Discussion Paper on Proposals to Reform the Transco Energy Incentive - British Gas Trading 11 December 2000

The following paper provides a potential model for revision of the Transco energy incentive mechanism.

The model assumes that there are appropriate incentives on shippers to balance and attempts to align the incentives of both shippers and Transco.

Under the proposal the incentive becomes achievement of balance position at market price. This will provide cashout prices which are reflective of the supply and demand situation on the day whilst simultaneously discouraging the setting of prices which may be considered to be penal. BGT believes that it is vital that Transco is equally incentivised to achieve balance and to have regard to the price at which its actions are taken. It is not desirable for Transco to have regard for only one of these or for Transco to determine which is the more important on any day and therefore aim to achieve the linepack rather than the price incentive at the cost of the other.

The proposed incentive mechanism encourages Transco to find the optimum balance between the price and linepack incentives and will thus give a real indicator of the cost of balancing the system on the day whilst simultaneously ensuring that the correct level of cashout differential is discovered in order that the incentives on shippers to balance are maintained. Such a mechanism will discourage balancing actions that would be likely to set marginal prices at an extreme level, either early or late in the gas day.

Issues with the Current Mechanism

The current energy incentive based on minimising price spreads between SAP and SMP encourages Transco to either:

- take no balancing action, even if this results in a large linepack carry-over between days and a mis-allocation of costs
- take a balancing action in only one direction, again leading to linepack carry-overs between days and mis-allocation of costs
- take larger volumes of gas than may be operationally required so that the SAP is unlikely to move significantly, relative to the marginal price. This may result in higher overall balancing costs.

It was envisaged that such an incentive would reduce the likelihood of Transco accepting high priced bids for small quantities of gas and it has been successful in this. However, it is not at all clear that such an incentive is in line with the interests of the industry given that the type of action this drives Transco to adopt, particularly the carry over of linepack length or shorts and the resulting failure to target costs to the appropriate shippers, or even to the appropriate day. Ofgem analysis demonstrates that between October 1999 and May 2000 end-of-day linepack differentials from target have increased from the pre-incentive regime. During this period, positive differentials (long position) have averaged 4.4 mcm (max of 15 mcm) and have occurred on 70% of days. This feature of the regime has been accompanied by a greater tendency for system sell actions before the gas day suggesting that linepack carry-over results in a mis-allocation of costs between gas days.

The main problem with the current incentive mechanism stems from the fact that it disincentives Transco from taking action if it has already taken action in the opposite direction. This disincentive should be removed.

Transco action on both sides of the market would achieve:

- market reflective incentives for shippers to balance
- cashout prices set by Transco action rather than reliance on default mechanisms
- disincentives for shippers to take large imbalance positions within-day and end-of-day
- reduces incentives for shippers to change imbalance positions outside tolerance levels
- smaller, less predictable and more anonymous balancing actions within-day

- more frequent balancing actions
- increased OCM liquidity.

