CEG COMPETITION ECONOMISTS GROUP

Reply to Mr Houston's (and QCoal Users) 21 October 2025 further reports

Criterion b

7 November 2025

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1 Purpose

1. We have been engaged by Gilbert and Tobin acting for the North Queensland Export Terminal (NQXT) in relation to the proposed declaration of the terminal under the Queensland Competition Authority Act. We have provided:

   a. a report dated 26 August 2025 that provided our opinions of whether the coal handing services provided by NQXT satisfy Criterion b of the declaration criteria (**First CEG Report**); and

   b. a supplementary report dated 21 October 2025 addressing certain new information provided in a submission from Aurizon Network.

2. A further report of Mr Greg Houston was submitted on behalf of the QCoal Users on 21 October 2025 (**Further Houston Report**). The Further Houston Report includes certain criticisms of the approach to market definition set out in the First CEG Report. In particular:

   a. Mr Houston claims that our approach results in an 'artificially high' estimate of demand, because it ignores an important determinant of customers' maximum willingness-to-pay, being the cost of the next best alternative; and

   b. Mr Houston claims that our approach is unorthodox and fails to properly apply the Hotelling framework.

3. This further supplementary report addresses these criticisms. In doing so, we explain the difference between Mr Houston's and CEG's approach to market definition using the exhibits provided in the Further Houston Report.

4. The two key exhibits are Figures 3.1 and 3.2. Mr Houston's presentation and discussion of these two figures make clear that Mr Houston's approach to "market definition" is to define the demand for a single firm based on the prices offered by other firms. That is, Mr Houston's approach is not, in fact, a methodology for defining a market but is, rather, an approach to define firm level demand within a market.

5. Mr Houston's approach if applied to firms operating in highly competitive settings[1] would define the demand for each firm within the market to be the market demand, and conclude that all firms satisfy criterion b. For example, if Mr Houston's approach was applied to restaurants operating along the high street, he would define market demand for each restaurant to be the firm's demand from those patrons that have strong preferences for that restaurant. These preferences might be due to the location of the restaurant or the cuisine served, but for the set of customers that have strong preferences for a particular restaurant, that restaurant is "least cost" for them.

6. In contrast the CEG approach is to define the total market demand as including demand for an individual firm's services *and any alternative or substitute services*. In order to assess this total market demand, we ask what demand would be faced by the firm, or restaurant, on the basis that the other firms, restaurants, were closed. This approach correctly defines a market in order to assess

[1] With the exception of perfect competition between firms – i.e., each firm supplies a product that is a perfect substitute for all other firm's products.

whether that firm, or restaurant, is least cost to serve demand from customers that would consider it an economically viable alternative.

7. The CEG method is therefore an appropriate and orthodox method for estimating the total market demand for the purposes of criterion b.

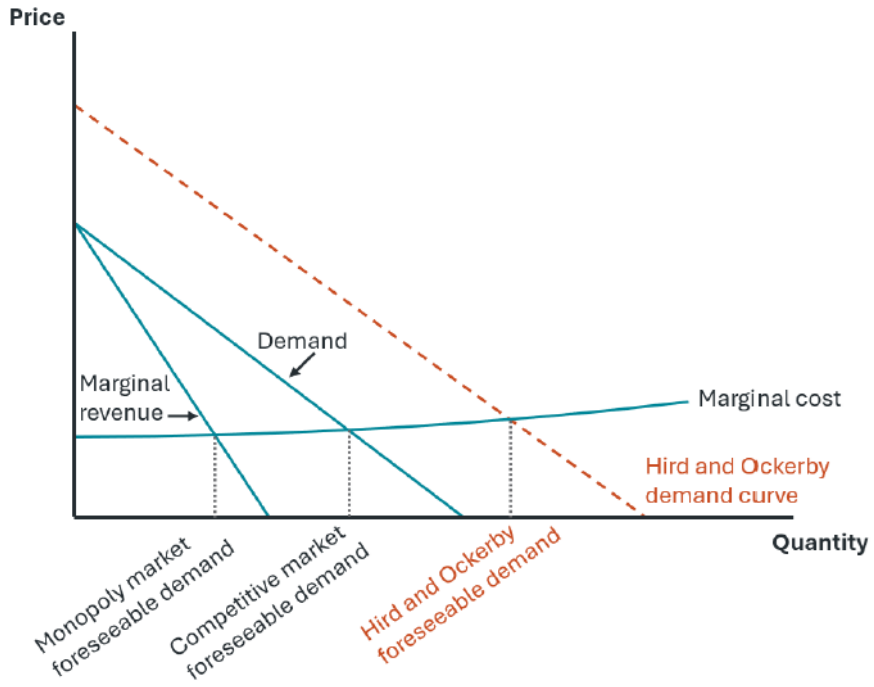
2 Mr Houston's criticism of CEG for including sales to the next best competitor

