CARBON
TRUST

A COMPARATIVE ANALYSIS

Carbon footprint of soft drinks packaging

December 2021

INTRODUCTION

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In 2020, the Carbon Trust was commissioned by Reuters to evaluate the environmental impact of one way / single use PET and aluminium beverage packaging. Coca-Cola Europacific Partners has funded an extension of this to enable a comparable modelling for glass and refillable packaging, and the creation of a report - Carbon footprint of soft drinks packaging: a comparative analysis which explores the carbon footprint of soft drinks packaging. It includes relative carbon footprint ranges of five different beverage packaging types (one way and returnable/refillable PET and glass bottles, and aluminium cans) including a view of a typical European pack.

Who we are

The Carbon Trust's mission is to accelerate the move to a decarbonised future.

We are a trusted, expert guide to Net Zero, bringing purpose led, vital expertise from the climate change frontline. We have been pioneering decarbonisation for more than 20 years for businesses, governments and organisations around the world.

We draw on the experience of over 300 experts internationally, accelerating progress and providing solutions to this existential crisis. We have supported over 3,000 organisations in 50 countries with their climate action planning, collaborating with 150+ partners in setting science-based targets, and supporting cities across 5 continents on the journey to Net Zero.

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Executive summary

Drinks packaging provides an essential service of transporting products to consumers. At the same time, it is a key driver for brand recognition and for many soft drinks the main contributor to the overall product carbon footprint. In the context of the wide-spread recognition of our climate emergency, beverage companies, along with most parts of society, are looking for ways to transition to a low-carbon economy.

With a number of very different competing packaging formats, this study wanted to look beyond the simple question of which packaging material has the lowest carbon footprint to consider the various factors affecting the carbon footprint of each alternative to establish the respective footprint ranges and establish the key drivers to reduce the carbon footprint for each pack type according to specific market circumstances. The Carbon Trust considered aluminium cans, single-use glass and PET bottles, as well as refillable glass and PET bottles within a European context. The key underlying drivers of their respective carbon footprints that were assessed include:

- The carbon intensity of the electricity used for primary aluminium production and packaging forming;
- Recycling rate at end-of-life;
- Recycled material content in packaging;
- Re-use rate for refillable packaging;
- Transport and distribution distances.

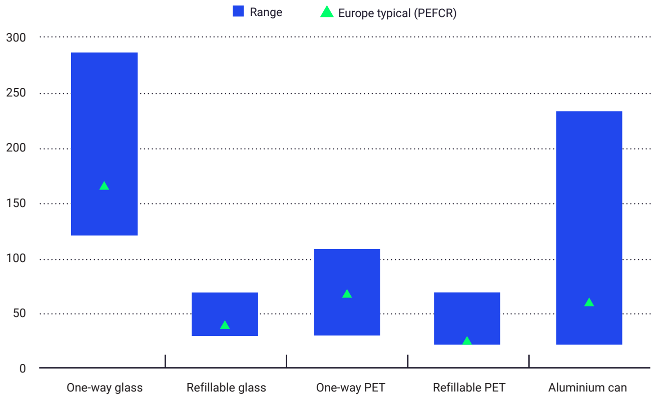
By running a range of scenarios with different values for each of the above parameters, a theoretical carbon footprint range was established for each packaging material, along with an indicative value for the European market. This study not only allows direct comparisons of the different materials to be made, but also points to the potential, and conditions required, for improvement in each respective carbon footprint.

Chart 1, presents a summary of the results, indicating that one-way glass clearly stands out as having the highest carbon footprint range. Although aluminium cans have a very wide potential carbon footprint range, the typical European scenario compares well to refillable bottles and single-use PET. The lowest end of the range for all formats, apart from one-way glass, are very similar.

Although today one-way PET seems to be slightly higher in indicative footprint than other formats (aluminium cans and refillables) in Europe, it also has the greatest carbon reduction potential from today's values, by using recycled content and improving recycling rates.

The refillable formats typically offer some carbon benefits over the one-way options, and can be further improved by reducing material weight whilst maintaining high reuse (trippage) rates.

Chart 1: Carbon footprint ranges of packaging alternatives (gCO₂e/330ml)



This study has shown that multiple soft drinks packaging formats can provide low carbon footprint options in a market that is increasingly accounting for and mitigating carbon impacts, whilst at the same time pointing to improvement opportunities in each case. To drive the lowest possible carbon footprint for each pack, circularity is needed: high collection and recycling rates must be achieved in order to deliver high levels of reuse of recyclate in new single use packs. For refillable packs, high return rates, multiple use cycles and low distances travelled between points of consumption and refill are fundamental. Beverage companies need to ensure, that their packaging is designed to be easily sorted and recycled/refilled– i.e. in a closed loop – to drive the optimal carbon outcome.

It is also clear, however, that in the longer term the industry will need to rely on more disruptive innovations that can deliver the functionality of current packaging solutions at a carbon cost below the ranges identified in this report in order to contribute to the overall move to a Net Zero society.

Aims and objectives

Acknowledgement of the climate crisis, accompanied by demand from customers and investors, is leading to a rapid response by businesses - many of which are setting ambitious carbon emissions reduction targets, increasingly encompassing their full value chain. This requires identification of key emissions hot spots in order to assess the scope for reduction opportunities. In the case of fast-moving consumer goods (FMCG), packaging is often a key hot spot. For soft drinks, packaging is typically the main contributor to the product's carbon footprint, i.e. the extent to which it contributes to climate change throughout its life. As such, environmental considerations, in general, and carbon impact and circularity, in particular, have become key considerations in the packaging design process.

One aspect of this environmental design focus is to optimise the size and weight required for the functional purpose of containing and protecting the product inside. The other significant impact is the choice of materials. Looking at carbonated soft drinks (CSDs), in particular, the common packaging formats are:

- Plastic (PET) bottles;
- Glass bottles;
- Aluminium cans.

The first two of these can either be one-way packaging or, in certain markets, refillable bottles.

The Carbon Trust has conducted a study to consider the relative merits of these alternative packaging solutions in terms of carbon emissions, considering a range of different options and constraints within different markets. The aim of this study is, therefore:

- To identify the potential range of carbon footprints of each packaging material.
- To understand which parameters are critical for action to reduce the carbon impact of different packaging types over time.

Assessment parameters

The carbon footprint of packaging is determined by a range of different parameters and circumstances, some of which are directly influenced by the brand or manufacturer, whereas others are driven by conditions in the market within which they operate. As a result, the same packaging material will not necessarily always provide the lowest carbon solution in all circumstances.

