

MODIFICATION 0433
Changes to System Cashout prices

WORKSTREAM REPORT

Background to proposal

The Network Code energy balancing regime was designed to provide commercial incentives for shippers to balance inputs and offtakes on the Transco system by applying System cash-out prices to shipper imbalances measured at the end of each gas day. The prices to be applied to any imbalance volumes were intended to be market reflective and would thus achieve a degree of cost targeting to those shippers out of balance. Imbalances within a tolerance are cashed-out at a System Average Price (SAP), representing a 'neutral' price for 'modest' imbalances. Imbalance volumes falling outside of tolerance are cashed out at the appropriate System Marginal Price (SMP). The use of SMPs should incentivise shippers towards achieving a balance within tolerance. The derivation of these SMPs is dependent on Transco balancing actions and will typically be the highest and lowest prices associated with Transco actions. On days when Transco has taken no balancing actions, or where the highest price of any Transco trade is less than SAP then the SMP_{buy} Price will be set equal to SAP. Similarly, on days where Transco has taken no action or the lowest price for any Transco trade is greater than SAP then the SMP_{sell} price will be set equal to SAP.

There may be circumstances where the SAP is attractive relative to the price at which shippers value gas and shippers thus have a commercial incentive to adopt a particular imbalance position. Unless Transco takes balancing actions that set unattractive SMPs for such shippers there will be no incentive for them to contain imbalances to within tolerances.

Transco has expressed concerns that the efficient operation of the System may be adversely affected by the level of gas imbalance that is being experienced, both within day and at the end of day. Such imbalances have caused concerns regarding the efficient operation of the network and may have led to inappropriately targeted costs. The structure of the current cashout regime has remained largely unchanged despite the implementation of RGTA in October 1999. However, the degree of commercial freedom within the energy-balancing regime has changed and it now appears that the current arrangements may no longer deliver shipper incentives consistent with efficient balancing of the System.

The issue of System cash-out prices was recently considered under Modification Proposal 0420. The proposal was rejected as it contained a flaw that would cause extreme prices to influence cash-out prices indefinitely. Ofgem believed these flaws would create impacts in the gas market leading to distortions in competition between shippers and suppliers by setting non-market reflective cash-out prices for shippers out of balance.

In the decision letter for Proposal 0420 Ofgem stated that it is convinced that there is a need for reform of the cash-out regime in the short term and that the industry should consider alternative solutions. In view of concerns regarding the operation of the System Transco also seeks to enhance shipper incentives for energy balancing to ensure that the System remains safely and efficiently balanced.

Analysis of whether the proposal would facilitate achievement of the relevant objectives

Transco has argued that a regime with enhanced incentives for shippers to balance would lead to more efficient operation of the System. In addition it could be argued that incentives that encourage increased shipper to shipper trading would promote liquidity in gas markets and facilitate competition between shippers. Greater levels of trading might also lead to more efficient price discovery and potentially lower prices for gas that would benefit gas consumers.

Implications for the operation of the System

Transco believes that enhancement to the incentives for shippers to balance would be beneficial for the operation of the System. Transco has expressed concern regarding the apparent change in shipper balancing behaviour and the consequent uncertainty about the requirement for Transco to undertake balancing actions. Any enhancement

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Development, capital and operating cost implications for Transco

A revision to the mechanism for the calculation of cashout prices would require some changes to Transco systems. In the short term a manual process could be performed to provide cashout prices according to the agreed publication timetable.

Recovery of costs

Costs of system development would be met from allowed revenues for such purposes.

Consequences of implementing the proposal on the level of contractual risk to Transco

No change is anticipated. The modification proposal is not intended to adversely affect the existing Transco energy incentive and drafting changes would separate the default prices used for imbalance cashout from the prices considered under the Transco performance measure.

Development implications for computer systems of Transco and other Users

A change to the method of calculating System cashout prices might precipitate a need to change functionality within the EnMO system if within-day estimates of SMP prices are still required.

Implications of implementation of the proposal for Users

Users would face enhanced incentives in respect of energy balancing as the current regime would be replaced by one where differential prices would always be set for shipper imbalance quantities falling outside the balancing tolerance. It is argued that whilst the existence of differential prices around the SAP may not always deliver incentives for shippers to aim for a neutral balance position, the price differences would provide stronger incentives for shippers to achieve imbalance positions within balancing tolerances. This might be expected to enhance the prospects of within-day trading.