2.1 Mr Houston's Figure 3.1

8. The following are relevant extracts from Mr Houston's report (emphasis added):

> *87. In economic terms, demand for a service reflects each customer's maximum willingness-to-pay for that service, which is itself a function of the next best alternative option available. More specifically, a business customer's maximum willingness-to-pay for a service is the lesser of:*
>
> *a. the total returns they expect to derive from a transaction; and*
>
> ***b. the cost of the next best alternative option available to them.***
>
> *88. By way of example, the demand for transporting coal by road will be a function of the expected cost of instead transporting coal by rail, if that is the next best alternative.*
>
> *89. By defining a market on the assumption that there are no alternatives to the NQXT service, the Hird and Ockerby report proceeds to estimate foreseeable demand that:*
>
> *a.* ***ignores an essential determinant of customers' maximum willingness-to-pay – and, therefore, the level of demand for the service[62] – being the cost of the next best alternative;*** *and*
>
> *b. reflects demand for coal handling services over a geographic area that is likely to be at least as large as the CQCN, but that is not related to the market in which the NQXT service is provided.*
>
> *90. In my opinion, the former also brings into question whether the level of demand subsequently estimated by the Hird and Ockerby report's assessment of criterion (b) can reasonably be treated as 'foreseeable'. It is also unclear whether Dr Hird and Mr Ockerby's assessment of expected costs, revenue and throughput, measured as an average over the 2025 to 2030 period, is an accurate reflection of the corresponding expected values over the proposed declaration period, ie, the ten-year period commencing 1 July 2027.*
>
> *91. I illustrate these shortcomings in the approach contended for by Dr Hird and Mr Ockerby in Figure 3.1 below, in which:*
>
> *a.* ***the 'monopoly market' and 'competitive market' points*** *are derived by reference to a demand curve that reflects an essential determinant of customers' maximum willingness-to-pay (and therefore demand), being the cost of the next best alternative; whereas*
>
> *b. the* ***'Hird and Ockerby' approach omits this important determinant of demand (the next best alternative) and therefore results in an artificially high demand curve.***

Figure 3.1: Illustrative difference between assumed demand curves



> 92. *I note that the Hird and Ockerby demand curve may be relevant in a criterion (b) assessment if a properly applied market definition process was to identify, potentially after an expansion step, that alternative suppliers should be taken to be in the same market as the coal handling service at NQXT.*
>
> 93. *The fundamental error in Dr Hird and Mr Ockerby's approach is that they include, as a starting point in their market definition process, customers for whom transacting at NQXT:*
>
> a. *is profitable, in an accounting sense; but,*
>
> b. *gives rise to a negative economic surplus due to the existence of DBT (and other alternatives).*

9. We start by explaining Mr Houston's Figure 3.1. The "Hird and Ockerby demand curve" is the demand for the services provided by a firm absent any competitors. In this the firm is NQXT, but it could equally apply to a local neighbourhood Italian restaurant.

10. Mr Houston has also drawn a marginal cost curve in his Figure 3.1 which he does not fully describe but which, given the way it is used,[2] must be for the marginal cost curve for the firm in question (be that NQXT, or a local Italian restaurant etc).

11. Mr Houston argues that the demand for the firm absent competitors is an overstatement of the "market" within that firm operates because it:

> *… ignores an essential determinant of customers' maximum willingness-to-pay – and, therefore, the level of demand for the service – being the cost of the next best alternative*

[2] The intersection of this marginal cost curve with the "marginal revenue" curve is used to define the "monopoly" level of output and prices charged by the firm in question.

12. Mr Houston then proceeds to exclude that portion of the "Hird and Ockerby demand curve" that would be served by "the next best alternatives". In doing so, Mr Houston explicitly identifies that there are alternative / substitute services that are influencing demand for NQXT's service and removes the share of the overall demand that would flow to these alternatives.

13. The difference between Mr Houston and our approach is simple. Our estimate of market demand includes demand for those alternative / substitute services, whereas Houston excludes demand for those substitute / alternative services.

14. In doing so, Mr Houston defines a narrower demand curve which is the demand for the firm in question (NQXT, neighbourhood Italian restaurant etc) given the existence of competitors (other coal expert terminals, other neighbourhood restaurants etc) who are offering a differentiated service (e.g., by location and/or other attributes (e.g., cuisine style)). Implicitly, Mr Houston's "Demand" curve is based on the prices that competitors are offering their alternative substitute services.

15. Ultimately, Mr Houston has defined a "Demand" curve for a single supplier within a market (given the existence of competitors providing substitute services).

16. Having defined a downward sloping "Demand" curve for a single supplier given competition from other suppliers, Mr Houston then proceeds to, in our opinion remarkably:

    a. Define a "competitive market foreseeable demand" to be the volume that would be sold of the service if it was priced at marginal cost; and

    b. Define "monopoly market foreseeable demand" to be the volume of services that would be most profitable for the supplier to sell (being the volume were marginal cost equals marginal revenue). Although not marked in Mr Houston's Figure 3.1 the price at which these services would be sold is found by continuing the black dotted line up from the "monopoly market foreseeable demand" on the x-axis until it reaches the "Demand" curve.

17. In so doing, Mr Houston is proposing an approach to "competitive market foreseeable demand" and criterion b that, if it were accepted, has the following characteristics:

    a. There is no need to apply a "least cost" test to serving foreseeable demand. Mr Houston has, in effect, defined foreseeable demand as being the volume of services for which the service in question is least cost to serve; and

    b. Every service that has a downward sloping demand curve given its competitors' prices, will pass criterion b. That is, any provider of any service that is not a perfect substitute for its competitors services will pass criterion b.

18. Consider a hypothetical local Italian restaurant facing competition from a local Thai and Malaysian restaurant. The "Hird and Ockerby demand curve" in Figure 3.1 involves an estimate of how many meals the Italian restaurant would serve if there was no competition from the Thai and Malaysian restaurants. My Houston's "competitive market foreseeable demand" is the actual demand for the Italian restaurant given the existence of the Thai and Malaysian restaurants.

