September 2001

Transco's National Transmission System

System Operator incentives 2002-7

Initial proposals

Summary

This document sets out Ofgem's initial proposals for Transco's National Transmission System (NTS) System Operator (SO) incentives to take effect from April 2002.

The proposals set out in this document are intended significantly to improve the incentives on Transco to invest to expand the NTS in a timely fashion in response to its customers' changing needs. The proposals are also intended to improve the incentives on Transco to carry out its day to day role of operating the NTS economically and efficiently. This should see a reduction in the cost of system operation over time, to the benefit of customers, who ultimately pay these costs.

Ofgem is in the process of conducting a periodic review of Transco's price control. The new price control will take effect from 1 April 2002. Our initial proposals, published in June 2001, suggested setting separate price controls for the NTS and the Local Distribution Zones (LDZs) and a further split between the regulation of Transco's role as NTS Transmission Asset Owner (TO), where it builds and maintains the network, and Transco's role as NTS System Operator (SO), where it determines the need for additional NTS capacity and operates the system day to day.

Defined capacity outputs

Transco's allowed revenues under the NTS TO price control will, for the first time, be set against explicit measures of entry and exit capacity outputs for each of the five years of the price control. Transco will have to offer for sale at least these baseline output measures and the entry capacity will be sold through a series of long term auctions of firm, tradable capacity rights.

Improved signals for NTS investment

Prices emerging from these auctions, and subsequent trading of capacity, will improve the signals to Transco of the need for new capacity and hence additional investment. These new signals should emerge sufficiently in advance for Transco to invest to meet the demand, given average investment lead times of two to three years. Transco will also continue to assess capacity needs through its annual planning cycle.

Firm, tradable long term rights for users

NTS users will be able to purchase and trade firm capacity rights covering several years ahead to meet their own requirements and hedge short term capacity price risks. If Transco does not deliver the baseline output measures, it will have to buy back at market prices the capacity rights it has sold under an entry capacity buy-back incentive scheme.

Innovative and generous new incentives for Transco to invest -

Transco will have an innovative commercial incentive to move away from the initial baseline entry capacity outputs, set as part of the NTS TO price control, in response to changing demand at the various entry points. Transco will be able to earn a higher rate of return for the duration of the price control (2002-7) where it invests to meet demand over and above the agreed baseline entry output measures. If revenues from the additional capacity sales exceed a pre-determined allowance, Transco will keep the additional revenues subject to an overall cap on its returns of up to 3 times the allowed rate of return under the NTS TO price control.

- with limited downside for Transco

Transco's exposure, in the event that it invested above the baseline output measures and market demand for capacity is below the capacity available, would be limited. Ofgem proposes limiting Transco's exposure, if revenues from the extra capacity are insufficient to cover the depreciation and financing costs of the additional investment, to at most a 1 per cent reduction in its allowed cost of capital. Within this cap and collar, Transco will be exposed to the potential benefits and risks of undertaking additional investment in response to signals of market demand.

Exit savings will be shared between Transco and its customers

Under Ofgem's proposed exit capacity incentive, Transco will have commercial incentives to consider the most effective means of meeting customer demand. Transco will be set a target level of costs and where it is able to substitute pipeline investment for cheaper alternatives, such as interruption contracts with customers or local storage, it could keep up to 75% of the savings, capped at £20m for 2002/3.

Additional incentives on day to day operations can bring additional revenues

Under the day to day system operator incentive schemes, Transco will be set an allowance or target level of costs. If it manages to beat the target, it will keep a share of the difference. If costs exceed the target, Transco will pay a proportion of the difference. Where significant uncertainty exists regarding the likely level of costs, Transco's potential profits and losses will be capped. Transco could earn over £30m in additional incentive revenues. Transco's potential liabilities under the schemes are capped at around £30m.

New freedoms and obligations for Transco

Ofgem is proposing that Transco be given greater commercial freedom and discretion under the new incentives including, for example, the ability to forward contract where Transco believes it would be more efficient. Ofgem is also proposing new licence obligations upon Transco to ensure it sets out clearly how it intends to balance the system and ensure that it contracts in an transparent way that is non-discriminatory. Transco will also have a new licence obligation to operate an economic and efficient transportation system, as a regulatory safeguard, in recognition that commercial incentives with capped liabilities may not always condition Transco's conduct.

A step forward for RPI-X price controls

Ofgem's innovative proposals for new SO incentives set out in this document are designed to provide real benefits to customers, who ultimately pay for system operation. They are also designed to deal with the concerns of gas producers, traders and customers about Transco's investment incentives for the NTS under the current regime. Ofgem believes that the proposals will create a better incentive framework for Transco and provide better information about the need for network expansion, during a period of increased uncertainty about both the levels and location of future demand and supply. Transco will be able to earn significant additional returns if it responds to the new incentives and invests in response to demand.

Ofgem believes that the proposals represent an important advance in network regulation, building on and enhancing the traditional RPI-X price control. They have the potential to provide benefits to customers, Transco and the industry.

Ofgem is inviting comments on its proposals by November 5 and will publish its final proposals in December.

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1. Introduction

Purpose of this document

1.1 This document sets out Ofgem's initial proposals for Transco's National Transmission (NTS) System Operator incentives to take effect from April 2002. The proposals are intended to improve the incentives on Transco to operate the NTS economically and efficiently. Customers will benefit as they ultimately pay for the costs of system operation.

Background and rationale

1.2 Ofgem is in the process of conducting a periodic review of Transco's price control to take effect from 1 April 2002. The new price controls and the proposals set out in this document are designed to take account of future developments in the gas market.

1.3 Transco is currently subject to a single RPI-X transportation price control that covers both the NTS and the Local Distribution Zones (LDZs). As part of the price control review, Ofgem has decided to put in place separate price controls for the different constituent parts of Transco's business[1]. Transco will face separate price controls for the NTS and the LDZs. Ofgem has proposed that the NTS control be further split between Transco's role as NTS Transmission Asset Owner (TO) and Transmission System Operator (SO). This proposed split is consistent with the new arrangements under the National Grid Company's (NGC's) price control implemented from April of this year[2].

1.4 Transco, in its role as NTS TO, is deemed to be responsible for building and maintaining the NTS pipeline infrastructure efficiently. Transco, in its role as NTS SO, is deemed to be responsible for determining the need for additional investment in the NTS and for the efficient day to day operation of the network.

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[1] *Review of Transco's price control, Draft proposals*, Ofgem, June 2001
[2] *The transmission price control review of the National Grid Companys from 2001, Transmission asset owner, Final proposals*, Ofgem, September 2000 and *NGC system operator price control and incentive scheme under NETA, Final proposals*, Ofgem, December 2000

1.5 Ofgem believes that separate regulation of Transco's TO and SO responsibilities will allow more effective incentives to be set, reflecting Transco's different roles.

NTS Capacity Investment Incentives

1.6 The proposals cover Transco's longer term responsibility to invest to expand NTS capacity. The proposals are designed to improve the existing signals and incentives on Transco to invest in a timely manner to expand NTS entry and exit capacity in response to its customer's changing demands (the entry and exit capacity investment incentives).

1.7 The entry capacity incentive is designed to implement the incentive framework set out in the conclusions of Ofgem's review of long term signals and incentives for investment in transmission capacity on Transco's NTS[3]. The exit incentive is intended to follow up Ofgem's review of Transco's exit capacity, interruption and Liquefied Natural Gas (LNG) arrangements.[4]

Day to day operations incentives and Transco's NTS SO internal costs

1.8 The SO proposals set out in this document also cover Transco's day to day responsibilities. These include: ensuring the efficient use of its existing pipeline capacity (particularly associated with the short term entry capacity buy-back incentive), ensuring the security and quality of supplies (particularly associated with the system balancing incentive) and ensuring an overall balance between inputs and offtakes, to the extent that shippers inputs and offtakes do not precisely match (the residual gas balancing incentive).

1.9 Transco also incurs operating and capital expenditure in its role as NTS SO, which are also covered by proposals set out in this document.

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[3] *Long-term signals and incentives for investment in transmission capacity on Transco's National Transmission System: Conclusions on the framework*, Ofgem, December 2000 & *Long-term signals and incentives for investment in transmission capacity on Transco's National Transmission System: The new regime*, Ofgem, March 2001.

[4] *The new gas trading arrangements: review of Transco's exit capacity, interruption and liquefied natural gas arrangements – A consultation docuement,* Ofgem, March 2001.

1.10 The residual gas balancing and short term entry capacity buy-back incentives for the period up to April 2002 are incorporated in Transco's Network Code.[5] The costs associated with the system balancing incentive (as well as the SO internal costs) are incorporated into Transco's price control until April 2002.

Summary of Ofgem's initial proposals

NTS SO capacity investment incentives

1.11 The capacity investment incentives are designed to provide Transco with strong financial incentives to invest in the NTS, where is efficient to do so and in response to its customers' changing needs. The incentives relate to both NTS entry and exit capacity.

1.12 Under Transco's TO price control, Transco will receive funding to cover efficient operating and capital expenditure to provide an agreed level of capacity (the baseline outputs). Baseline output measures will be set for NTS entry capacity and NTS exit capacity. A baseline output measure in relation to system linepack[6] will be determined from the setting of the entry and exit capacity levels. Transco will be required to offer for sale at least the agreed level of entry capacity outputs (the revenues from which will count against its allowed TO price control revenue) as firm capacity rights.

1.13 In agreeing the level of baseline outputs, Ofgem and Transco will set the outputs on the basis of a reasonable forecast of future supply and demand on the NTS. However, there is considerable uncertainty surrounding future demand levels and supply patterns and the location of future supply and demand. The baseline outputs should therefore be seen as a reference point rather than a firm commitment with regard to physical, as distinct from contractual, delivery.

1.14 The investment incentives will ensure that Transco responds to emerging market signals and will move away from the baseline output measures by investing more (or less) where there is demand for additional (or reduced) capacity. Under the proposals Transco will have strong incentives to build more capacity

[5] The current gas balancing and entry capacity incentives were introduced as part of the New Gas Trading Arrangements on 1 October 1999. These are discussed in greater detail in Chapter 3.
[6] The storage in the pipeline system itself is known as linepack.

at particular locations or to bring forward investment (or defer it) on the basis of better information on demand emerging from the market.

1.15 At exit, Transco will face new incentives that will, over time, encourage Transco to reform the existing exit arrangements and begin to discover the relative costs associated with substitutes for pipeline investment such as interruptible capacity contracts with customers and contracting with local storage providers. The incentive framework will encourage Transco to enter into such arrangements as an alternative to pipeline investment where it is cheaper to do so.

1.16 The entry capacity incentive is concerned with incentives to build capacity in excess of the baseline output measures (the incentive to defer investment in response to market demand is described below). Under the incentive, we propose to allow Transco to earn additional returns for the duration of the price control period where it invests (over and above the baseline) to meet additional market demand. If Transco's auctioning of the additional capacity raises more revenue than that required to cover the associated depreciation and financing allowance (at the cost of capital set as part of the price control review), Ofgem is proposing that Transco keeps excess revenue subject to a cap on its return of between 1.5 and 3 times its allowed cost of capital under the NTS TO price control.

1.17 Transco's exposure, in the event that it invested over and above the baseline output measures and market demand for capacity is below the capacity available, would be limited to a reduction against its allowed depreciation and financing costs equal to at most a 1% reduction in its allowed cost of capital. Within this cap and collar, Transco will be exposed to the potential benefits and risks of undertaking additional investment in response to signals of market demand.

1.18 The exit capacity incentive is designed to encourage Transco to consider the trade-offs between interruption, local storage and additional pipeline investment in order to meet the demand for exit capacity in the most efficient manner. Thus, we propose to set target values for each of the five years of the price control to cover the costs of interruption and local storage (constrained LNG). For 2002/3, our proposed target value is £66.5m (based on the current exit

arrangements) and we have constructed three potential combinations of sharing factors, caps and collars that give rise to the ranges shown in Table 1.1.

Table 1.1: Ofgem's initial proposals with regard to NTS capacity incentives

Component	Duration	Target (£m, 2000 prices)	Upside sharing factor	Downside sharing factor	Cap	Collar
NTS entry capacity	5 years	0	100%	100%	1.5 to 3 times NTS allowed cost of capital	Up to 1% below NTS allowed cost of capital
NTS exit capacity	2 years	66.5	50% - 75%	25% - 50%	10 to 20	0 to –5

Day to day System Operator incentives

1.19 Under the day to day operator incentive schemes, Transco will be set an allowance or target level of costs. If it manages to beat the target, it will keep a share of the difference. If costs exceed the target, Transco will pay a proportion of the difference. Where significant uncertainty exists regarding the likely level of costs, Transco's potential profits and losses will be capped.

1.20 In terms of the duration of the controls, Ofgem proposes to set:

- the parameters for buying-back entry capacity for one year;
- the parameters for the system balancing incentive for two years;
- the parameters for undertaking residual gas balancing for one year; and
- the internal operating and capital expenditure costs associated with providing SO services for five years. Sharing factors will be applied and reviewed after one year.

1.21 A summary of Ofgem's initial proposals for the day to day SO incentives and the SO costs in 2002/3 is set out in Tables 1.2 to 1.4.

Table 1.2: Summary of Ofgem's initial proposals for day to day operating incentives

Component	Target	Upside sharing factor	Downside sharing factor	Cap	Collar
Entry capacity buy-back costs	100 to 175	20% - 50%	10% - 40%	15 to 30	-10 to – 15
System balancing – gas costs	57 to 61	20% - 25%	20% - 25%	2 to 4	-2 to -4
System balancing - system reserve	17.1*	100%	100%		
Residual gas balancing	-15 to -25	20% - 30%	20% - 30%	3.5 to 5	-3.5 to –5

*The target value for system reserve has been converted from 2000 prices to money of the day assuming an inflation rate of 1.25% per annum.

Table 1.3: Ofgem's initial proposals for SO internal operating costs (£m, 2000 prices)

2002/3	2003/4	2004/5	2005/6	2006/7	Total
23.1	20.7	19.1	18.2	18.1	**99.1**

Table 1.4: NTS SO Regulatory Value, depreciation and capital expenditure (£m, 2000 prices)

	2001/2	2002/3	2003/4	2004/5	2005/6	2006/7
Opening Value	7.8	12.0	10.2	7.3	4.8	3.3
Capex	6.3	1.2	0.2	0.4	1.3	1.2
Depreciation	(2.0)	(3.0)	(3.1)	(2.9)	(2.7)	(1.9)
Closing Value	12.0	10.2	7.3	4.8	3.3	2.7

New licence obligations

1.22 Ofgem is also proposing to introduce new obligations on Transco as part of the new incentive arrangements. In particular, Ofgem proposes that the following new licence obligations be introduced:

- a requirement for Transco to operate an economic and efficient transportation system; and

- a requirement to produce procurement guidelines and balancing principles statements.[7]

1.23 The obligation to operate an economic and efficient transportation system will provide an important regulatory safeguard underpinning the new arrangements. Ofgem believes that this new licence obligation is required for a number of reasons. First, it recognises and formalises expectations about the manner in which Transco should carry out its system operator function. Second, to the extent that the incentive scheme encompasses a cap on payments to Transco and a collar on the payments by Transco, there could be instances in which the scheme no longer provides a commercial incentive for Transco to operate efficiently, e.g. when Transco hits its cap or collar.

1.24 The new obligation would give Ofgem the ability to take enforcement action in such instances should it be necessary.[8]

1.25 Transco, as SO, currently procures a number of services for the purposes of gas balancing and system balancing. Under Ofgem's proposals, coupled with other recent changes to the regime,[9] the SO would be given greater discretion over the utilisation of these services. For a number of such services, transparent and liquid markets exist, such as the on the day commodity market (OCM) for spot gas. However, if the SO is to contract forward for the provision of both system and gas balancing services then there may be a need for the SO to enter into bilateral contracts.

1.26 The Procurement Guidelines and Balancing Principles Statement will aid transparency for market participants by setting out clearly, the types of services the SO might contract for, the frequency of any tenders to procure such services

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[7] This will replace Transco's existing obligation to produce Operational Guidelines.
[8] Furthermore, such an obligation complies with the European Gas Directive. Article 7(1) of the Directive states that "Each transmission, storage and/or LNG undertaking shall operate, maintain and develop under economic conditions secure, reliable and efficient transmission, storage and/or LNG facilities with due regard to the environment".
[9] On 1 October 2000, Transco's obligation to only purchase balancing gas on the OCM expired and it is now free to source such gas from any market deemed appropriate.

and the high level principles the SO will adopt in balancing the system. They will also oblige the SO to publish information on the contracts it holds, the average prices associated with services procured and reports on how and when such contracts are exercised.

1.27 The two new licence conditions and associated arrangements will be based on similar obligations to those in NGC's licence and introduced as part of its SO incentives.

The present review in context

1.28 The proposals in this document need to be seen in the context of a series of inter-linking reviews that are presently underway.

Review of Transco's Price Control from 2002

1.29 Ofgem is in the process of conducting a periodic review of Transco's price control to take effect from 1 April 2002, and we set out our initial proposals in June.[10] These are summarised in Table 1.5 for Transco's regulated revenues in total, although as mentioned previously, Ofgem will be introducing separate NTS and LDZ price controls. We will publish our final proposals at the end of September 2001.

[10] *Review of Transco's price control from 2002: Draft proposals*, Ofgem, June 2001.

Table 1.5: Transco Price Control Review: Initial Proposals (£m)

	Current price control (1997/8-2001/2(MMC's projections	Next price control	
		Transco BPQQ proposals	Ofgem base case
Regualtory value	Unfocused	Unfocused	Unfocused
Cost of capital	7.0%	At least 7.0%	6.0%
Total operating expenditure *(five year total)*	£7.1bn	£6.4bn	£5.3bn
Controllable operating expenditure: annual reduction	5% *(1997/8-2001/2)*	0 *(1999/00-2006/7)*	3.5% *(1999/00-2006/7)*
Capital expenditure *(five year total)*	£3.0bn	£2.4bn	£1.9bn
Replacement expenditure *(five year total)*	£1.5bn	£2.0bn	£1.7bn
Initial reduction in revenues	21%		14%
X	2%		2%

NTS output measures

1.30 As part of the preparation for this price control review, Transco provided Ofgem with a set of NTS output values at the end of April 2001 and Ofgem consulted on these proposals. During this consultation period, Transco published a consultation, Transporting Britain's Energy, on its future plans for investment on 25 May 2001. This document outlined key areas of uncertainty remaining in the planning process and updated the peak capacity output values that it had previously provided to Ofgem. Transco held a workshop to discuss this document on 6 June 2001 and asked for responses by 15 June 2001. It became clear that the original output values submitted by Transco had not been based on its most recent planning assumptions. In the light of this and other concerns raised by respondents, Ofgem asked Transco to resubmit new values based on the most up-to-date scenarios that its planning department was using.

1.31 Following the conclusion of its consultation, Transco has submitted to Ofgem NTS entry and exit maximum physical capacity levels under its current planning scenario. Transco has also submitted the capital and operating expenditure associated with these output levels. Transco has also proposed a series of investments to provide additional 'NTS flexibility' and system 'resilience'. Investment in 'NTS flexibility' will increase NTS entry capacity in off peak months and, as a by-product, more capacity at peak. Transco argue that

resilience expenditure would make the NTS more robust to rapid loss of gas supply at particular locations. Transco has argued that these investments should be funded under the price control in addition to the capital expenditure already identified.

1.32 Ofgem will issue its final decision on the output measures and the associated efficient capital and operating expenditure in our Price Control final proposals document. Ofgem is minded to accept Transco's current planning scenario and also allow the proposed summer flexibility capital expenditure within the control, although Transco has yet to quantify the impact of the summer flexibility investment on peak capacity levels. Outlined below, are the maximum physical capacities at entry associated with Transco's planned investment. For the reasons outlined above, these capacity levels will be revised upwards slightly, in the event that the NTS flexibility expenditure is allowed.

Table 1.6: Transco final base case NTS maximum physical entry capacities (GWh/d)[11]

	2002/3	2003/4	2004/5	2005/6	2006/7
Bacton	1527	1646	1711	1787	1787
Barrow	812	790	790	791	791
Easington	1105	985	996	1050	1094
St. Fergus	1689	1721	1754	1787	1819
Teesside	910	823	856	899	845
Theddlethorpe	758	628	639	650	650
Aggregate NTS	**6801**	**6593**	**6746**	**6964**	**6986**

Long term signals and incentives for investment in the NTS

1.33 A number of customers, shippers and producers expressed concern about Transco's incentives to invest in the NTS in a timely manner to meet the changing needs of the GB gas market. These concerns stemmed from the delay in commissioning new capacity at the St Fergus terminal in 1998.

[11] For simplicity this table excludes values for on-shore entry capacity but baseline output measures will also be set in respect of them.

1.34 In response to these concerns, in 1999 Ofgem initiated a review to improve Transco's long term investment signals and incentives on the NTS. We concluded this review in March of this year and outlined our new long term signals and incentive framework to take effect from 1 April 2002.[12]

1.35 The incentive arrangements set out in this document are designed to implement Ofgem's incentive framework. The introduction of auctions of longer term capacity rights should see the emergence of forward trading of entry capacity. The price signals emerging from the primary auctions and secondary markets should provide Transco with valuable additional information that will assist it in planning efficient network expansion, given Transco's investment lead times.

1.36 Transco, shippers, customers and other interested parties have begun the process of designing the new long term capacity auction arrangements and considering the changes necessary to Transco's Network Code and licence to implement the new arrangements. This process is currently being taken forward as part of Industry Workstreams[13] with Ofgem's full involvement.

Signals emerging from the entry capacity auctions to date

1.37 A number of concerns about the gas and system balancing arrangements led Ofgas to argue that the allocation of capacity and the balancing of the system could be conducted in a more efficient and economic manner. To address some of these concerns, Transco, since October 1999, has been auctioning NTS entry capacity for six month periods.

1.38 These short term entry capacity auctions have provided some market signals with regard to the short term value of capacity at different locations on the NTS. Whilst they do not necessarily indicate the need for long term investment, they seem to indicate that, at least in the short run, there is a clear need for more flexibility in the NTS, particularly in the summer months, to accommodate different patterns of beach supply to meet a particular level of demand.

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[12] *Long-term signals and incentives for investment in transmission capacity on Transco's National Transmission System: The new regime*, Ofgem, March 2001.
[13] For information on Workstream meetings, please see www.RGTA.co.uk.

Review of Transco's exit, LNG and interruptible capacity arrangements

1.39 A number of gas customers have expressed concerns to Ofgem about the existing exit capacity, interruption and LNG arrangements. The criticisms have focused on the limited choice of interruptible contracts that are available (a standard contract is to provide 45 days of interruption); potential discrimination between different classes of customer (customers deemed "network sensitive" can be interrupted significantly more frequently than other customers); and the level of rebates offered to interruptible customers relative to rebates offered to LNG sites providing network support. Ofgem has also expressed concerned that the current arrangements provide a number of perverse incentives for Transco, including an incentive to over-contract for interruption and under-invest in network reinforcement.

1.40 In March 2001, Ofgem published a review[14] of these arrangements, which incorporated proposals for their reform. We argued that it would be desirable to establish market-based arrangements to establish the relative price of firm and interruptible exit capacity. Ofgem proposed that all customers at exit should be deemed to have firm rights and would be obliged to pay the appropriate transportation charges. Transco could then contract with customers and storage operators to offer interruptible contracts of varying durations and forms. Under the proposals, Transco would face new incentives to ensure that it entered into such contracts where it was cheaper to do so than to build additional pipeline capacity to meet firm demand.

1.41 The incentive arrangements in relation to exit arrangements set out in this document will provide Transco with stronger commercial incentives to reform the current arrangements over time. Again, under our proposals Transco will have better signals (based on market prices) of the costs of substitutes for pipeline at exit (such as interruptible contracts and the use of storage). The new incentive framework will ensure that Transco responds to these signals by using substitutes for investment in additional pipeline capacity where it is cheaper to do so.

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[14] *The New Gas Trading Arrangements: Review of Transco's exit capacity, interruption, and liquefied natural gas. A consultation document,* Ofgem, March 2001.

Reform of the gas balancing regime

1.42 Ofgem also published, in February 2001, a document[15] setting out proposals for further reform of Transco's NTS gas balancing arrangements. Our proposals seek to address Ofgem's concern that the current arrangements, based around an end of day balancing regime, are inefficient and are not sustainable given increased convergence with the electricity market and greater trade with continental Europe. As a consequence, the current arrangements increase the operational risk faced by Transco in its role as a system balancer and may, over time, increase the costs of operating a safe and secure NTS.

1.43 In response to these concerns, Ofgem proposed:

- to replace the current end-of-day balancing regime with arrangements where by shippers' inputs and offtakes to the system can be measured on a hourly (or half-hourly) basis;
- to sell the storage available within the pipeline system, known as linepack,[16] to shippers. Under this proposal, participants would acquire the right to hold a 'linepack inventory'. This inventory would allow them to carry forward imbalances between their inputs and offtakes from hour to hour;
- to provide new commercial incentives on shippers to balance their inputs, offtakes and use of linepack each hour (or half hour);
- to provide Transco with greater freedom to contract ahead for a range of services if it believes this will lead to lower balancing costs; and
- to improve access to information on the wholesale gas market by making more operational information available to customers and shippers in real time.

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[15] *The New Gas Trading Arrangements: further reform of the gas balancing regime: a consultation paper,* Ofgem, February 2001.

[16] Linepack is defined as the gas stored within the pipeline system itself. Transco monitors the level of linepack in the system and takes balancing actions if it is forecast to depart from a pre-determined range or bandwidth.

1.44 Ofgem intends to issue a further paper on these issues next month. The proposed incentive arrangements set out in this document are based on the existing daily balancing regime set out in Transco's Network Code. As a result, certain elements of the incentive arrangements set out in this document, specifically the gas balancing incentive, but also potentially other aspects (such as internal SO costs) may need to be adjusted if revised gas balancing arrangements are introduced.

Outline of this document

1.45 This document describes Ofgem's initial proposals for the NTS SO incentive arrangements in more detail.

- Chapter 2: outlines the regulatory framework;
- Chapter 3: describes the background to the proposals, the weaknesses of the current arrangements and the rationale for reform;
- Chapter 4: sets out Ofgem's proposals for the form, scope and duration of the NTS SO incentive schemes;
- Chapter 5: summarises Transco's views of the maximum physical capacity levels that are consistent with its capital expenditure proposals;
- Chapters 6 to 10: respectively cover the proposed incentive schemes for NTS entry capacity investment, NTS exit capacity investment, entry capacity buy-backs, other system balancing costs and residual gas balancing costs;
- Chapter 11 covers Ofgem's initial proposals for the operating and capital expenditure and the regulatory value of NTS SO internal costs;
- Chapter 12: considers the other parameters of the NTS SO incentive arrangements and presents initial proposals for sharing factors and caps/collars;
- Chapter 13: summarises Ofgem's main conclusions and the way forward; and

- Appendices 1 to 3 cover the new licence condition, the procurement guidelines and the detailed modelling underpinning the proposed residual gas balancing incentive.

Related issues

NGC's System Operator incentives

1.46 NGC has been subject to incentive schemes on the costs of operating the electricity transmission grid since 1994. These have been successful in reducing the costs of system operation over time so that, for example, NGC reduced the costs of balancing the system from £680m[17] in 1993/94 to £208m in 1999/00.

1.47 New SO incentive arrangements, covering both NGC's external costs of operating the system and, for the first time, its own costs, were introduced following the introduction of the New Electricity Trading Arrangements (NETA) on 27 March 2001. The incentive arrangements were designed to provide NGC with strong incentives to reduce the total costs of system operation, which are ultimately paid for by customers.

Views Invited

1.48 Ofgem is seeking comments on the initial proposals outlined in this document. It would be helpful if responses could be received by 5 November 2001, addressed to:

Dr Eileen Marshall CBE

Managing Director, Competition and Trading Arrangements

Office of Gas and Electricity Markets

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London SW1P 3GE.

1.49 Electronic responses may be sent to: lorraine.ladbrook@ofgem.gov.uk

[17] April 2000 prices, excluding the costs of Unscheduled Availability and transmission losses.

1.50 Respondents are free to mark their replies as confidential although we would prefer, as far as possible, to be able to place responses to this paper in the Ofgem library. Unless clearly marked 'confidential', responses will be published by placing them in the Ofgem library.

1.51 If you wish to discuss any aspect of this document, Mark Feather (telephone: 0207 901 7437) will be pleased to help.

Way forward

1.52 Ofgem intends to hold a seminar to give respondents an opportunity to discuss the issues raised in this document before responding to the consultation document. The seminar will be held on the morning of the 20 September 2001 at a venue to be announced shortly. Anyone wishing to attend the seminar should contact Lindie Kruger on 020 7901 7362 or email her (lindie.kruger@ofgem.gov.uk)

1.53 Ofgem will publish our final proposals for the Transco Price Control at the end of September 2001.

1.54 Ofgem will publish our final proposals on the SO incentives in December 2001.

2. The Regulatory and Legal Background

The Gas Act 1986

2.1 The Gas Act 1986 (the Gas Act), as amended by the Utilities Act 2000, provides for the regulation of the onshore gas regime in Great Britain and for the separate licensing of Gas Transporters (GT), gas shippers and gas suppliers. Transco is the largest gas transporter in Great Britain. The Gas Act also provides for the creation of the Gas and Electricity Markets Authority (the Authority).[18]

2.2 The duties of the Authority are set out in section 4A of the Gas Act. The principal objective of the Authority in carrying out its functions under the Gas Act is to protect the interests of consumers in relation to gas conveyed through pipes, wherever appropriate by promoting effective competition between those engaged or concerned with the shipping, transportation or supply of gas or engaged in commercial activities relating to such activities. In carrying out its functions under the Gas Act in a manner which furthers the principal objective, the Authority shall have regard to the following:

- the need to secure that, so far as it is economical to meet them, all reasonable demands in Great Britain for gas conveyed through pipes are met; and
- the need to secure that licence holders are able to finance the carrying on of the activities which they are authorised or required by their licences to carry on.