This study has looked at a number of levers that will impact the carbon footprint of different packaging solutions beyond the embodied carbon of the raw material production in order to determine their potential range and highlight the preferred solutions under a given set of circumstances. The parameters considered are:

- **Recycled content**: The amount of recycled material contained within the packaging. This can be within the control of the manufacturer, but may be limited by supply, technical or regulatory issues;
- **Recycling rate**: The percentage of the packaging being recycled at the end of life. This is determined by the inherent recyclability of the material, its economic value, the available infrastructure for collection and processing and consumer engagement, where collection routes are segregated, to ensure the right behaviour;
- **Return rate for refillable bottles**: Reusing bottles several times significantly cuts down on the embodied footprint of the bottles per use, compared to one-way bottles. This is at least partially offset by the return logistics and washing requirements prior to reuse. Here again, the consumer plays a crucial role in the process that cannot be taken for granted. Incentivisation and education are important elements in the success of such a scheme;
- **Transport of raw materials**: Local availability of the materials will affect the upstream transport distance. The mass of required material and, in particular, the distance between package forming and filling will determine the carbon intensity of the transport. The finished cans or bottles can only be packed at low density, meaning that any transport method will not be able to carry its maximum load mass, making the transport less efficient. As a result, PET bottle forming operations are often integrated with the filling process and can forming also tends to be located close to the filling site;

- **Distribution distance**: Similar to upstream transport, the distribution distance can also affect the relative carbon intensity of different packaging formats based on their weights. In addition, refillable packaging will have to travel the same distance in reverse for washing and refilling;

- **Electricity emissions factor**: The source of electricity (fossil fuels, nuclear, renewables, etc.) determines the carbon intensity of the electricity used to make the raw materials and convert them into packaging. As the electricity input into both of these process steps varies for the different materials, the electricity carbon intensity can have a material impact on the relative footprint of packaging solutions. Primary aluminium smelting, in particular, is a very electricity intensive process. The source electricity used for this process can, therefore, have a very significant impact on the final footprint of the can. In the scenarios considered in this study, it was assumed that the grid carbon intensity is the same for both the manufacturing and forming processes, which is often not the case.

The relative impacts of these parameters are considered through a range of different combinations in a number of scenarios. The parameters for the various scenarios are outlined in Tables 1, 2 and 3, below. The parameter values in each scenario were chosen to provide the range of results for a given condition of two parameters (e.g., high recycling rate, fossil grid).

Table 1: Parameters for One-way Packaging

	Less than half recycled, fossil power, low	Less than half recycled, fossil power, high	Very high recycling, fossil power, low	Very high recycling, fossil power, high	Medium recycling rate, renewable power, low	Medium recycling rate, renewable power, high	Very high recycling rate, renewable power, low	Very high recycling rate, renewable power, high	Very high recycling content and rate, low	Very high recycling content and rate, high
Recycled content	50%	0%	50%	50%	50%	0%	50%	0%	100%	80%
Recycling rate	50%	0%	100%	80%	60%	40%	100%	80%	100%	80%
Electricity carbon intensity ($kgCO_2e/kWh$)	0.6	0.9	0.6	0.9	0.1	0.25	0.1	0.25	0.1	0.9
Transport to filler (km)	100	200	100	200	100	200	100	200	100	200
Distribution distance (km)	50	200	50	200	50	200	50	200	50	200

The study defined five pairs of scenarios that represent the lower and upper range associated with particular characteristics of two impact levers (e.g. high recycling rate and low carbon electricity)

Table 2: Parameters for Glass Refillable Packaging

	High trip rate, low distance, high	High trip rate, low distance, low	High trip rate, long distance, high	High trip rate, long distance, low	Low trip rate, low distance, high	Low trip rate, low distance, low	Low trip rate, long distance, high	Low trip rate, long distance, low	High carbon grid, long distance, high	High carbon grid, long distance, low
Recycled content	40%	70%	40%	70%	40%	70%	40%	70%	40%	70%
Recycling rate	94%	95%	94%	95%	88%	92%	88%	92%	90%	95%
Electricity carbon intensity (kgCO$_2$e/kWh)	0.9	0.1	0.9	0.1	0.9	0.1	0.9	0.1	0.9	0.9
Transport to filler (km)	80	80	200	200	80	80	200	200	200	200
Distribution distance (km)	250	50	250	50	250	50	250	50	250	250
Return rate	18	22	18	22	8	12	8	12	10	20

Table 3: Parameters for Plastic Refillable Packaging

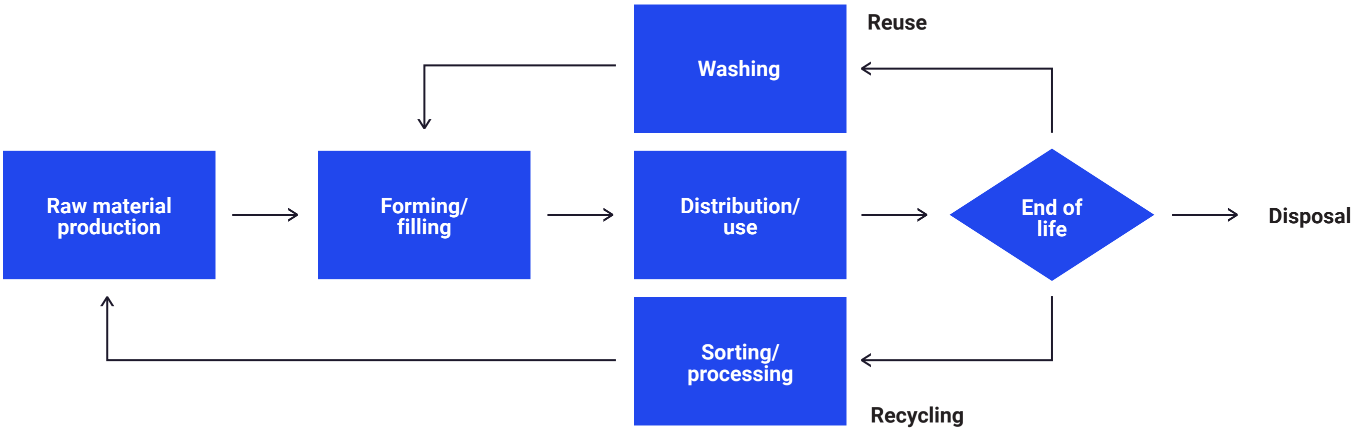
	High trip rate, renewable power, high	High trip rate, renewable power, low	High trip rate, fossil power, high	High trip rate, fossil power, low	Low trip rate, renewable power, high	Low trip rate, renewable power, low	Low trip rate, fossil power, high	Low trip rate, fossil power, low	Fossil power, long distance, high	Fossil power, long distance, low
Recycled content	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Recycling rate	92%	94%	92%	94%	75%	83%	75%	83%	80%	93%
Electricity carbon intensity (kgCO$_2$e/kWh)	0.25	0.1	0.9	0.6	0.25	0.1	0.9	0.6	0.9	0.9
Transport to filler (km)	200	80	200	80	200	80	200	80	200	200
Distribution distance (km)	250	50	250	50	250	50	250	50	250	250
Number of trips	13	17	13	17	4	6	4	6	5	15

Scope, boundaries and methodology

The effects of the above-mentioned levers are examined within a full cradle-to-grave boundary, as outlined in Figure 1, below. Once the packaging becomes an integral component of the final product, during distribution and use-phase, the marginal impact of the packaging component is still included within this boundary. The only aspect affected by this is the distribution, where the transport emissions associated with the weight of the packaging is taken into account. Any relative impact on energy requirements for refrigeration resulting from different packaging has been disregarded in this study. Secondary and tertiary packaging is also excluded from the analysis, since each packaging type assessed can be combined with a range of different outer packaging options.

