

HUNTER VALLEY ACCESS UNDERTAKING

SECTION 4.18 DETERMINATION OF THE FINAL INDICATIVE SERVICE

**Is gtkm the appropriate pricing unit to
encourage efficient consumption of Capacity?**



October 2013

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1. Introduction

Terms used in this paper are as per the definitions in ARTC's Hunter Valley Coal Network Access Undertaking varied by ARTC and accepted by the ACCC on 17 October 2012 (2012 HVAU) unless otherwise obvious from the context.

On 29 June 2011, the Australian Competition and Consumer Commission (**ACCC**) accepted the ARTC Hunter Valley Coal Network Access Undertaking (**2011 HVAU**) under section 44ZZA(3) of Part IIIA of the Competition and Consumer Act 2010 (**Act**).

During stakeholder consultation leading to the ACCC's acceptance of the 2011 HVAU, stakeholders expressed some concerns with the use of the gross tonne kilometre (**gtkm**) unit to express the take-or-pay component (**TOP**) of Interim Indicative Access Charges forming part of the 2011 HVAU. Specifically, some stakeholders were concerned that use of the gtkm unit in this manner would not deliver efficient outcomes for the Hunter Valley coal network. In response, the ACCC recognised these concerns and sought ARTC to incorporate a review of the appropriateness of the gtkm as a pricing unit to encourage efficient consumption of Capacity¹ (**Review**). Such a review was incorporated in the 2011 HVAU as part of the determination of the Indicative Service (efficient train configuration) contemplated at Section 4.18 of the 2011 HVAU. The review process and greater detail as to earlier stakeholder consultation is provided in later sections of this paper.

The 2011 HVAU was subsequently varied by ARTC and accepted by the ACCC on 17 October 2012 to become the 2012 HVAU. This variation did not have any substantive impact on ARTC obligations in relation to the Review other than to rename the Indicative Service contemplated at Section 4.18 of the 2011 HVAU to Final Indicative Service for clarity.

¹ ACCC, Position Paper in relation to the Australian Rail Track Corporation's proposed Hunter Valley Rail Network Access Undertaking, 21 December 2010, p134.

2. Relevant ARTC Obligations under Section 4.18 of the 2012 HVAU

Relevant ARTC obligations under Section 4.18 of the 2012 HVAU are to, within 30 months of the Commencement Date (1 July 2011):

- Consult with Access Holders, Operators and the Hunter Valley Coal Chain Coordinator (**HVCCC**) on whether gtkm is the appropriate pricing unit to encourage efficient consumption of Capacity.
- Having regard to submissions arising from the consultation above, if ARTC considers that gtkm is not an appropriate pricing unit to encourage efficient consumption of Capacity, submit to the ACCC an alternative pricing unit that ARTC considers will encourage efficient consumption of Capacity.
- Seek the approval of the ACCC to vary the 2012 HVAU to provide for the adoption of the alternative pricing unit (if any).

3. Relevant earlier consultation and learning

Development of the 2011 HVAU

The 2011 HVAU contemplated, at Section 4.19(c), Interim Indicative Access Charges to apply to Interim Indicative Services as at the Commencement Date (1 July 2011) for the period until Indicative Access Charges (or Initial Indicative Access Charges under the 2012 HVAU) approved by the ACCC came into effect. This period was anticipated at the time to be around 12-18 months.

At the time, and in the absence of any existing robust modelling of the impacts of different Coal Train configurations on cost and capacity, and to maintain some broad continuity with existing pricing relativities for an interim period following the 2011 HVAU coming into effect, ARTC proposed Interim Indicative Access Charges (expressed on a \$/000gtkm basis) that would be applied to all Coal Train configurations in a Pricing Zone (including Coal Train configurations that were not Interim Indicative Services).

Under this interim pricing approach, a Coal Train configuration carrying half as many gross tonnes (and close to half as many net tonnes) as another Coal Train configuration would attract a TOP component of the Access Charge that was approximately half. Essentially, a gross or net tonne would attract approximately the same TOP component of the Access Charge irrespective of the size of the Coal Train configuration (gross tonnes) that the tonne was carried.

At the time, a number of stakeholders expressed in submissions a view that the use of larger Coal Train configurations would result in more efficient consumption of network and coal chain capacity. Consequently, the interim pricing approach and expression of Interim Indicative Access Charges on a \$/000gtkm basis would not provide any incentive to use larger Coal Train configurations to deliver more efficient consumption of network and coal chain capacity.

At the time, ARTC maintained a position as follows:

- ARTC supported the identification of what constituted efficient utilisation of network and coal chain capacity and access pricing that would incentivise efficient utilisation of that capacity.
- There was an absence of any reliable network or coal chain capacity modelling at the time that would enable access pricing (in particular pricing differentials) that would incentivise efficient use of capacity to be determined with any confidence.
- The introduction of access pricing based on incorrect assumptions and modelling could result in pricing signals that delivered adverse outcomes for the industry.

- Whilst ARTC accepted that applying the same Interim Indicative Access Charge (expressed on a \$/000gtkm basis) to all Coal Train configurations in a Pricing Zone would not encourage to use of bigger Coal Train configurations as sought by a number of stakeholders, ARTC considered that the circumstances as described above meant that the use of such a pricing approach on an interim basis only, and until pricing incentives could be determined in a reliable and robust manner, was reasonable.
- The approach to apply the same Interim Indicative Charge (expressed on a \$/000gtkm basis) to all Coal Train configurations in a Pricing Zone removed any incentive. The mere expression of the Interim Indicative Access Charge on a \$/000gtkm basis, by itself, however, did not have any effect on the incentives.
- Irrespective of the basis in which access pricing was expressed, as long as the resultant TOP component of the Access Charge applied to the Coal Train configuration was reflective of the relative cost and capacity consumption of that Coal Train configuration, then appropriate incentives would exist. This would occur over time through the development of the Indicative Service and Indicative Access Charges (at the time).

