

## © Queensland Productivity Commission 2020

The Queensland Productivity Commission supports and encourages the dissemination and exchange of information. However, copyright protects this document.

The Queensland Productivity Commission has no objection to this material being reproduced, made available online or electronically but only if it is recognised as the owner of the copyright and this material remains unaltered.

This report is available online and in PDF format on our website.

WEB qpc.qld.gov.au TEL (07) 3015 5111 email enquiry@qpc.qld.gov.au ABN 18 872 336 955



# About the Queensland Productivity Commission

The Queensland Productivity Commission is an independent statutory body that provides policy advice on complex economic and regulatory issues.

The Commission has an advisory role and operates independently from the Queensland Government—its views, findings and recommendations are based on its own analysis and judgments.

Further information on the Commission and its functions can be obtained from the Commission's website www.qpc.qld.gov.au



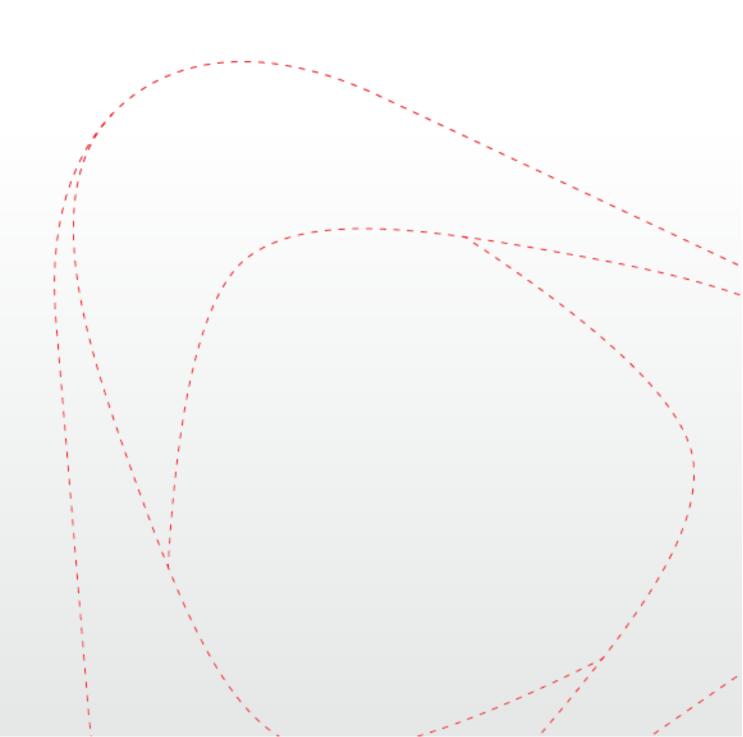
# **Contents**

Overv	/Iew		V
1.0	Introduction	1	1
	1.1	The Commission's task	2
	1.2	Scope of the review	2
	1.3	The Commission's approach	3
	1.4	Structure of the report	4
2.0	How the Sch	neme works	5
	2.1	A snapshot of the Scheme	6
	2.2	Roles and responsibilities	7
	2.3	Redeeming the refund	9
	2.4	Scheme funding	9
	2.5	Determinants of scheme prices	11
	2.6	Compliance costs	11
3.0	Impact on re	etail prices	13
	3.1	The Scheme's effect on beverage prices	14
	3.2	Estimating the Scheme's impact on beverage prices	15
	3.3	Results	16
	3.4	Price increases compared with scheme costs	19
4.0	Impacts on o	competition and participant behaviour	23
	4.1	Impact on competition	24
	4.2	Impact on conduct and performance	25
	4.3	Impact on consumption and expenditure patterns	25
	4.4	Refund methods	29
5.0	Other consu	mer impacts	31
	5.1	Introduction	32
	5.2	Access to container refund points	33
	5.3	Recovery rates	35
	5.4	Scheme scope and alignment	36
	5.5	Captive markets	38
	5.6	Improving governance and transparency of the scheme	41
	5.7	Refund sharing between local governments and MRFs	42
6.0	Appendices		45
	Appendix A	Terms of Reference	46
	Appendix B	Submissions and consultations	47

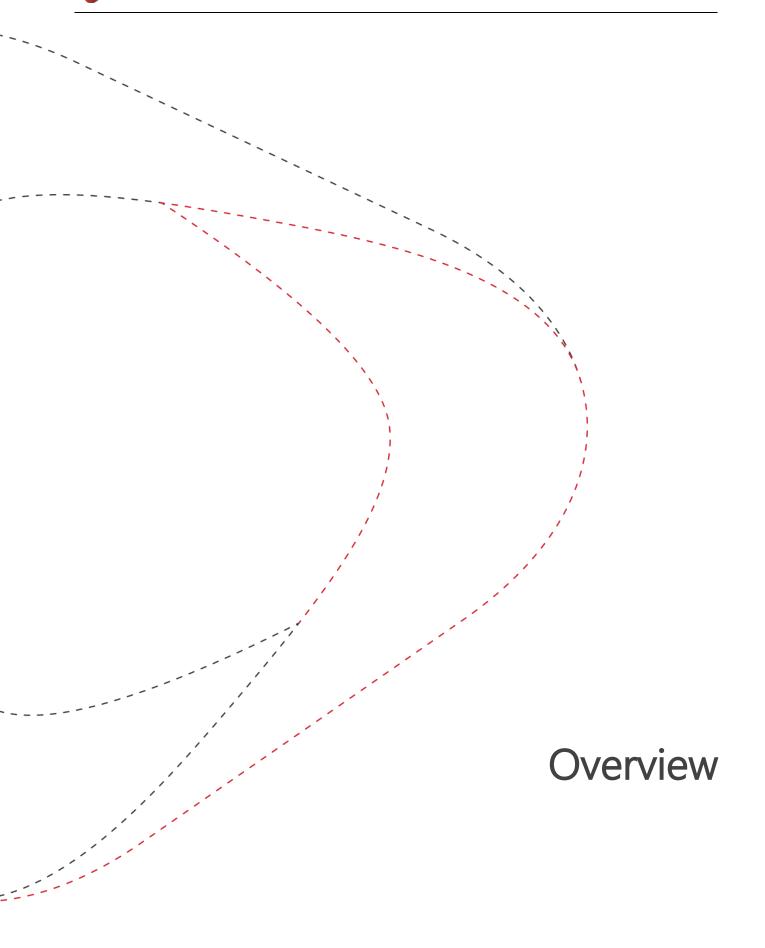


-	Appendix C	Eligible and excluded containers	
	Appendix D	Market definition	5
_	Appendix E	Empirical approach	5
Referenc	ces		$\epsilon$











In February 2019, the Queensland Government asked the Queensland Productivity Commission to monitor and report on price impacts arising from Queensland's Container Refund Scheme over its first 12 months—from 1 November 2018 to 31 October 2019. This report sets out the Commission's findings and recommendations.

### What the review is about

The Queensland Government asked the Commission to monitor and report on the impact of the Container Refund Scheme (the Scheme)—specifically, the impact on prices of beverages sold in Queensland in eligible containers; the impact on competition for beverages and the performance and conduct of beverage manufacturers and retailers; and other specific market impacts on consumers that arose from the commencement of the Scheme.

The terms of reference focus on how scheme costs are passed through to consumers, rather than on the costs themselves. They state that 'the underlying policy aim of this review is to ensure that consumer interests are protected from unjustified pricing behaviour such as retailers and suppliers using the introduction of the scheme to increase prices higher than what would be expected or reasonable'.

# How the Scheme works

The Scheme provides consumers with a refund of 10 cents per container if they return eligible containers for recycling. Two aims of the Scheme are to increase recycling and reduce the amount of litter.

Beverage manufacturers and beverage importers (together called suppliers) are required to contribute to the costs of running the Scheme. They must pay the scheme coordinator—Container Exchange (COEX)—the relevant 'scheme price' that COEX has set for each eligible container that they sell. The scheme price is set at a level that COEX estimates will generate enough revenue to fund the 10 cent refund paid to consumers who return eligible containers, and to recover the costs of collecting, transporting and processing containers, and administering the Scheme. The weighted average scheme price¹ was 10.2 cents (excluding GST) per eligible container for the period that this review covers, which is 1 November 2018 to 31 October 2019. It was increased to 11.6 cents (excluding GST) on 1 November 2019. Other things being equal, it may need to be raised further as the proportion of returned containers, on which 10 cents must be refunded, increases.

In addition to paying scheme prices, beverage suppliers also incur some costs to comply with the Scheme's labelling and reporting requirements. They will seek to pass on both the scheme price and compliance costs further down the supply chain to distributors, wholesalers and retailers, who will ultimately seek to recover them from consumers through higher retail prices.

# Are retail price increases consistent with reasonable pricing behaviour?

To assess whether retail beverage price increases have been consistent with reasonable pricing behaviour, the Commission first estimated those price changes of beverages sold in eligible containers that can be attributed to the Scheme over its first 12 months of operation. It used econometric analysis to provide a best practice estimate that isolates the causal impact of the Scheme itself on prices, controlling for other factors. The Commission then compared the changes with the increased costs that the industry has faced because of scheme prices it pays and compliance costs it incurs.

While the price increases of individual types of beverages over this period differed, the Commission has not found evidence of unreasonable price increases that over-recovered the cost increases caused by the Scheme. The weighted average scheme price per eligible container paid by suppliers was 11.2 cents per container

<sup>&</sup>lt;sup>1</sup> Different scheme prices are charged depending on the material type of the container. The weighted average scheme price is the average of these prices, weighted by the expected number of containers of each material type sold in Queensland.



(including GST) over the Scheme's first 12 months. This exceeds the estimated increase in average retail prices of non-alcoholic and alcoholic beverages of 9.0 cents and 9.9 cents per container, respectively, which can be attributed to the Scheme in its first year of operation. Cider is the only beverage with a retail price increase that exceeded the scheme price (Table 1.1); however, this is the least reliable estimate due to limited data availability.

Table 1.1 Average price increases of beverages sold in eligible containers attributable to the Scheme over its first 12 months

Beverage	Price increase (cents per container)
Soft drinks	10.3
Bottled water	8.0
Flavoured milk in small containers	8.9
Fruit juice	3.8
Beer	8.6
Cider	16.2
Ready-to-drink spirits	9.5

Note: Data was unavailable for October 2019 for non-alcoholic beverages, so the estimates for soft drinks, bottled water, flavoured milk and fruit juice are estimated using data from the Scheme's first 11 months.

Source: CIE estimates based on Nielsen data for non-alcoholic beverages and the Drinks Association data for alcoholic beverages.

Price increases due to the Scheme appear to be similar in regional Queensland and in Brisbane.

# Has the Scheme affected consumption, expenditure, or competition?

Between November 2018 and September 2019, Queensland households reduced their consumption of non-alcoholic beverages covered by the Scheme by an estimated 6.5 per cent (1.04 litres) per month as a result of the Scheme. This fall was, however, more than offset by the increase in beverage prices, resulting in a moderate estimated increase in expenditure on non-alcoholic beverages of 93 cents (4.3 per cent) per household per month over this period.

Because of data limitations, the Commission could not form a robust conclusion on alcoholic beverages.

The Scheme does not seem to have changed market competition dynamics. There is no evidence that the Scheme has changed the market shares of firms in beverage markets or significantly increased barriers to entry, although there may be some impact on small entrants. The Commission has not observed any deterioration in firms' performance or conduct, and stakeholders did not identify any issues about this aspect of the review.

# Are there other impacts on consumers?

The Commission was asked to monitor and report on any other specific market impacts on consumers that arise from the commencement of the Scheme and any other matters that are relevant to the consumer interest. Consultations during the review identified six matters.

First, the accessibility of container refund points (CRPs) is particularly important for consumers, because it affects their ability to redeem their 10 cent refund. COEX has set up its legislated target number of CRPs, but should keep under review the collection network's effectiveness and efficiency. It should publish its strategy for developing the network and the reasons for making specific changes to the location or type of CRPs. This would strengthen COEX's incentives to invest in developing an effective strategy; give scheme participants opportunities to make suggestions that would help COEX to improve it; assist current and potential operators of CRPs to make decisions



that are consistent with the strategy; and embody COEX's value of 'work[ing] closely with our customers and the community to safely deliver accessible services and opportunities' (COEX 2019b, p. 6).

Second, COEX's target is to increase the eligible container recovery rate from the projected 70 per cent at 1 November 2019 to the target of 85 per cent for the financial year starting 1 July 2021. Options for increasing the recovery rate include spending more on the collection network, or on market awareness campaigns to encourage more people to return eligible containers, and increasing the refundable amount. These may all increase scheme prices, leading to higher beverage prices. COEX should publish estimates of the incremental costs and benefits of further increasing the recovery rate.

Third, Australia's environment ministers have agreed to work together to expand and harmonise the scope and alignment of schemes and product labelling for beverage manufacturers. Expanding the Scheme's scope by bringing in other types of containers could increase recycling and reduce littering. However, given that containers currently not in the Scheme are less likely to be littered, the benefits for littering from including them are likely to be smaller than is the case for currently eligible containers. Decisions about expanding the types of eligible containers should be based on thorough evaluation of benefits and costs, including of alternative options to achieve the same outcomes.

Harmonisation of schemes across jurisdictions could reduce the costs for suppliers that operate in different jurisdictions. Harmonisation would, for example, reduce requirements to satisfy different labelling and reporting requirements. However, Queensland's beverage industry and consumers could be disadvantaged if harmonisation was achieved at the expense of losing desirable features of the Scheme, such as payment in arrears. This risk could be reduced by assessing proposals for harmonisation against criteria such as whether they contribute to the effectiveness of the Scheme in achieving its objectives, generate net benefits, and can be implemented easily.

Fourth, there are concerns about possible over-recovery of scheme costs in beverage markets such as sports stadiums and remote communities, where consumers might be considered 'captive' because they have restricted choice when making purchases. However, this review has not revealed instances of over-recovery. If there are problems associated with weak competition, the Scheme has not made them worse and policy should focus on how to improve competition in these markets.

Fifth, achievement of the Scheme's objectives will be enhanced if its participants continually search for ways to achieve them more effectively, while constraining costs and minimising the need to increase scheme prices that flow through to retail beverage prices. Transparency is particularly important as COEX has sole responsibility for administering the Scheme and there is limited external scrutiny or pressure to constrain costs. COEX should be more transparent about the composition of scheme costs and how they are evolving; its reasons for changing scheme prices, and its strategies and options for achieving its targeted recovery rate. Increasing public scrutiny of these matters would enable COEX to take advantage of information and ideas from participants in the Scheme about how to improve it. COEX should add transparency as a sixth organisational value to its current five.

Complaints that scheme participants make to COEX—particularly if they are about system-wide issues—are a useful source of information for developing strategies to improve the operation of the Scheme. COEX should review its complaints-handling process, to ensure that it is making good use of customer feedback and to build confidence in the Scheme. This review should involve wide and transparent consultation with scheme participants and COEX should publish its results.



# Findings and recommendations

The Commission has made findings relating to the impacts of the Scheme on prices of beverages sold in Queensland in eligible containers; competition for beverages and the performance and conduct of beverage manufacturers and retailers; and other specific market impacts on consumers arising from the commencement of the Scheme. Based on these findings, six recommendations are made, which address the transparency of COEX regarding its costs, strategies and procedures; the way to assess proposals to harmonise schemes across Australia and expand container eligibility; and the accessibility of CRPs.

# Finding 1

Over the first 12 months of the Scheme's operation, retail prices of non-alcoholic beverages increased by an estimated 9.0 cents per container, on average, due to the Scheme:

- Soft drinks increased by 10.3 cents.
- Water increased by 8.0 cents.
- Flavoured milk in small containers increased by 8.9 cents.
- Fruit juices increased by 3.8 cents.
- Soft drinks in multipacks increased by between 10.2 and 10.7 cents.
- Water in multipacks increased by between 9.4 and 11.4 cents.

# Finding 2

Over the first 12 months of the Scheme's operation, retail prices of alcoholic beverages increased by an estimated 9.9 cents per container, on average, due to the Scheme:

- Beer increased by 8.6 cents.
- Cider increased by 16.2 cents.
- Spirits (ready-to-drink) increased by 9.5 cents.

### Finding 3

The estimated average retail price increases attributable to the Scheme in its first year of operation were similar in Brisbane and regional Queensland for both alcoholic and non-alcoholic beverages.

### Finding 4

The estimated average retail price increases attributable to the Scheme in its first year of operation:

- were less than the weighted average scheme price for both alcoholic and non-alcoholic beverages sold in eligible containers
- were either less than or not statistically different from the weighted average scheme price for all disaggregated beverage categories sold in eligible containers.

Consequently, the Commission has not found evidence of unjustified pricing behaviour during this period.



### Finding 5

The Commission has not found evidence that market shares of beverage manufacturers or retailers have been affected by the Scheme.

### Finding 6

The Scheme appears to increase barriers to entry into the beverage market by imposing costs on new entrants, but it is not possible to draw conclusions about the size of these costs, how they vary with firm size, and the extent to which the structure of the Scheme mitigates these impacts.

### Finding 7

The Commission has not found evidence of poor performance or poor conduct of beverage manufacturers or retailers as a result of the Scheme.

### Finding 8

The Scheme has affected the consumption of, and expenditure on, beverages covered by the Scheme. Estimates for the first year of the Scheme's operation suggest the following:

- Household consumption of non-alcoholic drinks fell by 1.04 litres (6.5 per cent) per month, on average, due to the Scheme.
- Household expenditure on non-alcoholic drinks increased by 93 cents (4.3 per cent) per month, on average, due to the Scheme.
- Consumers who purchased beverages at large retailers decreased their consumption of non-alcoholic drinks by 1 litre per household per month (6.7 per cent), on average, due to the Scheme, with an associated increase in expenditure of \$1, on average, per household per month (4.7 per cent).
- The Scheme has caused consumption to fall and expenditure to increase in Brisbane and regional Queensland by similar amounts.

Much of the estimated decrease in the consumption of non-alcoholic beverages due to the Scheme can be attributed to the estimated reduction in the consumption of beverages sold in multipacks.

#### Recommendation 1

COEX should continue to review the effective and efficient mix of container refund points. It should publish its strategy for developing the network and the reasons for making specific changes to the location or type of container refund point, to build stakeholder confidence in the network and encourage users to provide information to COEX that would help it to further improve the network.

#### Recommendation 2

COEX should publish estimates of the incremental costs and benefits of further increases in the eligible container recovery rate from its present level, and its strategy for achieving the 85 per cent target.

#### Recommendation 3

The Queensland Government should inform decisions about expanding the types of eligible containers through a thorough evaluation of costs and benefits, including the costs and benefits of achieving the same outcomes in different ways.



#### Recommendation 4

The Queensland Government should assess proposals for harmonisation with other jurisdictions against criteria such as the extent to which the proposals contribute to the effectiveness of the Scheme in achieving its objectives, generate net benefits, and can be implemented easily.

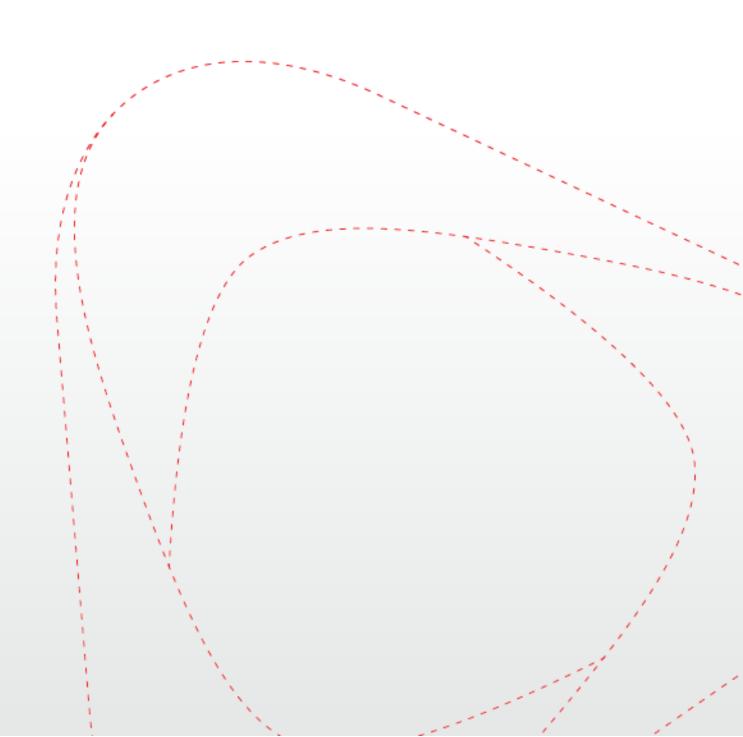
#### Recommendation 5

COEX should review its complaints-handling process, to ensure that it is making good use of customer feedback and to build confidence in the Scheme. This review should involve wide and transparent consultation with scheme participants and COEX should publish its results.