2.3 In performing such duties the Authority must have regard to the interests of those individuals that are disabled or chronically sick, or of pensionable age, or with low incomes or residing in rural areas.

[18] With the cmmencement of relevant provisions of the Utilities Act in December 2000, the duties and functions of the Director Generals of Electricity and Gas Supply were transferred to the new Gas and Electricity Markets Authority.

2.4 The Authority may, in carrying out any of its functions, have regard to the interests of consumers in relation to electricity, telecommunications and water and sewerage services.

2.5 The Authority must carry out its functions in the manner it considers best calculated to:

- promote efficiency and economy on the part of authorised persons and the efficient use of gas;
- protect the public from dangers arising from the conveyance of gas through pipes or the use of such gas; and
- secure a diverse and viable long term energy supply.

2.6 The Authority must also have regard to the effect on the environment of activities connected with the conveyance of gas through pipes.

The Utilities Act 2000

2.7 The Utilities Act 2000 amends the Gas Act in a number of significant ways. The Act gives the Authority new duties, as outlined above, and functions in relation to licensing and setting performance standards. The Act also gives the Authority the power to impose financial penalties on companies found to be breaching, or to have been in breach of, licences issued to them under the Gas Act or the Electricity Act 1989. The Utilities Act 2000 was given Royal Assent in July 2000 and large parts of the Act have been brought into force.

2.8 Under section 76 of the Utilities Act 2000, the term 'Public Gas Transporter' will become 'Gas Transporter'. Section 76 has not yet been commenced but, in anticipation of its commencement, throughout this document reference is made to Gas Transporters.

Gas quality

2.9 The Utilities Act 2000 included a provision for the transfer of the power to set gas quality standards from the Health and Safety Executive to Ofgem.[19] The range of characteristics permitted for conveyance of gas in a gas network[20] form part of the Gas Safety (Management) Regulations. These regulations determine the range of quality of gas that can be entered into a network and determine the permissible range of specifications of gas delivered to any network exit point. Network users cannot specify the quality of gas that they want to receive and can only be certain that its characteristics will fall within the range of allowed specifications.

Competition legislation

2.10 The Authority has concurrent powers with the Director General of Fair Trading under the Fair Trading Act 1973 and the Competition Act 1998. In relation to these concurrent powers, the Authority works in conjunction with the Office of Fair Trading (OFT) under the terms of an agreement between the Authority and the OFT.

Licence Enforcement

2.11 The Gas Act 1986 provides for the licensing of GTs, Gas Shippers and Gas Suppliers and imposes a number of conditions on such licensees. Where the Authority is satisfied that a licensee is contravening, or is likely to contravene, any licence condition or relevant obligation, it is required (except in certain specified circumstances) to issue an enforcement order against the licensee under section 28 of the Gas Act 1986.

[19] Due to be enacted during October 2001.
[20] Statutory Instrument 1996 No. 551.

2.12 Section 31 of the Gas Act requires the Authority to investigate any issue that appears to be a matter which is within the scope of its enforcement powers and which is the subject of a representation made to the Authority by a person appearing to have an interest in the matter. Under the Act, and under the conditions of the licences, the Authority may require licence holders to furnish it with information.

Gas Transporters' licence

2.13 A GT has a duty, under section 9 of the Gas Act, to develop and maintain an efficient and economical pipeline system for the conveyance of gas and, so far as it is economical to do so, to comply with any reasonable request to connect to that system and convey gas by means of that system to any premises. A GT has a further duty, also under section 9 of the Act, to avoid any undue preference or discrimination in the connection of premises to any pipeline system operated by it, or in the terms on which it undertakes the conveyance of gas by means of such a system.

2.14 The GT licence places certain obligations on the GT, including the requirement that the GT introduces a network code, which sets out the arrangements between the GT and shippers for the use of, and connection to, that GT's pipeline system. All network codes are required to meet the following relevant objectives as set out in Standard Condition 7 of the GT licence:

(a) the efficient and economic operation by the licensee of its pipeline system;

(b) so far as is consistent with sub-paragraph (a), the efficient discharge of its obligations under its licence;

(c) so far as is consistent with sub-paragraphs (a) and (b), the securing of effective competition between relevant shippers and between relevant suppliers; and

(d) so far as is so consistent, the provision of reasonable economic incentives for relevant suppliers to secure that the domestic supply security standards are satisfied as respects the availability of gas to their domestic customers.

2.15 Standard Condition 11(1) of the GT licence requires the GT to conduct its transportation business in the manner best calculated to ensure that neither the GT nor any person related to it, nor any gas shipper, obtains any unfair commercial advantage.

2.16 Standard Condition 13(2) sets out certain gas security standards to which the licensee shall plan and develop its pipeline system. These standards require the pipeline system be capable of meeting a peak aggregate daily demand that is only likely to be exceeded in one year every 20 years.

Transco's Network Code

2.17 Transco's Network Code was put in place in March 1996. The mechanism for modifying the Network Code is set out in Standard Condition 7 of Transco's GT licence and in the Network Code modification rules. Under the modification rules, only shippers and Transco are able to propose modifications to the Network Code. Ofgem is not itself able to propose modifications, although the implementation of all modifications requires the consent of the Authority.

2.18 The Authority may only direct that the Network Code should be modified if, in its opinion, the proposed modification would, as compared to the existing provisions of the Network Code or any alternative proposal, better facilitate the achievement of the relevant objectives as set out in Standard Condition 7 of the GT Licence. In making such a direction, the Authority is bound by its duties under sections 4A of the Gas Act 1986.

Transco's Operational Guidelines (OGs)

2.19 The operational guidelines (OGs) are a set of rules that govern Transco's balancing operations and use of balancing tools. The OGs are not part of the Network Code but are established by a separate obligation under Transco's GT licence (Special Condition 17). The OGs are intended to ensure that Transco takes balancing actions that are consistent with the efficient and economical operation of the system. Only Transco is allowed to propose modifications to the OGs and these require the consent of the Authority.

Gas Shipper's licence

2.20 The Gas Shipper's licence includes a number of standard conditions.

2.21 Condition 2(1) requires the licensee to act in a reasonable and prudent manner in making use of a GT's pipeline for the conveyance of gas. Condition 2(2) requires that the licensee shall not knowingly or recklessly pursue any course of conduct which is likely to prejudice:

(a) the safe and efficient operation, from day to day, by a relevant transporter of its pipeline system;

(b) the efficient balancing by that transporter of its system; or

(c) the due functioning of the arrangements provided for in its network code.

2.22 Condition 2(3) requires that the shipper shall not knowingly or recklessly act in a manner likely to give a false impression to a relevant transporter as to the amount of gas to be delivered by the licensee on a particular day to that transporter's pipeline system.

2.23 Condition 3 relates to the policies of dominant shippers in gas markets. Condition 3(2) requires that a dominant shipper must, if requested by the Authority, supply it with a statement of the shipper's policies in respect of its participation in the gas market. Where that statement no longer adequately or accurately describes the policies to which it relates, the licensee shall as soon as is reasonably practicable, give the Authority a statement of any change in those policies or of any new policies.

2.24 Condition 8 places further obligations on a licensee to provide information to a relevant transporter to enable the transporter to make plans for the safe operation of its pipeline system.

2.25 Condition 9 requires licensees to furnish the Authority with information as it may reasonably require, or as may be reasonably necessary for the purpose of performing functions assigned to it by or under the Gas Act.

Obligations under Transco's Network Code

2.26 Shippers are obliged to sign Transco's Network Code. As signatories to Transco's Network Code, shippers are faced with commercial incentives designed to encourage them to balance the gas that they put into the pipeline network with the gas they take off each day. In addition, shippers are required to use all reasonable endeavours to ensure that their daily gas inputs are delivered onto the NTS at a uniform flow rate to the end of the day, sometimes referred to as the 1/24 flow rate rule.

Regulation of the offshore regime

2.27 Offshore sectoral regulation is the responsibility of the Oil and Gas Directorate of the Department of Trade and Industry (DTI).

2.28 The Petroleum Act 1998, which consolidated a number of provisions previously contained in five separate pieces of primary legislation (including the Petroleum (Production) Act 1934), vests ownership of oil and gas within Great Britain and its territorial sea in the Crown and gives the Government rights to grant licences to explore for and exploit these resources and those on the UK Continental Shelf (UKCS). The Oil and Gas Directorate's Licensing, Exploration and Development Branch manages the licensing process. It issues exploration and production licences, approves operators and issues field determinations.

2.29 The OFT has jurisdiction under the Competition Act 1998 throughout the UK and in respect of all sectors of the economy. This includes the offshore oil and gas industry. The OFT also has jurisdiction under the Fair Trading Act 1973 to make a monopoly reference to the Competition Commission. The OFT has a general duty under the Fair Trading Act to keep markets for the supply of goods and services to consumers in the UK under review.

The Health and Safety Executive (HSE)

2.30 The Health and Safety at Work Etc. Act 1974, together with subordinate legislation in the form of regulations, provides the regulatory framework for health and safety related issues arising from work activities in Great Britain. This legislation is backed by the sanction of criminal law.

2.31 The enforcing authority for the gas industry is the HSE. There are a range of enforcement powers available to HSE, including the power to issue improvement and/or prohibition notices and bring prosecutions. Prosecutions for alleged breaches of health and safety legislation take place in the criminal courts and, where a conviction is obtained, the court may impose a range of penalties, including fines and imprisonment.

2.32 The HSE has the primary responsibility for developing new health and safety law and revising and reviewing existing legislation.

Gas Safety (Management) Regulations

2.33 The Gas Safety (Management) Regulations 1996 (GSMR), SI1996 No 551, set out certain safety requirements with which GTs, shippers and gas suppliers must comply. All gas conveyors, including holders of a GT Licence, must produce a safety case and have it accepted by the HSE,[21] before they can convey gas. A safety case is also required from the Network Emergency Co-ordinator (NEC) who has strictly limited powers to deal with potential or actual supply emergencies. Transco currently undertakes the role of the NEC. Material changes to any safety case need to be accepted by the HSE before the change can be implemented.

Financial Services Market Act 2000 (FSMA)

2.34 The Financial Services Market Act (the FSMA) will replace the Financial Services Act 1986 and is expected to commence later this year. Under the FSMA, the Financial Services Authority (FSA) will have four objectives: maintaining market confidence; promoting public understanding of the financial system; the protection of consumers; and fighting financial crime.

2.35 The FSMA contains a regime dealing with market abuse that may extend to markets such as the OCM and trading upon such markets. The penalties for market abuse range from unlimited fines to censure. Individuals and companies are subject to the regime. The new regime relating to market abuse will apply to

[21] The safety case must contain the particulars described in Schedule 1 of the Regulations.

the behaviour of all legal persons in relation to qualifying investments traded on 'prescribed markets', regardless of whether they require FSA authorisation.

3. Background and rationale for reform

Introduction

3.1 In this chapter we provide a background to the current proposals by outlining Transco's current transportation price control regime, the incentives that were put in place at the start of the current price control and developments in Transco's incentives that have resulted from the implementation of the New Gas Trading Arrangements. We then go on to describe the background to the industry's and customers' concerns about Transco's investment signals and incentives to invest in the NTS under the current arrangements and describe in more detail the process leading up to the development of Ofgem's proposals.

Transco's existing transportation price controls

Form, scope and duration of the present control

3.2 In August 1996, Ofgas published final proposals for new price controls for Transco covering the period April 1997 – March 2002. They comprised separate price controls covering Transco's transportation activities and its storage activities (including metering). These proposals were not accepted by British Gas, and consequently the price control was referred to the Monopolies and Mergers Commission (MMC) for investigation. The MMC reported in May 1997 and Ofgas published proposals based on the MMC's recommendations in July 1997.

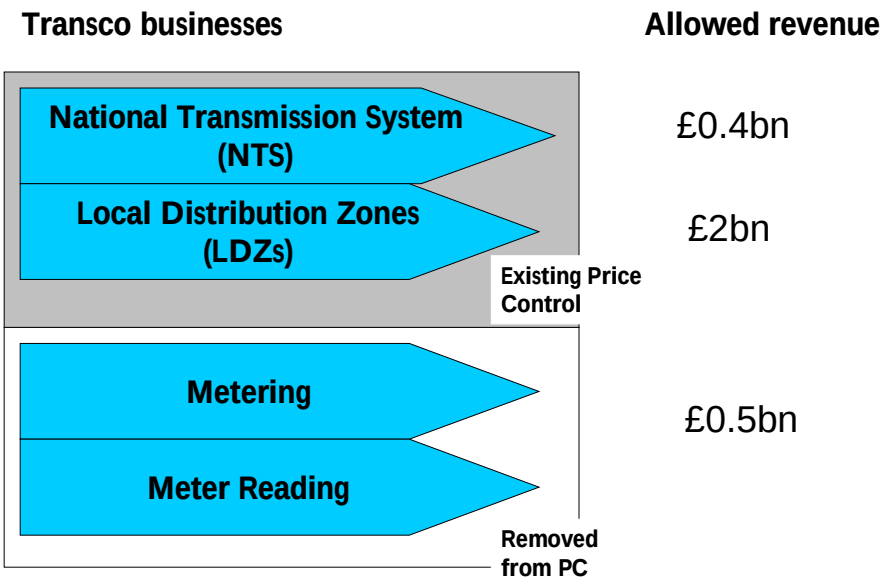
3.3 Ofgas' July 1997 paper set out the proposed separate licence conditions for transportation and storage that were based on the MMC's recommendations and included the proposed volume drivers within the transportation price control.

3.4 The transportation price control covered all transportation activities associated with NTS and the LDZs and meter and meter reading services. However, from 1

April 2000, meter and meter reading services were unbundled from the price control and regulated separately.[22]

3.5 The current arrangements are summarised in Figure 3.1.

Figure 3.1 Overview of Transco's existing controls



3.6 The current transportation price control was set on the basis of the MMC's projections of the efficient capital and operating expenditure associated with the NTS (TO and SO) and the LDZs. The form of the control is RPI-X, with X set at 2.

[22] *Securing effective competition in gas metering and meter reading services: The Director General's final proposals*, Ofgem, May 2000.

3.7 Under the control, fifty per cent of Transco's allowed transportation revenue is fixed and fifty per cent varies according to the volume of gas transported. Two separate market categories are identified: Large users and Business and Domestic users[23] and the allowed revenue is adjusted year by year in line with increases in volumes delivered in the two market categories, except when the volumes lie within prescribed dead-band ranges.

3.8 In setting the price control, Transco was provided with an allowance relating to the costs of system 'shrinkage'[24] and operating margins[25]. The allowance, based on Transco's forecast of its costs, was set for the five years of the control. Under the form of control, Transco keeps all of the revenue if costs are below those allowed in setting the control but pays in the event that actual costs are above those allowed.

3.9 An adjustment was also included to deal with under recovery of allowed revenues under the previous price control. A correction factor, 'K', enables Transco to collect or refund in subsequent years any revenue that it under-recovers or over-recovers in a particular formula year.

Capital expenditure monitoring

3.10 The 1997-2002 price control did not include explicit NTS entry and exit capacity output measures. Instead, in December 1999 Ofgem consulted on the appropriate approach to monitoring Transco's capital expenditure year on year through the price control period.[26]

3.11 Since the publication of the December 1999 document, Ofgem and Transco have agreed an annual capital monitoring and audit framework, based on a set of output measures and a method for allocating capital expenditures. Where variances occur between the actual levels of output, investment and workload, and those assumed within the price control, Transco is obliged to provide an

[23] The large user category covers transportation to customers using in excess of 1465 GWh per year (mainly interconnectors, power stations and large feedstock loads).
[24] Comprising of gas used to fuel compressors by Trasnco, unaccounted for gas and unbilled energy.
[25] Operating margins gas is short lead time gas and is held in store to be used to maintain system pressures, for example, where a compressor or NTS pipe has become damaged or failed, to manage an orderly system run down or where gas is otherwise not available from the OCM.
[26] *Monitoring Transco's capital expenditure, A report and consultation document*, Ofgem, December 1999.

explanation. Transco's explanations for any variances will be reviewed and, where appropriate, challenged.

3.12 The first Transco variance report[27] and the audit[28] of that report were published in February 2001. To bring the monitoring up to date, they covered the years 1997, 1998 and 1999 and included comparisons of actual expenditure against forecasts made at the time of the last price control review, which may provide an insight into Transco's forecasting accuracy and investment practices.

3.13 In summary, Transco's variance report states that, over the period 1997-1999, Transco under-spent relative to the price control forecast by £541m at 1996 prices (£603m at 2000 prices). However, Transco claimed that it achieved or exceeded the expected outputs based on standards of service in all but one area (the replacement of inaccurate meters). In particular, the capital expenditure and performance in the NTS are reported in Table 3.1.

Table 3.1: Capital expenditure in the NTS 1997 to 1999 (1996 prices)

Output Type	Forecast (£m)	Actual expenditure (£m)	Variance (£m)	Performance
Peak Supply and Demand	438	401	-37	Exceeded
Supply Security	0	0	0	Exceeded
New Connections	8	8	0	Met
Safety	9	0	-9	Met
Total	**455**	**409**	**-46**	

3.14 The auditors of Transco's variance report, who were appointed by Ofgem, concluded that Transco met increased demand on the NTS whilst making savings of £37m over three years by re-rating parts of the pipeline system and reducing purchasing costs on a large expansion of compression.

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[27] *Capital investment outputs monitoring, 1997-1999. Output Variance Report'* December 2000, available on Transco's website, www.transco.uk.com.
[28] *Report of the auditor to Ofgem under the Transco Capital expenditure framework for the period 1997-1999*, February 2001, available on the auditor's website, www.mazar-nr.co.uk.

Standards of service and liabilities

Public Service Standards

3.15 As part of the previous price control (i.e. the 1992-1996 price control), key standards of service were introduced covering areas such as keeping appointments and attending to gas escapes. Target levels of performance were set and Transco was required to pay fixed compensation to customers when Transco failed to provide certain standards of service to customers.

Competitive Market Standards

3.16 Following a review of the competitive supply market in 1995, Ofgas concluded that the existing poor service provided by Transco (particularly relating to nominations and meter readings) were a deterrent to customer switching and a barrier to entry. In March 1996, with the introduction of the Network Code, standards of service in this area, and associated liabilities for failing to meet these standards, were introduced.

Transco's Liabilities

3.17 In setting the current price control, Ofgas made clear that the then standards of service and liabilities package set out in the Network Code had been the base assumption when it determined appropriate levels of operating and capital expenditure as part of the price control review.

3.18 Under Transco's competitive market standards of service incentive scheme, Ofgas concluded in September 1998[29] that Transco's overall level of financial exposure under the service standards should be capped (there is no cap on its public service standards liabilities). Ofgas indicated that 10% of Transco's operating profits was a reasonable level for this cap. At the time, this would have implied a financial exposure for Transco of £100m. In Ofgas' view, this overall level of liabilities provided sufficient incentive to Transco, whilst not endangering the company's ability to finance its business.

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[29] See *Transco's Standards of Service: The Director General's Conclusions*, Ofgas, September 1998.

3.19 However, following the implementation of Modification 204 in July 1999, Transco's liabilities under the Network Code relating to Standards of Service are capped at £50m. Whilst Ofgem approved this modification against a legal test of whether it better facilitated the relevant objectives of the Network Code, Ofgem maintained that the overall level of the cap should be set at 10% of Transco's profits, which at the time would have led to an overall cap for 1999 of £120m. Ofgem requested that Transco initiate a review and implement Ofgas' decision in full.

Transco's existing SO incentives under the present price control

NTS capacity

3.20 Transco has certain obligations to invest in the NTS under its Gas Transporter's Licence and under the Gas Act. As discussed in Chapter 2, the planning standards to which Transco is obliged to develop and maintain the NTS, specify that it must be capable of meeting a peak aggregate daily demand, which is only likely to be exceeded once in twenty years (1 in 20 peak), taking into account data on weather derived from at least the last fifty years. Transco also has a statutory duty to develop and maintain an efficient and economical pipeline system for the conveyance of gas.

3.21 Transco bases its investment decisions on the current planning standards and data gathering procedures that include the annual Base Planning Assumptions (BPA) process. As part of this process, Transco sends Base Plan Questionnaires (BPQ) to producers, shippers, suppliers and customers to solicit their views on future demand and supply on the network.

3.22 Under the current price control, Transco received capital and operating expenditure allowances to expand the NTS. There are no direct commercial incentives on Transco to respond to changing market demands for capacity at any particular location, other than the link between allowed revenues and system throughput.

3.23 Capacity arrangements at the time of the last control involved shippers booking annual quantities of entry capacity and there was no limit to the amount of capacity that Transco was willing to sell. As a result, total bookings of capacity

often exceeded physical capacity. If aggregate shipper nominations to flow at an entry point exceeded available capacity, Transco would resolve this constraint by paying shippers to reduce gas flows at that location.[30]

3.24 Transco had no direct incentive either to expand capacity in response to its customer's demands or to ensure the efficient use of the existing capacity.

3.25 In order to achieve its statutory obligations to ensure that all reasonable demands for gas on a peak day are met, Transco currently operates a set of arrangements that allow it to allocate exit capacity to each supply point based upon registered demand requirements. Customers are charged NTS exit transportation charges on the basis of their allocated capacity. Customers with interruptible transportation contracts receive a fixed discount on a number of these administered charges.[31]

3.26 Thus, Transco has an incentive to enter into interruptible supply terms with customers, as this will increase its allowed revenue under the price control. This is because additional customers increase its throughput, and therefore its allowed revenue, but Transco can potentially avoid the additional network reinforcement costs that would be required to offer the customer firm capacity.

NTS SO internal costs

3.27 As part of the main price control, Transco received an allowance for both internal operating and capital expenditure associated with its system operator functions. Under the existing arrangements, Transco has strong incentives to reduce actual SO internal costs below the forecast costs as it retains all of the benefits for the duration of the control.

Other system balancing costs

3.28 As mentioned previously, Transco received an allowance within the transportation price control for other system balancing costs. Under the current

[30] Following the problems at St Fergus in the summer of 1998, Transco was required to scaleback booked capacity to levels that could be physically accomodated at a terminal.
[31] The discounts offered to interruptible customers do not directly affect the level of revenue Transco is allowed to recover under the price control. Transco recovers this revenue from charges levied on firm customers.

price control, Transco retains all of the benefits of reducing actual costs below the allowed costs.

Gas balancing

3.29 At the start of the price control period, Transco maintained the overall balance of gas inputs and offtakes on the gas system by recourse to the flexibility mechanism – a gas exchange where Transco was the sole counter-party to all trades. Transco took balancing actions strictly in accordance with its prevailing OGs, and the costs associated with these actions were recovered directly from shippers through the neutrality charge (with the costs charged back to shippers on the basis of their share of total system throughput). Transco had no direct incentive to minimise these gas balancing costs.

Developments since the last price control review

St Fergus capacity constraints 1998

3.30 Severe capacity shortages occurred during the summer and autumn of 1998 as a result of delays in Transco's NTS Capacity Expansion and Maintenance Programme. Ofgem subsequently investigated the resulting actions undertaken by Transco and shippers during the constraints.[32] Ofgem estimated that the direct costs of the constraints sustained by shippers amounted to approximately £21.3m (of which £9.1m was returned to shippers), while the indirect costs arising from the impact upon the gas forwards markets were of the order of 0.03p/kWh (1p/therm).

New Gas Trading Arrangements

3.31 On 1 October 1999, following a period of over two years of consultation, the New Gas Trading Arrangements (NGTA) were implemented in Great Britain, consisting of revised gas balancing and entry capacity regimes. The new regimes consist of the following elements:

[32] *St Fergus and Bacton Investigation: A progress report*, Ofgas, March 1999 and *St Fergus and Bacton Investigation: A report under Section 39(4) of the Gas Act 1986*, Ofgem, December 1999.

3.32 For the gas balancing regime:

- an independently operated, screen-based, on-the-day commodity market (OCM), which shippers can use to fine-tune their daily gas positions and which Transco can use in its role as residual gas balancer;
- commercial incentives on shippers to balance their own positions; and
- commercial incentives on Transco (which capped Transco's potential gains and losses at £2m per annum) as residual gas balancer to minimise the costs of system balancing.

3.33 For the entry capacity regime:

- an efficient, non-discriminatory method of selling firm entry rights to the NTS related to the physical capacity that Transco can make available. This was achieved through the introduction of price auctions for the sale of entry capacity; and
- appropriate commercial incentives for Transco to ensure that all physical capacity is made available and to manage the costs of constraints (which capped Transco's potential gains and losses at £5m per annum).

3.34 These changes to the entry capacity regime addressed short term availability and allocation issues, but did not attempt to provide any long term mechanism for the allocation of, and efficient investment in, NTS capacity.

Subsequent developments – gas balancing

3.35 In April 2001, a number of modifications to Transco's network code were implemented that introduced changes to the end of day gas balancing regime. These changes were intended to sharpen further the commercial incentives on shippers to balance by the end of the day and improve incentives on Transco in undertaking its residual balancing role. These changes included:

- the introduction of a flexibility element, based on proxy storage prices, to determine system buy and system sell cash-out prices for shipper imbalances on days where Transco did not take actions to set cash-out prices

- the removal of shipper balancing tolerances (with the exception of forecast deviation tolerances) that had protected them from exposure to marginal cash out prices for small imbalances; and

- the introduction of a linepack target in Transco's incentive scheme.

Subsequent developments – capacity

3.36 The first auction of six months of Monthly System Entry Capacity (MSEC) took place in September 1999, for the period October 1999 to March 2000.[33] Subsequent auctions for MSEC have been held every six months. As a result of experience of operating under the new arrangements, a number of subsequent modifications to the auction arrangements have been made and are summarised below.

3.37 A within-day capacity market, allowing Transco to buy and sell capacity within day, was launched in June 2000. In addition to the MSEC auctions, auctions for Monthly Interruptible System Entry Capacity (MISEC) were introduced in November 2000.

3.38 Following a significant over-recovery of revenues (£86m) from the summer 2000 auctions, Transco put in place a new methodology that saw a 42% reduction in NTS entry and commodity charges, within the remaining over-recovery passed back to customers the following year through the K factor mechanism in the price control. Following another significant over-recovery of revenue (£363m) from the summer 2001 auctions for monthly system entry capacity, Transco put in place a new methodology for dealing with revenue over-recoveries. As a result, Transco reduced the general level of transportation charges by 15% for the remainder of the charging year (running to April 2001).

3.39 Ahead of this winter's MSEC auctions, further changes to the arrangements were agreed. The volume of capacity to be sold in the monthly auctions, relative to the daily capacity auctions, was increased. As a result, the existing methodology used to calculate MSEC, which was based on historic gas flows, was replaced by

[33] For a full review of this auction, see: *The New Gas Trading Arrangements: A review of the October 1999 NTS capacity auctions and consultation on developing the capacity regime*, Ofgem, December 1999.

a methodology that based MSEC volumes offered on a proportion of the maximum physical capacity at each terminal.

3.40 As a result of this change, Transco's capacity incentives were modified. Transco was set a target of buy-back costs for the winter months of £60m. Under the scheme, Transco keeps a proportion of any savings if buy-back costs are below the target and pays a proportion if costs are above target. Transco's annual exposure under the scheme remained at £5m.

3.41 Finally, the methodology for dealing with any auction over-recoveries was changed. In the event of an over-recovery, the money was divided into equal monthly amounts and used to create a 'buy-back fund'. In the event of capacity buy-backs, this fund is used to offset shippers' exposure to that proportion of buy-back costs not covered under Transco's incentive scheme. Any surplus is then refunded through adjustments to the general level of transportation charges at the end of the year.

Review of long term signals and incentives for investment in transmission capacity on Transco's NTS

3.42 In response to concerns raised by the gas industry and consumers, Ofgem initiated a review of long term signals and incentives for investment on the NTS. Concerns about this aspect of the regime were exacerbated by increasing evidence of NTS constraints, most notably at the St. Fergus terminal in northern Scotland, in summer 1998, summer 2000 and, most recently, in autumn 2000 and summer 2001.

Industry workshops

3.43 As part of the review, Ofgem facilitated a programme of working groups and workshops over the summer of 1999 to examine the issues and develop proposals.

May 2000 document

3.44 In May 2000, Ofgem published a consultation document, setting out the workgroups' proposals as well as Ofgem's initial view on those proposals. The document also outlined Ofgem's initial view on the way forward.

3.45 Ofgem set out the following objectives for reform:

- promoting the economically efficient, longer term development of the NTS to meet the needs of the users of the NTS and, ultimately, gas customers; and
- ensuring that available NTS capacity is offered to purchasers in a non-discriminatory manner that does not distort competition in related markets, such as the supply of gas.

3.46 Ofgem's initial proposals consisted of the auctioning of longer-term rights to NTS entry capacity and enhanced financial incentives on Transco. Capacity rights would be financially firm - Transco would have to buy back capacity sold but physically unavailable – and tradable. Ofgem argued that the emergence of forward markets and prices in the primary auctions would improve the signals to Transco of the need for new investment. Transco, given typical investment lead times of two to four years, would receive better signals of future demand in sufficient time to be able to respond to them. In addition, customers would be able to hedge short term capacity price volatility by purchasing, firm long term rights.

3.47 Ofgem proposed that the new arrangements should be implemented at the same time as Transco's next price control. Under the proposals, as part of the price control review, Ofgem would set specific output measures for the NTS and Transco would be required to offer at least this level of capacity in the long term auctions.

December 2000 document

3.48 In December 2000[34], Ofgem published its conclusions on the framework for the new arrangements, in the light of responses to the consultation document.

3.49 Respondents to the May 2000 proposals supported changes to Transco's current investment regime to improve signals and incentives and agreed that these changes should be taken forward in parallel with work on setting the price

[34] *Long term signals and incentives for investment in transmission capacity on Transco's National Transmission System, Conclusions on the Framework*, Ofgem, December 2000

control. The majority supported the proposals to use agreed output measures to determine more clearly the investment that Transco will undertake during the subsequent price control period, and also supported Transco facing liabilities when it fails to provide the agreed level of capacity. Respondents believed that the sale of long term capacity was beneficial, although many opposed the use of auctions to allocate capacity.

