IPART

Independent Pricing and Regulatory Tribunal
New South Wales

Monitoring of wholesale and retail markets for fuel ethanol in 2017-18

Draft Report

Draft Report
Transport

October 2018

ISBN 978-1-76049-267-0

The Independent Pricing and Regulatory Tribunal (IPART)

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Tribunal Members

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Invitation for submissions

IPART invites written comment on this document and encourages all interested parties to provide submissions addressing the matters discussed.

Submissions are due by 12 November 2018

We would prefer to receive them electronically via our online submission form <www.ipart.nsw.gov.au/Home/Consumer_Information/Lodge_a_submission>.

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Monitoring of wholesale and retail markets for fuel ethanol
Independent Pricing and Regulatory Tribunal
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1 Executive Summary

The NSW *Biofuels Act 2007* (Biofuels Act) requires certain fuel sellers to ensure that ethanol accounts for at least 6% of the total volume of petrol sold in any one quarter, unless they have been provided with an exemption.[1] Recent amendments to the Biofuels Act moved the obligation for mandated ethanol sales from a small number of major fuel retailers and wholesalers, to a greater number of 'volume fuel retailers'.[2]

The Independent Pricing and Regulatory Tribunal of NSW (IPART) has two ongoing roles under the amended Biofuels Act:[3]

1. to determine, and periodically review, a 'reasonable wholesale price' (wholesale price) for ethanol for use in the production of petrol-ethanol blends such as E10,[4] and
2. to monitor the retail market (including prices) for petrol-ethanol blend and make reports to the Minister for Innovation and Better Regulation (the Minister) on the effect of a determination of the reasonable price for wholesale ethanol.

The markets for petrol and for wholesale ethanol are affected by fluctuating supply and demand conditions, as well as regulatory changes. Therefore, annual monitoring of the wholesale ethanol market is required to reaffirm our approach to regulation of wholesale prices remains appropriate. We are undertaking this assessment in conjunction with our annual monitoring and reporting on the retail market for E10.

This report presents our draft findings on the wholesale and retail markets for fuel ethanol in 2017-18.

1.1 Overview

We found that, on average across New South Wales, retail prices of E10 were 2.2 cents per litre lower than the price of regular unleaded petrol (RULP, or ULP91); consistent with the difference we found last year.[5] Sales of E10 as a proportion of total petrol sales were relatively stable during 2017-18, at around 26.7%. As E10 contains around 10% ethanol, this means approximately 2.7% of total petrol sales were ethanol.[6]

1 *Biofuels Act 2007* (NSW), ss 6-9B.
2 Under the Biofuels Act 2007 (s 4A) and the Biofuels Regulation (No 2) 2016 (cl 6), a volume fuel retailer is one that operates or controls the operation of: (a) a volume fuel service station (a station where the total volume of petrol and diesel fuel sold by retail for the fuelling of motor vehicles at the service station during the last 2 immediately preceding relevant periods exceeds, in each of those periods, 900,000 litres), or 20 or more service stations, none of which are volume fuel service stations.
3 *Biofuels Act 2007* (NSW), s 17A.
4 E10 is regular petrol mixed with up to 10% ethanol.
5 For the period July 2017 to June 2018, compared with August 2016 to June 2017.
6 Australian Petroleum Statistics, Commonwealth of Australia 2018, at http://www.environment.gov.au/energy/petroleum-statistics, accessed on 31 August 2018. Changes were made to the reporting of fuel data in January 2018, which mean that this percentage is not directly comparable with the 2.4% reported in the 2016-17 review. See Box 2.2 of this draft report for more information.

We also found that the availability of E10 has become more widespread over the past year and that customers continue to have effective choice between different types of fuel. During the past year the proportion of service stations offering RULP has decreased. Nevertheless, RULP remains widely available to consumers, with three quarters of service stations in NSW offering RULP, and almost all of the remaining stations located within a short drive of one that does.[7] Consumer choice is supported by a range of websites and apps that allow consumers to access information about where their fuel of choice is sold and at what price.

In relation to the wholesale ethanol market, we found that ethanol producers and fuel wholesalers have continued to negotiate prices below our determined wholesale ethanol price. Our analysis shows that the wholesale prices implied by terminal gate prices are moving closer to the determined wholesale ethanol price, which is based on an import parity price (IPP). We also found that oil and petrol prices as indicated by TGP have risen since the end of the 2016-17 financial year, placing less downward pressure on ethanol prices. At the same time, the domestic excise on ethanol has increased and, as a result, the advantage that excise gives domestic ethanol over petrol and imported ethanol has reduced.

Competition between the three major ethanol producers continued during 2017-18, while plans for additional ethanol production facilities have been progressing. A number of advanced biofuels commercialisation projects have commenced, demonstrating that market entry continues to evolve.

We have again applied our framework for assessing the level of pricing intervention required in the wholesale ethanol market. Consistent with previous years, we found that a less intrusive approach to regulation remains appropriate. While there have been developments in both retail and wholesale markets over the past year, we found that there have been no changes to either the degree of consumer choice in relation to fuel purchases or the extent of competition in the wholesale market that would require us to change our approach.

As a result of these findings, we have made a draft decision to continue to determine wholesale ethanol prices using an IPP methodology. We considered a number of potential changes to this approach including using an IPP from a commercial provider and making determinations six-monthly instead of quarterly. However, we found that there was no compelling case to warrant a change to our current methodology. Our draft decision is that we should continue to calculate the IPP using our current methodology and determine the wholesale price on a quarterly basis. We will update some of the components of our calculation when data becomes available and release these with our Final Report.

1.2 List of draft findings and draft decisions

Our draft findings and draft decisions are listed below.

Draft findings

1 The price of E10 was 2.2 cents lower than the price of RULP on average over the 2017-18 financial year. 7

[7] Our analysis found that 89.9% of petrol stations with E10 but not RULP have a station with RULP within 5 minutes' drive and 99.7% of petrol stations with E10 but not RULP have a station with RULP within 10 minutes' drive. The analysis was done using the Google Distance-Matrix API.

1.3 How this report is structured

The rest of this report explains our draft decisions, findings and recommendations in more detail:

- Chapter 2 describes the NSW retail market for E10 and developments in this market in 2017-18.
- Chapter 3 describes the market for wholesale fuel ethanol in the east coast of NSW, the current state of this market, and outlines potential future developments in this market.
- Chapter 4 explains our draft decision on the extent of regulation required in the wholesale ethanol market and why we consider that an IPP methodology remains the most appropriate approach.
- Chapter 5 describes our draft decision on how we intend to estimate the IPP for wholesale fuel ethanol and the changes we considered to this approach.
- Appendix A describes our IPP methodology in detail.
- Appendix B outlines how we calculated average retail prices using data from the FuelCheck website.

2 Monitoring the NSW retail market for E10

The NSW Biofuels Act requires fuel retailers to ensure that the volume of ethanol sold is not less than 6% of the total volume of all petrol sold: the NSW ethanol mandate (see Box 2.1). The Biofuels Act also requires IPART to monitor the retail market for petrol-ethanol blends, the most common of which is E10.

The prices of retail fuels, including E10 are determined in a competitive market. We consider that effective competition is the best means of protecting customers from excessive prices. As a result, our annual retail market monitoring focuses on indicators of effective competition. These indicators include changes in the retail market that affect the choices available to consumers, as well as their ability to identify and access these choices. We also consider the physical availability of various fuel types, and the availability of information about prices and locations of fuel and report on E10 prices and volumes sold.

2.1 Overview of draft findings

We found that, on average across New South Wales, retail prices of E10 were 2.2 cents per litre lower than the price of regular unleaded petrol (RULP, or ULP91); consistent with the difference we found last year.[8] Sales of E10 as a proportion of total petrol sales were relatively stable during 2017-18, at around 27%.[9] As E10 contains around 10% ethanol, this means that ethanol made up approximately 2.7% of the total volume of petrol sold over this period. This remains below the 6% required by the ethanol mandate.

The availability of E10 has become more widespread over the past year and customers continue to have effective choice between different types of fuel. While the availability of E10 has increased, we found that there has been a reduction in the proportion of service stations offering RULP. Nevertheless, it continues to be offered at three quarters of service stations and remains widely available.

Consumers can gain information about the availability of different fuel types and their prices from a range of websites and apps. Information from Fair Trading shows that consumers are accessing this information. FuelCheck, the NSW Government's real-time fuel comparison website was launched in October 2017 and reached 5.5 million visits by June 2018. The FuelCheck app has also been downloaded 266,755 times.[10]

8 IPART, *Monitoring of wholesale and retail markets for fuel ethanol 2016-17*, Final Report, December 2017, p 1.

9 This percentage has been calculated using the Commonwealth of Australia, *Australian Petroleum Statistics: Issue 263*, Table 3B, June 2018, at http://www.environment.gov.au/energy/petroleum-statistics, accessed on 31 August. In our 2016-17 review we reported that 2.4% of the total volume of petrol sold was ethanol. This percentage is not directly comparable with that reported in the 2016-17 review because changes have been made to the reporting of fuel data. See Box 2.2 for more information.

10 As of 23 July 2018, information provided by NSW Fair Trading.

Box 2.1 The NSW ethanol mandate

The Biofuels Act sets an ethanol mandate for NSW. Under the mandate 'volume fuel retailers' must have ethanol blended petrol available for sale and ensure that the volume of ethanol sold is not less than 6% of the total volume of all petrol sold.[a]

A number of amendments were made to the Biofuels Act, which came into effect on 1 January 2017.[b] These amendments expanded the number of service stations subject to the ethanol mandate.[c] Over 300 additional service stations are now required to meet the mandate compared with before January 2017.

The amendments also require volume fuel retailers to ensure that E10 is available across the forecourts of their service stations, and that the number of E10 nozzles is comparable to that of the other most available petrol product being offered.[d] They are also required to take reasonable steps to market E10, including advertising the price of E10 on their main price board along with other fuel prices.[e]

NSW Fair Trading is responsible for administering and enforcing the biofuels mandate, including collecting the relevant data from service stations.

In recent years the NSW Government has supported the mandate by launching a real-time fuel price monitoring service and an education campaign designed to improve understanding of E10 and its compatibility with different vehicles.

a A volume fuel retailer is one that operates or controls the operation of: (a) a volume fuel service station (a station where the total volume of petrol and diesel fuel sold by retail for the fuelling of motor vehicles at the service station during the last 2 immediately preceding relevant periods exceeds, in each of those periods, 900,000 litres), or 20 or more service stations, none of which are volume fuel service stations·

b Biofuels Amendment Act 2016

c From January 2017 the mandate applies to volume fuel retailers. Prior to January 2017 it applied to volume fuel sellers.

d NSW Fair Trading, Biofuels Act 2007 – Statement of Regulatory Intent, December 2016, at https://www.fairtrading.nsw.gov.au/__data/assets/pdf_file/0020/381404/Biofuels_statement_of_regulatory_intent_december_2016.pdf , accessed on 10 October 2018.

e Biofuels Regulation (No 2) 2016 (NSW), cl 9(1)(d).

2.2 Prices of E10 compared with other petrol types

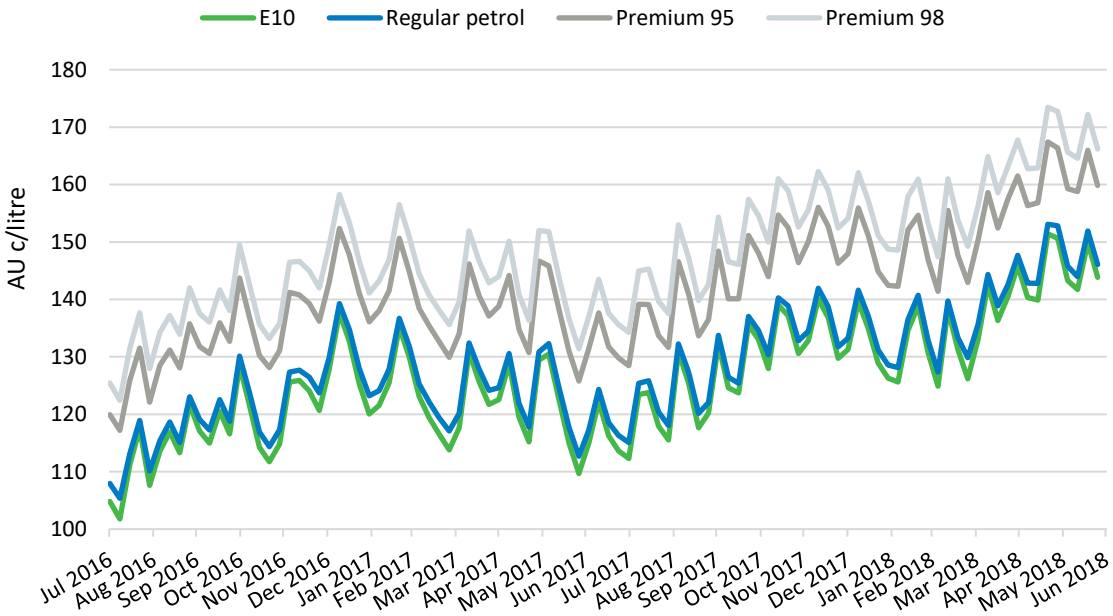
We used historical data from the FuelCheck website to calculate average prices by fuel type and the difference in the price of E10 and RULP.[11] Ideally we consider that this analysis should be based on a weighted average price rather than a simple average. Weighting the data would take into account how much fuel is sold at each price so would provide a better indicator of the relative fuel prices faced by consumers. Since we were unable to obtain data on volumes sold or the number of nozzles from FuelCheck that could be merged with the price data for this purpose, we could not calculate weighted averages.