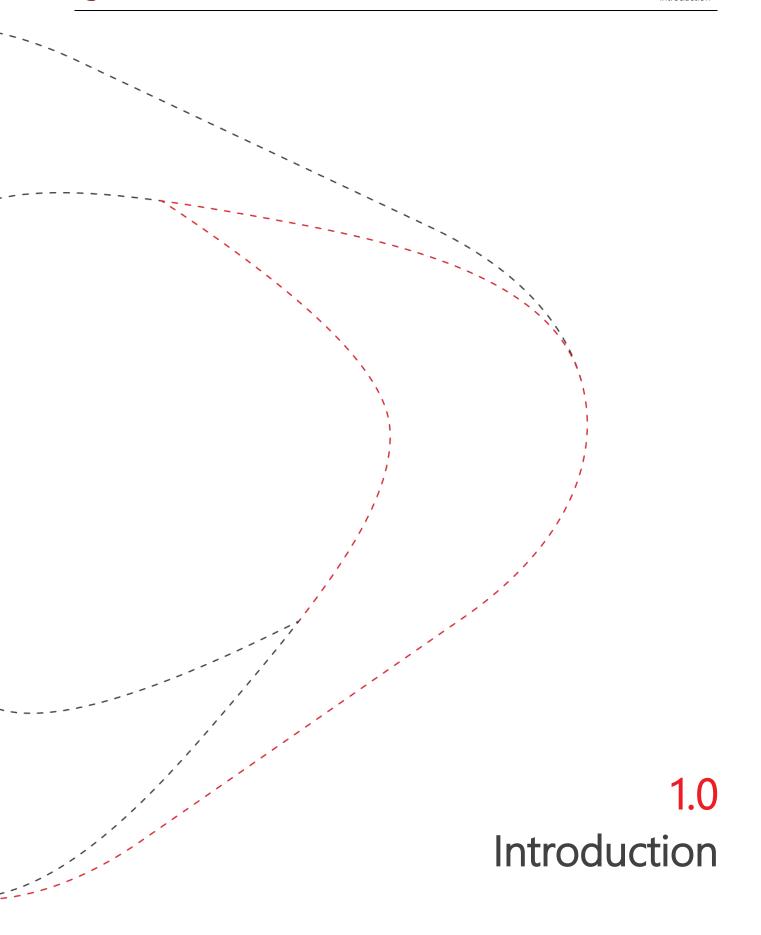
#### Recommendation 6

COEX should adopt transparency as a core organisational value. As a minimum, it should publish information about its costs, strategies and procedures. For example, it should report indicators of the Scheme's efficiency, its analysis of the reasons for changes in efficiency, and how these reasons affect its strategies.











This chapter summarises the scope of the price monitoring review and the Commission's approach.

## 1.1 The Commission's task

The Container Refund Scheme began operating on 1 November 2018 with the aim of increasing recycling and reducing litter in Queensland. Beverage manufacturers and beverage importers (together called suppliers<sup>2</sup>) fund the Scheme, through payments to the scheme coordinator—Container Exchange (COEX)—based on the number and type of eligible containers sold in Queensland. Suppliers can be expected to seek to pass these costs through the supply chain to customers. People who return eligible containers for recycling can exchange them for a 10 cent refund for each container.

In February 2019, the Queensland Government asked the Commission to monitor and report on:

- the effect of the Scheme on prices of beverages sold in Queensland in eligible containers
- the effect of the Scheme on competition for beverages and the performance and conduct of beverage manufacturers and retailers
- any other specific market impacts on consumers that arise from the commencement of the Scheme
- any other matters relevant to the consumer interest.

The Commission has also been asked to monitor and report on price impacts across consumer, geographical, supplier, retailer and product categories, including:

- state-wide, regions and localities
- types of beverages
- large and small retailers; for example, general grocers, liquor stores, hotels and online distribution.

The Commission is required to have regard for price impacts on beverage products in 'captive' markets such as entertainment and sporting venues.

The full terms of reference are provided at Appendix A.

# 1.2 Scope of the review

The underlying policy aim of the review is to ensure that consumer interests are protected from unjustified pricing behaviour by beverage suppliers and retailers. The terms of reference do not ask the Commission to monitor or report on the Scheme's effectiveness in achieving its five objectives, which are to:

- increase the recovery and recycling of empty beverage containers
- reduce the number of empty containers that are littered or disposed to landfill
- ensure that the manufacturers of beverage products meet their product stewardship responsibility in relation to their beverage products
- provide opportunities for social enterprises and benefits for community organisations
- complement existing collection and recycling activities for the state.<sup>3</sup>

<sup>&</sup>lt;sup>2</sup> The definition of 'supplier' varies across jurisdictions. In Queensland, the Waste Reduction and Recycling Regulation 2011 uses the term 'manufacturers'; however, beverage importers are also required to make payments to the scheme coordinator.

<sup>&</sup>lt;sup>3</sup> Waste Reduction and Recycling (Container Refund Scheme) Amendment Regulation 2018, Explanatory notes for SL 2018, No. 167 made under the *Waste and Recycling Act 2011*.



The report therefore does not review whether the Scheme is achieving these objectives. COEX has provided information about some of these matters in its first annual report (COEX 2019b).

Some stakeholders stated that this review should assess the efficiency of the operation of the Scheme. For example, the Australian Beverages Council (ABCL) commented that:

it is impossible to consider some aspects of a CRS, such as price, whilst having little consideration of others, like performance, particularly where these are matters which go to the very heart of the impact of the scheme on both its costs and pricing. An efficient and effective scheme will have a different cost structure, and therefore have a direct impact on pricing compared to an ineffective and deficient scheme. (ABCL sub. 5, p. 6)

The efficiency with which the Scheme is operated will affect its costs. These costs will be reflected in scheme prices, which in turn will affect retail beverage prices. The more efficiently it is run—other things being equal—the lower will be the increase in beverage prices.

However, the terms of reference focus on how scheme costs are passed through to consumers rather than on the costs themselves. The Commission has therefore interpreted the terms of reference to mean that it should focus on how scheme costs are passed on, rather than on whether those costs are efficient.

It is nevertheless important that the governance arrangements around the Scheme impose strong incentives to minimise the costs of operating it. As a result, while the Commission has primarily confined this review to price monitoring aspects, it has assessed a small number of governance issues that will affect the cost-effectiveness of the Scheme over time.

# 1.3 The Commission's approach

The Commission:

- estimated price changes of beverages sold in eligible containers that can be attributed to the Scheme
- assessed whether these price changes are reasonable, given the cost increases that the Scheme imposes on beverage suppliers
- reviewed whether the Scheme has affected competition in the Queensland beverage market, by looking for evidence of changes to:
  - market shares of beverage manufacturers, wholesalers, or retailers
  - changes in consumers' consumption and expenditure behaviour
  - performance and conduct of suppliers, distributors or retailers
  - cross-border impacts on prices and beverage purchases
- considered other ways in which the Scheme affects consumers' interests:
  - access to container refund points
  - the incremental costs of additional improvements in recovery rates
  - cross-border differences between schemes
  - revenue sharing between local governments and material recovery facilities
  - pricing behaviour in captive markets
  - strengthening incentives for continuous improvement.



# 1.4 Structure of the report

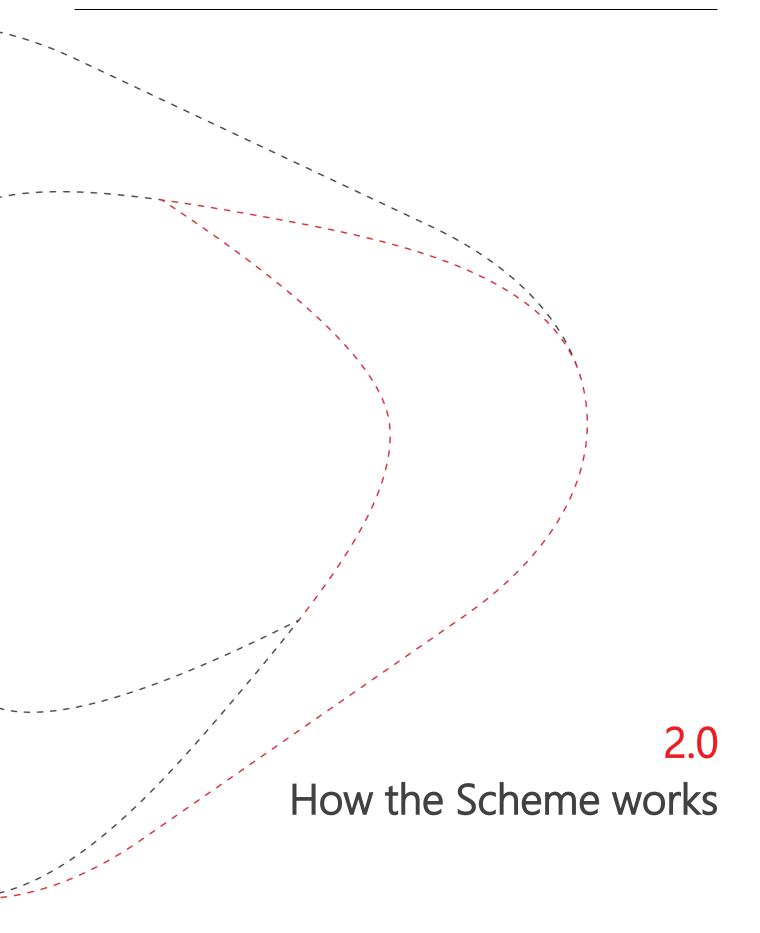
Chapter two summarises how the Scheme works and is funded.

Chapter three estimates the price changes of eligible beverages that have resulted from the Scheme, across various beverage categories, and assesses whether these price increases have been consistent with reasonable pricing behaviour.

*Chapter four* outlines how the Scheme affects competition in beverage markets and the consequent impacts on the performance and conduct of key participants in the Scheme.

Chapter five reports on other matters relevant to the consumer interest.







This chapter summarises how the Scheme works and is funded.

# 2.1 A snapshot of the Scheme

Queensland's scheme was introduced to increase the recovery and recycling of eligible empty beverage containers in Queensland, with the aim of improving the overall recycling rate and reducing the amount of litter (*Waste Reduction and Recycling Act 2011*, s. 99H).

The states and territories that have container refund/deposit schemes are Queensland, New South Wales (NSW), South Australia (SA), the Australian Capital Territory (ACT) and the Northern Territory (NT). Western Australia (WA) will implement a scheme in 2020 and Tasmania is expected to do so by 2022 (Archer 2019, p. 1). Victoria does not have a scheme.

Although the schemes vary across jurisdictions, they all (EPA SA 2019b, p. 6):

- provide a 10 cent refund when eligible containers are returned
- are authorised by legislation
- require similar refund marks to be displayed on eligible containers<sup>4</sup>
- exclude containers for plain milk, wine and spirits in glass bottles, pure juice and flavoured milk in containers greater than 1 litre.

Under the Scheme, people collect eligible beverage containers for recycling and exchange them for a refund of 10 cents per container. The Scheme targets containers that are less likely to be consumed at home—and therefore more likely to be littered (Containers for change 2019a). Most glass, aluminium, plastic, steel and liquid paperboard beverage containers with a capacity of between 150 millilitres and 3 litres are included in the Scheme. Figure 2.1 provides examples of eligible and non-eligible containers. Appendix C contains a comprehensive list.

Figure 2.1 Eligible containers

#### Eligible containers



#### **Examples:**

- Beer bottle
- Soft drink can
- Flavoured milk bottle < 1 litre

Source: Containers for change 2019a.

#### **Excluded containers**



#### **Examples:**

- Plain milk bottle
- Containers for concentrated/undiluted cordial or syrup.
- Glass containers for wine or spirits

<sup>&</sup>lt;sup>4</sup> The refund mark must state the refund amount and that it may be claimed at a container refund point, however described, in a participating state (Waste Reduction and Recycling Regulation 2011, s. 13).



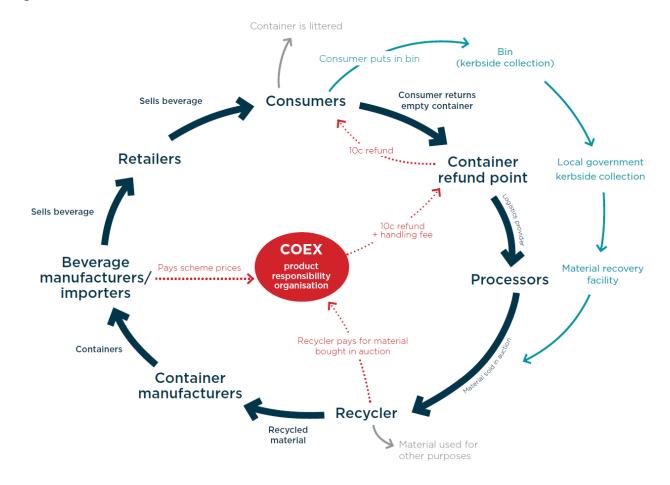
People can redeem their 10 cent refund only by returning eligible containers to a container refund point (CRP), from where they are sent onwards for recycling. They can instead continue to dispose of containers in recycling bins for kerbside collection, but will not receive a refund for the container. Their local government and the material recovery facility (MRF) will receive a refund for containers disposed of in recycling bins, subject to some conditions being met.

# 2.2 Roles and responsibilities

The Scheme relies on a process in which each step is performed by a participant with a specific role. Figure 2.2 illustrates the relationships between the main participants and Table 2.1 lists their functions.

COEX is the 'product responsibility organisation' (PRO)—a not-for-profit organisation appointed by the Queensland Government to coordinate the Scheme. Its role includes establishing a network of CRPs, which are operated by for-profit and not-for-profit organisations, to ensure ongoing, efficient and effective arrangements are available in Queensland for empty beverage containers to be recycled. It also sets the amount payable by manufacturers and importers to fund the Scheme, based on the number and type of eligible containers they sell in Queensland. By November 2019, 407 suppliers had registered with COEX.<sup>5</sup>

**Figure 2.2 Container Refund Scheme** 



<sup>&</sup>lt;sup>5</sup> Data received from COEX.



Table 2.1 Roles and responsibilities of scheme participants

Scheme participant	Function
Department of Environment and Science (DES)	Regulates the Scheme pursuant to the <i>Waste Reduction and Recycling Act 2011</i> and the Waste Reduction and Recycling Regulation 2011.
Product responsibility	Administers and coordinates the Scheme and is responsible for:
organisation (COEX)	establishing CRPs for people to return empty eligible beverage containers for payment of the refund
	<ul> <li>ensuring ongoing, efficient and effective arrangements are available in Queensland for empty beverage containers to be recycled</li> </ul>
	ensuring beverage manufacturers fund the Scheme
	<ul> <li>receiving and dealing with complaints relating to the Scheme from members of the public and participating entities.</li> </ul>
Container refund points (CRPs)	Provide refunds; collect, count and sort returned containers.
Logistic providers	Transfer eligible containers from CRPs to processors.
Processors	Provide container collection infrastructure to CRPs; verify the number of containers received from CRPs and prepare them for sale by baling materials; transfer sold materials to the purchasing recycler.
Material recovery facilities (MRFs)	Waste industry providers that receive materials from kerbside collection and sort and prepare them for sale to recyclers.
Recyclers	Recover resources to be used again or transformed into materials that can be used in new products.
Beverage manufacturers and importers	Make beverage products or import beverages from overseas or interstate, or arrange for the distribution of beverage products in Queensland (as defined in the <i>Waste Reduction and Recycling Act 2011</i> ). They contribute the funding necessary for administration of the Scheme and payment of refunds.
Local governments	Manage kerbside collection of beverage containers. Eligible containers recovered in this way are eligible for the 10 cent refund. Local governments may outsource kerbside collection and may enter into refund sharing agreements with that entity.
Retailers	Sell eligible beverage containers to consumers.
The community	Return eligible containers to a CRP and receive 10 cents per container.

Source: COEX 2020; Waste Reduction and Recycling Act 2011; Waste Reduction and Recycling Regulation 2011.

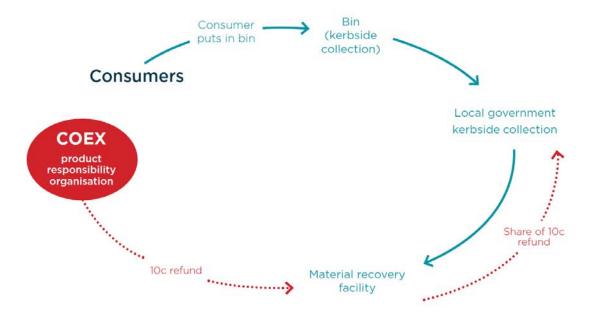


# 2.3 Redeeming the refund

Refunds can be redeemed in two ways:

- People can receive refunds by returning eligible containers to a CRP. COEX provides funds to CRPs to enable
  them to pay these refunds. COEX also pays for logistic providers to move scheme material from CRPs and for
  processors to prepare, bale and transfer containers for sale on the auction portal.
- COEX refunds MRFs for containers collected in kerbside recycling bins, provided that the MRF has a revenue sharing agreement with a local government. The MRF is responsible for providing the local government with the share of the refund amount that they have agreed. COEX is not permitted to distribute refunds directly to local governments (Figure 2.3). The purpose of this arrangement is to ensure that the Scheme complements existing kerbside collection activities (EHP Qld nd, p. 27).

Figure 2.3 Ways to redeem funds other than at a container refund point



COEX retains the refundable amounts for containers that are littered (and not later collected and returned), retained by consumers, or placed in a general waste bin.

# 2.4 Scheme funding

Beverage suppliers are required to contribute to the costs of running the Scheme<sup>6</sup> by paying COEX the relevant 'scheme price' that COEX sets for each eligible container they sell (Table 2.2). The scheme price is designed to fund the 10 cent refund paid when eligible containers are returned, and to recover the costs of operating the Scheme, including:

- a container handling fee—paid to owners of the CRPs for collecting the containers
- logistics and processing expenses, which include the costs associated with transport and processing containers for recycling markets

<sup>&</sup>lt;sup>6</sup> Waste Reduction and Recycling Act 2011, s. 99I(c).



• the costs that COEX incurs to administer the Scheme.

Scheme prices vary between the type of material a container is made of (Table 2.2). These differences 'reflect the cost of handling and recycling that particular material type' (COEX sub. 8, p. 1). Suppliers pay COEX an amount based on the number of eligible containers of each material type they have 'declared' that they have sold or imported in the previous month, multiplied by the relevant scheme prices (see Example 1).

Most beverage suppliers are required to pay monthly. Small suppliers—selling fewer than 300,000 eligible containers each year—may make scheme payments on a quarterly basis.<sup>7</sup>

As suppliers are billed in arrears, based on past sales of containers, the initial costs of the Scheme were financed through a \$35 million, 18-month, interest-free loan provided to COEX by the Queensland Government. This was further supported by industry-provided loan facilities totalling \$13 million (COEX 2019a, p. 18).

Billing in arrears avoids the need for the regular 'true-ups' that are required when payments are based on forecast container recovery and sales volumes, as happens in the NSW scheme.

Table 2.2 Scheme prices excluding GST

	Scheme price (cents per unit sold)			
Material type	1 Nov 2018 to 31 Oct 2019	1 Nov 2019 onwards		
Aluminium	9.9	11.2		
Glass	10.5	11.9		
High-density polyethylene (HDPE)	10.6	11.9		
Polyethylene terephthalate (PET)	10.3	11.8		
Liquid paperboard (LPB)	10.6	12.1		
Expected weighted average by number of containers sold	10.2	11.6		

# **Example 1: Funding**

A beverage supplier delivers 20,000 beverages in glass bottles to the Queensland market in September 2019.

The amount payable into the Scheme:

 $20,000 \times 10.5 \text{ cents} = \$2,100$ 

COEX issues the invoice to the supplier in October 2019.

Note: Scheme prices for 1 November 2018 to 31 October 2019 are based on an estimated recovery rate of 63 per cent. Scheme prices from 1 November 2019 are based on an estimated recovery rate of 70 per cent. Source: COEX 2020; information provided by COEX to the Commission.

Suppliers pay the relevant scheme price for every eligible container that they sell in Queensland, as well as an added component of GST. When an eligible beverage container is not exchanged for a refund—for instance, if it is littered or is put in a bin destined for landfill—COEX retains the refundable amount of 10 cents per container. As a not-for-profit organisation, COEX must invest all surplus funds back into the operation and advancement of the Scheme (COEX, pers. comm., 20 January 2020).

<sup>&</sup>lt;sup>7</sup> Waste Reduction and Recycling Regulation 2011, ss. 18–19.

<sup>&</sup>lt;sup>8</sup> A true-up is an adjustment made after a firm has been billed on a forecast amount to reflect actual outcomes. In NSW, suppliers pay their invoices in advance based on forecasts, and then in future months receive either a credit or a further charge to reconcile the difference between forecasts and actuals (Exchange For Change 2018, p. 1).



# 2.5 Determinants of scheme prices

Scheme prices are largely determined by:

- · the costs of operating the Scheme
- the cost of refunds, which depends on the recovery rate. OEX uses a predicted recovery rate to estimate the amount that will need to be refunded. In the short term, while the scheme price is fixed, COEX builds up its reserves if the actual recovery rate is below forecast and draws on its reserves to fund refunds when it is above the forecast. COEX assesses twice each year whether the difference between the forecast and actual recovery rate is large enough to warrant a change in scheme prices to maintain sufficient liquidity to cover the costs of operating the Scheme. In the longer term, if the recovery rate trends upwards, COEX will need to increase the scheme price to fund the correspondingly higher cost of refunds
- revenue from the sale of recycled material. COEX sells processed material from processors and MRFs through an online recycling material platform to approved recyclers (COEX 2020)
- the proportion of containers collected via kerbside recycling. The per-container cost is higher for COEX for containers returned at CRPs than for those collected by local government and passed to MRFs. This is because COEX pays CRPs both the 10 cent refund (that they pass on to people returning containers), a container handling fee (that they retain) and a logistics fee and a processing fee. COEX pays only the refundable amount for containers returned through a MRF. COEX may therefore need to increase scheme prices to recover growing container handling fees incurred if consumers shift from using kerbside recycling to returning containers at CRPs.