19. Of course, the Italian restaurant is least cost to serve this segment of demand because the segment has been defined to exclude the customers whose preference is to frequent the competing restaurants. But that is so precisely because what Mr Houston has defined as "competitive market foreseeable demand" is not market demand at all – it is firm-specific demand within the market.

20. Mr Houston's approach, applied more generally, would imply that almost every service provided in the economy would pass criterion b. Under Mr Houston's approach, the only services that might not

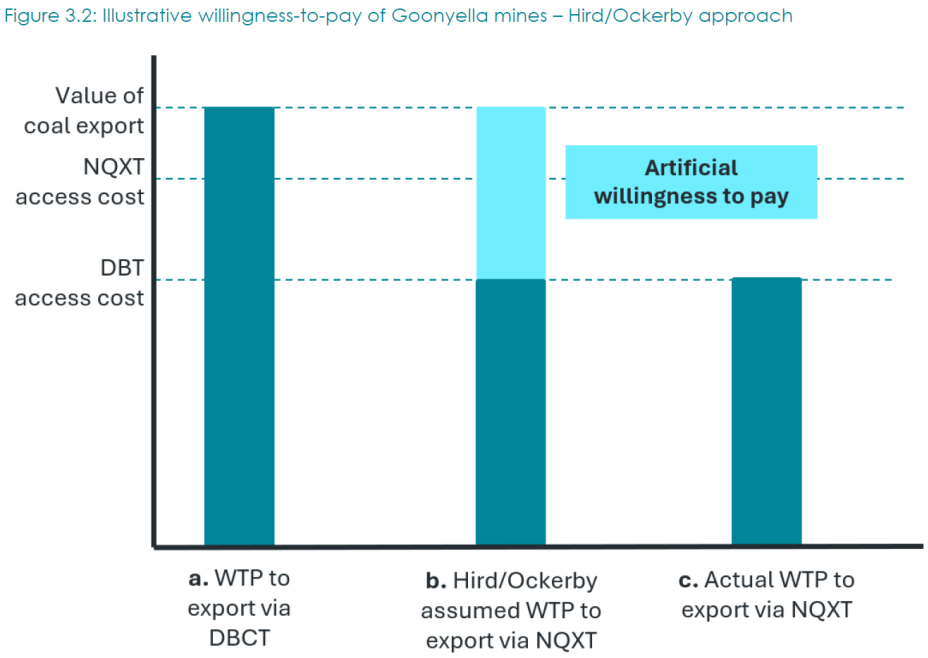
pass criterion b would be services for which there are perfect substitutes and firms all sell their products at marginal cost (Bertrand competition). In this scenario the firm specific demand curve would all be perfectly flat at marginal cost – such that any increase in price would lose 100% of the volumes to competitors.

21. However, as soon as there is any product differentiation (either based on geography or consumer preferences)[3] every service has a downward sloping firm specific demand curve and the provider of that service is, by definition, least cost to serve that demand curve (because the firm specific demand curve defines precisely the portion of the wider market for which that firm is best placed to serve).

2.2 Mr Houston's Figure 3.2

22. Mr Houston's Figure 3.2 simply confirms that Mr Houston is defining "market demand" as "firm specific demand".

Figure 2-1: Extract of Mr Houston's Figure 3.2



23. In Figure 3.2 and Figure 3.3[4] Mr Houston has three bars which are not precisely defined but which we interpret as follows:

[3] As explained in our original report, the Hotelling model of differentiated product competition can be used to model consumer preferences to use a given supplier based on actual physical distance to that supplier (e.g., distance from a mine to NQXT) or "distance" in consumer product preference space (e.g., a strength of preference for Italian vs Malaysian cuisine).

[4] This figure is simply a restatement of Figure 3.2. In this figure, Mr Houston says that any firm that would prefer DBCT (at some assumed prices and capacity availability) has "negative profit" from using NQXT and, therefore, their demand is not "foreseeable demand in the market" because those customers would choose

a. The left most bar is the value of export coal once it is loaded on a ship in the CQCN (at any terminal).

   i. Mr Houston calls this "WTP to export via DBCT" this is confusing in that willingness to pay "who" is not defined. Willingness to pay DBCT will be less than the value of export coal by the amount of rail cost and mining production costs. That is, it cannot simultaneously be "value of coal export" and "willingness to pay" unless willingness to pay include all parties in the production and transport chain (including the mines own production costs). The only way we can reconcile this is to interpret the height of the bar consistent with how it has been labelled on the Y-axis and not on the X-axis.

b. The right most bar is the total production and transport costs of getting the same coal onto a ship at DBCT (given prices charged at DBCT and for rail to DBCT and production costs);

c. The middle bar is broken into two components:

   i. The right most bar; plus

   ii. The surplus to the miner (light blue) after paying the right most bar in costs and exporting coal via DBCT at the "value of coal export".

24. Mr Houston defines the light blue component "artificial willingness to pay" by which he means that this is the component of willingness to pay to transport coal via NQXT that Dr Hird and Mr Ockerby include (estimated absent competition from DBCT) but which Mr Houston says is "artificial" given that the miner in question would find it lower cost to use DBCT (at whatever DBCT (and rail) prices Mr Houston has assumed).