Consequences of implementation of the proposal on the level of contractual risk for Users

The implementation of a mechanism to set differential SMPs for every day would increase the incentive for shippers to achieve an energy balance to within their balancing tolerance. This would increase the financial risk for shippers that were outside the tolerance band.

Summary of workstream discussions

The workstream met on three occasions to discuss this proposal. The discussions considered the criteria that should be used to evaluate any candidate cashout and a number of potential mechanisms. Transco circulated a paper to accompany the modification proposal. The paper described a number of options that might be applied to deliver enhanced balancing incentives.

The evaluation criteria were discussed during the workstream meeting held on 18 October. On 2 November Transco presented the options described in its paper to provide the workstream with an opportunity to clarify any details and to generate other alternatives. The meeting held on 8 November discussed options against the criteria to identify any preferred solution.

Discussion of criteria

It was noted that a number of conditions have been described as desirable for a cashout mechanism and that Ofgem indicated the relevant criteria in its decision letter for Modification Proposal 0420. Some of these conditions could conflict so the workstream also discussed where it might be appropriate to consider compromises and pragmatic choices in the light of the wide range of possible cash-out price derivations.

The meeting agreed that the cash-out regime should have the following properties:

- Provide a commercial (financial) incentive on shippers to achieve an end-of-day balance
- Ensure a degree of cost targeting
- Generate prices that are reflective of market conditions on a day (particularly supply / demand fundamentals)
- Not unduly penal
- Not unduly arbitrary

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(i) **Commercial (Financial) Incentives for shippers to Balance.**

The Ofgem decision letter for Modification 0420 stated: “Ofgem believes that to encourage shippers to balance their portfolios, it is desirable for differential cash-out prices to be set on both sides of the market. Failure to do so on a consistent basis could result in an expectation by shippers that they will not be discouraged, once a marginal price has been set, from taking large imbalance positions on the other side of the market. As a result, shippers may be able to deliver long or short onto the system and not be encouraged to trade these imbalance positions out. The failure to trade imbalance positions out may reduce gas market liquidity and thereby increase prices paid for NBP gas. Ofgem is therefore sympathetic to the aims of this proposal (0420) to ensure a differential between SAP and SMP prices to strengthen the incentive on shippers to balance.”

Under phase 1 of RGTA the industry had concluded that there should be strong incentives on Shippers to balance when the system is under stress and that marginal pricing and differentials would be necessary to provide such incentives. It was stressed that the HSE would expect the industry to put in place mechanisms that would at least maintain or improve the security of supply to domestic consumers.

It was argued that, as a general principle, a Shipper should be financially better off if it is in balance compared with when it is out of balance so strong price signals would be required on both sides of the market. Financial incentives to balance should be in place but differentials would not need to be penal. The workstream was mindful that unduly penal prices might lead to shippers incurring inappropriate additional costs to balance their portfolios.

Analysis shown at previous workstreams supported the arguments for the benefits of differentials, although the conclusion is not statistically conclusive as analysis is derived from only a small sample set when Transco has taken actions on both sides of market. Analysis by EnMO provided during consultation on Modification 0420 also supports the setting of SMP/SAP differentials.

Transco presented an analysis of 30 September 2000, a day when Transco took both buy and sell actions. Analysis showed nominations short for the first half of day and a series of buy actions then taken from 12:00 hours. No response at first but the buy actions set higher and higher SMP_{buy} , also dragging up SAP. Gradually a marked shift seen in nominations going long, suggesting that the application of a higher SMP_{buy} and SAP had encouraged a move from short position to at least within tolerance and then possibly long. A counter sell action was taken later setting a SMP_{sell} and reducing SAP slightly. The nominated long position moderated but stayed slightly long to end of day.

The analysis therefore does not reject the hypothesis that having SMPs set on both sides of market encourages appropriate balancing behaviour. However, comment was made that the 30 September was not untypical; Transco had been saying that this was the natural pattern of nominations on most days and that the system was consistently short of gas early in the day. Therefore, there should be a reluctance to draw any firm conclusions. However, the workstream noted that the sell action taken later in the day did appear to moderate shippers' long positions.

Market sentiment indicates that enforced differentials would increase incentives to achieve a commercial balance. The existence of more frequent SAP-SMP differentials was considered likely to enhance the liquidity of the within-day market as more shippers would be expected to trade out imbalances rather than cash-out large quantities to Transco as an enforced purchaser/seller .

