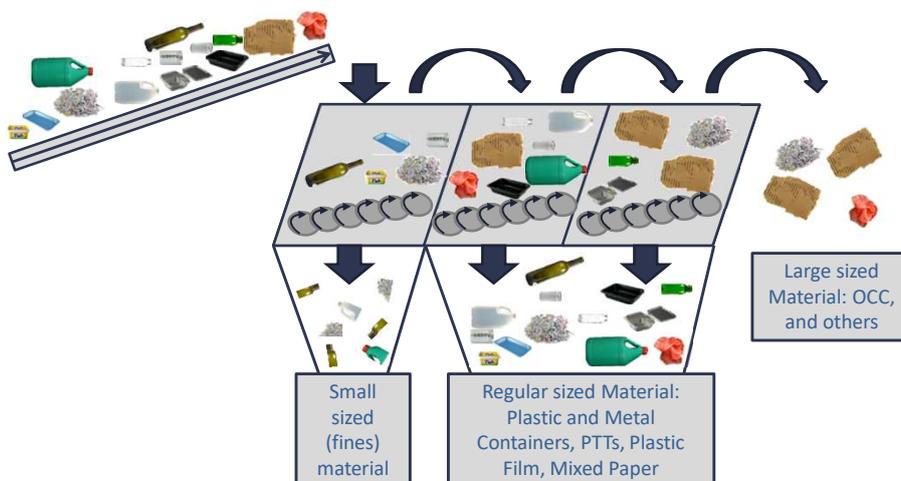


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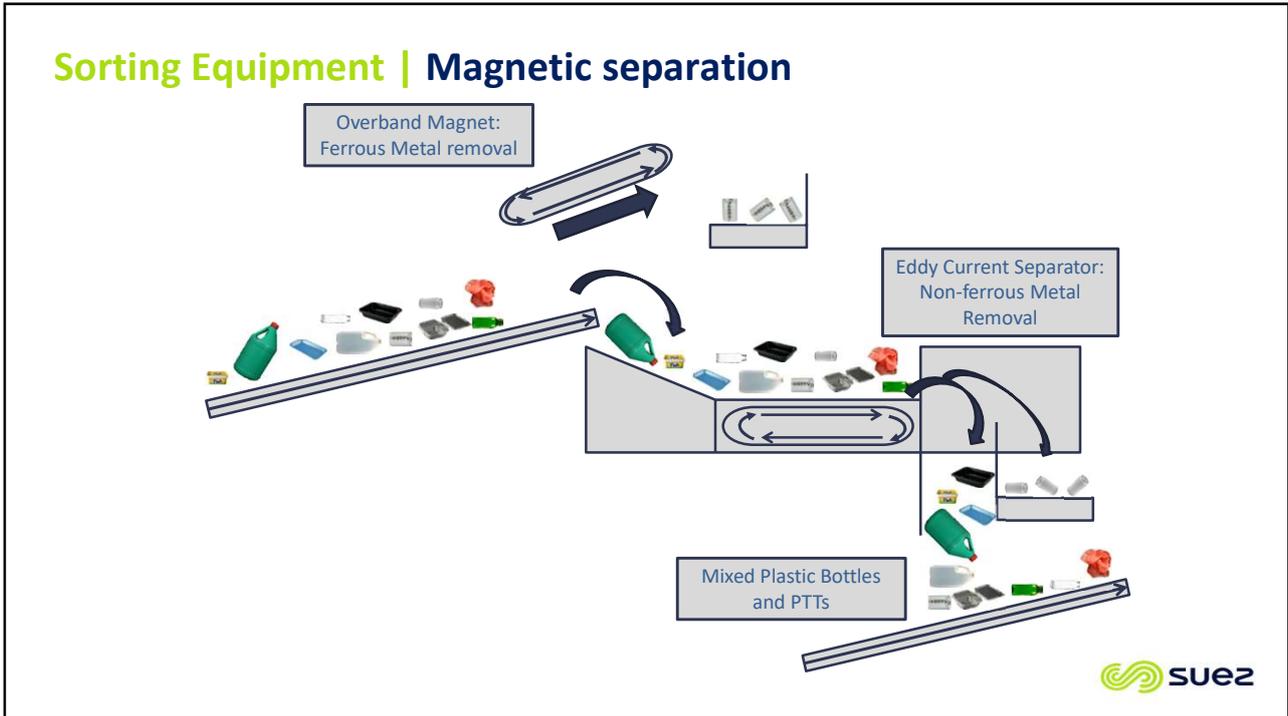
Sorting Equipment | OCC screens



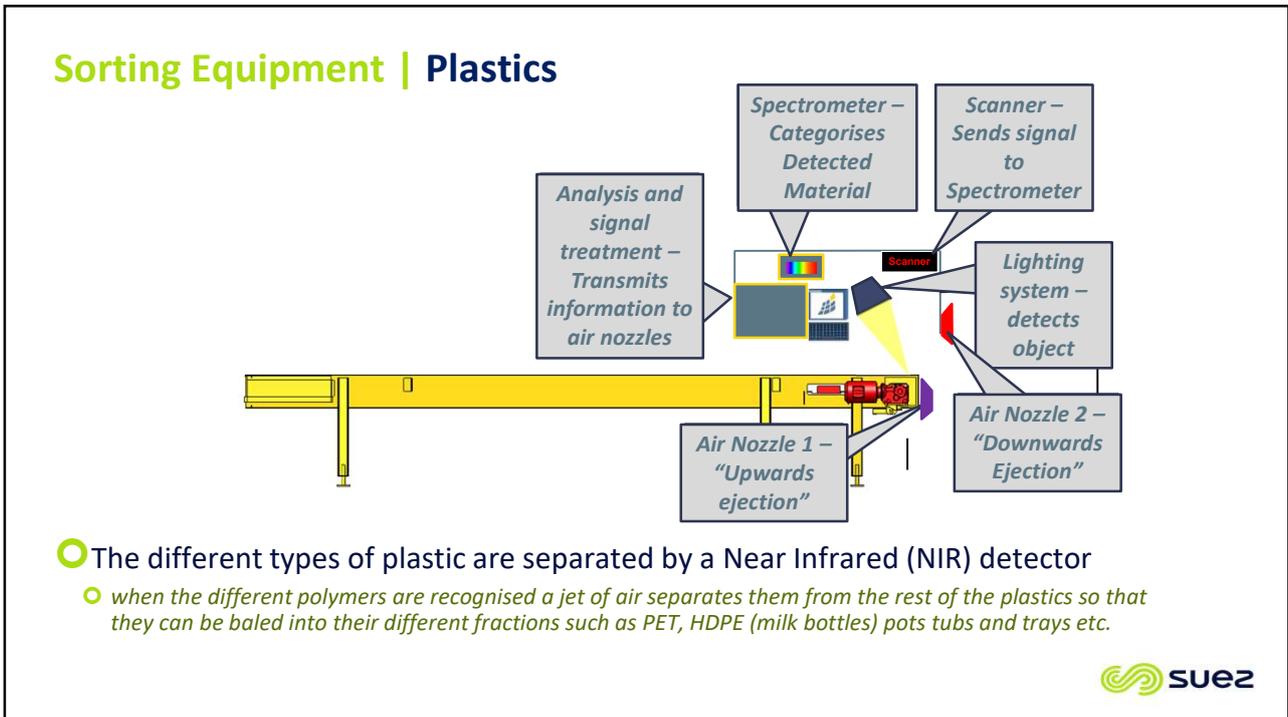
○ Segregate the entire commingled stream into size (and to a degree type) fractions



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We can adjust the MRF to meet circumstances



- Made harder by contamination, composite materials, liquids in containers etc.

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Reprocessing plastic into Flake

- The plastic, once sorted and separated must be cleaned and flaked
- This process cleans dirt and adhesives off of a product as well as removing labels and residue.
- It can also be separated by float sink to separate different polymers i.e. the bottle tops from the bottle themselves.



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Reprocessing flake into Compound

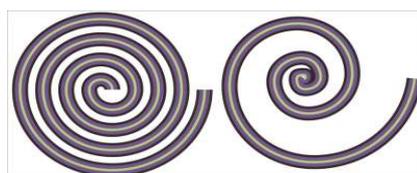
- The second stage to reprocessing is compounding flake into pellets.
- This process takes the clean sorted flake material and heats it up, it is then extruded through a machine, cooled and chopped into pellets for sale and use in new products....



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True progress | circular materials

- Ideally we want reuse, but if we can't we want high recycled content
- But some materials cant have 100% recycled content (degradation)
- Whatever, these materials need to be captured, harvested, cleansed, and moved as a minimum



| | |
|---------------|-----|
| Paper | 7x |
| Glass | 98x |
| Al | 99x |
| Steel | 99x |
| Plastic (PET) | 5x |



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Niche end markets ... this isn't really a scalable end market for plastics

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as plastic tonnage collected has increased | so did exports!

