

Key Issue 2: Containers Included in the CDS

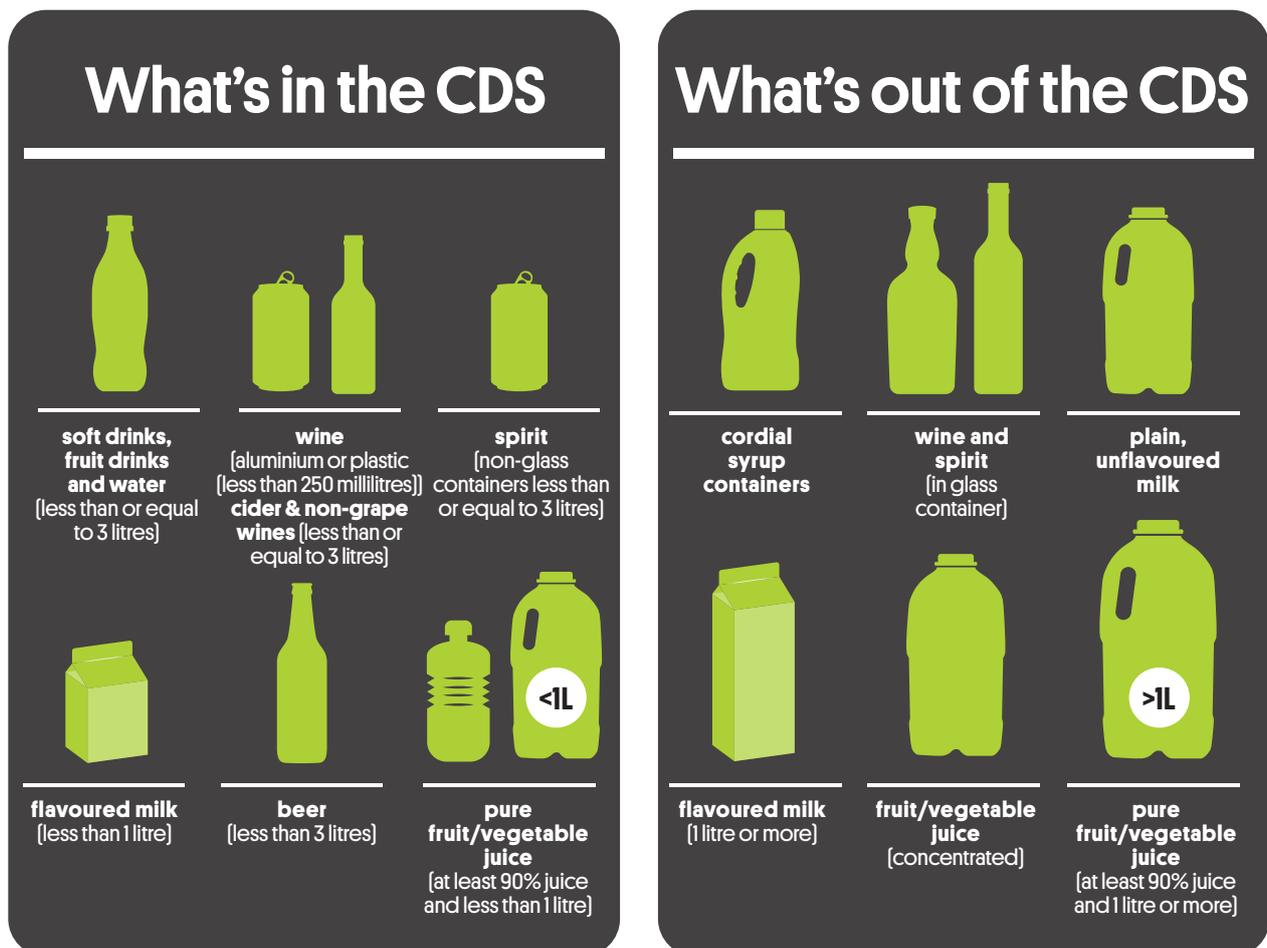
Beverage containers included in the South Australian CDS are specified within Part 8, Division 2 ('Beverage Containers') of the [EP Act](#) and [Part 4 of the Environment Protection Regulations 2009](#). Appendix 2 lists the categories of containers included and excluded from the CDS. Included containers require approval prior to being sold in SA and are required to carry the refund marking and have in place a waste management arrangement for their collection and return for recycling. The currently excluded containers and matching beverages are:

- plain milk in any container
- wine (made from the fermentation of grapes) in glass bottles, plastic containers and sachets (250 ml or greater), or aseptic packs/casks (1 litre or more)

- spirituous liquor in glass bottles
- pure fruit/vegetable juice (90% or more juice content) in containers of 1 litre or more
- flavoured milk in containers of 1 litre or more
- concentrated fruit and/or vegetable juice
- health tonic
- cordial syrup
- any beverages in containers greater than 3 litres.

Figure 5 illustrates examples of how the container volume and beverage type influence the containers that are in and out of the CDS. Containers are currently excluded on the basis of not being a major contributor to litter or are considered beverages that contribute to nutrition, that is, plain milk or pure fruit and/or vegetable juice.

Figure 5—What's in, What's out of the CDS



Scoping Paper feedback: Scope of containers included in the CDS

Feedback from the community and sector stakeholders recognises that the current scope of beverage containers assists in reducing litter, thereby supporting resource recovery and recycling, and diversion of resources from landfill. However, the current scope of the CDS was viewed as inconsistent, confusing to the community and needs to be reviewed in line with the principles of a circular economy and support local resource recovery investment. Key views expressed related to the following:

- In order to reduce confusion, a simplified scope should be employed, which would include within the CDS currently excluded beverage containers.
- More types of beverage containers should be included in the CDS. The most frequently mentioned items for inclusion were glass wine/spirit bottles.
- Those against the inclusion of additional containers were primarily concerned about financial impacts on beverage producers.
- In order to align with other jurisdictions and to address the disproportionate cost associated with smaller beverage containers, containers less than 150 millilitres should be removed from the current CDS.
- A revision of the scope of containers should also consider the resource recovery capabilities and value of the recyclable material market for beverage container materials.

Review of the CDS scope to support a circular economy

Historically, the categories of containers included in the CDS were focused on those commonly found in litter. This approach has resulted in container size, beverage type and whether containers are typically consumed at home as being the basis of the CDS scope. This has caused confusion around what's in and what's out, for

instance, a container of fruit and/or vegetable juice (less than 1 litre and containing at least 90% juice) is included in the CDS, but a similar container of concentrated fruit and/or vegetable juice intended for dilution is not included. Similarly, wine produced from fermented grapes in glass is not included, yet rice wines, fruit wines and ciders in glass are included. Over time, and with the expansion of the beverage product range, the level of confusion has increased for consumers, beverage producers and suppliers, scheme coordinators and depot container sorters.

A recent review of the Northern Territory CDS²⁶ made 21 recommendations about operational improvements and measures to ensure that the NT CDS meets the objectives under the relevant legislation. These included:

Recommendation 1: Consider the rationale and approach to excluding beverages and exempting containers from the scheme in order to ensure a well-defined, clear and consistent scope, which is aligned to all key objectives of the CDS.

Recommendation 2: Determine the feasibility of including additional containers as regulated containers, considering specifically wine/spirituous liquor containers and milk bottles as well as excluded beverages and exempt containers where a similar container is currently a regulated container.

One objective of this review is to make changes that will address the confusion about scope, as well as identify beverage containers where a benefit would be gained from their inclusion in the CDS, including ensuring stronger extended producer responsibility and circular economy objectives for the CDS.

Recovery of CDS containers

South Australian consumers typically discard empty beverage containers through CDS depots, at the kerbside or through commercial waste collection systems. The EPA receives CDS container sale and disposal data in order to monitor and report on the performance of the CDS. From this, it was found that

²⁶ Department of Environment and Natural Resources 2018, *Evaluation of the operation of the Northern Territory container deposit scheme*, https://ntepa.nt.gov.au/_data/assets/pdf_file/0011/590798/cds_review_report_ernst_young.pdf.

in 2019-20 over 605 million CDS beverage containers [40,354 tonnes] were returned to the CDS for a refund, but data on the number and types of containers disposed of through the kerbside collection is not readily available. Therefore, the EPA commissioned an audit of containers disposed of to the kerbside co-mingled recyclables bin and waste bins to better understand the container disposal habits of SA households²⁷. The CDS container return data [2019-20], kerbside bin audit, Recycling Activity Survey [2018-19]²⁸ and consultation with industry were used to develop an inventory of the beverage containers disposed of to the kerbside system in SA.

Based upon the inventory, it is estimated that approximately 276 million CDS and non-CDS beverage containers [47,563 tonnes] are placed in the kerbside co-mingled recyclables and waste bins in SA each year. The majority of these containers [211 million or 39,904 tonnes] were located in the co-mingled bin with the remainder [65 million or 7,659 tonnes] disposed of in the waste bin destined for landfill [see Figures 6 and 7]. By number, glass and plastic beverage containers were the most frequently identified container material types placed in the kerbside bin system, that is, over 124 million glass and over 96 million plastic containers [see Figure 8]. Of these, around 46 million [48%] were identified as plain milk HDPE containers [currently excluded from the CDS] located in the co-mingled recyclables bin.