3.50 Ofgem set out its conclusions on the new framework based on the initial proposals. Ofgem rejected arguments for the sale of long term rights through bilateral, negotiated contracts on the grounds that such arrangements would be inconsistent with Ofgem and Transco's duties to promote competition and avoid undue discrimination.

3.51 The key features of the framework were that Transco would be set allowed revenues under the price control and associated output measures. Transco could keep any additional revenue associated with delivering above the agreed output measures but would be exposed to any buy-back costs that resulted. Transco would be obliged to sell at least the output measures by way of a series of longer term price auctions.

3.52 Ofgem also proposed that Transco be given greater freedom to develop new tools (e.g. option and forward contracts) to manage the risks associated with capacity buy-backs and that appropriate anti-hoarding measures should be put in place through the release of use-it-or-lose-it capacity.

3.53 Following the publication of the December 2000 consultation document on long term investment, Ofgem held a seminar, in connection with the price control review, to discuss the appropriate output measures for the NTS. The issues were also discussed at meetings with the industry and customers throughout January and February 2001.

March 2001 document

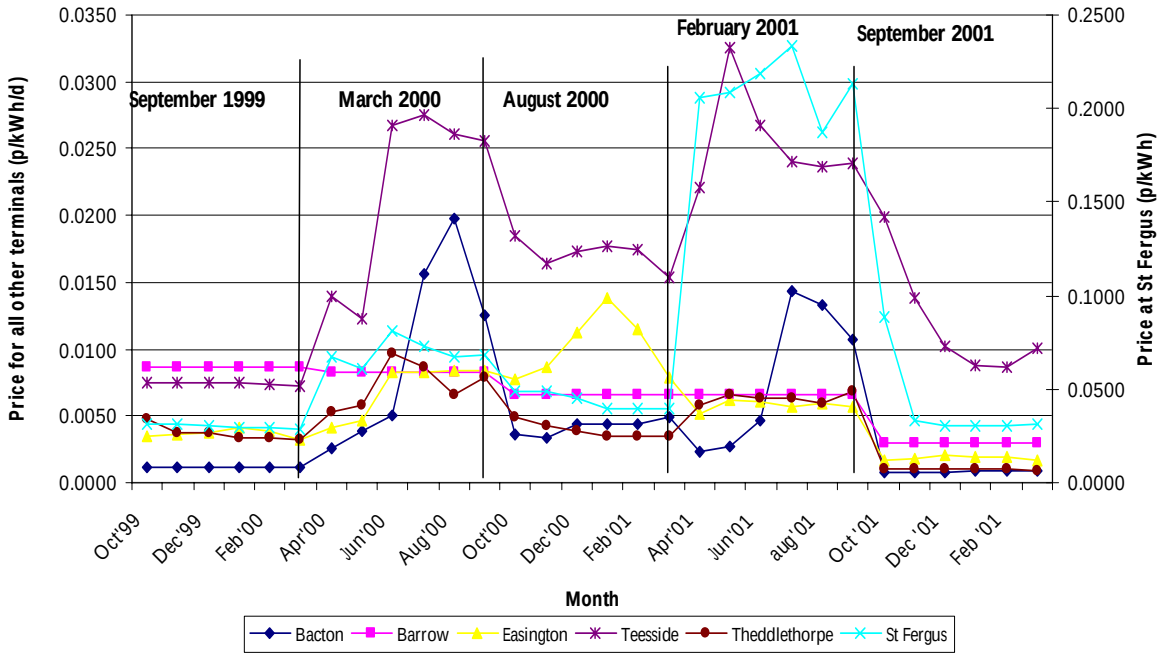
3.54 In its March 2001 document[35], Ofgem summarised respondents' views on a long term investment framework and outlined the new arrangements. Ofgem expects these proposals to be further developed through a combination of the Network Code modification process, Transco pricing consultations and licence amendments.

Signals emerging from the auctions to date

3.55 The current short term auctions have provided some market signals with regard to the short term value of capacity at different locations on the NTS. They are illustrated in Figure 3.2, below. They do not necessarily indicate the need for long term investment. However, they seem to indicate that, at least in the short run, there is a clear need for more flexibility in the NTS, particularly in the summer months, to accommodate different patterns of beach supply to meet a particular level of demand.

[35] *Long term signals and incentives for investment in transmission capacity on Transco's National Transmission System, The new regime*, Ofgem, March 2001

Figure 3.2: Market signals emerging from the short term auctions[36]



3.56 In particular, the results of the short term auctions highlight a tendency for the NTS to experience different constraints on a seasonal basis. The results suggest that the NTS is constrained in the summer months, particularly at Northern entry terminals (St Fergus, Teeside and Barrow). These constraints may in part be due to the level and location of demand on the system during the summer limiting volumes of gas that can be evacuated from St Fergus and other northern terminals. The results of the auctions in winter 2000 suggested at the time that the system was unconstrained at peak although the system appeared to be constrained in the shoulder months.

3.57 For example, in October 2000, Transco experienced severe capacity constraints, mainly at the St Fergus terminal, as system demand was below average levels for the time of year because of warmer weather. As a consequence, Transco was forced to buy-back significant levels of capacity often at very high prices. The total cost of buy-backs in October reached £8.5m. Additional buy-back activity in the subsequent months led to total costs of constraints, in the period 1 October 2000 to 31 December 2000, of over £11m.

[36] The 2001 winter auctions are still ongoing. The figures shown in this graph represent the weighted

3.58 With the commissioning of new fields and the re-commissioning of pipelines allowing Norwegian gas to be imported at St Fergus, it is not yet clear whether the system will be constrained this winter.

3.59 Evidence emerging from the auctions would also suggest that the timing and length of Transco's summer maintenance and capacity expansion work can have a significant impact on the gas market.

3.60 As a result, it appears that there are different seasonal capacity needs and that it is inadequate for NTS system planning to focus solely upon winter peak capacity levels, based upon historical patterns of demand and flows at beach entry points.

Review of Transco's exit, LNG and interruptible capacity arrangements

3.61 In March 2001, Ofgem published a review[37] of Transco's NTS exit capacity, interruption and LNG arrangements. The review identified a number of weaknesses in the current arrangements and set out Ofgem's proposals for reform.

3.62 A number of gas customers have expressed concerns to Ofgem about the existing arrangements. The criticisms have focused on the limited choice of interruptible contracts that are available (a standard contract is to provide 45 days of interruption); the potential discrimination between different classes of customer (customers deemed "network sensitive" can be interrupted significantly more frequently than other customers); and the level of rebates offered to interruptible customers relative to rebates offered to LNG sites providing network support.

3.63 Ofgem also expressed concerned that the current arrangements provide a number of perverse incentives for Transco, including an incentive to over-contract for interruption and under-invest in network reinforcement. Over-contracting for interruption can lead to a cross-subsidy between firm and interruptible customers. Ofgem has estimated that the value of rebates offered to interruptible customers (and therefore paid for by firm customers under the current arrangements) is over £80m per annum.

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average prices over the first four rounds.

[37] *The New Gas Trading Arrangements: Review of Transco's exit capacity, interruption, and liquefied natural gas. A consultation document,* Ofgem, March 2001.

3.64 Finally, we questioned whether the current arrangements are sustainable given wider energy market developments. In particular, Ofgem is concerned that, following the introduction of NETA, the restrictions placed on large off-take sites (such as power stations) and interconnectors may prevent them responding to price signals in the electricity market and continental Europe. Transco has limited incentives under the current arrangements to invest to provide greater flexibility at exit to large loads.

3.65 In reforming the existing arrangements Ofgem argued that it would be desirable to establish market-based arrangements to establish the relative price of firm and interruptible exit capacity. Ofgem proposed that all customers at exit should be deemed to have firm rights and would be obliged to pay the appropriate transportation charges. Transco could then contract with customers and storage operators to offer interruptible contracts of varying durations and forms. Under the proposals, Transco would face new incentives to ensure that it entered into such contracts where it was cheaper to do so than to build additional pipeline capacity to meet firm demand. Ofgem also proposed replacing the existing restrictions at exit with a requirement for Transco to contract at market prices to constrain the flexibility of large loads. Again, the new incentives would ensure that Transco would enter into such contracts where it was cheaper to do so than to invest in additional capacity to provide flexibility.

Weaknesses of the current arrangements

NTS investment incentives

3.66 Ofgem believes that there are a number of weaknesses with Transco's NTS capacity investment incentive arrangements that need to be addressed. In particular, we are concerned that:

- monitoring of Transco's capital expenditure is difficult in the absence of agreed outputs, as it is hard to determine if under-spend against a given target is due to efficiency gains, over estimation of capital expenditure requirements or a failure to invest to agreed levels;
- there are no clear incentives on Transco to invest at entry and exit in an efficient and timely manner in response to changing customer needs;

- there is no mechanism through which shippers can purchase long term capacity rights and effectively signal their requirements sufficiently far in advance to allow Transco to alter its investment plans; and

- Transco's existing planning process does not appear to deliver effective or timely signals of the need for additional investment.

3.67 We are also concerned that the arrangements for exit capacity encourage Transco to over-contract for interruptible capacity as it is not exposed to the costs of offering interruptible contracts. Furthermore, Ofgem believes that the current arrangements do not provide adequate incentives on Transco to invest to meet the requirements of customers at exit, in particular with regard to the flexible consumption of gas by large loads.

SO incentives

3.68 There are also a number of weaknesses with the current SO incentives. Ofgem believes that that the overall incentive regime should be designed to ensure Transco has strong commercial incentives to reduce total SO costs, which customers ultimately pay, rather individual cost components.

3.69 Overall, we believe that a consistent SO incentive scheme covering all SO costs would ensure that SO costs are maintained at an efficient level and that there are no perverse incentives on Transco to reduce one category of costs over another. Ultimately, this will ensure that Transco's incentives are aligned with customer's interests.

Transco Price Control Review

3.70 Ofgem published its initial consultation document on the approach to the next price control review in May 2000.[38] This consultation document initiated the review, set out the main issues and invited views on a number of key issues. In November 2000, Ofgem issued a further consultation paper on Transco's price

[38] *Review of Transco's price control from 2002: An initial consultation document,* Ofgem, May 2000.

control review[39] describing how the issues raised in the May document where being taken forward.

3.71 In February 2001, Ofgem published a further consultation document outlining initial thoughts[40] on the form and structure of Transco's price control including the output framework. In particular, it discussed Ofgem's views on:

- the form and structure of the transportation controls (NTS, LDZ, SO and metering);
- the appropriate output measures to use in monitoring the performance of each business;
- Transco's capital and operating cost requirements and proposals to develop an expenditure monitoring framework;
- the guaranteed and overall standards of service which should apply from April 2002; and
- the most appropriate approach to establishing Transco's Regulatory Value (RV).

3.72 The February 2001 document included a summary of the information obtained from the Transco Business Plan Questionnaire (BPQ) that Ofgem had received in December 2000. Transco has subsequently been asked a number of supplementary questions in order to derive a number of different scenarios for the levels of NTS capacity that Transco could make available, and the costs associated with providing that capacity, based on information gathered by Transco from its Base Planning Assumptions (BPA) process.

3.73 Ofgem's initial proposals for new price controls to apply to Transco from 1 April 2002 where published in June 2001[41] (the "June 2001 Initial Proposals"). In the document, Ofgem confirmed that it intended to introduce separate controls for

[39] *Review of Transco's price control from 2002: Update consultation document*, Ofgem, November 2000.
[40] *Review of Transco's price control from 2002: Initial thoughts consultation document*, Ofgem, February 2001.
[41] *Review of Transco's price control, Draft proposals*, Ofgem, June 2001

the NTS and LDZs. Ofgem set out for consultation its initial proposals for the NTS TO and the LDZs, and these were presented in Table 1.5.

Summary

3.74 In this chapter, we have outlined the existing arrangements regarding Transco's transportation control and outlined the need for reform of these arrangements.

3.75 At the start of the current price control, Transco received:

- an allowance for investing in the NTS to provide entry and exit capacity;
- an allowance for undertaking internal SO functions (operating and capital expenditure) and procuring a number of system balancing services ('shrinkage', operating margins and top-up); and
- a direct pass through to customers of the costs of resolving capacity constraints and undertaking gas balancing.

3.76 Transco had strong incentives to reduce its costs below these allowances, as it keeps all of the difference for the duration of the control. Although these incentives encourage Transco to reduce costs, they do not encourage Transco to respond to the changing needs of customers for entry capacity or exit capacity.

3.77 The New Gas Trading Arrangements (NGTA) have improved the incentives on Transco. They involved introducing an incentive on the costs of gas balancing and introducing new capacity arrangements that exposed Transco to a proportion of the costs incurred in resolving capacity constraints. However, the NGTA programme did not address the longer term incentives with regard to improving investment in the NTS.

3.78 In addition, the costs that Transco occurs as SO of the NTS are still split between the price control and individual SO incentive schemes, and this provides Transco with incentives that are not necessarily fully aligned with customers' interests.

4. Scope, form and duration of the NTS SO incentive schemes and proposed licence changes

Introduction

4.1 In our June 2001 Initial Proposals document, Ofgem outlined the proposed form of price control from April 2002 for Transco's gas transportation business, including the creation of separate NTS and LDZ specific controls that would apply from 1 April 2002. Furthermore, Ofgem discussed our intention that the NTS control will consist of:

- a TO price control that will specify baseline output levels of NTS entry and exit capacity (and linepack) and their associated allowed revenue; and
- SO incentive schemes that will place stronger financial incentives on Transco in relation to investing in the network in response to its customers' demand and to manage the costs associated with the day to day operation of the network.

4.2 In this chapter, we outline our proposals for the scope, form and duration of the NTS SO incentive schemes. These schemes fall into three broad categories:

- NTS capacity investment schemes;
- incentive schemes covering Transco's day to day operation of the NTS; and
- a scheme relating to Transco's NTS SO internal costs.

4.3 We discuss in turn our proposals for the scope, form and duration of the schemes in each of these categories. Our proposals for the parameters for each scheme are described in Chapters 6 to 11.

Overview of the NTS investment capacity incentive regime

Scope of the investment capacity regime

NTS entry capacity

4.4 As part of the TO control, Ofgem proposes to agree a series of entry capacity output levels at each entry point for the five year duration of the price control and associated allowed revenue based on forecasts of efficient capital and operating expenditure required to deliver those outputs. It is important, however, that Transco responds to future market developments by varying capacity availability as compared with its baseline output measures in response to its customers' demands. Transco might, for example, choose to sell output above the baseline (it must offer at least the baseline output measures) or to invest to a lower capacity than specified in the baseline, if there is still time to vary its capital investment.

4.5 Where Transco sells capacity over and above the agreed output measures, Transco may earn revenues over and above its original TO allowed revenues. This additional revenue will be counted as SO incentive revenue. Transco may also defer or cancel investment underpinning the baseline output measures, agreed as part of the price control, in response to changing market demand. Under this scenario, Transco will continue to have to offer the capacity for sale and will be exposed to buy-back costs in the event that there is demand for the capacity. Transco will, however, for the duration of the current control, retain the allowed revenues associated with the capital expenditure necessary to physically deliver the agreed output measures.

NTS exit capacity

4.6 Ofgem believes that Transco should face commercial incentives to trade-off the relative costs of investment in pipeline (and compression), interruption and local storage when deciding how best to meet demand for capacity at exit. As part of the NTS TO price control, exit capacity measures, together with the associated efficient capital and operating expenditure and allowed revenue, will be set. We remain of the view that, over the course of the next five years, all exit load should be deemed firm. Under the incentives, Transco will then only invest to

meet firm demand where this is cheaper than entering into contracts with local storage operators and/or customers to interrupt.

Form of the investment capacity regime

4.7 Ofgem believes that there is considerable uncertainty with regard to the operation of the NTS capacity investment incentives. Uncertainty about the value of incremental entry capacity, for instance, suggests that under certain outcomes, Transco could make very high (low) rates of returns on investments that would not be commensurate with the risks that Transco was taking. In terms of exit capacity, given investment lead times, it will take some time for Transco to be able to respond to the new incentives and begin to trade-off pipeline investment against the costs of signing interruptible contracts and using storage.

4.8 Ofgem also believes that the NTS capacity incentives will interact with other elements of SO day to day incentives – most notably the capacity buy-back cost incentive. Transco will have incentives with regard to the capacity buy-back market that will influence its investment decisions. For instance, Transco may wish to build additional capacity to respond to market signals for new investment and/or to reduce the unit costs of buy-back capacity.

Ofgem's initial proposals

4.9 Given these factors, Ofgem proposes that Transco's exposure under both the entry and exit capacity incentives should be capped. Since the entry capacity incentive relates solely to investment decisions, Ofgem believes that it would be appropriate for the cap and collar to be related to the rate of return that Transco is allowed to earn on investments that are incremental to those related to its baseline output measures.

4.10 The exit capacity scheme is a more conventional sliding scale scheme and hence Ofgem proposes that its cap and collar should be set in relation to Transco's target level of costs.

Duration of the investment capacity incentives

4.11 The purpose of the entry capacity incentives is to encourage Transco to respond to market signals regarding the need for investment and this is unlikely to occur unless it faces a stable regulatory regime for several years. On the other hand, with regard to the exit capacity incentive there is uncertainty about the actual level of interruption for system purposes that may be required in future years.

Ofgem's initial proposals

4.12 Given the considerations outlined above, Ofgem proposes to:

- set all the parameters for the entry capacity scheme for the five years of the price control, consistent with the duration of the TO control; and
- set target values for the exit capacity scheme for five years but initially set the other parameters (sharing factors, caps and collars) for two years.

Overview of the day to day SO incentive scheme

Scope

4.13 The SO's costs to be included in the incentive schemes cover the costs of:

- entry capacity buy-backs: the costs incurred in the buying back of entry capacity from market participants that Transco has initially sold but is not able to physically deliver on the day. The TO may not, on the day, be able to provide the entry capacity that has been sold for a number of reasons, including:
  - demand or supply conditions on the network effectively reducing the available entry capacity at certain locations;
  - maintenance of entry terminals by the TO and/or plant and equipment failures reducing entry capacity at those sites; and/or
  - a decision by the TO not to invest in long-lived assets to meet a short term constraint on the basis of market signals of long term demand levels at a particular location.

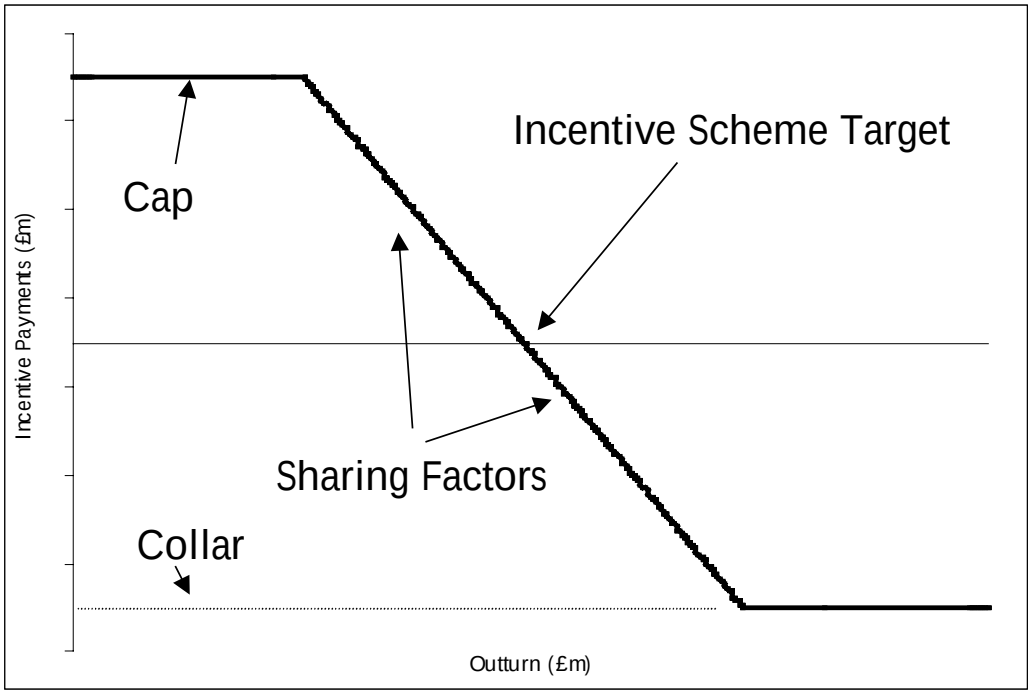
- system balancing: in operating the NTS, the SO uses gas as fuel for compressors and there are other smaller system demands for gas that are met by the SO (collectively these are known as shrinkage). In addition, the SO incurs costs in ensuring that there are sufficient reserves of gas (operating margins) to meet defined security and safety objectives through its holdings of linepack, storage and other flexibility tools; and

- residual gas balancing: shippers have an obligation and incentive to maintain a balance between their inputs and offtakes on a daily basis. In addition, Transco acts as residual gas balancer to keep inputs and offtakes in balance to acceptable tolerances. Gas balancing consisting of the costs incurred by Transco in buying and selling gas to keep the system in balance over the day.

Form of the day to day SO incentive regime

4.14 Historically, in both the gas and electricity markets, Transco and NGC have faced incentives to reduce SO costs through a 'sliding scale' or profit sharing form of incentive scheme. This form of incentive mechanism has been successful in reducing the costs of system operation over time. This approach also has the benefit of being simple to understand. An illustration of the sliding scale form of incentive is provided in Figure 4.1 below.

Figure 4.1: Illustration of sliding scale approach



Ofgem's initial proposals

4.15 Ofgem believes that for the day to day SO incentive schemes a sliding scale form of incentive is appropriate.

Duration of the day to day SO incentive regime

4.16 In general, Ofgem believes that it would be desirable for the SO incentive scheme(s) to be of the same duration as the TO price control. This would allow Transco to trade off the potential benefits of additional investment designed to reduce SO costs and to capture more of the benefits of investment that reduced system operation costs over a consistent time-frame as the TO price control. It would also provide Transco with a stronger incentive to innovate as it would be able to enter into longer term contracts against the background of a certain incentive regime.

4.17 However, given that new incentive arrangements are being proposed for the start of the new price control, there is inevitably some uncertainty concerning the possible distribution of costs and the risks under the different incentive schemes. Ofgem therefore believes that it is be appropriate to implement shorter duration schemes.

4.18 Over time, and as these risks become clearer, Ofgem believes it will be appropriate to lengthen the duration of the existing schemes, and ultimately, to align them fully with the duration of the price control.

Capacity buy-back

4.19 Ofgem believes that given the difficulties in forecasting buy-back costs, and the limited experience of buy-backs to date, it would be difficult to set an incentive scheme of more than one year's duration, initially.

System balancing

4.20 System balancing covers the purchases of gas that the SO makes to cover SO gas use and provide system reserves. Whilst Transco can directly influence the volume of gas that it requires for system balancing, it has less influence over the price that it has to pay for that gas. Thus, in considering the appropriate duration for the system balancing incentive, it is necessary to consider what price could be used in setting a target cost. Ofgem considers that forward prices should be used wherever these are available, and hence the issue is whether this provides a natural limit to the duration of the schemes. Ofgem has identified a number of options for the duration of the system balancing incentives including:

- a five year scheme on total costs using a reference price;
- a scheme on total costs covering the period for which forward gas prices are available; and
- a five year scheme on volumes but with prices and hence costs set only for the period for which forward gas prices are available.

4.21 The first option would provide regulatory stability that would enable Transco to trade-off investment in pipes with greater use of compression (for any given volume of gas, the larger the pipeline system, the less compression is needed to transport the gas). The use of a reference price would provide an incentive for Transco to reduce costs below that implied by the reference price. The reference price could be determined, for example, as the forward price prevailing at a predetermined point in the future (such as the first day of the formula year).

Residual gas balancing

4.22 Ofgem believes that there are two main options with respect to the duration of residual gas balancing incentive scheme:

- a 1 year scheme followed by two successive 2 year schemes: this option assumes that the uncertainty in costs evident now is likely to persist until a significant period of experience has been gained of operation under the new incentive arrangements; or
- a 2 year scheme followed by a 3 year scheme: this option would provide greater certainty to Transco regarding the parameters of the NTS SO incentive arrangements.

Ofgem's initial proposals

Capacity buy-backs

4.23 Ofgem believes that the schemes for entry capacity buy-backs the targets, sharing factors and caps and collars should be set for one year.

System balancing

4.24 For system balancing costs, Ofgem's initial proposal is to fix the volumes for NTS gas costs for a five year period and the gas price for the period over which forward prices are reported i.e. two years. Given potential developments with regard to gas storage facilities, Ofgem believes that system reserve volumes should only be set for two years. Ofgem's initial view is, therefore, to set the target cost values for both shrinkage and system reserve for two years.

Residual gas balancing

4.25 Ofgem believes that the schemes for residual gas balancing sharing factors and caps and collars should be set for one year, with provisions for them to be rolled over for a second year. This should provide an appropriate balance for Transco between uncertainty over the costs it will face and a stable regulatory regime.

4.26 In summary, Ofgem proposes to set Transco:

- one year incentives for both buy-back costs and residual gas balancing costs; and
- two year schemes for both elements of system balancing costs.

SO internal costs

4.27 Ofgem believes that there should, as far as possible be consistent incentives for both internal and external NTS SO costs. This is because at the margin, Transco may be able to spend more on its own internal costs to realise greater cost savings on external costs (or vice versa). This might, for example, involve increasing the number of trading and operational staff or increasing expenditure on developing analytical tools to understand system dynamics. Such actions would be to the overall benefit of customers who bear the total costs of the SO.

4.28 Under the current arrangements, Transco has a strong incentive to reduce its own internal costs but only limited incentives to manage the external costs of system operation.

Scope of the SO internal cost incentive regime

4.29 As we outlined in our June 2001 Initial Proposals, Ofgem believes that shipper services are not strictly an NTS SO internal cost – any improvements in performance in providing these services would not interact with the level of external costs incurred by the SO. For this reason, Ofgem believes that shipper services should remain part of the TO price control. All other internal costs that the SO incurs in its SO role will be included within the SO incentive.

Form of the SO internal cost incentive regime

4.30 With respect to SO internal costs, there are two main options for the form of the incentive:

- Option (a): Transco would get to keep any reductions in SO internal costs below the target values for the period of the price control but would be fully exposed if costs exceeded the targets. This would be similar in effect to the existing arrangements where the costs are taken

into account when capping Transco's allowed revenue under the RPI-X price control;

- Option (b): incorporate SO internal costs fully within the SO day to day 'external cost' incentive mechanism, either by having a single scheme or having separate targets but applying the same sharing factors.

4.31 The main difference between Option (a) and Option (b) relates to the sharing factors applied to any differences between actual and forecast costs. Under Option (a) the sharing factors would be 100% whilst under Option (b) the sharing factor would be lower and any downside may be capped. Thus, under Option (b), Transco would have to share any reductions in internal costs with customers.

4.32 In deciding between the options it is important to try and ensure consistency across the range of incentives that Transco face. The two options therefore need to be considered in the context of the interactions between the different costs Transco face – TO and SO operating expenditure, capital expenditure and SO external costs. There are interactions between each of these areas such that cost reductions or increases in one area will affect the costs in the other areas. Accordingly, if the interaction between SO internal costs and TO costs is stronger than that with SO external costs, Option (a) is more consistent than Option (b).

Ofgem's initial proposals

4.33 Our initial view is that the interactions between internal and external SO costs are stronger than the interactions between the external SO costs and TO costs. We therefore believe that the SO internal cost incentives should be aligned, as far as possible, with the external costs associated with its day to day SO incentive schemes.

4.34 Consequently, Ofgem has produced initial proposals based on a sliding scale scheme for SO internal costs. We accept that the values chosen for caps/collars and sharing factors will be an important driver of the strength of the incentive on Transco, as SO, and the consistency of incentives on Transco as a whole. The values chosen for these parameters will also affect the variability of Transco's

return. If the values currently applied to SO costs were adopted, Transco's variability of return would increase, but so also would the average returns available to it, such that overall Transco might be expected to benefit from such a change.

4.35 This form of incentive is also consistent with that put in place for the National Grid Company (NGC) from 1 April 2001.[42] Under NGC's new SO price control, both SO internal and SO external costs are subject to a sliding scale form of incentive with consistent sharing factors.

Duration of the SO internal cost incentive regime

4.36 Ofgem believes that it is important, where possible, to provide appropriate long term incentives to Transco to reduce and control the costs of system operation and long term incentives to respond to market demands for capacity. To a large extent, Transco has complete control over the internal costs of the SO business. This must be balanced by the fact that there is uncertainty regarding the likely level of SO external costs and the trade-offs that Transco may be able to make between internal and external costs. Thus, a choice must be made with respect to whether the duration of the incentive arrangements for the short-term SO external cost and the SO internal costs are the same or not. Chapter 10 of this document outlines proposals for SO internal cost targets for each of the 5 years of the TO price control. Therefore, the decision to be made relates solely to sharing factors and caps/collars and should:

- sharing factors and cap/collar for SO internal costs be set for five years; or
- sharing factors and cap/collar be set only for the period of the day to day SO incentive schemes (1 or 2 years).

4.37 The first option would provide greater certainty for Transco as to the incentive arrangements but would not guarantee consistency of sharing factors between internal and external SO costs beyond 2 years. The second option, on the other

[42] *NGC system operator price control and incentive scheme under NETA, Final proposals*, Ofgem, December 2000

hand, would provide for consistency to be maintained but would give Transco less certainly regarding its future revenues.

Ofgem's initial proposals

4.38 Ofgem believes that the importance of ensuring consistency of incentives for Transco across all its SO costs means that, whilst there are strong arguments for setting the SO internal cost sharing factors and cap/collar for five years, the incentive parameters should be set for the same duration as the SO external cost incentive schemes.[43] Thus, Ofgem proposes to set these parameters for one year in the first instance.

