

Secondary and tertiary packaging in the food and consumer goods industry

Halving the environmental impact of the UK packaging system

Social Impact from IGD



Executive Summary

Secondary and tertiary packaging is already efficient, however, industry can drive further environmental improvements

Taking a systems view

This report is an addendum to '[halving the environmental impact of the UK packaging system](#)' which focused on primary packaging.

In order to take a systemic view, this report addresses the secondary and tertiary packaging of the food and consumer goods industry.

It aims to help industry mobilise action around the shared ambition **to halve the environmental impacts of the UK packaging system by 2030.**

Key findings

We modelled three scenarios to understand what action is needed to reduce the environmental impact of packaging.

The results show that maximising efficiencies will only deliver minimal reductions, as secondary and tertiary packaging is already very efficient.

Focus should be maintained on reducing impacts from primary packaging. This in turn will also result in efficiency gains for secondary and tertiary packaging. However, there are still opportunities for improvement.

Secondary and tertiary opportunities

- ▲ Scale reuse systems in secondary packaging
- ▲ Focus reductions on paper and card (which is 68% of the market) by using the least material required to protect and transport the product
- ▲ Extend life of wood pallets and explore alternatives e.g. slip sheets and push-pull units
- ▲ Reduce plastic wrap and increase recycled content

How to get involved

IGD is convening industry and key stakeholders to address these challenges and drive tangible, positive change.

1

Join our network

- Our working group aims to drive progress towards the ambition to [halve the environmental impacts of all packaging systems by 2030](#)

2

Partner with us on projects

- Trial solutions that drive consumer engagement for reusable packaging
- Test our new [Life Cycle Assessment Decision-Making Guide](#)
- Help build tools that support packaging decision-making

Get in touch at sustainability@igd.com

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Setting the scene – taking a systems view

In April 2022, we published our [report](#) highlighting the UK's food and consumer goods packaging status and what interventions are needed to reduce our impact on the environment.

To meet our industry's shared ambition – to halve the environmental impact of all packaging systems by 2030 – there needs to be a reduction in the amount of packaging, combined with significant environmental efficiency gains. Current legislation and planned policy reforms will not deliver the progress needed, as any reductions will be offset by a growth in demand for primary packaging.

The report focused on UK primary packaging; but to take a whole systems view, it is also important to consider how we can reduce the impact of secondary and tertiary packaging.

This report outlines the current profile and impacts from secondary and tertiary packaging and identifies key areas for focus.



Industry Ambition to 2030

To **halve** the environmental impacts of all **packaging** systems by **2030** whilst still **enhancing** the **benefits** and quality enjoyed of products and their packaging today.

The current landscape

from **IGD**



Paper/card, plastic and wood are the dominant secondary and tertiary materials

Secondary packaging includes boxes or containers containing specific quantities of primary packages.

Tertiary packaging includes pallets and large shipping containers for storing and transporting secondary packages.

Secondary and tertiary packaging is discarded by retailers at back of store.¹

Our analysis does not include packaging from online retail or packaging discarded in the supply chain upstream of retail, for example during transportation or at distribution centres or warehouses.²



1. [Valpak's PackFlow COVID-19 reports](#).

2. Data provided by Valpak. Publicly available data is limited and much less granular than primary packaging. However, it provides an indicative profile for analysis.

1.06 million tonnes of secondary and tertiary packaging was put on the UK market in 2019