COEX set scheme prices for the first 12 months of the Scheme based on an assumed 63 per cent recovery rate. This 63 per cent was comprised of a projected 38 per cent of eligible containers sold being returned at container refund points, and an additional 25 per cent of containers sold being recovered at MRFs (COEX 2020). COEX increased scheme prices from 1 November 2019 (Table 2.2), attributing the increase to significantly higher than expected recovery rates through the CRP network and significantly less (12–15 per cent instead of the projected 25 per cent) through the kerbside network and MRFs (COEX, pers. comm., 20 January 2020). The new forecast recovery rate underlying these scheme prices is 70 per cent (COEX, pers. comm., 23 July 2019). The breakdown of proportions expected to be returned at CRPs and at MRFs has not been published alongside the new scheme prices.

The scheme price for each type of container will be reviewed bi-annually to align with the timing of other tax changes such as alcohol excise duties (COEX 2019c). While COEX has not published the methodology it uses in scheme price reviews, it informed the Commission that it provides beverage manufacturers with some information about the rationales for scheme price changes (COEX, pers. comm., 20 January 2020).

# 2.6 Compliance costs

In addition to paying the scheme price on each eligible container sold, beverage suppliers also incur costs to comply with the Scheme, such as changing labelling, or implementing new systems to enable them to report container volumes to COEX each month. The Independent Competition and Regulatory Commission (ICRC) indicated that the ACT scheme requires its suppliers to undertake the following additional tasks:

<sup>&</sup>lt;sup>9</sup> The 'recovery rate' is defined in the Waste Reduction and Recycling Regulation 2011 (s. 29) as the sum of the number of containers received at CRPs and the number of containers received at MRFs during a period, divided by the number of containers in which beverage products were sold in Queensland during the period. COEX refers to it as the redemption rate and some stakeholders refer to it as the return rate.

<sup>&</sup>lt;sup>10</sup> Volumes of containers sold are to be reported to COEX on a monthly basis under the *Waste Reduction and Recycling Act 2011*—unless the supplier falls under the definition of a small supplier. In the case of a small supplier, quarterly reporting is permitted.



- registering eligible containers with the scheme before sale
- labelling containers to meet scheme requirements
- informing customers about the scheme
- training employees to use the reporting system
- reporting volumes each month
- updating prices when scheme prices change (ICRC 2019a, p. 41).

Suppliers may also need to upgrade IT and reporting systems.

Estimating these costs can be difficult, as they differ for each business. For example, the cost of a labelling change can vary based on the magnitude of the change required and the type of container. The ABCL (2018, pp. 1–2) estimated that it costs approximately \$4,806 per stock keeping unit<sup>11</sup> (SKU) for a minor labelling change<sup>12</sup> to a glass bottle, compared to \$5,796 per SKU for an aluminium can. For major labelling changes, this increases to \$15,493 per SKU for a glass bottle and \$10,840 per SKU for an aluminium can.

Moreover, smaller suppliers may be disproportionately affected (Box 2.1).

## Box 2.1 Compliance costs—a case study of craft brewers

Craft brewing is growing in Queensland, nearly doubling in size between 2015–16 and 2017–18 (DSDMIP Qld 2018, p. 7). Craft brewers told the Commission that the Scheme imposes the following costs:

- ongoing costs—registering barcodes for each product, which is costly, because COEX's software is not easy to use and because craft brewers often introduce new products (Ballistic sub. 9, p. 1)
- once-off costs—complying with new labelling requirements, to generate new labels and change old
  ones, because smaller manufacturers often take longer (for example, six months) to sell a pre-printed
  product run than big manufacturers, which may take only a week (Ballistic sub. 9, p. 2). Ballistic Beer
  Co told the Commission that it costs approximately 20 cents per label to re-label aluminium cans
  (sub. 9, p. 2).

The Independent Pricing and Regulatory Tribunal (IPART) was unable to estimate the compliance costs of NSW's scheme but considered that an additional 1.5 to 2.3 cents per container (including GST) above the average direct cost of the scheme would be a reasonable estimate for its first 12 months (IPART 2018, p. 58). <sup>13</sup> The ICRC considered the indirect costs in ACT would be higher than IPART's estimate, because firms in the ACT are less able to take advantage of economies of scale (ICRC 2019a, p. 42).

The Commission received insufficient evidence to support a reliable estimate of the costs of complying with the Scheme. Indirect costs are likely to fall over time as, for example, re-labelling is completed, and manufacturers have adapted to the new processes.

<sup>&</sup>lt;sup>11</sup> A stock keeping unit refers to a distinct product item; for example, a particular product and container size.

<sup>&</sup>lt;sup>12</sup> A minor change is changes to text, a medium change is changes to text and or label layout with proofing required and a major change includes all of the above and changes to packaging shape/size/design (PwC 2008, p. 2).

<sup>&</sup>lt;sup>13</sup> The average price increases of 1.5 to 2.3 cents were considered reasonable for non-alcoholic beverages.







This chapter estimates the retail price increases of beverages sold in eligible containers that can be attributed to the Scheme, and assesses whether they have been reasonable.

### Key points

- The Commission used a 'difference-in-differences' approach to monitor the impact of the Scheme on prices of beverages in eligible containers for the first 12 months of the Scheme's operation (1 November 2018 to 30 October 2019).
- In this period, prices of non-alcoholic beverages in Queensland are estimated to have risen, as a result of the Scheme, by 9.0 cents per container on average. Prices rose by an estimated:
  - 10.3 cents per container for soft drink
  - 8.0 cents per container for bottled water
  - 8.9 cents per container for flavoured milk in small containers
  - 3.8 cents per container for fruit juice.
- Prices of alcoholic beverages in Queensland are estimated to have risen by 9.9 cents on average per scheme-related container as a result of the Scheme. Prices rose by an estimated:
  - 8.6 cents per container for beer
  - 16.2 cents per container for cider
  - 9.5 cents per container for ready-to-drink spirits.
- Increases in the price of beverages due to the Scheme were similar in Brisbane and regional Queensland.
- The Commission has not found evidence of unjustified increases in the retail prices of beverages sold in eligible containers due to the Scheme.

# 3.1 The Scheme's effect on beverage prices

Manufacturers and importers pay scheme prices to cover the costs of the Scheme, and they and other firms also incur compliance costs (Chapter 2). They seek to pass on these costs further down the supply chain to distributors, wholesalers and retailers, who ultimately seek to recover them from consumers through higher retail prices.

It is challenging to identify the impact on prices due to the Scheme, because prices are affected by a range of factors. Price changes along the supply chain are difficult to observe and are affected by commercial contracts and bargaining power. The Australian Beverages Council (ABCL) commented that manufacturers have a commercial right to recover scheme costs and a limited role in relation to setting prices for beverages sold in retail settings. After leaving a manufacturing facility, a beverage's retail price is impacted by at least one, and sometimes two, other commercial entities that are not the brand owner (sub. 5, p. 7). How retailers react to increases in wholesale prices may be affected by whether they have access to discounts or rebates; have contractual provisions with their suppliers for price changes resulting from regulatory provisions; have national pricing policies; practise 'lumpy' pricing, under which prices are left at a round figure before an increase, say from \$2.00 to \$2.20; or offer 'specials'.

The share of scheme costs that suppliers can pass through to consumers is influenced by the responsiveness (elasticity) of supply and demand for beverages to price changes. The more elastic the supply and the less elastic the demand, the more likely is it that the costs of the Scheme will be passed on to customers. The structure of the market can also affect suppliers' ability to pass through scheme costs. In competitive markets, if firms face similar



cost increases caused by the Scheme, they would seek to pass on as much of these costs as they can, subject to supply and demand conditions.<sup>14</sup> In general, and perhaps counter-intuitively, a greater degree of market power will imply a smaller proportion of the cost increase is passed through to consumers (CIE 2020, p. 28).<sup>15</sup> This is because a firm with market power is already using this power to extract higher prices before the impact of a policy such as the Scheme is factored in.

To assess whether price increases have been consistent with reasonable pricing behaviour, the Commission examined whether observed price increases attributable to the Scheme have exceeded the scheme costs over its first year of operation.

# 3.2 Estimating the Scheme's impact on beverage prices

The Centre for International Economics (CIE 2020) was engaged to estimate the impact of the Scheme on beverage prices, separating its impact from other factors that may also affect prices. Namely, difference-in-differences analysis is used to estimate the causal impact of the Scheme on the prices of beverages in eligible containers sold in Queensland. Implementation of the Scheme can be viewed as a natural experiment, as changes in the prices of beverages covered by the Scheme in Queensland can be compared with price changes in other jurisdictions where policy has not changed, or has not changed in the same time period. If prices in Queensland increased by more than those in the control group following introduction of the Scheme, the econometric analysis identifies how much of the difference was caused by the Scheme itself. Appendix E provides further details about the method and its limitations, the interpretation of the estimates, and the sensitivity analysis that was undertaken.

#### The datasets

The beverage industry supplies a wide range of products to different markets. Price impacts were therefore analysed for alcoholic and non-alcoholic beverages, which were further disaggregated into categories of drinks: soft drinks, bottled water, flavoured milk in small containers, fruit juice, beer, cider and ready-to-drink spirits (see Appendix D).

The Scheme's impact on prices of non-alcoholic beverages was analysed using household-level transactions data sourced from the Nielsen Homescan Consumer Panel survey, which collects monthly consumption data for 10,000 Australian households across many purchase categories. <sup>16</sup> This dataset was selected because it provides detailed monthly coverage of different beverage types across all Australian jurisdictions before and after the Scheme began—from January 2016 to September 2019. <sup>17</sup> The Nielsen panel was not used to assess the Scheme's impact on alcoholic beverages, as less than 10 per cent of its observations are for alcoholic beverages (CIE 2020, p. 3). This under-sampling means that this dataset may not provide accurate estimates for alcoholic beverages. It also does not align with consumption data for these beverages reported in the Australian Bureau of Statistics (ABS) household expenditure survey.

<sup>&</sup>lt;sup>14</sup> The impact on prices will also depend on the value to consumers of the potential refund, which will depend on the proportion of containers that are refunded and the costs to consumers of securing the refund. If the value to consumers is larger, it is more likely that suppliers will be able to pass on the costs of the Scheme (the refund makes their demand less elastic) (CIE 2018, pp. 29–30).

<sup>&</sup>lt;sup>15</sup> This can be demonstrated by considering a situation in which there is a monopoly. The Scheme can be characterised as imposing a per-unit tax on suppliers of beverages, combined with a refund paid to consumers who return containers. Before the tax was imposed, a monopolist would have been able to charge a higher price than in a competitive market. The tax reduces the ability of a supplier to extract monopoly rent, so that some of the incidence of the tax falls on the monopolist's mark-up (CIE 2020, p. 28).

<sup>&</sup>lt;sup>16</sup> This dataset was also used to estimate the impact of the Scheme on household consumption of and expenditure on beverages sold in eligible containers (Chapter 4).

<sup>&</sup>lt;sup>17</sup> A full month of data was not available for October 2019, when the report was prepared. Observations from October have therefore been excluded from the analysis, as not all households had been fully sampled.



The Scheme's impacts on alcoholic beverages were therefore estimated using the Drinks Association's 'Retail Ad Watch' database of advertised prices—in particular, the monthly observations of beverage advertisements between January 2016 and October 2019.

Both datasets provide retail prices, rather than wholesale prices, which is appropriate, given the review's focus on the Scheme's impact on prices paid by consumers.

### 3.3 Results

As expected, prices of beverages sold in eligible containers increased as a result of the introduction of the Scheme.

## Non-alcoholic beverages

The Scheme caused the price of non-alcoholic beverages in eligible containers to rise by an estimated 9.0 cents (5.1 per cent) on average over the period since its introduction. Prices of fruit juices, water and flavoured milk increased by less than the average increase, while soft drink prices increased by slightly more (Table 3.1).

Table 3.1 Estimated impact of the Scheme on prices of non-alcoholic beverages in its first year

	Soft drinks	Water	Flavoured milk (small container)	Fruit juices	Total
Estimated impact (cents per container)	10.3***	8.0***	8.9***	3.8***	9.0***
Standard error	0.59	0.81	1.43	1.35	0.47
Implied percentage change (%)	8.0	5.1	4.2	1.4	5.1

<sup>\*\*\* 1%</sup> significance.

Source: CIE estimates based on Nielsen data.

The estimated impact of 9.0 cents is close to that reported in the interim report of 9.5 cents, which was calculated using data up until May 2019 (QPC 2019, p. 29). This indicates that the Scheme's impact on prices largely occurred when the Scheme began, and that impact has been sustained.

# Alcoholic beverages

It is estimated that prices of alcoholic beverages increased by 9.9 cents per eligible container on average, due to the introduction of the Scheme (Table 3.2). The estimates for each subtype of alcoholic beverage are more sensitive to modelling specification than those for non-alcoholic beverages, due to small sample sizes, particularly for cider and spirits (see the sensitivity analysis in Appendix E). Results, which should be treated with caution, suggest the price of cider increased by considerably more than the average, while the increases in beer and ready-to-drink spirits prices were below average.

\_

<sup>&</sup>lt;sup>18</sup> Coefficients for each subcategory will not average to the broad category average owing to the methodology employed. The coefficients for 'alcoholic' and 'non-alcoholic' can be considered a weighted average of the coefficients for each of the subcategories nested within them. They are effectively weighted by the relative number of observations for each beverage subcategory in the overall sample. For example, if soft drinks make up a significant proportion of the overall sample, the estimated effect for soft drinks will dominate the overall effect estimated for non-alcoholic beverages.



Table 3.2 Estimated impact of the Scheme on prices of alcoholic beverages in its first year

	Beer	Cider	Ready-to-drink spirits	Total
Estimated impact (cents per container)	8.6***	16.2***	9.5***	9.9***
Standard error	0.73	2.91	1.71	0.76
Implied percentage change (%)	4.0	5.4	2.5	3.7

<sup>\*\*\* 1%</sup> significance.

Source: CIE estimates based on the Drinks Association data.

### Multipack containers

Price impacts per eligible container have also been estimated for beverages sold in multipacks over the first year of the Scheme. As manufacturers must pay the scheme price for each container, the Scheme would be expected to have a bigger impact on retail prices per litre of beverages sold in multipacks than on those for other beverages. For example, if the retail price per container rose in line with the 10 cent refund amount, a 10-pack of 375 millilitre soft drink cans would have \$1 added to its purchase price (10 cents multiplied by 10 cans). In contrast, consumers who buy a roughly equivalent volume in two bottles of 2 litres each would only pay 20 cents more.

The econometric analysis estimates that the prices of soft drinks and water sold in multipacks increased by between about 9 and 11 cents per container on average, due to the Scheme, and that in both cases the price increases were higher the more containers there were in a multipack (Table 3.3).

Table 3.3 Estimated impact of the Scheme on prices of non-alcoholic beverages sold in multipacks in its first year

Multipack size	Soft drinks (price change, cents per container)	Soft drinks (implied percentage change, %)	Water (price change, cents per container)	Water (implied percentage change, %)
2–9 containers	10.2***	10.3	9.9***	11.2
10–24 containers	10.2***	18.1	9.4***	33.3
25–40 containers	10.7***	18.2	11.4***	50.9

<sup>\*\*\* 1%</sup> significance.

Source: CIE estimates based on Nielsen data.

While these price increases are broadly similar in absolute terms, the percentage change in price per container is higher for multipacks, as the price per container typically decreases as the multipack size increases (due to buying in bulk). This is especially the case for water, where the price increase for a container in a pack of 25 to 40 is equivalent to a 50.9 per cent price increase per container.

There was insufficient data to enable reliable estimates of price increases for alcoholic beverages sold in multipacks.

# Price impacts by region

A comparison of Brisbane and regional Queensland, the two areas for which data are available, indicates that the regional impacts of the Scheme on prices for non-alcoholic beverages have been similar, with prices increasing by



an estimated 8.9 cents in Brisbane and 8.8 cents in regional Queensland on average due to the Scheme, in its first year (Table 3.4).

Table 3.4 Estimated impact of the Scheme on prices of beverages sold in Brisbane and regional Queensland in its first year

	Brisbane		Regional Queensland	
Beverage	Point estimate (cents per container)	Standard error	Point estimate (cents per container)	Standard error
Non-alcoholic	8.9***	0.55	8.8***	0.64
Soft drinks	10.4***	0.52	9.8***	0.72
Water	7.7***	0.93	8.4***	0.71
Alcoholic	10.8***	0.95	9.4***	0.87
Beer	8.7***	0.89	8.8***	0.86
Cider	17.2***	3.06	14.3***	4.48
Ready-to-drink spirits	11.2***	2.11	8.8***	1.98

<sup>\*\*\* 1%</sup> significance.

Source: CIE estimates based on Nielsen data for non-alcoholic beverages and the Drinks Association data for alcoholic beverages.

Prices of alcoholic beverages in Brisbane have increased by an estimated 10.8 cents on average due to the Scheme, whereas prices in regional Queensland have increased by 9.4 cents.

# Price impacts by retailer size

Price increases due to the Scheme were estimated across different-sized retailers (Table 3.5). The estimates for non-alcoholic beverages sold at small retailers are less robust, as most households in the dataset purchase beverages at larger retailers, such as supermarkets. In contrast, the Drinks Association data for alcoholic beverages contains advertised prices at different kinds of retailers, making them more reliable for this analysis.

While the estimates suggest that price increases due to the Scheme may have differed between small and large retailers, the difference is not statistically significant.

Table 3.5 Estimated impact of the Scheme on beverage prices by retailer size in its first year

	Large retailer		Small retailer	Statistically	
Beverage	Price impact (cents per container)	Standard error	Price impact (cents per container)	Standard error	different from each other (Yes/No)
Non-alcoholic	9.0***	0.46	~0.0	7.84	No
Alcoholic	6.9***	1.67	10.4***	0.89	No

<sup>\*\*\* 1%</sup> significance. No asterisks indicates that the estimate is not statistically significant.

Note: To assess if there was a price difference between retailers, a model was estimated that measured the Scheme impact on large and small retailers jointly. This coefficient was not statistically significant from zero.

Source: CIE estimates based on Nielsen data for non-alcoholic beverages and Drinks Association data for alcoholic beverages.



### Price impacts compared to the impacts in NSW and the ACT

The estimated price increases of non-alcoholic beverages are consistent with those observed in NSW following the introduction of a similar scheme (Table 3.6). Estimates for the ACT are higher—potentially because these price increases were estimated using data on wholesale container prices instead of retail prices.<sup>19</sup>

Table 3.6 Estimated price impacts of container refund/deposit schemes in Queensland, NSW and ACT

	Price impact (cer	Price impact (cents per container)		
Beverage	Queensland	NSW	ACT	
Non-alcoholic	9.0	10.1	12.2	
Soft drinks	10.3	10.8	12.2	
Water	8.0	11.6	12.2	
Flavoured milk (small container)	8.9	NA	12.2#	
Fruit juices	3.8	5.3	11.9	
Alcoholic	9.9	5.1	12.7	
Beer	8.6	4.2	12.8	
Cider	16.2	10.0	12.7	
Ready-to-drink spirits	9.5	6.9	12.4	

<sup>&</sup>lt;sup>#</sup> This estimate is for the category 'Other', which includes flavoured milk, iced tea and energy drinks.

Notes: (a) Estimates have been rounded to the nearest decimal place. (b) Estimates from NSW are made over the first year of operation using an approach most comparable to the econometric approach reported by the Commission. (c) Estimates from the ACT are made over the first year of operation with a methodology most comparable to the simpler method employed by the Commission (see Appendix E). (d) The reported impacts for alcoholic beverages in NSW are a weighted average calculated using results from multiple data sources (IPART 2018, p. 32).

Source: CIE estimates for Queensland are based on Nielsen data for non-alcoholic beverages and the Drinks Association data for alcoholic beverages; NSW estimates are from IPART 2018, p. 31; ACT estimates are from ICRC 2019b, p. 28.

Estimated price increases for non-alcoholic beverages are lower in Queensland, but the comparisons are mixed for alcoholic beverages. As noted previously, estimates for alcoholic beverages are sensitive to modelling specification (Appendix E), which may explain some of the differences between estimates in Queensland and NSW.<sup>20</sup>

# 3.4 Price increases compared with scheme costs

#### In aggregate

As set out in Table 2.2, the weighted average scheme price per eligible container (which manufacturers and importers experience as a cost increase) was 10.2 cents between 1 November 2018 and 31 October 2019. However, the cost to manufacturers and importers includes a GST component, meaning that their costs increased by 11.2 cents per container in the first 12 months of the Scheme. This cost increase exceeded the estimated average price increases over this period for both non-alcoholic and alcoholic beverages sold in eligible containers (9.0 cents

<sup>&</sup>lt;sup>19</sup> The ICRC reported that the estimated price increases using retail prices are less than those estimates using wholesale prices, and that the difference may be because promotions and discounts are not included in the wholesale prices (ICRC 2019, p. 30).

