MEMORANDUM

TO: GTAC Stakeholders

FROM: First Gas

DATE: 31 July 2018

RE: Block 2 Support - 5 Pricing Methodology

This memo provides an overview of the pricing methodology for gas transmission services under the GTAC. The purpose of the memo is to demonstrate how First Gas intends to set prices to comply with the regulatory controls set by the Commerce Commission. We then compare these prices with existing prices charged under the VTC/MPOC and potential changes to the amount paid by each shipper.

This memo is provided to give more certainty to stakeholders on the likely changes arising from the implementation of the GTAC. While the methodology presented in this memo explains the intended approach to pricing under the GTAC, it is preliminary and will be subject to change. This memo also complements information released in 2017 on the intended pricing approach (see for example slides 6-9 of http://www.gasindustry.co.nz/work-programmes/transmission-pipeline-access/developing/gtac-phase-1-development/revised-draft-gtac-11-september-2017/)

This information is presented for discussion at the workshop on 9 August.

Key principles behind the pricing

The revenue that First Gas can earn from providing gas transmission services is capped under the Default Price-quality Path (DPP) set by the Commerce Commision. The current DPP runs from 2017 to 2022. The allowable revenue is primarily derived from the value of regulated transmission assets and the allowable rate of return set by the Commission. All inputs need to be in line with the Input Methodologies (IMs) developed by the Commerce Commission in 2010 and amended in 2016.

All revenue earned from use of the gas transmission system to transport gas – transmission fees (standard fees, non-standard fees, underrun and overrun fees) and interconnection fees – are covered by the DPP. Balancing charges (including any charges for park and loan) are classified as recoverable costs/credits under the IMs and are passed through directly to system users.

Our pricing methodology is also informed by the pricing principles contained in Information Disclosure regulations. In considering how prices should be set, we have applied those principles in the following way:

- Pricing for zones and delivery points should reflect usage of the system – i.e. deliveries to points further out in the system should pay more
- Pricing at the zone and delivery point level should continue along the same trajectory established under the VTC and MPOC to ensure there are consistent incentives for gas usage in a particular region and any tariff shock is minimised
- Revenue generated from each shipper should be consistent with previous years revenue to avoid shocks to individual businesses from the change.

In applying these principles, we recognise that the move to the GTAC will still change the prices that are charged to particular shippers and end-users.

Pricing Methodology under the GTAC

The basis of the GTAC pricing methodology has been to identify what revenue is currently earned from each GTAC zone and dedicated delivery point, and to convert this revenue into a DNC fee for the corresponding zone or delivery point. This ensures that a consistent level of revenue will be collected at each location on the network on an annual basis.

The use of zonal pricing under the VTC and distance-based charging on the Maui pipeline means that existing prices reflect usage of the system in terms of distance travelled on the network. This pricing incorporates changes to underrun and overrun fee settings as per our memo *'Block 2 Support Materials – 4 Overrun/Underrun Incentive Charging'* (F=1.5 for overrun and F-2 for underrun). Revenue from Overflow Fees has not been included in the assessment since this is expected to be zero.

Forecasting flows for the coming pricing year

Each year First Gas forecasts demand at each delivery point for the coming the year starting 1 October. This forecasting is undertaken by an independent expert and peer reviewed internally by First Gas staff. Forecasts take account of growth in existing loads as well as known new loads coming onto the system. As all gas enters the system in the GTAC receipt zone (Taranaki), there is no pricing need to examine the specific entry point of gas into the system.

Forecasting overruns and underruns

We used proxy data to look at the potential for overrun at each delivery point and delivery zone as follows:

- VTC system - data from BPP pool receipts in relation to deliveries
- Maui system – data from intra-day 4 nominations in relation to actual flows

From this analysis, we were able to classify zones based on their potential to overrun or underrun and assigned overrun and underrun values as shown in the table below. These categorisations were applied based on the characteristics of flows at each points. Dedicated Delivery Points were more likely to be categorised as 'low' while deliveries to mass market shippers were assigned to higher categories.