By weight, beverage containers accounted for around 22% of the total content of kerbside co-mingled bins and 2.4% of the waste bin each week. Of the total beverage containers discarded to the kerbside system each year, the dominant [89%] beverage container material by weight was glass at 42,049 tonnes [as shown in Figure 9]. Of this glass, approximately 20,342 tonnes [43%] was attributed to wine, 11,494 tonnes [24%] to non-alcoholic drinks, 7,044 tonnes [15%] to CDS-eligible containers and 3,169 tonnes [7%] to spirit containers²⁹. The kerbside audit

reported that, measured against all of the materials within the co-mingled bin, wine and spirit containers, alone, comprise on average 13% of that weight per week. The weight of the wine and spirit bottles differed by council area and ranged from 8%-17%.

The costs of the collection and recovery of CDS containers through the depots is fully funded by the participating beverage producers and suppliers based upon the number of eligible beverage containers sold and returned in SA. However, local councils pay for the collection, transport, recovery and disposal of the contents of the kerbside system on a per tonne basis. In cases where beverage producers and suppliers do not participate in the CDS and allow others to cover the costs of container collection and recovery from the kerbside collection system, commonly referred to as the 'free-rider' effect in product stewardship schemes, the benefits they acquire can be significant given the volumes and weight of these beverage containers.

27 SA EPA - CDS Review: Kerbside Household Bin Audit Report June 2020, Rawtec 2020, https://www.epa.sa.gov.au/files/15058_cds_kerbsite_bin_audit_report_jun2020.pdf.

28 Green Industries SA 2020, *South Australia's recycling activity survey 2018-19 report*, https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKewjBjch7-8ryAhVAzTgGHZ-cCZYQFnoECAIQAQ&url=https%3A%2F%2Fwww.greenindustries.sa.gov.au%2Fdocuments%2FGISA_RAS%2520Report%25202018-19_final%255B1%255D.pdf%3Fdownloadable%3D1&usq=AOVvaw08x4-QKpgvtSnU4sPQN_st.

29 Hudson Howell 2020, South Australian Environment Protection Authority, Container Deposit Scheme Economic Analysis Review December 2020, https://www.epa.sa.gov.au/files/15056_cds_econanalysis_review_report_dec2020.pdf.

Figure 6—Total beverage container extrapolated number of items per annum disposed of in the kerbside waste bin and co-mingled recyclables bin [Hudson Howells, 2020].

Total Beverage Containers Kerbside & CDS (millions per annum)

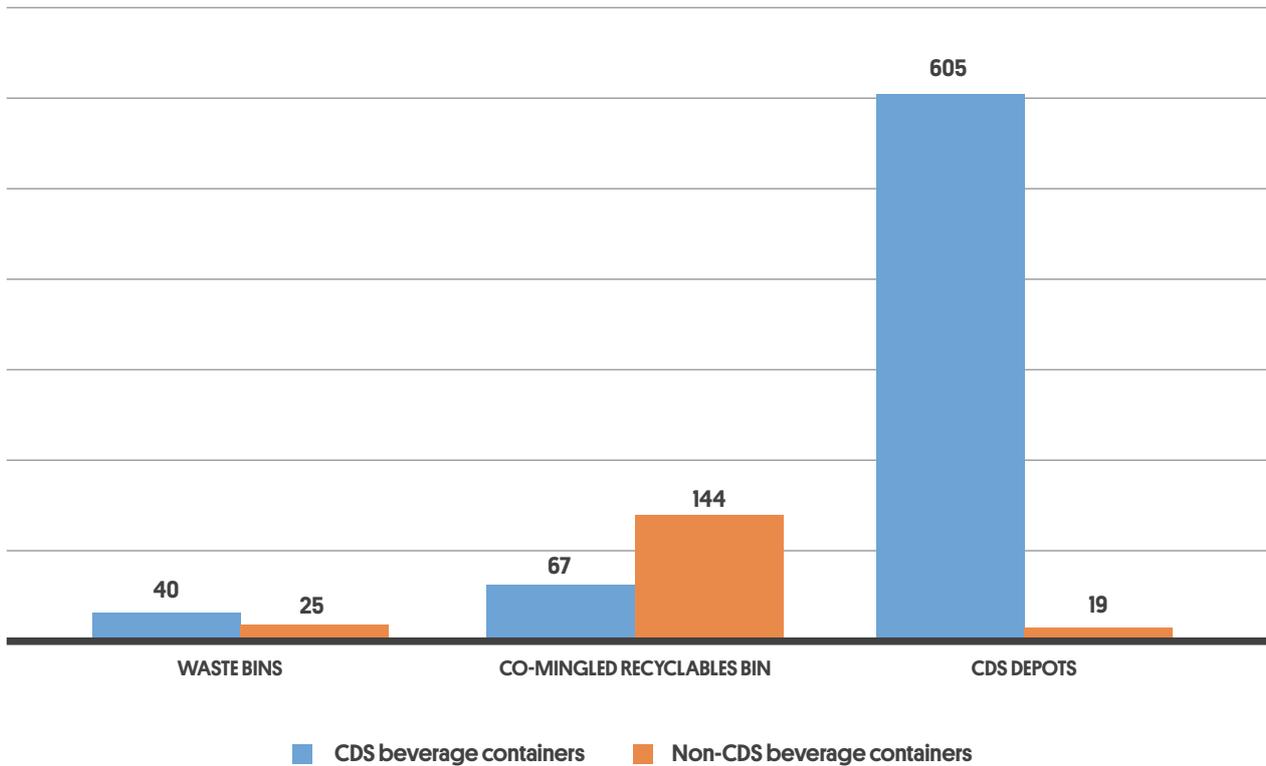


Figure 7—Total beverage container extrapolated weight per annum disposed of in the kerbside waste bin and co-mingled recyclables bin [Hudson Howells, 2020]

Weight of Total Beverage Containers Kerbside & CDS (tonnes per annum)

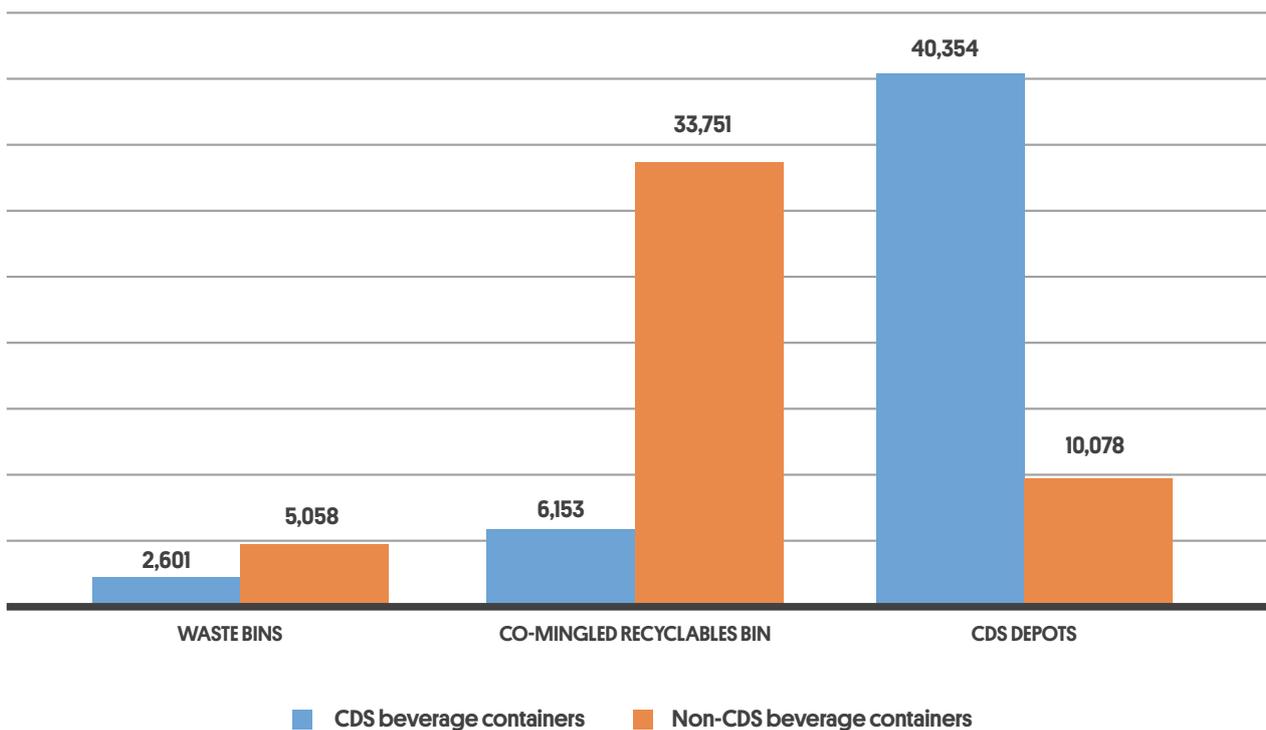


Figure 8—Count of beverage containers in kerbside bins by material type and plastics content [items per annum extrapolated to all of state]

Total Kerbside Beverage Container Items by Material Type
(millions per annum)