As an alternative, we focused our analysis on average prices for the hours between 6 am and 10 pm, since very little petrol is sold outside these hours. As a check, we also calculated the average prices and price difference across all 24 hours of the day and the results are very similar.

11 *NSW Government Open Data Portal – Datasets – FuelCheck*, at https://data.nsw.gov.au/data/dataset/fuel-check, accessed on 31 August 2018.

Figure 2.1 shows the weekly average petrol prices in New South Wales from the launch of the FuelCheck website in August 2016 to June 2018. It shows that prices have increased substantially since July 2017 and they were considerably higher in June 2018 than they were a year earlier.

Figure 2.1 Weekly average petrol prices in NSW – August 2016 to June 2018 (AUc/litre)



Note: The calculations are based on prices between the hours of 6 am and 10 pm since very little petrol is sold outside these hours. Data is for the period 31 July 2016 to 24 June 2018.

Data source: *NSW Government Open Data Portal – Datasets – FuelCheck*, at https://data.nsw.gov.au/data/dataset/fuel-check accessed on 26 July 2018 and 22 August 2018.

Submissions from Manildra Group and Bioenergy Australia supported our proposed approach (of looking at E10 and RULP), but also suggested that our analysis examine the relationship between E10 and PULP in addition to RULP.[12] Manildra Group submitted that PULP is a closer substitute for E10 than RULP due to the higher octane level of E10 (typically around 94 octane) compared with RULP (91 octane);[13] typically PULP has either 95 or 98 octane.

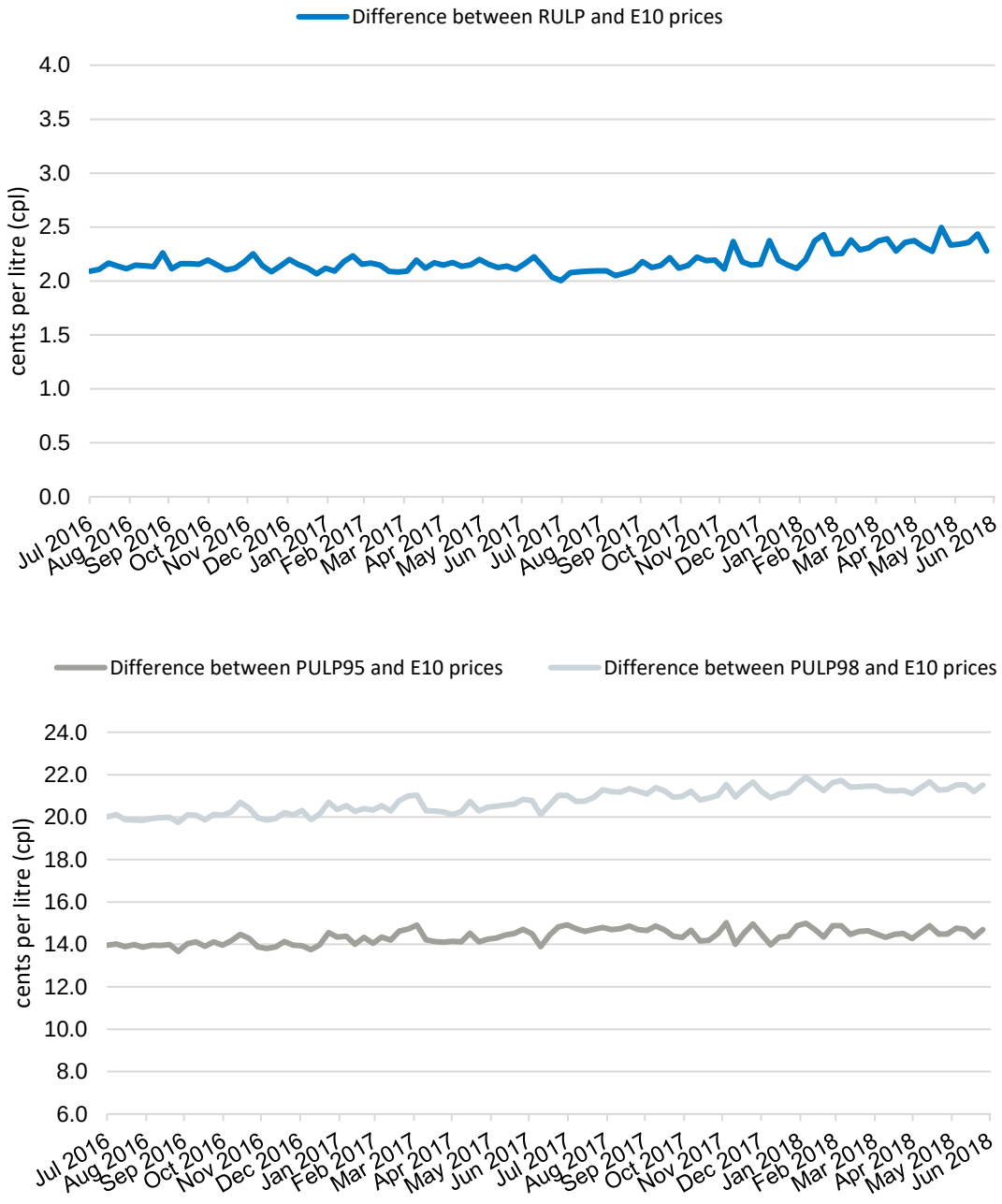
Using FuelCheck data we calculated the average difference in price between E10 and RULP and between E10 and PULP over 2017-18. For each of these calculations we included only service stations that sold both petrol types. Figure 2.2 shows the weekly average price difference in NSW from the launch of the FuelCheck website in August 2016 to the end of June 2018. Since about the end of 2017, there has been a slight increase in the gap between RULP and E10 prices. On average over the financial year, the price of E10 was 2.2 cents per litre lower in 2017-18 than the price of regular petrol. While we adopted a slightly different method this year, our findings are consistent with our findings for 2016-17[14] where E10 was, on average, 2.2 cents per litre less than RULP.

12 Manildra Group submission, September 2018, pp 1-2; Bioenergy Australia submission, September 2018, p 4.
13 Manildra Group submission, September 2018, pp 1-2.
14 IPART, *Monitoring of wholesale and retail markets for fuel ethanol 2016-17,* Final Report, December 2017, p 1.

Draft finding

1 The price of E10 was 2.2 cents lower than the price of RULP on average over the 2017-18 financial year.

Figure 2.2 Weekly difference between RULP and E10 prices and PULP and E10 prices in NSW – August 2016 to June 2018 (AUc/litre)



Note: The calculations are based on prices between the hours of 6 am and 10 pm since very little petrol is sold outside these hours. The data is for 31 July 2016 to 24 June 2018.

Data source: *NSW Government Open Data Portal – Datasets – FuelCheck*, June 2018, at https://data.nsw.gov.au/data/dataset/fuel-check, accessed on 26 July 2018 and 22 August 2018.

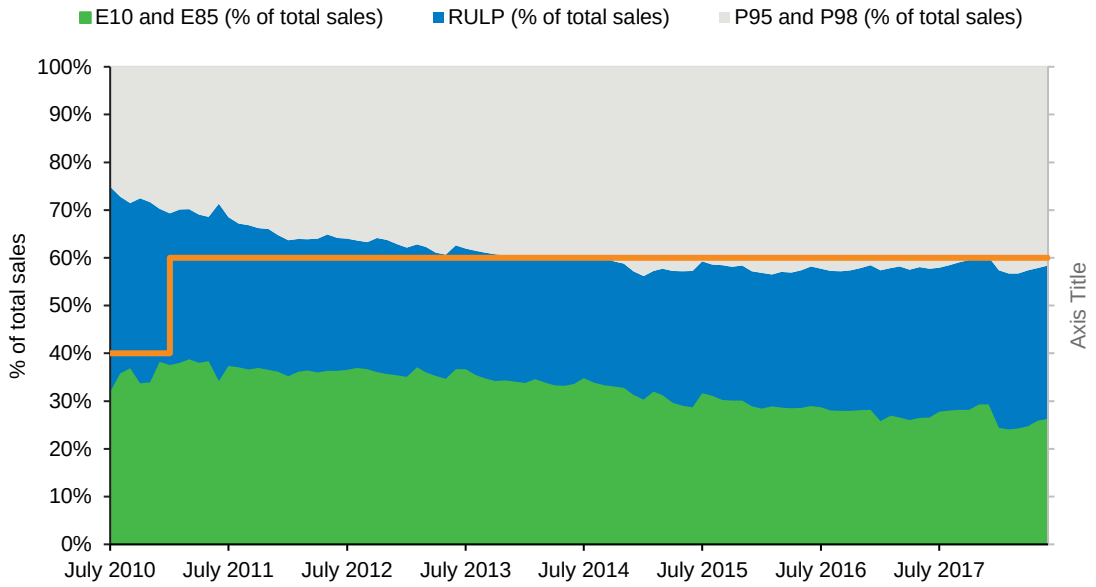
2.3 Volume of ethanol sold as a proportion of total petrol sales

The Australian Petroleum Statistics from the Australian Government's Department of the Environment and Energy show that total sales of ethanol blended petrol in NSW were slightly lower in 2017-18 than in 2016-17, and considerably lower than in 2015-16.[15]

As a percentage of total petrol sold in NSW, ethanol blended petrol made up around 26.7% of petrol sales in 2017-18.[16] Almost all ethanol blended petrol sold by fuel retailers in NSW is E10 (see Box 2.2). This means that over the 2017-18 financial year the volume of ethanol sold was approximately 2.7% of total fuel sales. This is less than the 6% required if all fuel retailers were to meet the mandate on average across NSW.

Figure 2.3 shows the composition of petrol sales across NSW since July 2010. The orange line shows the proportion of petrol sales that must be E10 in order to meet the mandate and the green shaded area shows the proportion of sales that was ethanol blended fuel. The step change in the value of the orange line reflects an increase in the mandate from 4% to 6%. This figure shows that total volumes are well below the level required to meet the 6% mandate.

Figure 2.3 Sales of petrol types in NSW since July 2010 (%)



Note: The orange line shows the proportion of petrol sales that must be E10 in order to meet the mandate, on average across NSW. The step change in the value of the orange line reflects an increase in the mandate from 4% to 6%.

Data source: Australian Petroleum Statistics, Commonwealth of Australia 2018 Issue 263, Table 3B, at http://www.environment.gov.au/energy/petroleum-statistics, accessed on 31 August 2018; IPART calculations.

15 Commonwealth of Australia, *Australian Petroleum Statistics 2018: Issue 263*, Table 3B, June 2018, at http://www.environment.gov.au/energy/petroleum-statistics, accessed 31 August 2018 (statistics for NSW include sales volumes for ACT).

16 Australian Petroleum Statistics, Commonwealth of Australia 2018: *Issue 263*, Table 3B, at http://www.environment.gov.au/energy/petroleum-statistics, accessed 31 August 2018. Changes were made to the reporting of this data in January 2018, which mean that this percentage is not directly comparable with the percentage for 2016-17 we reported last year. See Box 2.2.

Figure 2.3 also shows that the proportion of total petrol sold in NSW that is ethanol blended petrol has fallen in recent years. Ethanol blended petrol made up around 26.7% of petrol sales in 2017-18, down from 27.3% in 2016-17 and 29.5% in 2015-16. Sales of both ethanol blended petrol and RULP dropped in favour of premium unleaded petrol (PULP) over this period. As a proportion of total petrol sales, monthly sales of ethanol blended petrol peaked at around 40% in March 2011 before dropping to a low of 24.4% in January 2018.[17] The latest figures show a small increase in the proportion of E10 sales since January 2018.[18]

Draft finding

2 Monthly sales of fuel ethanol in NSW averaged around 2.7% of total petrol sales in 2017-18. This remains below the 6% required if all fuel retailers were to meet the mandate on average across NSW.

17 Commonwealth of Australia, *Australian Petroleum Statistics 2018: Issue 263*, Table 3B, at http://www.environment.gov.au/energy/petroleum-statistics, accessed on 31 August 2018. This is a decrease of 5% from the December 2017 value of 29.3%. However, we note that changes were made to the reporting of this data in January 2018 and it is possible that some of the observed decrease may be reflective of the change in methodology – see Box 2.2.

18 Commonwealth of Australia, *Australian Petroleum Statistics 2018: Issue 263*, Table 3B, at http://www.environment.gov.au/energy/petroleum-statistics accessed 31 August 2018.