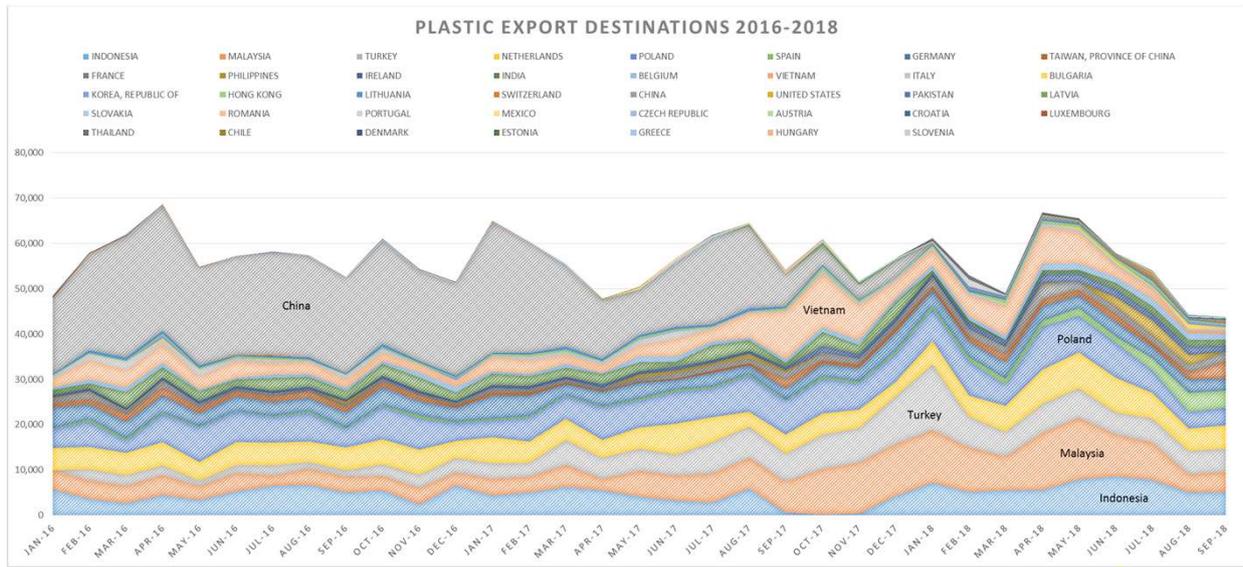


- Over 50% of recyclables were being exported in 2017
- Little investment in UK markets from 2000 onwards, because of **cheaper international markets, expensive UK land, energy and labour costs etc.**
- And a lack of Government intervention ... but that saved the UK money

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Recycled plastics exported | changing market conditions



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But these markets are being swamped

Thailand waste import ban 2021
18 OCTOBER, 2018 | BY KATIE COYNE

UK plastic waste found in illegal Malaysian dumps after China ban
23 OCTOBER, 2018 | BY MARK SMULJAN

Jammed waste im...
30 MAY, 2018 | BY MARK SMULJAN

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plastic pact targets | by 2025

- Take actions to eliminate problematic or unnecessary single-use packaging items
 - *Redesign | Innovation | Alternative (reuse) delivery models*
- 100% of plastic packaging to be reusable, recyclable or compostable
- 70% of plastic packaging effectively recycled or composted
- 30% average recycled content across all plastic packaging
- Huge uplift in materials needing a new 'home' = OPPORTUNITY OR THREAT?



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| | |
|--|---|
| <p>BY 2025</p> <h1 style="font-size: 4em;">100%</h1> <p>of plastic packaging to be reusable, recyclable or compostable</p> | <p>BY 2025</p> <h1 style="font-size: 4em;">70%</h1> <p>of plastic packaging effectively recycled or composted</p> |
| <p>BY 2025</p> <h1 style="font-size: 3em;">ELIMINATE SINGLE-USE PACKAGING</h1> <p>Take actions to eliminate problematic or unnecessary single-use packaging items through redesign, innovation or alternative (reuse) delivery models.</p> | <p>BY 2025</p> <h1 style="font-size: 4em;">30%</h1> <p>average recycled content across all plastic packaging</p> |

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Blue Planet Effect

Recycled packaging 'may end up in landfill', warns watchdog

Lack of farms elastic recycling options

Charge could rise to 10p

up of polystyrene found off coast is 'biggest piece of litter' from UK waters

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2017/ 18 UK Government more active than ever before!!!



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DEFRA's Resources & Waste Plan (17th December 2018)

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf

5 principle themes:

- How we will become a zero avoidable waste economy by 2050
- Phase out avoidable plastic waste by 2042
- New targets for waste and recycling - which after Brexit will be the same as the EU's circular economy package
- Stopping food waste going to landfill by 2030
- Reforming the PRN scheme

I was in the room!

- Optimism at scope, scale and vision
- We knew it was a tough ask
- But we were supportive!

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The consultations soon arrived | #everythingwillchange!

- Over 450 pages and 275 questions all in a 12-week period... February 2018....

- Will revolutionise packaging, resource management and costs from 2023 onwards
- Detailed 2nd stage consultations expected in Q2 2020 & they arrived (albeit a little late)

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the need | synchronised systems & interventions

EPR – delivers the base system & some behaviour change

DRS – helps deliver the behaviour change & some systems

Synchronised systems

Tax/Incentive - pull measures drive markets for the secondary resources

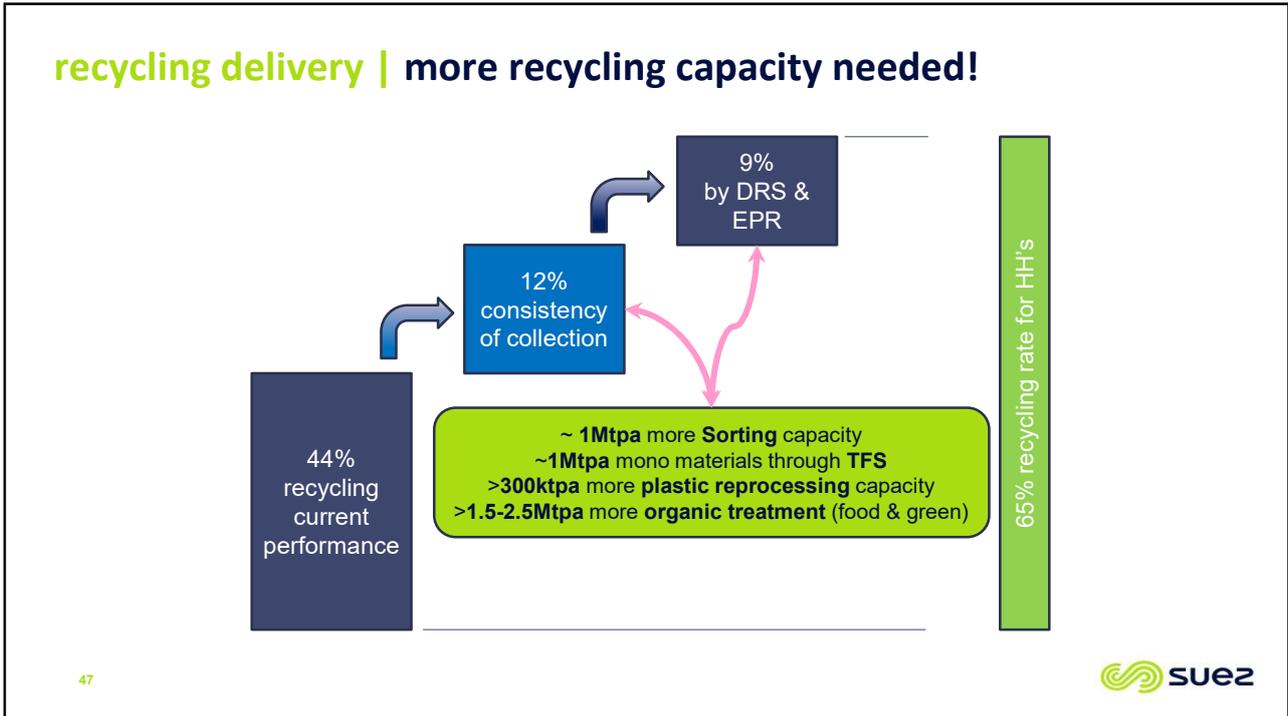
Consistent collection of materials drives feedstock and consistent messages

a vision for England's long-term resources and waste strategy

how a deposit return scheme for 'on the go' could be designed for the UK

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The attack on single use plastics | October 2018!

Department for Environment Food & Rural Affairs

Consultation on proposals to ban the distribution and/or sale of plastic straws, plastic-stemmed cotton buds and plastic drink stirrers in England.

October 2018

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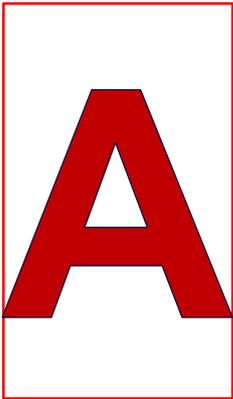
The focus on plastics continues



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Impact of change

What does this mean for us?



13/10/2023 | SUEZ Conference 2022



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Change is coming - EPR and DRS!
But will they drive circularity through refillables?

sky ocean rescue

Bottle deposit scheme could boost recycling
#OceanRescue

ing at Morrisons

Reducing Plastic. You can now recycle your plastic bottles & cans right here. For every bottle & can recycled.

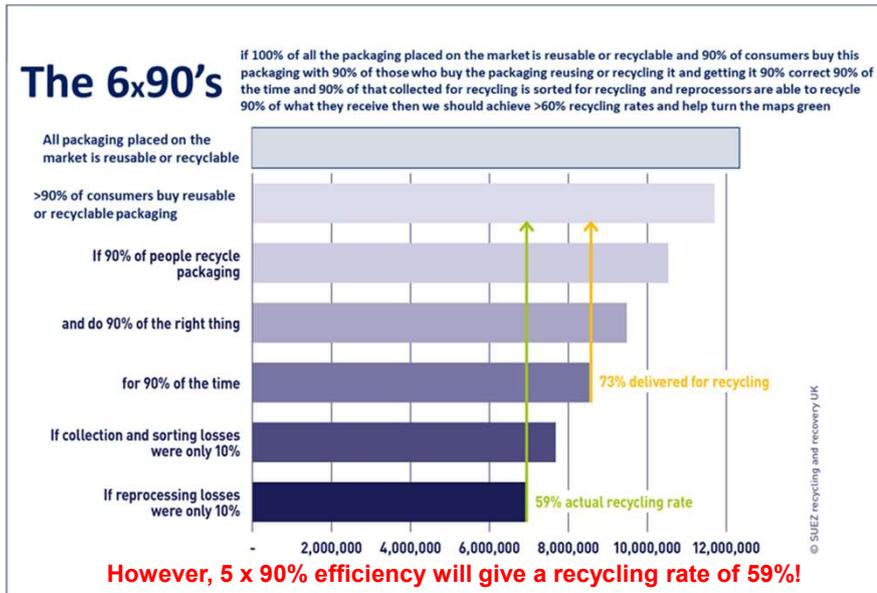
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So who's a good recycler? STAND UP!