Category	Underrun	Overrun
Low	1.00%	1.00%
Low/Medium	2.00%	2.30%
Medium	4.00%	4.60%
Medium/High	5.00%	5.75%
High	6.00%	6.90%

Establishing the DNC revenue base

The transmission system revenue base for FY 2018/19 was established based on the Forecast Allowable Revenue under the DPP including pass through and recoverable costs. The forecast revenue from supplementary agreements (SAs) and interconnection agreements (ICAs) was then deducted from the total revenue base to establish the base for DNC revenue.

DNC Revenue at GTAC Delivery Zone and Delivery Point level

The revenue for each Delivery Point and Zone was then allocated based on:

- Forecast VTC charges for each delivery point based on capacity, throughput and overrun charges. This estimate excluded SA and ICA revenue.
- Forecast MPOC revenue from small Welded Points, dedicated Delivery Points and TP Welded Points (Frankley Road, Pokuru, Pirongia and Rotowaro). The TP Welded Point charges from the MPOC were then apportioned to each delivery point proportionally to the forecast flows for each point under the VTC.
- Adjustment to the allocation of Target Revenue to each Delivery Zone was then made based on the following:
    - a comparison of the notional per GJ charge unit charge under the MPOC/VTC using forecast flows and the same value based on the previous year's capacity bookings. This ensured that there was a control on the until price in setting revenue.
    - any macro adjustments to ensure equity between Delivery Zones and Points on a geographic basis.

Those charges were totalled per Delivery Zone or Delivery Point as required to give the Target Revenue for the location in question.

DNC fee calculation

The DNC fee for each Delivery Zone or Delivery Point was then calculated using the Target Revenue for each point or zone divided by the sum of the throughput, overrun and underrun volumes as follows:

$$DNC\ Fee = DNC\ Target\ Revenue / (Throughput\ Quantity + Overrun\ Quantity \times F + Underrun\ Quantity \times (F-2))$$

Pricing for subsequent years

While the comparison for the first year of the GTAC will look back to the VTC and MPOC revenue, in the second year of operation pricing will be able to take into account the following data from the first year of operation:

- Transmission revenue in each Delivery Zone and Delivery Point
- Overrun and underruns in each Delivery Zone and Delivery Point
- Any overflow charges (which we expect to be zero).

Pricing will also take into account any eventual design changes from subsequent GTAC workshops – such as peaking regime charges and changes to nominations for mass market shippers.

Pricing Dry Run

The following sections present how the methodology described above has been applied to forecast flows for the 2018/19 pricing year (i.e. as if the GTAC had come into effect on 1 October 2018). Draft prices have been released for the VTC and final pricing for the MPOC will be released on 2 August. This work, and the resulting revenue forms the comparison for the pricing and our analysis of the appropriateness of the pricing in terms of consistency of pricing at the shipper, Zone and Point level.

This dry run is based on:

- Draft Forecast Allowable Revenue under the First Gas DPP based on the Commerce Commission IMs
- Draft forecast flows generated for the draft 2018/19 TPM under the VTC and MPOC
- Changes to incentive fee settings to set F = 1.5 for overruns and underruns are calculated with (F-2)
- No consideration of Overflow Fee revenue
- No consideration of any rebates applying to Overrun and Underrun Fees (which will be discussed separately).

This work also does not take into account the potential introduction of a mass market auto-nomination and related charging regime for daily overruns and underruns.

It is important to note that these results are preliminary only and are subject to other changes to the GTAC that arise from subsequent workshops. Final pricing during the first year of the GTAC will also depend on forecast flows for the first year of the GTAC. If the GTAC is to go live on 1 October 2019, we expect to release the final prices that will apply by 30 June 2019.

Allocation of revenue between zones

The GTAC and VTC/MPOC revenue by Delivery Point and Zone is shown in the table below. The percentage change for each location is also given with discussion of the rationale for any changes.