Proposal for Revision to the Incentive Mechanism

In addition to the current price based mechanism Transco should be incentivised to achieve closing linepack (CLP) target.
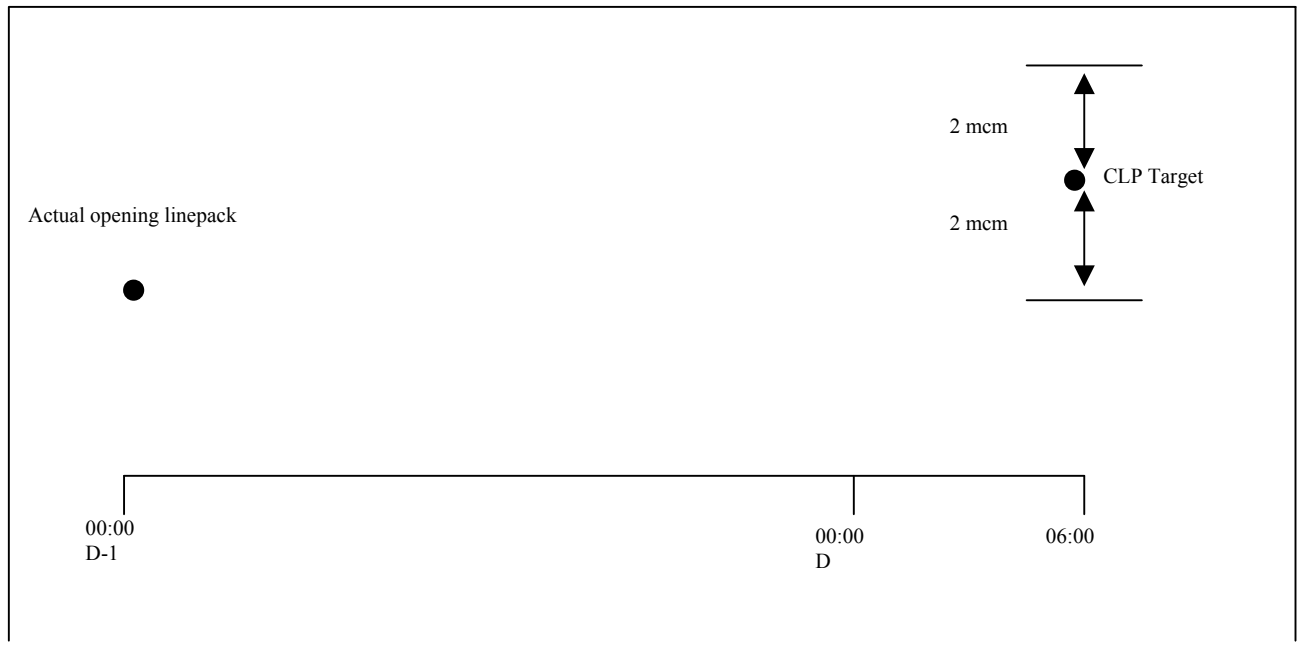
Closing linepack target would be initially set at D-1 according to a defined methodology predominantly based on demand forecast for the relevant and succeeding days. This target would be dynamic and would change in line with forecast demands. This would enable Transco to aim for a target linepack level that recognises the requirements of the system to run at a higher linepack level during times of high demand. It would also permit the transition between days to be smooth, as the target would have been set with regard to subsequent days forecast demand levels.

The setting of the target range at +/- [2] mcm is derived from information on differentials between closing and target linepack for the period October 1998 to June 1999. During this period the average differentials were 2.8 mcm on the long side and 2.6mcm on the short side. Whilst both these figures are in excess of the +/- [2] mcm suggested here, it must be remembered that these figures were achieved in a regime where there was no incentive on Transco at all. If differentials of 2.8 mcm and 2.6 mcm can be achieved with no incentive then it should be achievable to reduce these differentials with a financial reward for doing so.

Transco would be assessed on the achievement of CLP target against actual closing linepack at the end of the gas day.

The target is achieved if actual closing linepack is within a +/- [2] mcm range around target closing linepack.