25. Once more, this amounts to simply saying that the "market" for NQXT is simply defined by all mines for which NQXT is the lowest cost to serve. Having defined the "market" in this way Mr Houston has, by definition, determined that NQXT passes criterion b. Equally, with this approach to "market" definition every firm will pass criterion b because every firm is, by definition, least cost to serve the customers who have the lowest cost (highest surplus) of using that firm. Having adopted this approach to "market" definition Mr Houston has, in effect, determined that every product or service will also pass criterion b. The only possible exception to this would be firms that are in competition with other firms providing what are, in the eyes of at least some customers, perfect substitutes.

26. Let us return to considering a local Italian restaurant competing with a Thai restaurant where there are some customers who prefer the Thai restaurant but would frequent the Italian restaurant if the Thai restaurant was closed down (or booked out). We (Hird and Ockerby) would say that the market within which the Italian restaurant operates includes customers who prefer the Thai restaurant but would frequent the Italian restaurant absent the Thai restaurant.

27. Mr Houston would say that is not correct and "foreseeable demand in the market" does not include all local restaurant bookings. Mr Houston would argue that "foreseeable demand in the market" only covers the bookings that will occur for the Italian restaurant and excludes the customers who have a preference for the other restaurants. For Mr Houston, it does not matter that the prices set by the restaurants (which also determine the share of total bookings) have been determined in a

DBCT (at the implicit prices that Mr Houston is assuming the background). Once again, this is equivalent to saying that a booking at a local Thai restaurant is not "foreseeable demand in the market" that a local Italian restaurant operates in because, by definition, the customers choosing to book the Thai restaurant would have had "negative economic profit" from eating at the Italian restaurant

competitive setting and are much lower than if there was a single monopoly restaurant in the local area. For Mr Houston, "foreseeable demand in the market" is synonymous with firm specific demand given the availability of competing restaurants and the loss of bookings to those restaurants. Defined in this way, of course the Italian restaurant passes criterion b because it is, by definition, right sized to serve those customers that prefer it to other competitors.

3 Alleged "unorthodox" approach

28. At paragraphs 100 to 102 Mr Houston states:

> *In justifying their unconventional approach to market definition, Dr Hird and Mr Ockerby seek to distinguish the purpose of market definition:*
>
> *a. in the context of merger assessments under the Competition and Consumer Act 2010 (Cth) (the CCA), where it is standard practice for market definition to be guided by substitutability; and*
>
> *b. in the context of criterion (b), where the Hird and Ockerby report states it is necessary instead to assume away all alternatives.*
>
> *From an economic perspective, both contexts concern whether intervention is required to constrain the creation or exercise of market power and promote economic efficiency.*
>
> *In my opinion, that the regulatory intervention contemplated in the form of declaration in the context of criterion (b) differs from the prevention of a merger or the enforcement of conduct-related provisions of the CCA, falls significantly short of an economic justification for a fundamentally different and unconventional approach to market definition.*

29. In our view it is Mr Houston that is adopting a fundamentally different and unconventional approach to identifying total market demand.

30. From an economic perspective, total market demand must include demand for an individual firm's services and demand for substitute services. In assessing this total market demand, it is necessary and orthodox to ask what demand would be if only a single supplier was offering the service. This ***total market demand*** should not change based on whether there is a single supplier or multiple suppliers of substitute services. Focusing on demand from only those customers who prefer a particular supplier over its competitors will mean that only that firm's demand is being estimated – such an approach ignores demand for substitute services and is, therefore, not an estimate of total market demand.

31. Under Mr Houston's approach to market definition every firm that does not have a perfect substitute is in its own market. According to Mr Houston, NQXT is in its own market as is the illustrative local Italian restaurant.

32. In fact, under Mr Houston's approach, the relevant demand will change each time an alternative or substitute service becomes available – this illustrates the fact that it is an estimate of firm-specific demand rather than total market demand. Section 5.3.2 of our 26 August 2025 report illustrated this exact problem with Mr Houston's analysis. In that section we modelled the results of Hotelling competition when Firm A, located at one extreme end of the customer space:

    a. Faced no competition and served 100% of all customers at an average price of $150;

    b. Faced one competitor at the opposite end of the customer space in which case Firm A served 50% of the customers and had an average price of $60;

    c. Faced two competitors – one in the middle of the customer space and one at the other end of the customer space. In which case Firm A served 25% of the customers and had an average price of $35.

33. Under our approach to market definition the market is 100% of all customers served by any firm and Firm A's market share falls from 100% to 50% to 25% as the number of competitors in the market increases from zero to 1 to 2. But under Mr Houston's approach to "market definition" the "market" Firm A operates in shrinks every time a competitor enters such that the "market" is always simply equal to the residual sales of Firm A. That is, as a new "next best alternative" enters the Market Mr Houston' method simply shrinks the market that Firm A operates to exclude all of the sales it lost to the new "next best alternative).

34. Firm A simply maintains a 100% market share of an ever shrinking "market" as new competitors enter.

Figure 3-1: Extract from Section 5.3.2

5.3.2 Consumers are made better off from entry (if supplier's markets overlap)

149. Figure 5-7 below summarises the difference in average outcomes for customers under monopoly and duopoly under the assumptions set out in Figure 5-2 above. We also include a further case where a third firm (Firm C) located in the centre of the railway line (and, therefore, is closest to 50% of the customers).