Other considerations

Linepack

4.39 As part of its proposals to reform further the gas balancing arrangements, Ofgem has proposed that NTS linepack is sold to shippers by way of a price auction. Any sale of NTS linepack will be based on the baseline output measures agreed as part of the TO price control. Any commercial incentives on Transco relating to the sale (or purchase by Transco) of system linepack will be implemented through subsequent modifications to the SO incentive arrangements.

Gas quality

4.40 In its role as SO, Transco must also keep gas being transported through the NTS within certain specified quality limits. Gas quality impacts on both the levels of entry capacity available (it requires a higher volume of lower quality gas to provide a given amount of energy) and on the service provided to customers at exit.

[43] The same approach has been adopted for NGC's SO incentive scheme.

4.41 Ofgem's preliminary view is that it would not be necessary to introduce an explicit gas quality incentive at entry. Under the proposed entry capacity incentives, Transco should be willing to invest to alleviate gas quality constraints at entry, if market demand suggested that the costs of any additional investment would be met. This is because additional investment would manifest itself in additional entry capacity and Transco would keep the additional revenues generated.

4.42 While Ofgem believes the long term entry capacity incentives will provide the right incentives on Transco to alleviate any problems at entry, we are concerned that the proposed exit incentives do not provide sufficient incentives to improve quality services at exit. In particular, as exit capacity is currently measured over a day, Transco may have limited incentive to deliver additional within-day flexibility (e.g. through the removal of ramp rate restrictions) even if customers were willing to pay more for such a service. Similarly, Transco has limited incentives to offer enhanced services at exit (such as delivering at or below a specified quality level) even if customers are willing to meet any additional costs Transco incurs.

4.43 Any commercial incentives on Transco relating to improving gas quality services at exit will be implemented through subsequent developments of the SO incentive arrangements.

Network Code and licence changes

4.44 Ofgem's SO proposals may require the transfer of certain provisions relating to its existing entry capacity buy-back incentive and gas balancing incentive, which are currently set out in Transco's Network Code, into Transco's Gas Transporter's licence. This would give Transco greater certainty, as any proposed amendment to the form, scope and duration of the scheme would require Transco's consent.

New licence obligations

4.45 Ofgem is also proposing to introduce new obligations on Transco as part of the new incentive arrangements. In particular, Ofgem proposes that the following new licence obligations be introduced:

- a requirement for Transco to operate an economic and efficient transportation system; and

- a requirement to produce procurement guidelines and balancing principles statements.[44]

4.46 The obligation to operate an economic and efficient transportation system will provide an important regulatory safeguard underpinning the new arrangement. Ofgem believes that this new licence obligation is required for a number of reasons. First, it recognises and formalises expectations about the manner in which Transco should carry out its system operator function. Second, to the extent that the incentive scheme encompasses a cap on payments to Transco and a collar on the payments by Transco, there could be instances in which the scheme no longer provides an incentive for Transco e.g. when Transco hits its cap or collar.

4.47 The new obligation would give Ofgem the ability to take enforcement action in such instances should it be necessary.[45]

4.48 Transco, as SO, currently procures a number of services for the purposes of system balancing and residual gas balancing. As discussed in this chapter, under Ofgem's SO incentive proposals, coupled with other recent changes to the regime,[46] the SO would be given greater discretion over the utilisation of these services. For a number of such services, transparent and liquid markets exist, such as the OCM for spot gas. However, if the SO is to contract forward for the provision of both system and residual gas balancing services then there may be a need for the SO to enter into bilateral contracts. Ofgem proposes, therefore, that Transco should have a new licence obligation requiring it to produce Procurement Guidelines and Balancing Principles statements, similar to those that NGC already produces in relation to its SO incentives.

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[44] This will replace Transco's existing obligation to produce Operational Guidelines.
[45] Furthermore, such an obligation complies with the European Gas Directive. Article 7(1) of the Directive states that "Each transmission, storage and/or LNG undertaking shall operate, maintain and develop under economic conditions secure, reliable and efficient transmission, storage and/or LNG facilities with due regard to the environment".
[46] On 1 October 2000, Transco's obligation to only purchase balancing gas on the OCM expired and it is now free to source such gas from any market deemed appropriate.

4.49 The Procurement Guidelines and Balancing Principles statements will aid transparency for market participants by setting out clearly the types of services for which the SO might contract, the frequency of any tenders to procure such services and the high level principles the SO will adopt in balancing the system. They will also oblige the SO to publish information on the contracts it holds, the average prices associated with services procured and reports on how and when such contracts are exercised.

4.50 The two new licence conditions, and their associated arrangements, will be based on similar obligations that are set out in NGC's licence under its SO incentives. Appendix 2 sets out the relevant conditions in NGC's licence relating to Procurement Guidelines and Balancing Principles to assist respondents in understanding the nature and intent of Ofgem's proposals.

Development of the SO incentive schemes

4.51 Ofgem considers that over time the various incentive schemes outlined in this chapter should be aligned and potentially brought within a single scheme. Therefore, the schemes discussed here are transitional. In addition the capacity investment incentive schemes will only begin to take effect as Transco is able to vary its investment in line with market driven changes in capacity, as against the baseline outputs set in the context of the NTS TO price control.

4.52 The future entry capacity buy-back schemes will need to be carefully constructed so as to interact appropriately with the entry capacity investment incentive scheme.

Summary and views invited

4.53 In this chapter, we outlined our proposals with regards to the scope, form and duration of the SO incentive regime. Ofgem invites views on any of the issues raised in this chapter and on the specific aspects of our proposals on the scope, form and duration of each of the incentive schemes. We have outlined an incentive regime consisting of seven separate schemes:

- NTS entry capacity investment, with all elements of the scheme set for five years;

- NTS exit capacity investment, with target values set for five years and other parameters initially set for two years;
- entry capacity buy-backs, with the initial scheme to last one year;
- other system balancing (SO gas costs and system reserve); with the initial schemes to last two years;
- residual gas balancing; with the initial scheme to last one year; and
- internal costs (operating and capital expenditure) with target values set for five years and other parameters initially set for one year.

4.54 We have also set out proposals to modify Transco's GT licence to introduce new obligations consistent with the proposed SO incentive arrangements. Ofgem would also welcome views on the proposed amendments to Transco's GT licence set out in this chapter.

5. NTS output measures

Introduction

5.1 In this chapter we set out the process to date on setting the NTS output measures under the price control. Ofgem will make its final decision on the NTS entry capacity, exit capacity and linepack output measures, and their associated capital and operating expenditure, as part of the final proposals under the price control. We also explain Transco's current proposals, which have been revised and updated in the light of its own consultation exercise with the industry and customers. The chapter then sets out Ofgem's latest thinking on Transco's proposed investment plan, discusses auction design issues associated with the long term auctions of the output measures and considers potential ways to deal with any revenue over/under-recovery associated against allowed revenue as a result of the auctions. Finally, the chapter sets out the process going forward to determine the output measures.

5.2 As part of the preparation for this price control review, Transco has provided measures of NTS capacity and linepack that are consistent with the capital expenditure that Transco is requesting for upgrading the NTS. In Table 5.1 we outline the submissions that Transco has made as part of this process.

Table 5.1: Process to date

Submission / publication	Date
Initial output matrices	Submitted April 30, 2001
Transporting Britain's Energy (TBE)	Consultation with the industry – May 2001
Updated output matrices	Submitted July 2001
Transporting Britain's Energy	Conclusions – July 2001

Initial output matrices

5.3 In March 2001, Ofgem provided Transco with a template for producing output matrices on the level of NTS entry, exit and linepack capacity and associated capital expenditure.

5.4 Ofgem asked Transco to complete the matrices for the three scenarios (scenarios A, B and C) set out in Transco's 10 Year Statement 2000, plus an additional scenario which was a variation on scenario C with additional power station related load. The scenarios were constructed from two gas demand forecasts – base level and strong demand – and two gas supply forecasts. The first supply forecast assumed that additional gas is supplied via St Fergus ('St Fergus expansion") while the second assumes greater imports via the Bacton-Zeebrugge interconnector ("interconnector balance"). The completed matrices were published by Transco on 1 May 2001 and provided Ofgem and all other interested parties with an opportunity to comment on the initial estimate of the output measures.

5.5 In the June 2001 Initial Proposals, respondents' views on both output measures and the matrices were reported. Both Transco and Ofgem also outlined concerns with the matrices that Transco submitted, namely that:

- the capacity figures provided by Transco did not correspond to the maximum physical levels of capacity at each terminal but rather reflected the expected peak day supply pattern at each terminal;[47] and
- the output matrices were completed using old planning information rather than the information gained through the 2001 Base Planning process.

5.6 As a result of these concerns, Ofgem requested that Transco resubmit output matrices based on the most up-to-date scenarios that its planning department was using.

Transco's consultation: Transporting Britain's Energy

5.7 After Transco submitted its original output matrices, it published a consultation on its future plans for investment, on 25 May 2001.[48] This document reviewed the BPA process, outlined key areas of uncertainty remaining in the planning process and updated the peak capacity output measures under its three

[47] Maximum physical capacity at a terminal is the maximum amount of gas that could be evacuated from a terminal for a given forecast of system demand.
[48] *Transporting Britain's Energy*, Transco, May 2001.

scenarios. This document also outlined some additional analysis that Transco had undertaken with regard to improving NTS flexibility (the ability to deliver more capacity off-peak) and resilience (the ability to cope with supply shocks). Transco presented the contents of this document at a workshop on 6 June 2001, and asked industry participants to respond to the consultation by 15 June 2001.

Scenario analyses

5.8 As outlined above, Transco developed three different scenarios for NTS investment, based on the existing peak day (1 in 20 year) licence obligation. The scenarios identified the level of peak day capacity available and their associated levels of capital expenditure. The combination of supply and demand assumptions in the three scenarios are shown in Table 5.2. The associated levels of capital expenditure and peak day capacities are presented in Figures 5.2 and 5.3 (which appear later in this chapter).

Table 5.2: Investment scenarios presented by Transco

	Supply scenarios	
Demand scenarios	Interconnector balance	St Fergus expansion
Base demand	Scenario C	
Strong demand	Scenario A	Scenario B

Transco's proposals – improving NTS flexibility

5.9 Transco stated that the NTS is designed primarily to meet the 1 in 20 peak day planning criteria but that there had been calls for these to be augmented to consider off-peak requirements as well. In particular, it mentioned the issue of availability of entry capacity during the summer months and reported the results of its analysis of different strategies for increasing summer capacity.

5.10 Transco compared two options for increasing off-peak capacity, either:

- raising the terminal capacity curve (providing additional flexibility throughout the year and additional peak capacity); or
- flattening the terminal capacity curve (achieving a similar level of available capacity in summer as in winter).

5.11 Transco reported that its analysis indicated that it would be cheaper to lift capacity levels throughout the year. This result partly reflected the existing configuration of the NTS and that, in order to enable existing compressors to operate year-round, 'sister' stations adjacent to the existing stations would need to be built.

5.12 Transco estimated that the total capital costs involved with providing peak capacity levels all year (at all terminals) were around £430 million.

Transco's proposals – improving network resilience

5.13 Transco also proposed additional investment to increase the ability of the NTS to accommodate entry flows in the event of supply shocks, such as the loss of a sub-terminal at any of the main beach entry terminals. It identified three new pipelines (around the Theddlethorpe and Easington entry terminals), costing around £200m, that could provide additional resilience to the network:

- Ryther to Scunthorpe, supporting the loss of supply at Teesside, Barrow or St Fergus;
- Paull to Scunthorpe, supporting the loss of supply at either Teesside or St Fergus; and
- Nether Kellet to Pannal, supporting the loss of supply at Teesside, St Fergus, Theddlethorpe, Easington or Barrow.

Respondents' views

Demand assumptions

5.14 Of the respondents who commented on Transco's demand growth assumptions, the majority expressed the view that they might be unduly high. They referred to the:

- possible dampening effect of high gas prices, particularly on power station load which might also be adversely affected by the introduction of NETA and the current over capacity in the generation market;

- the growth of on-shore salt cavity storage or off-shore storage schemes; and

- the Government's estimate of the impact of the Climate Change Levy (CCL) and its targets for combined heat and power (CHP) and other renewable forms of energy.

Supply sources

5.15 Although no real consensus was found, a number of respondents commenting specifically on the sources of supply supported Transco's focus on investing in St Fergus and Bacton. Most respondents supported the assumption that imports would be likely to come from Norway through the St Fergus terminal.

Peak output scenarios

5.16 Most respondents argued that higher entry capacity requirements at either Bacton or St Fergus was more likely than the base demand scenario (C). A number expressed the view that they should not be seen as being mutually exclusive, whilst some believed that an intermediate position between A and B was most likely. Only one respondent thought that scenario C was the most likely. There was a call from one respondent to see the impact on linepack of the different scenarios and the temporary impact on capacity likely to be caused by the additional investment.

NTS flexibility

5.17 Respondents strongly supported the concept of increasing the flexibility of the NTS. However, some concern was expressed that the concept of flexibility had not been clearly defined. Respondents suggested that Transco should have additional licence obligations relating to meeting one, or more, of:

- terminal-specific off-peak supply capacities;

- a 1:20 summer demand (as well as winter demand); and

- swings of within-day gas supply between terminals of up to five per cent of daily UK gas demand.

5.18 However, respondents also argued that the costs of increasing flexibility should be borne by those who benefit and that it would be inefficient to increase capacity to relieve transient constraints that were a result of short-term, localised conditions.

Network resilience

5.19 Three respondents commented on this issue with two expressing support for the suggested projects. However, one respondent pointed out the trade-off between increased resilience and costs. Another respondent argued that resilience should be built into future investment where the incremental cost of doing so was small.

July 2001 submission of revised outputs

5.20 In its July 2001 submission, Transco provided updated estimates for peak capacity at entry terminals for two scenarios. Transco moved away from the different demand scenarios in its original submission and provided peak outputs for two cases based on a single demand forecast (resembling the original base demand case) and the two supply scenarios with slight modification.

Demand assumptions

5.21 Transco's main assumptions about demand were that:

- LDZ demand will reduce initially before recovering in the later years of the control. This was based on the view that:
  - domestic gas use has limited but steady potential for growth (around 1% per year);
  - industrial and commercial users on interruptible contracts are relatively price sensitive and the forecast strong gas prices for next few years will depress demand from these sectors. This affects Transco's annual load growth assumptions but not those for peak load growth (as interruptible users are assumed to have no peak consumption);
  - firm industrial and commercial users will be less affected but are still price sensitive;

- power generation growth will be modest, with around 10 GW of CCGT and 7.5 GW of CHP being built by 2010. In addition, CCGTs are assumed to operate at lower load factors than those seen so far;
- Corrib coming on stream in 2003/4, thereby reducing Irish demand for GB gas from that time; and
- a reduction in annual flows through the NTS to the interconnector – assuming the bulk of those flows will go through the Shearwater, Elgin and Franklin pipeline (SEAL).

Supply assumptions

5.22 On the supply side, Transco's assumptions include:

- Norwegian gas will land through the Vesterled pipeline at St Fergus, although alternative landing points are possible given off-shore infrastructure;
- significant new UKCS developments are unlikely since the West of Shetland is uneconomic at current gas prices;
- supply reductions from major UKCS fields occur around 2005 and are only partially offset by new marginal field developments; and
- an increase in interconnector capacity with the possibility of new gas being landed in the south (Bacton).

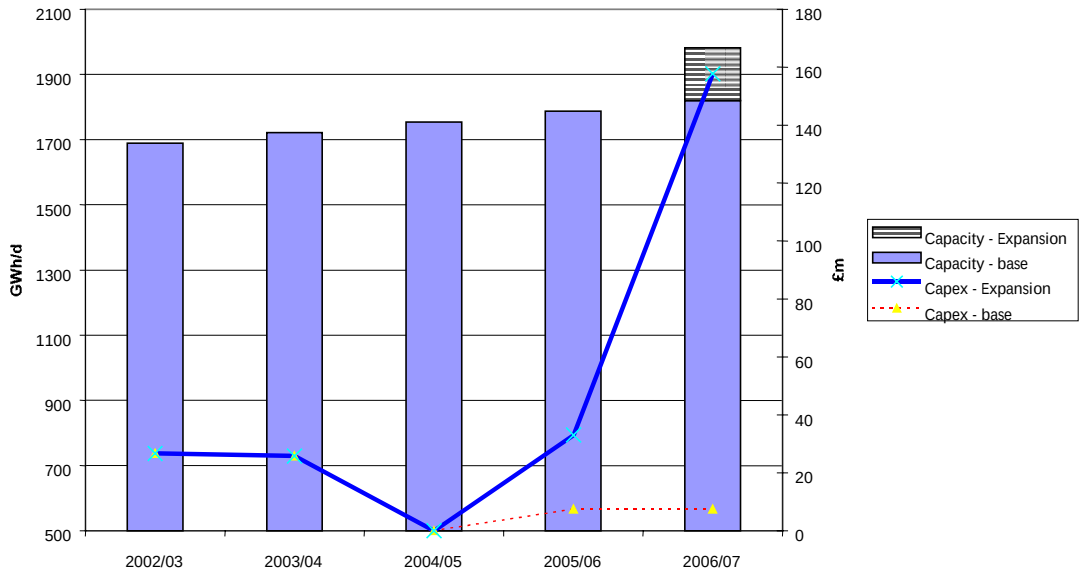
5.23 In general, Transco assume that growth in gas supply will either occur at the St Fergus terminal (predominantly from new, but marginal, UKCS developments and from imports of Norwegian gas) or the Bacton entry terminal (imports of gas through the Belgian interconnector).

5.24 The only difference between the two scenarios relates to the volume of gas that shippers seek to land at St Fergus in the final two years of the price control. Under the base scenario the demand for capacity at St Fergus is lower than under the expansion case.

NTS entry capacity

5.25 Unsurprisingly given the small differences between the scenarios, Transco's July 2001 scenarios show little variation in terms of entry capacity outputs. Transco's two scenarios are the same with the exception of capacities and investment at St Fergus in the final two years of the control (2005/6, 2006/7), as shown in Figure 5.1.

Figure 5.1: Transco's final investment scenarios



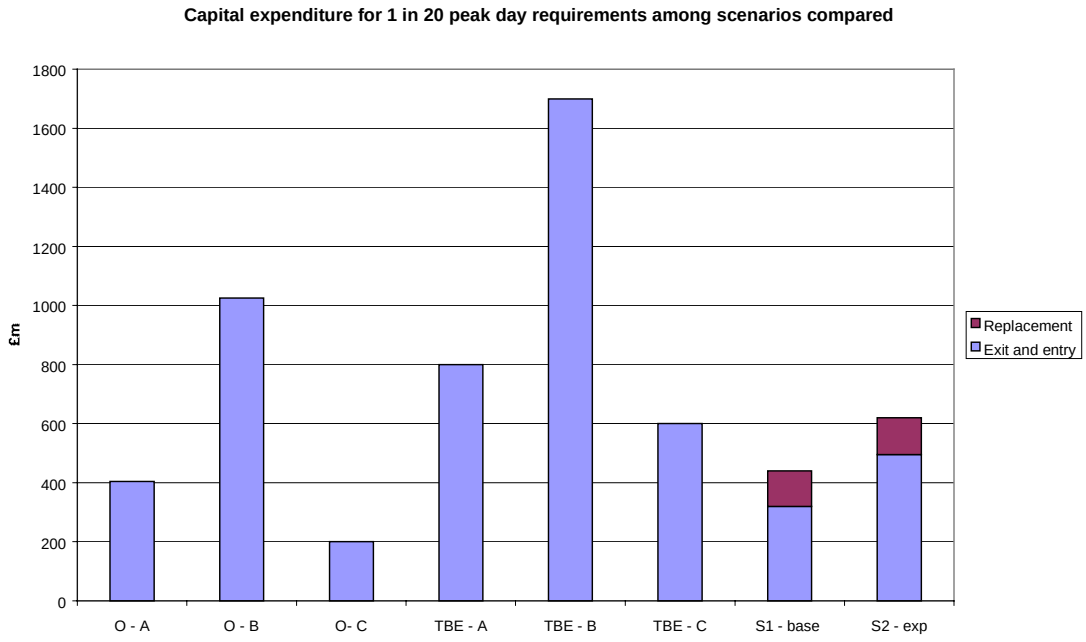
Comparison of final, TBE and original scenarios

5.26 Transco's views on the required capital expenditure and resulting peak day capacity have evolved over time quite significantly. Figures 5.2 and 5.3 compare the capital expenditure estimates and peak capacity values incorporated in its original three scenarios (O-A, O-B and O-C) its TBE scenarios (TBE-A, TBE-B and TBE-C) and its final (July 2001) scenarios (SI-base and SI-expansion).

5.27 For the final scenarios for capital expenditure we have separated out expenditure related to replacement rather than expansion, as Transco has not allocated this to either entry or exit in the matrices that it has submitted to Ofgem. In the original and TBE scenarios, the replacement and increments to peak entry and

exit figures were bundled together and not separately identified. Figure 5.2 shows that Transco's capital expenditure estimates for its final scenarios are low compared to those in the TBE scenarios but similar to that in the base demand cases originally submitted to Ofgem.[49]

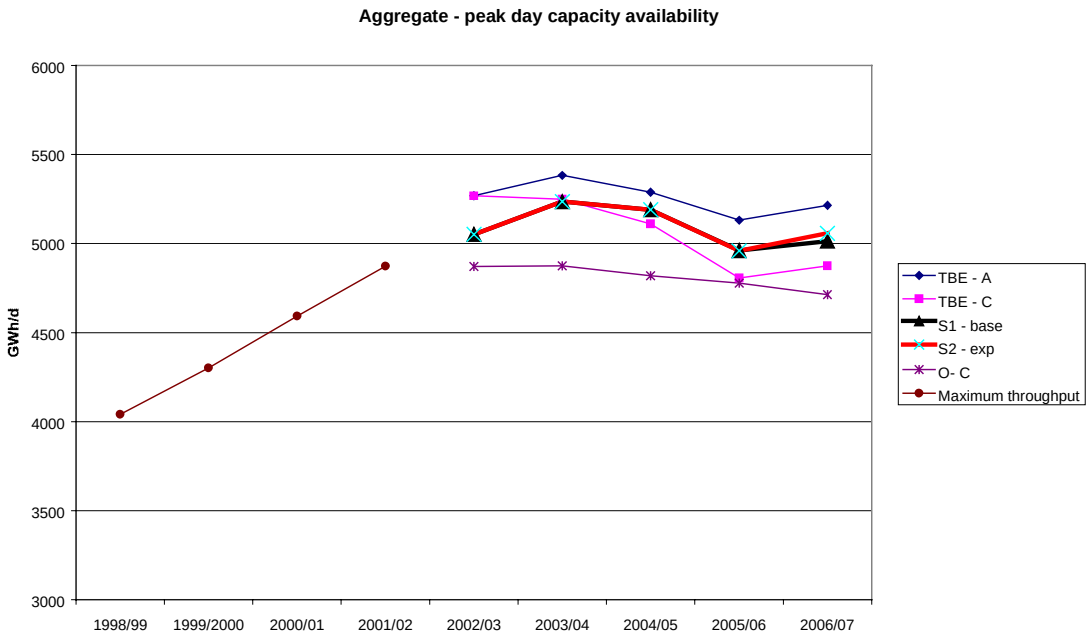
Figure 5.2: Capital expenditure for peak day capacity



5.28 Figure 5.3 presents the aggregate (across the six main beach entry terminals) peak day entry capacities under a selection of these scenarios, together with the peak day throughput on the system in each of the last three years and the forecast for 2001/2. This shows that the current scenarios follow a similar pattern to the previous proposals.

[49] Transco have reported to Ofgem that the TBE figures include expenditure for summer flexibility. This appears inconsistent with what is written in the TBE consultation document.

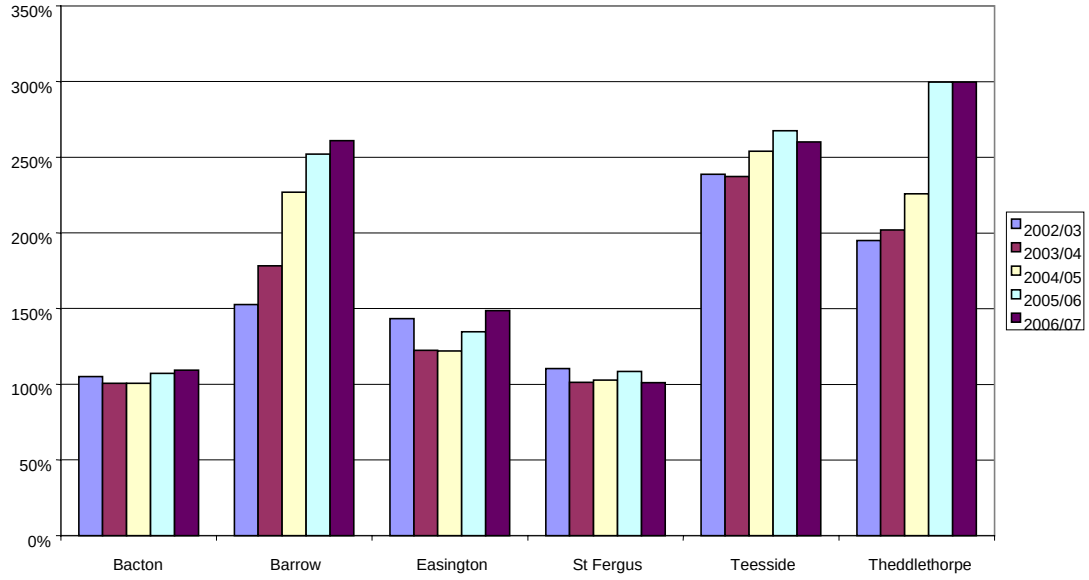
Figure 5.3: Aggregate NTS peak day capacity



Final base scenario

5.29 In Figure 5.4, we show the relationship between the maximum physical level of output and the peak day capacity by year for the base scenario at each of the entry terminals. It shows that the expected peak day is only close to the maximum physical level of capacity i.e. the ratio shown in Figure 5.4 is close to 100%; at two terminals – St Fergus and Bacton.

Figure 5.4: Maximum physical capacity as a proportion of peak day capacity



5.30 Ofgem notes that the level of maximum physical capacity at a number of entry terminals (notably Easington, Theddlethorpe and Teesside) falls throughout the period. Transco reported that this occurs due to an assumption underlying the maximum physical calculation that relied on increasing flows from marginal fields with lower quality gas.

5.31 Transco assumed that maximum physical flows at Theddlethorpe require very high deliveries from particular marginal fields with low calorific values. For this reason, Transco will have to blend this gas at the Hatton compressor with gas from terminals further north. The capacity at the Hatton compressor becomes the constraint on flows and reduces the capacity at all of the affected terminals.

5.32 Transco argue that this impact only occurs given the extreme flows through Theddlethorpe assumed in determining the maximum physical level of capacity. Transco report that based on "credible forecasts, Transco does not expect to encounter the gas quality issue that emerged from the matrices".[50] As a result,

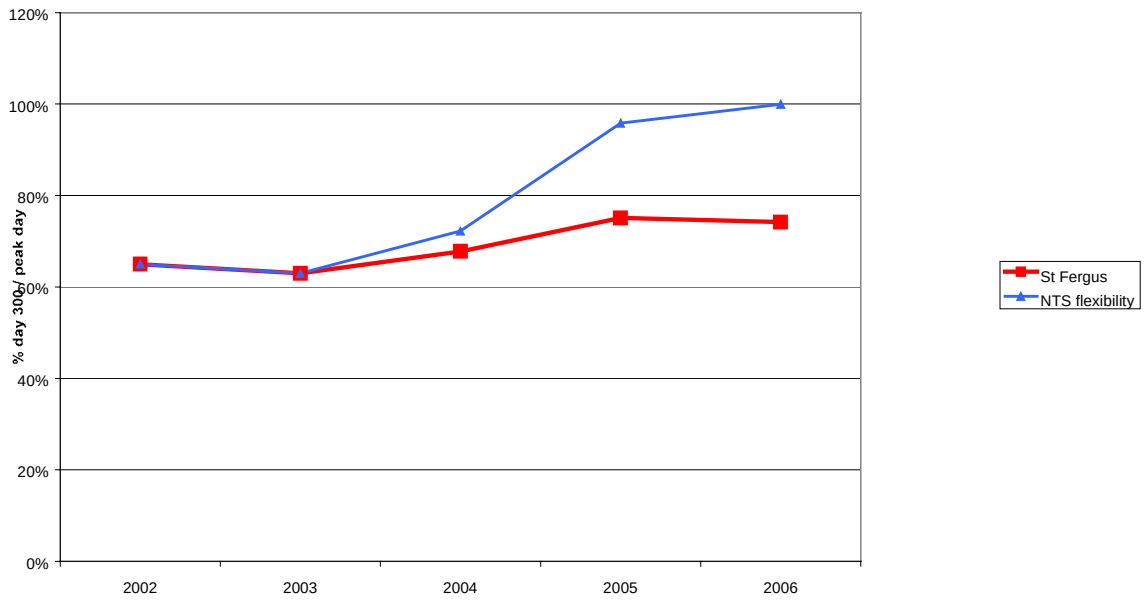
[50] Transco submission to Ofgem.

Transco has not undertaken additional modelling work to determine the capital expenditure necessary to alleviate these gas quality constraints.

NTS flexibility spend

5.33 Figure 5.5 illustrates the current proposed NTS flexibility in the absence of any additional spend to raise off-peak flexibility for St Fergus. It compares the capacity that would be likely to be available at average summer demand levels[51] with that on the peak day. Transco predicts an improvement in NTS flexibility particularly towards the end of the price control period (this applies to all terminals except Bacton). The graph also shows the impact of Transco's proposed expenditure for this flexibility, which is to raise the existing summer deliverability to the level of the proposed peak by the final year of this control.