In the December 2010 Position Paper², the ACCC broadly acknowledged ARTC's position by accepting that the use of gtkm as a pricing unit may be appropriate in the short term, but subject to the implementation of longer term price signals to run efficient trains. The ACCC did not express a view as to what pricing unit would be appropriate to meet that aim.

The ACCC considered that:

- the determination of the efficient train should also involve a determination of the pricing approach that will enable and incentivise efficient consumption of network capacity;
- the Hunter Valley Access Undertaking should ultimately provide for the efficient use of infrastructure by ensuring that users pay charges reflective of their consumption of capacity; and
- the issue of whether calculating access charges by reference to gtkm units promotes efficiency, or whether another approach is optimal, is resolved.

The 2011 HVAU, as accepted by the ACCC, incorporated provisions at Section 4.18 that addressed the ACCC's considerations in this regard.

2012 Determination of the Initial Indicative Service and Initial Indicative Access Charges

In order to address the concerns of some stakeholders that the delay in the delivery of efficient outcomes inherent in the determination of the Indicative

² Op. Cit. p125.

Service and Indicative Access Charges was too long, the 2011 HVAU accepted by the ACCC, at Section 4.17, also included provision for an earlier determination of the Initial Indicative Service and Initial Indicative Access Charges intended to move some way towards the delivery of efficient outcomes but recognising the existing constraints of the existing Hunter Valley infrastructure and existing coal chain modelling.

This determination was undertaken in the second half of 2011 and concluded in 2012. The determination made way for the introduction of the Initial Indicative Service and Initial Indicative Access Charges to apply in late 2012, and 2013, that for the first time with respect to Hunter Valley coal access, introduced pricing that differentiated between different Coal Train configurations and reflect cost and capacity impacts to the extent that the above constraints reasonably permitted.

In particular, the determination established non-TOP and TOP components that reflected the different impacts of the use of a particular Coal Train configuration on track maintenance cost, Capacity and Coal Chain Capacity. This differentiated pricing was intended to provide initial pricing incentives to encourage more efficient coal operations in the Hunter Valley. The non-TOP and TOP component of the access pricing was still expressed in terms of \$/000GTK as was the case for Interim Indicative Access Charges. Differential pricing (and the attendant incentives) arose because the non-TOP and TOP components of access pricing were now different for each Coal Train configuration determined as an Initial Indicative Service, Interim Indicative Service and non-Indicative Service. This reinforces ARTC's initial position that the expression of the TOP component of Charges does not, in itself, impact on incentives for more efficient utilisation of Capacity and Coal Chain Capacity.

In general, longer and heavier Coal Train configurations were determined as Initial Indicative Services and the cost of access (per tonne or GTK) for Initial Indicative Services was less than for other Services³.

2012 Initial Indicative Access Charges

The Initial Indicative Access Charges accepted by the ACCC in 2012, to apply for a short period towards the end of 2012, are shown at Figure 1.

³ To the extent permitted under the 2011 HVAU and, in particular, the transitional arrangements at Section 4.15(a)(iii) of the 201 HVAU.

Figure 1

Segments	Non-TOP \$/kgtkm (ex GST)	TOP \$/kgtkm (ex GST)	Initial Indicative Service Characteristics
In Pricing Zone 1*			
Initial Indicative Service 1	0.844	8.314	30 tonne maximum axle load 60 kph maximum speed (loaded) 80 kph maximum speed (empty) 96 wagon train length 1543 metres maximum train length section run times as per applicable Hunter Valley standard working timetable
Initial Indicative Service 2	0.812	9.636	25 tonne maximum axle load 80 kph maximum speed (loaded) 80 kph maximum speed (empty) 82 wagon train length 1350 metres maximum train length section run times as per applicable Hunter Valley standard working timetable
In Pricing Zone 2*			
Initial Indicative Service 1	2.393	6.920	30 tonne maximum axle load 60 kph maximum speed (loaded) 80 kph maximum speed (empty) 96 wagon train length 1543 metres maximum train length section run times as per applicable Hunter Valley standard working timetable
In Pricing Zone 3*			
Initial Indicative Service 1	0.837	5.564	25 tonne maximum axle load 80 kph maximum speed (loaded) 80 kph maximum speed (empty) 82 wagon train length 1350 metres maximum train length section run times as per applicable Hunter Valley standard working timetable

2012 Charges for Interim Indicative Services and non-Indicative Services

ARTC subsequently published Charges for Interim Indicative Services and non-Indicative Service categories in accordance with Section 4.18 of the 2011 HVAU as shown at Figure 2 below.