Zone	August 2017 Naming	2018/19 Pricing Inputs			Change (%)	Comments
		Throughput (GJ)	VTC/MPOC Revenue ($)	GTAC Revenue ($)		
Delivery Zones						
Northland	Zone 5	317,843	$826,492	$784,468	-5.1%	Adjustment made to moderate zone pricing
Auckland	Zone 4	15,553,280	$29,930,392	$29,690,532	-0.8%	
Waikato North	Zone 6	1,810,162	$3,721,479	$3,599,635	-3.3%	
Hamilton	Hamilton	1,626,164	$2,138,247	$2,333,234	9.1%	Align with other points in the region
Mokau North	Zone 3	710,906	$1,520,008	$1,413,687	-7.0%	Align pricing in Waikato North and Waikato South
Waikato South	Zone 13	4,397,206	$10,031,054	$8,744,348	-12.8%	Align ricing in Waikato North and Mokau North
Bay of Plenty West	Zone 14	1,085,544	$2,363,830	$2,508,443	6.1%	Reallocation to align pricing on a regional basis
Bay of Plenty South	Zone 15	1,754,742	$3,814,005	$4,211,606	10.4%	Reallocation to align pricing on a regional basis
Bay of Plenty East	Zone 16	1,224,698	$4,079,788	$3,105,406	-23.9%	Reallocation to align pricing on a regional basis
Eastland	Zone 17	425,521	$1,297,621	$1,097,303	-15.4%	Reallocation to align pricing on a regional basis
Central South	Zone 7	1,134,173	$714,495	$453,483	-36.5%	Reallocation to align pricing with Mokau South
Mokau South	Zones 1&2	7,629,047	$2,807,007	$3,050,366	8.7%	Reallocation to align pricing with Central South
South Taranaki – Whanganui	Zone 8	1,450,828	$2,701,737	$2,543,806	-5.8%	Reallocation to allow for unit price consistency
Manawatu – Horowhenua	Zones 9&11	2,473,302	$5,015,182	$4,433,328	-11.6%	Reallocation to allow for unit price consistency
Hawkes Bay	Zone 10	2,079,646	$3,874,309	$3,823,895	-1.3%	
Wellington	Zone 12	4,251,041	$9,199,378	$9,161,236	-0.4%	
Delivery Points						
Bertrand Road (Waitara Valley)		17,711,098	$2,895,309	$2,867,498	-1.0%	
Faull Road		10,287,409	$784,343	$777,058	-0.9%	
Huntly Power Station		24,963,209	$11,602,152	$11,489,668	-1.0%	
Ngatimaru Rd (Delivery)		42,477,457	$5,103,620	$5,054,526	-1.0%	
TOTAL		143,363,276	$101,143,528	$101,174,844		

Compliance with Forecast Allowable Revenue

The following table shows the build-up of forecast allowable revenue for the 2018/19 year. These figures are the draft inputs to our current TPM.

	Amount
Forecast Net Allowable Revenue	$123,904,000
Pass-through and recoverable costs	$4,016,527
Forecast Allowable Revenue	$127,920,527

Our modelling then builds up the Target Revenue ensuring that the Forecast Allowable Revenue is not exceeded. This is an iterative process. The first step is to split out the interconnection fees and non-standard revenue as shown in the table below, which are estimated using the throughput forecasts for the Delivery Points in question. The Target Revenue for standard products from Delivery Points and Zones can then be calculated. The table below shows that the calculated Target Revenue complies with the Forecast Allowable Revenue

Revenue Component	
Forecast Allowable Revenue (A)	$127,920,527
Target Revenue	
ICA Revenue (B)	$882,676
SAs Revenue (C)	$25,865,192
Standard Pricing - Delivery Zones (D)	$80,954,777
Standard Pricing - Delivery Points (E)	$20,188,750
Target Revenue (F = B + C +D + E)	$127,891,396
Difference (A – F)	**- $29,131**
Compliant?	**YES**