Figure 5.5: Proposed impact of NTS flexibility spend



Resilience

5.34 Transco has not provided an estimate of the impact on the output measures of its proposed system resilience expenditure. Transco argue that this is in part due to

[51] This is based on Transco's forecast of demand on Day 300 of the annual load duration curve.

the nature of the expenditure, which is effectively an "insurance policy" for the network. However, the expenditure involves three projects in the middle of the NTS that should serve to:

- increase the ability of Transco to withstand unforeseen outages by increasing its ability to offer additional capacity to the market at other terminals in the event of a supply outage;
- increase system linepack;[52] and
- increase the overall reliability of the system, thereby reducing potential exposure to buy-backs.

NTS Exit outputs

5.35 As Transco now only has one demand scenario, it only has one proposal for outputs and capital expenditure for exit capacity. Transco's assumptions on firm and interruptible capacity by sector are shown in Figures 5.6 and 5.7 respectively while its capital expenditure assumptions are included in Figure 5.10.

[52] The impact of this spend is not linked to the outputs that have been submitted for linepack.

Figure 5.6: Proposed NTS firm load

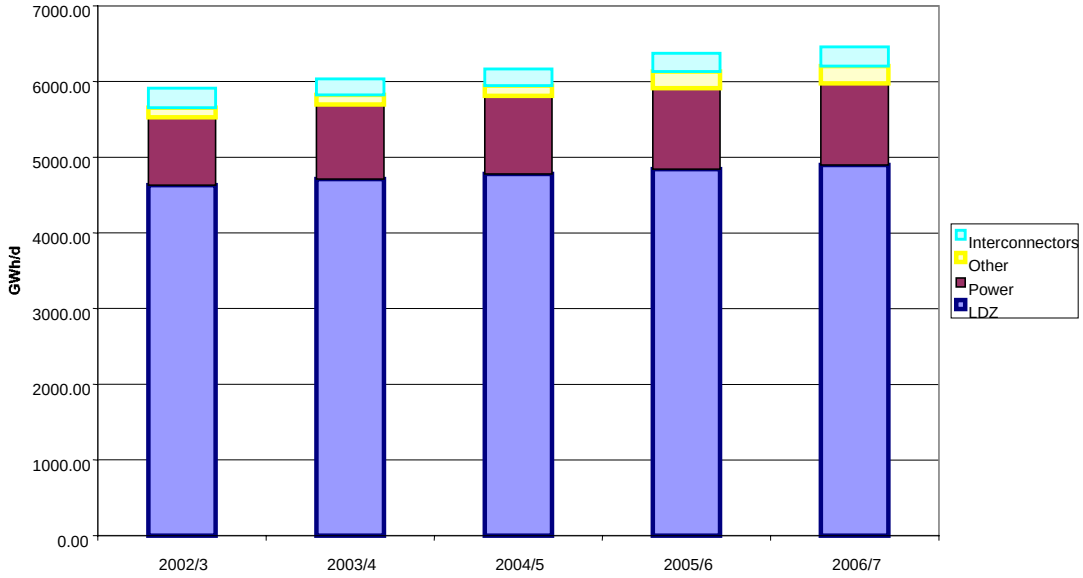
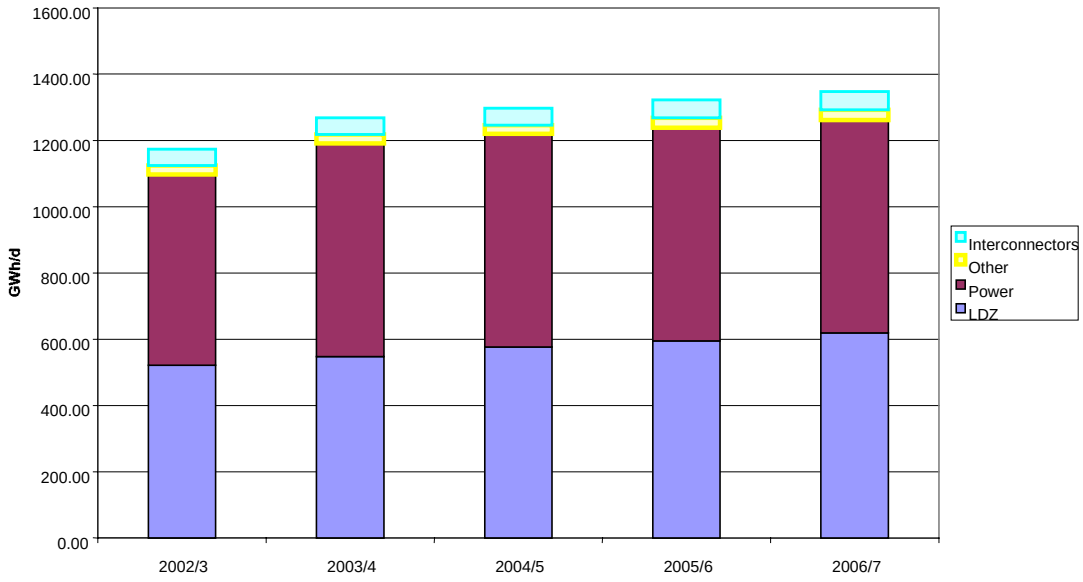


Figure 5.7: Proposed NTS interruptible load

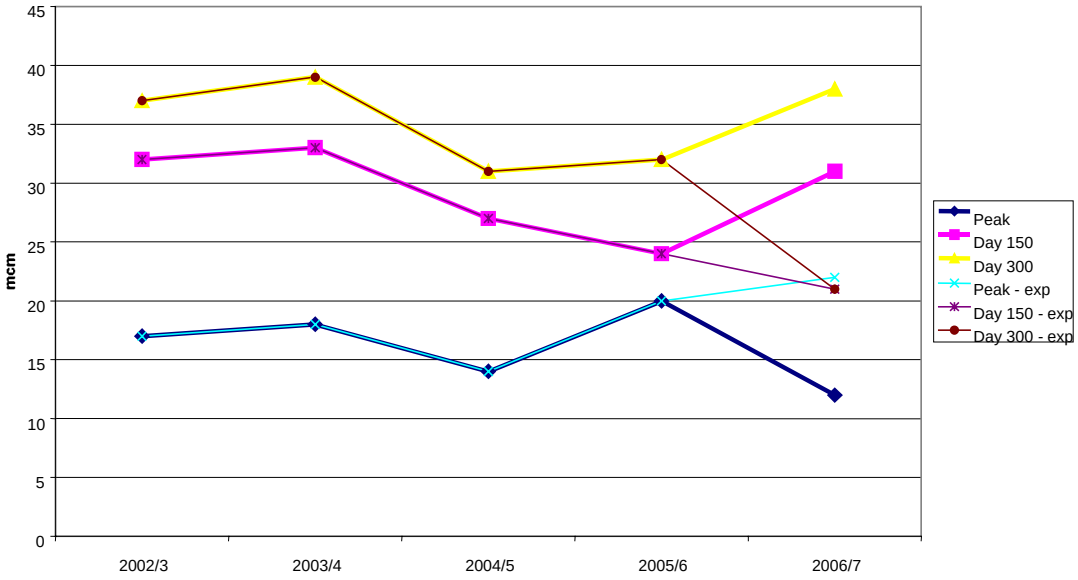


Linepack output measures

5.36 Figure 5.8 shows the linepack output measures that have been submitted by Transco. Transco points out that linepack is a by-product of designing the network to meet entry and exit capacity requirements rather than something for

which they plan. Consequently, there is no capital expenditure associated with these outputs.

Figure 5.8: Proposed NTS Linepack output measures[53]



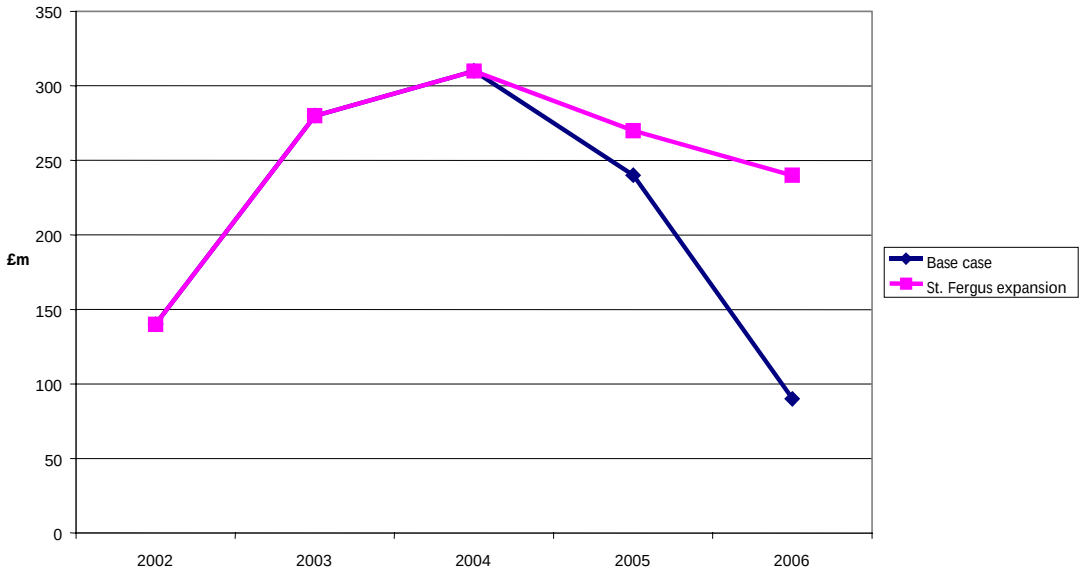
Proposed capital expenditure

Total proposed capital expenditure

5.37 Figure 5.9 outlines the total capital expenditure profiles associated with Transco's two final scenarios. Note that all capital expenditure figures are quoted in 2000 prices.

[53] Peak day demand corresponds to demand on the coldest day in the last 20 years (adjusted for load growth). Day 150 demand corresponds to an average day demand in the spring / autumn while Day 300 corresponds to demand on an average summer day. The two sets of figures are for either the base case or the ST. Fergus expansion (exp) case.

Figure 5.9: Total capital expenditure scenarios



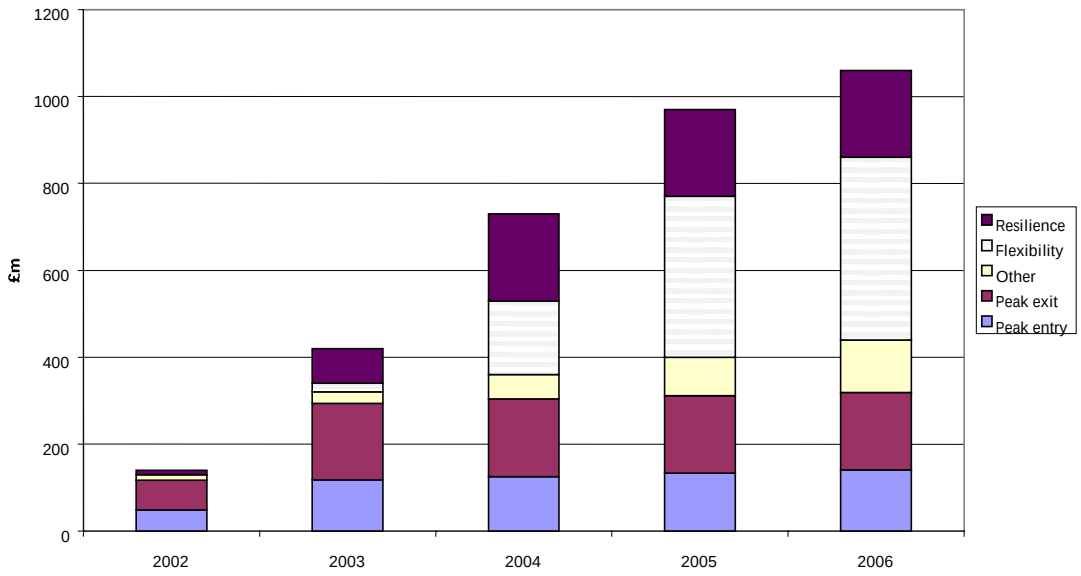
5.38 It shows that:

- there is no difference between the two investment scenarios in the first three years of the control;
- the expenditure peaks in the third year of the control; and
- Transco is proposing to spend over £180 million in each of the middle three years of the next control on the NTS (four years under the base scenario).

Breakdown of proposed capital expenditure

5.39 The values presented in Figure 5.9 include expenditure associated with meeting NTS peak capacity obligations, increasing off-peak flexibility and increasing system resilience. Figure 5.10 shows the breakdown of the capital expenditure by each of these categories on a cumulative basis.

Figure 5.10: Transco's proposed NTS investment (cumulative) – base case



5.40 Peak entry, peak exit (both of which relate to network expansion) and flexibility expenditure together account for over 80% of the total proposed spend over the price control. Replacement expenditure ("other") accounts for 20-25% of the total peak expenditure. Transco proposes to spend over 95% of its capital expenditure for NTS exit outputs in the first two years whereas its expenditure in other areas is more evenly spread.

Independent audit of Transco's proposals

5.41 At the request of shippers, Ofgem asked Transco to commission an independent technical report from an engineering consultant on the maximum available level of physical NTS entry capacity. Transco appointed Mott MacDonald to undertake an audit of the original matrices submitted to Ofgem and published its report on 31 July 2001.[54]

5.42 The report concludes that Transco's:

[54] "Ofgem Matrices: Validity of Transco Development Process", Mott MacDonald, July 2001. Available at www.transco.uk.com

- demand forecasting is comprehensive and utilises sound techniques;
- supply forecasting has inherent inaccuracies but it is as reasonable as can be expected within the current operating environment; and
- network modelling procedures are comprehensive and produce efficient solutions to the network problems identified.

5.43 The auditors note that the estimates of peak day capacity presented do not provide Ofgem with an indication of the maximum physical delivery. Thus, the audit does not cover the subsequent estimation of maximum physical capacity by Transco.

NTS output measures: Ofgem's views

5.44 Ofgem is minded to accept Transco's final base scenario and base the NTS TO baseline NTS entry, exit and linepack output measures on this scenario. The entry output measures will be set as the maximum physical capacity levels at each NTS entry point for each year of the price control.

5.45 Ofgem is also minded to accept Transco's proposed summer flexibility expenditure, subject to Transco providing further information on the impact of this expenditure on maximum physical capacity levels. Transco have indicated that a by-product of making this investment will be an increase in maximum physical capacity over and above the levels set out in the final Transporting Britain's Energy document.

5.46 Ofgem will set out its final decision on the NTS TO baseline outputs and the associated efficient capital and operating expenditure (and allowed revenue) as part of the final proposals for the NTS TO, to be published at the end of this month. In this document we will set out the final baseline output measures for entry, exit and linepack.

5.47 In Table 5.3, Ofgem has set out the maximum physical capacities at entry at each of the main beach entry terminals for the years 2002-7 based on Transco's final base scenario. If Ofgem does decide to include the NTS flexibility expenditure, then, for the reasons outlined above, these maximum physical capacities will be revised upwards.

Table 5.3: Transco final base case NTS maximum physical entry capacities (GWh/d)[55]

	2002/3	2003/4	2004/5	2005/6	2006/7
Bacton	1527	1646	1711	1787	1787
Barrow	812	790	790	791	791
Easington	1105	985	996	1050	1094
St. Fergus	1689	1721	1754	1787	1819
Teesside	910	823	856	899	845
Theddlethorpe	758	628	639	650	650
Aggregate NTS	**6801**	**6593**	**6746**	**6964**	**6986**

Long-term capacity sales and auction design

5.48 Under the present proposals Transco will have to offer for sale (at least) the baseline entry capacity output set as part of the NTS price control which will operate from April 2002.

5.49 Under proposals currently in development by Ofgem and the industry, Transco will offer entry capacity for sale for a number of years ahead - possibly for as long as ten years. By bidding for firm long-term capacity rights, shippers will be able to signal to Transco their future requirements at each entry terminal.

5.50 In our March 2001 long-term incentives decision document, Ofgem argued that the clarity of market signals coming out of the primary auctions will be influenced by the design of those auctions.[56] The document highlighted a number of the key design parameters that will need to be decided including:

- duration of capacity release – Ofgem believes that entry capacity should be released for at least five years to provide longer term investment signals to Transco;
- proportion of available capacity to be sold long term – Ofgem believes that the amount of entry capacity made available in the long term

[55] For simplicity this table excludes values for on-shore entry capacity but baseline output measures will also be set in respect of them.
[56] For a full discussion of these issues, see *Long term signals and incentives in transmission capacity on Transco's National Transmission System (NTS)*: *The new regime*, Ofgem, March 2001.

auctions should be a significant proportion of the agreed baseline output measure. The remaining capacity (and any capacity unsold after the long term auctions) should be allocated through shorter-term (annual, monthly and daily) auctions. As now, Transco should be obliged to make all capacity available to market on non-discriminatory terms;

- definition of the capacity product offered – the capacity product offered could be a bundled strip of capacity (e.g. a five year capacity strip) or an unbundled product (e.g. a series of one year capacity strips). In addition, Transco could release a "top-down" capacity level equal to the output volume in every month, or a monthly profile of capacity (a percentage of maximum physical). Decisions will need to be made on both these issues and will affect the target under the buy-back incentive;

- design of the auction process – the auction process could include a variable volume of capacity, so that Transco could allocate additional capacity above a minimum level;

- reserve prices – it is for consideration whether the long-term auctions have reserve prices or whether Transco should just indicate the price at which it is willing to make additional volumes of capacity available based on investment costs;

- anti-hoarding measures – Ofgem considers that the use-it-or-lose-it regime currently used for short term capacity should be extended to long term capacity. If possible, we believe a monthly use-it-or-lose-it product should be considered.

5.51 The decisions that are taken in respect of the design features outlined above are important, not only in relation to the sale of the baseline capacity outputs, but also because they will also affect Transco's incentives to invest above or below its baseline output measures, as they will influence the level of revenues that it is

likely to raise from the auctions.[57] The discussions about auction design are therefore important to the success of the entry capacity investment incentives.

Over/under-recovery of allowed revenues

5.52 As indicated in our March 2001 document, it is possible that the revenue Transco recovers from the sale of baseline output capacity will be different from that allowed under the NTS TO price control. Over-recoveries against annual allowed revenues under the present price control have already been seen as a result of the current short term entry capacity auctions. Thus far, the over-recoveries have been returned to participants each year via reductions in their transportation charges. The most appropriate method of dealing with over/under recoveries remains a subject of keen debate. Thus, the issue of how over- or under- recoveries are resolved will be an important consideration in developing the proposals for long term auctions.

5.53 There appear to be three main options. First, they could continue to be treated as adjustments to NTS transportation charges (as under the current methodology). Second, over-recoveries could be used to offset a proportion of buy-back costs. Given that at least some of Transco's buy-back costs will be recovered from shippers (via the buy-back incentive scheme described in Chapter 8), this would also result in a direct reduction in the costs that shippers face. Third, any over/under recoveries for the duration of the price control period could be 'rolled up' and dealt with by making appropriate adjustments in setting the next price control. This would see Transco's allowed revenue rise in the event of an under-recovery or fall in the event of an over-recovery. This option is equivalent, in its effects, to the proposal that has been discussed recently to use any auction over-recoveries to create an 'investment fund' for the NTS.

[57] If this additional capacity is offered to market simultaneously with baseline output capacity, it would be allocated the lowest accepted bids on that additional capacity. In a cleared price auction, this means it would receive the same unit price for baseline as incremental capacity. In a pay as bid auction, this means the weighted average price of incremental capacity would be lower than that of baseline capacity.

5.54 The three options are clearly not mutually exclusive. It would be possible, for example, to use a combination of the first two options. Similarly, hybrids could also be used with, for example, different treatments for over and under recoveries. In the event of an under-recovery, NTS commodity charges could be adjusted but over-recoveries could be 'rolled up' into the next price control.

5.55 Ofgem believes that the merits of the different options should continue to be discussed by the industry and other interested parties as part of the overall design of the long term auction arrangements.

Summary

5.56 In this chapter, Ofgem outlined the process that has led to Transco's current proposals for NTS output measures.

5.57 These proposals are based on a single demand forecast, under which most demand growth occurs at St Fergus. This, in turn, leads essentially to a single view of exit output levels and essentially a single view of entry output levels. In addition, Transco's proposals for improving the flexibility and resilience of the NTS will not affect our SO incentive proposals unless they impact upon the agreed baseline output measures.

5.58 Ofgem will set out its final decision on NTS output measures and associated capital expenditure in its price control final proposals document at the end of this month.

6. NTS entry capacity investment incentive scheme

6.1 Ofgem believes that Transco should have clearer incentives to invest efficiently in entry capacity. The SO will be required to offer for sale at least the baseline output level of firm entry capacity set for each entry point over the 5 years of the new NTS TO price control. Transco will not be obliged to build to that level of capacity. Transco will be able to choose to build more capacity, or less in response to its customer's demands. Ofgem's proposals allow Transco to earn revenue over and above that allowed for in the NTS price control where it invests efficiently in response to increased demand. This should give Transco strong financial incentives to meet its customers' changing needs.

Weaknesses of the current arrangements

6.2 Ofgem's proposals for the NTS entry capacity investment incentive are the culmination of the review of long term signals and incentives for investment that began in 1998 following the delay in commissioning new capacity at the St Fergus terminal. The subsequent capacity constraints, particularly during summer months, have led to high prices in the short-term capacity auctions at some entry points, indicating a substantial demand for capacity. However, the short-term nature of the current auctions mean that it is not possible to determine whether this demand will continue and warrant capital investment to increase capacity. For this reason, Ofgem has proposed that longer term auctions of entry capacity should be introduced in 2002.

6.3 Long term auctions of firm, tradable capacity rights should provide clearer market signals of where additional capital investment is required (Transco will also continue to use its annual planning arrangements to inform its Base Planning Assumptions). The signals should be provided sufficiently far in advance for Transco to be able to respond to them and the sale of the capacity over the longer term will ensure that the signals are underpinned by financial commitments to pay for the capacity for a number of years. In addition, Transco will be able to demonstrate to Ofgem that its capital expenditure was efficiently incurred.

6.4 For these arrangements to be effective, Transco must have appropriate incentives to respond to market signals. The current arrangements do not provide them, particularly in respect of market signals for increased capacity. There is no mechanism under the current price control (other than re-opening it) for Transco's allowed revenues to be increased if it undertakes investment in addition to that included in the price control calculations. Equally, the short term nature of the current capacity buy-back incentive arrangements (discussed in Chapter 3) simply encourage Transco to make efficient use of its existing capacity by maximising the capacity available each day and by managing the costs of any capacity buy-backs on the day.

6.5 For example, the incentives do not allow Transco to trade off higher buy-back costs against lower capital expenditure, from deferring or cancelling investment projects, if the longer term signals suggest that higher demand for capacity at a particular entry point is set to continue in future years. Ofgem's proposals for an NTS entry capacity investment incentive, in combination with the entry capacity buy-back incentive in future years, are designed to overcome these weaknesses.

Initial proposals for the SO entry capacity investment incentive

6.6 Under Ofgem's proposed arrangements, if Transco delivers to the baseline level of output it will receive no SO entry capacity investment incentive revenue, over and above the allowed revenue under the NTS TO price control. Transco's entry capacity investment incentives are focused on movements away from the baseline output levels for which it will be funded under the NTS TO price control.

Investing above baseline in response to demands from the market

Cap on Transco's returns

6.7 Under its incentive arrangement Transco should invest and deliver additional capacity over and above the agreed output measures at any location where the market signals the need for additional capacity. If Transco undertakes this additional investment to provide additional capacity, then the sale of the additional capacity will generate additional revenue, which subject to a cap, Transco will be able to keep for the five year duration of the forthcoming price

control (i.e. April 2002 – March 2007). The cap will be determined by reference to a maximum rate of return on the additional investment. The allowed revenue for capital investment to provide the baseline levels of entry capacity outputs over the 5 years of the next price control comprises a depreciation and financing allowance (at the costs of capital set as part of the price control review). A similar allowance would be calculated in respect of the additional entry capacity outputs. If Transco's auctioning of its proposed additional entry capacity raises more revenue than this pre-agreed allowance, then it will be allowed to keep the difference. This will be subject to a maximum return in total on the investment of between 1.5 and 3 times the cost of capital set in the NTS TO price control. Transco will be able to keep this additional revenue (subject to the cap) for the remaining life of the price control.

6.8 To calculate the allowance, Ofgem will agree pre-defined unit costs (unit cost allowances – UCA) at each entry point associated with investment in excess of that required for the baseline output measures.

Collar on Transco's returns

6.9 The long term auctions are likely only to apply to a proportion of the entry capacity outputs and hence Transco will earn revenues associated with incremental capacity investments from both the longer and shorter term auctions. It is possible, therefore, that Transco will undertake additional investment to increase capacity above baseline outputs only to discover that it has over-estimated demand. As a result, the revenues associated with this incremental capacity may be less than the additional allowed revenues calculated using the unit cost allowance.

6.10 In these circumstances, Ofgem proposes to allow Transco to increase its other transportation charges (allowed revenues) so as to ensure that it can fund the additional investment up to its unit cost allowance and achieve a minimum level of return of 1 per cent less than the allowed cost of capital under the NTS TO price control.

6.11 The adjustments in Transco's allowed revenues relating to additional investment could be made at the time it makes the investment, or at the time the extra capacity is offered for sale (which may be a forward sale). At the end of the

price control period, the actual capital expenditure associated with the additional capacity would be reviewed in the normal way, and, provided that the additional investment was efficiently incurred, the assets would be incorporated in Transco's RV. Transco would then revert to earning the regulated rate of return on those assets from the beginning of the next control period.

Deferring baseline investment to meet demand from the market

6.12 Equally, Transco should defer or cancel investment at any location where the evolution of market demand comes to signal that the baseline level of capacity set for the five years of the price control up to 2007, would be excessive in comparison with demand. During the price control period Ofgem proposes that no adjustment should be made to Transco's allowed revenues, even though it will not have undertaken the capital expenditure necessary to physically deliver the agreed output measures. The reason for this is Transco's commitment with regard to baseline output measures lies in offering this capacity for sale. Transco will be fulfilling that commitment, even if it subsequently chooses to invest less because it becomes clear that the capacity will not be fully utilised.

6.13 However, Transco will need to use a proportion of the incentive revenue (i.e. the depreciation and financing allowance that had been taken account in setting its allowed revenues under the price control) to fund the buy-backs of capacity that it is obliged to sell but that will not be backed up by physical capacity. Hence, Transco will only defer investment if its incentive revenue from that deferral is greater than the cost of buying back capacity to which it is exposed. For this reason, it is important that Transco's exposure to buy-back costs is reviewed through time.

6.14 In this case, Transco will face a RV reduction at the end of the price control period (in comparison to what it would be if it had invested in accordance with the baseline output measures).

6.15 A summary of the proposals is set out in Table 6.1.

Table 6.1: Summary of Transco's NTS Entry capacity incentives

Auction revenues related to sale of additional capacity	Effective SO transfer to TO	SO incentive revenue/cost
Revenues greater than unit cost allowance	Unit cost allowance	Revenue equal to difference between unit cost allowance and auction revenue up to maximum rate of return plus depreciation. Excess refunded to participants
Revenues less than unit cost allowance	Unit cost allowance	Cost equal to difference between unit cost allowance and minimum rate of return plus depreciation. Transco charges increased to ensure recovery of minimum rate of return plus depreciation

Note: in all cases return and depreciation calculated in relation to capital investment inferred from agreed unit costs

Investing away from market demand

6.16 If Transco makes available capacity in excess of market demand, Transco will see low prices in the capacity auctions and will therefore subsequently face lower buy-back liabilities. However, at the next price control review, Ofgem would need to consider whether all the investment was efficiently incurred and whether it should be included in the RV. Thus, over-investing against market demand could result in Transco not only losing the benefit under its incentive scheme of reducing capital expenditure, but also introduces the risk of Transco being left with stranded assets in the event that the investment can be determined to be unreasonable on the basis of information available at the time the decision is made.

6.17 If Transco fails to invest in additional capacity, despite evidence of market demand, it would forego the opportunity of earning incentive revenue. It would also likely see higher prices in the primary auctions for capacity and higher prices in the capacity buy-back market subsequently. In addition, Ofgem could consider enforcement action under Transco's GT Licence for failing to meet all reasonable demand for capacity.

6.18 In summary, interms of a cap and collar limiting the rate of return that Transco can earn on incremental investment (to remain fixed for five years), Ofgem proposes:

- an upside cap set at 1.5 to 3 times above the regulated cost of capital set as part of the price control final proposals; and
- a downside collar set at up to 1 per cent below the regulated cost of capital.

6.19 Under this proposed incentive, for every £100m of extra investment that Transco makes in the NTS, to increase entry capacity over and above the baseline outputs it would be able to make earn additional revenues of £23m or could lose up to £2m within period.[58] For example, if Transco was to undertake capital expenditure in line with one of its other scenarios (scenario A – see discussion in Chapter 5), it would spend approximately £360m more than under the proposed baseline levels. Given such expenditure, it would be able to earn up to £85m in additional revenues or lose up to £7m in revenues over the period of the control.

6.20 Ofgem is proposing that no cap and collar be applied for deferrals of investment from baseline levels as Transco will only defer investment where it is more economic to buy-back capacity than make the investment. This implies that the Transco's upside benefit is already limited by the revenue allowed under the price control for the baseline output (equal to depreciation and the allowed rate of return) whilst its downside risks will be protected via the entry capacity buy-back incentive.

The role of the planning process under the new incentives

6.21 In addition to the signals emerging from long term auctions and secondary markets, Transco has indicated that it will continue, in line with its current licence obligations, to produce a ten-year statement and will continue to undertake an annual planning process. Transco has proposed that Ofgem be

[58] This calculation assumes, for the purposes of this illustration, a cost of capital of 6% which is at the lowest end of the proposed cost of capital set out in Ofgem's price control initial proposals. It also assumes that the investment is made in year 3 of the control and capacity is delivered by year 4.

granted a right of veto under its licence. Ofgem would exercise this right of veto if it believed that investment plans announced by Transco as part of producing the annual Ten Year Statement did not appear efficient on the basis of available information at the time. Transco believes that this will significantly reduce their perception of the risk of NTS investment being disallowed at subsequent price controls by Ofgem. Transco has argued that this would further increase their incentive to invest and is also consistent with Ofgem's proposed cost of capital for the NTS TO. Ofgem is currently considering this proposal.