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The realities of recycling



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#CONFUSION | Do you know what these symbols really mean?



- 2,300 supermarket shoppers surveyed (November 2020)
- 61% of Britons do not understand basic recycling symbols
- 25% did not know the 'Tidy Man' figure!
- Most were confused by the 'alu' symbol for recycled aluminium products!

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Simplicity is key

The diagram illustrates a transition from a complex set of recycling rules to a simpler one. On the left, three categories are shown: 'SLEEVE' (Widely Recycled), 'TRAY' (Check Locally), and 'FILM' (Not Yet Recycled). An arrow points to a simplified system with two categories: 'Recycle' and 'Don't Recycle'.

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UK legislation creates huge change for our customers

Focus on regulatory objectives

Waste treated mix in the UK

| Year | Recycling | Energy-from-waste | Landfill |
|------|-----------|-------------------|----------|
| 2018 | 52% | 21% | 28% |
| 2030 | 57% | 41% | 2% |

£10bn investment required by the private sector until 2030 to assist UK in moving to a more circular economy

Source: Company information
Notes: ¹ Extended Producer Responsibility and Deposit Return Scheme

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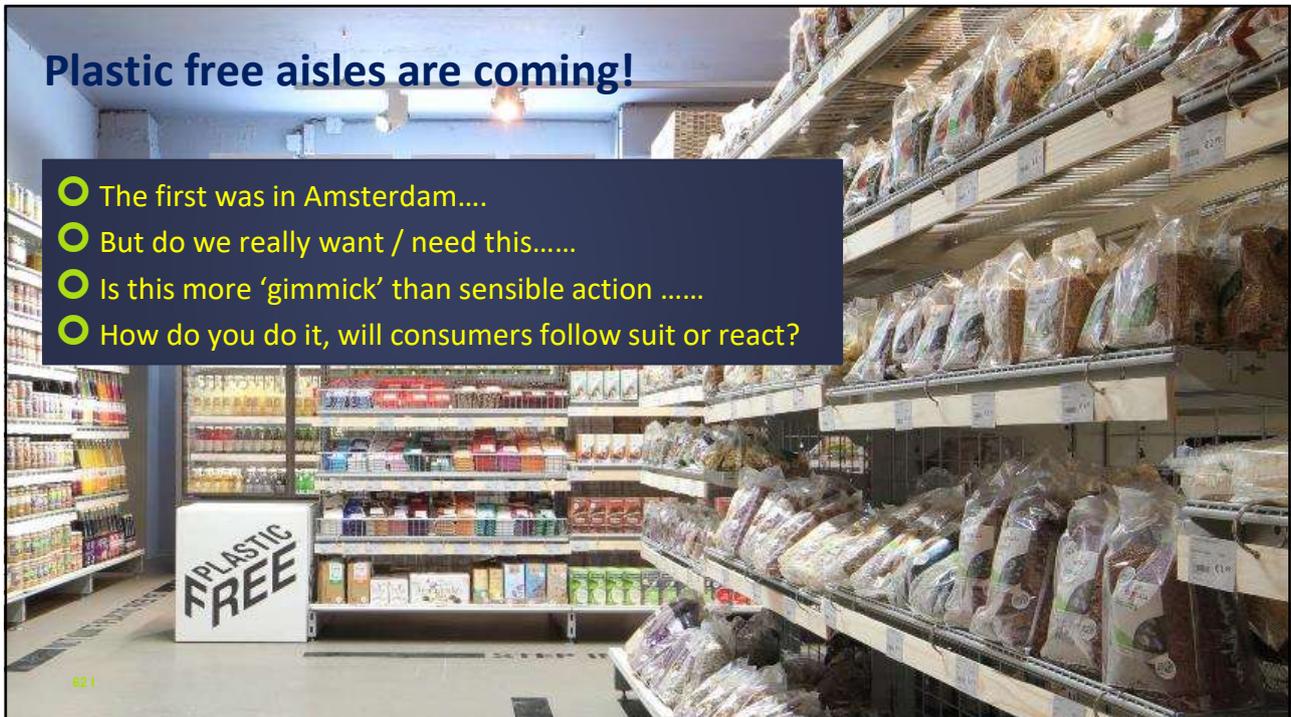
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Ongoing research into unintended consequences of knee-jerk reactions against plastic



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Is switching out of plastic water bottles right?

| Plastic | Aluminium | Glass | Cartons | Refillables |
|---|---|---|---|--|
| <ul style="list-style-type: none"> Production waste Carbon emissions End of life | <ul style="list-style-type: none"> Production waste Carbon emissions End of life | <ul style="list-style-type: none"> Production waste Carbon emissions End of life | <ul style="list-style-type: none"> Production waste Carbon emissions End of life | <ul style="list-style-type: none"> Production waste Carbon emissions End of life |
|  <p>700,000 plastic bottles are littered every day in the UK. Single use water bottles make up half of the plastic litter in the Thames.</p> |  <p>If half of the UK's plastic water bottles switched to cans, mining the aluminium could generate 162,010 tonnes of toxic waste, enough to fill up the Royal Albert Hall over six times.</p> |  <p>If half the UK's plastic water bottles switched to glass, that could generate 1.42MtCO₂e. This is equal to the average emissions of 94,538 people in the UK, roughly the number who live in the city of Bath.</p> |  <p>If half of the UK's plastic water bottles switched to cartons, it would create 98,141 tonnes of low quality waste every year because cartons can't be turned back into new cartons. That's enough to fill almost 9,000 bin lorries.</p> |  <p>Tap water causes 180 times fewer emissions than a standard single use plastic bottle of water. A typical container designed for refill only has to be topped up 15 times to have a lower carbon impact than a single use plastic one.</p> |

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Using recycled content

Using PCR (Post Consumer Recycled) content in our products

- PCR materials are a mixture of different grades of plastic with some contaminants so are normally weaker than virgin polymer
- Therefore we sometimes have to make heavier products if they contain PCR – so we sometimes use a % instead
- Depending on the source PCR materials can be grey and colour matching can be an issue between batches
- Supply of PCR materials can be erratic and the cost is relatively high compared to virgin polymer

JCB Oil bottle



- Full range of 100% PCR HDPE containers
- Weight and quality implications

Paint pots



- Up to 35% PCR
- FEA analysis to adjust design

Soaper duper bottles



- 100% PCR HDPE Content

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Substitute materials

Changing materials to a more sustainable alternative

- Replacing materials that have larger carbon footprints with a plastic alternative
- Using bio based materials sources from sustainable crops instead of petrochemical based materials
- Using bio degradable materials that can be broken down to their chemical constituents through being composted
- Big issues on cost and availability of these materials for ongoing projects

Coffee cup lids



- Replace styrene with Novamont (PLA) biodegradable material

Coffee capsules



- Biodegradable coffee capsules made in PHA
- Can be composted with the coffee grounds still inside

Bulldog brand tubes



- Tubes made from biobased LDPE derived from sugar cane

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Alternative materials



Corn starch



PLA



Bamboo



Sugar by-product
Cassava



Mushroom-grown



Algae based



Hemp



Sugarcane Lego



Tequila by-product
Agave

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Aluminium eminently more recyclable....

- 75% of the 1 billion tonnes of aluminium ever produced (since 1880s) is still in circulation!
 - *in comparison, nearly 80% of the 8.3 billion tonnes of plastic ever produced (since 1950s) was landfilled or littered.....*
- BUT is this really the answer..... Water in cans?
 - *And how much more bauxite must we mine?*



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Is switching away from plastic really the answer?

- Plastics came to the salvation of animals and the ivory trade (for billiard ball production!!)
- But there are risks of switching.....
 - *Not doing full LCA analysis*
 - *New emissions that are potentially worse longer term*
 - *Damage to ecosystems from a switch to something 'new'*
 - *More unrecyclable materials on the market (the new plastic problem)*

"As petroleum came to the relief of the whale, so has Celluloid given the elephant, the tortoise, and the coral insect a respite in their native haunts; and it will no longer be necessary to ransack the earth in pursuit of substances which are constantly growing scarcer."

– early promotional pamphlet for Celluloid

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Is this the future | services not products

Rent your Radio
— & Television — or buy

- FALLING RENTALS
- CONTINUOUS FREE SERVICE, TUBES & VALVES, etc.

CASH or Hire Purchase

- 2 Years' FREE Service, Tubes & Valves, etc.

COUPON FREE 28-page BOOK

RADIO RENTALS (OVER 150 BRANCHES throughout the Country)

97 WESTBOURNE GROVE, LONDON, W.2

Please send FREE Book—Radio from 2/3 per week—Television from 9/3 per week and full details of RENTING or BUYING with Free Service.