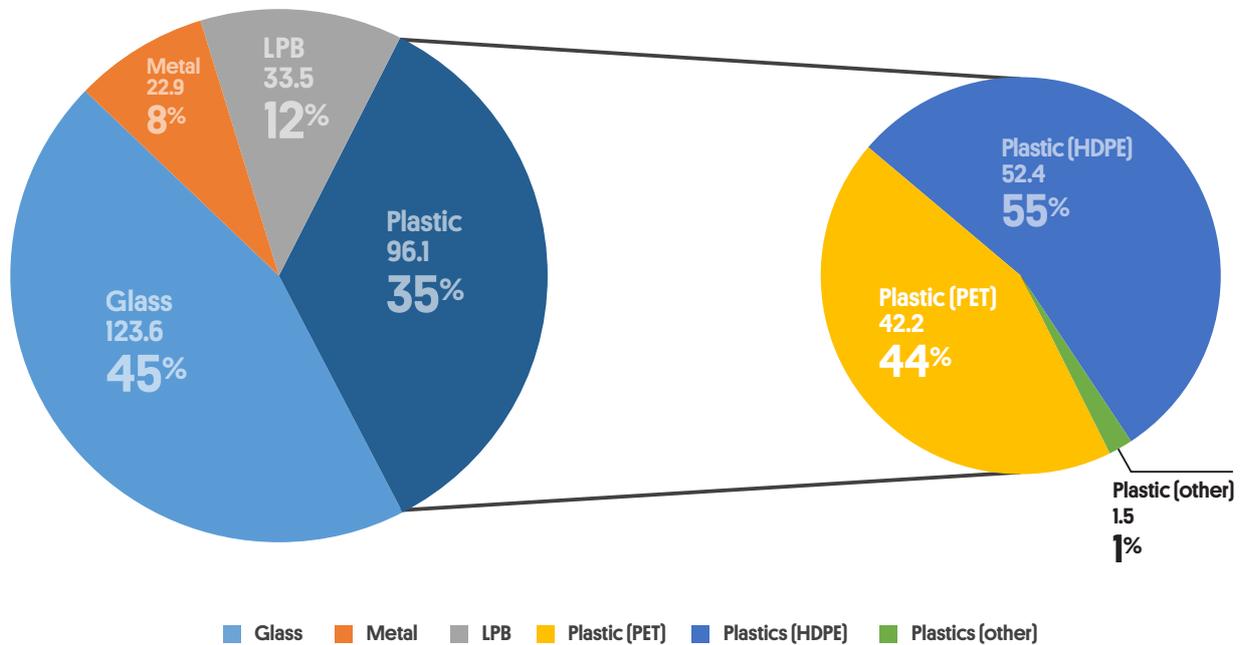
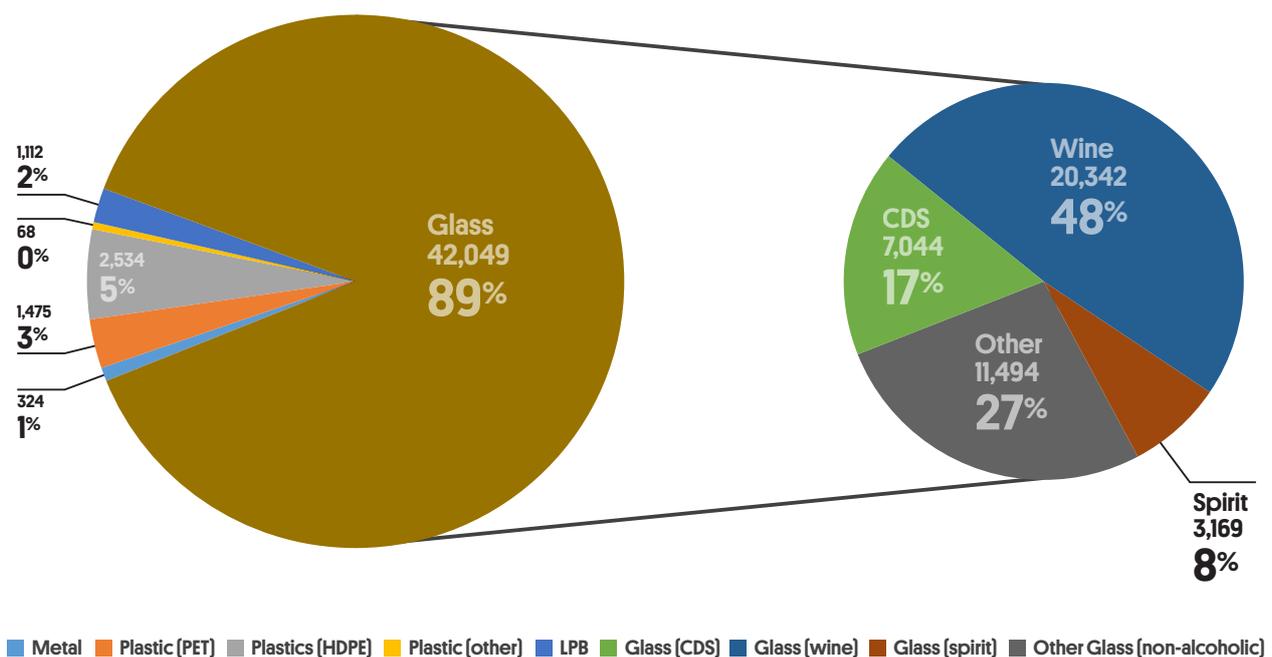


Figure 9—Weight of beverage containers in kerbside bins by material type and glass beverage content [tonnes per annum extrapolated to all of state]

Kerbside Beverage Container Weight by Material Type
(tonnes per annum)



Current fate of beverage container materials in South Australia

The recovery of empty beverage containers in SA occurs primarily via the CDS or kerbside systems. The CDS container return data [2019-20]³⁰, kerbside bin audit [2020]³¹, the Recycling Activity Survey [2018-19]³² data and consultation with industry were used to develop a discarded glass [beverage and non-beverage] and plastic beverage [PET and HDPE] container inventory. The MRF material recovery data was derived from a South Australian facility that is considered to be best-in-class in terms of material recovery from the co-mingled kerbside bin. The pathways of glass, plastics PET and HDPE beverage containers were then mapped to reveal the fate of these materials used by beverage producers and suppliers to package beverages sold in SA [see Figures 10, 11 and 12]. These container material types were chosen for further investigation due to their prevalence in the kerbside management system [see Figures 8 and 9], the limited knowledge about their movement and fate, and opportunities for recycling.

The recovery of beverage container materials through the CDS results in high-value recovered resources that are segregated according to material type and colour [glass] in accordance with the market requirements for recycled materials. Glass, aluminium and plastic [PET and HDPE] containers that are returned to depots in SA have very high recycling rates [as shown in Figures 10, 11 and 12] and, because they are contaminant-free, are highly desirable to be directly used as feedstock in the remanufacturing of containers or other industrial uses.

Beverage and non-beverage containers placed in the kerbside co-mingled recyclables bins are collected and transported by, or on behalf of, local government to a MRF. The bin contents are then processed to recover resources for sale and diversion from landfill. CDS beverage containers in the co-mingled recyclables bin are recovered by the MRF and returned to the CDS. A proportion of the co-mingled recyclables bin is disposed of to landfill rather than being recycled, due to the material being one of the following:

- non-recyclable materials [placed in the wrong bin] or recyclables that are too contaminated [including due to breakage of glass during collection, handling and processing of kerbside co-mingled bin contents]
- of low market value
- not able to be recovered by the systems and processes within the facility due to excessive breakage or contamination.

The materials that are recovered are then onsold to markets and the revenue is used to offset the costs of running the facility.

Glass beverage container recovery

The inventory of glass beverage containers discarded in South Australia³³ indicates that about 86,100 tonnes of glass container waste is generated in SA each year, with 45,200 tonnes recovered for bottle manufacturing, over 24,000 tonnes sent to civil construction uses [via the CDS and kerbside systems] and 17,400 tonnes disposed of to landfill [see Figure 10]. There are 41,900 tonnes of CDS and non-CDS glass containers returned to the depots, with CDS glass accounting for 77% [32,286 tonnes] of this glass. The vast majority of the remaining glass [9,614 tonnes] handled by the depots is received from commercial returns of non-CDS glass containers, such as wine and spirit glass bottles from hotels, entertainment venues and sporting clubs. Individuals also return non-CDS glass to depots when they return their CDS containers for a refund. However, that number of containers is minor when compared with the commercial returns.

The glass received by depots is sorted, aggregated and sent on to a glass 'beneficiation' facility for further processing prior to sale as glass cullet. The beneficiation process results in 41,271 tonnes [99%] of glass received by the depots recovered for sale as cullet. The remaining 1% is disposed of as waste to landfill due to not being recoverable.

Of the 35,800 tonnes of glass containers placed in the kerbside co-mingled recyclables bin, only 11% is

30 Environment Protection Authority South Australia 2021, *Container deposits*, https://www.epa.sa.gov.au/environmental_info/waste_recycling/container_deposit.

31 SA EPA – CDS Review: Kerbside Household Bin Audit Report June 2020, Rawtec 2020, https://www.epa.sa.gov.au/files/15058_cds_kerbside_bin_audit_report_jun2020.pdf.

32 Green Industries SA 2020, *South Australia's recycling activity survey 2018-19 report*, <https://www.greenindustries.sa.gov.au/resources/recycling-activity-in-south-australia-2018-19>.