The most challenging and often contentious boundary consideration applies to the treatment of recycling of materials. As the term cradle-to-grave indicates, life-cycle assessments are particularly geared towards taking a linear view of material flows ending up with disposal. As recycled materials are typically lower carbon than their primary equivalents due to reduced processing energy requirements, there is a question of how best to account for the circular nature of the material flow in the carbon footprint calculation.

Figure 1: Lifecycle stages of carbonated soft drinks (CSD) packaging



The most obvious approach would seem to consider the carbon footprint of the input materials, which would therefore give a benefit to any products using recycled materials in their production. However, for many commodity materials, such as metals and glass, the characteristics of the recycled material are identical to those of the virgin equivalent and processing costs are lower. This drives an inherent preference for recycled over virgin material and its use is limited by available supply. As LCA is a tool to drive decision-making towards sustainable choices, the argument here would be to recognise the benefits of products that are both recyclable and actually recycled. In this case, the carbon benefits of recycling are attributed to a product on the basis of its end-of-life recycling rates.

These two recycling allocation methods are often referred to as 100:0, i.e. all the benefits are accounted based on recyclate input, and 0:100, where all benefits are based on the end-of-life recycling rate. More recently, the European Commission has developed some Product Environmental Footprint Category Rules (PEFCR) defining appropriate recycling allocation methods for different materials. As part of this, a more nuanced approach has been defined, which allocates part of the benefits to both input and output. The proportion to which these are allocated varies by material type, based upon the balance between supply and demand for recyclate. For most materials, including glass and aluminium, this ratio has been set at 20:80 with some papers and all plastics at 50:50.

In recognition of the fact that the choice of recycling allocation methodology is ultimately an accounting convention to measure the overall benefit of recycling, this study has considered a range of methodologies in order to determine to what extent this impacts on the relative carbon footprints of the different packaging options. The PET bottles were modelled based on a 50:50 allocation methodology whereas glass and aluminium were assessed against 20:80, as per the PEFCR. All single-use formats were then also analysed on the basis of the alternative methodology (20:80 for plastic and 50:50 for glass and aluminium) to see if this materially affects the conclusions.

For comparison purposes, a uniform packaging size of 330ml was considered. Since 330ml PET bottles are not common, 500ml PET bottles were also assessed. The weight of the packaging is obviously also a key determinant of its carbon footprint, but this was not chosen as a parameter, as the impact of the material input can be linearly scaled to the weight of the packaging. In contrast, the weight ratio between packaging and liquid content is not linear and larger containers require less packaging per litre of product. The packaging weights used in this study are representative values for each type, based on a 330ml volume.

Aluminium cans

Primary aluminium is produced through electrolysis of alumina, obtained from bauxite. This is a very energy intensive process, requiring large amounts of electricity. As a result, the carbon footprint of primary aluminium is, to a large extent, determined by the carbon intensity of the electricity generation used for smelting and can vary in the range of 4 - 20 kgCO_2e/kg. Much of the primary aluminium produced (and consumed) in Europe is produced with renewable energy, most typically hydro power, thus sitting at the lower end of the range, on average. For specific products, the source of primary aluminium remains of critical importance.

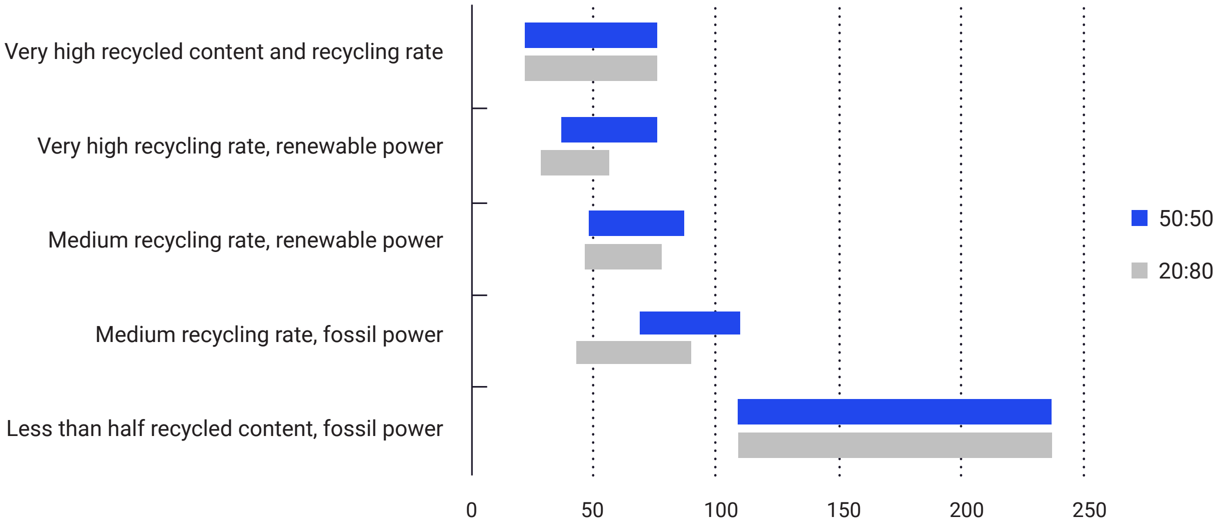
On the other hand, aluminium can be infinitely recycled without loss of quality. Remelting aluminium takes 95 percent less energy compared to primary aluminium, resulting in significantly lower carbon emissions. Due to the high economic value of used beverage cans and the associated environmental benefits of aluminium recycling, recycling rates for drink cans are high across Europe (75% in 2019). Another advantage of aluminium is its high strength, meaning that the cans can be relatively lightweight, reducing both the material input and transport impact.

The transport component, in common with all one-way formats, is only a minor contributor to the overall footprint, contributing less than 1%, in the scenarios assessed.

The largest contributor in all scenarios, is the aluminium material, followed by the can manufacturing. Disposal impacts are negligible. The overall carbon footprint per 330ml can varies between 22 gCO_2e and 239 gCO_2e, as indicated in Chart 2, below.

As a result of the dominance of the raw material on the overall footprint, scenarios with low-carbon electricity in the aluminium smelting or with a high recycling rate sit towards the lower end of the range, whereas the combination of fossil power sources and low recycling rates push the footprint up quite significantly.

Chart 2: Carbon Impact per 330ml aluminium can (gCO_2e) (20:80 is default recycling allocation approach)



The primary aluminium on the European market is not exclusively produced in Europe, which is reflected in a slightly higher carbon footprint. Nevertheless, the typical footprint of a European aluminium can lies towards the lower end of the range at around 60 gCO_2e.