Box 2.2 Sales of E10 required to meet ethanol mandate

Service stations in NSW operated by volume fuel retailers are subject to the ethanol mandate. Under the mandate 'volume fuel retailers' must ensure that the volume of ethanol sold is not less than 6% of the total volume of all petrol sold.

E10 is an ethanol blended petrol that consists of RULP (unleaded 91 octane) mixed with between 9% and 10% ethanol. If E10 was the only ethanol-blended petrol sold by a service station subject to the mandate, it would have to sell between 60% (with 10% ethanol) and 67% (with 9% ethanol) E10 to meet the mandate.

A small number of service stations also offer E85 – a specialist fuel for high performance vehicles which consists of unleaded petrol mixed with 70% to 85% ethanol. Service stations that also sell E85 are able to sell less E10 in order to meet the 6% ethanol mandate. The Australian Petroleum Statistics do not distinguish between sales of E10 and E85. However, in late 2015/early 2016, E85 made up only 0.1% of total petrol sold in NSW.[a]

The Department of the Environment and Energy changed the reporting requirements for the Australian Petroleum Statistics in January 2018. As a result, the 2.7% of total fuel sold as ethanol in 2017-18 is not directly comparable with the 2.4% for 2016-17 we reported last year. Using the updated fuel statistics in the 2018 release the proportion of total fuel sold in NSW that is ethanol was 2.7% in 2016-17 and 3.0% in 2015-16.

We also note that the sales volumes reported for NSW in the Australian Petroleum Statistics includes sales from the ACT as well as sales from non-retail outlets and from retail sites not subject to the mandate. Performance against the mandate by those retailers subject to it would therefore be slightly above that suggested by the Australian Petroleum Statistics.

a NSW Fair Trading, *Service station data collection results*, July 2016, p 4, at http://m.fairtrading.nsw.gov.au/biz_res/ftweb/pdfs/Businesses/Biofuels_industry/Service_station_data_collection_results.pdf accessed on 31 August 2018.

b Commonwealth of Australia, Australian Petroleum Statistics 2018 *Issue 263*, Table 3B, at http://www.environment.gov.au/energy/petroleum-statistics accessed on 8 October 2018.

2.4 Availability of ethanol-blended petrol

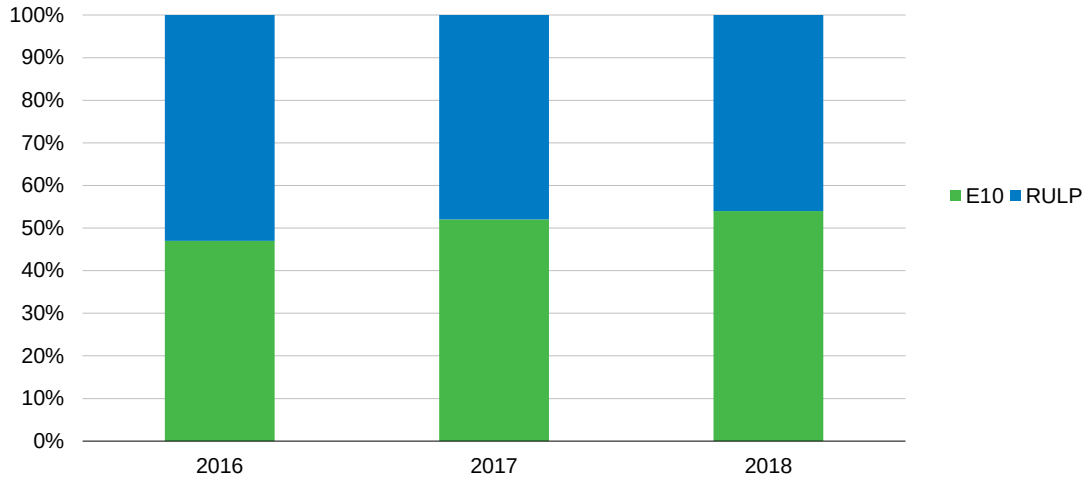
Since amendments to the Biofuels Act commenced in January 2017 volume fuel retailers have been required to ensure that they make ethanol petrol available across the forecourts of their service stations, that the number of E10 nozzles is comparable to that of the other most available petrol product being offered and to take reasonable steps to market E10. Each of these measures should increase the availability of E10.

E10 has become more widely available since the amendments to the Biofuels Act came into effect in January 2017. There has been an increase in the number of nozzles dispensing E10 as a proportion of all nozzles dispensing E10 or RULP (Figure 2.4). Of the total number of nozzles dispensing either E10 or RULP, in June 2018, 54% dispensed E10 and 46% dispensed RULP.[19] We noted this trend in our 2016-17 market monitoring review.[20]

19 Information provided by NSW Fair Trading. Nozzle data relates to stations operated by VFRs.

20 IPART, *Monitoring of wholesale and retail markets for fuel ethanol 2016-17,* Final Report, December 2017, p 7.

Figure 2.4 Nozzles dispensing E10 and RULP



Note: Figures are for Q1 2016, September 2017 and June 2018

Data source: Information provided by NSW Fair Trading. Nozzle data relates to stations operated by Volume Fuel Retailers.

Draft finding

3 E10 has become more widely available since the ethanol mandate was amended in January 2017.

2.5 Level of fuel choice available to consumers

One of the indicators of the level of effective competition is whether consumers can exercise choice over what type of fuel they purchase.

While E10 has become more widely available over the past year, the proportion of service stations offering RULP has fallen from 92% in September 2017 to 75% in June 2018.[21] Despite this reduction, RULP is still widely available. Three quarters of service stations in NSW continue to offer it, and almost all of the remaining stations are located within a short drive of one that does.[22] The availability of websites and apps that assist customers to identify which service stations sell each type of fuel, and at what price, means that it remains relatively easy for consumers to purchase their fuel of choice even where every type of fuel is not available at every service station.

PULP is also widely available and has been growing in popularity over recent years, rising as a proportion of total fuel sold (see Figure 2.3) compared with both RULP and ethanol blended petrol. Bioenergy Australia submitted that our review should consider the marketing tactics being used by petrol stations to persuade people to choose PULP.[23] However, whether marketing campaigns are misleading or deceptive is a matter for the ACCC. In our view,

21 *NSW Government Open Data Portal – Datasets – FuelCheck*, at https://data.nsw.gov.au/data/dataset/fuel-check, accessed on 31 August 2018.

22 Our analysis found that 89.9% of petrol stations with E10 but not RULP have a station with RULP within 5 minutes' drive and 99.7% of petrol stations with E10 but not RULP have a station with RULP within 10 minutes' drive. The analysis was done using the Google Distance-Matrix API (Driving Distance, Coordinates, No traffic model).

23 Bioenergy Australia submission, September 2018, p 2.

what is important is that consumers are not forced into purchasing fuel they do not want due to lack of availability of alternatives or knowledge of where to find their fuel of choice.

2.6 Ease of access to market information

In markets where competition is working well, we would expect most consumers to be aware of the choices that are available to them and to be shopping around for better deals. Websites and apps that provide easy access to accurate information make competition more effective by improving transparency around the different fuels offered and their prices to both consumers and other retailers.

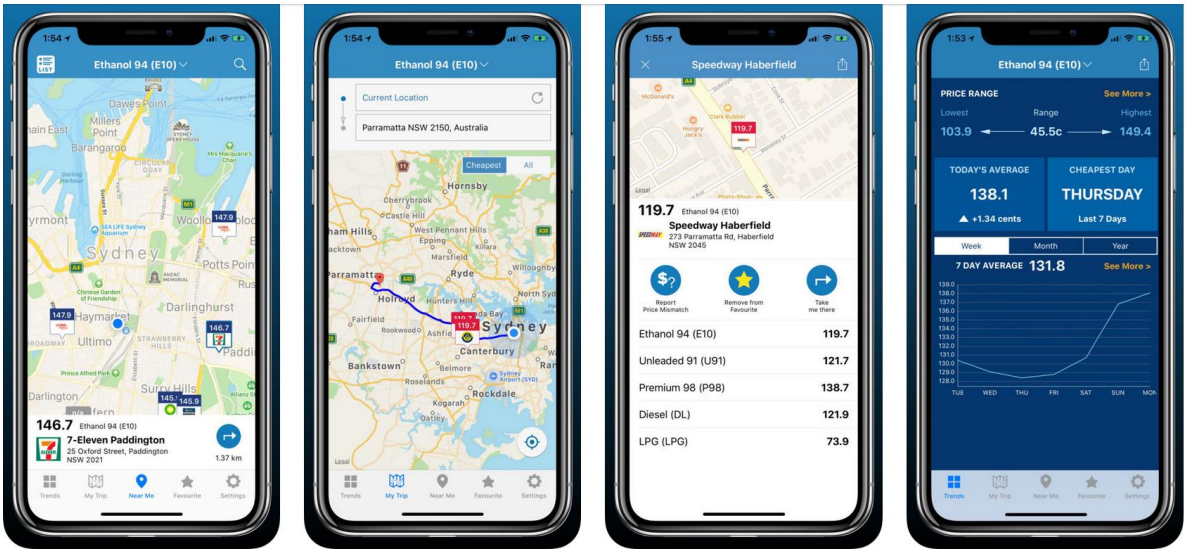
There are a number of commercially operated fuel comparison services. In August 2016, the NSW Government launched its own website: FuelCheck. FuelCheck is a fuel-price monitoring service that provides real-time information to consumers about fuel prices across NSW.[24] Every service station in NSW is legally required to submit its prices to FuelCheck every time prices change. FuelCheck allows consumers to easily identify what fuels are available at each service station and to search for their fuel of choice.

The FuelCheck website reached 5.5 million visits by June 2018. The FuelCheck app was launched on 11 October 2017 and since then has been downloaded over 266,700 times.[25] The app has expanded functionality compared with the website, such asthe "Favourite Stations" function - which allows users to save their favourite petrol station and receive a notification when the petrol reaches their chosen price. Also the "My Trip" function utilises Google Maps to enable users to find the cheapest petrol station on their journey and direct them to the station; and the "Trends Page" - which displays the cheapest day of the week to fill up, the day's price range and allows users to track the changing petrol price over a day, week, month or year.[26]

Figure 2.5 shows the capabilities of the FuelCheck app including locating a service station nearby or along a selected route that sells a particular type of fuel, seeing the fuel offerings and prices available at a particular service station, or plotting historical prices over time with the aim of timing fuel purchases to obtain the lowest price.

24 FuelCheck can be accessed from any internet-enabled device at www.fuelcheck.nsw.gov.au.
25 The app was downloaded 266,755 as of 23 July 2018, information provided by NSW Fair Trading.
26 Information provided by NSW Fair Trading.

Figure 2.5 Examples of FuelCheck app screenshots



Source: Apple app store, August 2018, *Fuelcheck*, at https://itunes.apple.com/au/app/nsw-fuelcheck/id1266569551, accessed on 31 August, 2018.

Services similar to FuelCheck have existed for some time, but they have not had prices from every service station and/or have relied on consumers to report observed prices. Some of these pre-existing services have incorporated prices from FuelCheck, and sometimes offer additional information and services not available via FuelCheck. For example, based on understanding local petrol price cycles, MotorMouth offers forward-looking buying advice for a chosen area.[27]

Bioenergy submitted that IPART should also consider whether consumers have access to credible information regarding compatibility of their vehicle with E10.[28] We agree that the accessibility of this information is important. We note that there is a NSW Government run website 'E10 Fuel for Thought' that allows customers to access this information by inputting their vehicle make, model and year.[29]

Draft finding

4 Consumers continue to have an effective choice of fuel with widespread availability of E10, RULP and PULP. This choice is supported by a range of comparison websites and apps including the NSW Government's FuelCheck service.

27 See MotorMouth website at https://www.motormouth.com.au/

28 Bioenergy Australia submission, September 2018, p 2.

29 NSW Government, *E10 Compatibility Check*, https://www.e10fuelforthought.nsw.gov.au/compatibility-check, accessed on 2 October 2018.

3 Monitoring the east coast market for wholesale ethanol

IPART is required to determine and periodically review a reasonable wholesale price for ethanol. To inform our approach to this determination, we undertake annual monitoring of the wholesale ethanol market. This chapter provides an overview of the current state of the wholesale ethanol market, and outlines plans for future expansion of ethanol production on the Australian east coast.

3.1 Overview of draft findings

We found that under our methodology for determining wholesale ethanol prices, ethanol producers and fuel wholesalers have continued to negotiate prices below our determined prices. However, our analysis shows that the wholesale price implied by terminal gate prices are moving closer to the determined wholesale price, which is based on an import parity price (IPP).

Oil and petrol prices have risen since December 2016, putting less downward pressure on ethanol prices. However, at the same time, the domestic excise on ethanol has increased and the price advantage that domestic ethanol had over petroleum and imported ethanol has reduced.

Competition between the three major ethanol producers continued during 2017-18, while plans for additional ethanol production facilities have been progressing. A number of advanced biofuels commercialisation projects have commenced.