NB. The assessment of CLP target and actual closing linepack must be according to an agreed methodology with Ofgem. Both CLP target and assessment against actual closing linepack calculations should be subject to Operational Guidelines audit.
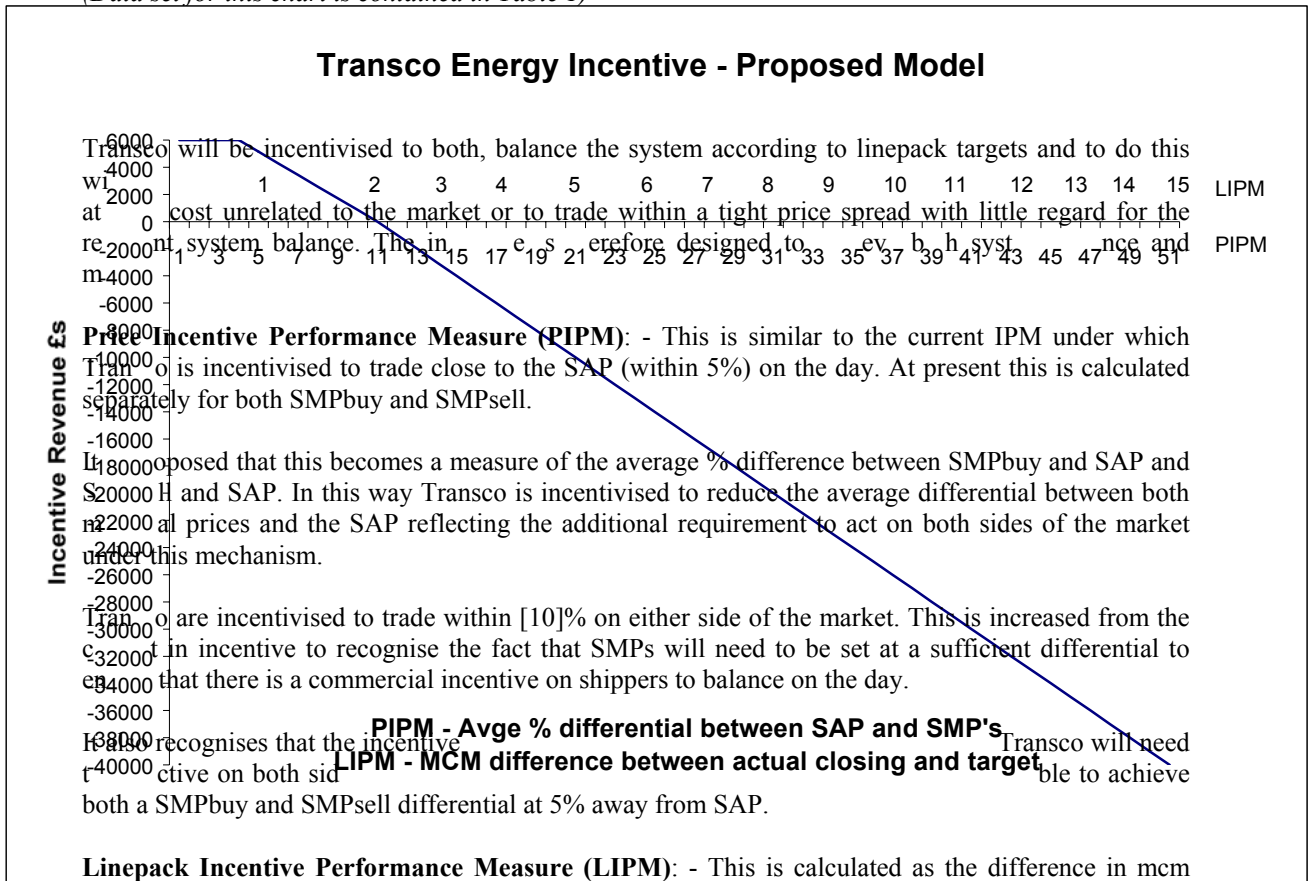

Transco receive incentive payments for achieving the CLP target. The payment is 100% if target is met but would reduce to zero just outside the target range. Transco would make incentive payments once

outside target range and these payments would increase as the difference between target and actual became larger.

It is not proposed that Transco must operate according to bandwidths. Discretion should remain with Transco as to when balancing actions are taken and how large they should be. The dual consideration of price and linepack should, however, encourage behaviour from Transco so that they are in the market in a more anonymous and less predictable way. This should encourage more OCM liquidity.

(Data set for this chart is contained in Table 1)

Transco Energy Incentive - Proposed Model

Transco will be incentivised to both, balance the system according to linepack targets and to do this with [minimum] cost unrelated to the market or to trade within a tight price spread with little regard for the resultant system balance. The incentives are therefore designed to achieve both system balance and minimum...

Price Incentive Performance Measure (PIPM): - This is similar to the current IPM under which Transco is incentivised to trade close to the SAP (within 5%) on the day. At present this is calculated separately for both SMPbuy and SMPsell.

It is proposed that this becomes a measure of the average % difference between SMPbuy and SAP and SMPsell and SAP. In this way Transco is incentivised to reduce the average differential between both marginal prices and the SAP reflecting the additional requirement to act on both sides of the market under this mechanism.

Transco are incentivised to trade within [10]% on either side of the market. This is increased from the current incentive to recognise the fact that SMPs will need to be set at a sufficient differential to ensure that there is a commercial incentive on shippers to balance on the day.

It also recognises that the incentive must be effective on both sides of the market. Transco will need to be able to achieve both a SMPbuy and SMPsell differential at 5% away from SAP.

PIPM - Avge % differential between SAP and SMP's
LIPM - MCM difference between actual closing and target

Linepack Incentive Performance Measure (LIPM): - This is calculated as the difference in mcm between closing linepack target and actual closing linepack.

Both the LIPM and PIPM scales are imposed on the same graph. The incentive payment is calculated by reference to the furthest point along the graph that either PIPM or LIPM is set.

Transco will receive maximum payment if PIPM <= [3]% and LIPM <= [1] mcm. This recognises that it would be very unlikely that Transco would be able to achieve exact target linepack with a zero SAP/SMP differential.