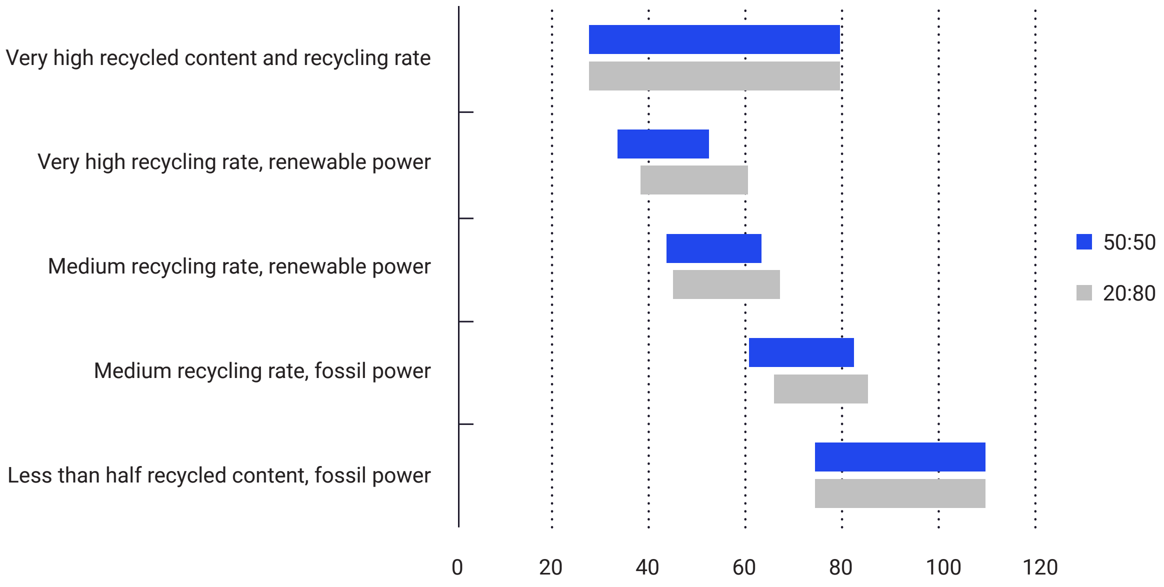
The 20:80 recycling allocation methodology recommended by the European Commission's Product Environmental Footprint project means that even a can with 100% primary aluminium from a source using fossil-based electricity will have a relatively low carbon footprint in a market with a high recycling rate. Using a 50:50 allocation for recycling will only materially change the results where there is a large discrepancy between recycled content and recycling rate and a high-carbon power grid. Recycled aluminium represents around 47% of total European aluminium can sheet production, below the approximately 75% of end-of-life recycling for aluminium cans. Using the 50:50 approach, rather than 20:80, would therefore result in a slightly higher footprint by around 15%.

PET bottles

For PET bottles, the stretch blow moulding process of forming the bottles is relatively energy intensive, so the carbon intensity of the electricity used in this process drives variability of the footprint more than the recycled content or recycling rate. Depending on the scenario, however, either the raw material input or the forming can be the most significant contributor to the footprint ranging between 27gCO_2e and 109 gCO_2e in our scenarios.

Recycling infrastructure and technology for PET has improved significantly over the last few years, meaning that 100% recycled PET (rPET) bottles are now seen on the market. Nevertheless, the average recycled content of PET bottles is still relatively low at 11%. One reason for this is that recycled and virgin material cannot be routinely combined and treated identically, in the same way as is the case for glass and aluminium. Recycling rates for PET in Europe are getting towards, and in some cases exceeding, 50%. This is still lower than rates for glass and aluminium. The PEFCR allocation rule of 50:50 for plastic gives equal weight to the importance for companies to use more recycled content as well as to drive recycling rates for PET. If PET were to use to use a 20:80 accounting allocation, it would result in a reduction in the carbon footprint of 11% for a 100% rPET bottle in the UK.

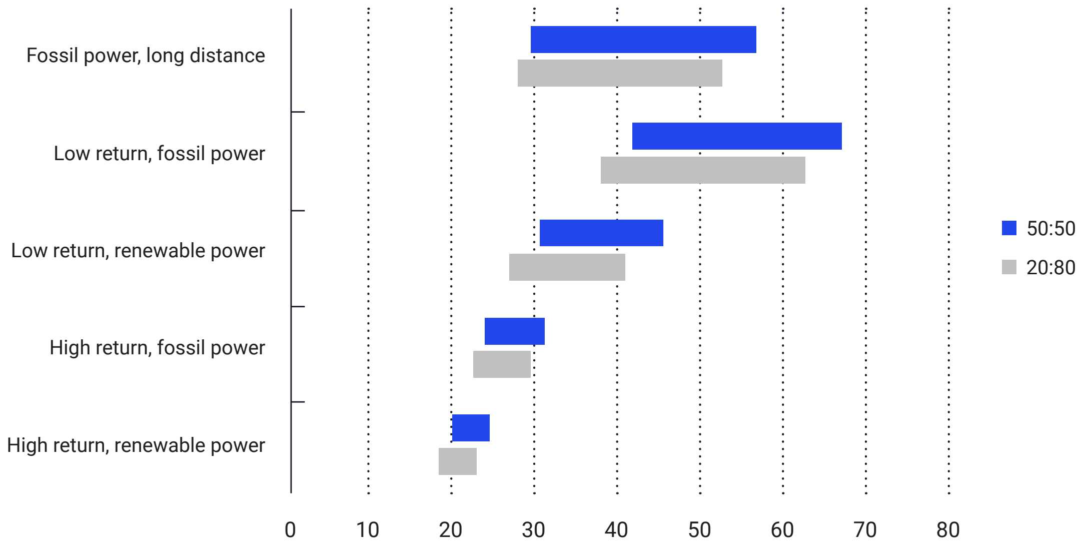
Chart 3: Carbon Impact per 330ml one-way PET bottle (gCO₂e) (50:50 is default recycling allocation approach)



A number of European markets have a deposit-return scheme for refillable PET bottles. The bottles used for these schemes tend to be significantly heavier to withstand the multiple use cycles and also use lower or no recycled content, which leads to them having a higher carbon footprint. This is normally amply compensated by the number of refills per bottle, resulting in a footprint of between 20 and 67 gCO₂e per use. Nevertheless, the PET material is the single largest contributor to the footprint in all scenarios analysed, ranging from 49% to over 81% of the footprint.

A low number of refills obviously inflates the footprint per use. The carbon intensity of the electricity grid affects the blow moulding, which is the second largest contributor. Transport still continues to be a minor though not insignificant contributor despite the additional step of return logistics. In the scenarios analysed, transport contributes no more than 8% of the overall footprint at a 250km average distribution distance. More centralised operations may see greater transport distances and a share of emissions from transport to rival blow moulding and washing.