<sup>&</sup>lt;sup>20</sup> Note that IPART used the same data source for non-alcoholic beverages, but used data collected by Invigor Group Insights Retail for alcoholic beverages (IPART 2018, p. 22).



and 9.9 cents respectively including GST) due to the Scheme, indicating that suppliers have passed on less than the cost of the Scheme to consumers.

Because the scheme price does not incorporate compliance costs, suppliers are passing on a lower share of the costs of the Scheme than estimated above. Overall, there is no evidence that beverage price increases exceeded scheme costs in the first year of the Scheme's operation.

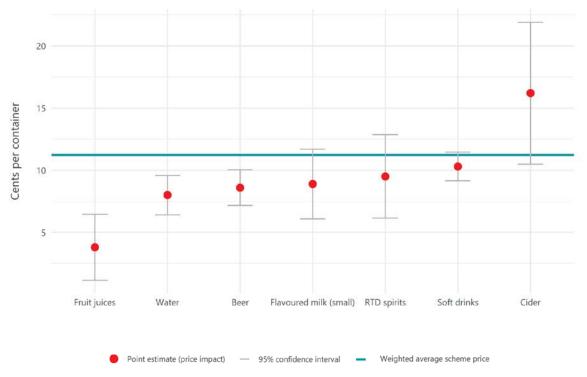
# By beverage type

Comparisons based on average prices could disguise examples of unjustified price increases for individual beverages. Analysis disaggregated by beverage category indicates that this has not happened.

Figure 3.1 compares the estimates for the price impacts of the Scheme for each beverage type and their associated 95 per cent confidence intervals (as a measure of uncertainty for each estimate) with the weighted average scheme price of 11.2 cents (including GST), shown as the horizontal line in the figure. If the confidence interval for a point estimate crosses this line, it means that the estimated beverage price increase is not statistically different from the scheme price.

This approach is useful for comparing the estimates of price changes caused by the Scheme with scheme prices, given the substantial amount of uncertainty associated with some of the estimates, particularly for those with smaller sample sizes, such as fruit juice, cider and ready-to-drink spirits.

Figure 3.1 Price increases compared to weighted average scheme price



Source: Confidence intervals constructed by the Commission based on CIE estimates from Nielsen data for non-alcoholic beverages and the Drinks Association data for alcoholic beverages. Weighted average scheme price provided by COEX.

Figure 3.1 shows that estimated price increases attributable to the Scheme during its first year were less than the weighted average scheme price for fruit juices, beer and water. Estimated price increases for flavoured milk in small



containers, ready-to-drink spirits, soft drinks and cider were not statistically different from the weighted average scheme price. These results indicate that, on average, estimated price increases for all beverage types attributable to the Scheme in its first year did not exceed scheme costs.

\_\_\_\_\_

## Finding 1

Over the first 12 months of the Scheme's operation, retail prices of non-alcoholic beverages increased by an estimated 9.0 cents per container, on average, due to the Scheme:

- Soft drinks increased by 10.3 cents.
- Water increased by 8.0 cents.
- Flavoured milk in small containers increased by 8.9 cents.
- Fruit juices increased by 3.8 cents.
- Soft drinks in multipacks increased by between 10.2 and 10.7 cents.
- Water in multipacks increased by between 9.4 and 11.4 cents.

## Finding 2

Over the first 12 months of the Scheme's operation, retail prices of alcoholic beverages increased by an estimated 9.9 cents per container, on average, due to the Scheme:

- Beer increased by 8.6 cents.
- Cider increased by 16.2 cents.
- Spirits (ready-to-drink) increased by 9.5 cents.

## Finding 3

The estimated average retail price increases attributable to the Scheme in its first year of operation were similar in Brisbane and regional Queensland for both alcoholic and non-alcoholic beverages.

#### Finding 4

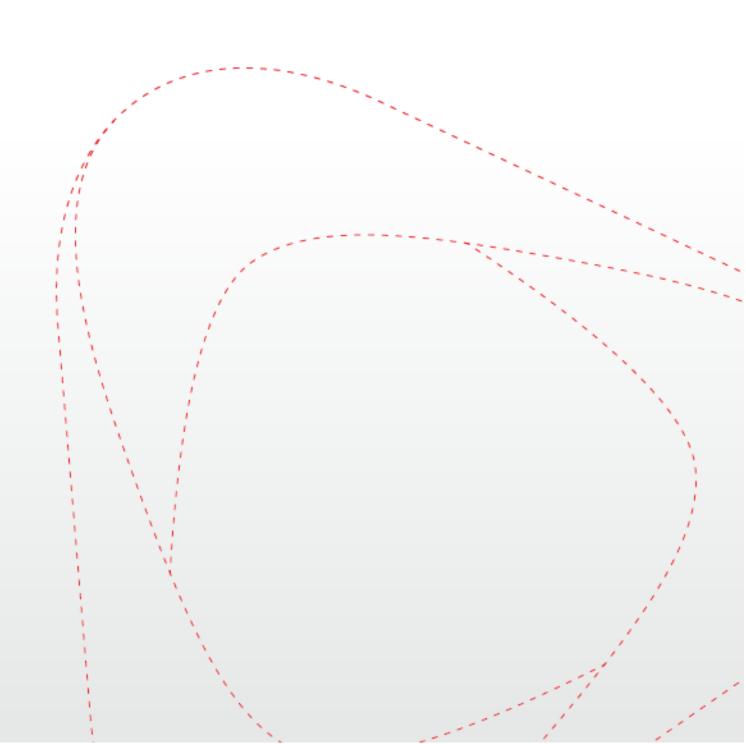
The estimated average retail price increases attributable to the Scheme in its first year of operation:

- were less than the weighted average scheme price for both alcoholic and non-alcoholic beverages sold in eligible containers
- were either less than or not statistically different from the weighted average scheme price for all disaggregated beverage categories sold in eligible containers.

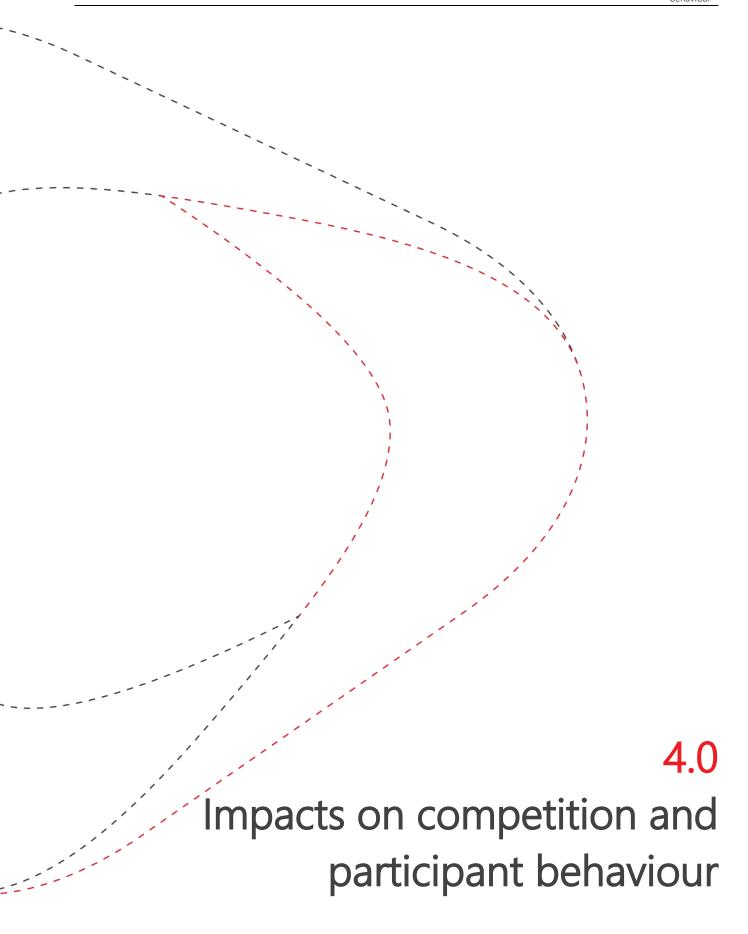
Consequently, the Commission has not found evidence of unjustified pricing behaviour during this period.

\_\_\_\_\_











This chapter outlines how the Scheme affects competition in beverage markets and the consequent impacts on the performance and conduct of key scheme participants.

## Key points

- The Commission has not found evidence that the Scheme has:
  - affected market structure or market share in relevant beverage markets
  - raised barriers to supplier entry, or increased supplier exits.
- The Scheme is estimated to have:
  - reduced consumption of non-alcoholic drinks covered by the Scheme by 1.04 litres, or 6.5 per cent, per household per month, on average
  - increased expenditure on non-alcoholic drinks covered by the Scheme by around 93 cents, or 4.3
    per cent, per household per month, on average.
- The estimated decrease in the consumption of non-alcoholic beverages due to the Scheme can largely be attributed to the estimated reduction in the consumption of multipack beverages.
- The Scheme is estimated to have caused a similar fall in consumption and rise in expenditure in regional Queensland as in Brisbane.
- The Commission has not found evidence of poor performance or poor conduct of beverage manufacturers or retailers as a result of the Scheme.

# 4.1 Impact on competition

To assess how the Scheme has affected competition in beverage markets, the Commission reviewed whether there have been changes in market shares, barriers to entry, or the consumption and expenditure behaviour of beverage consumers.

#### Market shares

Changes in beverage market shares could indicate that the Scheme is affecting competition. Market share data for beverage manufacturers in Queensland before November 2018 is not available. Since then, COEX has collected monthly sales data that, in time, could be used to review changes in market shares. However, this data reveals considerable volatility that may be explained by seasonal or short-term factors, rather than indicating trends that might be attributed to the Scheme.

For beverage retailers, data on beverage purchases from large and small retailers may indicate whether their market shares have changed. In the Scheme's first year, purchases from larger retailers, such as supermarkets, fell by an estimated 1 litre per household per month on average due to the Scheme, with an associated average increase in expenditure of \$1 per household per month. In contrast, expenditure on purchases from smaller retailers hardly changed (Table 4.1).

However, the small number of observations makes the estimates for smaller retailers potentially unreliable, so it is not possible to conclude that the market shares of large and small retailers have changed due to the Scheme.



Table 4.1 Change in estimated consumption of and expenditure on non-alcoholic beverages sold in eligible containers due to the Scheme in its first year, by size of retailer purchased from

		Bought from large retailer	Bought from small retailer
	Estimated change (litres per household per month)	-1.0***	0.1
Consumption	Standard error	0.2	0.0
Ir	Implied percentage change (%)	-6.7	15.6
	Estimated change (dollars per household per month)	1.0***	0.1
Expenditure	Standard error	0.3	0.1
	Implied percentage change (%)	4.7	7.8

<sup>\*\*\* 1%</sup> significance. No asterisks indicates that the estimate is not statistically significant. Source: CIE estimates based on Nielsen data.

# Barriers to entry and exit

Factors such as economies of scale in beverage manufacture, brand loyalty, and investments required for start-ups create moderate barriers to entry into most beverage markets (IBISWorld 2019a, 2019b, 2019c, 2019d, 2019e, 2019f, 2019g). The issue for this review to consider is whether the Scheme increases these barriers.

Complying with the Scheme increases the costs of entering into beverage markets, particularly for smaller suppliers (Chapter 2, Box 2.1). However, some aspects of the Scheme's design aim to reduce the adverse impacts of fixed costs on suppliers, particularly for small suppliers:

- Scheme payments are based on sales volumes, and therefore are not proportionately higher for small firms.
- Small suppliers report to COEX each quarter, while larger suppliers report monthly.
- Queensland does not have fixed registration costs per container, which in NSW could be impeding entry by small firms (IPART 2018, pp. 72–73).

The Commission reviewed whether firm entry and exit data has changed since the Scheme was introduced. However, there is little disaggregated evidence about what causes firms to leave beverage markets or prevents them from entering.

The limited available evidence means that, while the Scheme appears to increase barriers to entry into the beverage industry by imposing costs on new entrants, it is not possible to draw conclusions about the size of these costs, how they vary with firm size, and the extent to which the Scheme's structure mitigates these impacts.

# 4.2 Impact on conduct and performance

The Commission sought information about the conduct and performance of beverage manufacturers, importers, distributors and retailers. It received no reports of inappropriate performance or conduct.

# 4.3 Impact on consumption and expenditure patterns

The Scheme does not appear to have features that would reduce relevant information for consumers or make it more difficult for them to switch between products. Stakeholders did not provide evidence of problems in these areas.



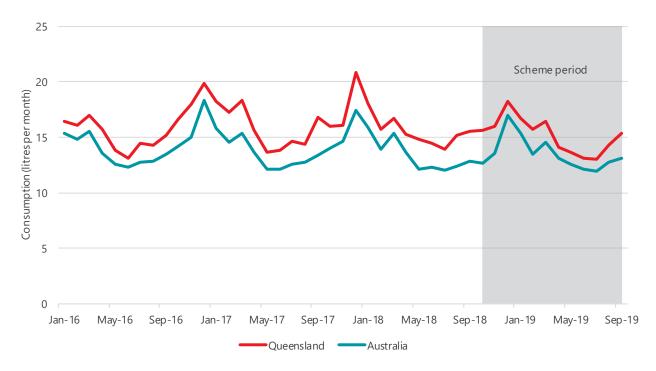
The Scheme would be expected to affect the consumption of, and expenditure on, affected beverages because it leads to changes in retail prices. Real price increases will be smaller for those who return their containers for a refund, suggesting that the Scheme may affect their consumption less. Consumers who do not return containers will experience larger real price increases and may shift to beverages in non-eligible containers<sup>21</sup>, or to other goods and services, or may cut back expenditure overall.

The Commission engaged the Centre for International Economics (CIE 2020) to track consumption and expenditure patterns of a sample of households in Queensland on non-alcoholic beverages between January 2016 and September 2019, using the Nielsen Homescan Consumer Panel data. The analysis compared consumer behaviour in Queensland to the rest of Australia since the Scheme began. Data limitations prevented a similar analysis of alcoholic beverages.

## Consumption changes

While the consumption of non-alcoholic beverages in Queensland fluctuates over time (Figure 4.1), it fell by an estimated 1.04 litres per household per month (6.5 per cent) on average due to the Scheme in its first year (Table 4.2).

Figure 4.1 Average household consumption of non-alcoholic beverages sold in eligible containers, January 2016–September 2019



Source: Nielsen data.

<sup>&</sup>lt;sup>21</sup> The Commission did not estimate changes in consumption of and expenditure on beverages sold in containers not covered by the Scheme, and so cannot conclude how much substitution may be occurring.



Table 4.2 Estimated impact of the Scheme in its first year of operation on household consumption of non-alcoholic beverages sold in eligible containers

Product	Average consumption pre-Scheme (litres per household per month)	Estimated change (litres per household per month)	Standard error	Implied percentage change (%)
Non-alcoholic beverages	15.92	-1.04***	0.25	-6.5
Soft drinks	9.67	-0.73***	0.18	-7.6
Water	3.25	-0.32**	0.16	-9.8
Flavoured milk (small container)	0.28	~0.00	0.02	-1.7
Fruit juices	2.72	0.02	0.06	0.6

<sup>\*\*\* 1%</sup> significance, \*\* 5% significance. No asterisks indicates that the estimate is not statistically significant. Source: CIE estimates based on Nielsen data.

The impacts on consumption were also estimated for beverages sold in multipacks. Data limitations restricted the analysis to soft drinks and bottled water.

Given that beverage prices increased by more in percentage terms for containers sold in multipacks than for single containers (see Chapter 3), consumers would be expected to choose to consume larger containers—on which the scheme price is only charged once—instead of large multipacks—for which the scheme price is charged on every bottle in the pack. The evidence is consistent with this expectation, as much of the estimated decrease in the consumption of non-alcoholic beverages overall can be attributed to an estimated reduction in the consumption of large multipack beverages, particularly for those sold in 10–24 packs (Table 4.3). The percentage reductions in consumption were less for single and 2–9 packs, although the results were not statistically significant.

Table 4.3 Estimated impact of the Scheme in its first year of operation on household consumption on nonalcoholic beverages sold in eligible containers by multipack size

	Average consumption pre- Scheme (litres per household per month)	Estimated change (litres per household per month)	Implied percentage change (%)
Soft drinks			
Single pack	4.87	-0.15	-3.0
2–9 pack	0.41	-0.01	-2.0
10–24 pack	2.78	-0.39***	-14.1
25–40 pack	1.61	-0.18**	-11.4
Water			
Single pack	1.12	-0.01	-1.0
2–9 pack	0.18	0.02	11.8
10–24 pack	1.93	-0.33**	-17.3

<sup>\*\*\* 1%</sup> significance; \*\* 5% significance. No asterisks indicates that the estimate is not statistically significant. Note: Estimates are not available for water sold in a 25–40 pack.

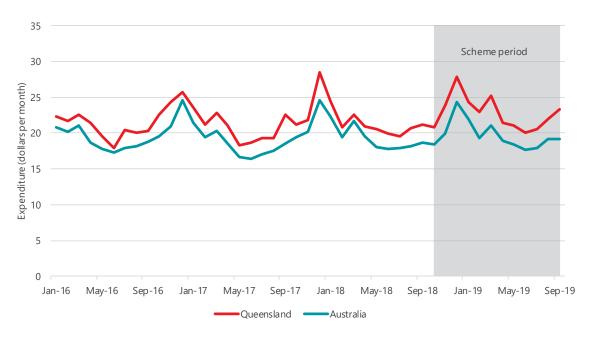
Source: CIE estimates based on Nielsen data.



# **Expenditure changes**

Average household expenditure on non-alcoholic beverages sold in eligible containers in Queensland fluctuates over time and tracks expenditure on the same set of beverages in the rest of Australia (Figure 4.2). While consumption has fallen since the Scheme began, this was more than offset by the increase in the price of beverages, resulting in a moderate increase in expenditure <sup>22</sup> (Table 4.4).

Figure 4.2 Average household expenditure on non-alcoholic beverages sold in eligible containers, January 2016–September 2019



Source: Nielsen data.

Table 4.4 Estimated impact of the Scheme in its first year of operation on household expenditure on non-alcoholic beverages sold in eligible containers

Product	Average expenditure pre- Scheme (dollars per household per month)	Estimated change (dollars per household per month)	Standard error	Implied percentage change (%)
Non-alcoholic beverages	21.44	0.93***	0.33	4.3
Soft drinks	12.99	0.49*	0.26	3.8
Water	2.22	0.22**	0.10	10.0
Flavoured milk (small container)	1.25	0.07	0.09	5.7
Fruit juices	4.98	0.14	0.12	2.8

\*\*\* 1% significance, \*\* 5% significance, \* 10% significance. No asterisks indicates that the estimate is not statistically significant. Source: CIE estimates based on Nielsen data.

\_

<sup>&</sup>lt;sup>22</sup> Reported increases in expenditure do not include the refund, which will offset increases in expenditure for some consumers.



Estimates of the Scheme's impacts on expenditure range from zero to positive depending on model specification (Appendix E); however, only two of the estimated models yield statistically significant estimates. In contrast, the reductions in consumption were robust to model specification. The expenditure estimates may therefore be less reliable, suggesting that there is less evidence that expenditure has changed as a result of the Scheme than there is that consumption has changed.

## Regional differences

Preliminary estimates by region in the interim report suggested that the Scheme's impact on consumer behaviour may differ between Brisbane and regional Queensland (QPC 2019, p. 48). However, this finding was inconclusive due to limited data availability.

Final estimates suggest that the Scheme caused consumption to fall and expenditure to increase in both Brisbane and regional Queensland, and by similar amounts (Table 4.5).

Table 4.5 Estimated impact of the Scheme on the consumption of and expenditure on non-alcoholic beverages sold in eligible containers by region

	Change in consumption (litres per household per month)	Implied percentage change (%)	Change in expenditure (dollars per household per month)	Implied percentage change (%)
Brisbane	-1.06***	-6.8	0.75**	3.6
Regional Queensland	-1.01**	-6.1	1.35**	5.9

<sup>\*\*\* 1%</sup> significance; \*\* 5% significance. Source: CIE estimates based on Nielsen data.

Estimates for consumption and expenditure of alcoholic beverages are not robust owing to a lack of data. IPART was also unable to report on these measures for the same reason (IPART 2018, p. 77).

## 4.4 Refund methods

Stakeholders told the Commission that different payment methods available to people at container refund points (CRPs) may affect competition. One stakeholder stated that some CRPs provide a retail or gift card to spend at a specific retailer, rather than cash.

This would limit consumer choice. Moreover, many retail cards are either not spent in full or at all. The Commonwealth Consumer Affairs Advisory Council's (CCAAC) review of gift cards found that about 6 to 7 per cent of gift card balances are likely to be unredeemed in Australia. It also noted that rates can differ significantly depending on the market segment and average transaction value (CCAAC 2012, p. 25). Submissions to that review estimated the size of the gift card market in Australia to be between \$1.5 billion and \$2.5 billion annually (CCAAC 2012, p. 27), which suggests that more than \$90 million a year may not be redeemed. The proportion of unredeemed gift cards may be higher under the Scheme, as the size of the refund is small and the mechanism for storing it (such as a printed paper receipt) may be less robust than gift cards.