Name _____

Address _____

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RENT
from **RADIO RENTALS**

17" TV 7/6

You can rent a 17" TV for only 7/6 a week. Installed on payment of £3. Open rental 32/6 a month. Minimum period 6 months. Free from Government restriction

Reductions every 12 months - Free Repairs and Maintenance

Also available full range of TV - TRANSLATOR RADIOS - REFRIGERATORS - RADIOGRAMS - RECORD PLAYERS - TAPE RECORDERS - AERIALS

BETTER TERMS • SUPERIOR SERVICE

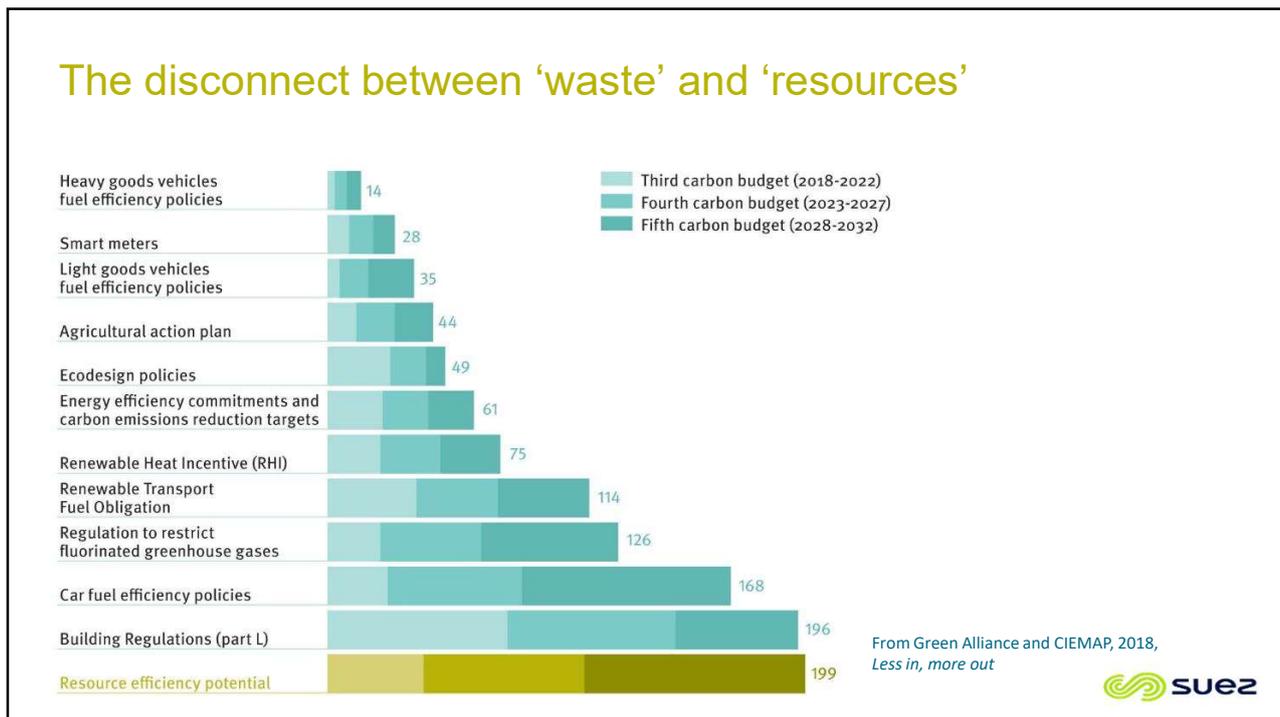
RADIO RENTALS!

119 HIGH STREET, KING'S LYNN — Tel. 2250.
NORWICH: 21 33 BRIDWELL ALLEY — TEL. 28195.

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We don't yet have the right targets!

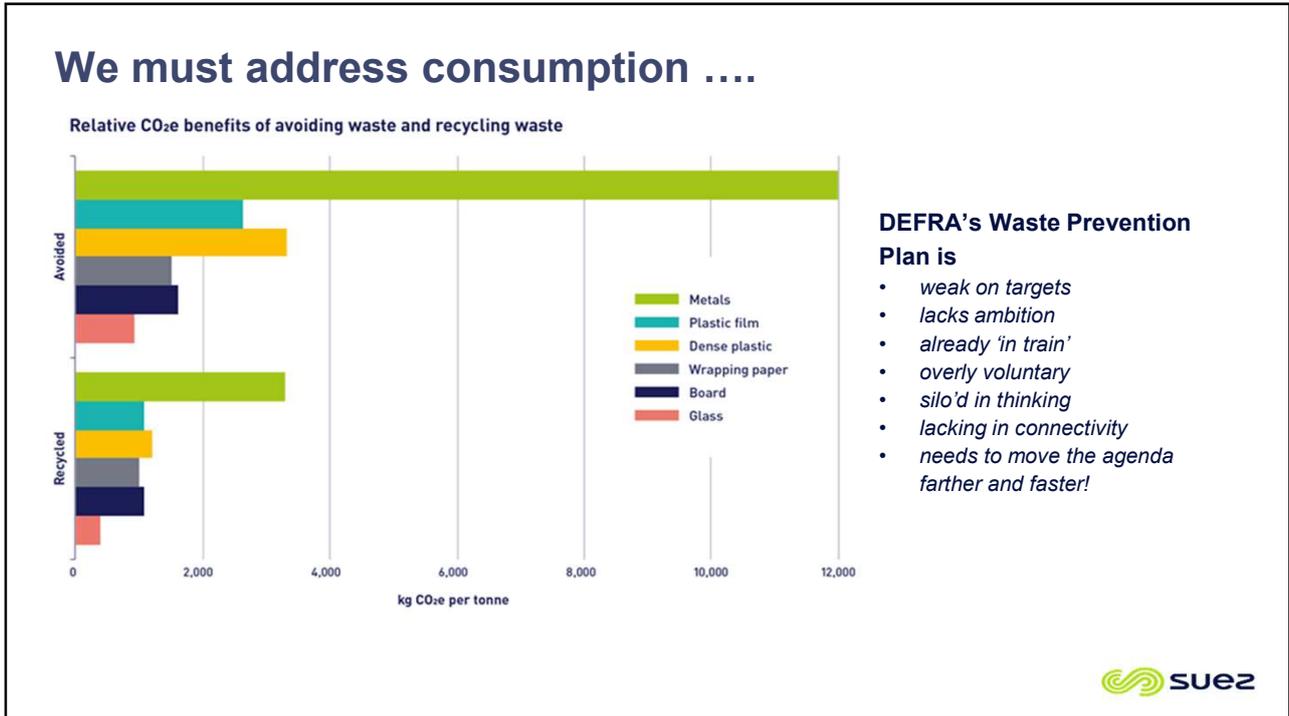
- **The last Waste Prevention Plan prevented less than 0.01% of waste from arising!**
- **New Environment Bill targets do not tackle resource consumption**
 Target to halve resource use
 Plans for specific sectors and materials
 Binding interim goals
- **Will the Environment Act consultation on targets really correct this?**
 Halving residual waste by 2040?

Green Alliance policy insight
March 2021

Targeting success

Why the UK needs a new vision for resource use

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The issue of food waste

Around a third of the food produced globally is lost or wasted and it's having a real impact on climate change, contributing 8–10% of total man-made greenhouse gas emissions.

70% of food wasted in the UK post farm gate is wasted by citizens in their own homes



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The connection between wasting food and climate change

81% of citizens are concerned about climate change

37% realise the connection with wasting food

A HUGE GAP!



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We don't yet have the right targets!

- **The last Waste Prevention Plan prevented less than 0.01% of waste from arising!**
- **The latest version said nothing new and promised little**
- **New Environment Act targets do not tackle resource consumption**
 - *Target to halve resource use*
 - *Plans for specific sectors and materials*
 - *Binding interim goals*
- **Just because its hard doesn't mean its wrong!**

Green Alliance policy insight
March 2021

Targeting success

Why the UK needs a new vision for resource use




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Clarity remains the concern.....

- **What is the desired end market for residual waste?**
 - *10% SAF target = 4-8Mt residual waste needed!*
 - *But DEFRA want to half residual waste*
 - *DESNZ want it for boosting the economy.... Who wins?*
- **Business Waste & EPR**
 - *Deemed too difficult after round 1 of the consultations*
 - *Perhaps they were right given the problem with HH EPR 2 years on!*
 - *BUT we wont hit 70% recycling without a huge uplift in business waste (30% to 80%) and that wont happen without incentives..... or penalties but EPR and TEEP dot seem to be fit for purpose!*
- **If NetZero is key then why are we delaying food waste collections?**

“

Clear thinking requires courage rather than intelligence.

– Thomas Szasz



trvst
trvst

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IN 2018-19 THERE WERE WIDESPREAD 'HIGH HOPES' ABOUT THE CONSERVATIVE MANIFESTO

'WORLD LEADING' AND THE MOST 'AMBITIOUS' ENVIRONMENTAL PROGRAMME IN THE WORLD!

BUT IT HAS FAILED TO DELIVER.....



The tweet by Shaun Spiers (@ShaunSpiers1) states: "The government says it's still committed to delivering #netzero by 2050 in a 'pragmatic and proportionate' way. But how?? @GreenAllianceUK's June net zero policy tracker shows we're already off track. bit.ly/45zq97N 1/".

| Policy Status | Percentage |
|---------------------------|------------|
| Confirmed policy | 35% |
| Policy under consultation | 29% |
| Policy ambition | 21% |
| No policy | 15% |

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IS ENVIRONMENT A VOTE LOSER?

Sunak planning to drop net zero policies in pre-election challenge to Labour

Plans set to be announced on Friday could include delaying ban on sales of new petrol and diesel cars



PM set to shelve 'burdensome recycling plans' this week, reports say

The prime minister is "likely" to shelve "burdensome recycling plans" later this week, according to national media reports, with consistent recycling plans set to be halted.