33 Hudson Howell 2020, South Australian Environment Protection Authority, *Container Deposit Scheme Economic Analysis Review December 2020*, https://www.epa.sa.gov.au/files/15056_cds_econanalysis_review_report_dec2020.pdf.

recovered as high-value cullet, with 85% recovered as low-value mixed glass for lower value civil application and, the remainder unable to be recovered due to excessive breakage, is disposed of to landfill. All 8,400 tonnes of glass containers placed in the general waste bins is sent to landfill. With recent improvements to MRF processing, the glass fines arising from glass breakages from the kerbside co mingled recyclables bin collection, transport and processing have largely [66%] been redirected from landfill by being collected and used for civil construction, for example, replacement of sand in road base. Although a beneficial use for recycled glass, it is of significantly lower value than glass recovered as cullet that is able to be remanufactured into glass bottles and containers.

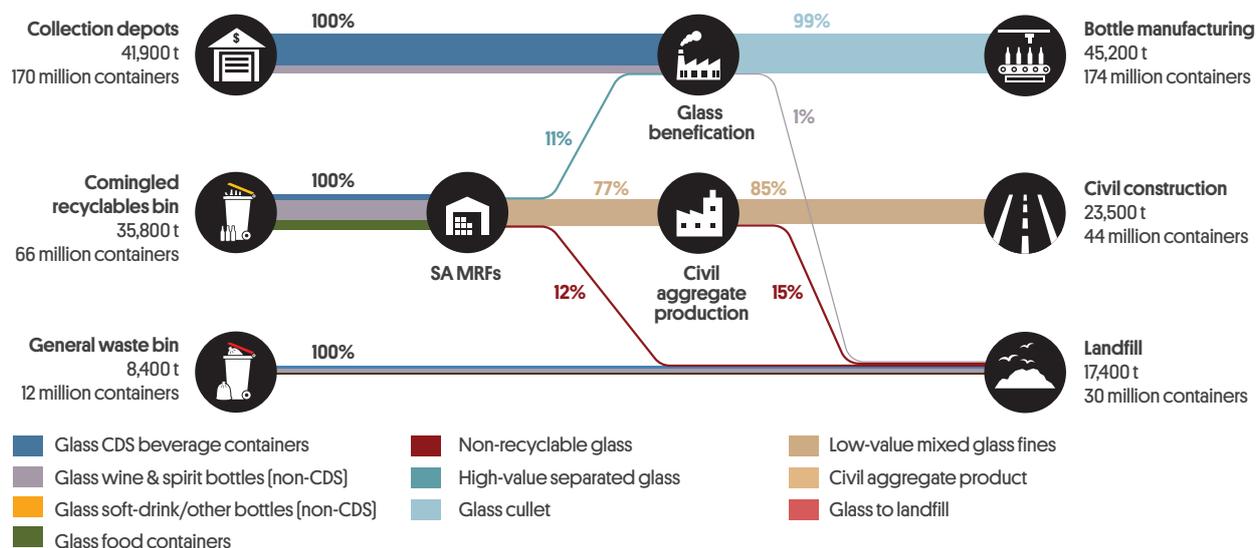
In summary, of the material recovered to high-value glass cullet per year, around 93% is derived through the CDS depots and around 7% is derived through the kerbside co-mingled recyclables bin. This is despite the tonnages of glass placed in the kerbside co-mingled recyclables bin and returned to the collection depots being similar [35,800 versus 41,900 tonnes per year, respectively].

The recovery of glass containers through the kerbside co-mingled recyclables bin represents a significant cost to local government and, ultimately, rate payers. A survey of local councils on the benefits and value of the current CDS identified that an increase in the types of beverage containers within the CDS will reduce the costs of the kerbside waste collection services provided by councils³⁴. Modelling was undertaken to estimate the cost savings to local government as a result of diversion of the non-CDS glass beverage containers from the co-mingled kerbside bin to the CDS.

This showed, for example, that the diversion and recycling of 51 million non-CDS glass wine, spirit and cordial containers from the kerbside co-mingled bin to the CDS is estimated to save local government approximately \$34 million per year³⁵. The reduced costs are mostly attributed to the reduced volume of glass containers required to be processed by MRFs and reduced waste glass disposal costs³⁶. The reduced volume of glass containers processed by MRFs would reduce the glass fines and waste glass generated at the facilities and, subsequently, reduce disposal costs of the facilities and local government, and offer more high value material for glass remanufacturing.

Figure 10—Material flow of glass containers in South Australia per annum [source: Rawtec, 2020]

Material flow of glass in South Australia



Disclaimer: This is a high-level illustration of the material flow of glass CDS and non-CDS beverage containers placed into general waste and co-mingled recycling kerbside bins by households or returned at collection depots. It does not include containers that are placed into commercial/industrial bins (general waste to landfill, co-mingled recycling), public place/street litter bins or litter in the environment due to insufficient data on these disposal destinations.

34 SA EPA - CDS Review: Council Survey Report July 2020, Rawtec 2020, https://www.epa.sa.gov.au/files/15058_cds_kerbsite_bin_audit_report_jun2020.pdf.

35 Hudson Howell 2021, South Australian Environment Protection Authority, Container Deposit Scheme Economic Analysis Review - Addendum Report January 2021, https://www.epa.sa.gov.au/files/15057_cds_econanalysis_review_addendum_jan2021.pdf.

36 SA EPA - CDS Review Council Survey Report July 2020, Rawtec 2020, https://www.epa.sa.gov.au/files/15058_cds_kerbsite_bin_audit_report_jun2020.pdf.

Glass wine and spirit container recovery

The fate of wine and spirit glass containers in South Australia includes processed glass cullet for bottle remanufacturing, glass fines for civil construction, and unrecoverable material to landfill or to the broader environment as litter. A significant proportion of the wine and spirit bottles returned to depots arises from the commercial and hospitality sectors, and entertainment venues. The return of these containers occurs in combination with the collection of CDS containers also provided at these venues. Material flow for wine and spirit glass containers is described as follows:

- Around 10,020 tonnes of wine and spirit glass containers are returned to CDS depots each year with over 98% [9,870 tonnes] of this material recovered as high-value cullet, and only 2% [150 tonnes] disposed of to landfill.
- Approximately 22,031 tonnes of wine and spirit glass containers are placed in the kerbside co-mingled recyclables bin each year, with only 11% [2,523 tonnes] recovered as high-value cullet, and 67% [14,659 tonnes] as low-grade mixed glass, with the remaining 22% [4,849 tonnes] being disposed of to landfill.
- An estimated 1,304 tonnes of wine and spirit glass containers are disposed of in the kerbside waste bin each year, with 100% of this glass material disposed of to landfill.

Failure to recover these glass containers is attributed to breakage during collection, handling and processing of the kerbside co-mingled bin. Excessive damage or breakage of containers leads to the materials not being able to be recovered by the systems and processes within the MRFs. This breakage and the disposal of wine and spirit containers in the kerbside waste bin is estimated to result in 6,303 tonnes [or estimated 12,500 bottles] of glass wine and spirit bottles sold in SA ending up in landfill each year. The presence of these glass fines results in significant costs to both the MRFs

and local government associated with collection and landfill, as well as cost to the remanufacturing industry and the community at large due to the lost opportunity to benefit from reusing and remanufacturing recovered containers. Broken glass also compromises the recovery and value of other kerbside co-mingled recyclable materials.

Plastic (HDPE and PET) beverage container recovery

The inventory of HDPE and PET beverage containers discarded in South Australia³⁷ indicates that each year, about 2,750 tonnes of HDPE and 4,700 tonnes of PET beverage container waste is generated in this state. The majority of the HDPE and PET container waste arises from non-CDS plain milk HDPE containers [81%] and non-alcoholic CDS PET containers greater than 150 millilitres [91%]. The fate of HDPE and PET beverage containers is as follows:

- 2,400 tonnes [87%] of HDPE is recovered for recycling, 20 tonnes [1%] is recovered and used for energy production³⁸ and 325 tonnes [12%] is disposed of to landfill each year [see Figure 11]
- 4,100 tonnes [87%] of PET is recovered for recycling, 175 tonnes [4%] is recovered as energy and 400 tonnes [9%] is disposed of to landfill each year [see Figure 12].

A portion of the HDPE and PET beverage containers sold in SA are discarded via the commercial and industrial, and construction and demolition sectors, as well as to public bins. This is estimated to equate to 5 tonnes of HDPE containers and 25 tonnes of PET containers that are either recovered for recycling, recovered as energy or disposed of to landfill.

An estimated 200 tonnes [7%] of HDPE beverage containers were returned to the depots, and 2,550 tonnes [93%] were placed in the kerbside system. An estimated 3,200 tonnes [68%] of PET beverage containers were returned to depots and 1,500 tonnes [32%] were placed in the kerbside system. Recovery rates for plastic are as follows:

³⁷ Hudson Howell 2020, South Australian Environment Protection Authority, Container Deposit Scheme Economic Analysis Review December 2020, https://www.epa.sa.gov.au/files/15056_cds_econanalysis_review_report_dec2020.pdf.