Chart 4: Carbon Impact per use of 330ml refillable PET bottle (gCO₂e) (50:50 is default recycling allocation approach)



Glass bottles

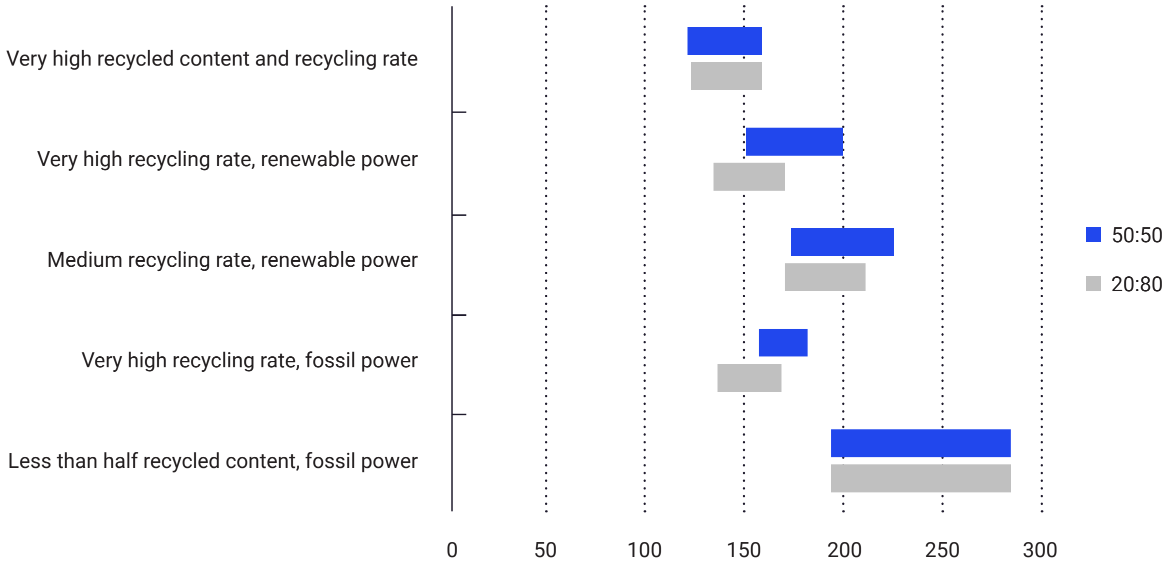
Glass has the lowest carbon footprint per gram of the three materials. However, per package, it is also by far the heaviest with a one-way 330ml bottle weighing around 180 grams. That is why glass bottles have the largest carbon footprint of the packaging formats analysed at between 121 and 285 gCO_2e for single-use bottles. There is also no need to take a secondary forming process into account, as this is integrated into the glass-making process. With transport and end-of-life disposal only contributing less than 5% to the overall footprint, the key driver is the recycling rate and, to a lesser extent due to the accounting rules, the recycled content. A certain percentage of cullet (broken glass) is always mixed in with the raw ingredients going into the kiln, as this improves the overall efficiency of the process.

This is why glass has a 20:80 recycling allocation, as the limitation tends to be availability of colour-segregated cullet, suitable for recycling back into bottles.

As for aluminium, an assessment based on 50:50 recycling allocation only has a material impact in scenarios where recycled content is far lower than the recycling rate and it can, potentially push the upper boundary, slightly. On the whole, however, it has relatively little impact on the conclusions of the comparative analysis.

The carbon intensity of the electricity is less of a factor for glass bottles, as their production is more reliant on thermal energy, mostly from natural gas.

Chart 5: Carbon Impact per 330ml one-way glass bottle (gCO_2e/330ml) (20:80 is default recycling allocation approach)



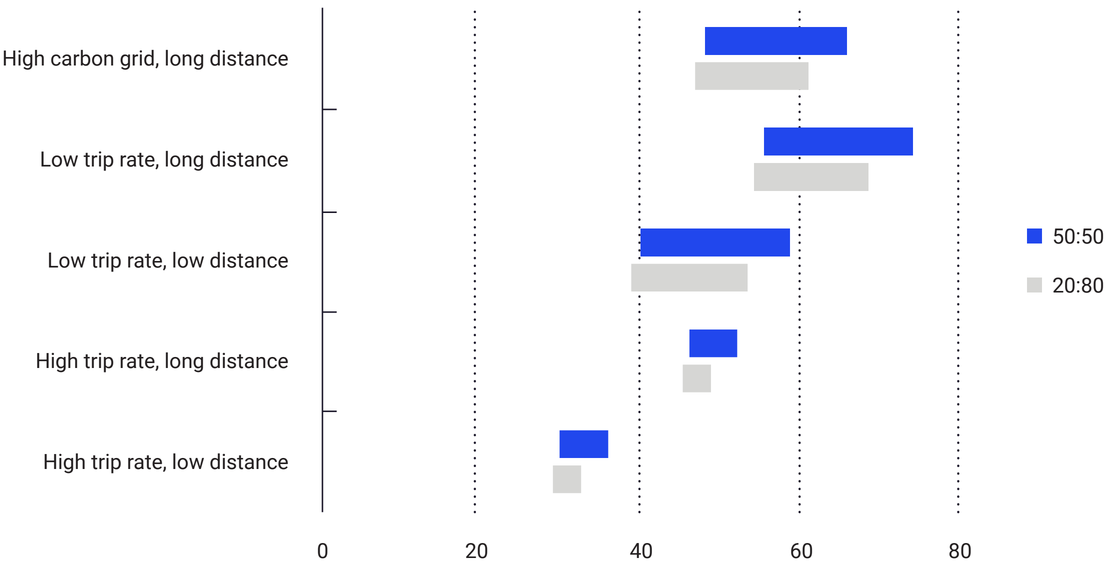
As for plastic bottles, there is an established market for refillable glass bottles in some countries. Again, refillable bottles are up to twice the weight of the equivalent single-use bottle and the glass remains the main contributor to the footprint. The results presented here are based on a 330ml bottle weight of 380g, resulting in a footprint range between 29 and 68 gCO_2e per use. Bottles that are closer to the weight of a single-use bottle can reduce their footprint by up to a third per use.

In comparison to PET bottles, the average trip rate tends to be significantly higher. This is because glass scratches less easily and can withstand more washing and use cycles without impact on its appearance. This puts the embodied carbon per use firmly within the range of other packaging materials.

The additional weight of the glass also means that this is the only format where transport can become a significant contributor to the final footprint. In the most extreme scenario, this contributed up to 44% of the footprint at an average distribution distance of 250km.

As a result, the average distribution and return distances need to be taken into account when considering the viability of a glass return and refill scheme.