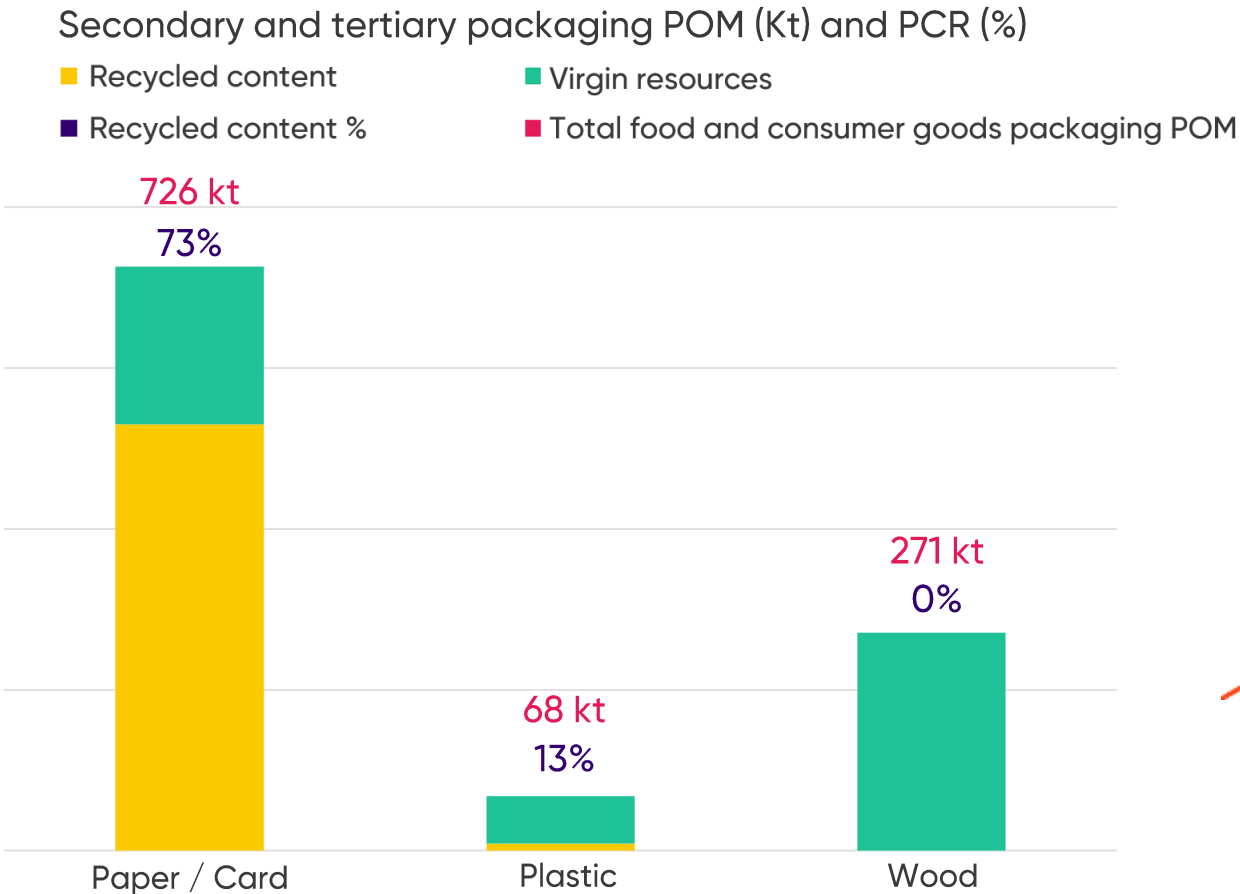


Packaging profile

Paper and card is the dominant material. Plastic is significantly lower as film is very lightweight.

Wood represents virgin wood placed on the market. However, there is much more circulating in the system, as 85% of pallets are reused. These high reuse rates means lower quantities being discarded and therefore available post-consumer recycled (PCR) is low.¹

Three times as much primary packaging² was placed on the market (POM) in 2019, compared to secondary and tertiary packaging.



1. These insights were provided by CHEP.
2. 2. 3.5 million tonnes of primary packaging was placed on the market in 2019.
2019 data. Main source: [Valpak's PackFlow COVID-19 reports](#). Plastic is split into grocery retail back of store and non-grocery retail back of store, but the other materials are not. Plastic grocery retail back of store is reported as 68% of total retail back of store packaging. We applied this percentage to the other materials to calculate the grocery retail back of store packaging.