Calculation of DNC fees

The resulting DNC fees for each Delivery Zone and Delivery Point are shown in the table below. Underruns and overruns were estimated as between 1% and 6% of flows depending on the characteristics of the flows at the site. The estimated DNC Fee presented to stakeholders in 2017 is shown for comparison along with any reasons for material changes. Based on the analysis below, there are some changes to the pricing relative to the indicative prices presented in August 2017. These are largely due to different treatment of SA capacity. The removal of this capacity from a zone can significantly change the volumes and

therefore the DNC Fee calculation. Other changes have evolved from a desire to harmonise fees across the transmission system – such as those in Hamilton.

Zone	Overrun/ Underrun Category	Current DNC Fee Estimated ($/GJ)	Notional DNC Fee Under MPOC/VTC ($/GJ)	DNC Fee Estimated in 2017 ($/GJ)	Comments on differences 2017 to 2018
Delivery Zones					
Northland (Zone 5)	MH	$2.33	$2.60	$1.98	
Auckland (Zone 4)	MH	$1.80	$1.92	$1.77	
Waikato North (Zone 6)	MH	$1.87	$2.06	$2.02	Align with Mokau North
Hamilton (Hamilton)	MH	$1.35	$1.31	$1.12	Align with nearby zones
Mokau North (Zone 3)	MH	$1.87	$2.14	$1.16	Align with Waikato North
Waikato South (Zone 13)	H	$1.85	$2.28	$1.88	
Bay of Plenty West (Zone 14)	H	$2.15	$2.18	$2.07	Align with Waikato
Bay of Plenty South (Zone 15)	H	$2.24	$2.17	$2.08	More granular pricing adopted
Bay of Plenty East (Zone 16)	H	$2.36	$3.33	$2.08	More granular pricing adopted
Eastland (Zone 17)	H	$2.40	$3.05	$2.08	More granular pricing adopted
Central South (Zone 7)	M	$0.38	$0.63	$1.92	Change to SAs in the region
Mokau South (Zone 1-2)	M	$0.38	$0.37	$0.72	Change to SAs in the region
South Taranaki – Whanganui (Zone 8)	M	$1.67	$1.86	$1.92	Change to SAs in the region
Manawatu – Horowhenua (Zone 9-11)	M	$1.71	$2.03	$2.14	Changes to forecast flows
Hawkes Bay (Zone 10)	M	$1.75	$1.86	$1.77	
Wellington (Zone 12)	M	$2.05	$2.16	$2.18	Changes to forecast flows
Delivery Points					
Bertrand Road (Waitara Valley)	L	$0.160		NA	
Faull Road	L	$0.075		NA	
Huntly Power Station	L	$0.456		NA	
Ngatimaru Rd (Delivery)	L	$0.118		NA	

How are shippers likely to be affected by the changed fee structure?

In order to assess the impact on shippers on the revised pricing we examined the forecast fees paid in 2018/19 in comparison to the amounts that would have been paid under a VTC/MPOC regime in the same year. As activity under the GTAC is unknown, the estimates for this comparison have been made as follows:

- GTAC – revenue has been calculated using the DNC Fees calculated above and the actual flows for 2016/17. Underrun and overrun fees were based on the categorisation of Delivery Point accuracy given previously.
- VTC/MPOC - while the volumes at Delivery Points has been estimated for the Draft 2018/19 VTC/MPOC TPMs, we have not estimated these volumes by shipper. We have therefore estimated this based on the 2016/17 VTC/MPOC revenue per shipper and pro-rated this across forecast 2018/19 volumes.

The resulting percentage change for each shipper is given in the table below. From an analysis of shipper volumes, the largest drop in overall revenue are shippers who had large volumes of unused capacity reservation under the VTC. However, there are no parties are likely to increase costs by more than 7% in this analysis. This percentage change is likely to alter when auto-nomination charges and other charges are taken into account.