Allowing retailers to provide a voucher for their store in return for containers may encourage them to open a CRP on their premises, improving consumer convenience and accessibility (DWER WA 2017, p. 23). However, restricting the uses that can be made of refunds may reduce their value to the consumer.

EY (2018, p. 12) found that the literature does not set out a best practice for refund methods. However, they recommended that multiple redemption options should be available. The Commission considers that while retail cards are a viable redemption method, cash refunds or monetary transfer to a bank account should be available at every CRP.



\_\_\_\_\_

## Finding 5

The Commission has not found evidence that market shares of beverage manufacturers or retailers have been affected by the Scheme.

## Finding 6

The Scheme appears to increase barriers to entry into the beverage market by imposing costs on new entrants, but it is not possible to draw conclusions about the size of these costs, how they vary with firm size, and the extent to which the structure of the Scheme mitigates these impacts.

## Finding 7

The Commission has not found evidence of poor performance or poor conduct of beverage manufacturers or retailers as a result of the Scheme.

## Finding 8

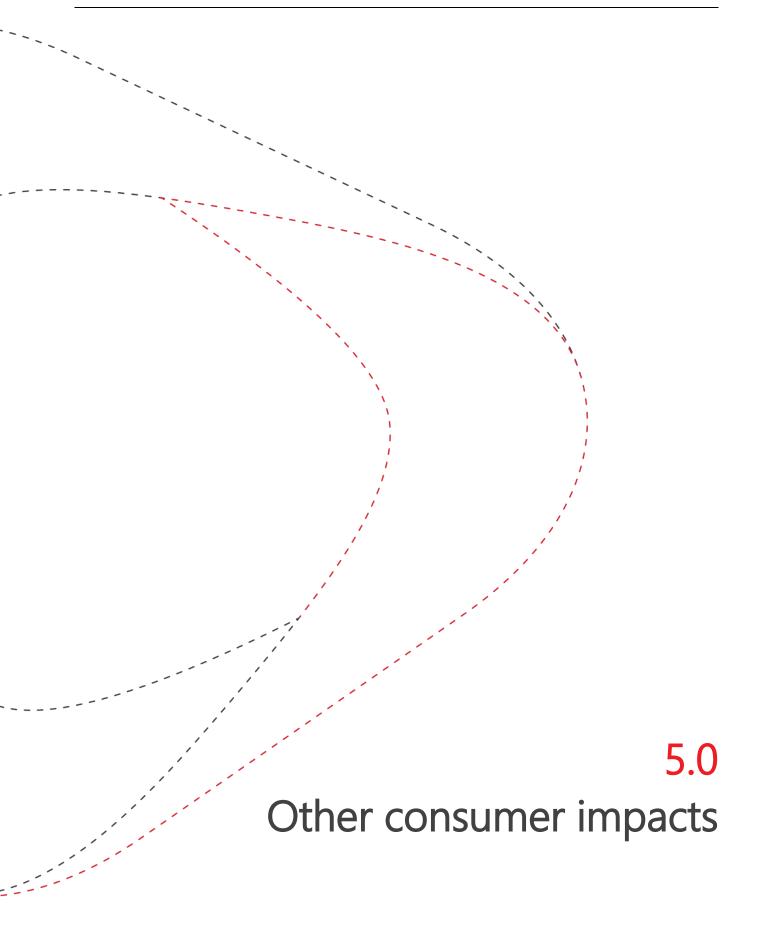
The Scheme has affected the consumption of, and expenditure on, beverages covered by the Scheme. Estimates for the first year of the Scheme's operation suggest the following:

- Household consumption of non-alcoholic drinks fell by 1.04 litres (6.5 per cent) per month, on average, due to the Scheme.
- Household expenditure on non-alcoholic drinks increased by 93 cents (4.3 per cent) per month, on average, due to the Scheme.
- Consumers who purchased beverages at large retailers decreased their consumption of non-alcoholic drinks by 1 litre per household per month (6.7 per cent), on average, due to the Scheme, with an associated increase in expenditure of \$1, on average, per household per month (4.7 per cent).
- The Scheme has caused consumption to fall and expenditure to increase in Brisbane and regional Queensland by similar amounts.

Much of the estimated decrease in the consumption of non-alcoholic beverages due to the Scheme can be attributed to the estimated reduction in the consumption of beverages sold in multipacks.

Queensland Productivity Commission







This chapter addresses the requirement in the terms of reference to monitor and report on any other specific impacts on consumers and any other matters relevant to consumers' interests.

## Key points

- The Commission has not reviewed the Scheme's effectiveness and efficiency. However, it identified
  several issues that may affect prices or consumers' interests: access to container refund points;
  recovery rates; harmonisation of schemes; impacts on consumers in captive markets; improving
  incentives for continuous improvement of the Scheme; and refund sharing arrangements between
  local governments and material recovery facilities (MRFs).
- It is recommended that COEX should:
  - continue to review the effective and efficient mix of container refund points (CRPs). It should publish its strategy for developing the network and the reasons for making specific changes to the location or type of CRP
  - publish estimates of the incremental costs and benefits of further increases in the eligible container recovery rate from its present level, and its strategy for achieving the 85 per cent target
  - adopt greater transparency about its costs, strategies and procedures as a key organisation value.
     For example, it should report indicators of the Scheme's efficiency, its analysis of the reasons for changes in efficiency and how these reasons affect its strategies
  - review its complaints-handling process, to ensure that it is making good use of customer feedback and to build confidence in the Scheme. This review should involve wide and transparent consultation with scheme participants, and COEX should publish the results of the review.
- Decisions about expanding the types of eligible containers should be based on thorough evaluation
  of costs and benefits, including the costs and benefits of achieving the same outcomes in different
  ways.
- Proposals for harmonisation with other jurisdictions could be assessed against criteria such as
  whether they contribute to the effectiveness of the Scheme in achieving its objectives, generate net
  benefits, and can be implemented easily.

# 5.1 Introduction

The Scheme could have various direct and indirect impacts on consumers in addition to those discussed in Chapter 4. For example, the Scheme may alter the prices in associated markets for different recycled materials, which could flow through to the prices of new containers or affect local government revenues.<sup>23</sup>

Issues identified during consultation are:

- access to container refund points
- recovery rates
- the commitment by environment ministers to expand and harmonise the scope and alignment of schemes

<sup>&</sup>lt;sup>23</sup> The value of recyclable material collected in kerbside collection may fall if the reduction in eligible containers means that the remaining material has a higher proportion of contaminants, leading to less revenue for local governments and MRFs, which could affect local government rates or services.



- impacts on consumers in captive markets
- improving incentives for continuous improvement of the Scheme through complaints handling and transparency
- refund sharing arrangements between local governments and MRFs.

# 5.2 Access to container refund points

The accessibility of CRPs is an important feature of the Scheme. Consumers who consider that the time and transport costs involved in returning containers exceed the value of the refund will not return containers, even though they pay more for their beverages. Nevertheless, establishing an accessible network involves costs, particularly in Queensland, where vast distances and isolation mean it is unlikely to ever be cost-effective to have full geographic coverage.

COEX is responsible for establishing the network of CRPs, which are owned and operated by firms and charities with which it has contractual agreements.<sup>24</sup> It achieved its target of establishing 307 CRPs before 1 November 2019 (Enoch 2019). While this target is specified in legislation, other features of CRPs that influence accessibility are not—such as the type of CRP (Box 5.1) and their hours of operation. However, COEX received a ministerial direction in October 2018 outlining targets and timelines for remote and regional communities' access to CRPs (COEX 2019b, p. 17). COEX is required to publish actions it has taken as a result of the direction.<sup>25</sup>

# Box 5.1 Types of container refund points

There are four types of CRPs:

- **Drop-offs.** People can return containers in a bag labelled with their Scheme ID to these locations. Refunds from these points are slower, as containers are not counted until they have been returned to a depot. Many bags are collected weekly, although collections may be less regular for rural areas.
- **Over-the-counter depots.** Manual or electronic scanners count containers and provide a refund either in cash or through electronic transfer of funds. Some depots may provide a drop-off service.
- Reverse vending machine (RVM), drop-off, depot (commercial bulk sorting). These locations
  have more than one option for returning containers. At a reverse vending machine, people can scan
  barcodes and insert uncrushed containers into the machine. Refunds are received via a voucher, a
  Scheme ID, or the ID of a local community group or charity. These locations also provide a drop-off
  service and a depot for large-scale quantities of containers.
- **Mobile and pop-up refund points**. Mobile CRPs are a scheduled service, allowing people to return containers for a refund to their Scheme ID or for cash. They are typically a trailer parked at a regional location for a few hours and are operated by owners of an over-the-counter depot or drop-off. Pop-up points are temporary, usually operating at an event or function.

As at 20 January 2020, 42 per cent of the network (by count) was serviced by drop-off CRPs and 35 per cent by depots. The remaining 23 per cent were largely RVMs or mobile refund points.

Source: Commission estimates based on Containers for change 2019b.

<sup>&</sup>lt;sup>24</sup> COEX does not operate permanent CRPs but may operate pop-up CRPs if no other entity has come forward to operate one in the area

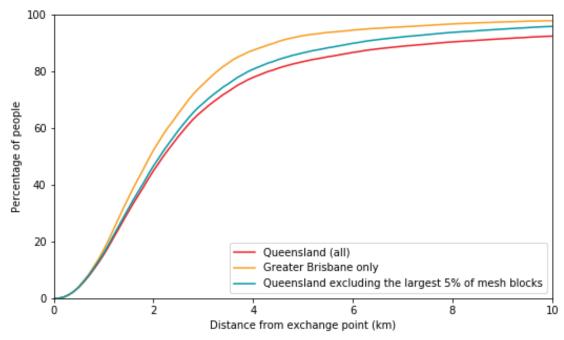
<sup>&</sup>lt;sup>25</sup> Waste Reduction and Recycling Act 2011, s. 102ZE (3).



The Local Government Association of Queensland (LGAQ) (sub. 7, p. 2) submitted that 'challenges with accessibility' remain in rural, remote and Indigenous communities. Other stakeholders made similar comments. There have also been concerns that bags are unavailable at drop-off depots (DES Qld 2019a, p. 4) and that bag drop processes are not transparent (Byrnes sub. 1, p. 1).

About two-thirds (66 per cent) of Queenslanders reside on average within 3 kilometres of a CRP and about 92 per cent live within 10 kilometres of one (Figure 5.1). However, limitations with these statistics mean that these figures overstate accessibility, particularly for those living in remote areas.<sup>26</sup>

Figure 5.1 Average distance to CRPs in Queensland



Notes: a) Calculated distances are based on the central point of each mesh block (the smallest geographical area defined by the ABS) to the nearest CRP using the shortest direct distance. Distances may be over- or underestimated, depending on where population centres reside with respect to the central point used. Distances are likely less realistic in areas with large mesh blocks, such as in rural and remote Queensland. b) Calculations are based on 327 CRPs as at 15 November 2019. c) 'Queensland excluding the largest 5 per cent of mesh blocks' contains 96.4 per cent of Queensland's population, to adjust for the impact of remote areas on the data. d) As would be expected, people who reside in urban areas such as 'Greater Brisbane only' are much closer to CRPs.

Source: Commission estimates based on ABS 2017a, cat. no. 1270.0.55.001; ABS 2017b, cat. no. 2074.0; Containers for change 2019b.

Even in urban areas, some people who live less than 3 kilometres from a CRP may consider that the cost and time involved in travelling to a CRP and storing containers (to reduce the number of times required to make the trip) outweigh what might be a relatively small refund amount. Locating CRPs in high-traffic areas, such as supermarkets, could reduce these transaction costs, but may increase network costs if, for example, rents in these areas are higher.

While COEX has achieved its target number of CRPs, there will be opportunities to improve accessibility by fine-tuning their location and type.<sup>27</sup> For example, by May 2019, COEX had already closed seven sites, had

.

<sup>&</sup>lt;sup>26</sup> Limitations with the statistics include that distances are calculated from ABS mesh block centre points (rather than households) to CRPs; and calculations are based on the shortest direct distance between the CRP and the consumer's residence, rather than the distance they may need to travel via various forms of transport.

<sup>&</sup>lt;sup>27</sup> Some CRPs listed on the COEX website may not have accessible opening hours. Some CRPs are mobile roving CRPs and may only be open for one hour in the fortnight (Containers for change 2019a).



relocated or was planning to relocate 22 sites, and had upgraded some sites from bag drop points to depots (Queensland Parliament 2019b). COEX could also, and currently does, provide more CRPs than the legislation requires.

The optimal configuration of the network is likely to change over time as peoples' preferences for where and how they return containers change. COEX collects information about each CRP's returned container volumes—including their material types—and refund payments. It assesses these measures on a Scheme-wide basis to provide regular performance snapshots against strategic targets (COEX 2019b, p. 24). To the extent that contractual arrangements permit, COEX will need to keep under review the effective and efficient mix of container refund points, and to assess options such as providing more CRPs, upgrading sites or changing their location, and changing collection frequency for drop-off and mobile points.

COEX should publish its strategy for developing the network and the reasons for changing the location or type of CRP. This would:

- strengthen COEX's incentives to invest in developing an effective strategy
- give scheme participants opportunities to make suggestions that would help COEX to improve the strategy
- assist current and potential operators of CRPs to make decisions that are consistent with the strategy
- be consistent with COEX's value of 'work[ing] closely with our customers and the community to safely deliver accessible services and opportunities' (COEX 2019b, p. 6).

# 5.3 Recovery rates

The recovery rate is the sum of the number of containers received at CRPs and the number of containers received at MRFs during a period, divided by the number of eligible containers in which beverage products were sold in Queensland during the same period (Waste Reduction and Recycling Regulation 2011, s. 29).

Queensland's regulated target recovery rate is 85 per cent<sup>28</sup>, to be achieved for the financial year starting on 1 July 2021, and for each financial year thereafter. While differences between schemes mean that they are not strictly comparable<sup>29</sup>, it is noticeable that Queensland's target is higher than other Australian jurisdictions have been able to achieve—even, in the case of South Australia, after operating for over 40 years (Table 5.1). Further, while COEX has based scheme prices on predicted recovery rates of 63 per cent between November 2018 and October 2019 and 70 per cent from November 2019 (COEX, pers. comm., 23 July 2019), the actual recovery rate over the first 12 months of Scheme operation was approximately 50 per cent (COEX, pers. comm., 11 November 2019).

To achieve the 85 per cent target, money may need to be spent on awareness campaigns or on increasing the accessibility of the collection network, both of which would increase scheme costs. Increasing the value of the refund amount above 10 cents may also increase the recovery rate, but that would create incentives for containers purchased in NSW to be returned for refund in Queensland, unless its refund amount was increased at the same time, which may be difficult to achieve. Moreover, it is likely that incremental increases in the recovery rate will become progressively more expensive, as the gains from marketing campaigns diminish and new CRPs are opened in less attractive sites.

<sup>&</sup>lt;sup>28</sup> Waste Reduction and Recycling Regulation 2011, s. 31.

<sup>&</sup>lt;sup>29</sup> Comparing jurisdiction recovery rates against each other is not necessarily comparing like with like, as there are operational differences between schemes. Further, population density and geographical distribution may also affect recovery rates.



Table 5.1 Comparison of container recovery rates in selected jurisdictions

Jurisdiction	Recovery rate (%)	Time period
Queensland	50	First 12 months of operation (1 Nov 2018 to 31 Oct 2019)
South Australia	76	2018–19
New South Wales	53	First 12 months of operation (1 Dec 2017 to 1 Dec 2018)
Australian Capital Territory	35	First 12 months of operation (2018–19)
Northern Territory	60	2016–17
Norway <sup>30</sup>	97	2018
California	77	Unknown

Source: Data provided to the Commission by COEX; EPA SA 2019a; EY 2018, pp. 1–2; Taylor 2018, p. 1; ICRC 2019b, p. xvii.

As experience with the Scheme increases, it will be possible to develop more accurate estimates of these incremental costs and benefits. Reviewing such estimates regularly would help COEX to make decisions about improving the recovery rate. For the same reasons that COEX should publish its network strategy, COEX should also publish its strategies for achieving the target rate and its estimates of the costs of incremental improvements.

# 5.4 Scheme scope and alignment

Australia's environment ministers have agreed to work together to expand and harmonise the scope and alignment of schemes and product labelling for beverage manufacturers (COAG 2019, p. 2).

## Scope

Some jurisdictions were considering broadening their schemes before the announcement by environment ministers. A report produced for the NT Government recommended determining the feasibility of including additional containers (EY 2018, p. 4). The SA and NT governments are reviewing container eligibility within their schemes and the Queensland Government is participating in these discussions (Queensland Parliament 2019a).

Expanding the Scheme's scope by bringing in other types of containers could increase recycling and reduce littering. However, given that containers currently not in the Scheme are less likely to be littered, the benefits of reduced littering from including them are likely to be smaller than is the case for currently eligible containers. Expanding the Scheme would also increase its operating costs and the prices of containers included in the Scheme, and reduce consumption. Decisions about expanding the types of eligible containers should be based on a careful definition of the objective that is being pursued and thorough evaluation of benefits and costs, including the benefits and costs of other options to achieve the same outcomes.

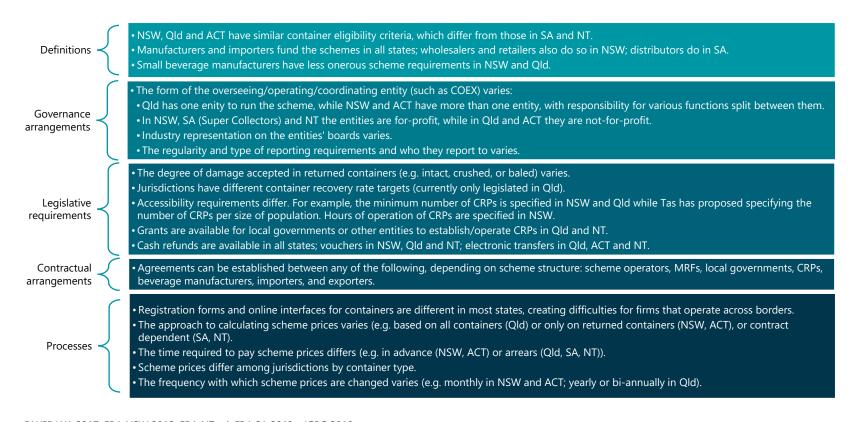
# Alignment

The significant differences between schemes in different jurisdictions (Figure 5.2) impose costs on suppliers operating in more than one jurisdiction that can lead to higher prices for consumers (IPART 2018, p. 78).

<sup>&</sup>lt;sup>30</sup> The recovery rate in Norway may have been boosted by an environmental tax imposed on the production of plastic bottles. The tax declines as the proportion of bottles recycled increases, reaching zero when the recycling rate reaches 95 per cent (Infinitum nd). It may also be due to other factors such as higher population density and accessibility.



Figure 5.2 Differences between schemes<sup>31</sup>



Source: DWER WA 2017; EPA NSW 2018; EPA NT nd; EPA SA 2019a; ICRC 2018.

Queensland Productivity Commission

<sup>&</sup>lt;sup>31</sup> Representations of existing schemes are illustrative only and may not capture all differences between schemes.



Stakeholders provided examples of these costs.

Ballistic does not know who to report volumes to for containers sold in other states, and how to cheaply/accurately track where their products are being sold. The scheme is onerous enough with dealing with one state, let alone multiple. Do we need to do 5 lots of reporting?

The states aren't talking to each other. They should just recognise each other's schemes and do away with import and export reporting. (Ballistic sub. 9, p. 1)

The differences between schemes in different jurisdictions is placing an enormous administrative cost to businesses with cross-border operations. Each scheme has its own unique differences that make compliance and conformance with each scheme's requirements adding to costs for all sized businesses with cross-border markets. (ABCL sub. 5, p. 9)

The LGAQ (sub. 7, pp. 1-2), Coca-Cola Amatil (CCA) (sub. 10, p. 2) and other stakeholders supported moving towards national scheme harmonisation. Reports prepared for other jurisdictions have proposed:

- recognising containers registered in other jurisdictions and working towards a uniform approach to administering the definition of first suppliers and export protocols (IPART 2018, pp. 83–85)
- aligning payment models and system processes more generally (ICRC 2019b, pp. xix–xx)
- moving towards a payment in arrears model in the ACT and in NSW (ICRC 2019a, p. 55; IPART 2018, p. 9)
- designing schemes so that they align with existing and proposed schemes (DWER WA 2017, p. 11; EY 2018, p. 36; Marsden Jacob Associates 2018, p. vi).

As the fifth jurisdiction to introduce a container refund scheme, Queensland has learnt from the experience of other schemes, which implies that moving towards harmonisation may involve other jurisdictions adopting features of its scheme. For example, IPART has recommended changes to the NSW scheme—particularly moving to payment in arrears—that would mirror significant features of Queensland's scheme (IPART 2018, p. 64). However, progress on this recommendation has been slow.