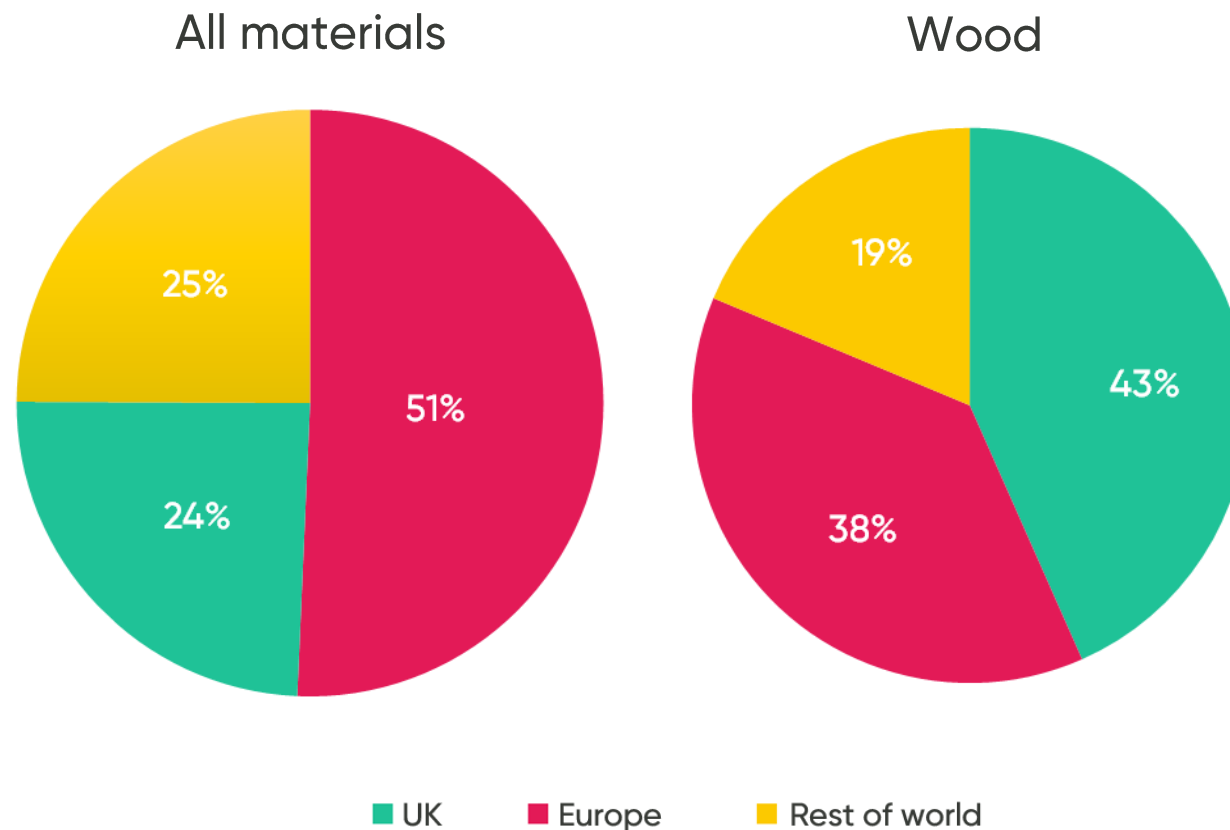
75% of packaging comes from Europe and the UK



Sourcing supply chain

There is not full transparency over where the raw materials for secondary and tertiary packaging come from, but we do know that:

- More than half of all materials are sourced from Europe
- 43% of wood pallets are produced in the UK