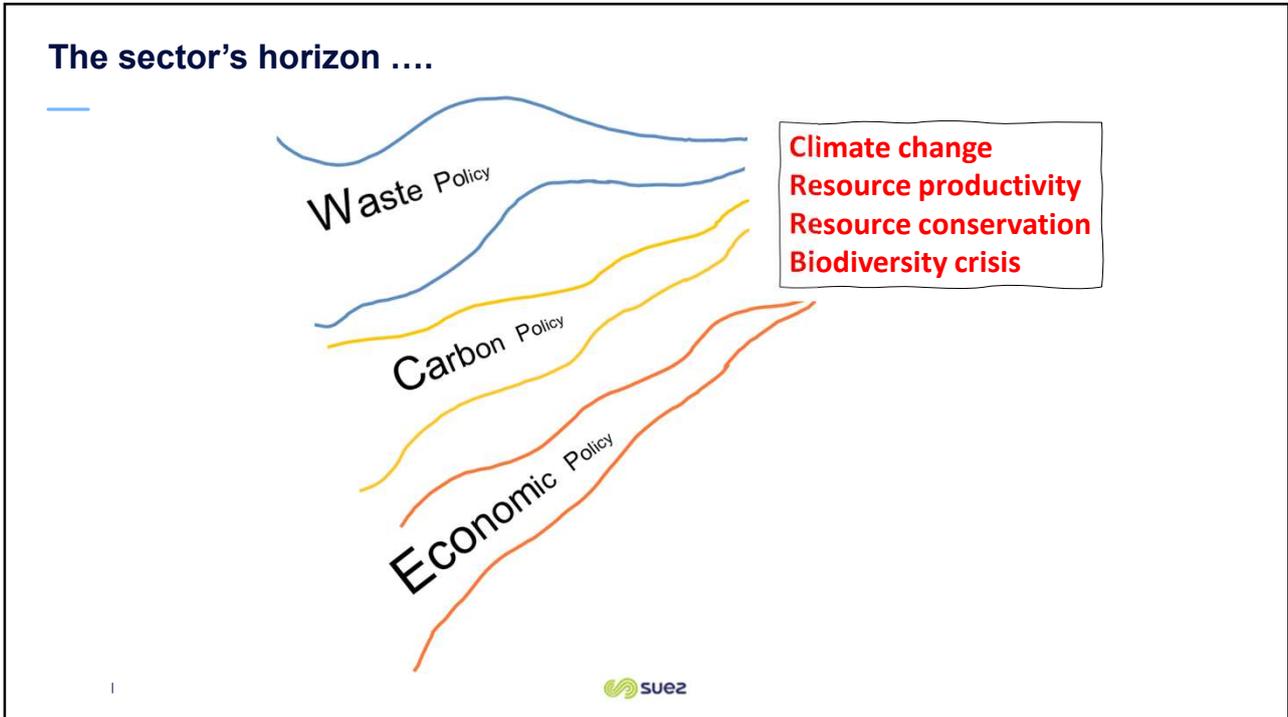


Delays in publishing the ree... has been conc

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Is it time to revisit the 'waste hierarchy' BUT do we have 'professionals' who can do this strategically & locally?

The diagram illustrates the waste hierarchy as a pyramid with seven levels from top to bottom: ROT (light green), RECYCLE (medium green), REPAIR (dark blue), REHOME (orange), REUSE (light green), REDUCE (medium green), and REFUSE (dark blue). To the left of the pyramid is a trash can with a green character (resembling Oscar the Grouch) sitting inside it. A sign on the trash can reads "I ❤️ Trash". An orange arrow points from the trash can towards the bottom of the pyramid. To the right of the pyramid is a green t-shirt with a white recycling symbol and the text "SOYLENT GREEN 100%".

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A photograph showing a woman and a man in a kitchen. They are looking at a blue delivery box with the "Loop" logo and a white arrow pointing to the right. The kitchen has a white tiled wall, a stainless steel sink, and a stove.

Post COVID, will new home shopping platforms like LOOP be accelerated?



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REPAIR REUSE REDUCE

Sector capacity needs?

- Lets assume everybody returns 1 item per year for repair, and its takes 60 minutes to do the repair properly
- This will cost £1.3 Billion (a new economy)
- Employ 40,000 skilled practitioners!
- But where are they & who is training them?

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Flexible plastic packaging | the next niche material?

22% of all UK consumer packaging **Only 8% currently collected for recycling**

Expected that all local authorities will have to collect by 2027

Dry flexibles

- Coffee stick / envelope: 17%
- Coffee / tea pouch: 16%
- Household clean tablet wrapper: 16%
- Household product bag: 7%
- Overwrap: 14%
- Pet food large bag: 17%
- Snack bar / confectionery wrapper: 13%
- Snacks / confectionery pouch: 0%

Wet flexibles

- Household product bag: 62%
- Overwrap: 1%
- Ready meal pouch: 37%

UK total – 895,000 tonnes, 215 billion packs

| Type | PE mono | PP mono | PE/PP mix | Metallised layer with plastic | Aluminium layer with plastic | All other forms of flexible plastic packaging |
|--------------------|--------------|-------------|------------|-------------------------------|------------------------------|---|
| Tonnes | ~430,000 | 180,000 | ~15,000 | ~60,000 | ~120,000 | 90,000 |
| Number of packs | ~105 billion | ~42 billion | ~4 billion | 13 billion | 31 billion | 20 billion |
| Share of materials | 48% | 20% | 2% | 7% | 13% | 10% |

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Compostable plastics | saint or sinner?



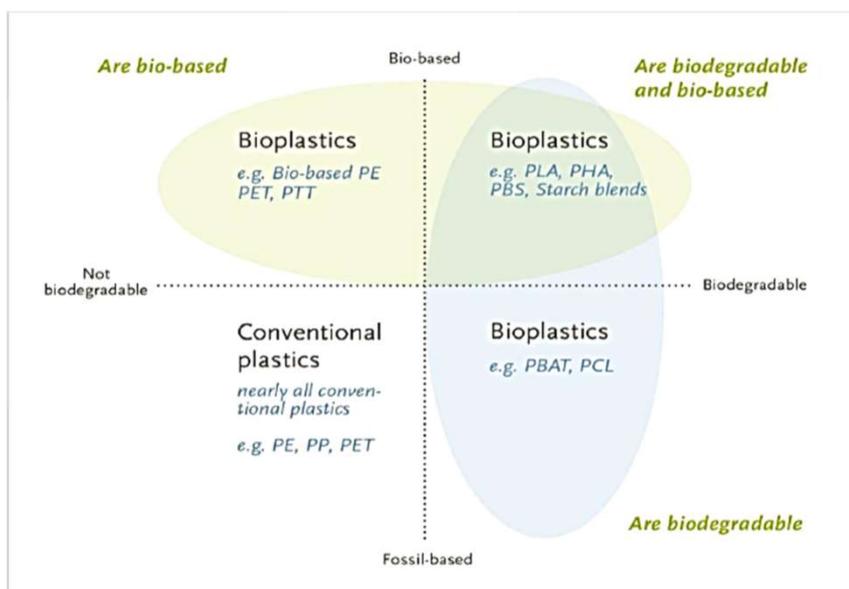
- Research shows these don't degrade / compost @ home or in most UK sites
- If the UK wants to switch then we need new agreed standards and new infrastructure
- Until then we will have increasing confusion / tension / contamination

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Just what are they, and are you confused yet?



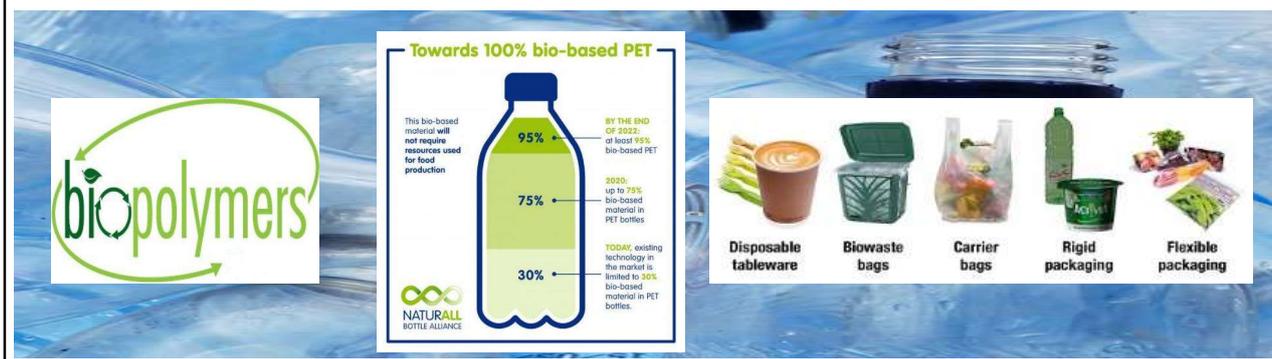
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And what about biopolymers | gaining traction

- Do the public understand the issues fully?
- BUT is this switch one that we really want? We prefer biodegradable going to AD with food wastes!!
- Transition will be painful as sorting equipment cant cope, they could end up anywhere in the MRF!
- Should we focus on simpler polymers, readily available for collection and reprocessing?



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WRAP GUIDANCE ON COMPOSTABLE PACKAGING ...



CONSIDERATIONS FOR COMPOSTABLE PLASTIC PACKAGING

[HTTPS://WWW.WRAP.ORG.UK/SITES/FILES/WRAP/CONSIDERATIONS-FOR-COMPOSTABLE-PLASTIC-PACKAGING.PDF](https://www.wrap.org.uk/sites/files/wrap/considerations-for-compostable-plastic-packaging.pdf)



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**#systemicchange
#keepitsimple**



Lets go Pink!

But only if we have a clear set of agreed standards

Then we can pick it out as contamination (NOW)

And we can track as it becomes more prevalent = trigger point for system design change.....

And consumers will learn quickly @ the till, @work, and @home!

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Mandated Food Waste Collections



Is this the trigger point?

From 2023 every household & business will get a weekly collection

An obvious window for food contact bio-polymers

New outlets (AD / IVC) will be coming on line & designed with these new feedstocks in mind

#opportunityknocks

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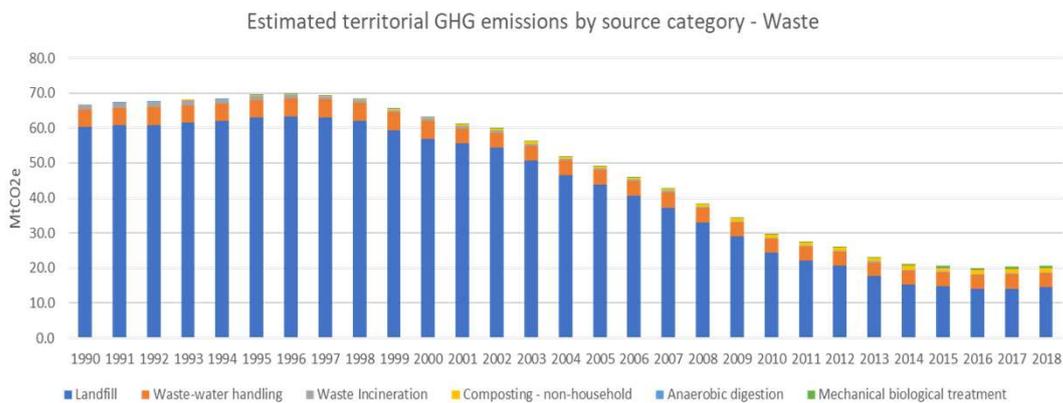
#carbon positivity

- ✓ The sector has taken far-reaching steps to reduce emissions over the past two decades (46% since 1990)
- ✓ But, the sector's activities are still associated with 8% of the UK's total GHG emissions!
- ✓ Our commitment is to become a Net Zero industry by 2040...