Capacity buy-back incentives in future years

6.22 In Chapter 8, we have set out our proposals for Transco's initial capacity buy-back incentive scheme that will be in place for the first year of the new control. Given Transco's average investment lead times, it is likely that the investment incentive will only begin to influence Transco's NTS investment decisions to a considerable extent after the first year of the control.

6.23 Given the important interactions between Transco's decision on how much to invest in building capacity to meet demand and the level of buy-back costs it will incur in subsequent years, it will be important to ensure that any future buy-back incentives are consistent with the investment incentive.

6.24 In particular, it is likely that Transco's potential exposure under the capacity buy-back incentives and any sharing factors applied to costs will need to increase to ensure that Transco's incentives are well aligned.

Summary and views invited

6.25 In this chapter, we have outlined the working of the entry capacity component of the SO entry capacity investment incentive scheme and set out our proposals with regard to the five year period of the control.

6.26 Ofgem's initial proposal is to set:

- a cap and collar applied to the total return Transco can make from any additional investment. The cap will be set in the range of 1.5 to 3 times the agreed NTS cost of capital and the collar will be set in the range of 0-1 percentage points below the agreed NTS cost of capital (for example if

the cost of capital were set at 6 per cent the cap on returns would be 9-18 per cent and the collar a minimum of 5 per cent).

6.27 In setting the parameters for this incentive scheme, Ofgem has chosen values that will provide a strong incentive on Transco to invest above baseline outputs where it is efficient to do so. Thus we have chosen values for a relatively large upside cap and a small downside collar. Ofgem notes that it is difficult to select values on these parameters and is particularly interested in respondents' views on this issue.

6.28 Ofgem would welcome views on Transco's proposal to introduce an Ofgem right of veto on proposals to invest over and above the baseline output measures to reduce Transco's perception of the risk of additional investment being disallowed at subsequent price control reviews.

6.29 Ofgem also seeks views on the regime for the entry capacity buy-backs beyond the one year scheme proposals set out in Chapter 8.

7. NTS exit capacity investment incentive scheme

Introduction

7.1 Ofgem believes that Transco should have clearer incentives to deliver exit capacity efficiently. In Chapter 3, we set out the potential perverse incentives under the existing price control. In this chapter, we re-state our concerns with the current arrangements that were first highlighted in our March 2001 exit review.[59]

7.2 In our March exit review document, Ofgem proposed that all exit load should be deemed firm, and that Transco should face incentives to use the most efficient combination of contracting for interruption, contracting for storage (including LNG) and undertaking pipeline investment to meet this load.

7.3 Ofgem recognises that some transitional arrangements will be needed to facilitate the introduction of these arrangements to deal with, for instance, lead times for Transco to develop the IT systems, contractual framework and the necessary changes to Transco's charging methodology for the new arrangements.

7.4 Ofgem believes that Transco, consistent with its statutory and licence obligations, must reform the current exit arrangements to address the potentially discriminatory nature of the existing arrangements.

7.5 Ofgem believes that it is appropriate to introduce new incentive arrangements during this transitional period. The NTS TO price control will be set on the basis of allowing Transco to fund the efficiently incurred costs associated with meeting the baseline output levels of firm exit capacity agreed as part of the TO price control.

7.6 The SO exit capacity incentive will provide Transco with strong commercial incentives to contract for interruptible rights and/or with local storage providers

[59] *The new gas trading arrangements: review of Transco's exit capacity, interruption and liquefied natural gas arrangements, A consulation document*, Ofgem, March 2001

when it is cheaper than increasing network capacity at exit by building additional pipelines and/or compression.

7.7 In this chapter, we discuss these issues in greater detail and outline our initial proposals with regard to the NTS exit capacity incentive scheme. We also present a summary of our March 2001 review of Transco's exit capacity, interruption and LNG arrangements and respondents' views on the proposals it contained.

7.8 As outlined in Chapter 4, Ofgem believes that target values for the exit capacity incentive scheme should be set for the five years of the price control but the other parameters (sharing factors, caps and collars) should only be set for two years.

The existing exit capacity, interruption and LNG arrangements

The current NTS exit capacity arrangements

7.9 Under the current exit arrangements, Transco administers the allocation of capacity using separate methods for Daily Metered sites, Non Daily Metered sites, and Connected System Exit Points (e.g. the Bacton interconnector).

7.10 In addition, Transco enters into Network Exit Agreements (NExAs), which are contractual arrangements between Transco and a shipper or end customer.[60] A NExA sets out a number of provisions relating to the flow of gas at the offtake, such as offtake pressure, notice periods, numbers of allowed maintenance days, and specified communication and metering equipment. NExAs also specify the maximum rate at which the supply point can increase or decrease its offtake of gas from the NTS within day.

7.11 Subject to Ofgem approval, Transco may also enter into an Advanced Reservation Capacity Agreement (ARCA) before guaranteeing that exit capacity will be available for new larger loads that it judges to have a higher risk of resulting in stranded assets than that associated with a typical new connection.

[60] Individual sites must have an annual consumption of 58.6 GWh per year to qualify for a NeXA.

The current interruption arrangements

7.12 Transco currently manages network constraints predominantly by interrupting gas supply to customers with interruptible transportation agreements and by constraining the use of LNG Storage capacity that is located close to extremities of the NTS. Transco may call interruption in the event of network capacity constraints, high system demand, in an emergency or for testing purposes.

7.13 Interruptible transportation arrangements can be included in contracts between shippers and their customers. Typically, such contracts provide both for some level of shipper interruption ('commercial interruption') as well as Transco interruption. At present, any supply point that has daily metering and annual consumption in excess of 5.86 GWh can apply for interruptible status.

7.14 In terms of Transco interruptions, Transco distinguishes between Standard Interruptible (SNI) and Transco Nominated Interruptible (TNI) supply points. A SNI agreement allows Transco to interrupt the site for up to 45 days each year, while a customer with a TNI agreement may face greater than 45 days of interruption. In addition, Transco may unilaterally designate an interruptible point (either a SNI or a TNI) as a Network Sensitive Load (NSL). Such loads, by virtue of their location, are more likely to be interrupted.

7.15 In return for having interruptible status, a customer receives relief from various charges. A SNI site pays no NTS exit capacity or LDZ capacity charges. In addition to this, a TNI site receives a reduction in NTS commodity charges. However, no additional compensation is provided to an NSL.

The current LNG arrangements

7.16 There are five LNG sites that are directly connected to the NTS and are located at points that are, or were in the past, at the extremities of the pipeline system.[61] The LNG facilities were developed, in part, to alleviate the effects of potential transmission constraints in areas where there was inadequate transportation capacity, by enabling Transco to ensure that sufficient quantities of gas can be delivered to specific localities in order that firm demand could be met at peak

[61] The sites are located at: Avonmouth, Dynevor Arms, Glenmavis, Isle of Grain and Partington.

times. Thus, they can be used both for storage purposes and for transmission support.

7.17 Under Network Code arrangements, Transco secures the transmission support it requires from LNG facilities by 'constraining' their use. In particular, storage users who book capacity at a Constrained LNG (CLNG) site are required to maintain specified minimum inventories of gas in store throughout the winter period. Shippers are contractually obliged to allow Transco to dictate the use of all, or part, of their storage holdings at the site as if it were its own when flow at particular points on the network exceeds specified levels. Storage users receive a rebate on their transportation charges in return for these constraints.

7.18 Transco currently constrains three of the LNG sites in this way, and has forecast inventory requirements for these sites for each year of the next price control period.[62]

7.19 Transco introduced interim arrangements relating to the five LNG sites in 2000/1, following a review by Ofgem.[63] They included:

- arrangements for Transco to continue to purchase its Operating Margins[64] and Scottish Independent Undertakings[65] requirements at the prices set out in Special Condition 9D of Transco's GT Licence;
- the offer for sale of all remaining LNG capacity on a bundled basis (consisting of defined units of injection/space/withdrawal) by way of an annual price auction; and
- an increase in transportation rebates provided to shippers booking LNG at constrained sites, in recognition of the transmission support these sites provide.

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[62] Whilst it has a 'constrained' status, there has been no inventory requirement at Dynevor Arms for 2000/01 and 2001/2. However, Transco forecast an inventory requirement from 2003/4 to 2006/7.
[63] *Review of BG plc's Liquefied Natural Gas facilities A consultation document*, Ofgas, June 1999.
[64] Operating Margins gas is short lead time gas and is held in store to be used to maintain system pressures, for example, where a compressor or NTS pipe has become damaged or failed, to manage an orderly system run down or where gas is not otherwise availabe from the OCM.
[65] The Scottish Independent Undertakings refer to Transco's undertakings to supply gas to a number of remote towns in Scotland that are not connected to the NTS. These towns are supplied using LNG.

Weaknesses of the current arrangements

7.20 In our March 2001 exit review document, Ofgem identified a number of weaknesses with the above arrangements, which we summarise below.

Incentives to under invest in pipeline capacity

7.21 In offering a customer interruptible capacity, Transco can often avoid the need for additional investment in pipeline capacity or compression, thereby reducing its costs. However, the trade off it faces between offering interruptible terms and additional investment is biased because over-contracting for interruption allows Transco to increase its allowed revenue (through the volume driver in the current price control) without being fully exposed to the costs of interruption. This is because Transco recovers the costs of the discounts it allows holders of interruptible contracts through exit capacity charges, so that the only costs it incurs are those related to reductions in throughput associated with actual interruption.[66]

7.22 Ofgem also noted that:

- Transco, in failing to take account of commercial interruption possibilities, may over-estimate the requirement for firm capacity rights at exit in planning the network and may, as a result, over estimate its CLNG requirements; and
- the current arrangements may result in Transco inefficiently limiting the flexibility at exit within day using NExAs, by limiting the rights of large firm customers (such as CCGT operators) to vary their offtakes within day through the imposition of maximum ramp rates[67].

[66] Transco is exposed to costs associated with the reduction in throughput (on which the price control is based) that the interruption entails. Ofgem estimate that Transco loses around 1.5p for each therm of gas interrupted.

[67] Firm customers can request a higher level of service from Transco at exit. Transco undertakes network planning models to determine when such a higher level of service could be provided and whether the load would need to make a contribution to the costs of providing that service.

Discrimination

7.23 Ofgem believes that under the current arrangements, to the extent that Transco is over-contracting for interruptible capacity, firm customers are effectively providing a cross-subsidy to interruptible customers, since the discounts offered to interruptible customers means that firm customers pay higher exit capacity charges.

7.24 Customers have also raised a number of criticisms concerning the terms of interruptible contracts available to them. In particular, they argue that the range of interruptible contracts offered by Transco is limited. Customers would like contracts of varying length rather than the standard 45 day contract. Customers have also expressed concern that if they are classified as NSLs or TNIs, they are not sufficiently compensated for either the higher probability of being interrupted or the prospect of sustained interruption over and above the standard 45 days. This is compounded by the fact that Transco has sole discretion to determine the terms on which interruptible capacity is offered. Ofgem believes that these arrangements potentially discriminate between different types of interruptible customers.

Inconsistency between the NTS entry and exit regimes

7.25 Given that the NTS is an integrated network, constraints at one point in the network can have consequences for other parts of the network. Ofgem therefore believes that it is important that the entry and exit regimes are consistent to reduce the scope for any perverse incentives on Transco and/or market participants.

7.26 For example, entry capacity availability is influenced by patterns of exit offtakes (e.g. higher demand in Scotland allows more gas to be evacuated from St Fergus). As Transco is exposed to a proportion of the costs associated with entry capacity constraints through its capacity incentive, it is important to ensure that it makes appropriate trade-offs in deciding whether to use interruption or entry capacity buy-backs to deal with network constraints.

7.27 Transco can use various constraint management tools[68], such as supply interruption and LNG, for gas balancing purposes (if the system is short) or for system balancing purposes (to deal with a locational transmission constraint) or to deal with both. It is, therefore, important to ensure that Transco's incentives and the arrangements in place for entry and exit encourage it to balance the system and to manage constraints in an efficient manner. These incentives need to be designed to ensure that Transco uses the most cost-effective tools available to it at the time.

7.28 As mentioned above, NExA provisions relating to ramp rates and limits on offtake quantities may restrict customers' operations, in particular those of CCGT power stations under NETA. Given that Transco can largely determine offtake specifications, there is the possibility that these arrangements could unduly discriminate between customers of similar types, unless differing NExA terms are reflected in corresponding variations in charges.[69]

7.29 These restrictions could also limit the operation of the gas interconnectors between Great Britain, Ireland and Belgium. Greater trading across the interconnectors is expected as the European market deregulates and these provisions could prevent efficient trade and arbitrage.

Ofgem's March 2001 proposals

7.30 Given the concerns set out above, Ofgem outlined a number of proposals for reform in its March 2001 exit review. Ofgem's proposals sought to ensure that Transco will appropriately trade-off the costs associated with using interruption and CLNG against the costs of additional investment. Improved signals and incentives will ensure Transco manages network constraints in order to meet demand for exit capacity in the most economic and efficient manner.

7.31 Our proposals also sought to improve customers' choices with regard to different exit capacity products, while preventing any undue preference, discrimination or

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[68] As set out in Transco's Operational Guidelines document.
[69] Transco may make an offer to potential loads, but the choice to accept that offer or otherwise is down to the connecting load. In the event it does not accept those terms, it can refer the terms to Ofgem for a determination.

commercial advantage between: Transco's customers; Transco's transportation business and its LNG storage business; and the gas and electricity markets.

7.32 Our March 2001 proposals consisted of:

- deeming all load firm and removing any restrictions set out in existing NeXAs;
- allowing Transco to tender for interruptible services, local storage (including CLNG) and/or contracts to restrict offtake profiles within day for large loads; and
- introducing new financial incentives that expose Transco to the costs of such contracts so that they will, over time, trade-off the costs associated with pipeline investment against substitutes for such investment.

7.33 Ofgem believes that these proposals will:

- provide market signals of the value of interruption and CLNG at different locations;
- expose Transco fully to those signals, so that it can correctly trade-off interruption and CLNG costs against those of pipeline investment, thus encouraging it to develop an efficient system;
- provide an incentive to invest to meet its customers requirements by allowing Transco to keep additional revenues associated with exceeding the baseline exit output measures;
- remove any cross-subsidy between firm and interruptible customers by ensuring that all customers pay for firm transportation rights;
- allow shippers, storage operators and customers to offer a price and duration for the interruptible services they would be willing to provide. This will eliminate any discrimination between interruptible customers and provide customers with a choice on how many days of interruption they provide to Transco;

- ensure consistency between the entry and exit arrangements and encourage Transco to call interruption only when it is efficient to do so; and

- allow market participants in both the electricity and the gas markets to arbitrage efficiently between the two markets by setting a market price for interruption.

Respondents' views

Pricing of firm and interruptible exit capacity

7.34 The majority of respondents agreed that a cross subsidy exists between firm and interruptible customers and that, under the current arrangements, there is a perverse incentive on Transco to over contract for interruptible capacity. In this respect, respondents were almost equally divided over whether Ofgem had over or under-estimated the levels of the cross subsidy. One shipper questioned whether a cross subsidy existed between interruptible and firm users *per se*, since firm users are paying for access to peak day capacity. A number of respondents also agreed that discrimination exists between customers who provide differing levels of interruptible services to Transco but receive the same (or very similar) levels of discounts.

7.35 The majority of respondents were opposed to the use of primary auctions as a mechanism for pricing firm and interruptible exit capacity, primarily on the basis that auctions would introduce uncertainty and risk to the market.

7.36 However, the majority of respondents offered some support for the proposal to deem all sites firm with Transco buying back interruptible services through auctions/tenders. Respondents argued that this approach would:

- allow price discovery whilst avoiding the volatile prices that may result from primary auctions; and

- make the overall process more cost reflective with any location-based costs offset by the related gains to be made through interruptible contracting to provide interruption with Transco or other shippers.

7.37 A number of respondents also expressed support for the use of a variety of interruptible contracts with varying durations and notice periods.

7.38 Some respondents expressed opposition to the proposal to deem all load firm on the basis that it would:

- negate customer choice to take interruptible supply and would allow Transco to exercise discretion over the writing of interruptible contracts;
- result in considerable reinforcement and thus increased costs to existing firm users, who would not derive any benefit;
- exclude the majority of customers from the auctions since only customers who directly held capacity would be able to participate;
- possibly involve over-contracting for interruption by Transco, given uncertainty over the volume contracted for commercial interruption; and
- allow individual sites that are needed for interruption to exercise locational market power.

Reform of Transco's administrative arrangements: NExAs and ARCAs

7.39 The majority of respondents were in favour of removing ramp rate restrictions from NExAs and the re-negotiation of NexAs, to allow efficient arbitrage between gas and electricity markets. However, some shippers commented that, in most cases, ramp rate restrictions are non-binding, and suggested that the most critical constraint is the rate change notice period. If this notice period was removed, along with the other NeXA restrictions, they argued that balancing risks would increase and the safety of the system might be jeopardised.

7.40 Respondents were overwhelmingly in favour of the retention of ARCAs to signal the need for incremental investment. However one respondent argued that long term ARCAs should be limited to ensure that there is no discrimination between new and existing loads of a similar type.

Other issues

7.41 Respondents also commented on a range of other issues including:

- the importance of NTS and LDZ interactions. Customers holding firm NTS capacity rights may be interrupted on the LDZ and hence be unable to use their NTS rights. In addition, they pointed out that LDZ interruption could provide a substitute to NTS interruption;

- the timetable for reform. They argued that insufficient time was being allowed adequately to discuss and develop all the issues, particularly, in light of the work being undertaken on reform of the gas balancing regime and long term investment.

Transco's views

7.42 Transco agreed that there is merit in reforming the regime and that a move from a cost-reflective approach to a value-based regime may be appropriate. Transco also acknowledged that shippers and customers have requested more varied terms for interruptible contracts. However, Transco thought that the proposal to declare all exit rights as firm and require users to contract for interruption would expose both itself and users to considerable uncertainty. It also argued that deeming all capacity firm may send incorrect signals, perhaps leading to over-investment if users would have been willing to accept an interruptible service.

7.43 Transco advocated an interim approach of developing a range of exit arrangements associated with differing maximum numbers of interruptible days, priced on a cost-reflective basis. Transco also raised the same concerns as other respondents about the possible abuse of market power in constrained locations under a market-based approach. However, it argued that a deregulated LNG business might improve competition at some locations on the network.

Ofgem's proposals for the long term exit arrangements

7.44 Ofgem continues to believe that Transco should face commercial incentives to trade-off the relative costs of investment in pipeline, interruption and LNG when deciding how to meet demand at exit. We remain of the view that, over the course of the next five years, all exit load should initially be deemed firm. Under the incentives, Transco will then only invest to meet firm demand where this is cheaper than entering in to contracts with local storage operators and/or customers to interrupt.

7.45 As part of these arrangements, it may be necessary to consider the current commercial boundary between NTS and LDZ connected loads. It will, for example, be important to ensure that large interruptible loads are treated consistently under any new arrangements irrespective of whether they are connected directly to the NTS or within LDZs. This will avoid any perverse incentives on Transco to favour interruption of loads connected in a particular way, and hence on new loads to locate themselves accordingly, as a result of inconsistencies in the interruptible regimes. It may, for example, be necessary to 'deem' certain large loads to be connected to the NTS to allow them to participate in the new exit arrangements. This issue is discussed in greater detail in the subsequent chapter on exit capacity.

7.46 In line with our NTS entry capacity proposals, Ofgem believes that it is appropriate to use the SO incentive arrangements to provide these incentives. This scheme will provide commercial incentives on Transco to:

- respond to customers needs for firm capacity by undertaking additional pipeline investment where it is efficient to do so;
- contract more efficiently for the levels of interruption the NTS requires;
- provide more flexible interruptible contracts to users; and
- contract more efficiently for its locational storage requirements.

7.47 One option would be for Transco to develop interruptible contracts that have both an option and an exercise price. Transco could tender for these contracts and allow sites to specify both the option price and the exercise price. Transco could then award interruptible contracts at those sites whose combination of option and exercise prices offered the best value for money, taking account of the likely frequency of interruptions at each site. The benefit for customers is that the level of compensation they received would be directly related, via the exercise price, to the number of times they were interrupted. The benefit for Transco would be that it should be able to reduce the costs associated with contracting with sites that are interrupted only infrequently (by choosing offers that incorporate low option fees).

7.48 Ofgem recognises the potential issues associated with market power in constrained locations. However, Ofgem believes that substantial locational market power is only likely to be a major issue in the short term as Transco should be able, over time, to rely on additional investment in capacity as a substitute for interruption. That is, the costs to Transco of providing these sites with firm capacity rights is limited by the costs associated with network reinforcement. On this basis, and given that Transco will be able to contract ahead on a longer term basis for interruption, Ofgem currently expects longer term arrangements to take effect following a transitional period of around two years, consistent with Transco's average investment lead time at exit.

Transitional arrangements

7.49 Given investment lead times, the need to develop IT systems, Transco's charging methodology and the framework for new interruptible and storage contracts, Ofgem accepts the need for a transitional period under the incentive as Transco moves from the existing arrangements to the proposed longer term arrangements.

7.50 Given our concerns about the potentially discriminatory nature of the existing arrangements, Ofgem expects Transco to implement the first phase of these transitional arrangements from 1 April 2002, consistent with the start of the new incentives. Ofgem will also expect Transco to clearly set out to shippers and customers how it intends to migrate to the new longer term arrangements over the next two years from that date.

7.51 As a minimum, Ofgem would expect Transco to:

- offer standard interruptible contracts on at least the same terms as now but incorporating a maximum of 15 days interruption (instead of the current 45 days);
- offer more flexible interruptible contracts of varying durations with additional discounts (over and above the existing levels) to the extent that Transco requires longer duration contracts in particular locations;
- ensure that payments under the contracts better reflect the value to Transco of the costs saved and the service provided – in particular to the

extent it remains necessary to designate sites as NSL and TNI during the transitional period to ensure that payments for interruption reflect their additional value to Transco; and

- ensure that existing provisions in NeXAs do not discriminate unduly and to the extent it is necessary to keep existing provisions in place during the transitional period, ensure that any customers with more onerous conditions than average receive adequate compensation.

Initial proposals for the SO exit capacity incentive scheme

Target exit costs

7.52 As part of its submission on output measures outlined in Chapter 5, Transco provided its forecast of levels of interruptible capacity for the next five years. Using this forecast, Ofgem has estimated the transportation charges that Transco would forgo (that is, the interruptible discounts that it would pay) on the basis of the current interruption arrangements and charges. This provides a forecast of the costs of interruptible contracts to Transco based on current terms and prices. However, capacity and commodity charges will change with the advent of the new TO price control from 1 April 2002. In deriving our initial proposals, presented in Table 7.1, we have, therefore, adjusted out preliminary estimate of the costs of interruption to take account of the likely changes to these charges.

7.53 Since the interruption of LDZ loads (as it results in reduced NTS flows) can be used to resolve NTS exit constraints, it will be important that the arrangements for NTS and LDZ interruption are complementary in order to avoid distortions and discrimination between the two sets of off-takes. Also, given this complimentarity, there are likely to be significant benefits in the procurement and exercise of NTS and LDZ interruptible contracts being managed in a co-ordinated manner. Consistent with this, the preliminary estimates shown in Table 7.1 for NTS interruption include an estimate of NTS transportation charge discounts received by interruptible LDZ loads (in addition to those received by interruptible NTS loads). This table also provides Ofgem's initial estimate of the costs of LDZ interruption based on expected LDZ transportation charge discounts received by LDZ loads given the same assumptions concerning future reductions in charges. Ofgem considers that the funding for LDZ interruptible

costs would most appropriately be treated within the NTS SO incentive so that the interactions between NTS and LDZ interruption are managed in a co-ordinated manner.

7.54 The methodology we used to derive our initial proposals for a target cost for CLNG was equivalent to that we employed for interruption costs i.e. we used the current CLNG rebate methodology, Transco's forecast of the volumes of CLNG required and an allowance for the impact of the TO price control.

Table 7.1: Ofgem's initial proposals for NTS SO exit capacity allowances 2002/3 to 2006/7

(£m, 2000 prices)	2002/3	2003/4	2004/5	2005/6	2006/7	Total
NTS interruption	32.4	33.5	33.4	33.2	33.1	166
LDZ interruption	28.3	29.2	30	30.3	30.9	148.7
CLNG	5.8	6	6.2	6.1	6	30.1
Total	**66.5**	**68.7**	**69.6**	**69.6**	**70**	**344**

Sharing factors, caps and collars

7.55 As discussed in Chapter 4, Ofgem believes that sharing factors, caps and collars should initially only be set for two years (2002/3 and 2003/4). For this period, Ofgem believes that Transco should face strong incentives with regard to contracting efficiently for interruption and locational storage services and for efficiently trading it off with investment and our proposals for initial sharing factors, caps and collars reflect this view.

7.56 Table 7.2 contains three options for combinations of sharing factors, caps and collars and sharing factors that Ofgem considers represent appropriate balances between risks and rewards. Option 1 provides a symmetric and relatively modest sharing of risks and rewards whilst the other two provide Transco with greater upside but also greater downside exposure.

7.57 We would expect that, over time, Transco's exposure to both the upside and the downside should increase so that these options for initial values of the parameters should not be seen as setting expectations for their longer term values.

Table 7.2: Options for caps and collars and sharing factors for the exit incentive, 2002/3 – 2003/4

£m, 2000 prices			Sharing factors	
	Cap	Collar	Upside	Downside
Option 1	10	0	50%	50%
Option 2	10	-5	75%	25%
Option 3	20	-5	50%	50%

7.58 However, Transco's incentives to make savings could be significantly distorted by its ownership of the LNG storage facilities. In particular, increases in the price and/or volume of CLNG over forecast levels would result in increased revenues to Transco LNG – a business unit within Transco – with the costs recovered in whole or in part by higher transportation charges than would otherwise be the case.

7.59 In order to avoid the perverse incentives that may result from such arrangements, Ofgem proposes that in addition to the arrangements set out above, there should be a sub-collar of zero on the costs of Transco procuring transmission support from the LNG facilities. Transco would also face a 100% exposure to CLNG costs incurred in excess of the allowances set out in Table 7.1 i.e. it would have to bear these costs in full. However, Ofgem would consider other suggestions that addressed the issues that arise from common ownership. More generally, it will be important to ensure that any rights that Transco purchases from Transco LNG result from an arms length tender through a transparent process set out in the proposed procurement guidelines.

Further development of the exit incentive – gas quality

7.60 Ofgem believes that there may be demand for a range of gas quality services at offtake points (e.g. the Bacton interconnector). Customers may desire gas conforming to a more specific quality range be delivered than that contained within the GSMR.[70] Presently, customers' main option to ensure delivery of a

[70] The Gas Safety (Management) Regulations (GSMR) specify the range of characteristics permitted for conveyance of gas in the NTS.

specific quality of gas is to invest downstream of the network in assets that can ensure that their own requirements are met.

7.61 Gas quality services may include the delivery of a specific CV of gas that does not vary (NTS gas may vary within certain bands), or a number of other elements of gas quality, such as delivery at a particular hydrocarbon dewpoint. For instance, Transco is currently providing a gas quality service to the UK-Belgium interconnector, relating to the dew point of gas, on a best endeavours basis.

7.62 Ofgem believes that the SO should be have incentives to offer services to users, reflecting the additional costs incurred in providing such services. Customers will then be able to determine whether it is cheaper to pay Transco to deliver enhanced gas quality services or to invest in their own equipment to meet their needs.

7.63 Therefore, it is Ofgem's intention to further extend the proposed SO exit incentives to encompass gas quality. Ofgem will require that any quality services that are provided by Transco will be offered to all customers on a cost reflective and non-discriminatory basis.

Summary and views invited

7.64 In this chapter we have summarised Ofgem's concerns with the existing arrangements and Ofgem's proposals for reform from our March review. We have summarised respondents' views on our proposals and in the light of those responses, have set out Ofgem's initial proposals for the exit capacity element of the SO incentive. We have set out proposals for transitional arrangements to be implemented from April 2002 until Ofgem's longer term proposals are implemented in full.

7.65 Ofgem has proposed to provide an incentive on Transco to efficiently use investment, interruption and CLNG. Ofgem expects Transco to respond to these signals in such a way as to develop the reform of the exit, interruption and LNG arrangements.

7.66 For the SO exit capacity incentive, Ofgem proposes to:

- set the allowance for efficiently contracting for interruption and locational storage for five years; and

- set caps and collars and sharing factors initially for two years. We expect that Transco's exposures to these incentives will increase over time on both the upside and downside.

7.67 Ofgem invites views on any of the issues contained in this chapter. In paritcular, views are invited on our initial proposals and our proposed transitional arrangements.

8. Entry capacity buy-back incentive scheme

8.1 As outlined in Chapter 3, Transco is currently incentivised to reduce the costs associated with buying back firm capacity that it has sold but that it is unable to make available on the day. For the reasons outlined in Chapter 6, Ofgem believes that in the longer term the incentive on Transco to reduce the costs of buying back capacity needs to be considered in the context of the entry capacity incentive scheme.

8.2 In Chapter 4 we explained our initial proposal was to set a new entry capacity buy-back incentive scheme for one year (April 2002 to March 2003).

Overview

8.3 Transco has argued that its ability to move away from the baseline output measures is limited in the short-term by the lead-time for making investment decisions. It suggested that typical investment lead times are of the order of 3 years. Transco has, therefore, argued that for 2002/3, the SO incentive with regard to capacity will, in practice, be limited to buying-back baseline entry capacity.