Recycling rates are high for all materials

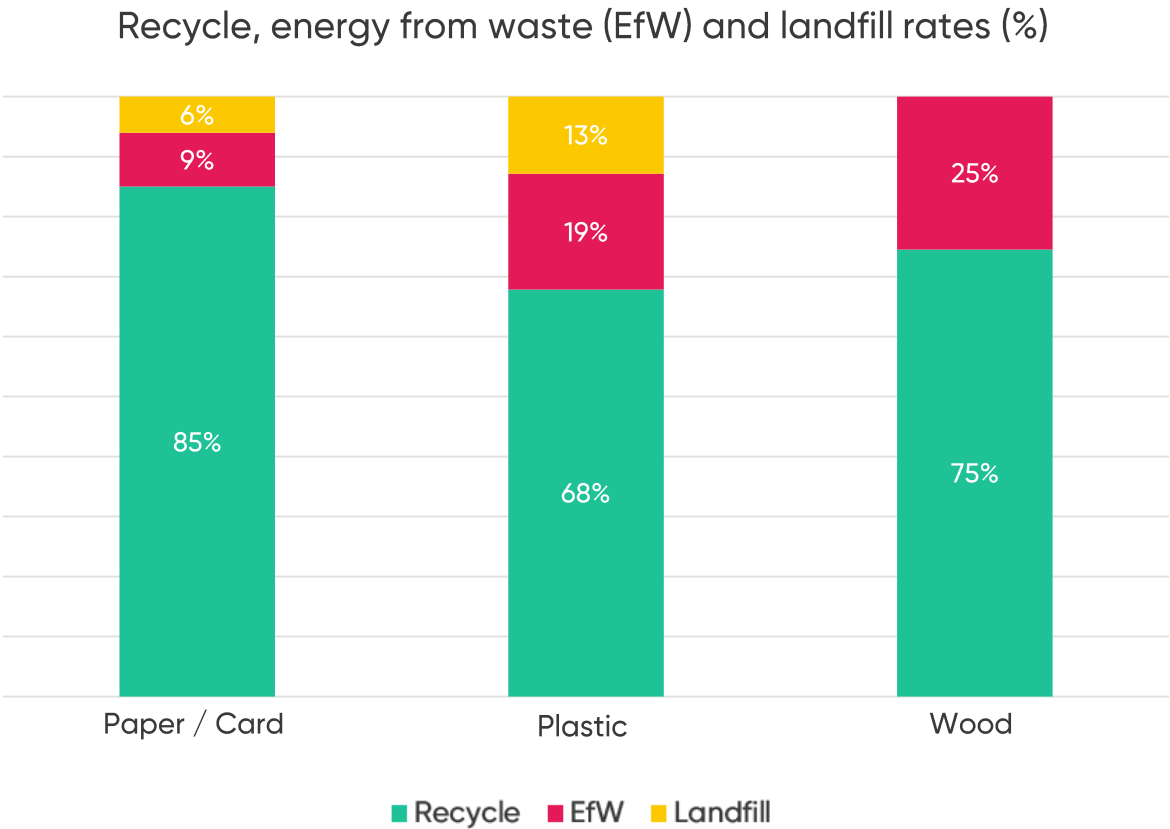


End of life supply chain

Paper/card and wood have particularly high recycling rates.

The recycling rate for secondary and tertiary plastic (68%) is much higher than for primary plastic (32%), due to cleaner waste streams and enhanced packaging segregation in retail environments compared to households.

Wood waste is very high quality (grade A and B) which explains the low landfill rates.¹



2019 data. Main source: [Valpak's PackFlow COVID-19 reports](#) The reports have limited end of life data. We took the residual waste figure (1 - recycling %) and applied a split from Anthesis' internal market waste and forecast report based on infrastructure change (60% EfW and 40% landfill).
1. These insights were provided by CHEP.

Taking the high reuse of wood into account

Flat wooden pallets make up 85% of wood packaging and are used time and again in the system. Therefore, we have taken a circular approach for this material.

- Virgin wood placed on the market accounts for 10% of pallets in circulation across the UK.
- The remaining 90%¹ of pallets are recirculated within a reuse system.
- It is estimated that each pallet is reused 25 times before being discarded.²

To account for reuse, only the full lifecycle impact of new pallets placed on the market each year has been considered. An additional transport impact category has been added to consider the impact of recurring journeys in the UK and Europe.



2019 data. Main source: [Valpak's PackFlow COVID-19 report](#)

1 & 2. These assumptions were based on insights provided by CHEP and complementary research.