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UK Waste carbon footprint (excludes EFW emissions)



Recycling and EFW have in the majority contributed to the sectors big reduction in emissions through driving waste away from landfill.....

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THE WASTE SECTOR WILL TAKE ACTION ...

- 1. RECYCLING INFRASTRUCTURE DELIVERY**
- 2. REMOVING ORGANICS FROM LANDFILL BY 2030**
- 3. REMOVING PLASTICS FROM EFW**
- 4. EMBRACING CARBON-CAPTURE-UTILISATION & STORAGE**
- 5. TRANSITIONING TO ZERO EMISSIONS VEHICLES**

BUT POLICY CERTAINTY & CLARITY IS CRITICAL TO ENABLING INVESTMENT!

WE HAVEN'T MADE THE KIND OF PROGRESS WE HAD ALL PREDICTED IN 2020



Taking action to deliver impactful change

We know that achieving Net Zero emissions for the sector by 2040 will be challenging and will require everyone involved in the sector to act - including our customers and government at all levels. With the right regulatory and policy framework, we can reduce the impact of society's waste on the climate and drive positive change across every community in the UK. We have outlined a clear roadmap detailing how we plan to achieve this target, but the key priorities for decarbonising our sector will be:

- 1 Investing a forecasted £10bn in recycling infrastructure over the next decade to make the recycling process more efficient, reduce associated emissions, meet the government's 65% municipal recycling target and create 40,000 permanent jobs



65%



+40,000
- 2 Decarbonising non-recyclable waste treatment by removing organics from landfill by 2030 and plastics from energy recovery facilities, while working with government to enable carbon capture, utilisation and storage (CCUS) technology to mitigate remaining emissions


- 3 Transitioning vehicles and fuel use to zero emission sources



A number of targets and commitments are associated with each of these priorities and are outlined further in this document. We will review these every five years against progress, policy changes and market shifts to ensure they are both achievable and consistently ambitious. We will also review and report performance against this strategy annually via the ESA's Annual Report.

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The sector's make-up today....

- 135,000 core staff
- 18% of the UK resources and waste sector workforce held **no qualifications** in 2015
- 16% female workforce (and lower ethnic diversity @ 7%) – **not diverse!**
- We are also an **ageing sector**, with 12% of the workforce over 60 years of age
- We are **struggling to attract younger blood** to our sector (only 5% are < 24 years of age)
- The sector is aware of this challenge and is beginning to work together
 - *Enhanced recruitment and sector attractiveness through support to school and universities positioning resource management at the heart of the green recovery and climate change management*
 - *Collaboration with the value chain to make sure our skills are aligned with the needs and demands of the sector's we service and support*
 - *The leading professional and trade bodies are also collaborating about identifying the skills we will need and how we can showcase these new types of roles to target audiences etc.*



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REPAIR REUSE REDUCE
REUSE has real potential ...

- Lets assume everybody returns 1 item per year for repair, and its takes 60 minutes to do the repair properly
- This will cost £1.3 Billion (a new economy!)
- Employ 40,000 skilled practitioners!
- But where are they & who is training them?

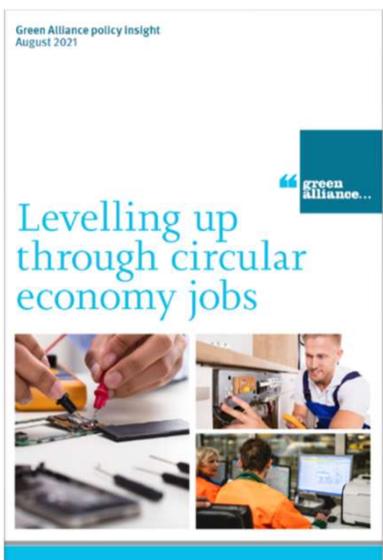
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So what's the opportunity?

Green Alliance report published in August 2021

- The government could help to create over **450,000 jobs in the circular economy by 2035**
- But we must support new skills development
 - *Support workers transitioning into the circular economy with retraining programmes and work coaches*
 - *Provide strategic funding to universities and colleges to market and run new courses central to the circular economy*
 - *Make our sectors interesting to school children so they pick the right subjects*



Green Alliance policy insight
August 2021

green alliance...

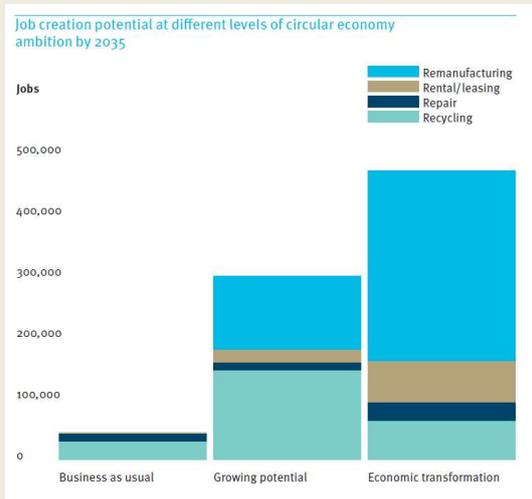
Levelling up through circular economy jobs

CIWM

suez

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What will CE offer us



1. Reuse

Direct reuse of a product to preserve as much of its value and embodied carbon as possible. For example, a reused iPhone retains around 48 per cent of its original value, whereas this figure as recycle is just 0.24 per cent.

2. Repair

Extending the lifetime of products by repairing them instead of throwing them away.

3. Remanufacturing

Disassembling used products into components for repair and reconditioning, to restore performance and quality to new product specifications.

4. Servitisation

Moving away from product-based to service-based business models. Examples are frequently business to business, such as Rolls Royce renting engines to airlines based on the amount of time an engine is used in flight.

5. Closed loop recycling

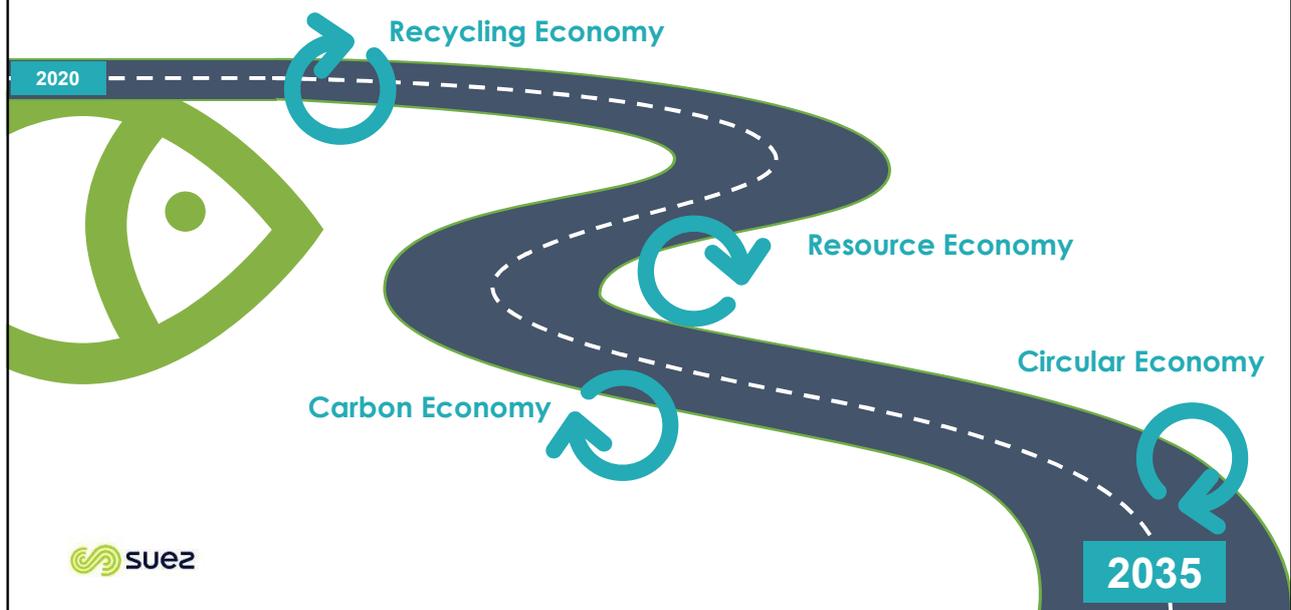
Secondary materials are processed to create a new product of the same or similar value. For example, bottles made from PET being recycled and remade back into PET bottles.

6. Open loop recycling

Also known as downcycling, recovered materials are processed to create new materials of lower value, such as turning glass bottles into road aggregate.

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Evolution & Revolution | the road to 2035?