Figure 5-7: Three firm oligopoly illustration

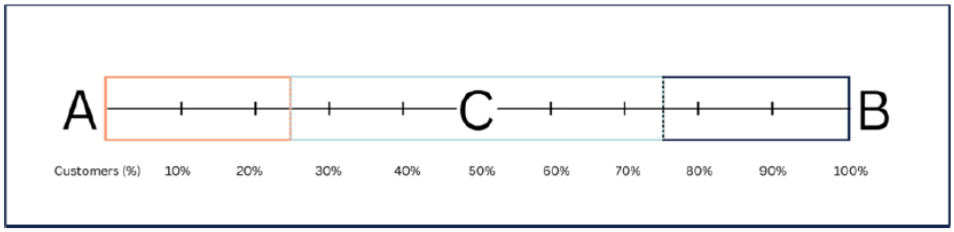
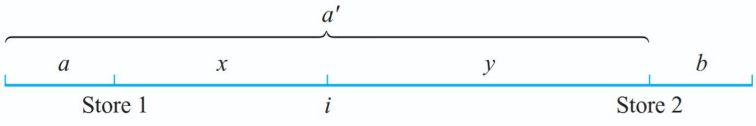


Table 5-1: Monopoly, duopoly, oligopoly modelling comparison, assuming V=$200, T= 1.0 $/km

Number of firms	Sales of firm A	Average price paid to all suppliers	Average transport costs all customers	Average total surplus across all customers
Monopoly	100%	$150.0	$50.0	$0.00
Duopoly	50%	$60.0	$25.0	$115.0
3 firm oligopoly	25%	$35.0	$12.5	$152.5

35. Our approach is the standard approach in the economics profession. For example, Carlton & Perloff (2015, Modern Industrial Organization, 4th ed., Pearson) develops the Hotelling linear-city model as the canonical framework for horizontal differentiation. On page 246, the authors' state (with Figure 7.5 also replicated here):

FIGURE 7.5 Hotelling's Town



> *"However, suppose that the two stores are permanently located some distance apart at a and b in Figure 7.5. If Store 1 charges less than Store 2, Store 2 still gets a number of customers. The reason is that Store 2 is much closer for several customers than Store 1, and some shoppers will pay more for the convenience.*
>
> *Thus, Hotelling's model illustrates that the Bertrand equilibrium price equals the marginal cost only if the products are homogeneous (located at the same place in product or geographical space). In a more general model of differentiated products, firms with Bertrand expectations may charge different prices and all prices are above marginal cost.[19] In short, differentiation gives firms market power.*
>
> *[19] Mergers of a subset of the firms in the industry have no effect in a Bertrand model with homogeneous goods, but are profitable for the merging firms in a Bertrand model with heterogeneous goods (Deneckere and Davidson 1985)."*

36. Our approach would define the firms at "a and b" to be in the same market and competing with each other. They have some "market power" within this market in the sense that they are differentiated and face a downward sloping firm-specific demand curve (and, therefore, will price above marginal cost). But this is true for almost every firm in a modern economy. It does not mean that every firm is in its own market. Such a conclusion would be highly unorthodox.

37. By contrast, Mr Houston would argue that the "foreseeable demand in the market" that "firm a" operates in only includes the customers who choose "firm a" given "firm b's" prices and *vice versa*. This is, in our view, nonsensical and inconsistent with standard text-book analysis. It would render a "market" definition useless for any meaningful analysis of competition issues.

38. If there were a merger between firm a and firm b we would, correctly, define them to be in the same market. By contrast, Mr Houston would define "foreseeable demand in the market" within which "firm a" operates to exclude the sales made by "firm b" – at least to the extent that those sales would not switch to firm a for a small change in price.

3.1 Mr Houston's "bolt on" of a 5%-10% price change to his methodology

39. In his original report, Mr Houston adds a margin of error to his estimate of "foreseeable demand in the market" that is not captured in his Figure 3.1 or 3.2. Mr Houston's approach to defining "foreseeable demand in the market" is to:

    a. Estimate firm specific demand for the firm subject to declaration at current prices (charged by it and its competitors (as described in his Figure 3.1 of his 21 October 2025 report)); then

    b. Add demand that would switch to the firm subject to declaration if there was a small, say 5%-10%, reduction in its prices.

40. For example, imagine that, at current prices, each of three local restaurants (Italian, Thai and Malaysian) would serve 500 meals per week. Further, imagine that if the Italian restaurant reduced their prices by 5%-10% then the Italian restaurant would serve 550 meals and the Malaysian and Thai restaurants would serve 480 meals each. Under Mr Houston's approach, "foreseeable demand in the market" within which the Italian restaurant operates would be:

    a. 500 meals based on firm specific demand at current prices; plus

b. 50 meals if price relativities changed by 5%-10%.

41. The extra 50 meals is what we describe as a "margin of error" added to Mr Houston's firm specific demand. In effect, Mr Houston's estimate of "foreseeable demand in the market" is firm specific demand for NQXT if it lowered its prices 5%-10% below its current levels. This is not a sensible approach to market definition.

42. It may be naïvely believed that adding this "bolt on" discussion of a 5%-10% price change to Mr Houston's estimate of firm specific demand has some sort of root in the well accepted hypothetical monopolist (SSNIP)[5] test used to define competitors in merger assessments. This would be an error. Mr Houston's "bolt on" discussion of a 5%-10% price change to his firm specific demand estimate at best gives the appearance, but not the substance, of any commonality with the hypothetical monopolist test.