3.2 Prices for wholesale ethanol relative to IPART's determined prices

Since January 2017, we have determined wholesale ethanol prices on a quarterly basis using an import parity price (IPP) methodology that we developed with input from industry stakeholders in 2016.[30] Our determined prices have remained fairly stable over this time ranging from 111.3 cents per litre to 116.7 cents per litre.[31] The most recent wholesale price determination, for the fourth quarter of 2018, is 112.5 cents per litre.[32]

Consistent with our approach last year, we have again estimated a range of implied domestic wholesale ethanol prices based on the observed differences in the Terminal Gate Prices (TGPs) for RULP and E10 together with assumptions regarding the fuel excise on petrol and wholesaler margins.[33] Figure 3.1 shows how these implied wholesale ethanol prices (the blue

30 Our determined price is the price of wholesale ethanol delivered to fuel wholesalers' terminals, including the excise but excluding GST.

31 July 2017 to September 2017. IPART, *Wholesale price for fuel ethanol Q3 2018*, June 2018.

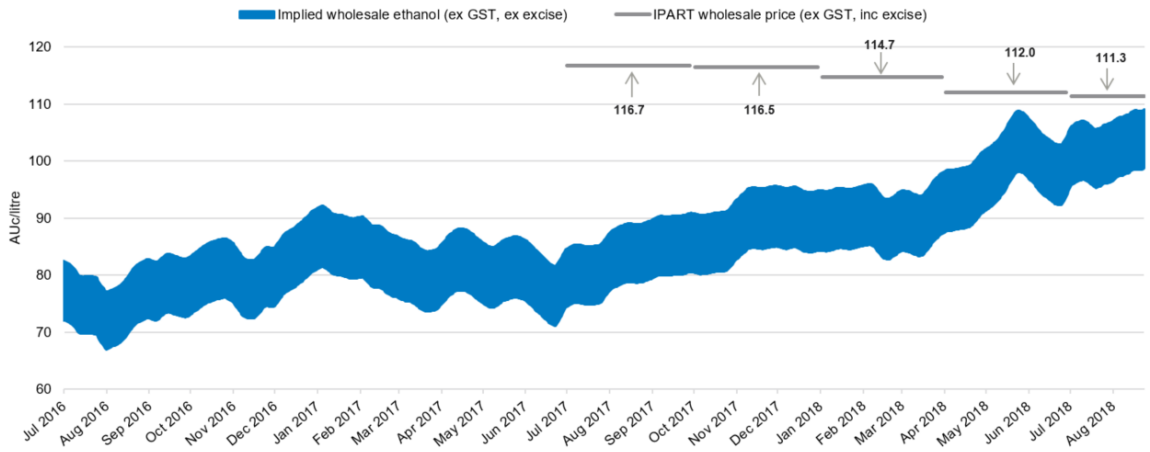
32 October 2018 to December 2018. IPART, *Wholesale price for fuel ethanol Q4 2018,* September 2018.

33 The implied range we have calculated assumes an ethanol blend in E10 between 9% and 10%, and includes domestic excise on ethanol, but excludes GST. It assumes fuel wholesaler margins of between 3 and 12 cents per litre of fuel, based on past estimates from the ACCC.

area of the chart) compare with the prices we have determined (the grey bars). This analysis suggests that the IPP methodology has provided scope for ethanol producers and fuel wholesalers to negotiate prices below our determined wholesale prices. It also suggests that domestic ethanol prices have risen since April 2018, and based on the top end of the range, may be approaching our determined wholesale prices.

This analysis provides a guide as to the relative difference between the domestic wholesale ethanol price and the IPP. However, market participants do not necessarily charge prices at the implied wholesale price ranges shown in Figure 3.1. Submissions on the Issues Paper indicated that wholesale prices remain below the IPP, suggesting that the implied prices we have estimated using TGPs may be above domestic wholesale prices. Manildra Group indicated that it continues to consistently price wholesale ethanol significantly below IPART's determined wholesale price.[34] Similarly, Bioenergy considers that wholesale ethanol producers will continue to negotiate with oil wholesalers below the determined wholesale prices.[35]

Figure 3.1 Wholesale ethanol prices determined by IPART vs implied by Sydney TGPs (AUc/litre)



Note: The range for the implied wholesale ethanol price assumes an ethanol blend in E10 between 9% and 10%, and includes domestic excise on ethanol, but excludes GST. It assumes fuel wholesaler margins of between 3 and 12 cents per litre of fuel, based on past estimates from ACCC. The range is smoothed using 7-day rolling averages.

Data source: Daily average Sydney TGPs for regular petrol and E10 from FuelTrac, August 2018, at http://www.fueltrac.com.au, accessed 31 August 2018; IPART calculations.

3.2.1 Higher oil and petrol prices are putting less downward pressure on wholesale ethanol prices

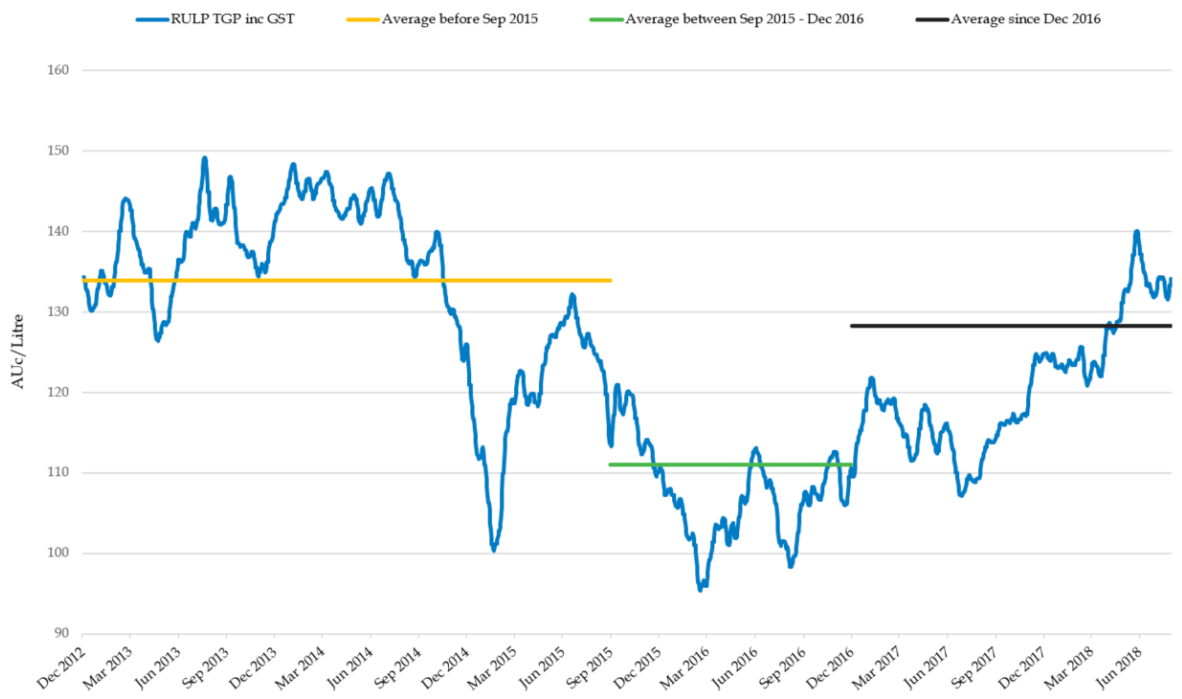
Where there is a high degree of choice in the retail fuel market, wholesale ethanol prices are constrained by the price of RULP because E10 competes with it. As a result, when petrol prices are low they put downward pressure on ethanol prices and when petrol prices are higher, this pressure is less.

34 Manildra Group submission, September 2018, p 2.
35 Bioenergy Australia submission, September 2018, p 3.

Stakeholders have a mixed view of the impact of petrol on ethanol prices. Bioenergy Australia submits that the oil price does not have an impact on the ethanol price as the majority of contracts for oil majors are for a one-year period.[36] However, Manildra Group strongly supports the view that where there is a high degree of choice in the retail fuel market, the price charged for wholesale ethanol is constrained by the price of non-ethanol petrol.[37]

Oil and petrol prices (measured by Terminal Gate Prices) have risen over the past year and are now well above the values discussed in our 2016-17 wholesale market monitoring reports (Figure 3.2). Consequently, there is less downward pressure being applied to wholesale ethanol prices from the fuel market.

Figure 3.2 Historical Sydney average TGPs for RULP



Data source: Daily average Sydney TGPs for regular petrol from FuelTrac (www.fueltrac.com.au); IPART calculations.

3.3 Outlook for competition in the wholesale ethanol market

Submissions to the Issues Paper from Manildra Group and Bioenergy Australia both indicated that there have been no significant changes in the level of competition in the wholesale ethanol market during 2017-18.[38] Bioenergy Australia also notes that the implementation of the ethanol mandate in Queensland has played a role in encouraging healthy competition in the wholesale ethanol market.[39]

36 Bioenergy Australia submission, September 2018, p 2.
37 Manildra Group submission, September 2018, p 2.
38 Manildra Group submission, September 2018, p 2; Bioenergy Australia submission, September 2018, p 3.
39 Bioenergy Australia submission, September 2018, p 2.

As in 2016-17, there were three major ethanol producers in Australia during 2017-18: Manildra Group (NSW), Dalby Bio-Refinery (Queensland), and Wilmar BioEthanol (Queensland). Their combined plant capacity is estimated to be around 450 ML per annum, with some of this capacity being used to produce non-fuel ethanol and some capacity remaining unutilised.[40] In July 2017, the Queensland government announced support for a 24ML expansion of the Dalby ethanol plant,[41] and for a new 55 ML ethanol plant in Atherton, North Queensland.[42]

A number of ethanol projects are planned for New South Wales and Queensland, with over 439ML of additional production capacity having received planning approval, an increase of 71ML compared to last year's projection.[43] This represents a doubling of current ethanol production capacity over the next five years, demonstrating that the threat of competitive entry remains.

A number of 'second generation ethanol' commercialisation projects have also been announced and progressed to constructing trial plants to demonstrate the commercial viability of their technology at scale.[44] These projects involve producing ethanol from feedstocks not linked to food supply,[45] or using novel processes with substantial projected reductions in production costs.[46] The submission from Bioenergy Australia noted that there are a number of new commercialisation projects up and running, including projects underpinned by ARENA and CEFC funding.[47]

3.3.1 The drought impact on the outlook for competition

On 13 June 2018, the NSW Government declared a drought in NSW.[48] Feedstock costs heavily influence the competitiveness of ethanol production, since feedstock make up between 40% and 70% of ethanol production costs, depending on the feedstock used.[49] The drought may put upward pressure on the market price of at least some feedstocks. For example ABARE has indicated that wheat production in NSW is forecast to fall by 46% in 2018–19 to around 3.9 million tonnes.[50] However, ethanol producers may have mitigated price risk by entering into longer term supply contracts.

40 APAC biofuel consultants, *Australian Biofuels 2018,* June 2018, p 23.
41 Ibid.
42 Queensland Government media release, *$60M FNQ biorefinery to create 130 jobs*, 10 July 2018, at http://statements.qld.gov.au/Statement/2017/7/10/60m-fnq-biorefinery-to-create-130-jobs, accessed on 31 August 2018.
43 APAC biofuel consultants, *Australian Biofuels 2017,* April 2017, p 13; APAC biofuel consultants, *Australian Biofuels 2017,* April 2017, p 23; APAC biofuel consultants, *Australian Biofuels 2018,* June 2018, pp 26-29; APAC Biofuels consultants, *Australian Biofuels 2018*, June 2018, p 26.
44 APAC biofuel consultants, *Australian Biofuels 2018,* June 2018, pp 58-59; ARENA, *Advanced Biofuels*, https://arena.gov.au/funding/programs/advanced-biofuels/, accessed 30 September 2018.
45 For example Microbiogen (QLD) - who is producing a strain of yeast enabling production of biofuel from non-fuel sources. https://arena.gov.au/blog/microbiogen/
46 For example Ausagave (NSW) - who is commercialising technology to convert agave to ethanol. Agave has a higher yield per acre than sugarcane, a conventional ethanol feedstock. www.ausagave.com.au/about/
47 Bioenergy Australia submission, September 2018, p 3.
48 NSW Government media release, *More than $584 million to help drought-affected farmers*, 13 June 2018 at https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0003/817824/More-than-$584-million-to-help-drought-affected-farmers.pdf, accessed on 9 October 2018.
49 APAC Biofuels consultants, *Australian Biofuels 2017,* April 2017, p 26.
50 http://agriculture.gov.au/abares/research-topics/agricultural-commodities/australian-crop-report/new-south-wales; assessed 9 October 2018.

While new entrant producers may be exposed to market prices for feedstock, many of the second generation commercialisation projects appear to be from alternative sources that may not be as impacted by the drought. As a result, we do not consider that at this stage the drought in NSW is likely to have a significant impact on the outlook for competition.

