MAY 2000

TRANSCO PRICING CONSULTATION PAPER PC56

Optional LDZ Tariff

SUMMARY

Loads which utilise the LDZ system presently attract LDZ commodity and capacity charges, with the unit rate payable based on load size. This paper proposes introduction of an optional LDZ tariff which could prove attractive for large LDZ connected loads located close to the NTS.

The rationale for the optional tariff is that, for large LDZ loads located close to the NTS, the standard tariff can appear to give perverse economic incentives for the construction of new pipelines to supply loads that are already connected to the transportation system, or for potential new loads to build lengthier and costlier pipelines than are available via nearby LDZ connections. This may give rise to economically inefficient bypass of Transco's system, and unnecessary duplication of infrastructure.

Shippers opting for the proposed optional tariff would pay this one tariff instead of the existing LDZ commodity and capacity charges in respect of the relevant loads.

The proposed charge is based on the estimated costs to Transco of laying and connecting a dedicated pipeline for a range of flowrates and distances from the NTS.

1. INTRODUCTION

In June 1998, Transco introduced an optional NTS commodity charge which may be attractive for large loads located close to an entry terminal, providing a more cost-reflective level of charge than the standard NTS commodity charge.

This paper proposes the introduction of a similar optional LDZ tariff. The tariff has been calculated using the same methodology that was applied for the NTS tariff, basing the charge on the cost of building and connecting a dedicated pipeline for a range of flow rates and distances from the NTS.

However, in the proposed application of the LDZ tariff there are two differences from the optional NTS commodity charge. Firstly, shippers using the optional NTS commodity tariff continue to pay capacity charges where applicable. Shippers using the optional LDZ tariff would pay this one tariff instead of both the standard LDZ charges. Secondly, whereas the optional NTS tariff is a commodity charge the proposed optional LDZ tariff would be a capacity based charge (see Section 3).

The tariff would operate in a similar way to the NTS tariff in that shippers would apply to use it for relevant sites, and there would be a verification and appeals procedure to check that the data for a specific site is accurate so that the correct charge can be calculated.

2. RELEVANT LEGISLATION

2.1 Gas Act Obligations with Regard to Efficiency

Section 9(1) of the Gas Act requires PGTs to develop and maintain an efficient and economical pipeline system.

Transco believes that there could be a reduction in efficiency if, as a result of the present structure, users decide to abandon their existing connection to the Transco system or potential new loads decide to seek to bypass the LDZ network and connect directly to the NTS. In this event there could be a small reduction in Transco's variable costs but, assuming they are recognised when the price control formula is set, the remaining non-marginal costs would be met by the balance of system users. Therefore, this would ultimately be expected to lead to higher prices for system users.

2.2 Relevant Objectives of Condition 4 of Transco's PGT Licence

Transco is obliged by Condition 4 of its PGT licence to modify its charging methodology from time to time in order that it better achieves the relevant objectives of the methodology set out in Condition 4(5). Transco believes that the introduction of the proposed optional LDZ tariff would assist in achieving these objectives, which are set out below.

a) Reflects the Costs Incurred by Transco

The existing charging methodology uses an averaging approach to determine charges for customers. It bases charges on costs by pressure tier and average use of the pressure tiers by particular sizes of customer. This methodology represents an equitable and practical way of reflecting LDZ costs in charges. However, for a small number of large loads located close to the NTS, the charges may be greater than the

annualised cost of building and maintaining a new dedicated pipeline. In these cases it may be appropriate to offer an optional tariff based on these costs rather than on the averaging method described above.

Transco has related the proposed tariff to the costs of a standalone pipeline to avoid the possible accusation of predatory pricing. Transco believes that the marginal costs/savings are much lower than the costs of building a dedicated pipeline.

b) Takes Account of Developments in the Transportation Business

Some large loads located close to the NTS may find it beneficial to build a new dedicated pipeline and Transco has received a small number of enquiries along these lines. A reduction in the efficiency of Transco's system from a potential bypass could ultimately lead to higher prices. Transco is therefore proposing the optional LDZ tariff to try and ensure there is no reduction in the efficiency of the system.

c) Facilitates Competition Between Shippers and Between Suppliers

The proposal is not expected to affect competition between Shippers nor between Suppliers.