43. A SSNIP test, properly applied, would ask whether restaurant prices would rise by 5%-10% if there was a hypothetical local restaurant monopoly. If they would then the relevant geographic boundary of the market would be the local neighbourhood. If not, then the boundary would be expanded to include restaurants in other nearby suburbs. Either way, the "market" demand would be at least 1,500 meals (being the sum of all meals sold by the closest substitute restaurants).

44. By contrast, Mr Houston's addition of a 50-meal "margin of error" to firm-specific demand does not have any direct connection to the SSNIP test. Rather, it seems intended to provide a superficial resemblance to that framework, by incorporating an economically meaningless adjustment to firm-specific demand. While this adjustment gives a superficial appearance of alignment with the principles underlying the SSNIP test it is substantively unrelated to the SSNIP test and economically meaningless.

45. In paragraphs 100 to 106 of his 21 October 2025 report, Mr Houston appears to be attempting to claim alignment of his approach with the standard hypothetical monopolist (SSNIP) test. In paragraph 102 Mr Houston states:

> *102. In my opinion, that the regulatory intervention contemplated in the form of declaration in the context of criterion (b) differs from the prevention of a merger or the enforcement of conduct-related provisions of the CCA, falls significantly short of an economic justification for a fundamentally different and unconventional approach to market definition.*

46. Here, Mr Houston appears to be asserting that his approach is consistent with the SSNIP market definition approach (used in merger and enforcement under the CCA) and our approach is not. The opposite is true.

47. The entire basis of Mr Houston's claim to orthodoxy appears to be along the following lines:

a. The orthodox hypothetical monopolist SSNIP test applied in merger/competition cases asks whether a group of firms could profitably increase prices by 5%-10% if they were under common ownership (a hypothetical monopolist);

b. Mr Houston's method also asks a question about a 5%-10% price increase. Specifically, it asks what the firm-specific demand would be for the firm subject to declaration if they reduced their prices by 5%-10%; therefore

[5] Small but significant non-transitory increase in price.

c. Because both approaches involve a "5–10 per cent price change," Mr Houston's method is said to have the orthodox imprimatur of the SSNIP test.

48. In our view, this reasoning is misplaced. Firm-specific demand at current prices remains firm-specific demand, and firm-specific demand at prices 5%–10% lower is still firm-specific demand (simply observed at a slightly different relative price). Such an exercise bears no relationship to a market-wide SSNIP test, which examines the collective response of all customers to a hypothetical monopolist's uniform price change across the candidate market.

49. We agree that the hypothetical monopolist test is the orthodox approach to defining the competitors in a market. As we explained in section 9.1 and, in particular, paragraphs 223 to 232, NQXT and DBCT would be in the same market if a hypothetical monopolist SSNIP test was applied to them.

50. We applied the orthodox hypothetical monopolist SSNIP test and concluded that NQXT and DBCT were in the same market. In our view, this is undeniably the result of applying the orthodox SSNIP test to determine the next closest competitor to NQXT and, equally undeniably, if NXQT and DBCT were hypothetical monopolists they would increase prices by more than 5-10% relative to duopoly prices. Orthodox market definition would include NXQT and DBCT in the same market.

51. However, as we explained at paragraph 235 of our 26 August 2025 report

> *But it does not follow that just because DBCT and NQXT are in the same market that output from all mines served by DBCT are also output in the market NQXT operates in. It is possible that there may be some mines served by DBCT that would not be willing to export via NQXT – even if DBCT did not exist.*

52. In short, our market definition is consistent with the orthodox SSNIP test but, instead of simply identifying DBCT as NQXT's closest competitor and then including all mines served by DBCT we only include mines served by DBCT that we are confident NQXT is a competitor for.

53. By contrast, Mr Houston excludes all mines served by DBCT – even where NQXT is clearly a competitor for those mines (and even where NQXT has served those mines in the past). Mr Houston's approach:

a. Is an entirely **unorthodox** approach to estimating market demand;

b. But is an **orthodox** approach to estimating firm-specific demand.

4 Other criticisms

4.1 Alleged perverse results from our approach

54. At paragraph 99 Mr Houston states:

> *By way of illustration, in assuming away the existence of any substitutes for the essential services that often exhibit natural monopoly characteristics, Dr Hird and Mr Ockerby's approach to market definition gives rise to perverse definitions of the market for a service. For instance, the approach suggested by Dr Hird and Mr Ockerby would give rise to a market for the provision of electricity distribution services by a provider in Brisbane by assuming away the existence of any alternatives for distributing electricity, eg, electricity distributors in adjacent regions. Given the likelihood that many customers have an extremely high willingness-to-pay for access to electricity, Dr Hird and Mr Ockerby's approach would likely conclude that the market for electricity distribution services provided by a supplier in Brisbane extended well beyond Brisbane and potentially into other states.*

55. This is not correct. A customer with a premises within a given electricity distributor would have as zero willingness to pay for the services of an electricity distributor that does not connect to their premises. The relevant market would be the provision of reliable electricity connections to the premises in question. The least cost way to provide this would be via a single local distributor. The single local distributor serving a set of premises would, therefore, pass criterion b