(ii) **Cost Targeting**

Views were requested on the costs that the regime should attempt to target. Ofgem advised the meeting that it considered that Shippers should pay for using flexibility in the system and this had been a consistent feature in its thinking. The meeting queried whether the definition was restricted to being reflective of the costs incurred by Transco for balancing on a day. Transco sought clarification what costs this should include. For example, should it include imbalance cash-out costs and costs such as compressors.

The workstream noted that the cashout regime should seek to be cost reflective and thereby achieve a degree of cost targeting. However, the mechanism for cost targeting might need to be further considered in the light of the content of linepack services and within day cost targeting proposals that are outside the scope of this proposal.

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However, the need to take into account temporal effects was noted. This recognises that imbalance positions may change throughout the day and while cash-out is based on end-of-day measurements there will be opportunities for shippers to avoid costs that they have caused. It was also observed that the limited availability of within day information makes a resolution of the causes of costs to shipper level difficult and that this might need to be considered in the content of the modification proposals which might address the possible developments of linepack services or within-day cost targeting.

Ofgem commented that shorter balancing periods may enable measurement of the use of flexibility and added that cost of flexibility might become apparent in linepack or storage markets. However, it was recognised that short term storage is not a liquid market and that market signals from linepack services would not be available in the short or medium term. The workstream expressed a desire that cash-out setting needs to be based on genuine market transactions or verifiable flexibility valuations to avoid prices being considered penal or arbitrary.

(iii) ***Market reflective prices***

Transco pointed out that in previous discussions it had been argued that the mechanism should ideally demonstrate market reflectivity, i.e. prices set within cashout are related to gas market prices for the relevant day. Transco should be taking actions to address supply and demand imbalances and the within day changes in such imbalances. When Transco is able to take such actions in a timely manner the prices associated with the actions should feed into the cashout price determination. However, the requirement within the proposal was for a price mechanism that would generate SMP-SAP differentials in the absence of Transco market actions. Therefore, it might be difficult to deliver a solution that perfectly matched this criterion.

Concerns were raised that rolling 7 day and 30 day averages were not particularly reflective of supply demand conditions on a single day. However, a default price would still be required on difficult days when Transco had acted only in a single direction to ensure that there would be prices on both sides of the market. This need for a default value might require the use of some average function.

It was argued that SAP reflects the gas supply fundamentals at end of day rather than the within day effects, however, it seemed appropriate that marginal within day prices were reflected in the cashout to ensure that appropriate disciplines for shippers to achieve balance within tolerance.

(iv) ***Not Unduly Penal***

The mechanism should not be unduly penal. Any proposal is likely to be rejected if it can be argued that it applies a level of risk to the regime that cannot reasonably be mitigated or which would add undue and inappropriate costs to industry participants. A number of previous proposals have been rejected through failure against this test. Therefore, it might be desirable to have a default SMP setting mechanism that delivered “typical” price differentials between SAP and SMPs that, at least in part, reflect an appropriate value for within day flexibility.

(v) ***Prices not unduly arbitrary***

It was noted and widely accepted that if there was a requirement to have marginal prices set to apply on both sides of the imbalance cash-out regime then it would be necessary to have a default that must in some respect be arbitrary. Many considered this appropriate provided that the differentials were not too great. It was suggested that the price would be less arbitrary if it was linked to history in some way. This could be possible, depending upon the approach and the period of history taken. However, one of features of Modification 0420 was a mathematical effect, which led to SMPs forever diverging which, was not desirable.

The workstream considered models using a rolling average of SMPs but concerns were noted over the dangers of the influence of extreme days that could lead to arbitrary differentials that might be regarded as penal. The trade-off between rolling averages and using gas prices specific to the day was noted – a daily sample means more volatility but samples based over a long period may lock in the undesirable effects of a few extreme days.

On 2 November Transco made a presentation based on the cash-out models described in the paper “Changes to System Cash-Out Prices – Options for Consideration”, which had been circulated to accompany Modification Proposal 0433. The workstream recognised that it would be impossible to satisfy all of the above objectives.

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The workstream considered various cash-out mechanisms based on either “derived” prices or “differential” prices. The models described included mechanisms to set SAP and SMPs. The workstream considered 2 issues, firstly the definition of a default price for system marginal prices in the absence of any Transco balancing actions and the second to consider whether this should always apply – “greater / lesser of” rules or only apply in the absence of a Transco market action.

The following points were noted:

Mechanisms to determine SMPs to be applied

The workstream urged against the introduction of an unduly complex mechanism, arguing that desirable behaviours would be more likely if the basis for calculation is understood by all parties.