Draft finding

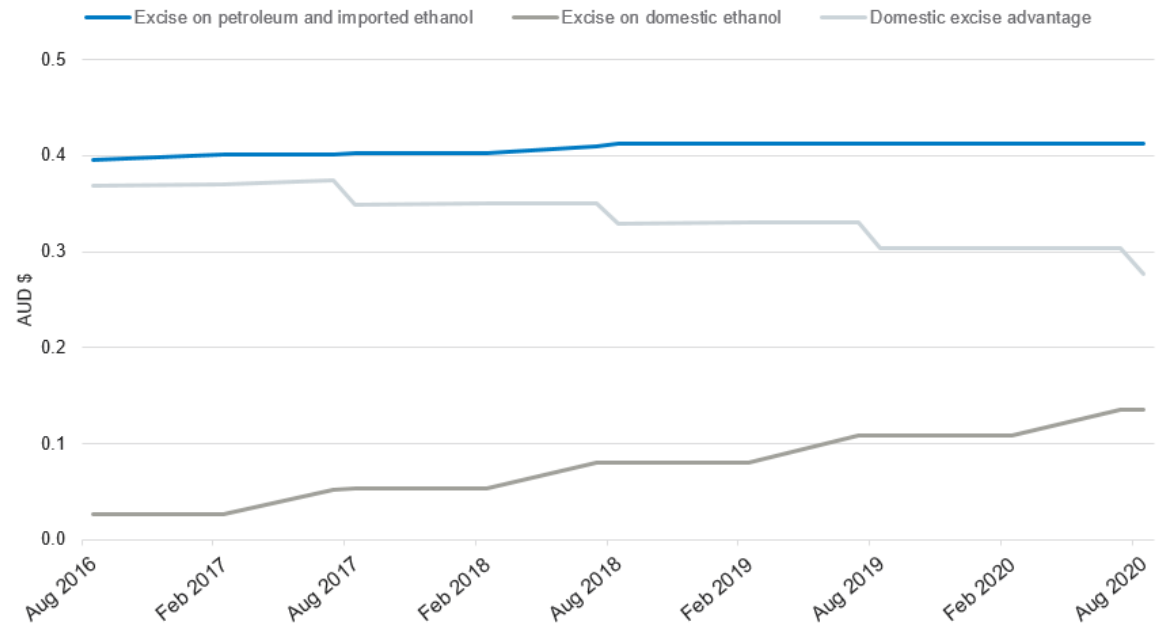
5 Competition between the three major ethanol producers continued during 2017-18, while plans for a number of additional ethanol production facilities have been progressing.

3.4 Changes to the domestic excise on ethanol

The domestic excise on ethanol increased at the beginning of the 2017-18 year, from the 2.63 cents per litre that had applied since 1 February 2017 to 5.26 cents per litre on 1 July 2017. It then increased slightly on 1 August 2017 to 5.28 cents per litre. Since the end of the 2017-18 financial year there have been another two increases in the excise value. As of 1 August 2018 the excise is 8.1 cents per litre.

The lower value of the domestic excise on ethanol relative to the excise on petroleum and imported ethanol has provided domestic ethanol with an advantage over petroleum and imported ethanol. The increase in the excise value has reduced this advantage in recent years, putting greater competitive pressure on domestic ethanol prices. Figure 3.3 shows how the domestic excise on ethanol, and the resulting excise advantage has changed over time.

Figure 3.3 Domestic ethanol excise and excise advantage



Data source: *Excise Tariff Act 1921*, section 6H(1); Department of Home Affairs, *Chapter 22 – Beverages, spirits and vinegar, at https://www.homeaffairs.gov.au/Busi/cargo-support-trade-and-goods/importing-goods/tariff-classification-of-goods/current-tariff-classification/schedule-3/section-iv/chapter-22#2207*, accessed on 10 October, 2018.

4 The extent of regulation required in the wholesale ethanol market

Under the Biofuels Act, IPART is required to determine a reasonable wholesale price for fuel ethanol.[51] This price forms part of the exemptions framework for the biofuels mandate.

We have previously developed a framework for assessing the level of price intervention required in the wholesale market for fuel ethanol and used it to inform our determination of the wholesale price.[52] The two key elements of the framework are the degree of consumer choice for retail fuel and the extent of competition in the wholesale ethanol market. Based on our application of this framework to date we have decided that a less intrusive approach to regulating the wholesale price is appropriate. However, as market conditions are liable to change over time we indicated that we would review this analysis each year to ensure that this approach continues to be suitable.

This Chapter applies our framework for assessing the level of pricing intervention required using the updated information and analysis set out in Chapters 2 and 3 of this report.

4.1 Overview of draft findings

We applied our framework for assessing the level of pricing intervention required in the wholesale ethanol market taking into account the retail and wholesale market information for 2017-18. We found that the less intrusive approach to regulation we have used in previous years remains appropriate.

While there have been developments in both retail and wholesale markets over the past year, we found that there have not been significant changes to either the degree of consumer choice in relation to fuel purchases (see Chapter 2) or the extent of competition in the wholesale market (see Chapter 3) that would warrant a move away from our current approach.

We propose to continue to determine wholesale ethanol prices using an import parity price (IPP) methodology.

4.2 The ethanol supply chain

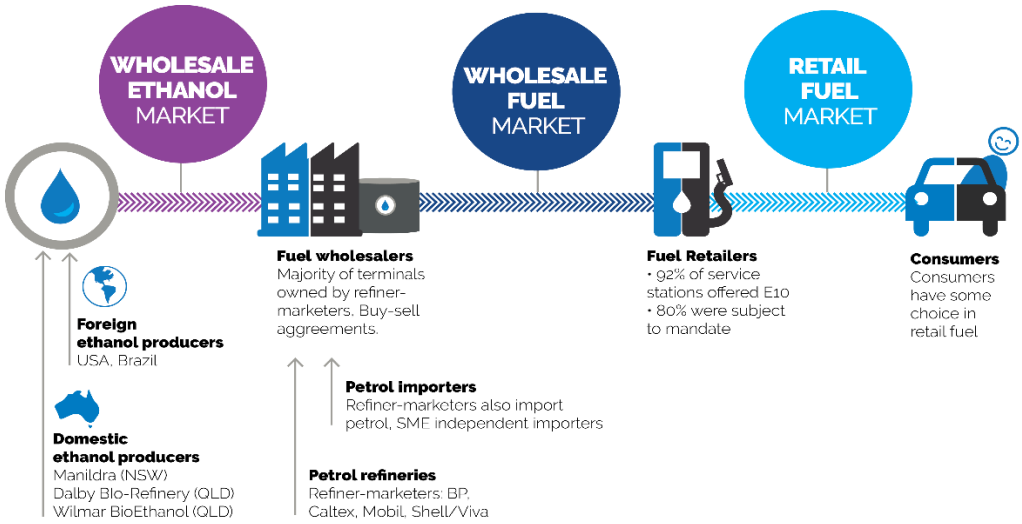
The Australian ethanol industry operates at three broad levels: production, distribution and retail. Ethanol is first distilled from feedstock to produce pure ethanol at the wholesale level, which is sold directly to downstream refiners or wholesalers who blend the ethanol with petrol.[53] This is then distributed to retail outlets to be sold as E10 or E85 varieties.

51 *Biofuels Act 2007* (NSW), s 17A.
52 IPART, *Final report on the review of a maximum price for wholesale ethanol in automotive fuel blends*, December 2016.
53 IBISWorld Industry Report, *Ethanol Fuel Production in Australia*, June 2018, p 13.

At the wholesale level, pure ethanol is produced by first sourcing feedstock. The feedstock is then transported to a production plant for distillation into pure ethanol. Each production plant process is specific to the type of feedstock used.[54] Therefore, feedstock types cannot be readily substituted with each other. Economies of scale applies, so that larger plants can produce ethanol at a lower cost per unit. Ethanol can be purchased either from domestic producers or from foreign ethanol producers. This wholesale ethanol is then sold directly to downstream manufacturers, or sold to wholesalers who arrange the blending through third-party contracts.[55]

Figure 4.1 summarises the markets involved in the supply of retail fuel including E10.

Figure 4.1 Markets involved in the supply of retail fuel, including E10



Source: IPART, *Monitoring of wholesale and retail markets for fuel ethanol 2016-17*, Final Report, December 2017, p 5, 7, 10, 14, 19; ACCC, *Petrol prices and Australian consumers: Report of the ACCC inquiry into the price of unleaded petrol*, December 2007, pp 4-8.

4.3 Framework to assess the need for price regulation for wholesale ethanol

In 2016 we established a framework to assess the need for price regulation for wholesale ethanol. The framework reflects that the markets for petrol and for wholesale ethanol are affected by fluctuating supply and demand conditions, as well as regulatory changes. Under this framework, the appropriate approach to determining the reasonable wholesale price, or whether any price regulation is needed at all, depends on two key factors – the degree of consumer choice in retail fuels and the extent of competition in the wholesale ethanol market.

To some extent these two factors are interdependent. Where consumers are free to purchase a range of fuels, for example, E10, RULP and PULP, then petrol is a substitute for fuel ethanol and the petroleum price imposes a market constraint on the price of wholesale ethanol. If consumer choice is restricted, the fuel price is less effective at constraining wholesale ethanol prices.

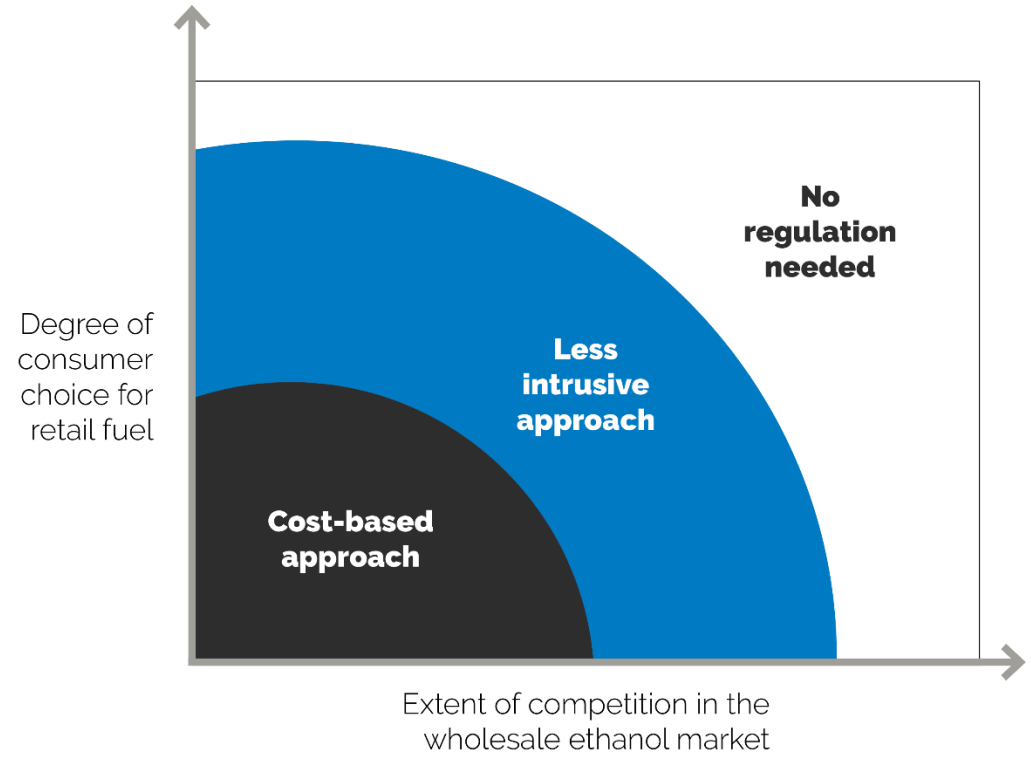
54 AECOM, *Efficient Costs of New Entrant Ethanol Producers*, December 2016, p 7.
55 IBISWorld Industry Report, *Ethanol Fuel Production in Australia*, June 2018, p 13.

Figure 4.2 shows how the framework takes into account these two factors to determine whether ethanol producers' market power is such that:

- cost-based price regulation is required (black shaded area)
- a less intrusive approach to price regulation is needed (blue shaded area)
- no price regulation is needed (white area).

It is not necessary to have both a high degree of consumer choice of retail fuel and a high degree of competition in the wholesale market for ethanol in order to be in the 'no regulation' area of the chart; it is sufficient to have one of these conditions apply. To date, we have found that consumers continue to have choice in retail fuels and that there is emerging competition in the wholesale market for ethanol. These factors suggest that a less intrusive approach to regulation is required. On that basis, we have adopted an IPP approach to determining wholesale ethanol prices.

Figure 4.2 Framework for recommended reasonable wholesale price of ethanol in NSW



4.4 A less intrusive approach to price regulation remains appropriate

We have reviewed the current market conditions identified in Chapters 2 and 3 and found that our current less-intrusive approach to determining the reasonable wholesale ethanol price remains appropriate. We consider that there have not been changes to either the degree of consumer choice in relation to fuel purchases or the extent of competition in the wholesale market over the past year that would mean that this approach is no longer appropriate.