4.2 Alleged failure to apply the Hotelling model to any factual situation

56. At paragraphs 117 to 119 Mr Ockerby claims that we did not apply the Hotelling model "to any factual situation".

> *117. First, Dr Hird and Mr Ockerby describe the Hotelling model in their report and purport to 'apply the principles outlined' therein to 'the factual situation of NQXT's location'.[74] However, I disagree that they 'apply' the Hotelling model to any factual situation.*
>
> *118. Dr Hird and Mr Ockerby assume away the existence of alternative suppliers of coal handling services, such that their approach does not represent 'the factual situation of NQXT's location'. This contrasts with the starting point for the approach that I apply in my criterion (b) report, which is grounded in the factual circumstances.*
>
> *119. Further, Dr Hird and Mr Ockerby do not actually apply the Hotelling model. Rather they use their 'stylised illustration' to contend that:*
>
> *The market that a firm operates in is at least as wide as the demand that it could profitably serve if it had not [sic] competitors.*

57. This claim is false. Moreover, this refutation serves to illustrate why our approach to market definition is sensible and orthodox and Mr Houston's is heterodox.

58. In section 5 of our report, we describe the application of the Hotelling model to describe competition within a market where suppliers are differentiated by transport costs. Figure 5-5 of that section illustrates the difference between monopoly prices and duopoly prices in such a market.

59. In that illustration we show how the price that Firm A charges is dramatically lower given the existence of a competitor than if there was no competitor (the smallest price drop when moving to duopoly is $90 relative to a monopoly price of $200 for the customer closest to Firm A while the largest price drop is $140 relative a monopoly price of $150 for the customer located midway between Firm A and its competitor). We use that illustration to explain, at paragraph 132 that:

- *The market that a firm operates in is at least as wide as the demand that it could profitably serve if it had not (sic) competitors. While adding competitors into that market will shrink the number of customers actually served, the wider market is unchanged;*
- *Even though customers tend to buy from their most preferred (closest) supplier, the price that supplier can charge is constrained by the existence of the competitor; and*
- *Customers are better off (customer costs are lower) with additional competitors – but only if the markets withing which the suppliers operate overlap. Otherwise, the firms are not actually competitors as each firm would be a local monopoly.*

60. This is presumably the analysis that Mr Houston is referring to at paragraph 119 (quoted above) where he states that we "*…do not actually apply the Hotelling model. Rather they use their 'stylised illustration' to contend'…*"

61. At the end of our report, we apply exactly the same modelling approach to competition between NQXT and DBCT.

62. In Section 6 we show willingness to pay for NQXT from miners in the Newlands and Goonyella systems if NQXT faced no competition. This is the monopoly price that NQXT would charge. This is as high as [redacted] for Centurion and falling to below [redacted] for Carmicheal – which largely reflects differences in the export value of the mines coal as well as transport costs.

63. In Section 8 entitled "Competition in the market" we estimate competitive duopoly prices for mines in the Newlands and Goonyella systems based on the same Hotelling competition logic set out in Section 5 of our report (the "stylised modelling" section). Below is Figure 8-2 which shows duopoly prices under our lower estimate of marginal transport and terminal costs.

[redacted]

64. The green series in Figure 8-2 shows the mines that NQXT will likely win in competition with DBCT and the price that they NQXT will charge. These mines are the mines that have lower transport costs to NQXT than DBCT. The price that they are charged is lower than the prices that they would be charged if NQXT did not face competition from DBCT. For example, [redacted] (see Figure 6-4 of our 26 August report).

65. Similarly, the orange line in this Figure shows the mines that DBCT will likely win in competition with NQXT and the price that they DBCT will charge. These mines are the mines that have lower transport costs to DBCT than NQXT and, once again, the duopoly prices are an order of magnitude lower than the monopoly prices for many of these mines.

66. We conclude immediately below Figure 8-2 as follows

> *As was the case in the illustrative Hotelling model, duopoly competition is the fiercest for mines in the "middle" (e.g.* [redacted] *) where transport to each export terminal is similar (the terminals are the closest substitutes for each other). The colour coding represents, as was the case in Section 5, which terminal would serve the mine (which terminal has the run rail/port marginal cost for that mine). Note that if there was a mine perfectly in the middle, it would enjoy an export terminal price equal to DBCT's (slightly higher) marginal cost (and be served by NQXT).*
>
> *As we move away from the middle, the prices that the export terminals can charge increase as the transport costs of using a more distant terminal increase, such that the highest potential prices charged by NQXT are at the far left and for DBCT the far right. This is*

because for these customers, the higher cost terminal provides a lesser competitive constraint due to transportation costs.

67. Mr Houston does not explain why, notwithstanding this analysis, he believes that we "did not actually apply the Hotelling model".

68. More importantly, we can use Figure 8-2 reproduced above to clearly illustrate the difference between Mr Houston and us.

    a. We say that the fact that competitive duopoly prices are [redacted] than monopoly prices means that NQXT and DBCT are operating in the same market. The fact that, within this market, some mines will have lower costs of being served by NQXT than DBCT (and *vice versa*) is a perfectly normal scenario within any differentiated product market (which is almost every market in a modern economy). Inevitably, some customers will have a preference for one supplier over the other (whether this is geographically based on based on some other preference). However, this does not mean that the suppliers are in different markets – if it did mean this then every service for which there is not a perfect substitute available for all customers would pass criterion b. The fact that duopoly prices are so much lower than monopoly prices demonstrates that NQXT and DBCT are competing in a wider market.

    b. Mr Houston looks at the same facts and asserts that only the green portion of Figure 8-2 represents "foreseeable demand in the market" that NQXT operates in. That is, Mr Houston asserts that the correct approach is to treat "market" demand as synonymous with demand for NQXT once one removes from the market all customers who have a preference for DBCT. This is true even though the prices that NQXT is charging the customers on the green portion of Figure 8-2 are [redacted] than the monopoly price that NQXT would charge if DBCT was not exerting competitive pressure on NQXT's pricing. Nonetheless, Mr Houston concludes that NQXT operates in its own market separate from DBCT by adopting the extraordinary and highly unorthodox approach of excluding competitor's sales from the "market".