3. STRUCTURE OF OPTIONAL LDZ TARIFF

The optional LDZ tariff would be paid instead of the standard LDZ commodity and capacity charges, and it would be a capacity charge because it is based on the cost of building a dedicated pipeline, which is primarily related to the capacity required rather than the annual throughput. The optional LDZ tariff, in being a replacement for both LDZ commodity and capacity charges, would be different from the optional NTS commodity tariff, which is an alternative to the standard NTS commodity charge only. However, in the NTS case, connection to the NTS system instead of a stand-alone pipeline confers the benefit of access to the NBP, providing alternative supply possibilities, and thus provides a higher service level compared to having a dedicated pipeline. Hence, shippers on the optional NTS tariff still incur capacity charges. In the LDZ case, the flexibility of supply would still be available with a direct NTS connection and so the LDZ connection may not provide a higher service level.

The proposed price function for the tariff (in p/pdkWh/d) is as follows :

$$902 \times [(SOQ)^{-0.834}] \times D + 772 \times (SOQ)^{-0.717}$$

where **SOQ** is the Registered Supply Point Capacity in kWh per day,

and **D** is the direct distance, in km, from the site boundary to the nearest point on the NTS.

The derivation of this function is shown in the Appendix to this paper.

The charging function represents the estimated costs of laying a dedicated pipeline for a range of flowrates and distances from the NTS. For a firm load with a SOQ of 10GWh, the optional charge would be cheaper than standard charges provided the load is within 17km of the NTS – if interruptible, the load would need to be less than 6km from the NTS. The break-even distances for loads upto 20 GWh is set out in the table below. For a given load size, it would be beneficial to switch to the optional LDZ tariff provided the distance is less than that shown in the table.

Break-even distances (km)

SOQ GWh/d	Interruptible	Firm
1		1.2
2	0.2	3.9
3	1.2	6.1
4	2.0	8.1
5	2.8	9.8
6	3.5	11.4
7	4.1	12.9
8	4.7	14.2
9	5.2	15.6
10	6.2	17.3
12	8.0	20.5
15	10.6	25.1
20	14.9	32.4

The table above has been calculated assuming a load factor of 75%. For a fixed SOQ, a higher load factor would increase the standard LDZ commodity charge which, when expressed as capacity equivalent, also becomes more expensive and thus makes the optional LDZ charge more attractive. This has the equivalent affect of increasing the break-even distances, for higher load factor loads, compared to those shown in the table.

To demonstrate the level of charge under the optional LDZ tariff, the following table gives the calculated charges, in p/pdkWh/d, for a range of distances and supply point capacities.

Proposed optional LDZ tariff, p/pdKWh/d, for combinations of distances and SOQs

SOQ GWh/d	Distance - km							
	0	2	4	6	8	10	15	20
1	0.0385	0.0564	0.0743	0.0921	0.1100	0.1279	0.1726	0.2173
2	0.0234	0.0335	0.0435	0.0535	0.0635	0.0736	0.0986	0.1237
3	0.0175	0.0247	0.0318	0.0390	0.0461	0.0533	0.0711	0.0890
4	0.0143	0.0199	0.0255	0.0311	0.0368	0.0424	0.0564	0.0705
5	0.0121	0.0168	0.0215	0.0262	0.0308	0.0355	0.0472	0.0588
6	0.0107	0.0147	0.0187	0.0227	0.0267	0.0307	0.0407	0.0508
7	0.0095	0.0131	0.0166	0.0201	0.0237	0.0272	0.0360	0.0448
8	0.0087	0.0118	0.0150	0.0181	0.0213	0.0244	0.0323	0.0402
9	0.0080	0.0108	0.0137	0.0166	0.0194	0.0223	0.0294	0.0366
10	0.0074	0.0100	0.0126	0.0152	0.0179	0.0205	0.0270	0.0336
12	0.0065	0.0087	0.0110	0.0132	0.0155	0.0177	0.0234	0.0290
15	0.0055	0.0074	0.0093	0.0111	0.0130	0.0149	0.0195	0.0242
20	0.0045	0.0060	0.0074	0.0089	0.0104	0.0118	0.0155	0.0192

4. DEFINITION OF SOQ & DISTANCE

SOQ : Existing definitions of SOQ would also apply for the purposes of the optional LDZ tariff. Most significantly, where there is an allocation arrangement or CSEP, the SOQ for inclusion in the optional LDZ tariff calculation would be based on the aggregate of the Supply Point.