*Includes new wood for pallets and for refurbishment





Our 2019 baseline

from **IGD**

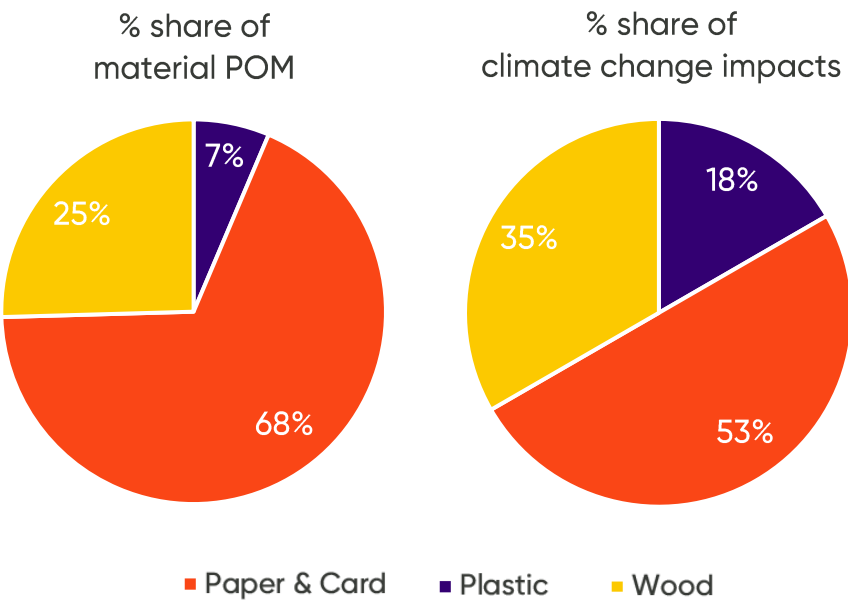


Our 2019 baseline

Paper and card makes up more than two thirds of all the material placed on the market (POM). It therefore has a high impact across the environmental indicators.



Material	Mass mt/y	Climate Change mt CO2e/y	Water mt/y	Land Use km2.y/y	Virgin Resource Use mt/y
Paper/Card	68%	0.9	10	746	0.2
Plastic	7%	0.3	4	29	0.1
Wood	25%	0.6	3	1,375	0.3
Total	1.1	1.7	17	2,151	0.5



We modelled three scenarios¹, but our findings pose a challenge

The scenarios

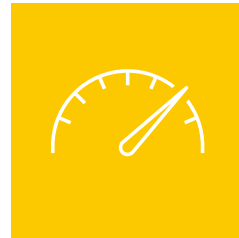
Business as usual (BAU)

Impact of already planned industry initiatives and/or regulations²



Maximising efficiency

Impact of increasing recycled content, recycling rates and decarbonisation³



Maximising efficiency + removal

Impact of the above combined with a percentage removal of materials needed to halve the environmental impacts



Our findings

- ▲ Limited reduction in impacts.
- ▲ Secondary and tertiary packaging is already very efficient with high recycled content and recycling rates, so any gains are small⁴.
- ▲ Minimal reduction in impacts.
- ▲ Plastic has the most room for improvement, but only makes up 7% of total packaging POM, so will not drive significant reductions.
- ▲ To meet the industry ambition, secondary and tertiary packaging would need to reduce by 42% as well as maximising efficiency.
- ▲ We recognise that this is neither feasible nor practical from an operational perspective.

1. The scenarios used are the same as the primary packaging modelling approach.

2. Includes reforms to the Extended Producer Responsibility in the UK and the UK Plastics Pact commitment.

3. Increase recycled content to 60% for plastic and 80% for paper/card; Increase recycled rates to 90% for plastic, 95% for paper/card and wood. Increase supply chain (global grid) by 41% and transport decarbonisation. More information on the scenarios can be found in appendix A4.

4. For example, paper/card starts out with a high recycled content rate in 2019 (73%). It only increases to 80% (in both the BAU and maximising scenarios).

Taking a different approach to action

from **IGD**



Action on primary packaging is key to meet the industry ambition

Focus should be on primary packaging

Action on primary packaging is the key driver to meet the ambition – halving the environmental impacts of packaging systems by 2030.

Demand for secondary and tertiary packaging is dictated by the products they contain, therefore reducing the volume of primary packaging simultaneously reduces the secondary and tertiary packaging requirements.

Primary packaging – levers for change

- Removal of packaging by eliminating unnecessary packaging, lightweighting and moving to reusable systems
- Increasing recycled content across all packaging materials
- Decarbonising existing supply chains or moving production to regions with lower carbon intensity

It's still important to improve secondary and tertiary impacts

Although it is very efficient with high recycled content and recycling rates, there are opportunities to further reduce impacts across the system.