Consumers continue to have choice of retail fuel, but due to the existence of the mandate, this choice is not unrestricted. As reported in Chapter 2, we found that availability of E10 has

become more widespread. Consumers continue to have choice in retail fuels with all fuel types remaining widely available and information to assist consumers to find their fuel of choice and compare retail prices readily accessible.

In the wholesale ethanol market, competition between the three major ethanol producers continued during 2017-18. As outlined in Chapter 3, plans for a number of new ethanol production facilities have been progressing. In addition, a number of trial ethanol plants which are commercialising new technologies have emerged.

As a result of these findings, we consider that market conditions continue to support adopting a 'less-intrusive' approach to determining the wholesale price. We note that submissions from Manildra Group and Bioenergy Australia also support this view.[56]

4.5 We will continue to determine the wholesale ethanol price using an IPP

We explained in our Issues Paper that we proposed to retain an IPP methodology[57] for determining the wholesale ethanol price if our findings on the level of pricing intervention required in the wholesale ethanol market suggest that a less intrusive approach to determining the price of wholesale ethanol remains appropriate.

We have chosen an IPP approach to minimise distortion of the wholesale ethanol market and allow competition to continue to develop. This approach provides scope for ethanol producers and fuel wholesalers to negotiate prices below our determine prices. We consider that our IPP approach remains appropriate given current market conditions.

Submissions from Manildra Group and Bioenergy Australia supported maintaining an IPP methodology.[58]

Draft finding

6 A less intrusive IPP approach to determining the reasonable wholesale ethanol price remains appropriate.

56 Manildra Group submission, September 2018, p 3; Bioenergy Australia submission, September 2018, p 3.
57 The IPP methodology has been applied since January 2017 to determine wholesale prices for ethanol on a quarterly basis.
58 Manildra Group submission, September 2018, p 3; Bioenergy Australia submission, September 2018, p 3.

5 The import parity price (IPP) methodology used to determine wholesale ethanol prices

In the previous Chapter we concluded that IPART will continue to use an import parity price (IPP) approach to determine prices for wholesale ethanol in 2019. In this Chapter we consider whether we should make any changes to our IPP methodology.

To date we have adopted an IPP methodology that includes the relevant fuel excise and customs duties. We considered that this approach would support the development of competition in the wholesale ethanol market. This means the wholesale price for ethanol is set in a way that reflects all options available to local purchasers of wholesale ethanol, such as importing ethanol from overseas. Our determined price therefore reflects the upper bound for what a local purchaser would be willing to pay for domestically produced ethanol.

5.1 Overview of draft findings and draft decision

We found that our current approach to estimating an IPP remains fit for purpose and that there are no substantial benefits of changing the approach. We considered a number of potential changes to this approach and evaluated them against a set of assessment principles (set out in Box 5.1).

We reviewed the source countries used in the IPP calculation and found that the US and Brazil remain the two most likely sources of ethanol imports. We also reviewed the method of calculating the international benchmark price for ethanol, including moving to an average of the Brazilian and US price rather than using the lowest price as put forward by submissions to the Issues Paper. Other changes we considered were purchasing information from a commercial providers to form part of the IPP calculation and making determinations six-monthly instead of quarterly. We do not propose to make any of these changes. As such, our draft decision is to continue to calculate a quarterly IPP using our current methodology.

5.2 The current IPP approach

As discussed in Chapter 4, for the past two years we have found that a less intrusive approach to determining wholesale ethanol prices is appropriate. Having considered several options, we chose an IPP methodology. The IPP methodology means that the wholesale price for ethanol is set in a way that reflects an option already available to local purchasers of wholesale ethanol, ie, importing ethanol from overseas. This price therefore reflects the upper bound for what a local purchaser would be willing to pay for domestically produced ethanol. We consider that this approach, which includes the relevant fuel excise and customs duties, would support the development of a competitive wholesale ethanol market.

Using an IPP methodology that includes the full excise and customs duties allows local competition in ethanol production to continue to develop and deliver increasingly

competitive prices over time. We expect producers and fuel wholesalers to continue to negotiate wholesale ethanol prices below our determined prices.

The IPP methodology IPART developed in 2016 is similar to the approach used by fuel importers and wholesalers to determine contract prices for petroleum. However, in contrast to the IPP methodologies used for petroleum pricing, which are estimated on a daily basis, we currently calculate the IPP on a quarterly basis.

Our IPP methodology is designed to reflect the price faced by fuel wholesalers for ethanol delivered to their terminals, rather than the price delivered to an import terminal. The components of the IPP are set out in Table 5.1. The two largest components of the IPP are mill-gate prices for ethanol and the Australian fuel excise. The exchange rate also has a significant effect on the estimated IPP.

Table 5.1 Components of IPART's current IPP methodology

IPP for wholesale ethanol (ex GST)	=	*International benchmark price for ethanol including costs of freight from the mill to port and export terminal charges*
	+	*Sea freight*
	+	*Insurance and loss*
	+	*Wharfage in Australia*
	+	*Landing costs in Australia (excise and import duties)*
	+	*Storage & handling at import terminal*
	+	*Freight from import terminal to wholesale fuel terminal*

Source: IPART, *Review of a maximum price for wholesale ethanol in automotive fuel blends*, Final Report, December 2016, p 34

Our IPP considers international benchmark prices for both the US and Brazil and includes the lowest of these two values in any given week.[59] Our December 2016 Final Report on the price for wholesale ethanol sets out the detailed IPP methodology we adopted as well as the reasons why we decided to take this approach to calculating each of the IPP components.[60]

5.3 Potential changes to our IPP approach

In this section we assess alternative approaches to determining an IPP based wholesale price and compare them to the current IPP approach using the assessment principles set out in Box 5.1. Using our existing approach as the starting point, we considered the following:

- Whether the US and Brazil remain the most likely source countries for ethanol imports
- Reconsidering the approach used to select the relevant price, specifically whether to use an average of two international benchmark prices or continue to use the lowest price
- Obtaining an IPP based in part on information from a commercial provider rather than estimating the benchmark price using publicly available information
- Moving to six-monthly determinations instead of quarterly determinations.

59 IPART, *Review of a maximum price for wholesale ethanol in automotive fuel blends, Final Report*, December 2016, p 36.

60 IPART, *Review of a maximum price for wholesale ethanol in automotive fuel blends, Final Report*, December 2016, pp 32-45.

We reviewed the potential benefits of these changes against the assessment principles. Our analysis and draft findings are set out below.

Box 5.1 IPART's assessment principles

The following assessment principles draw upon well-established regulatory theory and precedent in monitoring and setting prices, as well as the objectives in the *NSW Biofuels Act 2007*. We consider that consistency with these principles would help facilitate an efficient, transparent and sustainable approach to setting wholesale ethanol prices. We recognise that in practice there may be a trade-off between some of these principles. In response to the Issues Paper, the one submission we received that commented on the principles, from Manildra Group, was broadly supportive of them.[61]

IPART's draft decision is to apply the following principles for assessing alternative ways of estimating the wholesale price:

- be capable of responding to expected changes in the wholesale ethanol sector efficiently and effectively – in other words, the framework should be capable of meeting regulatory objectives under different future scenarios.
- be easy to understand and provide stakeholders with a sufficient level of certainty over future wholesale price regulation.
- not impose an overly onerous administrative burden, either for stakeholder businesses or IPART. The higher the cost of implementing the framework, the greater the likelihood that the cost will outweigh the expected benefits.
- provide transparency in determining the wholesale price components.
- promote consistency with regulatory precedent in monitoring and setting prices in other comparable industries IPART regulates (and frameworks applied by other regulators), where relevant.

Draft decision

1 IPART will continue to determine wholesale prices on a quarterly basis using our existing IPP methodology.

5.3.1 The US and Brazil remain the two most likely origins for imported ethanol

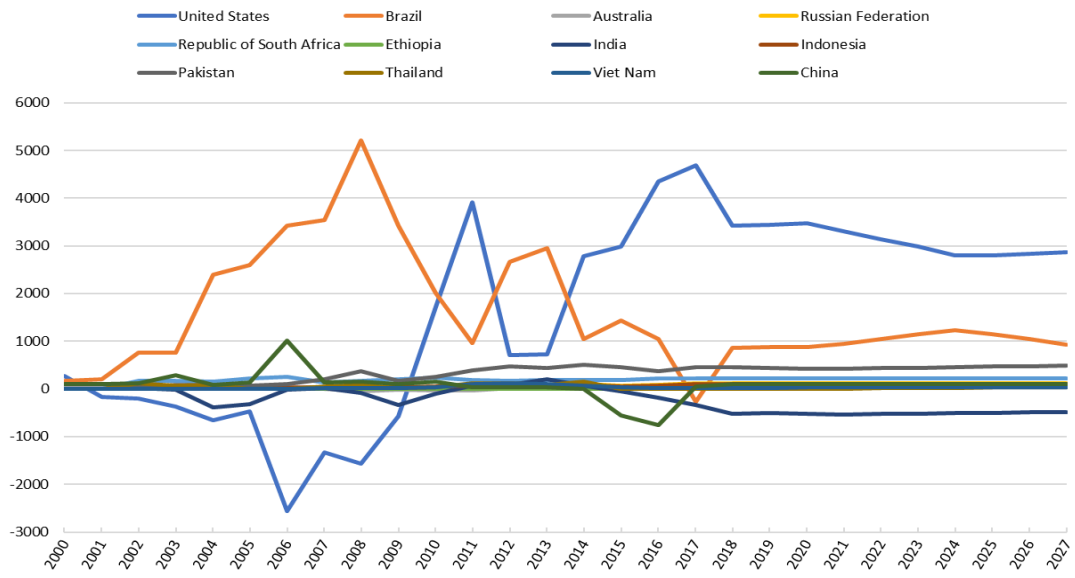
In our 2016 Final Report we noted that the international benchmark component for ethanol is the largest component of the IPP, and as such, it is important that it be based on a likely source market for ethanol to be imported into Australia and that the price information is robust and reliable.[62] At that time we considered that the US and Brazil were the most likely sources of ethanol imports for Australia.

We have reviewed whether the US and Brazil remain the appropriate sources to use in our IPP calculation. The OECD forecasts that the US and Brazil are likely to remain the two largest ethanol exporters for the foreseeable future (see Figure 5.1). As a result, we will continue to base our IPP on ethanol prices from the US and Brazil. Stakeholder submissions in response to the Issues Paper agree that these are the two most likely sources of imported ethanol into

61 Manildra Group submission, September 2018, p 2.
62 IPART, *Review of a maximum price for wholesale ethanol in automotive fuel blends*, *Final Report,* December 2016, p 35.

Australia.[63] The difference in the value of net exports between the US and Brazil has grown since the previous OECD Agricultural Outlook release, with US net exports forecast to be three times those of Brazil in 2026, compared to parity in the previous forecasts for 2026.[64]

Figure 5.1 Major ethanol exporting countries – historical and forecast net exports (ML)



Note: Includes only countries with historical or forecast net ethanol exports greater than 50ML in any year from 2014 through 2027. Figures for 2017 and 2018 are estimates, and figures from 2019 onward are forecasts.

Source: OECD (2018), *Agricultural Outlook 2018-2027: OECD-FAO Agricultural Outlook 1990-2028*, at https://stats.oecd.org/Index.aspx?datasetcode=HIGH_AGLINK_2018, accessed on 2 August 2018.

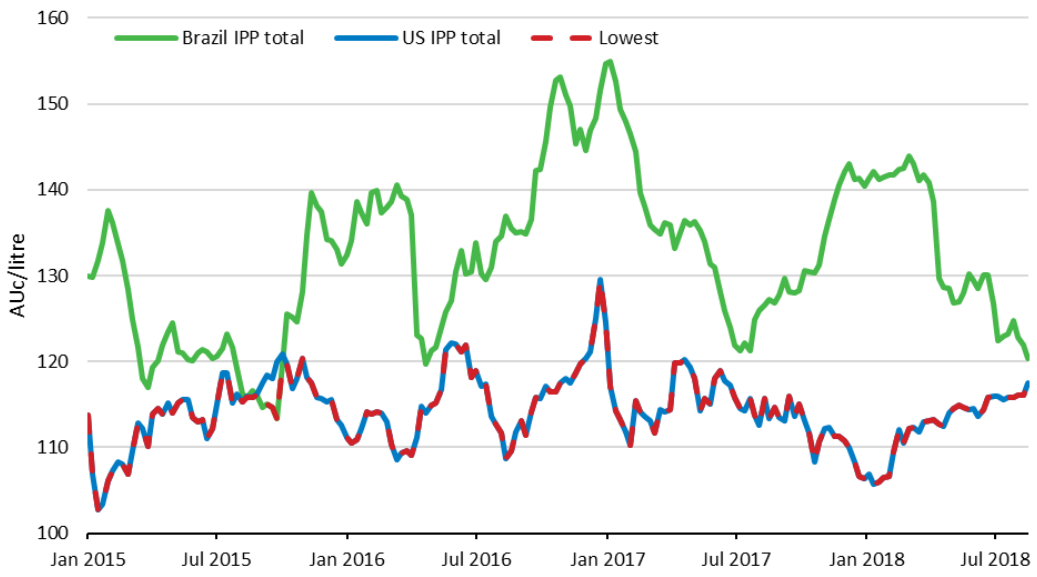
5.3.2 We should continue to base our calculation on the lower of the US and Brazil prices in each week

While we have decided to base the international benchmark price on the US and Brazil as the most likely sources of ethanol imports, we use a combination of these by taking the lowest priced ethanol source at any given time. Our draft decision is to continue to do this by calculating the ethanol IPP based on the lower of US and Brazilian ethanol prices in each relevant week.