Distance : The value of "D" (distance in km) will be determined as the notional straight-line distance of a pipeline between the supply point and the nearest point on the NTS.

5. ADMINISTRATION OF SERVICE

It is proposed that the optional LDZ tariff would be administered in a similar way to the optional NTS tariff, in that shippers would have to apply for a particular site to be charged at the optional rate. However, to try to avoid unnecessary administration on the part of both Transco and shippers, Transco proposes to endeavour to identify shippers that supply sites expected to benefit from the optional tariff. Shippers would then be required to inform Transco if they were considering utilising the optional tariff for the relevant site(s). Transco would provide the distance, load data, and associated charge for the Shipper to consider. The shipper would then inform Transco that it wished to see such site(s) billed on the basis of the optional tariff.

Unlike the optional NTS tariff there would be no need to specify entry points, or to consider the balance of inputs at terminals against outputs at Supply Points to determine eligibility of volumes for the optional rate. Moreover, because the optional LDZ tariff would be a capacity charge, the tracking of daily volumes would not be necessary for the appplication of LDZ charges.

6. EFFECT ON OTHER SYSTEM USERS

(This section compares the estimated revenue raised from the standard LDZ charges introduced from 1 May 2000 with the proposed optional LDZ tariff.)

Transco estimates that there are about 15 LDZ loads where the proposed optional LDZ tariff is likely to be attractive. If all the identified sites took up this tariff it would reduce transportation revenue by approximately £1.5m in comparison with application of the standard LDZ charges. The forecast annual LDZ revenue at the time of setting the May 2000 charges was £1,535m. In order to recover an additional £1.5m from transportation to all other LDZ loads would require an increase in the standard LDZ charges of 0.1%.

If, however, an optional LDZ tariff is not implemented and all these loads built alternative pipelines, then transportation revenue would reduce by £5.9m. If there were no cost savings this might ultimately be expected to lead to an increase in standard LDZ charges of around 0.4%. However, it is recognised that, should these loads cease to use the LDZ, then it will free up some capacity on the LDZ which may lead to reinforcement cost savings for Transco. A previous paper, PD4, indicated that the marginal costs associated with additional LDZ load are typically considerably below the average costs. The magnitude of these savings is thus likely to be considerably less than the reduction in transportation revenue and, although charges might need to increase by less than 0.4%, the change would be nearer to this level than the 0.1% increase required with the introduction of the optional LDZ tariff.

The introduction of the optional LDZ tariff could therefore, whilst requiring a very small initial increase in standard charges, discourage decisions which could subsequently lead to a larger increase.

QUESTIONS FOR CONSULTATION

Transco propose to introduce an optional LDZ tariff from 1 October 2000.

Transco would welcome respondents' views on the following :

Does this proposed charge better reflect the relevant Gas Act and Licence obligations with respect to the particular loads which might utilise the optional LDZ tariff ?

If it is appropriate to introduce an optional tariff, is the proposed derivation and structure of charge appropriate?

APPENDIX - DERIVATION OF THE PRICING FUNCTION

The methodology to calculate the optional LDZ tariff, as set out below, was also used in Pricing Consultation papers PC9 and PC9A to derive the optional NTS commodity tariff, with two significant differences :

i) the proposed LDZ charge is capacity based whereas the NTS charge is commodity based.

ii) Exclusion of some gas control operation costs.

A relationship of price in pence per kWh per day against flowrate and pipeline distance has been derived based on the capital and operating costs of a notional dedicated pipeline. The proposed price function is made up of two elements, both related to peak load size. The first element is related to the geographical distance from the NTS to the site. The second element is based on those costs which do not vary with distance (connection to the NTS, metering, volumetric control etc.).