It was pointed out that the methods that set SMPs based on a percentage spread about the SAP would generate larger differentials when the SAP is higher; some shippers felt this was inappropriate and preferred the approach based on fixed differentials.

In response to a request made for Ofgem’s views, the workstream was told that Ofgem were minded to support a pre-determined differential based on some measures of cost reflectivity rather than a more variable assessment. Ofgem raised concerns against basing a differential on any historical averages, which could incorporate some extreme prices that would distort the market. The meeting was advised that Ofgem still supported consideration of a SWAMP approach, although acknowledging the weaknesses of this proposal when there was a lack of liquidity in the market.

Ofgem further advised that another option supported by Ofgem was the use of a storage flexibility price to set differentials from SAP. It was suggested that this price could be derived from sources such as the annual storage auctions and could provide an appropriate proxy for flexibility in the system.

EnMO expressed support for the storage flexibility price, which would require few changes to its systems. It was also noted that on many days Transco did not currently act in the market at all and therefore on many occasions the storage flexibility price default would be effective.

Some shippers questioned the use of storage prices before a linepack service was in place. The concerns was also raised that if the storage flexibility price was determined through the storage auction then it could mean that the cash-out prices are open to influence by the participants bidding in these auctions. However, the workstream noted that this might only be a problem if such an approach is used prospectively. The transparency of using the storage flexibility price was queried, as detailed information on storage is only available to those who book it. It was also noted that it would not be a daily dynamic price. Some attendees expressed support for the storage flexibility price on the basis that it might provide a pragmatic way forward to address some of the concerns over the operation of the regime.

Attention was drawn to the concerns over the gameability of the SWAMP approach and it was suggested that the only pragmatic and workable solution would be to debate whether a fixed or percentage value for a fixed differential should be used. The workstream noted that a criticism of a percentage spread about the SAP was that the differential would widen as SAP increases. A fixed value would not leave the differential being dependent on SAP. Storage flexibility price would provide one method of defining the required differentials.

Transco raised the issue of how the Storage Flexibility Price would be defined, i.e. how the storage prices would be unbundled, for example use of Rough and Hornsea, assumptions made in respect of the cycling of prices and whether there would be a different differential above and below SAP.

It was argued that there was merit in relating the Storage Flexibility Price to Hornsea services as this was the most obvious storage facility which can be used to go long or short on a difficult day. It was argued that LNG was more used for peak shaving and transmission support and Rough more for large volumes of gas take over a sustained period.

Mechanism to apply SMPs

Several workstream attendees argued that any approach must retain the incentive on Shippers to balance when the system is under stress. Therefore it was urged that the “greater of” rule for the application of Transco set SMPs or SMPs set under the default mechanisms must be retained.

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Some shippers agreed with the principle to facilitate differentials but asserted that this should be achieved through encouraging Transco to take frequent small actions on both sides of the market. It was suggested that Transco moving back to operating within a tighter linepack bandwidth could gain a spread of prices.

Ofgem argued against a move back to Transco operating in this way as it could force Transco to take prices which are completely out of the market just so it can stay within a particular margin. The workstream was reminded that under RGTA phase 1, one of the key principles had been that Transco should be a residual balancer, implying that Transco would only take actions on both sides of the market if appropriate for physical reasons.

Timescale for changes

Ofgem was requested to give its view on whether it sees this change as an interim change and when it publishes its energy balancing review document this will set out how the regime was envisaged in the long term. Concerns were raised over the timescale to implement this change.

Ofgem confirmed that this was seen as an interim change and that the forthcoming energy regime development document would look at both short-term changes to the end of day regime and more long-term fundamental changes. Some shippers raised concerns over making more changes to the regime in quick succession and questioned how appropriate this is. They queried the scale of costs that the industry would have to incur before Ofgem would be deterred from making frequent changes to the regime. Ofgem argued that there was a legitimate problem with the end of day regime and had been actively suggesting for some time that changes to the cash out regime should be made. Others stated that changes should be introduced as soon as possible to see if such changes could avert the need for more fundamental changes.

Ofgem indicated that it was minded to accept changes to the cashout regime ahead of consideration of more fundamental reforms of the energy-balancing regime.

One participant suggested that it might not be appropriate to address the issue of Transco only taking actions in one direction through the setting of default cashout prices. Another argued that the industry had not considered the full scope of Transco's role in the structure of the current incentive and all the implications had not been envisaged. This workstream member advocated a complete removal of the incentive.

Transco advised that it would be keen to revisit the energy incentive after the release of Ofgem's energy regime review document.