5 Hotelling model

69. At paragraph 120 Mr Houston states:

> *Second, I disagree that the Hotelling model purportedly applied is 'better suited to the task at hand' than the approach that I apply, which reflects widely-accepted principles of market definition.*

70. It is not clear to us whether Mr Houston is expressing any scepticism about whether the Hotelling model is a well-accepted model of competition in differentiated product markets.

71. We note that our market definition is based on defining the customers that NQXT would serve if it was a monopoly – not based on modelling of Hotelling competition. Our approach draws on the foundational insights of the Hotelling model to properly understand the nature of the market dynamics in which NQXT provides coal handling services. We use the Hotelling model to illustrate how competition within this market will result in different firms having different market shares (based on their location in the customer preference space) and also what the prices charged will be under competition (e.g. duopoly or 3 firm oligopoly).

72. However, to the extent that Mr Houston is implying that the Hotelling model is not a well-accepted model of competition in differentiated product markets (including spatial differentiation) then Mr Houston is wrong.

73. The Hotelling model, since its publication in 1929,[6] has been one of the foundational frameworks in industrial organisation for analysing competition between firms offering differentiated products. It has been widely extended to cover both physical and non-spatial differentiation—such as quality, brand, or service attributes. The model's central insight—that firms competing in a differentiated market face a trade-off between margin and market share depending on their "distance" from consumers in preference space—remains a cornerstone of modern competition economics.

74. Contemporary treatments of the Hotelling framework appear in standard industrial-organisation textbooks. For example, Tirole's classic industrial organisation textbook "*The Theory of Industrial Organization*" (1988, 1994 seventh reprint, MIT) begins the discussion of Spatial Competition (section 7.1) as follows:

> *"We first consider a model (originally due to Hotelling (1929)) in which a "linear city" of length 1 lies on the abscissa of a line and consumers are uniformly distributed with density 1 along this interval…"*

75. This is typical for all industrial organisation textbooks. For example:

    a. Carlton & Perloff (2015, Modern Industrial Organization, 4th ed., Pearson) - Chapter 7, Product Differentiation and Spatial Models, develops the Hotelling linear-city model as the canonical framework for horizontal differentiation. For example, on page 246, the authors' state:

> *"However, suppose that the two stores are permanently located some distance apart at a and b in Figure 7.5. If Store 1 charges less than Store 2, Store 2 still gets a number of customers. The reason is that Store 2 is much closer for several customers than Store 1, and some shoppers will pay more for the convenience. Thus, Hotelling's model illustrates that*

6 Hotelling (1929) paper "Stability in Competition" (Economic Journal, Vol. 39, pp. 41–57)

> *the Bertrand equilibrium price equals the marginal cost only if the products are homogeneous (located at the same place in product or geographical space). In a more general model of differentiated products, firms with Bertrand expectations may charge different prices and all prices are above marginal cost. In short, differentiation gives firms market power."*

b. Pepall, Richards & Norman (2014, Industrial Organization: Contemporary Theory and Empirical Applications, 5th ed., Wiley). For example, on page 403 the authors' state:

> *"The spatial model was first formulated in Hotelling (1929), and subsequently extended in Schmalensee (1978) and Salop (1979). We saw in Chapters 4, 7, and 10 that this sort of spatial model has proven insightful in analyzing a variety of topics in industrial organization, including brand proliferation in the ready-to-eat breakfast cereal industry, Schmalensee (1978), and the effects of deregulation of transport services such as airlines or passenger buses, Greenhut, Norman, and Greenhut (1991). It is not surprising that the spatial model is also useful in analyzing mergers of firms selling differentiated products."*

76. Clearly, the Hotelling framework provides an accepted and tractable way to explain how prices are set in differentiated product markets with one or more suppliers. It describes how competition between multiple suppliers would affect equilibrium prices and market shares within that same market. Its use here is therefore not a theoretical novelty but a standard, well-grounded tool in competition analysis, consistent with both academic literature and the analytical practice of competition authorities internationally.

6 QCoal Users' further report

77. At paragraph 82 of the QCOAL Users' Further report (12 October 2025) there is an extract from the judgement of Jagot J in *NSW Ports*. The QCOAL Users argue that it is difficult to reconcile Mr Ockerby's opinions, as described in Jagot J's judgment and our earlier report.

78. In order to assist reconciliation, we note that Mr Ockerby's written evidence in that matter related to whether Port Botany, as the only major container terminal in NSW, displayed natural monopoly characteristics.

79. In Mr Ockerby's written evidence in that matter he explained the difference between this case of a single supplier and situations where there are multiple facilities. He specifically explained that applying criterion (b) to the case where there are multiple existing facilities would be different to the case where there is only one facility. He explained that where there are multiple facilities that at least some shippers regard as close substitutes, this would imply that a single facility is not a natural monopoly.

80. These views are entirely consistent with this and our previous report.