Any decisions should consider the full lifecycle of the product and its impacts across both primary and secondary/tertiary packaging. This will identify any potential trade-offs of environmental impacts between materials such as plastic and wood pallets.

Opportunities

Secondary Packaging



An efficient system but dominated by single-use

Displays some good examples of reuse (e.g. fresh produce trays)

Opportunity

- ▲ **Scaling reuse systems**
Supported by predictable and contained supply chains, without the complication of widespread consumer change.
- ▲ Remove unnecessary paper and card packaging (which is 68% of the market) from the system and use the least material required to protect and transport the product.

Tertiary Packaging



An effective reuse system is in place (e.g. wood pallets)

Plastic wrap used is single-use

Opportunity

- ▲ Extend life of wood pallets, reducing new demand and virgin material use. Explore alternatives e.g. slip sheets and push-pull units.
- ▲ Reduce plastic wrap layers and increase recycled content*.

Remember to take a lifecycle view when making decisions

IGD is here to support industry

We will mobilise industry across the following workstreams

Ambition

Create insights that encourage and mobilise industry to take action.

Projects

Deliver projects that help industry to work towards the ambition:

1. **Reuse:** Consumer insights and trials that support making reusable packaging mainstream
2. **Decision-making Lifecycle Assessment (LCA):** Develop tools to help industry make more robust and consistent decisions between packaging solutions.

Collaboration

Continue to convene stakeholders across the whole value chain focused on collective action, innovation and positive systemic change.

Get in touch at
sustainability@igd.com

Thank you

We would like to thank our invaluable stakeholders who have taken a complex issue, tackled it head on, and together continue to drive industry to reduce its impact on the environment and create positive change.

We would also like to thank our delivery partner at Anthesis Group.

Acknowledgements

We would like to acknowledge the industry stakeholders who contributed data, insights and feedback to this report:

Michael Archer, Customer Collaboration Director, Zero Waste World, CHEP

Talia Goldman, ESG Manager, Colpac Ltd

Laura Fernandez, Senior Packaging and Sustainability Manager, Ocado Retail Ltd

James Bull, Head of Packaging and Food Waste Strategies, Tesco

Valpak

Paula Chin, Senior Policy Adviser (Consumption) WWF-UK

Appendix

A1: Building the baseline

We used publicly available data and life cycle assessment principles to model the environmental impact of these complex supply chains. The results set the baseline for secondary and tertiary packaging.

Additional data was provided by industry stakeholders to supplement other data sources.

Packaging profile

- ▶ Valpak Packflow Covid-19 reports per material: paper / card, plastic and wood
- ▶ UK food and consumer goods packaging POM in tonnages
- ▶ Repartition of packaging per category and per packaging format

End of life supply chain

- ▶ Valpak Packflow Covid-19 reports per material
- ▶ UK Non-consumer packaging recycling rate
- ▶ Anthesis UK market assessment waste model for incineration and landfill rates
- ▶ Waste end markets

Sourcing supply chain

- ▶ 2020 WWF/Tesco Global Packaging Materials Footprint report and Valpak Packflow Covid-19 reports
- ▶ UK Consumer packaging demand composition: Domestic production, imports type and countries