Transco advised that 7% of system throughput currently went through the cash out mechanism and argued that it would be good to encourage Shippers to trade out these imbalances more and increase liquidity in the markets. Transco put forward the view that an approach to cash out prices such as Storage Flexibility Price should encourage trading within day so Shippers get back within tolerances. This might be preferable to encouraging Transco to take unnecessary actions.

Conclusions

Transco assessed that the workstream preference, in the light of Ofgem "minded to" statements, was towards fixed differentials around SAP. It was advised that storage prices could be unbundled to gain a Storage Flexibility Price as a proxy for this differential. Transco agreed that some indicative prices would be included in the draft Modification Report to allow parties to comment in the consultation.

Several shippers argued that the Storage Flexibility Price would just be a random value and that they had reservations regarding this approach. However, it was also argued that it fitted many of the criteria, it would be reasonably robust, may not be unduly penal if unbundled in right way and that it would be a good interim solution.

The introduction of differentials should act as an incentive to trade and this could have some beneficial impacts on OCM and price spreads. Whilst this might not fully meet the prime objective of providing a commercial incentive on Shippers to balance Transco argued that the assurance of differentials was a step in the right direction.

The demand differentials would provide minimum differentials about SAP. The differentials would be set by the application of "greater of" or "lesser of" rules so that on days when Transco takes actions which have marginal prices establishing wider differentials to SAP than such prices will generate the cash-out SMPs.

Other matters to be considered for production of a modification report

Transco agreed to provide analysis with this report describing how an SMP proxy price might be derived.

Analysis of historical data has examined the average differentials between SAPs and the SMPs. This analysis would illustrate the typical size of differential that might be expected and therefore should represent a relatively non-penal cashout.

Two periods were considered, gas years 1998/99 and 1999/2000.

Taking only those days where the SMPs were set by Transco actions the following was observed

Differential in p/kWh	1998/99	1999/2000
SAP to SMPb	1.1p	1.7p
SAP to SMPs	0.6p	1.2p

Taking an average of all days gives smaller values as the averages are affected by days where there is no differential when one or both SMPs are set equal to SAP.

Storage Flexibility Proxy Prices

In its May 1999 document Ofgas outlined mechanisms to calculate a proxy flexibility charge based on Hornsea storage prices.

A simple average approach takes the annual price and divides by 365 days to give a daily rate. However, the bundled service has injection and deliverability in the ratio 1:10 and so does not provide a realistic alternative to beach flexibility or use of system linepack, which might be expected to be rather more symmetrical.

A second approach attempts to unbundle injection and withdrawal charges as separate components. Ofgem analysis has split the bundled charge for Hornsea using relative values of 15.3% on injection, 39.9% on space and 44.8% on deliverability.

Using the weighted average price for the bundled service of 5.8638p/kWh (from the year 2000 auction of 1 year service) and unbundling in the above proportions gives;

Injection = 0.9p/pdkWh
 Space = 2.3p/pdkWh
 Deliverability = 2.6p/pdkWh

An assumption must then be made that injection is required on 50% of days and deliverability is required on the other 50%. This would correspond with a shipper going long on one day and going short on the next. A factor of 183 is used to convert the annual charges for injection and deliverability to daily rates. Space is required for every day so this element is divided by 366.

Injection = 0.0049p/kWh
 Space = 0.0064p/kWh
 Deliverability = 0.0144p/kWh

The commodity injection charge is 0.024p/kWh and the delivery charge is 0.008p/kWh. An assumption is made that one unit of space is required for each unit of injection or deliverability. This gives composite charges of

Injection = $(0.0049+0.0240+0.0064) = 0.0323\text{p/kWh} = 0.95\text{p/th}$
 Deliverability = $(0.0144+0.0080+0.0064) = 0.0288\text{p/kWh} = 0.84\text{p/th}$

A cashout mechanism based on these charges would deliver default SMP differentials that would on average be smaller than those delivered as a result of Transco balancing actions.

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Comments on potential implementation timetable

The Modification Panel is requested to send this proposal for consultation. This would permit an implementation date of 1 January 2001 and allow for the normal period for consultation. Whilst the proposed implementation date is not constrained Transco and a number of supporters of this proposal consider that it is desirable to achieve an implementation as soon as possible.

Comments on requirements for legal drafting

Legal drafting would be dependent on the solution chosen. Transco believes that the discussions that have taken place to date and the supporting documents that have been circulated have provided opportunities for industry participants to consider the implications of the proposed changes.