³⁸ The recovery of energy from beverage containers results from the collaboration of SUEZ-Resource Co and Adelaide Brighton Cement to produce a processed engineered fuel that is used to as a partial fossil fuel replacement at the Birkenhead, SA based cement kiln. The fuel is produced by the recovery of combustible materials from received at the SUEZ-Resource Co facility based Wingfield, SA.

- Almost all [98%] of the HDPE and PET containers returned to depots are sent for recycling.
- Of the 2,250 tonnes of HDPE containers placed in the co-mingled kerbside bin each year, the vast majority [98%] of containers were recovered by MRFs for recycling (including 52 tonnes of CDS containers returned to the CDS) with small amounts sent for energy production [1%] and to landfill [1%].
- Of the 1,150 tonnes of PET containers placed in the co-mingled kerbside bin each year, the vast majority [83%] of containers were recovered

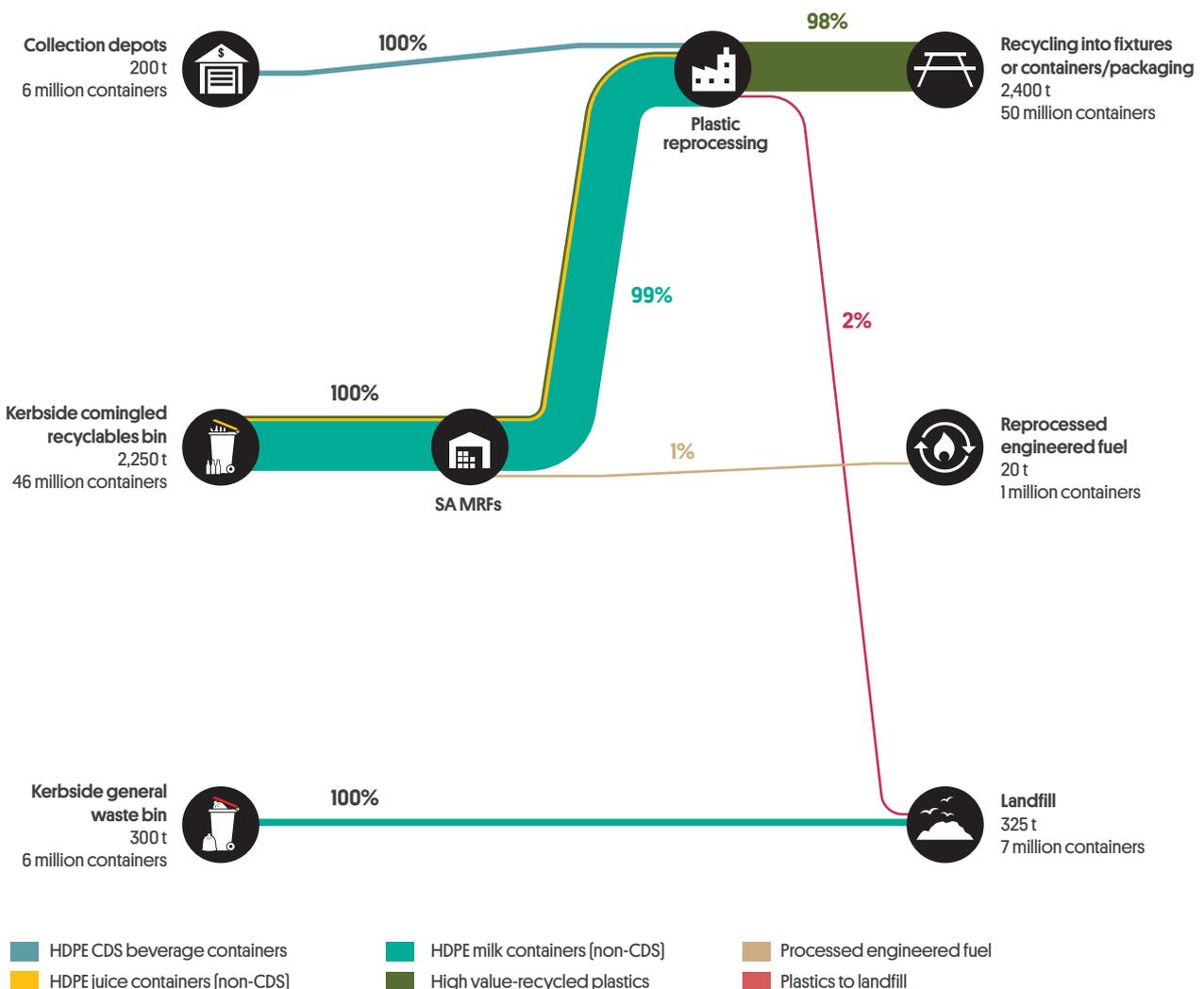
by MRFs for recycling (including 306 tonnes of CDS containers returned to the CDS) with a small amount [15%] sent for energy production and a lesser amount [2%] disposed of to landfill.

The high recovery of plastic beverage containers within the kerbside bin system is associated with their resistance to damage during collection, handling and processing of the kerbside co-mingled bin and the design of the MRF systems and processes to recover these high-value resources.

Figure 11—Material flow of plastic [HDPE] containers in South Australia each year [source: Rawtec, 2020]

Material flow of HDPE beverage containers in South Australia

Kerbside bins and collection depots

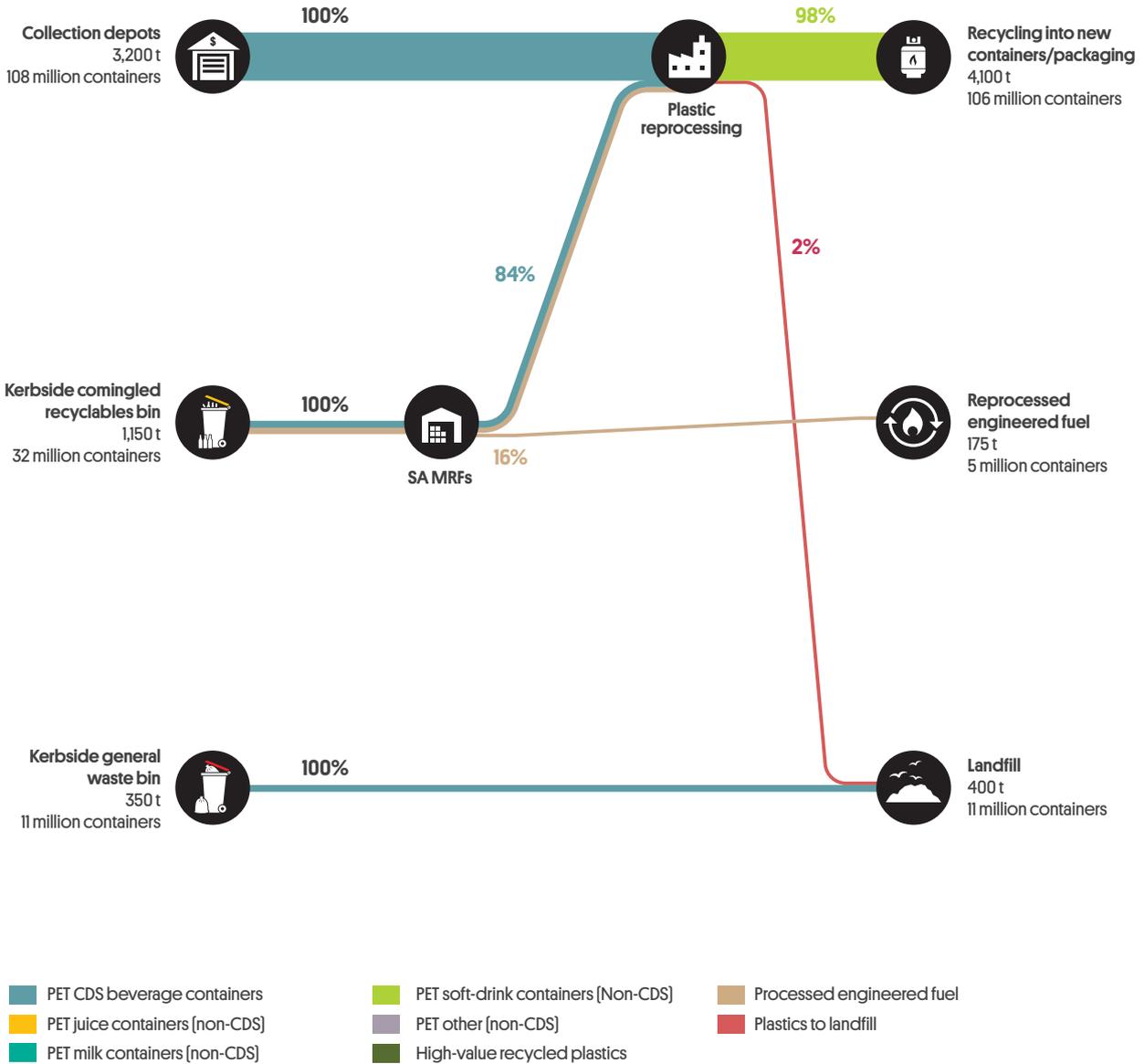


Disclaimer: This is a high-level illustration of the material flow of plastic HDPE CDS and non-CDS beverage containers placed into general waste and co-mingled recycling kerbside bins by households or returned at collection depots. It does not include containers that are placed into C&I bins (general waste to landfill, mixed recycling to alternative fuels), public place/street litter bins or litter in the environment due to insufficient data on these disposal destinations.