Figure 2

Segments	Non-TOP	TOP	Service Characteristics (as applicable)
	\$/kgtkm	\$/kgtkm	
	(ex GST)	(ex GST)	
In Pricing Zone 1*			
Interim Service 1	0.844	8.487	30 tonne maximum axle load
			60kph maximum speed (loaded)
			80kph maximum speed (empty)
			91 wagon train length
			section run times as per applicable Hunter Valley standard working timetable
Interim Service 2	0.844	8.487	30 tonne maximum axle load
			60kph maximum speed (loaded)
			80kph maximum speed (empty)
			74 wagon train length
			section run times as per applicable Hunter Valley standard working timetable
Interim Service 3	0.819	10.168	25 tonne maximum axle load
			80kph maximum speed (loaded)
			80kph maximum speed (empty)
			72 wagon train length
			section run times as per applicable Hunter Valley standard working timetable
Non-Indicative Service 1	0.819	9.644	25 tonne maximum axle load
			80kph maximum speed (loaded)
			80kph maximum speed (empty)
			80 wagon train length
			section run times as per applicable Hunter Valley standard working timetable
Non-Indicative Service 2	0.686	11.080	25 tonne maximum axle load
			80kph maximum speed (loaded)
			80kph maximum speed (empty)
			60 wagon train length
			section run times as per applicable Hunter Valley standard working timetable
Non-Indicative Service 3	0.754	12.849	19 tonne maximum axle load
			80kph maximum speed (loaded)
			80kph maximum speed (empty)
			60 wagon train length
			section run times as per applicable Hunter Valley standard working timetable
Non-Indicative Service 4	0.709	10.795	30 tonne maximum axle load
			60kph maximum speed (loaded)
			80kph maximum speed (empty)
			56 wagon train length
			section run times as per applicable Hunter Valley standard working timetable
Non-Indicative Service 5	0.686	12.461	25 tonne maximum axle load
			80kph maximum speed (loaded)
			80kph maximum speed (empty)
			50 wagon train length
			section run times as per applicable Hunter Valley standard working timetable
Non-Indicative Service 6	0.827	14.187	25 tonne maximum axle load
			80kph maximum speed (loaded)
			80kph maximum speed (empty)
			42 wagon train length
			section run times as per applicable Hunter Valley standard working timetable
Non-Indicative Service 7	0.760	16.681	19 tonne maximum axle load
			80kph maximum speed (loaded)
			80kph maximum speed (empty)
			39 wagon train length
			section run times as per applicable Hunter Valley standard working timetable
In Pricing Zone 2*			
Interim Service 1	2.393	7.049	30 tonne maximum axle load
			60kph maximum speed (loaded)
			80kph maximum speed (empty)

			91 wagon train length
			section run times as per applicable Hunter Valley standard working timetable
Interim Service 2	2.393	7.049	30 tonne maximum axle load
			60kph maximum speed (loaded)
			80kph maximum speed (empty)
			74 wagon train length
			section run times as per applicable Hunter Valley standard working timetable
In Pricing Zone 3*			
Interim Service 1	0.837	5.827	25 tonne maximum axle load
			80kph maximum speed (loaded)
			80kph maximum speed (empty)
			72 wagon train length
			section run times as per applicable Hunter Valley standard working timetable
Non-Indicative Service 1	0.837	5.568	25 tonne maximum axle load
			80kph maximum speed (loaded)
			80kph maximum speed (empty)
			80 wagon train length
			section run times as per applicable Hunter Valley standard working timetable
Non- Indicative Service 2	0.837	7.892	25 tonne maximum axle load
			80kph maximum speed (loaded)
			80kph maximum speed (empty)
			42 wagon train length
			section run times as per applicable Hunter Valley standard working timetable

*Pricing Zones contain Segments as specified at Schedule E of the undertaking

It should be noted that Initial Indicative Access Charges and Charges for Interim Indicative Services and non-Indicative Service categories for the 2013 calendar year have been determined on largely the same basis as 2012 charges.

Characteristics of these Charges

Subject to some exceptions⁴, the Initial Indicative Access Charges and Charges for Interim Indicative Services and non-Indicative Services have been determined using the following broad principles:

- factors considered most relevant, at the time, in relation to differentiating pricing for coal services in the Hunter Valley, were:
 - maintenance considerations, impacting ARTC's costs
 - Capacity considerations impacting ARTC investment; and
 - Coal Chain Capacity considerations, reflecting efficient use of the coal chain, and considered important by the industry;
- a prescribed methodology, at the time, was used to determine relative impacts of relevant Coal Train configurations in relation to each of these factors;
- any other practical aspects were considered at the time in determining, along with the above differential impacts, the basis for differentiating prices in relation to each of these factors; and

⁴ Obligations under Section 4.14(a)(iii) of the 2011 HVAU.

- a basis for weighting the relative importance/impact of each these factors, at the time, in determining overall pricing differentials was used.

Broad assumptions adopted to determine the Initial Indicative Access Charges and other relevant Charges, at the time, were:

- With respect to maintenance considerations, different Coal Train configurations were assessed on the basis of impact on ARTC variable and fixed maintenance cost of applicable average and maximum train speeds and axle loads relative to the configuration of the Initial Indicative Service.
- With respect to Capacity considerations, due to practical considerations, all train configurations were assumed to consume the same Capacity relative to the configuration of the Initial Indicative Service.
- With respect to Coal Chain Capacity, differentials had regard to the coal chain throughput arising from utilisation of different Coal Train configurations relative to the configuration of the Initial Indicative Service as modelled by HVCCC coal chain modelling tools and infrastructure constraints at the time.
- Weightings with respect to variable maintenance (to apply to the non-TOP component) and fixed maintenance (to apply to a portion of the TOP component) were determined on the basis of maintenance cost with respect to overall ARTC full economic cost in each Pricing Zone.
- The remaining weightings to Capacity and Coal Chain Capacity impacts were determined on a 50/50 basis.