Chart 6: Carbon Impact per use of 330ml refillable glass bottle (gCO_2e/330 ml) (20:80 is default recycling allocation approach)



Conclusions

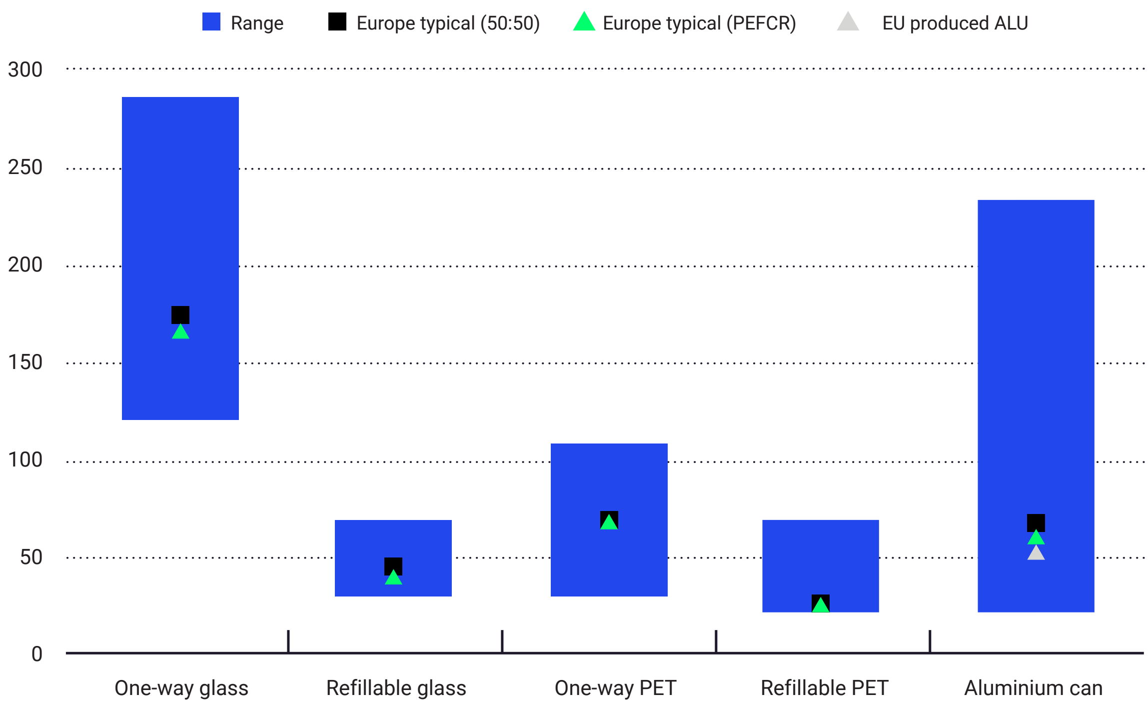
By considering the drivers underlying the carbon footprint of different packaging solutions for carbonated soft drinks, this study has sought to enable informed decision making based on materials, specific supply chain considerations and prevailing market conditions. It also shines a light on some key initiatives that will drive improvements in the longer term.

Considering the spread in the potential carbon footprint of different packaging solutions, shown in Chart 7, below, the one clear conclusion is that there is no realistic scope for single-use glass as a low-carbon packaging option without a significant, longer-term switch to alternative non-fossil fuels in the glass-making process.

All four other options considered in this study, on the other hand, have significant overlap in their ranges with a relatively similar lower limit. Whilst aluminium cans have the largest potential range, the relevant factors in the production of aluminium in Europe (in particular, low carbon electricity) indicate that in some circumstances it could present as one of the lowest carbon options, particularly where return and refill schemes for glass or plastic bottles are not available.

Nevertheless, the source of primary aluminium is of critical importance, as this can significantly affect the result, even where recycling rates are relatively high. This is illustrated by the two triangles in the aluminium column in Chart 7. The two triangles both indicate the position with current average recycling rates and transport distances, with the only difference being that the lower value represents the carbon intensity for aluminium produced in the EU and EFTA, whereas the higher value reflects the market average use of primary aluminium including imports from other regions.

Chart 7: Carbon footprint ranges of packaging alternatives (gCO2e/330ml)



The analysis of one-way PET suggests that there is still significant opportunity for reducing the carbon footprint within the identified range. This mainly comes from increasing recycling rates and recycled content, although reduced grid electricity carbon intensity will result in meaningful reductions in greenhouse gas emissions from the blow moulding process. The use of bioPET (PET from renewable sources) has not been considered in this study and could provide further carbon reductions over time, depending on biomaterial sources and processing technologies.

The key criteria that drive refillable PET and refillable glass bottles towards the lower end of their ranges are an effective collection system with high reuse rates. In the case of glass, particularly, the average distribution distance is also an important factor to consider and highly centralised bottling operations are less suited to refill schemes. The introduction of return schemes in new markets is likely to require significant consumer education and engagement to achieve the return rates needed to generate significant carbon savings over one-way PET bottles or aluminium cans, but can bring additional benefits in terms of resource use and circularity.

Chart 7 also shows how the typical European value changes when applying different allocation methods for recycling. The green triangles apply the relevant Product Environmental Footprint Category Rules (PEFCR) (50:50 for plastic, 20:80 for the others), whereas the black squares use 50:50 across the board. Aluminium cans see the highest percentage change at just under 15% increase.

The carbon footprint is, however, not the only consideration in consumers' perception of the sustainability credentials of the different alternatives. With concerns such as impacts of littering on wildlife and human health, there is a growing focus on packaging leaking into the environment that makes circular strategies increasingly relevant in their own right. On this front, although recent public focus has been on single-use plastic, other single-use packaging types are also likely to face increased scrutiny over time. It may also mean that new deposit return schemes – both for recycling and for reuse - will, in fact, be more readily embraced.

It must be noted that the footprint ranges presented here as the extremes are not static in themselves, and as part of the overall decarbonisation efforts of society there is ongoing development and innovation in the processes and materials, from using green fuels and electricity for heavy industrial processes to the development of affordable, sustainable bio-PET sources. Progress of these developments may change the relative balance presented in this report.

Appendices

Appendix A - Further results

The below charts present a breakdown of each scenario by emissions source.

Chart 8: Aluminium can carbon emissions by lifecycle stage ($gCO_2e/330ml$)