Shipper	GTAC Revenue as Percentage of MPOC/VTC Revenue	Net % Incentive charges
Shipper A	-6.4%	5%
Shipper B	-3.7%	2%
Shipper C	7.0%	6%
Shipper D	-17.3%	8%
Shipper E	4.5%	7%
Shipper F	-6.1%	7%
Shipper G	-22.5%	8%
Shipper H	0.4%	1%

The net incentive charges paid (overruns + underruns) by each shipper as a percentage of standard GTAC revenue (DNC Fees) is also shown in the table. This shows a range of incentive fees between 1% and 8% of DNC revenue. Some of the shippers at the higher end of this range are mass market shippers. This analysis does not take into account the potential for the implementation of a mass market auto-nomination scheme and therefore this percentage may reduce if this scheme is introduced.

Conclusions

Based on the analysis of the pricing dry run results we are satisfied that the methodology provides stability in terms of pricing for our customers in relation to amounts paid under the VTC and MPOC. We also feel that the methodology reflects the use of the system and provides for equity between users at the same location. Given that a single pricing approach applies across the network, this approach is inherently simper than the combination of distance based and zonal prices that apply under the MPOC/VTC. Further information on the pricing is given in Appendix 1 while a full table of all the Delivery Points is given in Appendix 2.

We look forward to discussing this work with stakeholders at the workshop on 9 August.

Appendix 1 – Detailed pricing information.

Table by zone and point of underruns, overruns, revenue pricing and full comparison to VTC/MPOC.

Zone	DNC	Underruns	Overruns	DNC $	Underrun $	Overrun $	Total $
Northland	317,843	15,892	18,276	739,193	-18,480	63,755	784,468
Auckland	15,553,280	777,664	894,314	27,976,944	-699,424	2,413,011	29,690,532
Waikato North	1,810,162	90,508	104,084	3,391,883	-84,797	292,550	3,599,635
Hamilton	1,626,164	81,308	93,504	2,198,572	-54,964	189,627	2,333,234
Mokau North	710,906	35,545	40,877	1,332,096	-33,302	114,893	1,413,687
Waikato South	4,397,206	263,832	303,407	8,145,644	-244,369	843,074	8,744,348
Bay of Plenty West	1,085,544	65,133	74,903	2,336,696	-70,101	241,848	2,508,443
Bay of Plenty South	1,754,742	105,285	121,077	3,923,247	-117,697	406,056	4,211,606
Bay of Plenty East	1,224,698	73,482	84,504	2,892,786	-86,784	299,403	3,105,406
Eastland	425,521	25,531	29,361	1,022,173	-30,665	105,795	1,097,303
Central South	1,134,173	45,367	52,172	432,300	-8,646	29,829	453,483
Mokau South	7,629,047	305,162	350,936	2,907,880	-58,158	200,644	3,050,366
South Taranaki - Whanganui	1,450,828	58,033	66,738	2,424,982	-48,500	167,324	2,543,806
Manawatu - Horowhenua	2,473,302	98,932	113,772	4,226,242	-84,525	291,611	4,433,328
Hawkes Bay	2,079,646	83,186	95,664	3,645,276	-72,906	251,524	3,823,895
Wellington	4,251,041	170,042	195,548	8,733,304	-174,666	602,598	9,161,236