Figure 5.2 shows our estimated weekly IPPs for the US and Brazil since January 2015, and the red dotted line shows the lower of the two in each week, which are the prices that we used in our quarterly determinations of wholesale ethanol prices. It shows that US ethanol prices have consistently been the lower prices in this period, except for a brief period around August and September 2015.

63 Manildra Group submission, September 2018, p 3; Bioenergy Australia submission, September 2018, p 4.
64 See Figure 4.2 of IPART, *Monitoring of Wholesale and Retail markets for Fuel Ethanol 2016-17,* Final Report, December 2017, p 19.

Figure 5.2 Weekly estimates of US and Brazilian IPPs (AUc/litre)



Note: IPART IPP model, on www.ipart.nsw.gov.au

In response to the Issues Paper two stakeholders submitted that the IPP calculation should use the average of US and Brazilian ethanol prices instead of the lowest price. Bioenergy Australia submitted that there are limitations with estimating an implied IPP from a spot ethanol mill-gate price and that these limitations suggest that an average of the US and Brazilian prices would be more appropriate than using the lowest price.[65] Similarly, Manildra Group submits that the average of the two prices should be used, noting that the data collected by IPART suggests US ethanol has been significantly cheaper than Brazilian sourced ethanol in recent years.[66] Further, Manildra Group notes that the volume of US net exports has not increased, while Brazilian exports have.[67]

Using the lowest price at any given time reflects that importers have a choice in relation to where they source their ethanol. We remain of the view that a prospective ethanol importer would choose to import from either the US or Brazil, whichever had the lower prices at the time. As a result, we consider using an average price would systematically overstate the cost of importing ethanol. We note also that US ethanol exports have been significantly higher than Brazilian exports for many years now (see Figure 5.1).

5.3.3 We should continue to use publicly available sources rather than obtain prices from a commercial provider

In our 2016-17 market monitoring Final Report, we indicated that we would consider whether IPART should obtain an IPP based in part on commercially provided information, such as data obtained from Oil Price Information Services (OPIS) and Platts (part of S&P Global).

65 Bioenergy Australia submission, September 2018, p 4.
66 Manildra Group submission, September 2018, pp 37-38.
67 Ibid.

The main advantage of adopting one of these services is to reduce the administrative costs of building up the IPP from component elements. However, while these services are able to provide IPPs for Australian petrol markets, they currently do not offer a complete supply chain IPP for importing ethanol to Australia. Using a commercial provider to obtain the FOB price would avoid the need to obtain mill prices, local freight and port costs (whose sum is the FOB price). All other components would still need to be sourced independently. This means that they would only reduce administrative costs to a small degree compared with the current approach.

The main disadvantage of using data from a commercial provider is that the resulting IPP is less transparent.

Stakeholder views on purchasing part of the IPP inputs from a commercial provider were mixed. Manildra Group supports investigating the use of commercial providers.[68] Manildra Group notes that US exports have not materially increased in recent years despite our IPP analysis showing that US ethanol has a significant price advantage over Brazilian ethanol.[69] Bioenergy Australia strongly recommends continuing to source all inputs independently rather than move to a commercial provider.[70]

In our 2016 Final Report, which established the methodology for determining the wholesale ethanol price, we compared our estimated FOB prices, using publicly available data from ESALQ and USDA, with free on board (FOB) prices from Platts for these countries. We found that the two sets of prices were closely aligned.[71] For US FOB prices, we noted that the publicly available USDA estimates were on average 5 cents per litre higher than the FOB prices from Platts.[72] This means that, for periods when the US ethanol prices are lowest, as they have been for most of the period we have been determining wholesale prices, our current approach could be expected to yield a slightly higher IPP than using FOB prices from a paid subscription service.[73]

We consider that there is likely to be limited advantage to moving to a commercially provided service and that our current approach better meets the principles in Box 5.1.

5.3.4 We will continue to make quarterly wholesale price determinations

We currently determine the wholesale ethanol price every quarter based on weekly IPPs. At the time we developed this approach we noted that the available data enabled more frequent determinations.[74] We initially proposed four-weekly IPP determinations but noted that there was significant stakeholder support for quarterly determinations, with ethanol buyers and sellers both supporting this approach.[75]

68 Manildra Group submission, September 2018, p 3.
69 Manildra Group submission, September 2018, p 3.
70 Bioenergy Australia submission, September 2018, p 4.
71 IPART, *Review of a maximum price for wholesale ethanol in automotive fuel blends*, *Final Report*, December 2016, p 37.
72 Ibid.
73 Ibid.
74 Ibid at p 39.
75 Ibid.

Selecting an appropriate timeframe for IPP determinations is about providing balance between the certainty and stability provided by a longer timeframe and the accuracy and responsiveness provided by more frequent determinations. In the Issues Paper we indicated that we would consider moving to a longer, six monthly, determination period. We have assessed a potential move to longer determination periods against the criteria in Box 5.1.

Both quarterly and six-monthly determinations are easy to understand and provide stakeholders with certainty over future wholesale price regulation. Both approaches are also consistent with the exemptions framework in the Biofuels Act as they align with exemption periods, which are quarterly. There are administrative advantages from making less frequent determinations, both for IPART and for industry participants.

One of the assessment principles we have identified is that our approach should be capable of responding to expected changes in the wholesale ethanol sector efficiently and effectively. As the determined prices have been relatively stable and domestic producers continue to price ethanol below the IPP, we consider that moving to a six monthly IPP would not substantially reduce the effectiveness or responsiveness of the approach. However, in response to our Issues Paper Manildra Group submitted that fuel prices in Australian dollar terms can be quite volatile and that a quarterly averaging period more closely reflects wholesale ethanol prices.[76]

As there is not currently stakeholder support for moving to a longer determination period, we do not propose to change the timing of the wholesale price determinations at this stage.

5.4 Updated inputs for the 2019 IPP calculation

In our 2016 Final Report, we decided that we would update certain components of the IPP every quarter, and other components annually, or as required.[77] We indicated that we would update the following components on an annual basis, and did this as part of our Final Report on market monitoring last year:[78]

- Origin country freight costs
- Origin country port costs
- Sea freight
- Conversion factor

We will obtain updated data for these components and include them in our Final Report, to be completed in December 2018. We will use the same data sources as used previously (listed in Table 5.2).

We will also consider whether to update insurance and loss, storage and handling costs at Australian Import terminal and transport costs from port to fuel terminal as part of this year's review.

76 Manildra Group submission, September 2018, p 3.
77 IPART, *Review of a maximum Price for wholesale ethanol in automotive fuel blends, Final Report*, December 2016, p 12.
78 IPART, *Ethanol market monitoring 2017: Final Report,* December 2017, pp 20-21.

Table 5.2 Source of IPP components and update frequency

IPP Component		Data sources		Update frequency
		Brazilian ethanol	***US ethanol***	
'Free On Board' (FOB) price	International benchmark price	University of Sao Paulo College of Agriculture (ESALQ) ethanol price index	US Department of Agriculture (USDA) national daily ethanol report	ESALQ: Weekly USDA: "Daily"
	Freight from mill-gate to export port in origin country	University of Sao Paulo ESALQ research unit into agro-industrial logistics	USDA Agricultural Marketing Service transport research and analysis datasets.	Annual
	Origin country port costs	University of Sao Paulo ESALQ research unit into agro-industrial logistics	Port of Houston Authority Tariff schedule for chemical exports	Annual
Sea freight from origin country to Australia		ICIS Market Intelligence sea freight rates from Brazil to Asia Pacific	ICIS Market Intelligence sea freight rates from the US to Asia Pacific	Annual
Insurance and loss		Quotes from sea freight insurance brokers		Annual (if required)
Australian wharfage (Botany)		Pricing information published by NSW Ports		Annual
Australian landing costs (taxes)		Australian customs tariff rates for fuel ethanol imports		Half Yearly
Storage and handling at Australian import terminal		Estimate by IPART based on confidential information		If required
Transport costs from port to fuel terminal		Estimate by IPART based on confidential information		If required

Appendices

A IPP methodology for determining the price of wholesale ethanol in 2018

This appendix sets out the methodology considered to calculate the reasonable price for wholesale ethanol in each quarterly pricing period in 2019. The first pricing period will commence on 1 January 2019.

A.1 Step 1: Calculating weekly IPPs for US and Brazilian ethanol

The first step in calculating the reasonable price for wholesale ethanol is calculating weekly IPPs for US and Brazilian ethanol for nine months up to one month prior to the commencement of the pricing period. This is illustrated in Figure A.1, which shows that for the pricing period commencing at Month 1, the averaging period for weekly IPPs covers Month -9 through Month -1. Weekly IPPs need to be calculated for every week for which the Friday of that week is within the averaging period. The averaging period will typically include around 39 weeks of weekly IPPs.

Table A.1 sets out volume and mass conversion factors required. Tables A.2 through A.4 describe how the weekly IPPs are calculated for US and Brazilian ethanol. These weekly IPPs include relevant fuel excise and customs duties, but exclude GST.

Table A.1 Conversion factors

Parameter	Definition	Unit
Ethanol kg per litre at 20°C	1 litre = 0.7848 kg	kg per litre
Gallon to litre conversion factor	1 gallon = 3.78541 litres	Litres per gallon

Figure A.1 Pricing periods and corresponding averaging periods for weekly IPPs

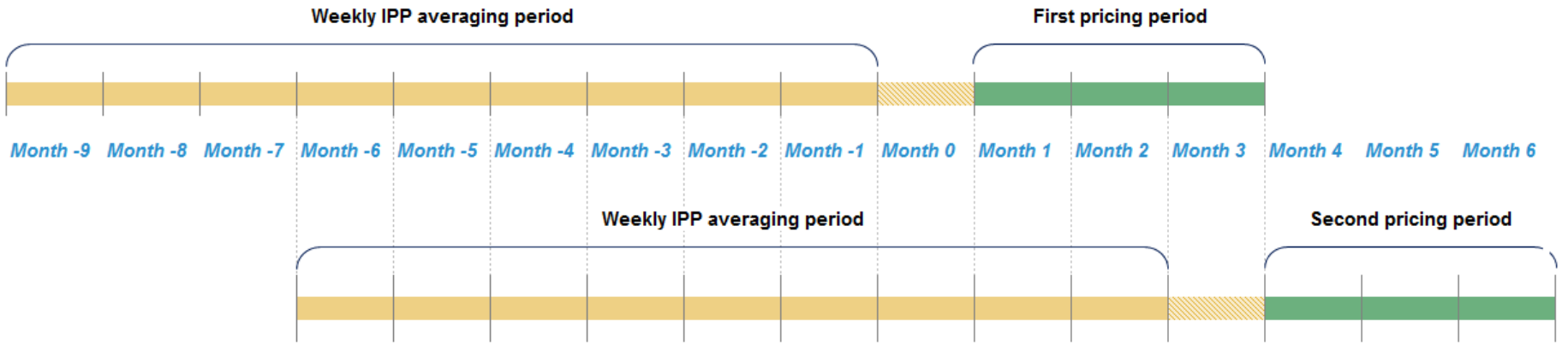


Table A.2 Parameters common to the calculation of weekly IPPs for US ethanol and Brazilian ethanol