8.4 Ofgem realises that investment lead-times are likely to constrain Transco's ability to respond fully to the incentive in the short-term. However, Ofgem believes that Transco may be able to make changes to investment plans at the margin and therefore may have some flexibility to vary capacity levels at some locations in the short term in response to emerging market signals. Nevertheless, in setting the capacity buy-back incentive for 2002/3 Ofgem accepts that these buy-backs will be very largely (if not wholly) associated with the baseline capacities. In this respect, Ofgem's proposals for the initial entry capacity buy-back scheme can be considered as an extension of the current arrangements.

Capacity release

8.5 The baseline entry capacity outputs, set as part of the TO NTS price control, will be defined in terms of the maximum physical capacities of each entry point.

8.6 Discussions about how much of capacity is actually sold, for example some proportion of maximum physical (say 80 or 90%) all year or a different amount in the summer compared with the winter months, is taking place as part of discussions with the industry and customers on auction design in workstream meetings.

8.7 However, we have assumed for the purposes of our analysis that Transco will release in all months a volume of capacity equal to the maximum physical capacity at each terminal. This is simply an assumption for the purposes of modelling potential buy-back costs and setting our initial proposals.

8.8 It will be necessary to set final proposals that are consistent with the proportion of maximum physical capacity that will actually be released.

Buy-back assumptions

8.9 There is only limited evidence on which to base estimates of Transco's future buy-back costs. So far, Transco has only bought back capacity spot, and then only on 54 days during the gas year October 2000 – August 2001.[71] It has predominantly bought back capacity at the St. Fergus (94%) and Teesside (6%) entry terminals and has paid a weighted average price of 0.46 p/kWh and 0.32 p/kWh respectively. This has resulted in buy-back costs of £13.3m.

8.10 Transco has usually entered the market when there is a physical constraint of which market participants are aware and hence it has been a distressed buyer. In order to mitigate this spot exposure, Ofgem believes that it is important (for the reasons outlined in Chapter 4) that Transco be allowed to contract for buying-back capacity using other markets. For instance, Transco could investigate forward contracts that would allow it to buy-back monthly strips of capacity. Alternatively, some primary auction designs could be used to allow shippers to effectively bid in both a price to purchase capacity and a price at which they would be willing to surrender capacity in different months.

[71] Since October 1999, Transco has bought back capacity on 83 days (44 days for constraint reasons and on 43 days in a market making role (arbitraging capacity buy-backs and sales)).

8.11 A key area of uncertainty is the future level of buy-back costs. In part, buy-back costs will be outside the control of Transco since they will be driven by developments in the wider gas market. For example, the future prices of oil and gas, both in the UK and elsewhere in Europe, will influence the demand for capacity and the opportunity costs that participants incur if they are unable to flow their own gas.

8.12 However, Transco's buy-back costs may also depend on the extent to which it makes use of alternative markets and contracts. In deriving an estimate of Transco's buy-back costs for 2002/3, we have assumed that Transco will make greater use of these markets than at present, particularly in off-peak periods where estimates of unused capacity are relatively certain. We have also assumed that the premium in the spot market is larger than that in the forward market, by linking it to the (forward) price for gas. These assumptions are consistent with those that Transco has employed to estimate its buy-back costs.

8.13 In addition to buy-backs relating to capacity deferrals, Transco will have to undertake buy-backs to cover reductions in the level of available capacity due to maintenance of the NTS, seasonal variations in network capacity (at least until the flexibility of the system is improved) and plant and equipment failures. We have assumed that Transco should be able to buy-back capacity ahead of need to cover maintenance and seasonal variations but that it will still be forced to buy-back capacity spot to cover plant and equipment failures.

Analysis for 2002/3

8.14 In Table 8.1 we report the results of our analysis of Transco's potential buy-back costs for 2002/3. Our analysis has produced a distribution of potential outcomes. To provide an indication of the range of possible outcomes, we have presented the mean of this distribution, a high confidence level (a 3% chance costs will be larger than that level) and a low confidence level (a 97% probability costs will exceed that level).

Table 8.1: Expected buy-back costs for 2002/3 (£m)

Mean	Low	High
142	67	296

8.15 As indicated above, forecast buy-back costs are sensitive to any assumption about the proportion of maximum physical capacity released in the monthly auctions. To give an indication of how this might affect the expected cost of buy-backs, we set out the results of some sensitivity analysis that we have carried out in Table 8.2. As an illustration, Ofgem has estimated the expected costs associated with buy-backs associated with a primary capacity release set at 80% of maximum physical terminal capacity during the whole year and just during the summer months (April-September).

Table 8.2: Sensitivities on expected buy-back costs for 2002/3 (£m)

Sensitivity	Mean	Low	High
Maximum physical less 20% all year	34	21	51
Maximum physical less 20% in April – September	126	60	250

Buy-back incentive scheme proposals

8.16 Even for 2002/3, there is considerable uncertainty surrounding the likely level of buy-back costs and some key factors e.g. gas prices, are not within Transco's control. For these reasons, Ofgem considers that the risks to which Transco is exposed in respect of buy-backs should be limited and, as discussed in Chapter 4, we propose that the initial scheme should only last for one year. Table 8.3 shows three options for targets, sharing factors, caps and collars for 2002/3 that result in broadly the same expected value for Transco and encompass the range of schemes that Ofgem considers reasonable.

Table 8.3: Ofgem's initial proposals for the SO incentive regime – buy-back costs

£m				Sharing factors	
	Target	Cap	Collar	Upside	Downside
Option 1	100	30	-10	50%	10%
Option 2	150	15	-15	20%	20%
Option 3	175	10	-15	20%	40%

8.17 In all three options, the proposed collar on Transco's exposure to buy-back costs represents some increase on its exposure under its existing incentives, reflecting views expressed that Transco's current exposure is too low. Under its existing

incentives (discussed in more detail in Chapter 4), Transco's existing exposure is capped at £5m each year. The current incentive scheme is contained within Transco's Network Code. If the new scheme is to be placed in Transco's licence, a network code modification will have to be raised to remove the existing scheme.

Summary and views invited

8.18 In this chapter we have presented our proposals for the entry capacity buy-back scheme for the year 2002/3. Ofgem proposes to set:

- a target between £100 and £175m, subject to a final decision on the proportion of capacity to be released in the long term auctions; and
- upside and downside sharing factors between 10% and 50%;
- caps in the range of £10m-£30m and collars set between £10m and £15m.

8.19 Ofgem invites views on any of the issues outlined in this chapter. In particular, Ofgem seeks views on the proposed parameters of the 2002/3 incentive scheme and the proposal to transfer the incentive scheme from the Network Code into Transco's GT licence.

9. System balancing incentive schemes

Introduction

9.1 This chapter sets out Ofgem's initial views on an incentive scheme for system balancing costs. These costs relate principally to:

- NTS SO gas costs (shrinkage); and
- system reserve (operating margins).

9.2 As discussed in Chapter 4, Ofgem proposes that these elements of Transco's SO costs should initially be the subject of two year incentive schemes.

9.3 We examine each element of system balancing costs in turn.

NTS SO gas costs

9.4 In operating the NTS, Transco, as SO, uses gas as fuel for NTS compressors so as to ensure that pipe pressure and system integrity are maintained. Gas is generally used to fuel the compressors[72] and significant quantities can be used. For example, in 1999, the volume of gas used in compression was 5,279 GWh, representing 0.53% of NTS annual throughput.

9.5 Compressor costs are related to the pattern of usage on the NTS, the system configuration and the prevailing price of gas. In general, an increase in the distance between inputs and offtakes of gas leads to a greater need for compression. Hence, the increase in throughput at St Fergus and other northern terminals from 1998 onwards has resulted in an increase in compression costs.

9.6 It is clear that Transco's performance as SO has some effect on the overall level of compression costs. Therefore, Ofgem intends to include the costs of compressor fuel within the SO system balancing incentive scheme.

9.7 Two other features of the NTS metering and billing methodologies give rise to costs that the NTS SO is well placed to minimise, and hence Ofgem considers

[72] Although a small number of compressors use electricity rather than gas.

that they should also be included within the NTS SO system balancing incentive scheme. They are:

- unaccounted for gas: biases between measured flows and actual physical flows lead to variations between measured NTS entry volumes and measured NTS offtake volumes. These amounted to 1,456 GWh in 1999, representing some 0.14% of annual throughput.

- unbilled energy: the difference between the actual calorific value of gas delivered onto the NTS and the Flow Weighted Calorific Value (upon which billing is based) results in variations between volumes input and their attributed energy. In 1999, the net result was an over-billing of 14 GWh, (-0.0014% of annual NTS throughput).

Volume of gas

9.8 Ofgem's consultants have reviewed the volume assumptions that formed the basis of Transco's BPQ submission regarding the quantity of gas it requires to cover its use of compressor gas, unaccounted for gas and unbilled energy. No material changes have been made to Transco's assumptions. Hence, it is proposed that the following percentages of NTS throughput are used in calculating the volume of gas required by the NTS SO for its gas consumption activities:

Table 9.1: Ofgem's initial proposals for NTS SO gas volumes

	Percentage of throughput					
	2002	2003	2004	2005	2006	2007
Own Use of Gas	0.55	0.55	0.57	0.56	0.58	0.58
Unaccounted for gas	0.12	0.12	0.12	0.12	0.12	0.12
Unbilled energy	0.0059	0.0060	0.0058	0.0060	0.0059	0.0053
Total	**0.68%**	**0.68%**	**0.70%**	**0.69%**	**0.71%**	**0.71%**
	GWh					
Own Use of Gas	6,534	6,816	7,235	7,184	7,427	7,419
Unaccounted for gas	1,470	1,501	1,522	1,534	1,542	1,553
Unbilled energy	71	75	73	76	75	67
Total	**8,076**	**8,393**	**8,831**	**8,795**	**9,045**	**9,040**

Reference price of gas

9.9 Ofgem considers that it would be appropriate to incentivise Transco with regard to its future gas costs by using a forward looking gas price. With the increased depth of the forward markets for gas, we believe that the price for NTS SO gas should be based on current forward prices.

9.10 This should not expose Transco to additional risks (as it could purchase its requirements at the prevailing forward prices) but it should encourage it to trade effectively. Furthermore, the use of the forward price curve will ensure that price forecasts and cost modelling are consistent across the gas and system balancing incentive regimes.

9.11 Currently, Transco receives a price supplement related to the purchase of flexibility gas that Transco obtains at short notice to meet within day fluctuations. At present, Ofgem is not convinced it is necessary to continue to make additional allowance for flexible gas because the costs are covered by Transco's allowance for gas balancing costs. Costs associated with unexpected requirements for gas for compression are similar to the costs incurred by Transco when shippers change their within day consumption patterns.

9.12 Hence, Ofgem proposes that gas prices used in calculating the costs of NTS SO gas costs should be the same as those used in calculating gas balancing costs (see Appendix 3 for details on the assumptions and modelling underlying Ofgem's forecast of forward gas prices). This results in an average price of 0.723p/kWh for 2002/3 and 0.677p/kWh for 2003/4.

Ofgem's initial proposals

9.13 Table 9.2 sets out Ofgem's initial views on the efficient level of costs associated with compressor and other NTS gas costs for 2002/3 and 2003/4.

Table 9.2: Ofgem's initial views of the costs of NTS SO gas costs

£m	2002/3	2003/4
Own Use of Gas	47.8	46.2
Unaccounted for gas	10.7	10.2
Unbilled energy	0.5	0.5
Total	**59.0**	**56.9**

9.14 Based on our analysis, Table 9.3 outlines a number of incentive scheme options. The options allow Transco to trade-off slightly higher cost allowances with slightly higher exposures to risk.

Table 9.3: Ofgem's initial proposals for the SO incentive regime – NTS SO gas costs

£m	**Target**				**Sharing factors**	
	2002/3	**2003/4**	**Cap**	**Collar**	**Upside**	**Downside**
Option 1	57	55	2	-2	25%	20%
Option 2	59	57	3	-3	20%	20%
Option 3	61	59	4	-4	20%	25%

System Reserve

9.15 Ofgem proposes that an allowance for 'system reserve' should be included in Transco's system balancing incentive scheme. The system reserve allowance would be designed to cover the costs of keeping gas in store at particular locations on the network to ensure continuity of supply and cover supply emergencies in case of problems on Transco's system. These are normally described as operating margins.

9.16 Transco has proposed that an allowance for national top-up[73] should also be included as part of the SO incentives. National Top Up was designed to ensure an overall balance between gas inputs and offtakes in a severe winter, if it is

[73] Other requirements that result in Transco making use of storage facilities will be funded through other means. The funding of the usage of stored gas for transmission support purposes (CLNG) will form part of the exit capacity incentive, whilst the funding of requirements for the 'Scottish Independent Undertakings' (SIU) will be covered by the TO control, since they concern the effective extension of the NTS to these localities by means of a tanker service from the Glenmavis LNG facility.

deemed that shippers have failed to provide sufficiently for demand during a severe winter through their own storage bookings and contractual arrangements with customers.

9.17 We have summarised Transco's proposals as part of this chapter, however, for the reasons outlined in detail in the relevant section, Ofgem is minded to reject this proposal at this stage and leave the treatment of Top Up and any funding arrangements under the governance of Transco's Network Code.

System reserve - operating margins

9.18 As part of its Safety Case, Transco must include provisions in relation to the continuity of supply and supply emergencies. These provisions underpin Transco's Operating Margins (OM) bookings.

9.19 In terms of continuity of supply, Transco must demonstrate that it has established adequate arrangements to minimise the risk of a supply emergency, and to ensure that the gas it conveys will be at an adequate pressure when it leaves the network. In terms of supply emergencies, it must demonstrate that it has established adequate arrangements for dealing with such emergencies or other incidents which could endanger persons and, without prejudice to this, that it has established procedures to discontinue safely supply to customers when it is known there is insufficient gas to meet demand.

9.20 On the basis of these general requirements, Transco has specified four elements to its OM booking requirements:

- forecast Changes;
- offshore supply failures;
- onshore plant failures: compressor failures or pipe breaks; and
- orderly rundown of the transmission system.

9.21 In each case, the OM requirement is driven by the need to provide within-day support to maintain pressures within safe tolerance levels whilst other action is taken to address a specific problem. In the case of the orderly run-down of the

system, for example, the OM booking provides support whilst action is being taken to initiate firm load shedding.

9.22 Under the current price control, Transco has a specified allowance to account for storage capacity costs. Storage commodity charges and the costs of purchasing and selling gas associated with the provision and use of OMs are not covered by the Transco price control, and are instead dealt with through Network Code arrangements. In particular, Transco recovers these costs from shippers by adjusting the Daily Margins Recovery Amount[74] in the calculation of Balancing Neutrality Charges. These charges are levied on the basis of the shippers daily quantity off takes (UDQO's).

9.23 Following the introduction of auctions at the Rough and Hornsea storage facilities, presently owned by BG[75], Transco must provide for its OM requirements at these sites on the same basis as other shippers booking capacity, i.e. either through the primary auctions or through the secondary market. For OM purposes, Transco considers Rough and Hornsea as equivalent for the purposes of providing locational support and has made all of its OM booking for this location at Rough in the past two years.

9.24 The situation at LNG sites, which are owned by Transco, currently differs from this. Prior to the 2000/1 storage year, LNG capacity was sold by means of an annual fixed price tender. In Ofgem's review of LNG[76], Ofgem recognised that in relation to OMs, the LNG facilities are of considerable importance to Transco and that its capacity bookings for this purpose accounted for about 27% of all LNG deliverability capacity. This led to our assessment that, at least to some extent, LNG facilities can be considered as hybrids: part storage facility, part system support. Since storage year 2001/2, Transco has purchased its OM requirements (and its requirements at Glenmavis for the Scottish Independent Undertakings) at the 1999/00 regulated maximum price at each facility.

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74 Daily Margins Recovery Amount is defined as eligible margins costs less eligible margins revenues. *Daily Eligible Margins Cost* is the sum of: the quantity of gas withdrawn from each storage site on the day for OM purposes multiplied by Net Margins Weighted Average Cost Of Gas; and the amount of any balancing charges payable by Transco in respect of the day.
Daily Eligible Margins Revenues *is the sum of the daily imbalance charge payable to Transco in respect of the day.*

[75] BG has announced the sale of the facilities to Dynegy, conditional on regulatory approval.

[76] *A review of the development of competition in the gas storage market*, Ofgem, October 2000.

Transco's view

9.25 For the next price control, Transco have proposed allowances for OMs as set out in Table 9.4. These show an increase over current levels, which is primarily driven by an increase in OM volumes.

Table 9.4: Transco's proposals for OM costs (£m, 2000 prices)

2002/3	2003/4	2004/5	2005/6	2006/7	Total
17.7	18.8	19.9	21.1	22.3	**99.8**

9.26 Transco argued that its ageing compressor stock meant that it was likely to have to provide for more extended periods of support to cover losses of standby capacity than had been necessary in the past.

Ofgem's view

9.27 As noted earlier, the costs of purchasing gas and the commodity costs of injecting it into and withdrawing it from storage facilities are not covered by the current OM price control allowance, but are instead recovered through Network Code arrangements. Whilst Ofgem has some concerns that this may lead to distortions, our initial proposal is that these costs should continue to be recovered in this manner, and that the SO system balancing allowance should relate only to storage capacity costs. Ofgem proposes that, when the initial two year incentive scheme expires, the separate treatment of capacity costs and commodity and gas costs for OM should be reviewed subsequently, together with any impacts that developments in the gas balancing regime may have on OM requirements.

9.28 Assessing what storage capacity costs Transco should be allowed is considerably complicated by the fact that its OM requirements are currently predominantly purchased from Transco LNG, a business unit within Transco. There is also only a limited potential for substitution away from the use of LNG for a significant part of its requirements in the short term.

9.29 Transco's ownership of the LNG facilities raises particular problems in relation to the use of sharing factors, as its incentives to make savings may be significantly distorted. This is because increases in the price and/or volume of

OM bookings made at LNG sites would result in increased revenues to Transco LNG which Transco could recover, at least in part (sharing factors would prevent a full pass through unless the collar was binding) by higher transportation charges. In order to avoid these perverse incentives, Ofgem proposes that there should be fixed provisions for storage capacity costs associated with OMs for 2002/3 and 2003/4, with Transco subject to all savings made or costs incurred relative to these provisions. (This is equivalent to setting 100% sharing factors.)

9.30 The LNG storage booking prices that underpin current OM storage capacity costs are the same in nominal terms as those that were set in relation to the storage revenue cap in 1997/8. These prices were originally based on allocated costs, and we believe that they are likely to be similar to, although a little higher than, prices that would be calculated on an equivalent basis given current conditions. However, given the relatively small costs involved, Ofgem's preliminary view is that it is reasonable to use these prices when determining Transco's allowance for 2002/3 and 2003/4.

9.31 However, whilst the potential substitutes to LNG in the provision of operating margins support may be limited, they are not absent and they can be expected to grow over time with the development of new storage facilities and more flexible demand management arrangements. As with other services that Transco currently purchases from Transco LNG, it will be important to ensure that any future purchases of LNG capacity for OM purposes result from a procurement process that is non-discriminatory and clearly in compliance with the established guidelines (see Chapter 4 for Ofgem's proposals on the establishment of clear and transparent procurement guidelines covering Transco's SO requirements). Ofgem will monitor this process closely.

9.32 Ofgem is unconvinced that Transco's proposed volume increase is required. Indeed, we would argue that Transco may be expected to be able to reduce its OM requirement over time. It is notable that Transco has been able to substantially reduce its OM bookings over the current price control period, and as a result, make substantial savings as against its price control allowances. Transco's OM bookings, price control allowances and actual OM capacity costs are shown in Table 9.5 for the recent years of the current price control period.

Table 9.5: OM bookings, allowance and spend, 1999/00-2001/2

	1999/00	2000/1	2001/2
OM space booking (GWh)	2536	1672	1672
Price control allowance (£m, 2000 prices)	27	20	18
Transco OM storage capacity spend (£m, 2000 prices)	16.8	17.2	17.3

9.33 Transco's arguments regarding the need for extended cover for loss of standby capacity seem contrary to the short duration support that OM is intended to provide. If longer-duration constraints arise due to onshore or off-shore failure, then they should be addressed and funded through other means. More generally, it can be noted that developments in demand-side management and gas balancing arrangements may be expected to reduce the duration over which OM support is required and provide contractual alternatives to OM storage bookings over time.

9.34 Ofgem also notes that the provisions for an orderly run-down of the system are currently being reviewed, and Transco has stated that the early indications are that this will suggest the need for an allowance closer to 1999/00 levels than the current higher level. This anticipated reduction is not taken into account in the Transco forecasts. Reducing the provision for an orderly run-down of the system to 1999 levels would provide a saving in the order of £4m at prevailing prices.

9.35 Taking these factors into account, Ofgem's initial view is that annual OM allowances should not be higher than the actual OM costs for 2000/1 of £17.3m, and that a downward adjustment of £1m is appropriate to take into account anticipated savings, including in relation to a reduction in the orderly rundown provision. Thus, we propose an allowance of £16.3m (2000 prices) for 2002/3 and 2003/4.

Top up

9.36 Top up gas placed in store by Transco to enhance security of supply when it has identified a shortfall. Transco has identified two different categories of top up:

- ‘national top up’ where there is a shortfall between Transco’s forecasts of national supply and demand; and

- ‘constrained LNG top up’ where there is a shortfall between storage user bookings at CLNG sites and the inventory levels Transco has specified that it needs at those sites in order that local transportation constraints can be overcome at peak times.

9.37 These are considered in turn below.

National top up

9.38 Ofgas’ April 1998 top-up review concluded in that national top-up would not be needed in the long-term given the availability and diversity of sources of peak gas and the commercial incentives on shippers under the Network Code to balance their own inputs and offtakes each day. Furthermore, the top-up arrangements were identified as a key obstacle to the development of competition in the storage market in Ofgem’s storage review[77]. One of the undertakings agreed by BG as a result of the review was to pursue the removal of the national top up requirement from its Safety Case.

9.39 The slow progress made by Transco in removing top-up from its Safety Case and the Network Code resulted in the proposal of modification 237 to address the top up funding question. Modification proposal 237 was rejected on the basis that under the proposal Transco could have received revenues well in excess of the costs it had incurred providing top-up. Subsequently, modification 297, which prevented Transco from recovering the costs of top-up from shippers, was raised and implemented in February 1999.

9.40 Transco has, thus far, been unsuccessful in gaining agreement from the Health and Safety Executive (HSE) for the removal of top-up from its safety case. Transco has calculated the need for a positive top up requirement for 2001/2,

[77] See *Review of the supply of gas storage and related services, A decision document*, Ofgem, February 1999.

and it has raised a Network Code modification for the restoration of funding for national top up[78].

9.41 Shippers and Ofgem have expressed considerable concerns about the methodology used by Transco to determine the requirement for national top up. In particular, Transco does not take account of any demand interruption during peak conditions (when prices would be expected to be very high) over and above those sites that are registered as interruptible for transportation purposes.

Constrained LNG top up

9.42 As set out in Chapter 7, at constrained LNG sites, Transco set minimum inventory levels of gas which must be kept in store by users who book capacity at those sites. Rights to use these quantities of gas enable Transco to overcome system constraints at peak times, and thus it provides an effective alternative method to pipeline investment and interruptible contracts for meeting exit demand. Under the Network Code, Transco is required to book 'Constrained LNG Top up' where shipper bookings at constrained LNG sites fall below the minimum inventory levels set by Transco.

9.43 With the introduction of interim arrangements for LNG storage in 2000/1, which among other things included the introduction of LNG capacity auctions, Ofgem approved the reintroduction of a cost recovery mechanism for constrained LNG top-up for 2000/1, and subsequently approved the cost recovery mechanism for 2001/2. However, in our decision letters approving these, Ofgem made very clear that this approval was given *only if the level of reserve prices did not frustrate the objective of ensuring that all LNG capacity is made available to the market*. Since all capacity cleared at the constrained sites, no constrained LNG top-up bookings has been required in 2000/1 and 2001/2.

Transco's view

9.44 As noted above, Transco has an outstanding Network Code modification that proposes the reinstatement of the previous cost recovery mechanism for national top-up. However, it has proposed that funding for top up costs could be

[78] Network Code Modification Proposal 472 – *'Restoration of Funding for National Top-up'*

provided for through a licence modification as part of Transco's SO incentive scheme. Transco have proposed that the allowances shown in Table 9.7 should be made in relation to top up costs.

Table 9.7: Transco's view of the costs of national top up (£m, 2000 prices)

2002/3	2003/4	2004/5	2005/6	2006/7	Total
4.2	2.0	0.5	0.5	1.7	8.9

Ofgem's views

National top up

9.45 Ofgem has made clear its commitment, consistent with its statutory duties, that it will ensure that Transco can fund efficiently incurred safety expenditure. Ofgem believes that leaving arrangements relating to national top up within the Network Code is consistent with this commitment. It is open, under the Network Code, for Transco to demonstrate that there is a national top up requirement and that the costs incurred in meeting that requirement have been efficiently incurred.

Constrained LNG top up

9.46 Ofgem's proposals regarding the funding of constrained LNG were set out in Chapter 7. These proposals involve the setting of an allowance for CLNG costs each year, as part of the NTS exit incentives. Ofgem proposes that any costs associated with the purchasing of constrained LNG top up should be considered simply as part of the overall costs of providing constrained LNG, and therefore covered by the CLNG allowances set out in Chapter 7. We propose, therefore, that no additional allowance be made.

Summary and views invited

9.47 In this chapter, Ofgem outlined our initial proposals with regard to the SO external system balancing cost incentives. We have proposed that:

- NTS SO gas volumes be set for five years;

- All other parameters be set for two years for compressor fuel costs and other NTS SO gas costs with:
  - Targets set between £55m and £61m;
  - Caps and collars set between £2m and £4m; and
  - Sharing factors set between 20% and 25%.
- All parameters be set for two years for system reserve (operating margins) with:
  - the targets set at £16.3m (2000 prices) with no allowance for top-up; and
  - no caps and collars or sharing factors applied.

9.48 Ofgem has also proposed that the arrangements relating to National Top Up be left in Transco's Network Code.

9.49 Ofgem invites views on any of the issues raised in this chapter and in particular on the parameters of the incentive schemes.

10. Residual gas balancing incentive scheme

Introduction

10.1 This chapter presents Ofgem's initial proposals for an incentive scheme relating to the gas balancing costs that Transco incurs in its role as residual balancer of shipper inputs and offtakes from the NTS.

10.2 The incentive arrangements outlined in this chapter are based around the existing gas balancing arrangements where shippers face commercial incentives under the Network Code to balance their inputs and offtakes each day. The incentive arrangements will need to be developed over time in the light of Ofgem's proposals to reform the gas balancing arrangements. As we discussed in Chapter 4, our initial proposal is to set a new gas balancing incentive in place for one year (1 April 2002 to 31 March 2003).

10.3 Two possible approaches to setting the incentive scheme are outlined in this chapter. The first is based on the existing gas balancing incentives. The second is an alternative proposal, based around the net costs of Transco's gas balancing actions. The detailed methodology that we have used to derive target costs for the second scheme is set out in Appendix 3.

Residual gas balancing activities

10.4 Under the existing arrangements, the net costs of Transco's balancing actions are made up of three elements:

- balancing costs and revenues;
- imbalance costs and revenues; and
- scheduling charge revenues.

10.5 These are discussed in turn below.

Transco's role in balancing

10.6 Shippers have commercial incentives under the Network Code to balance their inputs and offtakes to the system each day. Transco is responsible for residual

system balancing in the event that shippers do not accurately forecast their inputs and offtakes and the system is long or short of gas in aggregate over the day.

10.7 Transco therefore buys and sells gas to ensure that system remains in balance and that linepack remains within safe operational limits. When linepack is falling (i.e. offtakes exceed inputs) Transco buys gas (currently only on the OCM). Conversely, when system inputs exceed offtakes, Transco sells gas to bring the system back into balance.

Imbalance costs and revenues

10.8 Shippers who have entered more gas into the system than they have supplied to customers i.e. are long gas, receive payment for the excess gas deliveries at either the System Average Price[79] (SAP) or the System Marginal Sell Price (SMP_S). The SO pays the imbalance charges to shippers who are long gas.

10.9 Similarly, shippers who fail to enter sufficient quantities of gas to match their offtakes i.e. are short gas, will be exposed to the cost of the shortfall. In an equivalent manner to the cash-out regime for shippers who are long gas, this is charged at either SAP or System Marginal Buy price SMP_B. The SO receives the imbalance payments from shippers who are short gas.

10.10 SMP prices are calculated on the basis of the price at which Transco buys and sells gas on the OCM. In the event that Transco does not take any actions on the day, default prices apply. These default prices are bases on average prices at which shippers trade on the OCM on that day, adjusted for a flexibility charge, which is based on the costs of injections and withdrawals to/from storage facilities.

10.11 In both cases the SO incurs/receives the cost/revenue associated with cashing-out shippers who are long/short. At present, the net cost of the cash-out regime incurred by the SO is recharged to all users as part of the neutrality charge.

[79] If they are within their forecast deviation tolerance.

Scheduling Revenues

10.12 If shippers' actual inputs or offtakes differ from their final nominations, they may have to pay scheduling charges if this difference is greater than the amount of their scheduling tolerance (a deadband within which shippers are not exposed to scheduling charges). Scheduling charges differ between inputs and offtakes, but are generally very low:

- input scheduling charges are collected on the basis of the difference between end of day nominations and final allocations by entry terminal. Absolute differences between 3% and 5% attract a charge equal to 2% of SAP and those greater than 5% are charged at 5% of SAP.
- offtake scheduling charges are levied on a site-specific basis, with different charges for different site categories.

Transco's existing residual gas balancing incentive

10.13 The costs associated with Transco's residual balancing of the system are still recovered from all shippers through the neutrality charge.[80] However, the current gas price incentive provides Transco with a financial incentive to buy and sell gas efficiently and to reduce the day on day linepack changes. In line with these financial incentives, Transco was given greater discretion in determining how it maintains the residual balance of the system as the OGs were made much less prescriptive.