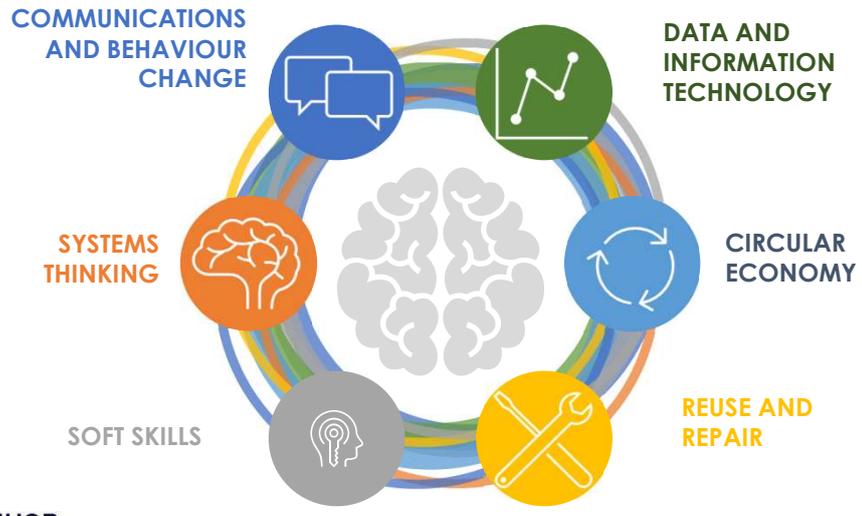
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What does our sector need?

| | |
|--|--|
|  Talent | Attract and retain talent Develop people capabilities |
|  Change | Respond to change Future proof skills |
|  Value | Build an employer brand Create a values based culture |
|  Compliance | Meet regulatory requirements Maintain safe, ethical practices |
|  Economy | Improve resource efficiency Increase profitability |
|  Growth | Professionalise and recognise Network and grow |

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Sector skills identified 'in summary'



COMMUNICATIONS AND BEHAVIOUR CHANGE

DATA AND INFORMATION TECHNOLOGY

CIRCULAR ECONOMY

REUSE AND REPAIR

SOFT SKILLS

SYSTEMS THINKING

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So what are circular economy jobs?

- Policy makers, Regulators
- Trainers, mentors, teachers
- Local authority support teams
- Rental and leasing activities
- Support repair, refurbishment and remanufacturing activities in communities
- Repair machinery, equipment, electronics etc
- Remanufacturing (similar to manufacturing)
- Retail of second hand goods
- All aspects of running biorefineries
- Collecting materials and wastes
- Resource and waste handling, reprocessing, wholesale



All jobs should be 'circular economy' jobs!
The new economy is just the 'economy'.....



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Strategic planning & collaboration ...

Higher Education Courses?

Systems thinking. Climate & Environmental change. Sustainability assessments. | Digital. Supply chain management. Risk management. | Collaboration skills. Knowledge exchange. Influence practices without direct control. Change management. | Governance, policy, regulation, implement & enforce. | Circular product design. | Circular business model innovation. Procurement. Marketing. Customer relations. Social research & experimentation skills for behaviour change. | Embedding in "traditional" studies. | Attitudes, openness, problem solving, creative thinking, continuous learning.

"As a sector we need to improve our strategic workforce planning capability. This doesn't necessarily mean planning for the next decade having absolutely clarity on what skills and competencies are required at the outset. The world is changing too rapidly for that. No, we need to have strategic workforce approaches and plans with built-in agility to cope with a range of contingencies. Only if we take this approach, and work collaboratively across the industry, will the longer-term investment required to deliver the skills we need for the future provide a return on investment."

Dr Tracey Leghorn, Chief HR and H&S Officer,
SUEZ Recycling and Recovery UK Ltd



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#WOMBLESWANTED

REPAIRER ENGINEER COMMS EXPERT DESIGNER TECHNOLOGIST DATA SCIENTIST

What skills and competencies should you develop?

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Top 3 skills required to perform current role?

- Communications
 - Behaviour change, stakeholder engagement, relationship building and community engagement also referenced
- Project Management
- Technical Knowledge
 - across a broad range of areas
- Other skills mentioned:
 - Data management and data analysis
 - Contract management and finance
 - Problem solving
 - H&S

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What skills do you think you will need in the future that you either do not have today or will need to further your knowledge in?

Mix of responses, top 5 most cited include:

- Carbon / net zero
- Circular Economy
- Data and technology
- Horizon scanning
- Chemistry and materials

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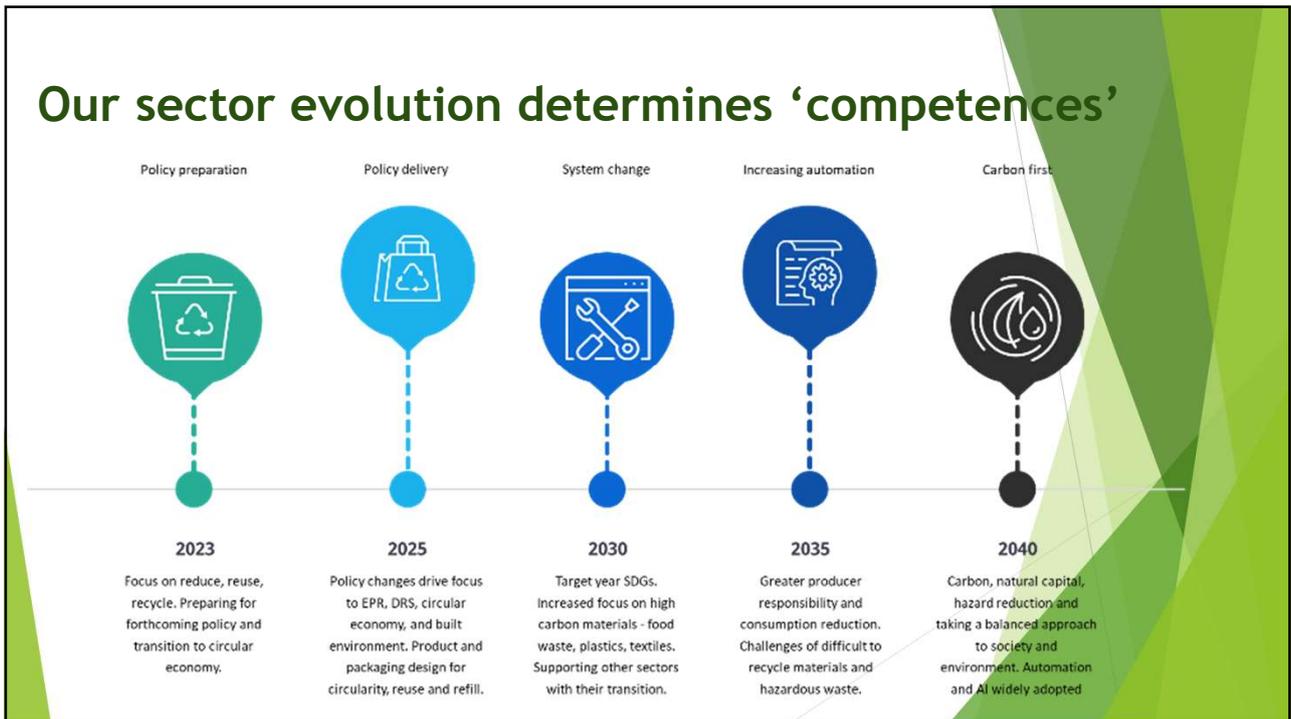


“ Our job is to keep materials flowing, working with designers on products and packaging of tomorrow, utilising new tech to treat our waste products and driving forward business and consumer change!



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CIWM Skills reports (a sector perspective)

June 2021

CIWM
The Chartered Institution of Waste Management

March 2023

CIWM
ciwm.co.uk

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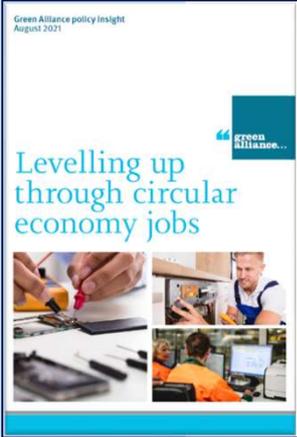
Government' Green Jobs Delivery Group

- ▶ CIWM as a founding member
- ▶ 4 Ministerial Departments represented by SoS!
- ▶ Mapping and 'managing' 18 sub-sector's in transition
- ▶ Our report due by September 2023 - Resource Sector Workforce Assessment
- ▶ CIWM drafting this with input from WG members and wider representation ...
- ▶ Recent Survey
 - ▶ Demand, Regionality, EDI, Competing Sectors etc.
 - ▶ Role specificity, skills & competency needs & training provision
- ▶ January report due on big themes, key competences and regional needs across the #NetZero transition!

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Gissa job?



Green Alliance policy insight
August 2021

green alliance

13/10/2023

Looking at ~ 500,000 people!

Key roles

- ⇒ Green engineers (mechanical, electrical)
- ⇒ Green chemists
- ⇒ AI / IT specialists
- ⇒ Behaviouralists, campaigners and nudge specialists
- ⇒ Transition managers as we go to circular business models and refill type models etc.
- ⇒ Repair specialists
- ⇒ Regulators who can regulated in the new world

- Repair – **40,000** (base level), more realistically **80,000** FTEs
- Green chemists – **20,000**
- Green engineers – **20,000**
- Behaviour / campaigners – **30,000**
- Entrepreneurs who will drive new circular economy businesses and models – **30,000**



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Which 'green occupations' within the waste and resources sector do you think will be most important in the future to drive the transition to net zero?