Figure 12—Material flow of plastic (PET) containers in South Australia each year [source: Rawtec, 2020]

Material flow of PET beverage containers in South Australia

Kerbside bins and collection depots



Disclaimer: This is a high-level illustration of the material flow of plastic PET CDS and non-CDS beverage containers placed into general waste and co-mingled recycling kerbside bins by households or returned at collection depots. It does not include containers that are placed into C&I bins (general waste to landfill, mixed recycling to alternative fuels), public place/street litter bins or litter in the environment due to insufficient data on these disposal destinations.

CDS versus kerbside beverage container recovery pathway

The glass and plastic (HDPE and PET) beverage container inventories and material flows show that the CDS pathway results in approximately 98% of glass, HDPE and PET containers being returned to the CDS depot is recovered as high-value material sold for recycling. The recovery of glass and plastic beverage

containers deposited within the kerbside system, in other words, the combined kerbside waste bin and the co-mingled recyclables bin (then MRF for processing) results in approximately 62% of glass, 87% of HDPE and 75% of PET recovered for recycling.

However, the fate of glass containers placed in the kerbside co-mingled bin is estimated to be 11% recovered as high-value cullet, 85% recovered as

low-value mixed glass for civil applications and the remainder, unable to be recovered due to excessive breakage, is disposed of to landfill. The recovery of high-value glass cullet through the kerbside co-mingled recyclables bin is impeded by the mixing of other materials disposed of in the bin and excessive glass container breakage resulting from the collection, transport, handling and sorting of the bin contents. The CDS pathway on the other hand, minimises cross-contamination of materials (including by colour) and limits excessive glass breakage, resulting in high-value clean and sorted recovered material.

The fate of PET and HDPE beverage containers deposited in the kerbside co-mingled bin and processed by MRFs is estimated to result in a high proportion being recovered for high-value recycling into new products. Around 98% of HDPE and 84% of PET containers are recovered by MRFs for plastics processing. Around 1% of HDPE and 16% of PET containers handled within the MRF are recovered for use as processed engineered fuel. The processing (beneficiation) of both kerbside- and CDS-recovered PET and HDPE containers results in a small proportion (1%) requiring disposal to landfill.

This shows that, whilst PET and HDPE container recovery rates are less than those obtained through the CDS, they are still effective in recovering high-value plastics for recycling. However, the recovery of high value glass through the kerbside system is inferior when compared with the CDS. The diversion of additional glass containers away from the current kerbside system represents both a significant circular economy opportunity as well as a cost reduction opportunity for local government and the community.

The CSIRO's *National circular economy roadmap for plastics, glass, paper and tyres*, published in January 2021³⁹ recommends recovery of clean, sorted glass at the source and avoidance of mixed, compacted waste glass as a pathway for future growth opportunities for a circular economy within Australia. The APCO *Packaging*

*material flow analysis 2018*⁴⁰ report also explains that the diversion of glass resources to the CDS would improve the quality and amount of glass packaging available for recycling and avoid the contamination of paper and plastic resources.

The Environment, Resources and Development Committee's June 2018⁴¹ report provides a series of recommendations following the Committee's inquiry into the recycling industry, including the diversion of as much glass as possible from the co-mingled recyclables kerbside bin. The accessibility and convenience of the kerbside co-mingled recyclables and general waste bins make them valuable pathways for litter prevention, but are less successful in relation to glass meeting state objectives for resource recovery and the circular economy.

Economic analysis

Inclusion of currently excluded containers 3 litres or less (excluding plain unflavoured milk)

To inform the review of the CDS, the EPA commissioned consultants to survey local councils⁴², CDS collection depots and licensed establishments such as hotels, clubs and sporting venues⁴³. In response to what should be included in an expanded CDS scope, the vast majority of local councils surveyed responded that a wider range of beverage containers should be included.

The majority of councils responded that an increase in the beverage containers included in the CDS would reduce the local street, park, picnic and recreation area litter associated with these types of containers. Some of the justification for including a greater range of glass beverage containers is that the removal of glass containers from the kerbside system (in particular the co-mingled kerbside bin) will significantly reduce the contamination of other recyclable materials from broken glass and the costs to local government associated with recovery of glass in the co-mingled bin and disposal of glass fines. The EPA also sought the views of industry

39 CSIRO 2021, *National circular economy roadmap for plastics, glass, paper and tyres*, <https://www.csiro.au/en/Research/Environment/Circular-Economy/Circular-Economy-individual-products>.

40 Institute for Sustainable Futures 2019, *APCO Packaging material flow analysis 2018*, <https://documents.packagingcovenant.org.au/public-documents/APCO%20Packaging%20Material%20Flow%20Analysis%202018>.

41 https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/WasteandRecycling/Report.

42 SA EPA - CDS Review: Council Survey Report July 2020, Rawtec 2020, https://www.epa.sa.gov.au/files/15060_cds_councilsurvey_report_jul2020.pdf.

43 SA EPA - CDS Review: Collection Depot & Licensed Establishment Survey Report June 2020, Rawtec 2020, https://www.epa.sa.gov.au/files/15059_cds_collectiondepots_report_jul2020.pdf.

specialists working within the local waste and resource recovery sector, who also considered glass in the kerbside co-mingled recyclables bin as problematic as it is costly to deal with, recovered as low-value glass and a significant portion of the MRF waste sent to landfill.

The 2019 CDS review scoping paper feedback, the above stakeholder survey results and the findings of the current beverage container materials fate in SA report, all suggest a revised CDS scope that is less confusing and continues to champion recycling and supports a transition to a circular economy.

Economic modelling was undertaken of an alternate CDS scope scenario where the current volume threshold is removed and the range of glass beverage containers materials included in the CDS is increased. In this scenario, a reviewed CDS scope by means of

- an increase in the current beverage container volume threshold to 3 litres or less,
- inclusion of currently excluded glass beverage containers (that is, wine, spirit, juice and cordial containers), and
- the continued exclusion of plain unflavoured milk

is expected to result in an annual net benefit of \$76 million (underpinned by glass recovery) and a net increase in employment (direct and indirect) of 121 (FTE) jobs in SA. Also, an additional 73 million beverage containers are estimated to be returned to CDS depots, equating to 679 million containers each year and diversion of 5,677 tonnes of CDS container materials from landfill each year (see Table 3).

The indirect cost of newly included beverage products for beverage producers and suppliers varies according to the size of the business and the number and range of CDS eligible beverage products sold in SA. The upfront indirect costs for small businesses are estimated to be 45 cents per CDS container in the first year of inclusion and 7 cents for larger businesses with a larger range of beverage products sold both within and outside of SA. The administrative costs, container approval

fees (proposed to be removed) and printing costs components of the scheme costs for large and small beverage producers and suppliers are estimated to be 0.5 for large businesses and 4 cents per CDS container per year for small businesses. The average ongoing indirect scheme costs are estimated to be between 1 to 2 cents per container per year. These costs can either be absorbed by the producer or supplier or passed on to the consumer through increased retail prices. These indirect costs are consistent with independent economic analysis of newer schemes in ACT⁴⁴, NSW⁴⁵ and WA⁴⁶.

Based on an assumption that demand for these products is moderately sensitive to small price increases, the economic analysis indicated a 1.67% reduction in sales of beverages such as cordial, juice and flavoured milks with a retail price of \$3, and a 0.33% reduction in sales of wine in glass bottles and 0.17% reduction in spirits in glass bottles with a retail price of \$15 and \$30, respectively. However, offsetting this is a substantial increase in the number of containers returned to the CDS, which, in turn creates economies of scale for depots and super collectors resulting in a small reduction in handling fees. A reduction in handling fees passed on to beverage producers and suppliers would lead to a reduction in the retail price of beverages that are already included in the CDS and mitigate the price impact of newly included beverage containers.

The CDS container scope change referred to above and the return of an additional 73 million (or 12%) beverage containers mainly via depots is expected to increase the return rate from the current 77% to 78% per year. The diversion of containers away from the kerbside system is estimated to result in a \$34 million saving in waste management costs for local government. These impacts are dominated by the diversion of glass from the kerbside system to the CDS and utilisation of existing capital, infrastructure and employment within the CDS. Under this reform, the annual recovery of glass beverage containers by the CDS is expected to increase by about 22,000 tonnes and would increase the total amount to over 65,000 tonnes (equating to around a 50% increase).

44 Independent Competition and Regulatory Commission Final Report Container Deposit Scheme Price Monitoring 2019, Independent Competition and Regulatory Commission, https://www.icrc.act.gov.au/_data/assets/pdf_file/0020/1407602/Container-Deposit-Scheme-Price-Monitoring-Final-Report.pdf.

45 Independent Pricing and Regulatory Tribunal NSW 2018, <https://www.ipart.nsw.gov.au/sites/default/files/documents/final-report-nsw-container-deposit-scheme-monitoring-the-impacts-on-container-beverage-prices-and-competition-december-2018.pdf>.

46 Economic Regulatory Authority Western Australia, Report on the effects of the container deposit scheme on beverage prices in Western Australia, draft report July 2021 <https://www.erawa.com.au/cproot/22078/2/-2019.CDS.Inq-CDS-Price-Monitoring---Draft-Report---to-publish.PDF>.