Capacity aspects of the TOP component of the Access Charge

Of particular relevance to this review is the application of price differentiation with respect to consumption of Capacity. That part of the TOP component of the Access Charge intended to apply differentiation with respect to Capacity has the following characteristics:

- Access revenue resulting from the application of that part of the TOP component applicable to the Coal Train configuration to the gtkm for that Coal Train configuration represents around 45-55% of the access revenue derived from the TOP Charge in total, depending on Pricing Zone. This results from the weighting afforded to that part of the TOP component.
- Access revenue resulting from the application of that part of the TOP component applicable to the Coal Train configuration to the gtkm for that Coal Train configuration will result in the same access revenue irrespective of the Coal Train configuration. This results from the assumption made that all Coal Train configurations consume the same amount of Capacity in a Pricing Zone.
- As such, the access revenue arising from application of this part of the TOP component is independent of the pricing unit (in this case gtkm), and is

dependent only on the assumptions made with respect to the relative consumption of Capacity by a Coal Train configuration compared to the configuration of the Initial Indicative Service.

In order to increase transparency and certainty with respect to Charges beyond 2012, ARTC committed to determining Initial Indicative Access Charges, Interim Access Charges and Charges for non-Indicative Services in accordance with those principles prescribed at Attachment A⁵ to this paper.

In Summary

ARTC recognises the basis for concerns expressed by some stakeholders during the development of the 2011 HVAU around the use of gtkm as a pricing unit. ARTC believes that these concerns may have stemmed from the broader approach that sought to apply the same non-TOP and TOP Charge for all Coal Train configurations in a Pricing Zone as an interim measure, which in its own right resulted in no incentive to operate bigger heavier Coal Train configurations.

On the other hand, ARTC maintains its position that the use of gtkm as a pricing unit, in itself, plays no role in providing incentives to use Capacity more efficiently. Gtkm merely acts as a basis for expression of, an application of the Access Charge for a particular Coal Train configuration.

With the development of the Initial Indicative Service, further insight was provided to stakeholders in relation to the development, direction and magnitude of coal access pricing differentials and incentives in the Hunter Valley. ARTC believes that this may have served to better inform stakeholders as to the drivers of access pricing differentials, the application of access pricing to drive efficiencies in the consumption of Capacity, and the implication (or lack of it) of the use of gtkm as the pricing unit for the expression of access pricing.

ARTC considers that that the adoption of Indicative Access Charges and the price differentiation inherent in Interim Access Charges and Charges for non-Indicative Services in 2012 and 2013 have already resulted in more efficient choices being made. An increase in average train size in 2013, facilitating volume increases without additional track infrastructure is noted in ARTC's 2013-2022 Hunter Valley Corridor Capacity Strategy published in ARTC's website⁶.

This has been achieved whilst the expression of the TOP component of the Initial Indicative Access Charges and Charges for non-Indicative Services using a gtkm pricing unit has been maintained.

With further improvements in coal chain modelling anticipated through the Section 4.18 review (Final Indicative Service), Indicative Access Charges may become even more refined and effective in driving behaviour towards efficient consumption of Capacity.

⁵ ARTC, Revised Application to vary the 2011 HVAU, Supporting Document, September 2012, Table 2, p 14.

⁶ <http://www.artc.com.au/library/2013%20HV%20Strategy%20-%20Final.pdf>, p3

4. Appropriateness of the gtkm pricing unit

Wider price differentiation considerations

Section 4.18 of the 2012 HVAU requires ARTC to develop, in consultation with the HVCCC, and seek to incorporate into the 2012 HVAU, the Final Indicative Service intended to represent what ARTC considers will deliver optimum utilisation of Coal Chain Capacity given certain System Assumptions. The development is intended to be based on a more robust modelling exercise than that used for selecting the Initial Indicative Service and include scenarios in which System Assumptions are varied in addition to Coal Train configurations.

Section 4.18 of the HVAU was incorporated in the 2011 HVAU so as to ensure that efficient utilisation of the Capacity and Coal Chain Capacity could be encouraged through the 2011 HVAU.

During consultation on the 2011 HVAU, the ACCC recognised that the determination of an 'efficient train configuration' goes only part of the way to ensure efficient utilisation of the Hunter Valley coal network, and that the fundamental concern was to ensure efficient consumption of network capacity, and the provision of pricing signals to ensure this outcome⁷.

ARTC considers that effective pricing signals to ensure efficient consumption of Capacity arise when the cost of access to the Network to a user reflects the cost and capacity impacts of that use. This would manifest in a unit of consumption (where in the coal industry broadly, and across the coal chain, this may be seen as a tonne) costing more where the nature of the utilisation of Capacity results in greater consumption of that Capacity by the unit, than another utilisation of that Capacity resulting in less consumption of Capacity by the unit.

The nature of utilisation of Capacity in relation to the Hunter Valley coal network is generally seen as the Coal Train configuration contracted by the user to transport the unit (tonne) on the Network. As ARTC has indicated in Section 3 of this paper, part of the TOP component of the Access Charge under the existing approach to access pricing for coal in the Hunter Valley seeks to provide incentive for more efficient consumption of Capacity.

This part of the TOP component of the Access Charge represents around 45-55% of the TOP component, and around 35-45% of the total Access Charge (including the non-TOP component). These proportions result largely from the approach to determining the relative weightings (importance) of different factors in driving efficient outcomes for the Network and coal chain. Factors considered appropriate in the development of Initial Indicative Access Charges include maintenance cost, Capacity and Coal Chain Capacity.