Increasing harmonisation of schemes across jurisdictions has the potential to reduce the costs of beverage suppliers that operate in different jurisdictions. It would, for example, reduce the need to satisfy different labelling and reporting requirements. On the other hand, Queensland's beverage industry and consumers could be disadvantaged if harmonisation was achieved at the expense of losing desirable features of the Scheme, such as payment in arrears. This risk would be reduced by assessing proposals for harmonisation against criteria such as whether they contribute to the effectiveness of the Scheme in achieving its objectives, generate net benefits, and can be implemented easily.

# 5.5 Captive markets

The terms of reference ask the Commission to consider pricing impacts in relation to products with captive markets. These are markets in which consumers are unable or unwilling to purchase a product or service from another seller because no suitable substitutes for it are available from other suppliers (Armstrong & Vickers 2018, p. 1).

Sports stadiums, convention centres, cinemas and theatres, theme parks, airports, and remote communities might seem to be potentially captive markets, but each case needs to be examined on its merits. For example, while beverage outlets in sports stadiums are typically operated by single tenants under long-term leases, tenders could be awarded on a competitive basis to bidders who offer to supply at lower prices, perhaps by benchmarking their prices to those outside the stadium.



## How might the Scheme affect prices in captive markets?

If consumers in a market are captive, the monopoly supplier could charge higher prices than it would if it had competitors. It is therefore not surprising that there are concerns that such suppliers would increase prices by more than the scheme price, to further increase their profits. However, if the supplier held a monopoly before the Scheme was introduced, and was already charging prices that maximise its profits (above the efficient price), it is possible that the supplier would absorb some of the additional cost rather than pass it on (CIE 2018, pp. 30, 57–61).

This possibility does not, of course, endorse captive market situations, which may lead to consumers paying higher prices than they would if competition was more effective. There is a strong case to strengthen competition in such markets, as the Stadium Taskforce recommended in the case of stadiums (Stadium Taskforce 2018, p. 28). However, the introduction of the Scheme itself does not make the competitive situation worse.

#### Two case studies

Stakeholders identified two markets that the Commission should review as being potentially captive: sports arenas/stadiums and remote communities (ABCL sub. 5, p. 9).

Unfortunately, there is not enough data in either case to enable price changes in these markets to be compared with scheme prices. However, the Commission did not receive reports about unreasonable pricing.

#### Sports stadiums

Stadiums Queensland (SQ) is a statutory authority that operates nine venues, including stadiums, an entertainment centre, elite athlete development facilities and community participation venues. Stadium services are typically outsourced (Stadium Taskforce 2018, p. 62), and only Brisbane Entertainment Centre does not outsource catering.

SQ selects vendors to provide food and beverage services through competitive tender (Stadium Taskforce 2018, p. 118). The basis on which contracts are awarded could affect vendors' pricing behaviour. However, the only information that the Commission has about these contracts is that their duration is five years; that SQ shares in the revenue from food and beverages, with these sales forming a significant part of stadium revenue (Stadium Taskforce 2018, pp. 12, 117); and that the Board of SQ must approve increases in beverage prices.

In setting prices at SQ venues, SQ reviews prices submitted by its caterers on an annual basis, with the assistance of catering consultants, taking into consideration market benchmarks (SQ, pers. comm., 17 January 2020). While SQ's revenue sharing arrangement means that it benefits from higher beverage prices, stakeholders pointed to pressure on stadiums to have prices comparable to other jurisdictions.

In 2018 (before the Scheme), a review by the Stadium Taskforce found that food and beverage prices in Queensland stadiums were, on average, below those in other interstate stadiums and similar to, if not slightly lower than, beverage prices in other captive markets (Stadium Taskforce 2018, pp. 116–17). Nevertheless, it concluded that competition between caterers in stadiums is ineffective and that, to strengthen competition, SQ should explore how to increase the variety of affordable food and beverages at SQ venues; for example, by increasing the number of subcontractors and smaller mobile operators within venues. The Government supported this recommendation (HPW Qld 2019, p. 2).

SQ told the Commission that while the Scheme is an additional factor to consider in pricing, it has not significantly affected how SQ views the pricing of eligible beverage containers, compared to other market factors. Consultations with stakeholders suggest that vendors in SQ stadiums have passed on scheme prices to their customers. SQ indicated that it has not received any consumer feedback regarding the Scheme or associated price changes (pers. comm., 20 January 2020).

Without relevant price data, the Commission has not reached a conclusion about whether there has been excessive recovery of scheme prices in stadiums, although it has not seen evidence of a problem. The risk of excessive



recovery would, however, be reduced if SQ was to implement the Stadium Taskforce's recommendation to increase competition.

A further issue may be consumers' ability to redeem a refund for their purchased containers. SQ informed the Commission that some consumers take their empty containers with them when they leave. SQ also informed the Commission that it is in the process of investigating the viability of CRPs at venues for consumers and of eligible containers being returned after on-site sorting at venues undertaken by SQ's waste contractors (SQ, pers. comm., 29 October 2019).

#### Remote North Oueensland communities

Stakeholders told the Commission that remote North Queensland Indigenous and Torres Strait Islander communities may be captive markets. These communities are among the most socio-economically disadvantaged communities in Queensland.

Their remoteness and small populations mean that these communities can support only one or a few retailers and that most residents cannot shop elsewhere for low-value purchases. While some retail stores in remote North Queensland have local competitors—for example, on Thursday Island—most do not.

Freight costs, refrigeration and associated power requirements, equipment maintenance costs and diseconomies of scale increase the costs of supplying remote communities (CEQ 2018, p. 10), which are likely to result in higher prices in these communities.

It is beyond the scope of this review to consider whether there is monopoly pricing in these communities. The issue for the review is whether firms have used their positions to increase the retail prices of eligible beverages by more than is reasonable since the Scheme was introduced. This could occur through prices being increased along the supply chain before being reflected in retail prices.

In some communities, retail outlets are operated by entities without conventional for-profit commercial structures, which have committed publicly to price restraint. For example:

- Community Enterprise Queensland (CEQ) is a Queensland Government statutory body that is controlled by a board with community representation. It operates 22 retail stores in the Torres Strait and Northern Peninsula area and five community supermarkets on the mainland. It commits to providing healthier options at the lowest possible price while remaining a sustainable business (CEQ 2018, p. 9).
- The Arnhem Land Progress Aboriginal Corporation (ALPA) is a benevolent Indigenous Corporation that, through Island and Cape, operates retail stores in Far North Queensland. ALPA has committed publicly to increase the affordability of healthier foods; for example, by subsidising the freight on fruit and vegetables and pricing diet soft drinks lower than their sugar-sweetened alternatives (ALPA nd).

ALPA told the Commission that its price rise reflected the introduction of the Scheme and an earlier supplier price rise (pers. comm., 15 October 2019). Other stakeholders servicing remote communities informed the Commission that beverage prices (in eligible containers) have risen commensurately with the cost of the Scheme to their business. The Commission has not found evidence of excessive price increases and has not heard complaints that the Scheme has led to unreasonable price increases or to other adverse impacts in remote markets.

A possibly more important issue for people living in remote communities is whether they have access to a container refund point. If they do not, they could face price increases of about 10 cents per eligible container without the opportunity to claim this back.

Communities in remote North Queensland are serviced largely by pop-up and mobile CRPs, and an over-the-counter depot located in Weipa. North of Port Douglas one other over-the-counter depot with Monday



to Friday opening hours is located in Cooktown. Most mobile services are available for only one hour each fortnight.<sup>32</sup>

COEX is expanding the number of CRPs and is establishing barge and air freight collection from some remote communities. However, the cost of collecting these containers often outweighs the value of the materials and can be complicated by biosecurity restrictions. Given that scheme prices are uniform across Queensland, these additional costs will have to be recovered through scheme prices overall being higher than they would otherwise be

# 5.6 Improving governance and transparency of the scheme

Achievement of the Scheme's objectives will be enhanced if its participants continually search for ways to achieve them more effectively, while constraining costs and scheme price increases that flow through to retail beverage prices. Improving the transparency of scheme costs and performance, and using the feedback provided through complaints, would promote continuous improvement.

## **Transparency**

Given the nature and potential impacts of the Scheme, maximising transparency is likely to better support the delivery of the Scheme's objectives in a cost-effective way and maintain the legitimacy of the Scheme over time. Transparency is particularly important as COEX has sole responsibility for administering the Scheme and there is limited external scrutiny or pressure to constrain costs. Scheme revenue was almost \$194.6 million in its first eight months, of which COEX returned \$54.8 million through container refund expenses and a further \$35.5 million to MRFs and container export rebates (COEX 2019b, p. 41). Ambitious recovery targets will likely increase costs. Moreover, in the absence of transparency, several stakeholders have raised concerns about the efficiency with which the Scheme is operated (ABCL sub. 5, p. 6; Ballistic sub. 9, p. 3; CCA sub. 10, p. 2; Sunshine Brewery sub. 11, p. 1).

Under current arrangements, COEX is required to provide quarterly reports to the Minister about the information stated in its strategic plan or prescribed by regulation. This reporting requirement could be used to motivate efficiency improvements, although the strength of that motivation will depend on the content of these reports and how they are assessed. These quarterly reports are not public. COEX has, however, published its first annual report.

A theme that emerged during this review is that increasing transparency about the costs of operating the Scheme and about plans to develop the collection network or increase the recovery rate, would strengthen incentives to improve Scheme performance in the least costly way.

Stakeholders also suggested that transparency about other information—for example, about the number of containers sold and returned each month—would help beverage manufacturers to anticipate changes in scheme prices, which would assist their forecasting and mitigate the risk of surprise price changes for retailers (CCA sub. 10, p. 1). Scheme prices and the underlying assumptions about how they are determined are published online monthly in NSW and the ACT.<sup>33</sup> As COEX already collects this information, publishing it should not involve significant extra costs. This would, for example, increase stakeholders' understanding of why the 1 November 2019 scheme prices are based on a forecast recovery rate of 70 per cent (COEX, pers. comm., 23 July 2019), while the average recovery rate in the first year of the Scheme was about 50 per cent (COEX, pers. comm., 11 November 2019).

\_

<sup>&</sup>lt;sup>32</sup> A map of CRPs, including their type and opening hours, is available on COEX's website (Containers for change 2019b). Kowanyama is listed as a drop-off point (rather than a mobile point) but is only open for an hour a fortnight, as with the mobile points. This information related to CRP locations and opening hours in remote communities was current as of 7 January 2020.

<sup>&</sup>lt;sup>33</sup> Monthly newsletter updates are published on the Exchange for Change website for NSW (Exchange for Change 2019a) and the ACT (Exchange for Change 2019b).



The community would also have a better sense of how well the Scheme is performing if COEX were to publish measures of its efficiency. One such measure is the Scheme's direct costs—the cost of container refund points, transport and logistics less the value of the materials collected—per returned container. Tracking this indicator over time would reveal whether the average cost of recovering returned containers is rising or falling. It would also provide an opportunity for COEX to set out its analysis of the reasons for changes in the indicator and to explain how they affect its strategy for improving the Scheme's efficiency.

More transparency about these matters may also promote community engagement in what is a community-based Scheme, thereby helping to build support for the Scheme and participation in achieving its objectives, and would provide a source of new ideas and information about better ways to meet the Scheme's objectives.

COEX has established a set of five organisational values to guide its culture, actions and decision-making. It should adopt transparency as a sixth value. As a minimum, it should publish information about its costs, strategies and procedures. For example, it should report indicators of the Scheme's efficiency, its analysis of the reasons for changes in efficiency and how these reasons affect its strategies.

# Complaints handling

The Scheme is large and complex, and affects all Queenslanders who purchase eligible containers. It processed almost 3.1 million refund transactions between 1 November 2018 and 30 June 2019 (COEX 2019b, p. 23). Problems will arise from time to time, particularly while the Scheme is new. For example, one submission complained that COEX's online container registration system is difficult to use and that there are lags in securing registration (Ballistic sub. 9, pp. 1–3). The Department of Environment and Science (DES) has identified other IT issues and implementation challenges (DES Qld 2019a, p. 4).

Problems may lead to complaints being made to COEX by consumers, community organisations, the industry, local governments or CRPs. For example, COEX's contact centre received 840 complaints between November 2018 and June 30, 2019 (COEX 2019b, p. 23). Complaints—particularly if they indicate systemic issues that require a system-wide response—are an important source of information. They can identify problems and options that would improve system performance. Queensland's Ombudsman (2019) considers that complaints management processes are 'integral to providing quality consumer service' and a source of feedback for improving service.

The Commission considers that COEX should take advantage of the feedback that complaints provide. For example, it could collate and analyse the complaints, identify any systemic issues that they reveal, and set out its strategies and proposed actions for addressing these issues. It could report its progress in addressing complaints to DES each quarter and to the public in its annual report.

COEX's complaints-handling process is based on five principles, one of which is that COEX will review its complaints-handling process regularly, 'to ensure that we are monitoring our performance and continuously identifying areas for improvement' (COEX 2018). Given that the Scheme has been operating for more than a year, a review would help COEX to ensure that it is making good use of customer feedback to improve the Scheme, while also improve stakeholders' confidence in the Scheme. To be effective, this review should involve wide and transparent consultation with scheme participants. COEX should publish its results and consider whether the reports and strategies mentioned in the previous paragraph should be published, rather than only provided to DES.

# 5.7 Refund sharing between local governments and MRFs

Kerbside bin collection is an alternative pathway for disposing of containers: more than 91 per cent of Queensland households receive a one-, two-, or three-bin kerbside collection service (LGAQ sub. 7, p. 1). They may now be less likely to use this form of disposal as it does not enable them to receive a refund. While the number of containers recycled through kerbside bins may have decreased as a result of the Scheme, the losses imposed on local



governments and MRFs are likely to be significantly smaller than the increased revenues available to them from the Scheme (CIE & APC 2018, p. 2).

This is because the *Waste Reduction and Recycling Act 2011* allows COEX to pay MRF operators for the refund on the eligible containers that they collect, and the value of the refunds is significantly higher than the value of the containers as commodities (CIE & APC 2018, p. 2). An original transitional arrangement allowed for equal sharing of recovery amounts (refunds) between MRFs and their relevant local government until they had negotiated their own recovery sharing arrangements. After the transitional deadline, MRFs would have been required to provide COEX with a notice of a signed recovery sharing arrangement if they wished to continue to be paid for returned containers. COEX would not have been permitted to make payments to the MRF—and, by extension, to local government—if no arrangement had been made.

The Scheme returned \$23.6 million to local governments and MRFs collectively over the first eight months of operation (COEX 2019a, p. 5).<sup>34</sup> This may have helped to shield MRFs from the effects of China's National Sword Policy<sup>35</sup>, as happened in NSW (NSW Government as cited in Legislative Council Environment and Planning Committee 2019, p. 103).

Not all local governments and MRFs were able to negotiate recovery sharing arrangements in a timely manner. In response to slow progress, an amendment to the *Waste Reduction and Recycling Regulation 2011* extended the transitional deadline to 31 December 2019 after agreements failed to be made by the original deadline of 30 September 2019. COEX, the LGAQ, and affected local governments supported this extension.<sup>36</sup>

Progress was also slow in negotiating agreements between MRFs and local governments in NSW, where an analysis concluded that negotiations may not proceed smoothly until issues around the viability of MRFs—which had been reduced by changes in China's acceptance of material—was included in the negotiations (CIE & APC 2018, p. 1).

Stakeholders told the Commission that:

- negotiations are complicated by variations in the relative bargaining strengths of local governments and MRFs.<sup>37</sup> Councils vary in size, and MRF operators range from community operators to large corporations servicing many local governments. Some have other options, whereas others do not. There is no one to mediate negotiations, which can be lengthy with significant transaction costs
- extending the duration of the default arrangement could be a permanent solution to negotiating problems, providing local governments and MRFs with more certainty and a starting negotiating position (LGAQ sub. 7, p. 2)<sup>38</sup>
- making Scheme audit data available to local governments would remove a barrier to them entering refund sharing negotiations and improve the Scheme's transparency and accountability (LGAQ sub. 7, p. 2).

There appear to be strong incentives for MRFs and local governments to negotiate agreements to secure additional revenue, but also some barriers to negotiation such as limited access to data about the Scheme.

\_

<sup>&</sup>lt;sup>34</sup> Total scheme revenue for MRFs in the first year of the scheme in NSW was estimated to be about \$100 million (CIE & APC 2018, p. 25).

<sup>&</sup>lt;sup>35</sup> In early 2018, China—the world's largest importer of recyclable materials—implemented their National Sword Policy, which meant the setting of strict limits on acceptable levels of contamination in recycling. This significantly reduced the value of scrap paper and cardboard and the sale of plastics to China all but ceased. This has had an impact on the financial performance and sustainability of the recycling industry, including that for kerbside recycling (APCO 2018, p. 1).

<sup>&</sup>lt;sup>36</sup> Waste Reduction and Recycling (Container Refund Scheme—Material Recovery Agreements) Amendment Regulation 2019, Explanatory notes for SL 2019 No. 189 made under the *Waste and Recycling Act 2011*.

<sup>&</sup>lt;sup>37</sup> This was also an issue in NSW (CIE & APC 2018, p. 47).

<sup>&</sup>lt;sup>38</sup> The Western Australian Local Government Association has similarly recommended that in WA 'both parties commence negotiations on the basis that benefits are shared 50/50' (WALGA 2019, p. 2).



The Commission understands that recovery amount protocol arrangements were reviewed by DES in December 2019, and were updated to include a default arrangement where local governments and MRFs share revenue equally (minus audit costs and administrative costs incurred by the MRF, capped at \$200 a quarter per local government). However, local governments and MRFs are still able to negotiate a different recovery sharing arrangement if they see fit, and this arrangement would take precedence over the default arrangement (DES Qld 2019b).

From the perspective of individual Queenslanders, the recovery sharing arrangements affect them in two main ways. On the one hand, the arrangements may lead to higher prices for consumers of beverages as COEX will need to continue to recover the payments it must make to local governments and MRFs through higher scheme prices. On the other hand, the arrangements will benefit ratepayers to the extent that payments to local governments enable them to reduce rates or increase services.

#### Recommendation 1

COEX should continue to review the effective and efficient mix of container refund points. It should publish its strategy for developing the network and the reasons for making specific changes to the location or type of container refund point, to build stakeholder confidence in the network and encourage users to provide information to COEX that would help it to further improve the network.

#### Recommendation 2

COEX should publish estimates of the incremental costs and benefits of further increases in the eligible container recovery rate from its present level, and its strategy for achieving the 85 per cent target.

#### Recommendation 3

The Queensland Government should inform decisions about expanding the types of eligible containers through a thorough evaluation of costs and benefits, including the costs and benefits of achieving the same outcomes in different ways.

#### Recommendation 4

The Queensland Government should assess proposals for harmonisation with other jurisdictions against criteria such as the extent to which the proposals contribute to the effectiveness of the Scheme in achieving its objectives, generate net benefits, and can be implemented easily.

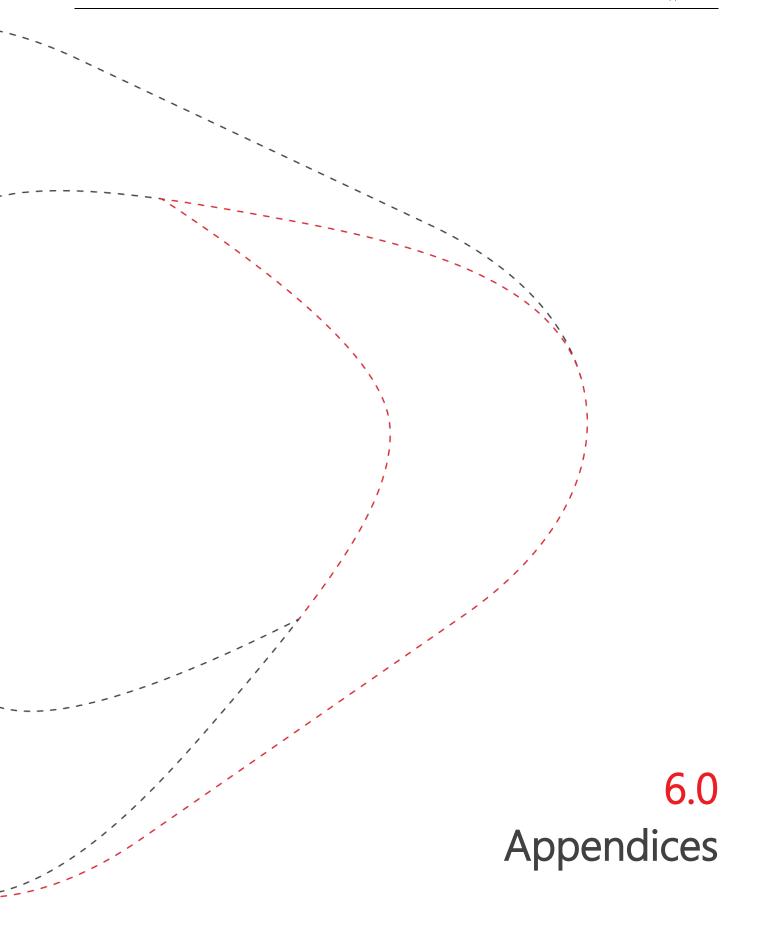
## Recommendation 5

COEX should review its complaints-handling process, to ensure that it is making good use of customer feedback and to build confidence in the Scheme. This review should involve wide and transparent consultation with scheme participants and COEX should publish its results.