Parameter	Definition	Unit
$Ex^{AUD/USD}$	Daily AUD/USD (A$1=USD) exchange rate as published by the Reserve Bank of Australia (RBA) at http://www.rba.gov.au/statistics/historical-data.html#exchange-rates	AUD/USD
$Ex^{USD/BRL}$	Daily USD/BRL (US$1=BRL) exchange rates as published by the US Federal Reserve at https://www.federalreserve.gov/releases/h10/hist/dat00_bz.htm	USD/BRL
$Ex^{AUD/USD}_{Week\ t}$	Arithmetic mean of $Ex^{AUD/USD}$ for Monday through Friday in *week t*	AUD/USD
$Ex^{AUD/BRL}_{Week\ t}$	Arithmetic mean of $(Ex^{AUD/USD} \times Ex^{USD/BRL})$ for Monday through Friday in *week t*	AUD/BRL
$C^{AUD}_{Wharfage,Week\ t}$	Wharfage charges at Australian import terminal in *week t*, based on ex-GST bulk liquids tariffs at Port Botany, published at https://www.nswports.com.au/resources/port-charges/ For the pricing period commencing 1 January 2019, the relevant wharfage charges for the weekly IPP calculations are: ▼ 1 July 2017 to 30 June 2018: AUD 2.53/tonne ▼ 1 July 2018 to 30 June 2019: AUD 2.58/tonne For the purpose of our methodology, these amounts are converted to AUD/litre. Wharfage charges in the calculation of weekly IPPs from 1 July 2019 will reflect updates to Port Botany's bulk liquids tariffs.	AUD/litre
$C^{AUD}_{S\&H}$	Cost of storage and handling at import terminal, assumed constant at AUD 0.03/litre	AUD/litre
$C^{AUD}_{Freight\ Australia}$	Cost of freight from import terminal to fuel wholesaler's terminal, assumed constant at AUD 0.015/litre	AUD/litre
$T^{AUD}_{Excise,Week\ t}$	Fuel excise tariffs applicable to imported ethanol in *week t*, as published by the ATO at https://www.ato.gov.au/business/excise-and-excise-equivalent-goods/fuel-excise/excise-rates-for-fuel/ For the pricing period commencing 1 January 2019, the relevant excise tariff for the weekly IPP calculations are: ▼ 1 February 2018 to 31 July 2018: AUD 0.409/litre ▼ 1 August 2018 to 31 January 2019: AUD 0.412/litre Excise tariffs in the calculation of weekly IPPs from 1 February 2019 will reflect updates to the excise tariffs published by the ATO.	AUD/litre

Table A.3 Calculation of weekly US IPPs

Parameters	Definition	Unit
$P^{USD}_{USDA,Week\ t}$	Price of wholesale ethanol at the mill gate in the US in *week t*. The USDA publishes end-of-week (EOW) low/high spot bids for wholesale ethanol at the mill-gate for seven major ethanol producing regions. Bids are presented in USD/gallon, and are converted to USD/litre. For each week, $P^{USD}_{USDA,Week\ t}$ is calculated as the median of the mid-points of the EOW bids in each of the seven regions (where available). Occasionally, the USDA does not publish the EOW bids. In those cases, we will seek daily price information directly from USDA, and use the latest of the bids obtained for the relevant week. Each $P^{USD}_{USDA,Week\ t}$ used in the calculation of the IPP will be published in the IPP model on our website www.ipart.nsw.gov.au. In the case that we do not obtain the necessary prices for the relevant week, we will use the last price previously available.	USD/litre
$P^{AUD}_{USDA,Week\ t}$	$P^{USD}_{USDA,Week\ t}$ converted from USD to AUD	AUD/litre
$C^{USD}_{US\ Freight}$	Sum of the costs of transporting the ethanol from the mill-gate in the US to Houston Port, plus any port and handling costs at Houston Port. ▼ US freight costs assumed to be constant at 0.0561 USD per litre for 2018 ▼ Houston port costs assumed to be constant at 0.0250 USD per litre for 2018	USD/litre
$C^{AUD}_{US\ Freight,Week\ t}$	$C^{USD}_{US\ Freight}$ converted from USD to AUD in *week t*	AUD/litre
$FOB^{AUD}_{US,Week\ t}$	Estimated price of the ethanol delivered 'Free-On-Board' (FOB) the vessel at Houston port in *week t*, calculated as $FOB^{AUD}_{US,Week\ t} = P^{AUD}_{USDA,Week\ t} + C^{AUD}_{US\ Freight,Week\ t}$	AUD/litre
$C^{USD}_{US\ Sea\ freight}$	Cost of sea freight from US to Australia. Assumed constant at 81.43 USD per tonne for 2018, converted to USD/litre	USD/litre
$C^{AUD}_{US\ Sea\ freight,Week\ t}$	$C^{USD}_{US\ Sea\ freight}$ converted from USD to AUD in *week t*	AUD/litre
$C^{AUD}_{US\ Insurance,Week\ t}$	Insurance of ethanol in transit from the US to Australia in *week t*, calculated as: $C^{AUD}_{US\ Insurance,Week\ t} = 0.4\% \times \left(FOB^{AUD}_{US,Week\ t} + C^{AUD}_{US\ Sea\ freight,Week\ t}\right)$	AUD/litre

Parameters	Definition	Unit
$C^{AUD}_{US\ Import\ ex\ tax,Week\ t}$	Total costs associated with the shipping of ethanol from the US to fuel wholesaler's terminal in NSW in *week t*, excluding taxes. Calculated as: $$C^{AUD}_{US\ Import\ ex\ tax,Week\ t} = C^{AUD}_{US\ Sea\ freight,Week\ t} + C^{AUD}_{US\ Insurance,Week\ t} + C^{AUD}_{Wharfage,Week\ t} + C^{AUD}_{S\&H} + C^{AUD}_{Freight\ Australia}$$	AUD/litre
$T^{AUD}_{US\ Customs\ duty,Week\ t}$	As of August 2018, customs duty on ethanol imported from the US was nil, as set out in the Australia – United States Free Trade Agreement (FTA), found here: http://dfat.gov.au/trade/agreements/ausfta/pages/australia-united-states-fta.aspx The customs duty for US ethanol is thus calculated as: $$T^{AUD}_{US\ Customs\ duty,Week\ t} = 0.0\% \times FOB^{AUD}_{US,Week\ t}$$ If relevant changes are made to the FTA, the changes will be reflected in the calculation of weekly US IPPs for the subsequent pricing period.	AUD/litre
$T^{AUD}_{US\ Total,Week\ t}$	Total import taxes on US ethanol in *week t*, calculated as: $$T^{AUD}_{US\ Total,Week\ t} = T^{AUD}_{US\ Customs\ duty,Week\ t} + T^{AUD}_{Excise,Week\ t}$$	AUD/litre
$IPP^{AUD}_{US,Week\ t}$	Total IPP for US ethanol in week t, calculated as: $$IPP^{AUD}_{US,Week\ t} = FOB^{AUD}_{US,Week\ t} + C^{AUD}_{US\ Import\ ex\ tax,Week\ t} + T^{AUD}_{US\ Total,Week\ t}$$	AUD/litre

Table A.4 Calculation of weekly Brazilian IPPs

Parameters	Definition	Unit
$P^{USD}_{ESALQ,Week\ t}$	Price of wholesale ethanol at the mill gate in São Paulo, Brazil in *week t*. The Centre of Advanced Studies on Applied Economics (CEPEA) at the "Luiz de Queiroz" College of Agriculture (ESALQ) at the University of São Paulo publishes weekly volume-weighted average spot prices for wholesale anhydrous ethanol at the mill-gate for ethanol producers in São Paulo. This publication is referred to as the CEPA/ESALQ Anhydrous Ethanol Index - São Paulo (ESALQ index), and is published at: http://www.cepea.esalq.usp.br/en/indicator/ethanol.aspx The index is published in USD per litre.	USD/litre
$P^{AUD}_{ESALQ,Week\ t}$	$P^{USD}_{ESALQ,Week\ t}$ converted from USD to AUD in *week t*	AUD/litre
$C^{BRL}_{BR\ Freight}$	Sum of the costs of transporting the ethanol from the mill-gate in São Paulo to Santos Port, plus any port and handling costs at Santos Port.	BRL/litre

Parameters	Definition	Unit
	▼ São Paulo freight costs assumed to be constant at 0.10 BRL per litre ▼ Santos port costs assumed to be constant at 0.10 BRL per litre	
$C^{AUD}_{BR\ Freight,Week\ t}$	$C^{BRL}_{BR\ Freight}$ converted from USD to AUD in *week t*	AUD/litre
$FOB^{AUD}_{BR,Week\ t}$	Estimated price of the ethanol delivered 'Free-On-Board' (FOB) the vessel at Santos port in *week t*, calculated as $FOB^{AUD}_{BR,Week\ t} = P^{AUD}_{ESALQ,Week\ t} + C^{AUD}_{BR\ Freight,Week\ t}$	AUD/litre
$C^{USD}_{BR\ Sea\ freight}$	Cost of sea freight from Brazil to Australia. Assumed constant at 87.50 USD per tonne for 2018, converted to USD/litre	USD/litre
$C^{AUD}_{BR\ Sea\ freight,Week\ t}$	$C^{USD}_{BR\ Sea\ freight}$ converted from USD to AUD in *week t*	AUD/litre
$C^{AUD}_{BR\ Insurance,Week\ t}$	Insurance of ethanol in transit from Brazil to Australia in *week t*, calculated as: $C^{AUD}_{BR\ Insurance,Week\ t} = 0.4\% \times \left(FOB^{AUD}_{BR,Week\ t} + C^{AUD}_{BR\ Sea\ freight}\right)$	AUD/litre
$C^{AUD}_{BR\ Import\ ex\ tax,Week\ t}$	Total costs associated with the shipping of ethanol from Brazil to fuel wholesaler's terminal in NSW in *week t*, excluding taxes. Calculated as: $C^{AUD}_{BR\ Import\ ex\ tax,Week\ t} = C^{AUD}_{BR\ Sea\ freight} + C^{AUD}_{BR\ Insurance,Week\ t} + C^{AUD}_{Wharfage,Week\ t} + C^{AUD}_{S\&H} + C^{AUD}_{Freight\ Australia}$	AUD/litre
$T^{AUD}_{BR\ Customs\ duty,Week\ t}$	As of August 2018, customs duty on ethanol imported from Brazil was 4.0%, as specified in Schedule 3 to the Customs Tariff Act 1995 – Item 2207.20.10. The customs duty for Brazilian ethanol is thus calculated as: $T^{AUD}_{BR\ Customs\ duty,Week\ t} = 4.0\% \times FOB^{AUD}_{BR,Week\ t}$ If relevant changes are made to the customs duty that applies to ethanol imported from Brazil, the changes will be reflected in the calculation of weekly Brazilian IPPs for the subsequent pricing period.	AUD/litre
$T^{AUD}_{BR\ Total,Week\ t}$	Total import taxes on Brazilian ethanol in *week t*, calculated as: $T^{AUD}_{BR\ Total,Week\ t} = T^{AUD}_{BR\ Customs\ duty,Week\ t} + T^{AUD}_{Excise,Week\ t}$	AUD/litre
$IPP^{AUD}_{BR,Week\ t}$	Total IPP for Brazilian ethanol in week t, calculated as: $IPP^{AUD}_{Brazil,Week\ t} = FOB^{AUD}_{BR,Week\ t} + C^{AUD}_{BR,Import\ ex\ tax,Week\ t} +$	AUD/litre

Parameters	Definition	Unit
	$T^{AUD}_{BR\ Total,Week\ t}$	

A.2 Step 2: Calculating the price for wholesale ethanol

After weekly IPPs for US and Brazilian ethanol have been calculated for all relevant weeks in the averaging period, they are combined to produce the price for wholesale ethanol. Let t represent the week-number of a given week in an averaging period, so Week 1 is the first week in the averaging period, etc.

The reasonable price for wholesale ethanol is calculated as follows:

$$Reasonable\ price\ for\ wholesale\ ethanol =$$

$$\frac{1}{n}\sum_{t=1}^{n} MIN\{IPP^{AUD}_{US,Week\ t}, IPP^{AUD}_{BR,Week\ t}\}$$

Where:

$Week\ 1$ = the first week ending on a Friday within the averaging period

n = the number of Fridays in the averaging period

Table A.5 sets out the averaging periods and corresponding week numbers for the pricing periods in 2019.

Table A.5 Averaging periods and week numbers

Pricing period	Week 1 is the week ending on the following Friday	Week n is the week ending on the following Friday	Number of Fridays in period, n
2019 Q1	1 March 2018	30 November 2018	39
2019 Q2	1 June 2018	28 February 2019	38
2019 Q3	1 September 2018	31 May 2019	38
2019 Q4	1 December 2018	31 August 2019	39

B Methodology to calculate average retail prices

We calculated annual and weekly average prices by fuel type, using FuelCheck data for the period August 2016 to June 2018 available on the NSW Government Open Data Portal.[79] We used the following methodology:

1. Reviewed and cleaned the data for outliers and other issues.
2. Created a time-series of half-hourly prices for each fuel type and each service station, where each price was carried forward up to 36 hours unless there was an earlier price change.
3. For sites that sold both regular petrol and E10, we also calculated the half-hourly difference in price between regular petrol and E10.
4. Adjusted Broken Hill prices by half an hour to allow for the fact that Broken Hill uses the same times as South Australia.
5. Calculated the average price for each fuel type in each half hour for all of NSW, and the regular petrol – E10 price gap, by averaging the corresponding half-hourly site prices across all sites in NSW.
6. Calculated average prices for NSW for each financial year for each fuel type, as well as the average price gap between regular petrol and E10 by financial year, by averaging the corresponding half-hourly NSW prices across all half hours in the financial year.
7. For Figures 2.3 and 2.4, we calculated weekly average prices across NSW for each fuel type, and the weekly price gap between regular petrol and E10, by averaging the corresponding half-hourly NSW prices across the half hours in each week.

79 *NSW Government Open Data Portal – Datasets – FuelCheck*, at https://data.nsw.gov.au/data/dataset/fuel-check accessed between 26 July and 22 August 2018.