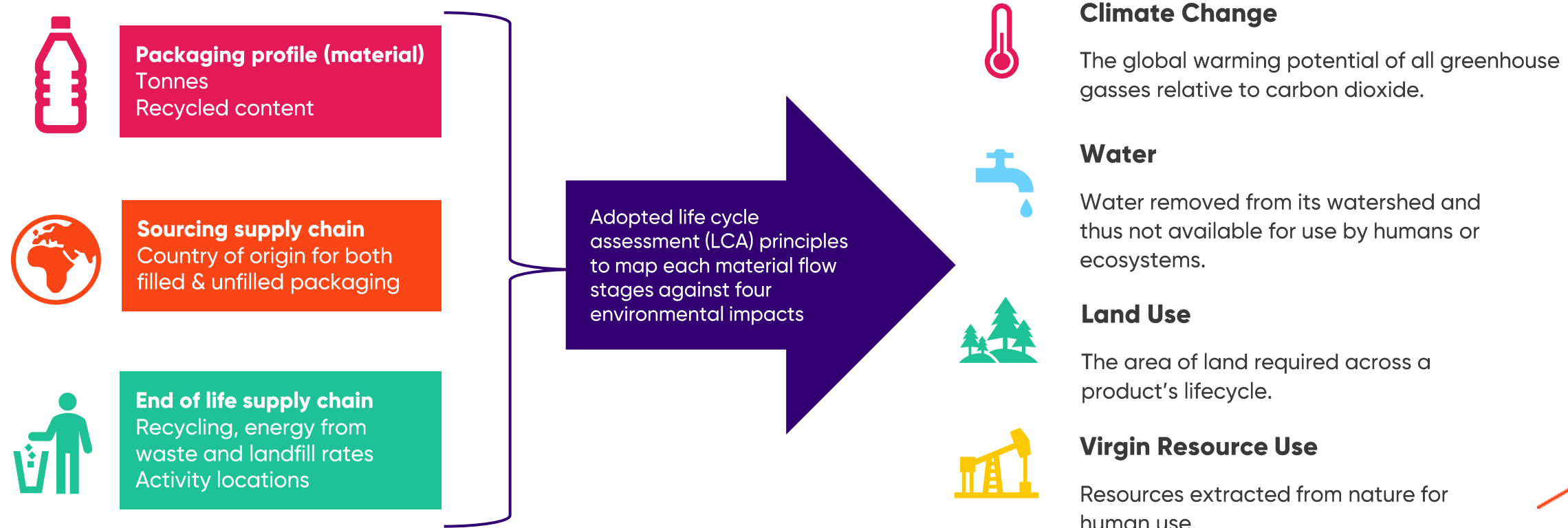
Environmental Impact Assessment

- ▶ Ecoinvent 3.6 database, 2019
- ▶ Applying LCA processes to the UK grocery secondary & tertiary packaging baseline (in tonnes)
- ▶ Packaging production and waste management impact calculation per material
- ▶ Including imports and exports impact

A2: Baseline caveats summary

Category	Elements	Material affected	Assumption used	Datapoint
Packaging profiles	Commercial & industrial packaging	Wood	Same as paper & card	99% of Non-consumer packaging POM
	Retail back of store packaging	Wood	Same as paper & card	32% of Non-consumer packaging POM
	Grocery packaging	Paper & Card	Same as plastic	68% of retail back of store packaging POM
		Wood	Same as plastic	
	Recycled content	Wood	No recycled content	0%
Sourcing supply chain	Sourcing countries	Paper & Card / Plastic	WWF - Tesco report is based on consumer packaging data.	N/A
		Wood	Valpak's PackFlow COVID-19 reports and Forest research UK statistics	
End of life supply chain	Exporting countries	Paper & Card/ Plastic/Wood	Valpak's PackFlow COVID-19 reports	N/A
	EfW rates	All	Anthesis UK market assessment waste model insights for EfW, RDF and Landfill proportions of residual waste after recycling	43%
	RDF rates	All		17%
	Landfill rates	All		40%
Reuse supply chain	Cycles/journey	Wood	Average based on Anthesis research and CHEP insights	25 cycles – 50 journeys (In/Out)
	Average distance per cycle	Wood	Average based on UK pallets lifetime journeys destinations based on CHEP insights	~ 220Km per cycled

A3: Assessment approach



A4: Scenarios assumptions summary

Element	Materials Affected	Baseline	BAU 2030	Max 2030
Annual sector growth	Plastic	N/A	1%	1%
	Paper & Card		1%	1%
	Wood		-	-
Recycled Content	Plastic	13%	30%	60%
	Paper & Card	73%	80%	80%
	Wood	0%	0%	0%
Recycling*	Plastic	68%	82%	90%
	Paper & Card	85%	85%	95%
	Wood	75%	85%	95%
Global Grid Decarbonisation	All	N/A	-19%	-41%
Transport Decarbonisation	Sea freight	N/A	-0.6%	-1.2%
	Road freight	N/A	-1.2%	-2.5%