⁷ ACCC, Position Paper in relation to the Australian Rail Track Corporation's proposed Hunter Valley Rail Network Access Undertaking, 21 December 2010, p134.

ARTC strongly believes that factors other than consumption of Capacity also play a role in delivering efficient outcomes and therefore attract some weighting in price differentiation considerations. Such other factors as described above played a role in price differentiation when developing Initial Indicative Access Charges.

ARTC also believes that pricing signals in relation to consumption of Capacity should form part of the TOP component of the Access Charge. Inefficient consumption of Capacity generally manifests in the provision of Additional Capacity that may otherwise not be necessary or could be deferred. The cost of Additional Capacity is normally recovered through the TOP component of the Access Charge. Price signals to encourage efficient consumption of Capacity were dealt with in the TOP component of the Access Charge during development of the Initial Indicative Access Charges.

The appropriateness of the factors identified in price differentiation, the basis for, and assumptions underpinning, the determination of relative impacts of different Coal Train impacts, and the weightings afforded to the various factors used to differentiate overall pricing were the subject of much discussion during the development of the Initial Indicative Access Charges.

As such, this paper does not seek to consult stakeholders on this basis. Stakeholders will be given an opportunity to more directly address these matters during ACCC consultation on the Indicative Access Charges provided under Section 4.18 of the 2012 HVAU.

The gtkm pricing unit

It is ARTC's view that two part pricing is appropriate for coal on the Hunter Valley network. Under current arrangements the non-TOP component of the Access Charge (\$/000gtkm) is applied to actual gtkm (based on nominal weights) operated in a period by the access holder to result in non-TOP revenue. The TOP component of the Access Charge (\$/000gtkm) is applied to the contracted gtkm in a period arising from the Coal Train configuration operated and the number of Base Path Usages for the period to determine TOP revenue that is fixed for the period irrespective of actual utilisation of Base Path Usages throughout the period.

As such, two part pricing including a TOP component, by itself, results in certain efficiency benefits including incentives to invest in Additional Capacity and to utilise that Capacity.

Given the above basis of application of the TOP component of the Access Charge, to determine a fixed amount of TOP revenue for a period, the choice of pricing unit would not appear to be material. A number of alternative pricing units would deliver the same outcome. Examples of applications of two alternative pricing units (net tonne kilometre (ntkm) and train kilometre (tkm)) are provided below.

Example 1 (ntkm) - The TOP component of the Access Charge (\$/000ntkm) is applied to the contracted ntkm in a period arising from the Coal Train configuration operated and the number of Base Path Usages for the period to determine TOP revenue that is fixed for the period irrespective of actual utilisation of Base Path Usages throughout the period.

Example 2 (tkm) - The TOP component of the Access Charge (\$/tkm) is applied to the contracted tkm in a period arising from the Coal Train configuration operated and the number of Base Path Usages for the period to determine TOP revenue that is fixed for the period irrespective of actual utilisation of Base Path Usages throughout the period.

The important aspect, in terms of pricing signals to encourage efficient consumption of Capacity, is that the TOP revenue for the period is such that when applied to the units of consumption (tonne of coal) for the period results in a higher per unit of consumption charge if a less efficient Coal Train configuration is used.

As indicated in Section 3 of this paper, in developing the Initial Indicative Access Charges (and other relevant Charges), ARTC has assumed for that part of the TOP component intended to import a pricing signal with respect to Capacity, that all Coal Train configurations consume the same Capacity in a Pricing Zone.

As such, gtkm arising from the use of a Coal Train configuration that generates half as many gtkm as another Coal Train configuration would attract a price (\$/000gtk) for that part of the TOP component of the Access Charge that was double that for the higher gtkm generating Coal Train configuration. Where, for example, rollingstock was also used that produced a less efficient (higher) gross tonne to net tonne ratio, the differential on a per tonne of coal basis would be more than double. Figure 3 below demonstrates this.

Figure 3

	Coal Tonnes	GT:NT ratio	000gtk per train	Relevant part of TOP component (\$/000gtk)	Relevant TOP revenue per train	Relevant TOP revenue per coal tonne
Coal Train configuration 1 (100km)	3000	1.8	540	\$2.00	\$1080	\$0.36
Coal Train configuration 2 (100km)	6353	1.7	1080	\$1.00	\$1080	\$0.17

It should be noted that this does not mean that the entire TOP component of the Access Charge will necessarily be double as other factors such as fixed maintenance and Coal Chain Capacity are considered and have certain weightings in the calculation.

ARTC maintains its position described earlier as to the question of the appropriateness of using gtkm as a pricing unit to encourage efficient consumption of Capacity. That is, the encouragement of efficient consumption of Capacity derives from the appropriate settings with respect to non-TOP and TOP component pricing differentials rather than the choice of pricing unit that is used to express the price itself. ARTC recognises that Interim Indicative Access Charges under the 2011 HVAU did not incorporate pricing differentials designed to achieve more efficient consumption of Capacity, as intended for an interim pricing measure. ARTC considers that the pricing approach adopted for development of pricing differentials for Initial Indicative access Charges and other relevant Charges was appropriate in the circumstances contemplated for that development. The use of gtkm as a pricing unit, by itself, is not intended to play a role in achieving efficient consumption of Capacity.

To this end, ARTC's preference would be to retain gtkm as a pricing unit for Coal Access Rights under the Hunter Valley Coal Network access Undertaking.