Based on these principles, the following price function to calculate the optional LDZ charge has been determined (in pence per peak day kWh per day) :

$$902 \times [(SOQ)^{-0.834}] \times D + 772 \times (SOQ)^{-0.717}$$

where **SOQ** is the Registered Supply Point Capacity in kWh per day,

and **D** is the direct distance, in km, from the site boundary to the nearest point on the NTS.

Where there is an existing allocation arrangement or CSEP at a supply point then the aggregate total SOQ will be the relevant quantity in determining the optional charge.

Table 1 shows the pipe diameters required to meet typical peak day flowrates for a range of pipeline distances, and Table 2 shows pipeline costs per unit length, based on Transco planning and design specifications. In addition there are a number of non-distance related costs e.g. connection, metering, volumetric control etc. The total capital costs for a range of pipeline diameters and lengths may then be calculated by adding the distance related and non-distance related costs - these are shown in Table 3.

The same approach as underpins the Optional NTS Tariff is then followed. By assuming a project life of 10 years and a pre-tax discount rate of 10%, the project costs are annuitised to establish annual costs as shown in Table 4. The ongoing costs of the hypothetical pipeline comprise costs for maintenance of the plant facilities and the pipeline, and formula rates - these are added to the annuitised capital costs (from Table 4) and shown in Table 5.

The next step is to divide the annual costs by the peak day quantities to generate a matrix of unit costs, expressed in pence per peak day kWh per day, for a range of supply point capacities and distances. Separate functions relating distance and non-distance related unit costs and supply point capacities can then be obtained by means of regression analysis on the data. These are shown as graphs at the end of this report. The two elements are then combined to generate the charging function defined above.

Table 1 : Pipeline diameters, in mm, for a range of distances and peak day flows

	Pipeline Length, km							
SOQ GWh	**5**	**10**	**15**	**20**	**25**	**30**	**40**	**50**
1.1	50	100	100	100	100	100	100	100
2.1	100	100	100	100	100	100	100	150
3.2	100	100	150	150	150	150	150	150
4.3	100	150	150	150	150	150	150	150
5.3	100	150	150	150	150	150	150	150
10.7	150	150	150	200	200	200	200	200
21.4	200	200	200	300	300	300	300	300
53.5	300	300	450	450	450	450	450	450
106.9	300	450	450	450	450	450	450	600
160.4	450	450	450	600	600	600	600	600

Table 2 : Pipelaying Unit Costs

Diam. (mm)	50	100	150	200	300	450	600
£/km	125,000	150,000	187,500	202,500	238,750	355,000	414,000

Table 3 : Total Capital Costs for a range of distances and peak-day flowrates

Costs in £000	**Pipeline Length, km**								
SOQ GWh	**0**	**5**	**10**	**15**	**20**	**25**	**30**	**40**	**50**
1.1	£900	£1,525	£2,400	£3,150	£3,900	£4,750	£5,500	£7,000	£8,600
2.1	£1,045	£1,795	£2,545	£3,295	£4,045	£4,895	£5,645	£7,145	£10,620
3.2	£1,045	£1,795	£2,920	£3,858	£4,795	£5,833	£6,770	£8,645	£10,620
4.3	£1,225	£1,975	£3,100	£4,038	£4,975	£6,013	£6,950	£8,825	£10,800
5.3	£1,225	£1,975	£3,100	£4,038	£4,975	£6,013	£6,950	£8,825	£10,800
10.7	£1,625	£2,563	£3,500	£4,438	£5,675	£6,788	£7,800	£9,825	£11,950
21.4	£2,025	£3,038	£4,050	£5,063	£6,800	£8,094	£9,288	£11,675	£14,163
53.5	£2,710	£3,904	£5,098	£8,035	£9,810	£11,685	£13,460	£16,910	£20,660
106.9	£3,010	£4,785	£6,560	£8,335	£10,110	£11,985	£13,760	£17,310	£23,910
160.4	£3,585	£5,360	£7,135	£8,910	£11,865	£14,035	£16,105	£20,245	£24,485

The non-distance related costs are shown in the 0 km column. These comprise :
Pipeline connection, Calorimetry/Chromatograph, Pressure Reduction/Volumetric Control, Pig traps.