- Net Zero and Circular economy
- Regulation and compliance
- The need to still manage residual waste and roles associated with this
- Sorting and reprocessing
- Technical skills
- Repair and reuse
- Only limited mention of data and IT

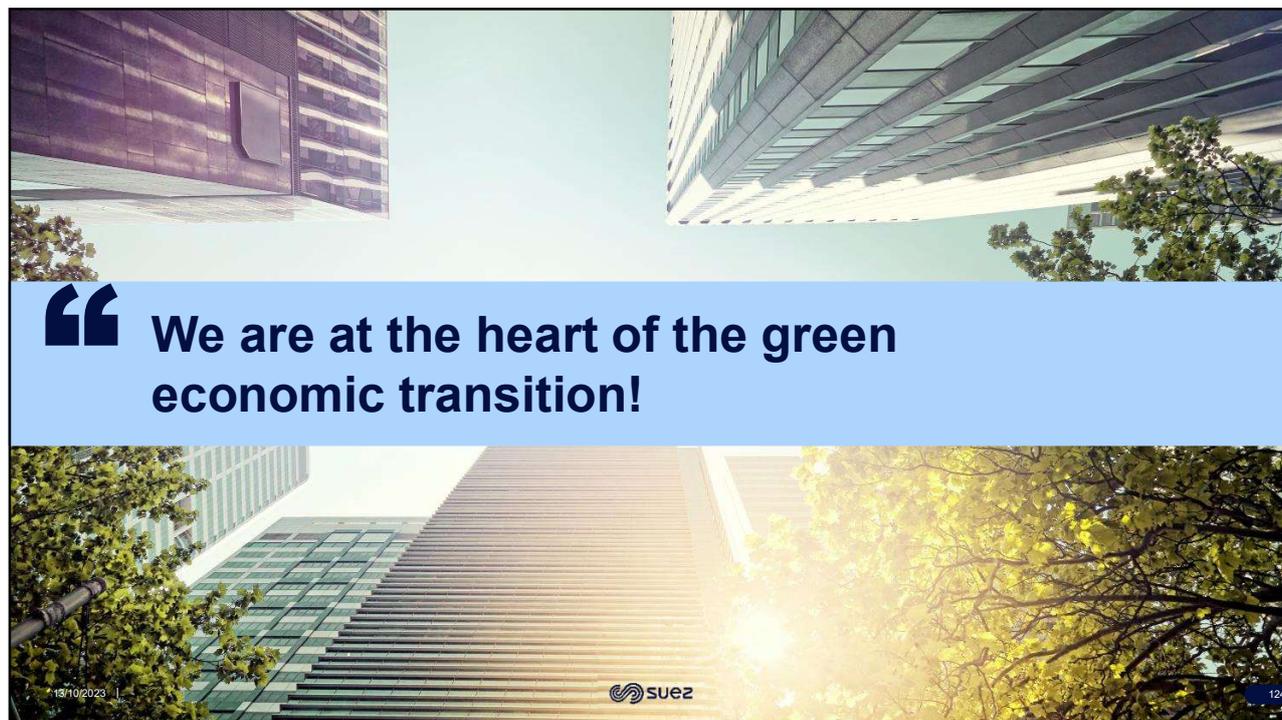


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How many roles will we need?

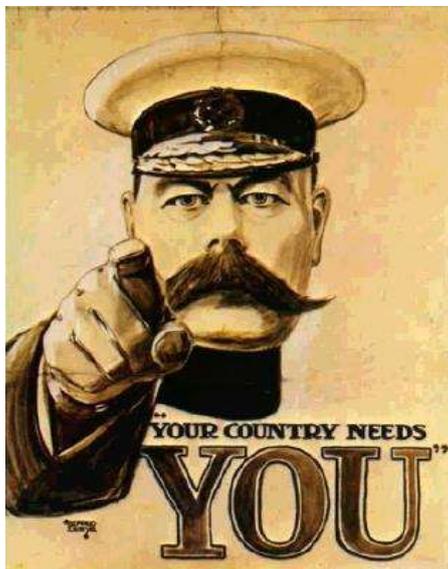
| Theme | Total estimate - new roles by 2030 | Total estimate - new roles by 2035 | Total estimate - new roles by 2040 | Aggregated total of new roles on top of baseline |
|--|------------------------------------|------------------------------------|------------------------------------|--|
| Collection, sorting, treatment & disposal | 18100 | 2000 | 1000 | 21100 |
| Reuse and repair | 20000 | 40000 | 80000 | 140000 |
| Consultancy / Professional Services | 5000 | 2000 | 2000 | 9000 |
| Communications and behaviour change | 5000 | 2500 | 1500 | 9000 |
| Design | 1000 | 100 | 100 | 1200 |
| Business support | 1000 | 1000 | 500 | 2500 |
| Regulation | 5000 | 1000 | 500 | 6500 |
| Facilities Management | 100 | 100 | 100 | 300 |
| Vehicles manufacture, repair, ELVs | 5000 | 5000 | 5000 | 15000 |
| Textiles - across all roles | 10000 | 3000 | 1000 | 14000 |
| Circular economy business models e.g. reuse and refill | 1000 | 5000 | 5000 | 11000 |
| Technical infrastructure development | 2000 | 2000 | 2000 | 6000 |
| Construction and Demolition | 1000 | 1000 | 1000 | 3000 |
| Total | 74,200 | 64,700 | 99,700 | 238,600 |

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Your sector needs you! Resources mk2



- New opportunities!**
- New business models!**
- New value streams!**
- New ideas!**
- New technologies!**
- New challenges!**
- New risks?**
- New careers?**

And a professional body in need of volunteers to lead the transition!!



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What can our sector do to attract more people into the industry (e.g. frontline staff, school/college leavers, graduates, staff transferring from other sectors etc.)?

Raising awareness of the breadth of the industry

Reframe the narrative

Education – work with schools & STEM

Input to universities / colleges (courses)

Paying higher wages – particularly for frontline staff

Frame that every job is a green job, promote the sector as jobs for the future = security (frontline staff)



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So what?

Its all about 'attractiveness' ...

Defined & respected 'career' paths

Transferable skills (widely accredited)

A strong narrative that can be used in schools / colleges / universities

Competitive wages & 'packages'

Employment that has purpose & meaning

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My key sector skills messages

- The sector is ready to boom!
 - Huge new career opportunities!
 - Revolution not evolution (disruption is the new norm)
- Subject choices?
 - Don't worry too much, most subjects @ GCSE and A-level may be relevant
 - *Geography / Environmental Science / Business Studies are great foundations*
 - Some careers / roles will need core competences
 - *Chemistry / Marketing / Economics might be critical*
 - Look out for the new disciplines – climate change / circular economy / resource management etc.
- Personal Attributes desired by the sector?
 - Systems thinkers / applied scientists / light green environmentalists
 - A 'can do attitude' / flexibility of location and career plan / a desire to learn and adapt
 - Good team players / collaborators / communicators / enablers
 - Have done some work experience / field work / volunteering



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Which sectors will be our partners in the future?



Materials and chemicals



Design



Producers and manufacturers



Retail 2.0 and logistics



Information technology

- Is Agriculture a priority opportunity for our sector?
- And what about the value chain from food manufacture through harvesting 'food waste' and processing this as a new feedstock for the 'raw producers'?
- Or will new solutions come to the fore

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Research opportunities will be driven by halving residual waste (target) & 'decarbonisation'

- New materials / Materials substitution
- LCA thinking / analysis / reporting
- Plastics in the oceans / food chain / human ecosystem
- DRS – logistics / materials handling / closed loop recycling
- Technologies – chemical recycling / carbon capture etc.
- Technologies – AI / automated sorting / Apps / Passports
- Data – real-time tracking & reporting /
- Reuse – the public journey (effort vs reward)
- Messaging & Behaviours – on pack labelling / nudge & comms /
- Refill & Repair systems – logistics / engagement / energy demands / emissions
- New business models that drive down waste production – leasing / sharing etc.
- Landfill mining – at some point the materials stored will be 'valuable'



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Solutions for stuff

Local authorities as enablers of change,
making waste prevention happen

Researched and written by Dr Jane Beasley and Sarahjane Widdowson
of Beasley Associates Ltd on behalf of SUEZ recycling and recovery UK
September 2023



<https://www.suez.co.uk/en-gb/news/list-of-publications>

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Re-use: you know it makes sense!



Putting re-use at the heart of your household waste recycling centre

A guide to introducing or improving re-use on site





The repair evolution

how it can become part of your approach to re-use

A guide to integrating repair into a household waste recycling centre network





Re-use – seizing the opportunity

Exploring the potential for implementing re-use on a larger scale to realise the benefits to people, planet and the economy.



<https://www.suez.co.uk/en-gb/news/list-of-publications>




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What will we do in 2025/26? Manage ‘post-consumer resources’ better!





More source segregation, more mono-stream management, MRFs begin to be re-aligned, **organics are being targeted** and energy-from-waste feedstocks are under scrutiny ... and much more reuse and repair!

Plus all the backroom and support teams





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What will we do in 2035? Managing 'resources' effectively (with partners)



But we may be looking at different technologies and sites as changes settle down and investment comes forward – 'more innovation, more natural capital, more biodiversity net gain, more synergies with the supply chain'

Plus all the backroom and support teams



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Innovation will be driven by us needing to halve residual waste (target) and 'decarbonising' ...

- New materials / materials substitution
- LCA thinking / analysis / reporting
- Plastics in the oceans / food chain / human ecosystem
- DRS – logistics / materials handling / closed loop recycling
- Technologies – chemical recycling / AD / carbon capture etc.
- Technologies – AI / automated sorting / apps / passports
- Data – real-time tracking and reporting
- Reuse – the public journey (effort v reward)
- Messaging and behaviours – on pack labelling / nudge and comms
- Refill and repair systems – logistics / engagement / energy demands / emissions
- New business models that drive down waste production – leasing / sharing etc.
- Landfill mining – at some point the materials stored will be 'valuable'

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- Changing composition in the bin
- Changing bins
- Commercial waste 'looks like municipal'
- New collection vehicles & patterns
- Back-haulage systems & DRS
- Materials quality & closed loop reprocessing
- Consumer engagement, education & support
- Data
- End markets
- Monitoring & reporting (and enforcement)
- Brand demands
- New sites, planning, permitting et al.
- New skills

The next 10 years?



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BUT, remember - attitude is everything in our game!

"Just because you're trash doesn't mean you can't do great things. It is called garbage can, not garbage cannot." - Oscar, the grouch

If YOU want to get on then GET ON WITH IT!



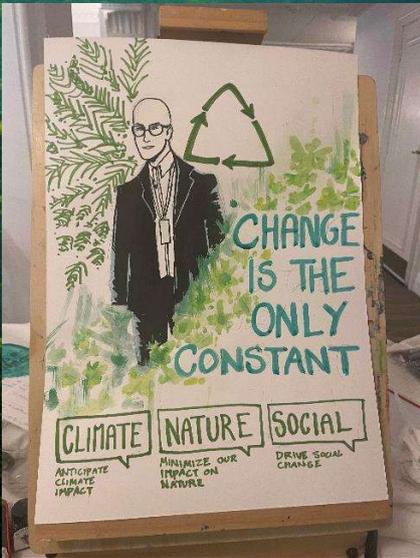
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THANK YOU!

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