ARTC seeks stakeholder views in relation to the continuation of using gtkm as a pricing unit for the TOP component of the Access Charge.

ARTC seeks stakeholder views in relation to whether the use of gtkm as a pricing unit for the TOP component of the Access Charge, by itself, impacts on the encouragement of efficient consumption of Capacity, and whether the impact is adverse.

5. The appropriateness of an alternative pricing unit

On the basis that the encouragement of efficient consumption of Capacity rests with the appropriateness of price differentials between different Coal Train configurations rather than the pricing unit in which prices are expressed, the choice of pricing unit is therefore not critical in this regard.

As such, ARTC considers that the minimisation of the complexity to aid understanding and transparency become an important characteristic of an efficient pricing regime. This has been consistently applied in the consideration of pricing structure across the ARTC network.

Other possible pricing units which have arisen from the 2011 HVAU consultation or from a review of applications in other similar jurisdictions are:

- Train path or train kilometre (**tkm**), arising from stakeholder submissions during the 2011 HVAU consultation.
- A combination of gtkm, train path, net tonne kilometres (**ntkm**) inherent in the multi-part reference tariffs applied for coal use of the Central Queensland Coal Network.

This list is by no means exhaustive and ARTC acknowledges that there are likely to be a number of other possible pricing units that could be utilised. This paper will consider only those alternatives described above given their proximity to consultation in relation to the Hunter Valley coal network, but ARTC does not seek to limit this consultation to just these alternatives.

The train path or tkm pricing unit

These pricing units were proposed in some stakeholder submissions during 2011 HVAU consultation as being superior pricing unit to gtkm, in the context of encouraging efficient consumption of Capacity.

ARTC considers that, of these two pricing units, tkm would be more appropriate as it recognises the train journey length. The TOP component of the Access Charge expressed on a train path basis would require a separate price to be prescribed for each loading point on the network (assuming terminals are considered the same for pricing purposes). This is similar to the historical net tonne pricing in the Hunter Valley which was load point specific. The introduction of a dimension for Coal Train configuration as well would result in myriad of different prices.

The TOP component of the Access Charge expressed on a tkm basis would simplify matters as only a price for each Coal Train configuration would be needed.

ARTC has sought to demonstrate in Section 4 that, as long as appropriate price differentiation to encourage efficient consumption of Capacity exists in the TOP

component of the Access Charge, the choice of pricing unit in which prices are expressed plays an immaterial role in this regard.

If this is accepted, then the question as to the appropriateness of a pricing unit to encourage efficient consumption of Capacity ceases to be material.

The question of appropriateness then becomes more one of simplicity, ease of understanding and administration.

Given the immateriality of the question of an appropriate unit to encourage efficient consumption of Capacity, ARTC is not particularly averse to utilising tkm as a pricing unit for the TOP component of the Access Charge if there was broad support from stakeholders. The cost associated with any adjustments to ARTC's billing administration systems is not substantial.

Changing the pricing unit in this regard is, however, likely to result in significant (although not insurmountable) adjustments to the 2012 HVAU and IAHA, as well as adjustments to train path schedules in existing AHA's. These will need to be negotiated with Access Holders in due course.

ARTC cannot identify any substantive benefits that would arise in the context of encouraging efficient consumption of Capacity from adopting tkm (or indeed another similar pricing unit).

ARTC seeks stakeholder views in relation to the adoption of tkm as a pricing unit for the TOP component of the Access Charge, in light of the costs and benefits of such an adoption suggested by ARTC.

ARTC seeks stakeholder views in relation to whether there are any other benefits or costs associated with the adoption of tkm as a pricing unit for the TOP component of the Access Charge.

Multi-part pricing and the use of a combination of pricing units

Coal access reference tariffs approved for relevant parts of the Central Queensland Coal region (**CQCR**) managed by Aurizon Network Access are multi-part in nature (as opposed to the two part pricing currently applied in the Hunter Valley, ARTC's interstate network and a number of other jurisdictions in Australia).

ARTC understands that the structure of CQCR coal reference tariffs to be a partial or full combination of the components below as applicable to certain parts of the CQCR network (each CQCR system) and applicable to a prescribed reference train for that system.

- AT1 - Incremental maintenance component levied on gtkm for the reference train;
- AT2 - Incremental capacity component levied on reference train path (rtp);

- AT3 - An allocative part of the reference tariff levied on ntkm for the reference train;
- AT4 - An allocative component of the reference tariff levied on net tonnes (nt) for the reference train;
- AT5 - Electric access tariff levied on egtkm for the reference train;
- EC - electric energy charge levied on egtkm for the reference train; and
- QCA levy levied on nt for the reference train.

For each CQCR system, the reference train (in broad terms) is specified in terms of the following criteria:

- Maximum speed;
- Maximum axle load;
- Maximum length;
- Maximum separation;
- Specified section run times; and
- Specified load/unload times.

The reference tariffs also incorporate take-or-pay provisions applicable to the AT2, AT3 and AT4 components that are applied to the quantum of the respective pricing units (rtp, ntkm and nt) associated with annual contracted entitlements, less entitlements not made available due to Aurizon Network Access cause.

In broad terms, it would seem that the multi-part approach used for coal in the CQCR consists of a number of parts that are applied with respect to the consumption of resources for a prescribed reference train configuration operated, such as gtkm, ntkm, net tonnes and egtkm (where applicable) as well as an incremental capacity related charge for that reference train.