The diversion of glass, increased CDS value, and weight reduction of the kerbside waste system are the most significant factors in reducing the waste management costs for local councils and also for encouraging increased glass recovery and recycling in SA.

The diversion of over 73 million additional containers to the CDS is estimated to result in an additional 55 (FTE) jobs within the depots and super collector agencies and 164 (FTE) jobs from the recycling of recovered container materials into new containers or industrial products. The reduced volumes of CDS materials disposed of to the kerbside bin system is estimated to lead to 121 (FTE) fewer local government-funded jobs required for the collection and transport of the bin contents and reduced disposal of materials to landfill. The reduced demand for processing of the co-mingled bin contents at the MRF is estimated to result in 45 (FTE) fewer jobs within the MRFs. Employment by the eligible beverage producers and suppliers is estimated to reduce by 5 (FTE) jobs as a result of a small negative effect of extending the scope of the CDS on the sales of some products.

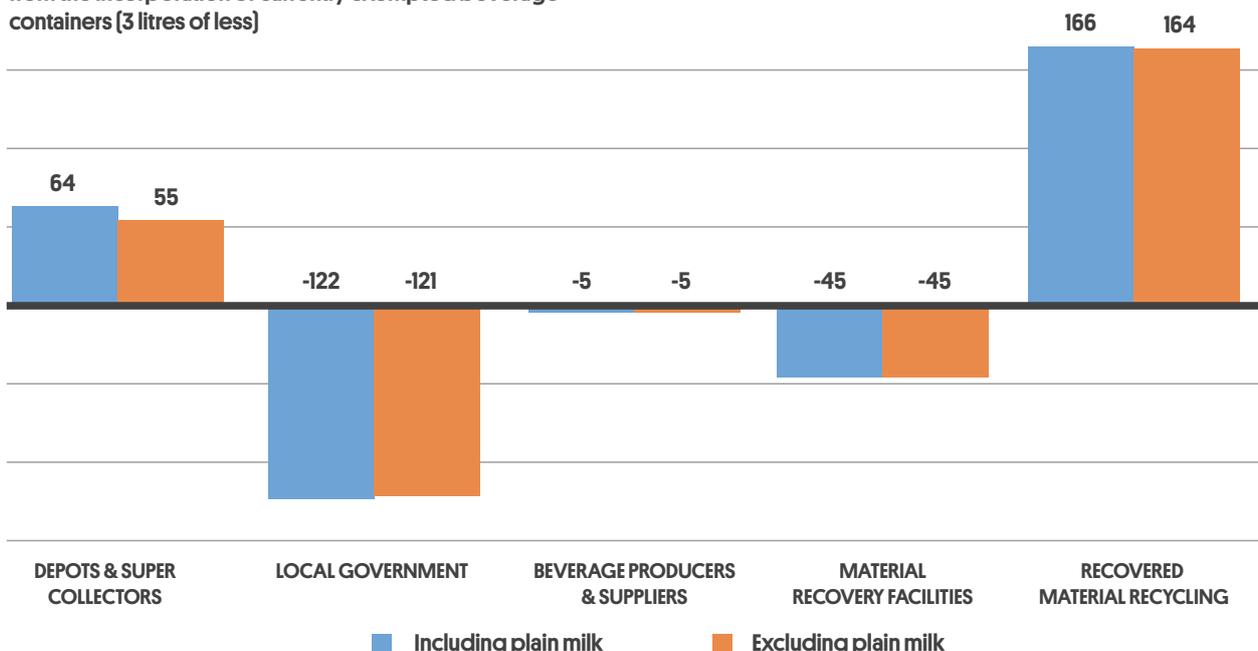
Analysis of an option to include plain unflavoured milk within this change to container scope estimated that an additional 30 million empty HDPE beverage containers will be diverted from the kerbside waste system and

returned to the CDS per year (from 679 to 709 million) and the annual net benefit to SA is estimated to increase by \$10 million (from \$76 to \$86 million). Inclusion of plain milk is also estimated to result in a further net increase in employment of 27 (FTE) jobs (from 121 to 148) and a reduced amount of container materials disposed of to landfill from 5,677 tonnes to 5,515 tonnes per year⁴⁷. Whilst the diversion of an estimated 30 million plain milk containers to the CDS will increase the volume of plain milk containers recovered by the CDS, there is little change to local government costs and opportunities stemming from the processing of these recovered containers via the CDS pathway. The limited benefit to local government and materials processing is attributed to their low weight and the effective and efficient recovery of HDPE plain milk containers through the existing kerbside system, as described previously.

Figure 13 shows the estimated change in jobs (FTE) (relative to the 2019-20 FTE baseline) for key CDS stakeholders resulting from the inclusion in the CDS of currently excluded beverage containers (3 litres or less), and provides a comparison between the two scenarios of including plain unflavoured milk containers and excluding plain unflavoured milk containers.

Figure 13—Estimated change in direct employment (FTE) from inclusion of currently excluded containers

Estimated change in direct employment (FTE) resulting from the incorporation of currently exempted beverage containers (3 litres or less)



47 Hudson Howell 2021, South Australian Environment Protection Authority, Container Deposit Scheme Economic Analysis Review - Addendum Report January 2021, https://www.epa.sa.gov.au/files/15057_cds_econanalysis_review_addendum_jan2021.pdf.

Economic analysis

Kerbside bin dedicated to glass

Whilst the inclusion of additional glass beverage containers in the CDS scope was identified as a pathway for improving the recycling of glass beverage containers, a small number of stakeholders suggested that a fourth kerbside bin dedicated to the disposal of glass is an alternative option to the CDS. A bin dedicated to glass waste is currently being trialled in Victoria and has also been in place in New Zealand since 2006 as part of the Glass Packaging Forum (GPF) Product Stewardship Scheme. All other industry groups, local government and the community held the view that wine and spirit glass containers should be included in an expanded CDS.

In New Zealand, the GPF invests in infrastructure that supplements the existing municipal recycling system by supporting councils, waste management contractors and community recyclers to recover container glass. The scheme is reliant upon government grants and local government subsidising collection and transport. The New Zealand GPF claims that the scheme currently recovers around 73% of glass containers. However, Zero Waste New Zealand has published the following statement:

It [73%] is not from an independent source and includes glass going to roading and other down cycling. There is no state, province or country in the world that has a recycling rate that high without a deposit system in place⁴⁸.

The Victorian Government's 10-year policy and action plan for waste and recycling is set out by the Recycling Victoria – a new economy, February 2020. The action plan recognises that putting recyclables into a single commingled bin produces low-quality materials that are no longer in demand. In response to this, the action plan commits to reform the way Victorians recycle by establishing a four bin kerbside collection system that is better aligned with our local recycling markets and introduce a container deposit scheme. Amongst other kerbside system reforms, it is proposed that all Victorians will have a new glass bin or access to glass services by 2027.

In February 2021, in support of the action plan, the Victorian Government committed \$20 million of public funds to support rural and regional councils as they work towards a four bin, or four service, recycling system that separates household waste into: rubbish, recycling, glass and green waste⁴⁹. In April 2021, Visy announced that it will build a state of the art \$35 million glass recycling cullet facility in Laverton in Melbourne's west in response to Recycling Victoria action plan⁵⁰. The additional recycled glass will be made into new jars and bottles for Australian food and beverage companies and will be used in asphalt and road base works.

The results of the Victorian kerbside glass collection trial were not available at the time of writing this discussion paper. In the absence of performance data on the addition of a fourth kerbside bin dedicated to glass, consultation and modelling of the expected outcomes of the introduction of a kerbside bin dedicated to the disposal of glass in SA were carried out to inform the CDS review.

The introduction of a fortnightly kerbside bin service dedicated to glass in SA is expected to result in no increased costs to beverage producers and suppliers, reduce the number of empty glass containers (beverage and non-beverage) disposed to landfill, and as a result of improved kerbside segregation, increase the amount of glass resources available to produce high-value cullet and low value mixed glass fines for civil applications in SA. To achieve these results the kerbside bin system will require new infrastructure including household storage of an additional kerbside bin, additional fourth kerbside bin collection and transport equipment and a dedicated glass processing facility that is able to remove contaminants including non-recyclable glass discarded to the kerbside bin. The cost of a kerbside bin service dedicated to glass is expected to be funded by local government and rate payers as is the case for the current kerbside bin collection service [see Table 3].

The introduction of a fourth kerbside bin dedicated to glass in SA is expected to require an additional fortnightly bin collection service provided on behalf of local government and additional investment to establish

48 Zero Waste Network 2021, <https://zerowaste.co.nz/container-return-scheme>.

49 State Government of Victoria 2021, <https://www.premier.vic.gov.au/regional-victoria-step-closer-four-stream-recycling>.

50 VISY 2021, <https://www.visy.com.au/newsroom/2021/4/15/investing-for-a-better-world>.

a dedicated glass optical sorting plant at a cost of \$12 million (not including other building structures and associated infrastructure). The change from a 3-bin to a 4-bin kerbside system is estimated to result in an annual net benefit of \$58 million to the SA community.