Example 1

> PIPM = 5%
> LIPM = 8 mcm

Under this scenario the LIPM is set furthest along the x axis and would result in an incentive payment by Transco of around £18,500. This reflects the fact that Transco have not balanced the system anywhere near linepack target and this will result in a linepack build or deficit carry-over into the next gas day and a resultant misallocation of costs between days and between shippers. Although Transco has achieved the price incentive it has failed to achieve balance and therefore have not performed as desired.

Example 2

> PIPM = 15%
> LIPM = 2 mcm

In this case Transco has met linepack target range but has not achieved this within a tight price spread. Transco therefore would face an incentive payment of £5,000.

Example 3

> PIPM = 4%
> LIPM = 1 mcm

Transco has met both requirements and receives incentive revenue of £4,284.

The maximum reward and penalties under this incentive mechanism have been increased. The reward has been increased from the present maximum of £4K to £[6]K to reflect the fact that Transco will find it more difficult to achieve an incentive reward. The incentive penalty has been increased from £30K to £[40]K to more closely reflect the cost to the community of linepack carry-over between days and the setting of marginal prices that are unjustifiably away from market prices.

Such an incentive mechanism will operate to find the optimum balance between price and closing linepack position and will reveal cashout prices that provide incentives for shippers to balance. For instance, Transco would be discouraged from setting cashout prices too low as in doing so they would weaken the incentive for shippers to balance and would therefore run the risk of not being able to achieve closing linepack target. Similarly Transco would be discouraged from setting marginal prices too high which although would encourage shippers to balance, this would result in an incentive payment to shippers.

Further development

The mechanism could be further developed to introduce default cashout prices. BGT would recommend that these are initially set at [10]% differential to SAP, the point at which the incentive payment line crosses at the zero point on the x axis. If Transco took no action during the day then it would receive no income from the incentive mechanism. Transco would be incentivised however to find the point at which the cashout differential provided a shipper incentive to balance. This could be greater or lesser than the default [10]%. If this point is less than the [10]% default then Transco would be able to achieve incentive revenue, but not at the expense of allowing linepack to drift away from target. If the correct differential for the day in question is greater than the default then Transco will be incentivised to act in order to prevent linepack from moving away from target. It is the dual consideration of the linepack and price incentives that drives the discovery of the true requirement for the SMP differentials and thus achieves a market reflective cashout.

Implementation

BGT does not foresee any real implementation issues for the introduction of the above incentive mechanism. Transco already produces a target linepack figure that is dependent on demand. The methodology for producing this should however be made available to shippers and Ofgem. Also it will be necessary to increase the scope to the Operation Guidelines audit to include derivation of target linepack against actual closing.

Table 1

LIPM MCM	0	0.2	0.4	0.6	0.8	1	1.2	1.4
PIPM %	0	1	2	3	4	5	6	7

Revenue £	6000	6000	6000	6000	5142	4284	3426	2568
LIPM MCM	1.6	1.8	2	2.325	2.65	2.975	3.3	3.625
PIPM %	8	9	10	11	12	13	14	15
Revenue £	1710	852	0	-1000	-2000	-3000	-4000	-5000
LIPM MCM	3.95	4.275	4.6	4.925	5.25	5.575	5.9	6.225
PIPM %	16	17	18	19	20	21	22	23
Revenue £	-6000	-7000	-8000	-9000	-10000	-11000	-12000	-13000
LIPM MCM	6.55	6.875	7.2	7.525	7.85	8.175	8.5	8.825
PIPM %	24	25	26	27	28	29	30	31
Revenue £	-14000	-15000	-16000	-17000	-18000	-19000	-20000	-21000
LIPM MCM	9.15	9.475	9.8	10.125	10.45	10.775	11.1	11.425
PIPM %	32	33	34	35	36	37	38	39
Revenue £	-22000	-23000	-24000	-25000	-26000	-27000	-28000	-29000
LIPM MCM	11.75	12.075	12.4	12.725	13.05	13.375	13.7	14.025
PIPM %	40	41	42	43	44	45	46	47
Revenue £	-30000	-31000	-32000	-33000	-34000	-35000	-36000	-37000
LIPM MCM	14.35	14.675	15					
PIPM %	48	49	50					
Revenue £	-38000	-39000	-40000					