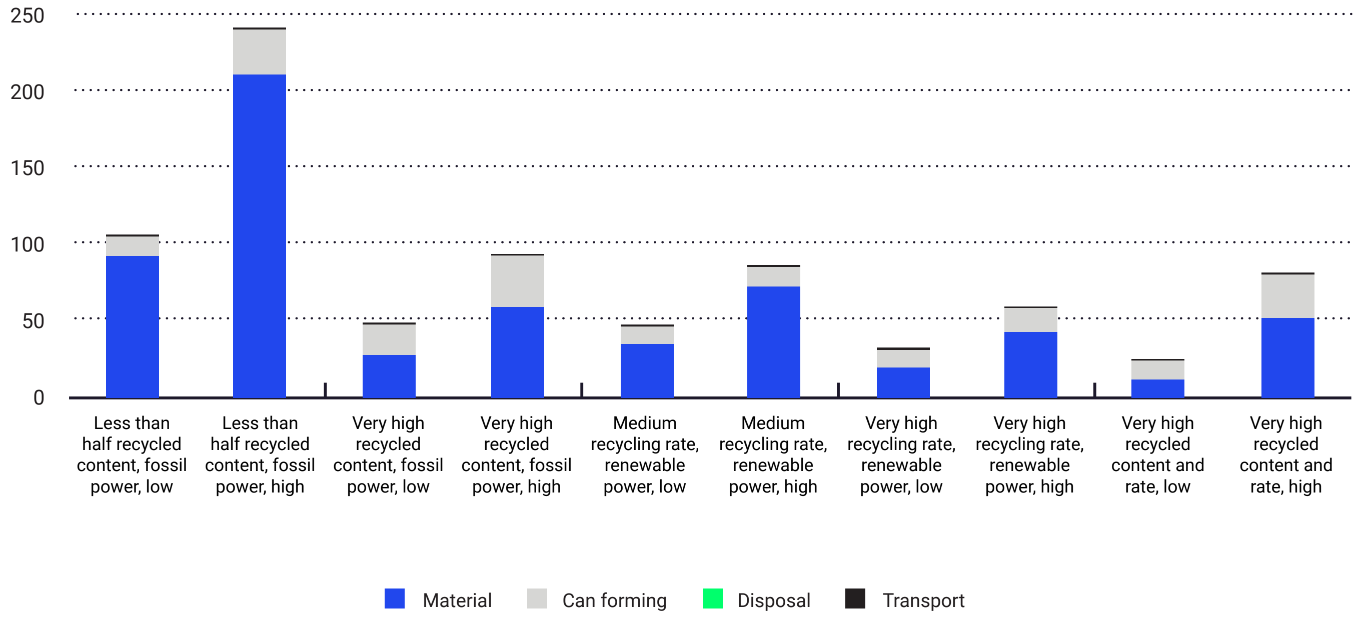


Chart 9: One-way PET bottle carbon emissions by lifecycle stage ($gCO_2e/330ml$)

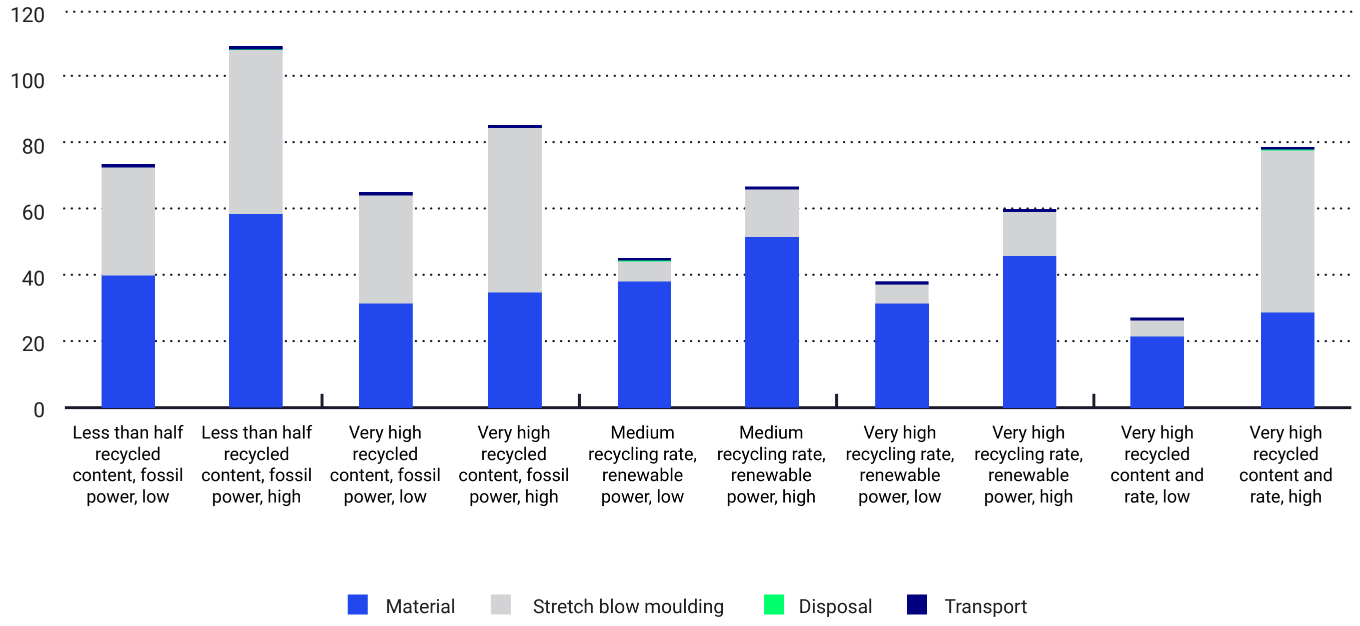


Chart 10: Refillable PET bottle carbon emissions by lifecycle stage (gCO₂e/330ml)

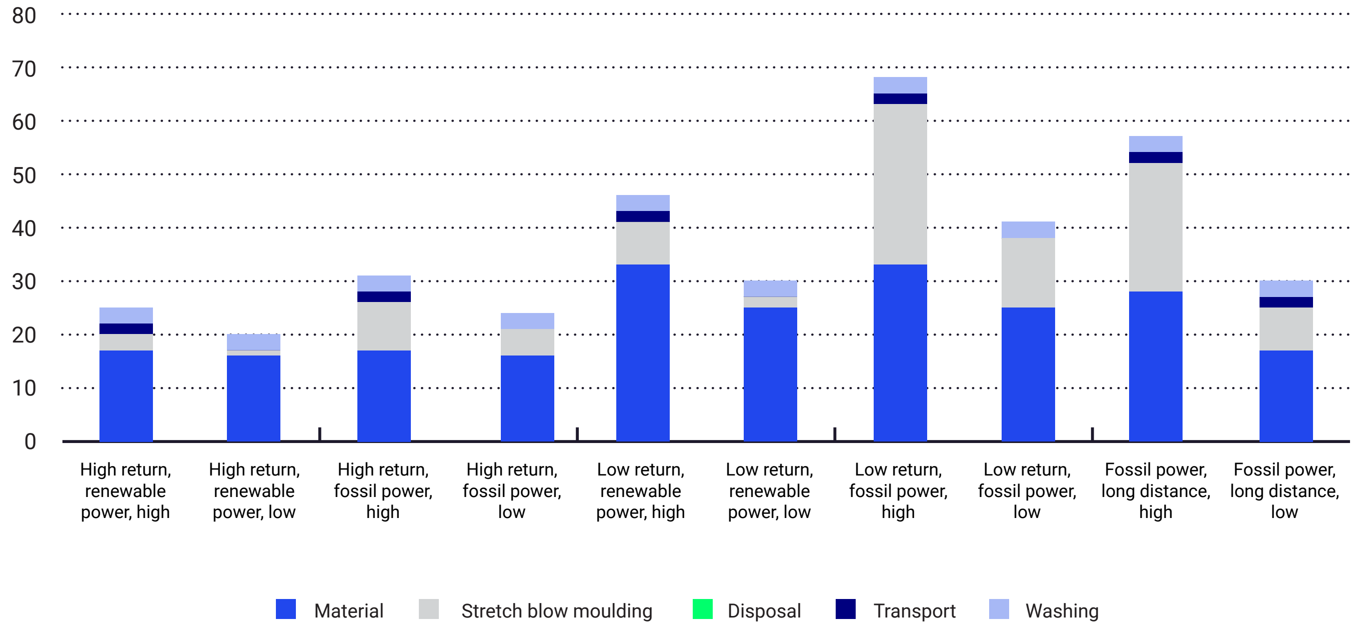


Chart 11: One-way glass bottle carbon emissions by lifecycle stage (gCO₂e/330ml)