The reference tariff would appear to be determined with respect to a notional reference train in the circumstances intended to represent some form of optimal utilisation of assets. In its proposal for reference tariffs to apply to the GAPE system⁸, Aurizon Network Access proposed an optimal train configuration for the GAPE system that contemplated several objectives including meeting the annual demand profile as provided by the coal industry, minimising capital costs, lowering Total Cost of Ownership (TCO), and system availability, maintainability and reliability.

With respect to train configurations operated in the CQCR with characteristics that are different to the relevant reference train configuration, the relevant reference tariff may be varied to reflect differences in cost or risk to Aurizon Network Access for that train configuration compared to the reference train configuration. A specific variation related to the application of the rtp in determining the charge where the number of rtp's to which the reference tariffs applies is adjusted to reflect the relative consumption of network capacity of the train configuration

⁸ Aurizon Network Access, Draft Amending Access Undertaking Reference Tariff for the GAPE System, April 2013, p 27.

compared to the reference train configuration as simulated. This application would relate to the AT2 component of the reference tariff.

Where the reference tariffs can be varied to reflect differences in cost and risk for various train configurations (including consumption of network capacity), there would appear to scope to ensure that pricing is reflective of the cost of relevant resources and network capacity, and so may act to encourage efficient consumption of network capacity, as long as differentials are appropriately set.

ARTC considers that, in broad terms, and where certain components that are not relevant to the Hunter Valley are ignored (AT5, EC and QCA Levy), the application of multi-part pricing in the CQCR and the application of two part pricing in the Hunter Valley is not substantively different, and indeed shares a number of common characteristics including:

- A variable component of the charge (AT1 component (CQCR), non-TOP component (Hunter Valley)) intended to reflect the variable or incremental cost of maintenance and differential impacts of different train configurations;
- A take-or-pay component of the charge (AT2, AT3, AT4 component (CQCR), TOP component (Hunter Valley)) intended to reflect and recover other (fixed) aspects of cost such as fixed maintenance, overheads and the cost of network capacity where differentials are based on relative network capacity consumption impacts and cost and risk impacts of different train configurations.

Key differences between the two pricing structures would seem to be:

- **Application of the TOP component of the charge.** The multi-part pricing in the CQCR would seem to apply certain parts of the TOP component of the charge separately (AT2, AT3 and AT4) and on the basis of three different pricing units (rtp, ntkm and nt respectively). It is not clear to ARTC whether these separate components are intended to separately recover different aspects of the Aurizon Network Access cost base. AT2 would seem to be aimed to recover the unit cost (per rtp) of provided Additional Capacity and AT3 and AT4 would seem to be aimed at recovering the remaining cost base (fixed maintenance, overheads, existing capital costs) as allocated to a train configuration on a ntkm or nt basis.

The TOP component of the Access Charge in the Hunter Valley separates the fixed maintenance component of the cost base from the remainder and seeks to differentiate the relative consumption impacts of different Coal Train configurations on fixed maintenance (on the basis of train axle load and speed) and remaining cost separately (on the basis of weighted Capacity and Coal Chain Capacity consumption impacts). The relative cost and consumption impacts of the Coal Train configuration on the basis of these three separate aspects is them combined into a single TOP component and expressed on a gtkm basis.

As long as price differentials for different train configurations (which are considered separately under both the CQCR and Hunter Valley pricing structures and from the perspective of the train or train path) appropriately reflect the relative cost and consumption impacts, the mere expression and application as a single TOP component using a single pricing unit such as gtkm is unlikely to substantively alter incentives for efficient consumption of Capacity. Once again, the appropriateness of differential treatments and aspects of cost and capacity considered is more likely to create these incentives.

Indeed, it is not entirely clear to ARTC as to the rationale behind the use of the ntkm and nt pricing units to recover costs through the AT3 and AT4 components of the charge under the CQCR multi-part pricing structure.

- **Differentiation through the TOP component of the charge on the basis of relative consumption of Coal Chain Capacity.** In developing price differentials through the TOP component of the Access Charge, ARTC explicitly has regard to impacts of a Coal Train configuration on consumption of Coal Chain Capacity. This explicit recognition of Coal Chain Capacity in access pricing differentials under the 2011 HVAU was sought by industry in order to provide incentives to use Coal Chain Capacity efficiently.

ARTC recognises that it is arguable as to whether pricing with respect to one part of the Hunter Valley Coal Chain (the rail network) should be used to provide incentives to use Coal Chain Capacity efficiently. Coal Chain Capacity incorporates system resources outside of ARTC's rail network and it could be argued that incentives to utilise Coal Chain Capacity efficiently should be more appropriately addressed in pricing across the all elements of the Hunter Valley Coal Chain and with respect to the consumption of the capacity of those specific elements of the Hunter Valley Coal Chain. For example, it is not clear that pricing with respect to the use of the terminals, nor above rail resources, is differentiated having regard to consumption of Coal Chain Capacity.

Nevertheless, it is not clear that price differentiation under the CQCR multi-part pricing structure has regard to consumption of coal chain capacity. Indeed, variations to the reference tariffs for train configurations other than the reference train configuration would seem to explicitly consider only cost and risk impacts to Aurizon Network Access and consumption of network capacity⁹.

As such, it is not clear to ARTC whether the adoption of a multi-part pricing structure with a number of different pricing units would deliver any substantive benefits in relation to providing incentives for efficient consumption of Capacity over the two part pricing structure expressed in terms of gtkm currently used in the Hunter Valley.

⁹ QR Network 2010 Access Undertaking, Schedule F, Part A, Clause 3.