Appendix 2 – Table of delivery point allocation to zones

GTAC Zone	Delivery Point
Auckland	Alfriston
Auckland	Drury 1
Auckland	Flat Bush
Auckland	Glenbrook
Auckland	Greater Auckland
Auckland	Harrisville 2
Auckland	Hunua
Auckland	Hunua (Nova)
Auckland	Hunua 3
Auckland	Kingseat
Auckland	Pukekohe
Auckland	Ramarama
Auckland	Tuakau 2
Bay of Plenty East	Edgecumbe
Bay of Plenty East	Edgecumbe DF
Bay of Plenty East	Te Teko
Bay of Plenty East	Whakatane
Bay of Plenty South	Broadlands
Bay of Plenty South	Kawerau
Bay of Plenty South	Kawerau (ex-Caxton)
Bay of Plenty South	Kawerau (ex-Tasman)
Bay of Plenty South	Reporoa
Bay of Plenty South	Rotorua
Bay of Plenty South	Taupo
Bay of Plenty West	Greater Mt Maunganui
Bay of Plenty West	Greater Tauranga
Bay of Plenty West	Rangiuru
Bay of Plenty West	Te Puke
Central South	Eltham
Central South	Inglewood
Central South	Kaponga
Central South	New Plymouth
Central South	Stratford
Central South	Waitara
Eastland	Gisborne
Eastland	Opotiki
Hamilton	Greater Hamilton
Hawkes Bay	Dannevirke
Hawkes Bay	Hastings
Hawkes Bay	Hastings (Nova)

GTAC Zone	Delivery Point
Hawkes Bay	Mangaroa
Hawkes Bay	Takapau
Manawatu - Horowhenua	Ashhurst
Manawatu - Horowhenua	Feilding
Manawatu - Horowhenua	Flockhouse
Manawatu - Horowhenua	Foxton
Manawatu - Horowhenua	Kairanga
Manawatu - Horowhenua	Kakariki
Manawatu - Horowhenua	Kuku
Manawatu - Horowhenua	Lake Alice
Manawatu - Horowhenua	Levin
Manawatu - Horowhenua	Longburn
Manawatu - Horowhenua	Mangatainoka
Manawatu - Horowhenua	Marton
Manawatu - Horowhenua	Oroua Downs
Manawatu - Horowhenua	Pahiatua
Manawatu - Horowhenua	Pahiatua DF
Manawatu - Horowhenua	Palmerston North
Mokau North	Huntly
Mokau North	Ngaruawahia
Mokau North	Otorohanga
Mokau North	Pirongia
Mokau North	Te Awamutu DF
Mokau North	Te Kuiti North
Mokau North	Te Kuiti South
Mokau South	Ballance 8201
Mokau South	Ballance 9626
Mokau South	Kapuni (Lactose et al)
Mokau South	KGTP Delivery
Mokau South	Kupe Delivery Point
Mokau South	Oakura
Mokau South	Okato
Mokau South	Opunake
Mokau South	Pungarehu No 1
Mokau South	Pungarehu No 2
Northland	Marsden 2
Northland	Waitoki
Northland	Warkworth
Northland	Wellsford
Northland	Whangarei
South Taranaki - Whanganui	Hawera
South Taranaki - Whanganui	Hawera (Nova)
South Taranaki - Whanganui	Kaitoke

GTAC Zone	Delivery Point
South Taranaki - Whanganui	Manaia
South Taranaki - Whanganui	Matapu
South Taranaki - Whanganui	Mokoia
South Taranaki - Whanganui	Patea
South Taranaki - Whanganui	Waitotara
South Taranaki - Whanganui	Wanganui
South Taranaki - Whanganui	Waverley
Waikato North	Cambridge
Waikato North	Horotiu
Waikato North	Kiwitahi 1 (Peroxide)
Waikato North	Kiwitahi 2
Waikato North	Matangi
Waikato North	Morrinsville
Waikato North	Morrinsville DF
Waikato North	Tatuanui DF
Waikato North	Waitoa
Waikato South	Greater Kihikihi
Waikato South	Kinleith
Waikato South	Kinleith (CHH mill)
Waikato South	Lichfield 2
Waikato South	Lichfield DF
Waikato South	Okoroire Springs
Waikato South	Putaruru
Waikato South	Tirau
Waikato South	Tirau DF
Waikato South	Tokoroa
Waikato South	Waikeria
Wellington	Belmont
Wellington	Greater Waitangirua
Wellington	Otaki
Wellington	Paraparaumu
Wellington	Pauatahanui 2
Wellington	Tawa A
Wellington	Tawa B (Nova)
Wellington	Te Horo
Wellington	Waikanae 2