#### Recommendation 6

COEX should adopt transparency as a core organisational value. As a minimum, it should publish information about its costs, strategies and procedures. For example, it should report indicators of the Scheme's efficiency, its analysis of the reasons for changes in efficiency, and how these reasons affect its strategies.







# Appendix A Terms of Reference

#### **Context**

The Queensland Government has decided to commission independent monitoring and analysis of the price impacts of the Container Refund Scheme (CRS) over its first 12 months.

The Container Refund Scheme commenced on 1 November 2018. The scheme is funded under legislation by a surcharge on beverage manufacturers.

The underlying policy aim of this review is to ensure that consumer interests are protected from unjustified pricing behaviour such as retailers and suppliers using the introduction of the scheme to increase prices significantly higher than what would be expected or reasonable.

It is anticipated that the beverage manufacturers will pass the costs of the scheme on to their customers, with some price increases. Price increases should be reasonable and reflect the rate of the surcharge.

Not all beverage products or containers are eligible for a refund under the CRS. For example, plain milk containers are excluded from the scheme. There should be no cost impact on excluded products.

#### **Task**

The Queensland Productivity Commission (QPC) is directed to monitor and report on the price impacts of the CRS over its first 12 months of operation.

This specifically comprises:

- the effect of the CRS on prices of beverages sold in Queensland in an eligible container;
- the effect of the CRS on competition for beverages and the performance and conduct of beverage manufacturers and retailers;
- any other specific market impacts on consumers that arise from the commencement of the CRS; and
- any other matters which are relevant to the consumer interest.

The QPC should monitor and report on price impacts across a range of consumer, geographical, supplier, retailer and product categories, including:

- state-wide, regions and localities;
- types of beverages; and
- large and small retailers, ranging from general grocers, liquor stores, hotels and online distribution.

Specifically, the QPC is asked to consider pricing impacts in relation to beverage products with 'captive' markets such as entertainment and sporting venues.

The QPC should provide advice and recommendations to the Government to address any adverse pricing effects or behaviours arising from the operation of the scheme.

#### Consultation

The QPC must undertake a public consultation process and targeted sectoral consultation with, but not limited to, individual beverage manufacturers and retailers, peak beverage bodies (alcohol and non-alcohol), peak retail and hotel associations and consumer organisations.

#### Reporting

The QPC must publish an Issues Paper by 1 May 2019, an Interim Report by 1 August 2019 and a Final Report by 1 February 2020. The QPC may also report to the Government at any time on matters relevant to price and market impacts of the CRS that arise during the inquiry.



# Appendix B Submissions and consultations

Written submissions provide a significant contribution to the Commission's evidence base. The Commission received 11 submissions as listed below (Table B.1 and Table B.2).

Table B.1 Submissions in response to the issues paper

Individual or organisation	Submission nui	nber
Matthew Byrnes	001	CRSIP-001
Scenic Rim Brewery (confidential)	002	CRSIP-002
Department of State Development, Manufacturing, Infrastructure and Planning	003	CSRIP-003
Waste, Recycling Industry Association (Qld)	004	CRSIP-004
Australian Beverages Council Ltd (ABCL)	005	CRSIP-005
Stadiums Queensland (SQ) (confidential)	006	CRSIP-006

Table B.2 Submissions in response to the interim report

Individual or organisation	Submission nu	mber
Local Government Association of Queensland (LGAQ)	007	CRSIR-007
Container Exchange (COEX)	008	CRSIR-008
Ballistic Beer Co	009	CSRIR-009
Coca-Cola Amatil (CCA)	010	CRSIR-010
Sunshine Brewery	011	CRSIR-011



The Commission held a total of 22 meetings with 25 individuals from 17 organisations (Table B.3).

### **Table B.3 Consultations and visits**

Organisation
Container Exchange (COEX)
Department of Environment and Science (DES)
Independent Pricing and Regulatory Tribunal (IPART)
Independent Competition and Regulatory Commission (ICRC)
Queensland Hotels Association
Tru Blu Beverages
Stadiums Queensland (SQ)
National Retail Association
Coca-Cola Amatil (CCA)
Brisbane City Council
Australian Food and Grocery Council
Waste, Recycling Industry Association Qld
Scenic Rim Brewery
Australian Beverages Council Ltd (ABCL)
Department of State Development, Manufacturing, Infrastructure and Planning
Local Government Association of Queensland (LGAQ)
Ballistic Beer Co



# Appendix C Eligible and excluded containers

Table C.1 Eligible and excluded containers for non-alcoholic beverages

Eligible and excluded containers*			
Beverage	Container type	Container size	
		Eligible* (exclusions apply)	Excluded
Fruit or vegetable juice—pure	All materials	• Less than 1 L	<ul><li>Less than 150 mL</li><li>1 L or greater</li></ul>
Milk—flavoured: - cow's or other animal milk - soy or other plant-based milk - low-fat milk - ultra heat-treated (UHT) milk, etc.	All materials	• Less than 1 L	<ul><li>Less than 150 mL</li><li>1 L or greater</li></ul>
Soft drinks, carbonated	All materials	• 3 L or less	• Less than 150 mL • Greater than 3 L
Soft drinks—non-carbonated: - energy drinks - fruit drinks - ready-to-drink cordials - sports drinks - vitamin drinks	All materials	• 3 L or less	• Less than 150 mL • Greater than 3 L
Water—intended for human consumption: - plain - still or carbonated spring water	Aseptic packs/casks (made from cardboard, plastic or foil)	• Less than 1 L	<ul><li>Less than 150 mL</li><li>1 L or greater</li></ul>
- mineral water	All other materials	• 3 L or less	• Less than 150 mL • Greater than 3 L

<sup>\*</sup> Most aluminium, glass, PET, HDPE, steel and paperboard drink containers between 150 mL and 3 L are eligible. Source: DES Qld 2018.



Table C.2 Eligible and excluded containers for alcoholic beverages

Eligible and excluded containers*			
Beverage	Container type	Container size	
		Eligible* (exclusions apply)	Excluded
Alcoholic beverages (non-grape): - derived from fruit or other substances such as:	All materials	• 3 L or less	• Less than 150 mL • Greater than 3 L
Beer/ale/stout	All materials	• 3 L or less	<ul><li>Less than 150 mL</li><li>Greater than 3 L</li></ul>
Pure spirituous liquor, distilled alcoholic beverage:	Glass	NIL	<ul> <li>All containers</li> </ul>
<ul><li>brandy</li><li>gin</li><li>rum</li><li>vodka</li><li>whisky</li></ul>	All other materials	• 3 L or less	Less than 150 mL     Greater than 3 L
Wine, alcoholic and non-alcoholic:	Glass	NIL	<ul> <li>All containers</li> </ul>
- beverage produced by the fermentation of grapes only	Aluminium cans	• Less than 1 L	<ul><li>Less than 150 mL</li><li>1 L or greater</li></ul>
- does not include grape juice which has not undergone fermentation process	Plastic	• Less than 250 mL	<ul><li>Less than 150 mL</li><li>250 mL or greater</li></ul>
	Sachets (plastic or foil)	• Less than 250 mL	<ul><li>Less than 150 mL</li><li>250 mL or greater</li></ul>
	Aseptic packs/casks (made from cardboard, plastic or foil)	• Less than 1 L	<ul><li>Less than 150 mL</li><li>1 L or greater</li></ul>
Spirit-based, flavoured alcoholic beverage: - any beverage that contains spirituous liquor plus additional beverages, ingredients or flavours:  • alcopops • ready-to-drink alcoholic beverages (RTDs) • spirit-based beverages sold in casks	All materials	• Less than 1L	Less than 150 mL     Greater than 3 L
Wine-based, flavoured alcoholic beverage: - any beverage that contains wine plus additional beverages, ingredients or flavours such as:	Aseptic packs/casks (made from cardboard, plastic or foil)	• Less than 1 L	• Less than 150 mL • 1 L or greater
<ul> <li>fruit flavoured wine</li> <li>wine coolers</li> <li>ready-to-drink alcoholic beverages (RTDs)</li> </ul>	All other materials	• 3 L or less	• Less than 150 mL • Greater than 3 L

<sup>\*</sup> Most aluminium, glass, PET, HDPE, steel and paperboard drink containers between 150 mL and 3 L are eligible. Source: DES Qld 2018.



# Appendix D Market definition

In the Competition and Consumer Act 2010 (Cth) (s. 4E), a market, when used in relation to any goods and services, includes:

a market for those goods and services and other goods and services that are substitutable for, or otherwise competitive with, the first-mentioned goods or services.

The substitutability of goods for each other is therefore the key factor when defining a market.

The Commission followed the approach to market definition taken by the Independent Pricing and Regulatory Tribunal (IPART) in its definition of relevant beverage markets in NSW, as well as that taken by the Independent Competition and Regulatory Commission (ICRC) in the ACT. That is, it followed the Australian Competition and Consumer Commission's (ACCC) guidance for defining markets in considering substitutability in terms of:

- the product classes and types of beverages offered
- the functional level of operation where competition occurs—for example, manufacturing, wholesale and retail
- geography (ACCC 2017, p. 13).

#### **Product classes**

Studies show that there is substitutability between non-alcoholic beverages, such as soft drinks, flavoured waters, energy drinks, fruit juices and cordials, as they have positive cross-price elasticities (Duckett et al. 2016, p. 58; Sharma et al. 2014). A high degree of substitutability has also been found among alcoholic beverages, including beer, wine, and ready-to-drink or pre-mixed spirits (Srivastava et al. 2014, p. 422).

There is less substitutability between alcoholic and non-alcoholic beverages, indicating that it is reasonable to consider them to be separate markets. This is consistent with the approaches of IPART and ICRC in NSW and the ACT.

The alcoholic and non-alcoholic beverages markets can be further segmented into categories of drinks—for instance, soft drinks and bottled water. IPART also considered that there may be further subcategories for boutique beverages (IPART 2018, p. 129); for example, many consumers may consider that mass-produced beers are not close substitutes for craft beers.

# Functional level of operation

This distinction between alcoholic and non-alcoholic beverage markets exists across the supply chain. IPART found the following differences in NSW:

- Businesses that manufacture alcoholic drinks require different equipment to businesses that manufacture non-alcoholic drinks.
- Wholesalers that *supply* non-alcoholic beverages are typically small, family-run businesses that focus on niche food and drink products, whereas larger retailers purchase direct from manufacturers. In contrast, two firms dominate the wholesaling of alcoholic beverages.
- In the *retailing* market, businesses that sell alcoholic beverages require a licence with their local authority<sup>39</sup>, while those who retail non-alcoholic drinks do not (IPART 2018, pp. 129–30).

The Commission's research indicates that similar findings apply in Queensland.

<sup>&</sup>lt;sup>39</sup> In Queensland this is regulated by the Office of Liguor and Gaming Regulation (Business Queensland 2019, 2020).



# Geography

Responding to an acquisition proposal in 2012, the ACCC indicated that geographic markets for both the manufacturing and wholesaling of non-alcoholic beverages (carbonated soft drinks, bottled water, fruit beverages and cordial) are not restricted to any particular state but exist Australia-wide (ACCC 2012).

In contrast, the market for beverage retailing may be restricted to smaller geographic areas, depending on how far consumers are willing to travel to substitute between retailers. For example, IPART found that the NSW scheme affects small retail businesses located close to the Victorian border, where consumers could seek to avoid the costs of the scheme by shopping across the border (IPART 2018, p. 130). Geographical restrictions (real or imposed) in the market for beverage retailing underpin the discussion of captive markets in Chapter 5.



# Appendix E Empirical approach

The Commission engaged the Centre for International Economics (CIE) to develop an empirical approach for monitoring changes in prices and household behaviour that are due to the Scheme. The CIE used a difference-in-differences approach, similar to that used by the Independent Pricing and Regulatory Tribunal (IPART) in NSW and the Independent Competition and Regulatory Commission (ICRC) in the ACT.

This framework is used to identify changes that have occurred in the pricing of beverages, household consumption of beverages and household expenditure on beverages due to the Scheme (CIE 2020).

#### The difference-in-differences framework

To estimate the impact of a policy change, or a 'treatment', on an outcome variable, the current state of the world can be compared to a counterfactual state of the world—that is, the potential outcomes in a world where the policy change did not take place. To evaluate the effect of the Scheme, outcomes for beverage containers affected by the Scheme (the treated) can be compared with outcomes for a control group of beverage containers that it has not affected (the untreated). The impact of the Scheme on the variable of interest—for example, the impact of the Scheme on the price of eligible beverages—is derived from the average difference in the outcomes of the two groups.

Eligible beverage containers sold in Queensland can only be observed in the treated state, as they are all exposed to the Scheme. However, the imposition of the Scheme in Queensland creates a 'natural experiment', whereby the policy has changed for those beverages sold in Queensland, but not for those in Victoria (for example), where a scheme does not exist. This creates a treatment group and a control group with which to study the impacts of the Scheme. While the treatment is not randomly assigned, the imposition of the policy itself can be treated as exogenous—it changes independently of the other variables that cause prices (or expenditure or consumption) to change. This makes it relatively simple to identify causal parameters.<sup>40</sup>

The difference in differences framework establishes a simple method for comparing outcomes before and after a policy intervention. This method is appealing because of its intuitive approach for identifying the effect of a policy change. It is illustrated graphically for the case of beverage pricing in Figure E.1.

<sup>&</sup>lt;sup>40</sup> See Meyer (1995) for a review of the use of natural and quasi-experiments in applied economics.



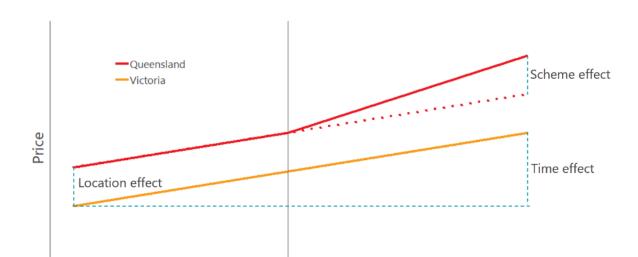


Figure E.1 Illustration of a difference-in-differences methodology

Note: The figure is for illustrative purposes only. Source: Based on Angrist and Pischke (2009, p. 231, figure 5.2.1).

Pre-CRS

This method relies on the assumption that the trends in the treatment group (Queensland) would be the same as the control group (for example, Victoria) if the Scheme was not implemented (the common trends assumption). To calculate the effect of the Scheme, the slope of the line for the control group is used to calculate what the time trend in the treatment group would have been without the treatment (shown by the red dotted line).

Post-CRS

The fixed difference—that is, the difference in the trend lines—between the two groups (the 'location effect' above) is also calculated to subtract any price changes that are due to differences between the two groups of study that are constant over time. In the figure above, the time effect and the location effect added together give the expected price without the Scheme. The effect of the Scheme can therefore be calculated as the difference between the expected trend without the imposition of the Scheme and the actual trend following the imposition of the Scheme.

Traditionally, a weakness of difference-in-differences methodologies is that they do not have external validity; that is, it may not be possible to generalise the results beyond the setting considered by the study (Meyer 1995, p. 153). For the purposes of this review, the Commission is studying the effects of the Scheme in Queensland, so external validity of the results need not be a priority. Nevertheless, it must be noted that the results of this review may not be generalisable to the effect of other kinds of container refund schemes in other markets.

For this review, the treatment is the introduction of the Scheme, and Queensland is the treatment group. Three potential control groups are studied:

- Victoria, where no scheme has been introduced
- NSW, where a scheme has already been introduced (in a prior period)
- the rest of Australia, where some states have schemes and others do not.

## Methodology

The Commission used two approaches to estimate the Scheme's impact on beverage prices, based on the difference-in-differences framework.



The first is a simple comparison of the changes in average prices of beverages in different beverage markets and categories before and after the Scheme commenced. For example, the average price change for eligible beverages in Queensland was compared to the average price change for the same beverages in the rest of Australia. However, this approach may not adequately account for other changes that may be occurring in beverage markets.

The second approach uses econometric analysis to provide a causal estimate of the impact of the Scheme. The model better controls for the timing of the Scheme to ensure that the effect can be causally linked to the Scheme itself and not to other changes that may be occurring in the market. These are the results reported in the main body of the report.

### Method 1: Simple computational approach

As an example, the steps to calculate the marginal effect of the Scheme's introduction on prices of eligible containers in Queensland between two time periods (t=1 and t=2) are the following (Table E.1):

- Calculate the average change in prices between the period without the Scheme (P<sub>12</sub>) and the period with the Scheme (P<sub>22</sub>) for beverages sold in eligible containers in Queensland.
- Calculate the average change in prices between the same two periods in the rest of Australia without the Scheme:  $P_{21} P_{11}$ .
- Calculate the difference in the average price changes between Queensland and the rest of Australia. This is the change in prices directly attributable to the Scheme:  $(P_{22} P_{12}) (P_{21} P_{11})$ .

Table E.1 The difference-in-differences method

	Treatment group	Control group	Difference between groups
t = 2	P <sub>22</sub>	P <sub>21</sub>	$P_{22} - P_{21}$
<i>t</i> = 1	P <sub>12</sub>	P <sub>11</sub>	$P_{12} - P_{11}$
Change over time	$(P_{22} - P_{12})$	$(P_{21} - P_{11})$	$(P_{22} - P_{12}) - (P_{21} - P_{11})$

Price changes for non-alcoholic beverages in the first 12 months following the introduction of the Scheme in November 2018 were calculated using the simple approach—the net differences in the year-on-year change in average prices of eligible containers between Queensland and the rest of Australia (Figure E.2). For example, in December 2018, prices in Queensland rose by 7.95 cents and prices in the rest of Australia fell by 1.75 cents. This means that the net difference, shown by the bar for December 2018 in Figure E.2, is an increase in the average price per container of 9.70 cents.

The horizontal line in Figure E.2 indicates that, averaging over the monthly year-on-year price changes for the first 11 months of the Scheme, the price of non-alcoholic beverages sold in eligible containers increased by approximately 9 cents more in Queensland than in the rest of Australia, on average.

These increases should not, however, necessarily be attributed to the implementation of the Scheme itself. The price changes could simply be caused by natural variation in the underlying data.





Figure E.2 Year-on-year change in the prices of non-alcoholic beverages, Queensland

Notes: Year-on-year changes compare the price changes in Queensland to price changes in the rest of Australia over the period in which the Scheme was introduced. For example, the bar for December 2018 is calculated by comparing prices in December 2018 to December 2017. Source: CIE estimates based on Nielsen data.

Econometric modelling can better isolate the causal impacts of the Scheme, using the same intuition as this simple method. Econometric estimates are therefore presented in Chapters 3 and 4 of this review, instead of those from this simpler approach.

#### Method 2: Econometric approach

The effects of the Scheme on prices, consumption and expenditure were estimated using a regression framework. This approach allows for the estimation of standard errors and confidence intervals to determine whether the results are statistically significant or just the result of random noise. Further, regression allows for the inclusion of fixed effects terms to control for factors that may also be affecting prices, consumption or expenditure—for example, to account for seasonal variation.

Consider the following two-way fixed effects model:

$$Y_{itrs} = \alpha_{irs} + \lambda_t + \beta' QLD * SCHEME_{its} + \epsilon_{itrs}$$

#### Where:

Y<sub>itrs</sub> is the outcome variable of interest; that is,

- the price of eligible beverage i in month t from retailer r in state  $s^{41}$ , in dollars per container, or
- the consumption (in litres per month) of beverages sold in eligible containers in month t by household r in state s, or

<sup>&</sup>lt;sup>41</sup> 'State' refers to Queensland or the counterfactual, which could be either NSW, Victoria or the rest of Australia.



- the expenditure (in dollars per month) on beverages sold in eligible containers in month t by household r in state s
- $\alpha_{irs}$  is a fixed effect that accounts for heterogeneity in prices at the product/retailer/state level, or in consumption or expenditure at the household/state level
- $\bullet$   $\lambda_t$  is a time fixed effect that captures general time trends in beverage prices/consumption/expenditure across Australia
- QLD\*SCHEME<sub>its</sub> is an interaction term between a dummy, QLD, that equals 1 if the beverage was sold in Queensland and a dummy, SCHEME<sub>its</sub>, that equals 1 for all eligible products sold in the period 1 November 2018 onwards. This term captures the marginal effect of the Scheme
- $\epsilon_{itrs}$  is a random noise term (assumed to have the usual properties—mean 0, uncorrelated with itself and other variables in the model, and homoskedastic).<sup>42</sup>

The coefficient of interest is  $\hat{\beta}$ , the difference-in-differences estimate, which captures the estimated marginal effect of the Scheme on the relevant outcome variable of interest. This is given as 'Scheme impact' in the following tables of regression results. Estimating  $\beta$  is equivalent to demeaning the above model (subtracting the time average from each observation) and estimating using ordinary least squares. About standard errors are calculated to account for possible serial correlation in the error term. The model is estimated independently for each beverage type (soft drinks, water, milk, juice, beer, wine, cider and ready-to-drink spirits), with frequency weights applied to better represent the types of beverages actually consumed by households.