In addition the adoption of a more complex pricing structure is likely to result in cost and time impacts associated with substantial re-development of ARTC billing systems.

ARTC seeks stakeholder views in relation to the extent to which the multi-part pricing approach applied to coal in the CQCR and the use of a range of different pricing units acts to provide incentive to consume network capacity efficiently.

ARTC seeks stakeholder views in relation to how the multi-part pricing approach applied to coal in the CQCR and the use of a range of different pricing units would result in substantive improvements over the existing coal access pricing approach in the Hunter Valley and the use of gtkm, in relation to encouraging efficient consumption of Capacity.

ARTC seeks stakeholder views in relation to whether the benefits of adopting a multi-part pricing approach applied to coal in the CQCR and a range of different pricing units would significantly outweigh the costs associated with adopting such an approach.

6. Stakeholder Consultation

In this paper, ARTC has sought to:

- describe its relevant obligations under Section 4.18 of the 2012 HVAU;
- describe stakeholder and regulatory views expressed during consultation on the 2011 HVAU;
- describe and discuss the existing pricing approach under the 2012 HVAU and, in particular, the expression and application of gtkm as a pricing unit;
- describe and discuss some other pricing approaches and pricing units arising from earlier consultation and in other similar rail jurisdictions; and
- seek stakeholder views in relation to a number of questions raised throughout this paper.

This consultation specifically relates to a review as to whether gtkm represents an appropriate pricing unit to encourage efficient consumption of Capacity, as provided under Section 4.18 of the 2012 HVAU. ARTC will therefore have regard to any submissions made with this in mind.

Within this context, ARTC seeks stakeholder views through written submissions and questions raised in this paper are not intended to limit the breadth of such views.

Attachment A

TABLE 2 – Excerpt from page 14 of Supporting Document to ARTC Revised Variation Application, Sept 2012

<p>During the Initial and Interim Periods, ARTC intends to determine IAC, Interim Access Charges and Charges for non-Indicative Services on the following basis.</p> <p>As a minimum, ARTC will consider:</p> <ul style="list-style-type: none"> • the relative consumption of: <ul style="list-style-type: none"> ○ ARTC's maintenance resource and cost; and ○ ARTC Capacity resource and cost, for the Service compared to the relevant Initial Indicative Service based on the relevant: <ul style="list-style-type: none"> ○ assumptions; ○ methodologies; and ○ any reasonable adjustments to reflect practical considerations similar to those, as indicated in supporting documents¹⁰ to the Variation application. • the relative consumption of Coal Chain Capacity for the Service compared to the relevant IIS where this is supported by available HVCCC modelling in the circumstances (or as contemplated under the 2011 HVAU) including the relevant <ul style="list-style-type: none"> ○ assumptions; ○ methodologies; and ○ any reasonable adjustments to reflect practical considerations similar to those, as indicated in supporting documents¹¹ to the Variation application.
<p>In determining pricing differentials, ARTC will weight its consideration in relation to the above factors having regard to:</p> <ul style="list-style-type: none"> • its cost structure; and • the importance placed by the industry on providing incentives for efficient utilisation of Coal Chain Capacity, as indicated in supporting documents¹² to the Variation application.
<p>In determining pricing differentials, ARTC:</p> <ul style="list-style-type: none"> • will incorporate the requirements of Section 4.15(a)(iii) during the Regulatory Transition Period; • may consider other factors as contemplated at Section 4.15 including any variation to the terms and conditions incorporated in the Indicative Access Holder Agreement or Indicative Operator Sub-Agreement relevant to the Charge; and • may alter the assumptions, methodologies or adjustments described above, but only where there is a reasonable basis for doing so.
<p>The following outcomes could be expected to arise where the above basis for determining IIS, Interim Access Charges and Charges for non-Indicative Services is applied. Where:</p> <ul style="list-style-type: none"> • all other material aspects of the terms and conditions of access are equal; • there are no pricing impacts based on factors prescribed at Sections 4.15(a)(ii), 4.15(a)(iii); and • there is no reasonable basis to adjust impacts based on practical considerations, <p>the following could be expected in a Pricing Zone:</p> <ul style="list-style-type: none"> • a negative(positive)¹³ price differential will arise where a Service operates with a higher(lower) average or maximum axle load than the IIS due to variable and fixed maintenance impact; • a negative(positive) price differential will arise where a Service operates with a higher(lower) average or maximum speed than the IIS due to variable and fixed maintenance impact; • a negative(positive) price differential will arise where a Service operates with a lower(higher) gross mass than the IIS due to Capacity impact¹⁴; • a negative(positive) price differential will arise where a Service is shown by available HVCCC modelling in the circumstances (or as contemplated under the 2011 HVAU) consumes more(less) Coal Chain Capacity¹⁵; • an overall price differential will result from the weighted combination of the above differentials, but a Service consuming, on balance, more of ARTC's maintenance and Capacity resources, and Coal Chain Capacity will result in a negative price differential; and • Services other than the relevant IIS will result in a negative price differential.

¹⁰ Attachment B to Variation application (1 Dec 2011), and ARTC response to the ACCC information request (February 2012).

¹¹ Ibid

¹² Ibid

¹³ A negative price differential is taken as leading to a higher price; a positive price differential is taken as leading to a lower price.

¹⁴ This applies where resulting path requirements consume the same amount of Capacity

¹⁵ Higher Coal Chain Capacity consumption would normally be evidenced in available HVCCC modelling by lower coal chain throughput as a result of operating the Service compared to the IIS.