Table 4 : Total Capital Costs annuitised over a 10 year period

Costs in £000	Pipeline Length, km								
SOQ GWh	0	5	10	15	20	25	30	40	50
1.1	£133	£226	£355	£466	£577	£703	£814	£1,036	£1,273
2.1	£155	£266	£377	£488	£599	£724	£835	£1,057	£1,572
3.2	£155	£266	£432	£571	£710	£863	£1,002	£1,280	£1,572
4.3	£181	£292	£459	£598	£736	£890	£1,029	£1,306	£1,598
5.3	£181	£292	£459	£598	£736	£890	£1,029	£1,306	£1,598
10.7	£241	£379	£518	£657	£840	£1,005	£1,154	£1,454	£1,769
21.4	£300	£450	£599	£749	£1,006	£1,198	£1,375	£1,728	£2,096
53.5	£401	£578	£754	£1,189	£1,452	£1,729	£1,992	£2,503	£3,058
106.9	£445	£708	£971	£1,234	£1,496	£1,774	£2,037	£2,562	£3,539
160.4	£531	£793	£1,056	£1,319	£1,756	£2,077	£2,384	£2,996	£3,624

Table 5 : Annual Costs based on Annuitised Capital Costs (from Table 4) plus ongoing costs

Costs in £000	Pipeline Length, km								
SOQ GWh	0	5	10	15	20	25	30	40	50
1.1	£156	£339	£528	£696	£865	£1,049	£1,218	£1,555	£1,907
2.1	£181	£384	£553	£721	£890	£1,074	£1,243	£1,580	£2,229
3.2	£181	£384	£612	£810	£1,008	£1,222	£1,420	£1,817	£2,229
4.3	£212	£415	£643	£841	£1,039	£1,253	£1,452	£1,848	£2,260
5.3	£212	£415	£643	£841	£1,039	£1,253	£1,452	£1,848	£2,260
10.7	£281	£514	£712	£911	£1,156	£1,382	£1,592	£2,012	£2,448
21.4	£350	£595	£805	£1,015	£1,340	£1,594	£1,833	£2,310	£2,803
53.5	£469	£742	£981	£1,495	£1,826	£2,172	£2,502	£3,148	£3,840
106.9	£521	£886	£1,217	£1,547	£1,878	£2,224	£2,554	£3,215	£4,358
160.4	£620	£986	£1,316	£1,647	£2,164	£2,556	£2,933	£3,688	£4,458

The ongoing costs comprise :

Maintenance costs, based on 1% of pipeline capital costs + 2.5% of installation capital costs.

Formula rates.

Operating costs.

Table 6 : Unit Costs in pence per peak day kWh per day

p/pdkWh/d	Pipeline Length, km								
SOQ GWh	0	5	10	15	20	25	30	40	50
1.1	0.03939	0.08587	0.13350	0.17613	0.21875	0.26538	0.30801	0.39326	0.48251
2.1	0.02287	0.04861	0.06992	0.09124	0.11255	0.13586	0.15718	0.19980	0.28190
3.2	0.01525	0.03241	0.05161	0.06832	0.08503	0.10307	0.11977	0.15319	0.18794
4.3	0.01340	0.02627	0.04068	0.05321	0.06574	0.07927	0.09180	0.11686	0.14292
5.3	0.01072	0.02102	0.03254	0.04257	0.05259	0.06342	0.07344	0.09349	0.11434
10.7	0.00711	0.01301	0.01802	0.02303	0.02925	0.03496	0.04027	0.05089	0.06192
21.4	0.00443	0.00753	0.01019	0.01284	0.01695	0.02017	0.02318	0.02922	0.03546
53.5	0.00237	0.00376	0.00496	0.00757	0.00924	0.01099	0.01266	0.01592	0.01943
106.9	0.00132	0.00224	0.00308	0.00391	0.00475	0.00563	0.00646	0.00813	0.01102
160.4	0.00105	0.00166	0.00222	0.00278	0.00365	0.00431	0.00495	0.00622	0.00752