An estimated additional 483 (FTE) jobs (comprising direct and indirect employment) within SA may be created. This includes the additional collection processing of materials in a kerbside bin dedicated to glass; an additional 82 (FTE) jobs funded by local government; 16 (FTE) jobs within MRFs to process bin contents; and 85 (FTE) jobs for the recycling of recovered glass materials into new containers, industrial products or civil applications (see Figure 14).

Comparison of expected glass recovery outcomes for an expanded CDS versus a kerbside bin dedicated to glass

The review of the CDS and associated consultation with industry experts has identified opportunities to increase the recycling of glass beverage containers through an expanded CDS, where currently excluded glass beverage containers are included in the CDS, or the introduction of a fourth kerbside bin dedicated to glass. The expected outcomes of these two options are outlined in Table 3.

The expansion of the CDS scope is expected to utilise the existing CDS infrastructure to recover high-value sorted and uncontaminated glass for high-value recycling and remanufacturing back to bottles. Associated with this recovery and recycling pathway is fewer jobs funded by local government and additional jobs within the glass material processing and remanufacturing sector.

The introduction of the fourth kerbside bin is expected to require new infrastructure to recover and process the glass resources placed in the new kerbside bin. A significant proportion of the resultant recovered glass is low-value glass for recycling within civil infrastructure and requires additional local government funded jobs needed for the collection and processing of the fourth bin contents.

It is estimated that \$76 million of net benefit to SA is associated with the recovery and recycling of glass beverage containers is realised through an expanded CDS, where the currently excluded glass beverage containers are included in the CDS. When compared to the estimated \$58 million net benefit of the introduction of a fourth kerbside bin dedicated to glass, the expansion of the CDS is a more efficient and beneficial way to remove glass containers from the kerbside bin system, reducing material going to landfill, and increasing more recovery to high-value products.

Figure 14—Estimated change in direct employment (FTE) from an expanded CDS or glass-only kerbside bin

Estimated change in direct employment (FTE) resulting from the expansion of the CDS versus the introduction of a kerbside bin dedicated to glass

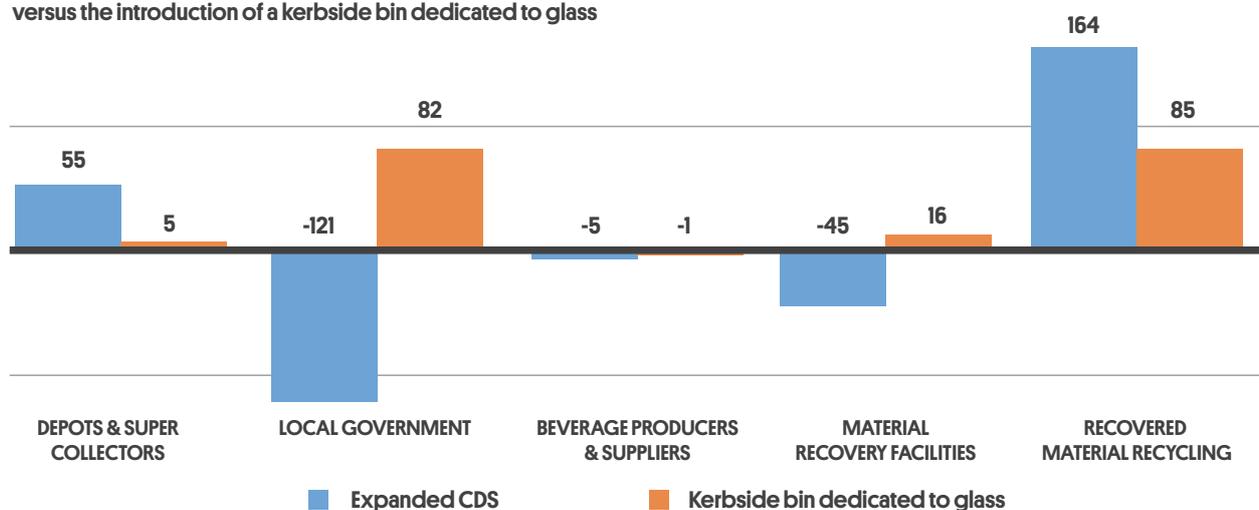


Table 3—Expected glass recovery outcomes for an expanded CDS versus glass-only kerbside bin

	Expanded CDS	Glass-only kerbside bin
Pros	<ul style="list-style-type: none"> ● Estimated net benefit of \$76 million to SA 	<ul style="list-style-type: none"> ● Estimated net benefit of \$58 million to SA
	<ul style="list-style-type: none"> ● Decreased cost to local government and rate payers due to reduced kerbside waste collection and processing costs – \$34 million 	<ul style="list-style-type: none"> ● No increased cost to beverage producers and suppliers
	<ul style="list-style-type: none"> ● Recovery of empty glass beverage and food containers <ul style="list-style-type: none"> » 22,000 tonnes diverted to cullet per annum » 20,000 tonnes diverted from road base per annum 	<ul style="list-style-type: none"> ● Recovery of empty glass beverage and food containers <ul style="list-style-type: none"> » 19,000 tonnes diverted to cullet per annum » 13,500 tonnes diverted from road base per annum
	<ul style="list-style-type: none"> ● Increased recovery of high-value sorted and uncontaminated glass for recycling 	<ul style="list-style-type: none"> ● Increased recovery of low-value glass for recycling ● Improved glass and other recyclable material segregation at the household
	<ul style="list-style-type: none"> ● Direct jobs (FTE) impact <ul style="list-style-type: none"> » 121 less local government funded jobs » 55 additional CDS depots and super collectors jobs » 5 less beverage producer and supplier jobs » 45 less MRF jobs » 164 additional material processing and remanufacturing jobs 	<ul style="list-style-type: none"> ● Direct jobs (FTE) impact <ul style="list-style-type: none"> » 82 additional local government funded jobs » 5 additional CDS depots and super collectors jobs » 1 less beverage producer and supplier job » 16 additional MRF jobs » 85 additional material processing and remanufacturing jobs
	<ul style="list-style-type: none"> ● Utilisation of existing CDS infrastructure and capacity 	<ul style="list-style-type: none"> ● Establishment of glass material collection and processing infrastructure – \$12 million
	<ul style="list-style-type: none"> ● Progression of product stewardship responsibilities of producers and suppliers selling beverage products in SA 	
Cons	<ul style="list-style-type: none"> ● Increased scheme cost impacts for newly included beverage suppliers and producers – \$570,000 per annum 	<ul style="list-style-type: none"> ● Increased cost to local government and rate payers due to new infrastructure requirements – \$25 million per annum
	<ul style="list-style-type: none"> ● Additional household storage space for CDS containers and increased frequency of trips to CDS depots 	<ul style="list-style-type: none"> ● Additional household and kerbside storage space required for kerbside bin dedicated to glass
		<ul style="list-style-type: none"> ● Exacerbates ‘free-rider’ effect and avoidance of product stewardship responsibilities by some beverage producers and suppliers selling beverage products in SA
		<ul style="list-style-type: none"> ● Recovery of additional glass containers at lower net benefit to SA (\$76 million via the CDS versus \$56 million for a dedicated kerbside bin for glass).

Preferred option – Review and clarify the CDS scope to support the circular economy principles

It is intended to progress alignment of the container scope of the CDSs across Australia to support the transition to a circular economy through working with other states and territories.

As a first step in reconsidering the scope of CDS containers across the country, SA proposes to:

- maintain the high level of beverage container litter reduction and consider options of how to further prevent beverage container litter within local streets, parks, picnic and recreation areas
- consider options of how to remove glass from the kerbside bin system, including adding all currently excluded glass beverage containers, for example, wine, spirit and cordial bottles, to the CDS
- include all fruit/vegetable juice and cordial containers (up to 3 litres) to remove the inconsistency and confusion of what is in and out of scope and increase recovery of high-value plastics (PET and HDPE) used as feedstock in remanufacturing
- remove beverage volume thresholds to include, for all beverage containers currently in the scheme, container sizes of up to 3 litres, to reduce confusion
- continue to exclude from the CDS
 - » containers for plain unflavoured milk on the basis of there being no confusing anomaly (and because they are effectively recycled via the kerbside bin system)
 - » containers greater than 3 litres
- exclude from the CDS
 - » containers less than 150 millilitres to align with other jurisdictions.

In parallel to progressing alignment across Australia, it is intended to undertake a coordinated CDS awareness and container return education campaign to divert CDS containers away from the kerbside waste collection system and bolster the return of CDS containers to CDS depots and return points.

Questions

2.1 Should plain unflavoured milk containers up to 3 litres continue to be excluded from the CDS? If not, why not?

2.2 Do you think the diversion of glass from the co-mingled recyclables bin is best achieved through the CDS or a fourth kerbside bin dedicated to glass?

2.2.a Do you agree that all glass beverage containers up to 3 litres should be included in the CDS (wine, spirit and cordial)? If not, why not?

2.2.b Alternatively, if a fourth kerbside bin collection system dedicated to glass was made available, who should pay for it?

2.3 Do you agree that all plastic fruit/vegetable juice and cordial containers [in addition to soft drinks, fruit juice drinks and water] up to 3 litres should be included in the CDS? If not, why not?

2.4 Do you think a contemporary CDS education and awareness campaign that incorporates the proposed new inclusions would divert more beverage containers away from the kerbside co-mingled bins and residual waste bins towards CDS depots? What media platforms should be used for such a campaign?