Compared to the model estimated by IPART in NSW (IPART 2018, p. 34), this specification differs by including fixed effects for product, state and retailer (or household) characteristics. The IPART approach only includes the equivalent of a fixed effect for state characteristics, instead opting for a matrix of other explanatory variables to control for other confounding factors.

The extra fixed effects may be able to better control for these confounding factors, as they will also control for any unobservable factors. In contrast, the NSW approach only controls for measurable (observable) factors. If some unobserved product/retailer/household/state characteristic is correlated with the Scheme variable (the assumption underlying the fixed effects model), it would introduce an endogeneity problem to the model if these effects were not included. While this is unlikely, as the imposition of the Scheme is effectively an exogenous treatment, these controls ensure that the common trends assumption holds. For example, instead of assuming that prices exhibit common trends in general, the assumption can instead be made that, for example, prices of a particular brand of soft drink sold at a particular retailer exhibit common trends. The latter is a more convincing assumption than the former.

# Coefficient interpretation

Each estimate presented in this report can be interpreted as the marginal effect of the Scheme on the price (or the level of consumption or expenditure) for that beverage category. As the Scheme variable is categorical (it is either switched 'on' or 'off'), a coefficient of '10.02', for example, would mean that prices are estimated to be 10.02 cents higher for that beverage category than they would have been if a Scheme had not been imposed. This estimate is an *average* marginal effect. The price of each beverage in each retailer will have increased by varying amounts, so the coefficient takes the average of the price changes for all the beverages in the sample under consideration.

<sup>&</sup>lt;sup>42</sup> See Cameron and Trivedi (2009, p. 76) for a discussion of these assumptions.

<sup>&</sup>lt;sup>43</sup> By the Frisch–Waugh–Lovell theorem, the least squares dummy estimator produces the same coefficients as the within estimator. This is the link between IPART's model specification using dummy variables and the Commission's fixed effects model.

<sup>&</sup>lt;sup>44</sup> See Bertrand, Duflo and Mullainathan (2004) for more on the calculation of standard errors in difference-in-differences frameworks.



It must be noted that the coefficients are estimates only and thus a level of uncertainty is associated with them. Standard errors are reported alongside the coefficients, which can give an indication of the uncertainty associated with an estimate. The smaller the reported standard errors, the more precise the estimate. The 'level of significance' of coefficients—based on a hypothesis test as to whether the coefficient is statistically different from zero—is also reported with asterisks in regression tables, as is standard. As 5 per cent level of significance is generally accepted as a good benchmark. If an estimate is not statistically different from zero, it would be concluded that the Scheme has had no effect, even if it appears large in magnitude. It can be noted that the estimates in this final report have improved in precision upon those in the interim report, often as the result of larger sample sizes, which lead to smaller standard errors.

A high level of significance, however, does not measure whether the coefficient is unbiased. While best econometric practice was undertaken to ensure the accuracy of the results in this report, results are affected by the quality of the underlying data. For example, the Nielsen data is biased towards consumers purchasing from larger retailers and thus may not provide accurate estimates for those purchasing from smaller retailers. A larger sample size alone will not improve problems related to bias in the data sample itself if the coefficient of interest is the price change in smaller retailers. Instead, sampling mechanisms would need to be adapted. Limitations of the data are noted throughout the report where necessary.

## Regression results

To ensure that the results are not driven by particular specifications of the model, various versions are estimated to test sensitivity to modelling choices. These versions are presented in Table E.2–Table E.7. Models tested include:

- model 1, which includes time and product–retailer–state (or household–state) fixed effects and is estimated using NSW as the counterfactual
- model 2, which is the same as model 1, but is estimated using Victoria as the counterfactual
- model 3, which is the same as models 1 and 2, but is estimated using data from all Australian states and territories (except Queensland) as the counterfactual. This is the main model used by this report
- model 4, which includes a state-specific time trend and is estimated using NSW as the counterfactual
- model 5, which is the same as model 4, but is estimated using Victoria as the counterfactual
- model 6, which is the same as models 4 and 5, but is estimated using data from all Australian states and territories (except Queensland) as the counterfactual.

The results for non-alcoholic beverages are robust to model specification, with a range of only one to two cents between the highest and lowest impact. However, the results for alcoholic beverages are highly sensitive to model specification and therefore must be interpreted with caution. This was a limitation of the interim report, and, while the certainty around many estimates has improved for the final report, the estimated impacts still vary more widely than those for non-alcoholic beverages. While the Scheme is estimated to have caused increases in the prices of alcoholic beverages, there is less certainty about the size of the change.

Model 3 was chosen as the preferred model, as it does not include the state-specific time trends. Inclusion of these extra fixed effects risks over-specifying the model, which is particularly problematic when estimating the results for alcoholic beverages with smaller sample sizes. Further, it can exploit a larger sample size by using Australia as the counterfactual instead of just Victoria (the most intuitive counterfactual) or NSW. These are the estimates presented in the main body of the report.

\_

<sup>&</sup>lt;sup>45</sup> \*\*\* 1% significance, \*\* 5% significance, \* 1% significance.



# Impacts on beverage prices

Table E.2 Sensitivity analysis—prices of non-alcoholic beverages

Prices (cents per container)	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Scheme impact	9.34***	9.68***	8.97***	8.45***	8.49***	8.22***
Standard error	0.43	0.44	0.45	0.36	0.36	0.38
Constant	0.98	0.97	1.02	0.96	0.95	1.02
Household fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Month	Month	Month	State-specific	State-specific	State-specific
Counterfactual	NSW	Vic	Aus	NSW	Vic	Aus
F-statistic	84.32	39.56	60.72	175.97	133.24	153.24
F-test p-value	~0	~0	~0	~0	~0	~0
N (types of beverages sold by retailer and state)	157 093 552	151 687 776	165 933 728	157 093 552	151 687 776	165 933 728

<sup>\*\*\*1%</sup> significance.

Notes: 1. The average of the individual fixed effects terms is reported as the constant. 2. Sample size N does not reflect dataset sample, as frequency weights were applied to each product in every period.

Source: CIE estimates using Nielsen data.

Table E.3 Sensitivity analysis—prices of alcoholic beverages

Prices (cents per container)	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Scheme impact	10.44***	10.09***	9.86***	18.58***	18.58***	18.58***
Standard error	1.07	1.35	0.76	0.62	0.62	0.62
Constant	2.50	2.41	2.49	2.49	2.39	2.53
Household fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Month	Month	Month	State-specific	State-specific	State-specific
Counterfactual	NSW	Vic	Aus	NSW	Vic	Aus
F-statistic	49.86	30.63	59.00	94.03	80.35	94.04
F-test p-value	~0	~0	~0	~0	~0	~0
N (types of beverages sold by retailer and state)	95 841	67 102	189 171	95 841	67 102	189 171

<sup>\*\*\*1%</sup> significance.

Notes: 1. The average of the individual fixed effects terms is reported as the constant. 2. Frequency weights were not able to be applied to the Drinks Association data. There are more unique observations on alcoholic beverages in the Drinks Association data than in the Nielsen data.

Source: CIE estimates using data from the Drinks Association.



## Impacts on beverage consumption

Table E.4 Sensitivity analysis—consumption of non-alcoholic beverages

Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
-0.93***	-0.89***	-1.04***	-1.52***	-1.52***	-1.52***
0.26	0.28	0.25	0.24	0.24	0.24
16.58	15.78	15.99	16.00	15.12	14.85
Yes	Yes	Yes	Yes	Yes	Yes
Month	Month	Month	State-specific	State-specific	State-specific
NSW	Vic	Aus	NSW	Vic	Aus
38.99	37.18	72.68	59.78	61.64	59.78
~0	~0	~0	~0	~0	~0
206 668	176 964	385 859	206 668	176 964	385 859
	-0.93*** 0.26 16.58 Yes Month NSW 38.99 ~0	-0.93*** -0.89*** 0.26 0.28 16.58 15.78 Yes Yes Month Month NSW Vic 38.99 37.18 ~0 ~0	-0.93*** -0.89*** -1.04*** 0.26	-0.93*** -0.89*** -1.04*** -1.52*** 0.26	-0.93***       -0.89***       -1.04***       -1.52***       -1.52***         0.26       0.28       0.25       0.24       0.24         16.58       15.78       15.99       16.00       15.12         Yes       Yes       Yes       Yes         Month       Month       State-specific       State-specific         NSW       Vic       Aus       NSW       Vic         38.99       37.18       72.68       59.78       61.64         ~0       ~0       ~0       ~0       ~0

<sup>\*\*\*1%</sup> significance.

Note: The average of the individual fixed effects terms is reported as the constant.

Source: CIE estimates using Nielsen data.

Table E.5 Sensitivity analysis—consumption of alcoholic beverages

Consumption (litres per month)	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Scheme impact	0.08	0.22	0.11	-0.24**	-0.24**	-0.24**
Standard error	0.12	0.20	0.13	0.11	0.11	0.11
Constant	1.98	2.04	1.99	1.82	1.77	1.73
Household fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Month	Month	Month	State-specific	State-specific	State-specific
Counterfactual	NSW	Vic	Aus	NSW	Vic	Aus
F-statistic	9.24	7.06	14.21	9.51	9.54	9.51
F-test p-value	~0	~0	~0	~0	~0	~0
N (households)	206 668	176 964	385 859	206 668	176 964	385 859

<sup>\*\*\*1%</sup> significance, \*\* 5% significance.

Note: The average of the individual fixed effects terms is reported as the constant.

Source: CIE estimates using Nielsen data.

# Impacts on beverage expenditure

Table E.6 Sensitivity analysis—expenditure on non-alcoholic beverages

Expenditure (dollars per month)	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Scheme impact	0.69**	1.16***	0.93***	0.64**	0.64**	0.64**
Standard error	0.35	0.37	0.33	0.31	0.31	0.31
Constant	22.44	21.02	21.56	21.50	20.50	20.20
Household fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Month	Month	Month	State-specific	State-specific	State-specific
Counterfactual	NSW	Vic	Aus	NSW	Vic	Aus
F-statistic	41.77	33.67	74.46	52.41	55.34	52.41
F-test p-value	~0	~0	~0	~0	~0	~0
N (households)	206 668	176 964	385 859	206 668	176 964	385 859

<sup>\*\*\*1%</sup> significance, \*\* 5% significance.

Note: The average of the individual fixed effects terms is reported as the constant.

Source: CIE estimates using Nielsen data.



Table E.7 Sensitivity analysis—expenditure on alcoholic beverages

Expenditure (dollars per month)	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Scheme impact	0.51	1.00	0.77	-0.64	-0.64	-0.64
Standard error	0.73	0.87	0.68	0.60	0.60	0.60
Constant	15.37	14.47	14.53	14.17	13.34	13.44
Household fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Month	Month	Month	State-specific	State-specific	State-specific
Counterfactual	NSW	Vic	Aus	NSW	Vic	Aus
F-statistic	12.06	9.83	20.81	11.94	12.92	11.94
F-test p-value	~0	~0	~0	~0	~0	~0
N (households)	206 668	176 964	385 859	206 668	176 964	385 859

Note: The average of the individual fixed effects terms is reported as the constant.

Source: CIE estimates using Nielsen data.



# References

ABCL (Australian Beverages Council Ltd) 2018, Cost of label changes 2018 updated.

ABS (Australian Bureau of Statistics) 2017a, Australian Statistical Geography Standard (ASGS): Volume 1—Main Structure and Greater Capital City Statistical Areas, July 2016, cat. no. 1270.0.55.001.

— 2017b, Census of Population and Housing: Mesh Block Counts, Australia, 2016, cat. no. 2074.0.

ACCC (Australian Competition and Consumer Commission) 2012, Coca-Cola Amatil—proposed acquisition of Foster's non-alcoholic beverage assets, viewed 16 July 2019, https://www.accc.gov.au/public-registers/mergers-registers/public-informal-merger-reviews/coca-cola-amatil-proposed-acquisition-of-fosters-non-alcoholic-beverage-assets.

— 2017, Merger guidelines, amended from November 2008 version.

ALPA (Arnhem Land Progress Aboriginal Corporation) nd, *ALPA Health & Nutrition Policy*, viewed 20 November 2019, http://www.alpa.asn.au/alpa-health-nutrition-policy/.

Angrist, JD & Pischke, J-S 2009, *Mostly harmless econometrics: an empiricist's companion*, Princeton University Press, Princeton, NJ.

APCO 2018, Chinese import restrictions for packaging in Australia, market impact assessment report, 30 March.

Archer, E 2019, Container Refund Scheme for Tasmania, media release, Tasmanian Government, 6 June.

Armstrong, M & Vickers, J 2018, *Discriminating against captive customers*, discussion paper series no. 858, Department of Economics, University of Oxford.

Bertrand, M, Duflo, E & Mullainathan, S 2004, 'How much should we trust differences-in-differences estimates?', *The Quarterly Journal of Economics*, vol. 119, no. 1, pp. 249–75.

Business Queensland 2019, *Food and beverage industry regulations and compliance*, Queensland Government, viewed 13 January 2020, https://www.business.qld.gov.au/industries/hospitality-tourism-sport/food/food-beverage/regulations.

— 2020, *Liquor guidelines*, Queensland Government, viewed 13 January 2020, https://www.business.qld.gov.au/industries/hospitality-tourism-sport/liquor-gaming/liquor/liquor-guidelines.

Cameron, AC & Trivedi, PK 2009, *Microeconometrics: methods and applications*, 8th edn, Cambridge University Press, New York.

CCAAC (Commonwealth Consumer Affairs Advisory Council) 2012, *Gift cards in the Australian market*, final report, Commonwealth Treasury, Canberra.

CEQ (Community Enterprise Queensland) 2018, Annual Report 2018: Financial year ended June 30, 2018.

CIE (The Centre for International Economics) 2018, *Monitoring the impacts of the NSW Container Deposit Scheme*, final report, prepared for the Independent Pricing and Regulatory Tribunal of NSW (IPART), 19 January.

— 2020, Queensland Container Refund Scheme: Impacts on prices, consumers and competition, final report, prepared for the Queensland Productivity Commission, 16 January 2019.

CIE & APC (A. Prince Consulting) 2018, Revenue sharing arrangements between MRFs and councils from the NSW Container Deposit Scheme, final report, prepared for the NSW Office of Local Government, 29 March.

COAG (Council of Australian Governments) 2019, *Ninth meeting of environment ministers—agreed statement*, 8 November, Adelaide.

COEX (Container Exchange) 2018, *Complaints handling process*, viewed 19 December 2019, www.containerexchange.com.au.



- 2019a, Annual Financial Report, 30 June 2019.
- 2019b, Annual Report 2018-2019.
- 2019c, *The Exchange*, August, viewed 4 November 2019, https://mailchi.mp/9c07d331aa4e/the-exchange-august-2019.
- 2020, Industry partners, viewed 3 January 2020, https://www.containerexchange.com.au/industry-partners/.

Containers for change 2019a, *How it works*, viewed 6 January 2019, https://www.containersforchange.com.au/qld/how-it-works.

— 2019b, Where can I return, viewed 20 January 2019, https://www.containersforchange.com.au/qld/how-it-works.

DES QId (Department of Environment and Science) 2018, List of eligible beverages for the Queensland Container Refund Scheme (as at June 1 2018), Queensland Government, viewed 8 January 2020, https://environment.des.qld.gov.au/waste/pdf/qld-container-refund-scheme-eligible-beverage-containers.pdf.

- 2019a, *Right to information: Disclosure log*, application 18–369, submitted 28 February 2019, Queensland Government, viewed 17 January 2020, https://www.des.qld.gov.au/our-department/rti/disclosure-log.
- 2019b, Queensland Container Refund Scheme—Recovery Amount Protocol, Queensland Government, December.

DSDMIP Qld 2018, Queensland craft brewing strategy, Queensland Government, November.

Duckett, S, Swerissen, H & Wiltshire, T 2016, *A sugary drinks tax: recovering the community costs of obesity*, Grattan Institute.

DWER WA (Department of Water and Environmental Regulation) 2017, Western Australia Container Deposit Scheme, discussion paper, Government of Western Australia.

EHP QId (Department of Environment and Heritage Protection) nd, *Implementing Queensland's container refund scheme*, discussion paper, Queensland Government.

Enoch, L 2019, Containers for Change hits 700 million, media release, Queensland Government, Brisbane, 31 July.

EPA NSW (Environment Protection Authority) 2018, *Return and Earn*, Government of New South Wales, viewed 25 July 2019, https://www.epa.nsw.gov.au/your-environment/recycling-and-reuse/return-and-earn.

EPA NT (Environment Protection Authority) nd, *Regulated containers*, Northern Territory Government, viewed 25 July 2019, https://ntepa.nt.gov.au/\_\_data/assets/pdf\_file/0005/285008/factsheet\_regulated\_containers.pdf.

EPA SA 2019a (Environment Protection Authority), *Container deposits*, Government of South Australia, viewed 2 January 2020, https://www.epa.sa.gov.au/environmental info/container deposit#return.

— 2019b, *EPA Board Summit 2019*, summary report, prepared from proceedings of *The next generation CDS*, EPA Board Summit, Hilton Hotel, Adelaide, 21 May 2019.

Exchange for Change 2018, True Up and Invoicing: Frequently Asked Questions.

- 2019a, *Drinks suppliers and exporters*, viewed 6 December 2019, https://returnandearn.org.au/partners/drinks-suppliers/.
- 2019b, Suppliers and retailers, viewed 6 December 2019, https://actcds.com.au/suppliers/.

EY (Ernst and Young) 2018, Evaluation of the Operation of the Northern Territory Container Deposit Scheme, prepared for the Department of Environment and Natural Resources, Northern Territory, 20 August.

HPW Qld (Department of Housing and Public Works) 2019, *Stadium Taskforce final report—Queensland Government response*, Queensland Government, 28 November.

IBISWorld 2019a, Beer manufacturing in Australia, industry report C1212.

— 2019b, Bottled water manufacturing in Australia, industry report C1211b.



- 2019c, Cider production in Australia, industry report OD4021.
- 2019d, Fruit juice drink manufacturing in Australia, industry report C1211c.
- 2019e, Milk and cream processing in Australia, industry report C1131.
- 2019f, RTD mixed spirit production in Australia, industry report OD5138.
- 2019q, Soft drink manufacturing in Australia, industry report C1211a.

ICRC (Independent Competition and Regulatory Commission) 2018, *Container Deposit Scheme price monitoring*, issues paper, July, Canberra.

- 2019a, Container Deposit Scheme price monitoring, progress report, February, Canberra.
- 2019b, Container Deposit Scheme price monitoring, final report, July, Canberra.

Infinitum nd, *The environmental tax system*, viewed 2 January 2020, https://infinitum.no/english/the-environmental-tax-system.

IPART 2018 (Independent Pricing and Regulatory Tribunal), NSW Container Deposit Scheme: monitoring the impacts on container beverage prices and competition, final report, December, Sydney.

Legislative Council Environment and Planning Committee 2019, *Inquiry into recycling and waste managemen*, final report, Parliament of Victoria, November.

Marsden Jacob Associates 2018, *A model framework for a Container Refund Scheme in Tasmania*, final report, prepared for the Environment Protection Authority Tasmania, April.

Meyer, BD 1995, 'Natural and quasi-experiments in economics', *Journal of Business and Economic Statistics*, vol. 13, no. 2, pp. 151–61.

PwC (PricewaterhouseCoopers) 2008, *Cost schedule for food labelling changes*, final report, prepared for Food Standards Australia New Zealand, 7 March.

QPC (Queensland Productivity Commission) 2019, *Container Refund Scheme Price monitoring review,* interim report, August, Brisbane.

Queensland Ombudsman 2019, Complaints management, viewed 17 December 2019,

https://www.ombudsman.qld.gov.au/improve-public-administration/public-administration-resources/complaints-management.

Queensland Parliament 2019a, *Questions on Notice*, no. 634, asked to the Minister for Environment and the Great Barrier Reef, Minister for Science and Minister for the Arts (Hon L. Enoch), 30 April.

— 2019b, *Questions on Notice*, no. 815, asked to the Minister for Environment and the Great Barrier Reef, Minister for Science and Minister for the Arts (Hon L. Enoch), 15 May.

Sharma, A, Hauck, K, Hollingsworth, B & Siciliani, L 2014, 'The effects of taxing sugar-sweetened beverages across different income groups', *Health Economics*, vol. 23, no. 9, pp. 1159–84.

Srivastava, P, McLaren, KR, Wohlgenat, M & Zhao, X 2014, 'Disaggregated econometric estimation of consumer demand response by alcoholic beverage types', *Australian Journal of Agricultural and Resource Economics*, vol. 59, no. 3, pp. 412–32.

Stadium Taskforce 2018, Stadium Taskforce Report, final report, July, Brisbane.

Taylor, M 2018, 'Can Norway help us solve the plastic crisis, one bottle at a time?', *The Guardian*, 12 July, viewed 13 November 2019, https://www.theguardian.com/environment/2018/jul/12/can-norway-help-us-solve-the-plastic-crisis-one-bottle-at-a-time.

WALGA (Western Australian Local Government Association) 2019, *Sharing the Benefits of the CDS—Local Government and Material Recovery Facilities*, discussion paper, February, Perth.