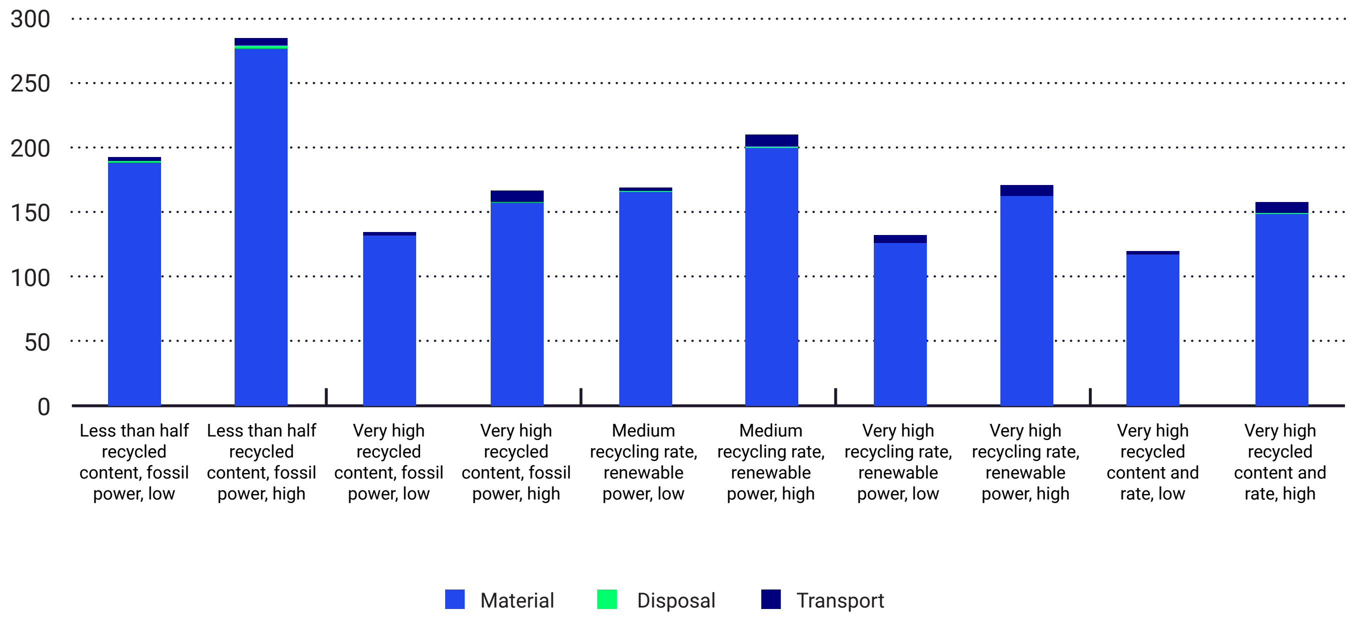
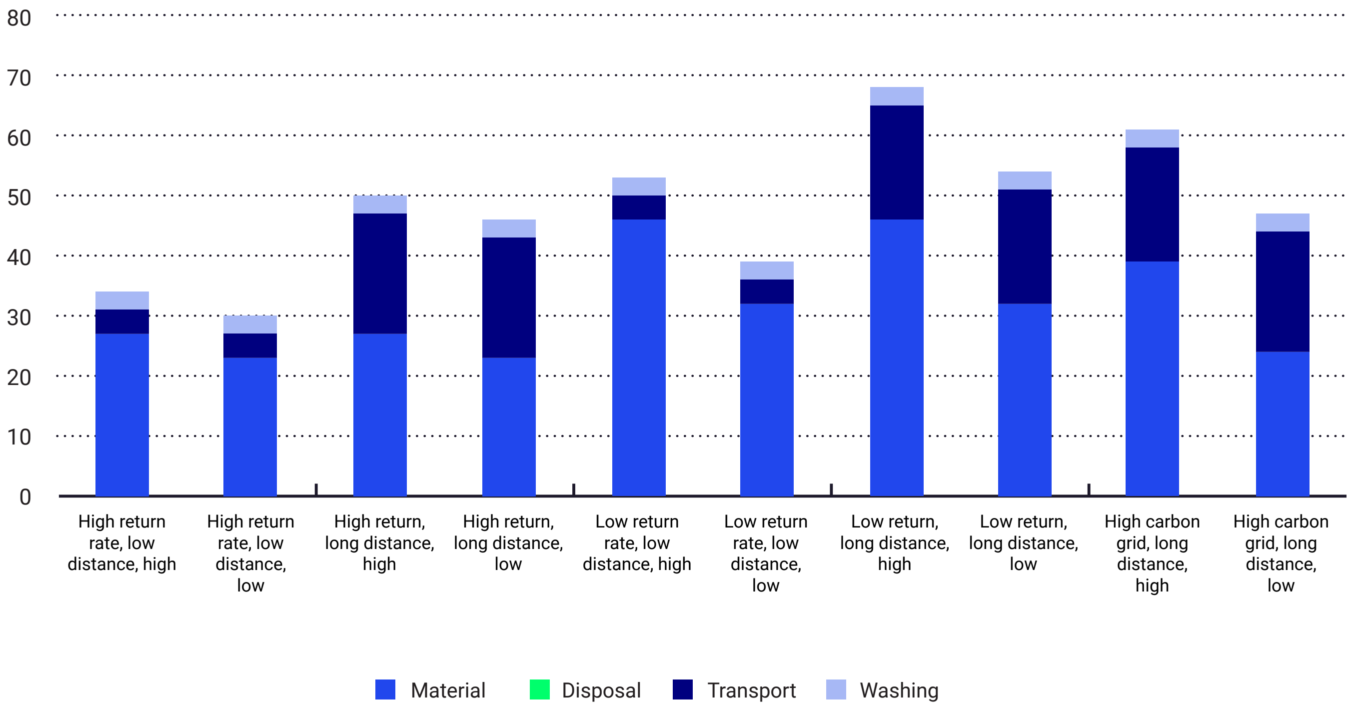


Chart 12: Refillable glass bottles carbon emissions per lifecycle stage (gCO₂e/330ml)



Appendix B – Typical European values

Table 4: Typical European values

	Aluminium Can	One-way PET	Refillable PET	One-way Glass	Refillable Glass
Recycled Content	47%	11%	11%	41%	41%
Recycling rate	74.5%	41%	41%	76%	76%
Weight (g)	12	21.5	52	190	380
Transport to retailer (km)	134.5	134.5	134.5	134.5	134.5

CARBON TRUST

carbontrust.com

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The Carbon Trust is a company limited by guarantee and registered in England and Wales under Company number 4190230 with its Registered Office at: 4th Floor, Dorset House, 27-45 Stamford Street, London SE1 9NT.

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