10.14 Transco's gas balancing incentive comprises of two main components, a price incentive component and a linepack incentive component. The daily revenue (cost) to Transco under its incentive is set equal to the sum of the incentive payment received under both its price incentive and its linepack incentive.

The price incentive

10.15 Transco's price incentive is designed to encourage Transco to undertake its gas balancing trades at prices close to the system average price (SAP) on the OCM

[80] The neutrality charge is the sum of the net costs of Transco's buying and selling of gas on the OCM, the net costs of imbalance cash-out and revenue from scheduling charges.

by reducing the spread between its buy and sell actions, as it was expected that this would reduce the overall level of balancing costs.

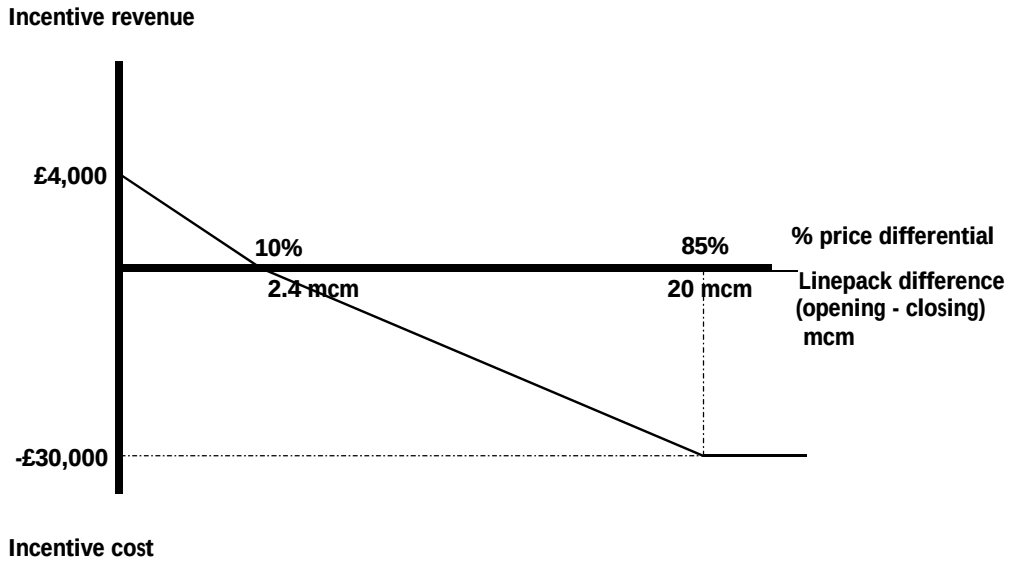
10.16 The price incentive regime is set on a daily basis, based on the differential between the prices of Transco's marginal trades on either side of the market. Transco receives a bonus, up to a maximum of £4,000 a day, if its marginal buy price is within 10% of its marginal sell price[81]. If the differential is greater, Transco is exposed to a penalty of up to £30,000 a day, which occurs when the differential between its marginal buy price and its marginal sell price exceeds 85%. The overall exposure under the incentive scheme is limited by an annual cap and collar of +/- £2 million.

The linepack incentive

10.17 The daily linepack incentive was introduced in June 2001 and is based on a similar format to the price incentive. Transco receives its maximum daily revenue under this incentive (£4,000) if there is no difference between opening and closing linepack. It continues to benefit under the incentive regime so long as the difference between opening and closing linepack is less than 2.4 mcm. If the difference is greater than 2.4 mcm, it losses money under its incentive up to a daily collar value of £30,000 at approximately 20 mcm. Both incentives are illustrated in Figure 10.1.

[81] The price incentive was changed by Modification 414, "Proposal to reform the Transco energy incentive – redesign", that facilitated the introduction of the linepack term. Prior to the implementation of this modification (for the period October 1999 to June 2001), the target (or break-even) price differential was 5% on each side of the market.

Figure 10.1: Transco's Gas balancing incentive



Form of the incentive scheme target

10.18 As described above, the main costs that Transco incurs in undertaking its residual gas balancing role are associated with Transco buying and selling gas and the net costs of cashing out shippers with end of day gas imbalances. Under the current incentive arrangements, Transco is incentivised on the **price** of the actions it takes on the OCM and the **volume** by which the system linepack changes over the course of a day.

10.19 In developing the scheme, Ofgem believes that it could be more appropriate for Transco incentives to be based on the **costs** it incurs in undertaking the residual gas balancing role. This is because customers ultimately pay these costs. Thus, it could be argued that under such an approach, Transco incentives would be aligned with the interests of customers.

10.20 Under either approach, Ofgem believes that Transco should have greater discretion in how it seeks to balance the system. In particular, Ofgem believes that Transco should have discretion to contract ahead for gas for balancing purposes and use tools other than the OCM where it believes that it would be more efficient to do so.

Option 1 – Ofgem's proposals based on the existing gas balancing incentives

10.21 Under its **price** incentive Transco receives benefits depending upon the proximity of the price of Transco's marginal trade to the system average price (SAP) in the OCM. If Transco's marginal price trade is within 5% of SAP on any day, Transco receives a bonus payment up to a maximum of £2,000, which it receives if it trades at the average price. Conversely, Transco is exposed to a penalty of up to £15,000 if the differential exceeds 5% (meeting its cap when the differential is equal to 50% away from SAP). The incentive parameters applied to both buy and sell actions. Hence, Transco can receive a total daily bonus payment of £4,000 or penalty of £30,000.

10.22 Under its **volume** incentive Transco is encouraged to minimise end of day deviations away from opening linepack. The linepack based incentive is similar in form to the price based incentive. Transco receives its maximum revenue under this incentive component (£4,000) if there is no difference between opening and closing linepack. It continues to benefit under the scheme so long as the difference between opening and closing linepack is less than 2.4 mcm. For any linepack deviations greater than 2.4 mcm, it faces penalties up to a collar value of £30,000 at approximately 20 mcm.

10.23 The sum of the daily caps and collars on both schemes could give rise to a maximum annual gain of £2.9 million (365 times the maximum price incentive gain of £4,000 plus the maximum linepack gain of £4,000) and a maximum loss of £21.9 m. However, Transco's exposure has been reduced below these levels by the introduction of an overall annual cap of £2m and a collar of -£2m.

10.24 If the current incentive structure were to be retained, Ofgem proposes that the current sharing factors should be retained but that the range of prices and linepack volumes over which Transco is incentivised should be increased. Our initial view is that Transco's daily upside on both price and linepack should be increased from £4,000 to £5,000 and that its annual cap should also be increased from £2m to £3.5m. In respect of its downside, Ofgem proposes that there should be no change in Transco's daily exposure but that, to retain the symmetric nature of the current scheme, its annual exposure should be increased from £2m to £3.5m.

Option 2 – Ofgem's proposals based on a new gas balancing incentive

10.25 Ofgem believes that arguably, Transco has influence over both the price and volumes of its balancing actions. These, in turn, set cash out prices so indirectly Transco can influence the level of shippers' imbalances. For these reasons, under this proposal, Ofgem has proposed basing Transco's incentive on the net costs associated with both its own actions in the market and those of settling shipper's imbalances.

10.26 The detailed modelling of the three elements of Transco's residual gas balancing costs (balancing costs and revenues, imbalance costs and revenues, scheduling charge revenues) and the assumptions underlying Ofgem's proposals are set out in Appendix 3.

10.27 Ofgem's analysis presented above suggests that expected net revenues that Transco will earn from its gas balancing activities in 2002/3 should be around £23.2 million. Taking account of the potential variability of the outcomes for each of the gas balancing components, we have constructed three incentive options that each lead to a zero expected profit for Transco, as shown in Table 10.1.

10.28 The various options allow Transco to trade-off potentially higher upside with lower downside risk, so that as the upside potential progressively increases, downside risk also increases. Option A combines a low target with low upside potential but higher downside risk. Option B offers a higher target combined with equal upside potential and downside risk. Option C, offers a higher target still but with lower downside risk and a lower cap/collar than in option B.

Table 10.1: Ofgem's initial proposals for the SO incentive regime – gas balancing cost

£m				**Sharing factors**	
	Target	**Cap**	**Collar**	**Upside**	**Downside**
Option A	-15	3.5	-5	20%	20%
Option B	-20	4	-4	25%	25%
Option C	-25	5	-3.5	30%	30%

10.29 As discussed in Chapter 4, Ofgem proposes that these targets, caps and collars and sharing factors should apply for one year from 1 April 2002.

Summary and views invited

10.30 Ofgem has proposed two alternative forms for Transco's residual gas balancing cost incentive. The first option would be to continue with the present form of incentive, under which Transco is separately incentivised with regard to the price of its balancing actions and changes in linepack volumes. The second option would be to incentivise Transco in respect of the net costs (or revenues) that it incurs (earns) in its role as residual gas balancer.

10.31 Ofgem invites views on the merits of the two alternative proposals outlined in this chapter. Ofgem would also welcome views on the methodology and assumptions proposed used in deriving these forecasts on the proposed targets, caps and collars and sharing factors to Transco.

11. SO internal cost incentive scheme

Introduction

11.1 This chapter sets out Ofgem's initial proposals on target values for Transco's NTS SO's internal costs for the period 1 April 2002 to 31 March 2007. These internal costs, over which Transco has direct control, comprise:

- operating expenditure;
- capital expenditure; and
- a return on the SO regulatory value.

Operating costs

11.2 Transco's NTS SO operating costs comprise:

- staff costs: the costs and number of employees of the NTS SO, which make up the largest proportion of NTS SO internal controllable costs;
- non-staff costs: the costs of computing and information systems, telemetry, and property rental costs; and
- allocated central costs: costs relating to support functions such as HR, finance, company secretary etc.

11.3 In carrying out a high level review of the operating costs of the NTS SO, Ofgem have considered:

- the allocation of costs between the NTS SO and the TO. Previous price controls have not sought to identify separately the internal costs that Transco incurs in its role as NTS SO. Hence, it is necessary to identify those cost streams that should be defined as NTS SO costs from other controllable costs which have been reviewed as part of the wider price control process; and
- the efficient level of internal operating costs that should be incurred by the NTS SO.

Allocation of Costs to NTS SO

11.4 Transco has proposed a split of its operating expenditure between that which is incurred by the SO function and that incurred by the rest of the business that is based on the model of a 'thin' SO. This is consistent with the approach adopted for NGC's current SO incentive schemes. Thus, the operating costs allocated by Transco to the SO are those it incurs in achieving operational balance and in the short-term management of the transportation system to support customer requirements, within the existing infrastructure and other constraints of the system. Specification of system requirements (i.e. the overall performance and capacity of the system to meet customer requirements) is undertaken by the TO function.

11.5 Transco then allocated the SO costs it had identified between those incurred in operating the NTS and those attributable to its LDZ SO role. These latter costs will remain within the TO price control. Transco's initial view of its NTS SO operating costs was presented in Table 6.9 of Ofgem's June 2001 TO Initial Proposals and this is reproduced here as Table 11.1.

11.6 As can be seen, Transco's initial view of its NTS SO operating costs included some external costs as well as internal costs. The external costs related to system balancing costs. These have already been discussed, in Chapter 9, and they are not considered further in this chapter, which focuses only on the efficient level of internal operating costs

Table11.1: Transco's initial view of its NTS SO operating costs

£m, 2000 prices	2002/3	2003/4	2004/5	2005/6	2006/7	Total
NTS SO costs*	73.4	74.7	76.5	77.6	79.7	381.8
External costs	*58.8*	*61.4*	*64.2*	*65.7*	*67.9*	*318.0*
Internal costs	*14.6*	*13.2*	*12.3*	*11.9*	*11.8*	*63.8*

* NTS SO cost figures as per Table 6.9 of Ofgem's Review of Transco's Price Control from 2002 - Draft Proposals, June 2001.

11.7 Ofgem's consultants have reviewed Transco's initial allocation of internal costs to the NTS SO and Transco has agreed that some costs that it had previously allocated to the TO should in fact be allocated to the NTS SO. These costs

related principally to Information Systems (IS) operating costs. Also, internal operating costs associated with Transco's procurement of reserve (operating margins) have been included.

11.8 Transco originally projected an average 3% per annum reduction in internal costs of the NTS SO over the price control period, from £20.4m in 2002/3 to £16.8m in 2006/7. This reduction in costs reflected the benefits projected to arise from the implementation of Project Ulysses, which will result in the replacement of Transco's gas control infrastructure (see the discussion of capital expenditure below for further details). However, aspects of the implementation of Project Ulysses have been delayed. Hence, Transco has revised its estimated reductions in operating expenditure to take account of the delay in Project Ulysses. It believes that, during the changeover between the old and new control systems, it will require additional manpower and this will increase its operating costs throughout most of the next price control period.

11.9 Transco's latest view of its NTS SO operating costs, allowing for both these adjustments, is shown in Table 11.2.

Table 11.2: Transco's revised view of its internal NTS SO operating costs

£m, 2000 prices	**2002/3**	**2003/4**	**2004/5**	**2005/6**	**2006/7**	**Total**
Original costs	14.6	13.2	12.3	11.9	11.8	63.8
Revision to include additional IS costs	*11.5*	*10.5*	*9.5*	*9*	*8.9*	*49.3*
Revision for rephasing of Project Ulysses	*(0.5)*	*0.9*	*2.6*	*2.1*	*1.6*	*6.8*
Transco's revised views	**25.6**	**24.6**	**24.4**	**23**	**22.3**	**119.9**

11.10 Transco has now submitted a Strategic Business Plan (SBP). Inter alia, this outlines Transco's requirements for additional NTS SO operating expenditure over and above the figures set out in Table 11.2. This expenditure relates to the need for additional staff in light of developments in the role of the SO and amounts to an additional £9.5m over the price control period, some 7.9% of Transco's view of total NTS operating expenditure.

Efficient level of internal operating costs for NTS SO

11.11 Ofgem's consultants have reviewed Transco's submissions and, as part of the wider price control, suggested a number of areas where efficiencies could be achieved by Transco over and above those put forward by Transco. Specifically, Ofgem believes the following adjustments should be made to Transco's figures:

- Ulysses rephase. Ofgem is reluctant to allow the costs of the delays in Project Ulysses to be passed through to customers. Instead, it might be more appropriate to incentivise Transco to seek compensation from those parties responsible for the delay, or else be exposed to the delay costs itself. For this reason, Ofgem's initial view is not to allow the adjustment for Project Ulysses re-phasing shown in Table 11.2, particularly since the delay in the associated capital expenditure should result in savings to Transco e.g. reduced depreciation, that will serve to offset the lost efficiency savings. As yet, Ofgem has not received sufficient information from Transco to be able to calculate whether there are likely to be any net costs associated with the Ulysses delay;

- central recharges: As part of the wider price control analysis, Ofgem's consultants identified efficiencies relating to the price control treatment of pension costs and bonus costs; and

- other adjustments relating to a number of corporate activities including corporate affairs, HR, legal, regulation and strategy and business planning.

Target values

11.12 Based on these adjustments, our initial proposals on an efficient level of internal operating costs for the NTS SO is shown in Table 11.3.

Table 11.3: Ofgem's initial proposals for target NTS internal SO operating costs

£m, 2000 prices	2002/3	2003/4	2004/5	2005/6	2006/7	Total
Transco's revised views	25.5	24.6	24.5	23.0	22.3	**119.9**
Adjustments						
- Ulysses rephase	*0.5*	*(0.9)*	*(2.6)*	*(2.1)*	*(1.6)*	*(6.8)*
– Recharge adjustments	*(3.0)*	*(2.9)*	*(2.8)*	*(2.7)*	*(2.6)*	*(14.0)*
Ofgem's initial proposals	**23.1**	**20.7**	**19.1**	**18.2**	**18.1**	**99.1**

11.13 Ofgem notes the additional costs that Transco has indicated in its SBP. However, in line with the policy adopted in the June 2001 Initial Proposals, Ofgem intends not to consider these costs formally at this stage of the review. We anticipate that, in the course of the forthcoming consultation period, Transco will provide further supporting evidence that will permit Ofgem to assess the need for such additional operating expenditure.

Proposals for caps and collars

11.14 In order to maintain consistency across the SO incentive schemes, Ofgem proposes applying sharing factors to internal operating expenditure equal to the average sharing factors of the external cost schemes (excluding the capacity buy-back scheme). Ofgem will adjust these sharing factors in line with adjustments to the other sharing factors.

NTS SO capital expenditure and regulatory value

11.15 In order to identify the allowable revenues of Transco's NTS SO business, it is necessary to calculate a RV for the NTS SO at 31 March 2002. This requires Transco's RV to be split between the NTS SO and the remainder of its business.

11.16 The opening SO RV can then be rolled forward by adding in projected capital expenditure and subtracting an appropriate depreciation allowance.

Allocation of assets to NTS SO

Transco's view

11.17 In its original submissions, Transco proposed an allocation of SO assets based on the valuation of its assets at historic costs, indexed by the Retail Price Index (RPI). Transco then further split the assets it had allocated to the SO between those assets used for NTS system operations and those used for LDZ system operations. This split was made on the basis of the number of telemetered outstations at the LDZ and NTS levels (1615 and 220 respectively). Transco has chosen not to include the land and buildings used by the NTS SO in the NTS SO RV but instead it has included a rental charge as part of its operating costs.

11.18 The resulting RV of the NTS SO as at 31 December 2000 is presented in Table 11.4. The table also shows the assumed economic life applied by Transco for each asset category.

Table 11.4: NTS SO opening regulatory value as at 31 December 2000

£m,. 2000 prices	Net Book Value of NTS SO assets at 31/12/00	Assumed economic life
Computers	5.0	5
Telecoms	0.4	10
Misc	1.3	5
Total NTS SO opening RV	**6.7**	

Ofgem's view

11.19 Transco's proposed separation of the current regulatory value between NTS SO and TO assets has been reviewed by Ofgem's consultants. Ofgem has made no amendments to the assets that Transco states should be reflected in the NTS SO RV.

11.20 Ofgem's consultants also reported that the assumptions regarding the economic life of the different asset categories are reasonable and consistent with those applied by NGC and other network utilities. Therefore, Ofgem has not amended these assumptions.

Appropriate capital expenditure additional to the SO Regulatory Value

11.21 Both to arrive at an opening RV for the NTS SO at the start of the price control period and to roll-forward the RV thereafter, it is necessary to take account of projected future capital expenditure for the SO.

Transco's view

11.22 Table 11.5 summarises the profile of SO capital expenditure from 1 January 2001 to the 31 March 2007 submitted by Transco for both the NTS SO and the LDZ SO by calendar year. As for its initial allocation of assets, Transco divided its SO capital expenditure between its NTS SO role and its LDZ SO role on the basis of the number of telemetered stations within the LDZ and within the NTS. This resulted in 18% of its projected capital expenditure being allocated to the NTS SO.

Table 11.5: Transco's initial SO capital expenditure profile

£m, 2000 prices	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
SO capital expenditure	41.4	8.2	1.1	0.9	7.1	7.1	3.8
NTS SO	*7.5*	*1.5*	*0.2*	*0.2*	*1.3*	*1.3*	*0.7*
LDZ SO	*33.9*	*6.7*	*0.9*	*0.7*	*5.8*	*5.8*	*3.2*

11.23 The bulk of capital expenditure incurred over the price control period relates to the costs of Project Ulysses. Project Ulysses involves the complete replacement of Transco's gas control infrastructure since this is now obsolete and significantly beyond its designated economic life. Hence, the project comprises the installation of telemetry outstations, communications networks, control systems, decision support tools and management information systems. This investment is expected to reduce the risk of a large loss of delivery and decrease the SO's operational expenditure. Thirty percent of Project Ulysses capital expenditure has been deemed by Transco to be attributable to the NTS SO.

11.24 As discussed above, whilst planned for implementation over the course of the current price control period, the full implementation of Project Ulysses has been delayed. In turn, this has delayed capital expenditure associated with the

project so that a significant portion of this expenditure will now fall within the 2002-2007 price review period.

11.25 Hence, Transco has revised its intended capital expenditure profile projection to take account of the delay in Project Ulysses. The revised capital expenditure profile is set out in Table 11.6, which shows a reduction in projected capital expenditure of 35% in 2001 and increases of a factor of five in 2002 and a factor of 12 in 2003. Overall, Transco's revisions increase its projected capital expenditure over the course of the price control period by £26.5m.

Table 11.6: Transco's revised SO capital expenditure profile

£m, 2000 prices	2001	2002	2003	2004	2005	2006	2007
SO capital expenditure	27.1	40.9	13.0	1.5	0.9	5.1	7.5
NTS SO	*4.9*	*7.4*	*2.3*	*0.3*	*0.2*	*0.9*	*1.3*
LDZ SO	*22.4*	*33.6*	*10.7*	*1.2*	*0.7*	*4.2*	*6.1*

11.26 In its SBP, Transco indicated that its capital expenditure had increased by £21m from that it had previously identified. Transco claims that this additonal expenditure relates to the anticipated changes in the gas trading arrangements, for example the costs related to replacing AT-Link as a result of Ofgem's proposed changes to the gas balancing arrangements and costs relating to the proposed changes in the NTS exit and interruption regime.

Ofgem's view

11.27 Ofgem's consultants have reviewed Transco's original capital expenditure profile and they believe that it is reasonable. Ofgem's consultants have not, however, reviewed Transco's revisions to its intended capital expenditure. In particular, it has not been possible to ascertain how the rephasing of the Ulysses Project has led to an overall net increase of £26.5m over the price control period. Transco has explained that some of the increase is attributable to the capitalisation of costs previously considered operating expenditure. However, Transco has not indicated what proportion of the total increase is explained by this, nor has it provided evidence to support the overall increase in net capital expenditure.

11.28 As for operating expenditure, Ofgem's initial view remains that the customers should not be exposed to increased costs on account of the delay to Project Ulysses. Instead, Transco should be incentivised to recover the costs from those parties causing the delay or be exposed to the costs itself. For this reason, until more supporting evidence is forthcoming, Ofgem's initial view is that the allowed capital expenditure for the SO should reflect only Transco's original submission, rather than its revised submission. On this basis, Ofgem's initial view of SO's capital expenditure is set out in Table 11.7 and represent the data presented in Table 11.5 for the NTS SO converted from calendar to formula years on a straight-line basis.

Table 11.7: NTS SO capital expenditure – Ofgem's initial view

£m 2000 prices	2001/2	2002/3	2003/4	2004/5	2005/6	2006/7
Capital expenditure	6.3	1.2	0.2	0.4	1.2	1.2

11.29 Ofgem has not, so far, considered Transco's SBP submission but we have agreed to do so in drawing up our final proposals. Hence, Ofgem has not considered Transco's claims for an additional £21m of capital expenditure over the review period. Given Ofgem's views on NTS SO capital expenditure, Table 11.8 shows how the RV for the NTS SO rolls forward to the end of the price control period.

Table 11.8: Ofgem's initial proposals for the NTS SO Regulatory Value, depreciation and capital expenditure

£m, 2000 prices	2001/2	2002/3	2003/4	2004/5	2005/6	2006/7
Opening value	7.8	12.0	10.2	7.3	4.8	3.3
Capex	6.3	1.2	0.2	0.4	1.3	1.2
Depreciation	(2.0)	(3.0)	(3.1)	(2.9)	(2.7)	(1.9)
Closing value	12.0	10.2	7.3	4.8	3.3	2.7

Cost of capital

11.30 The June 2001 TO Initial Proposals discussed the appropriate cost of capital for Transco's TO business. Arguably, the cost of capital for the SO could differ from that used for the TO business, due to the relative sizes of the TO and SO business and the differing risk profiles of each business.

11.31 However, given the SO assets will still be funded from Transco as a whole, and that the NTS SO and the TO are not to be separately ringfenced, Ofgem believes it is still appropriate to apply the same rate of return to both the TO and SO businesses.

Summary and views invited

SO operating costs

11.32 Ofgem has proposed two efficiency adjustments to Transco's adjusted BPQ cost projections in order to derive its efficient cost scenario. These relate to:

- disallowing the pass through of costs associated with the delay to Project Ulysses; and
- adjustments to the central recharges identified as part of the wider price control that are allocated to the NTS SO; and

11.33 Ofgem invites views on these proposed efficiency adjustments.

SO capital expenditure and regulatory value

11.34 Ofgem is of the view that the assets identified by Transco as relating to the NTS SO should be transferred from the TO business at a RV valuation. Furthermore, these assets should be depreciated in a manner that reflects their economic lives.

11.35 Ofgem invites views on the level of capital expenditure relating to the NTS SO function that Transco intends to undertake.

12. Transco's overall SO incentive framework

Introduction

12.1 This chapter summarises Ofgem's initial proposals for an SO incentive regime covering all the costs that Transco incurs in operating the NTS. For the avoidance of doubt, all values are in money of the day unless explicitly labelled otherwise.

Form, Scope and Duration of SO Incentive Regime

Form

12.2 Ofgem proposes to apply a sliding scale form to all the elements of the SO incentive regime. This involves setting:

- targets based on estimates of efficient levels of incurred costs;
- sharing factors that determine Transco's rewards and liabilities where actual costs deviate from the targets; and
- limits on the potential upside and downside (caps and collars) for the SO.

Scope

12.3 Ofgem proposes that the SO incentive regime should include:

- NTS capacity investment: separate incentives covering:
  - NTS entry capacity; and
  - NTS exit capacity.
- Day to day SO external costs: separate incentives covering:
  - entry capacity buy-backs;
  - system balancing; and
  - residual gas balancing.

- SO internal costs: a single incentive covering:
  - operating expenditure;
  - capital expenditure; and
  - a regulated return on the SO RV

Duration

12.4 Ofgem proposes that the incentive schemes be initially set for:

- 5 years for the NTS entry capacity investment incentive and for the target values for the NTS exit capacity investment and the SO internal cost incentives;
- 2 years for the system balancing incentives and the sharing factors, caps and collars for the NTS exit capacity investment incentive; and
- 1 year for the gas balancing and entry capacity buy-back incentives.

Initial proposals for the SO incentive regimes

12.5 For each of the SO incentive schemes that make up the overall incentive regime, Ofgem has proposed a range of different combinations of targets, sharing factors, caps and collars. These are all designed to provide an effective incentive on Transco to manage costs on customers' behalf but they place different emphasis on the trade-offs between allowed costs and potential upside benefits and downside risks.

Capacity investment incentives

NTS entry capacity investment incentive

12.6 This incentive, in combination with the entry capacity buy-back incentive, is designed to encourage Transco to move away from the baseline output measures when it is efficient to do so. Ofgem's preferred option is to set:

- a zero target allowance for additional investment;

- 100% upside and downside sharing factors; and
- a cap and collar related to the return that Transco can make from any additional investment. The cap will be set in the range of upside cap set at 1.5 to 3 times above the agreed NTS cost of capital and a downside collar set at up to 1% below the agreed NTS cost of capital.

12.7 The initial TO price controls suggested that an appropriate cost of capital for Transco would lie in the range of 6.0-6.25%. On this basis, Transco would be able to earn a return of up to 18% (and not less than 5%) on any additional investment that it undertakes. This very considerable upside should be available to Transco if it responds to market signals.

NTS exit capacity incentive

12.8 The exit capacity incentive is designed to encourage Transco to consider the trade-offs between interruption, local storage and additional pipeline investment in order to meet the demand for exit capacity in the most efficient manner. A summary of Ofgem's initial proposals for the target level of allowable costs for the SO function for the period 1 April 2002 to 31 March 2007 is shown in Table 12.1.

Table 12.1: Ofgem's initial proposals for NTS SO exit expenditure (£m, 2000 prices)

2002/3	2003/4	2004/5	2005/6	2006/7	Total
66.5	68.7	69.6	69.6	70.0	**344**

12.9 Ofgem has proposed three options for the other incentive scheme parameters, as shown in Table 12.2.

Table 12.2: Ofgem's initial proposals for NTS SO exit parameters (2002/3 and 2003/4)

£m, 2000 prices			Sharing factors	
	Cap	Collar	Upside	Downside
Option 1	10	0	50%	50%
Option 2	10	-5	75%	25%
Option 3	20	-5	50%	50%

Day to day SO external costs

NTS entry capacity buy-back costs

12.10 Ofgem accepts that there is considerable uncertainty with regard to the cost of entry capacity buy-backs both because there has been limited experience of buy-backs so far and because we are proposing to change the volume of entry capacity that Transco is required to sell. For these reasons, the three options presented in Table 13.3 are more widely spread and we have deliberately designed them to limit Transco's exposure and provide upside potential. In subsequent schemes, we would expect Transco to have a much higher exposure to the costs of buy-back.

Table 12.3: Ofgem's initial proposals for the entry capacity buy-back incentive (2002/3)

£m				**Sharing factors**	
	Target	**Cap**	**Collar**	**Upside**	**Downside**
Option 1	100	30	-10	50%	10%
Option 2	150	15	-15	20%	20%
Option 3	175	10	-15	20%	40%

System balancing costs

12.11 System balancing costs cover the costs of gas for both NTS SO use of gas (in compressors and to cover unaccounted for gas and unbilled energy) and system reserves (operating margins). Ofgem believes that reasonable forecasts of system balancing costs for the SO incentive scheme for the period of would be:

- £59 million for the period 1 April 2002 to 31 March 2003 for NTS SO use of gas; and
- £16.3 million per year (2000 prices) for the period 1 April 2002 to 31 March 2004 for system reserves.

12.12 Ofgem believes that there is reasonably little uncertainty with regard to these two components of external costs. Hence, our initial proposals for the NTS SO use of gas incentive for 2002/3 and 2003/4 encompass three relatively similar

schemes, as shown in Table 12.4. In respect of system reserves, Transco's ownership of the LNG facilities, in which it books capacity to provide system reserves, raises particular problems with regard to the use of sharing factors, caps/collars since they may create perverse incentives. Hence for the system reserve scheme, our initial proposal is to set 100% sharing factors and no caps or collars.

Table 12.4: Ofgem's initial proposals for the system balancing NTS SO use of gas incentive (2002/3 – 2003/4)

£m	Target				Sharing factors	
	2002/3	2003/4	Cap	Collar	Upside	Downside
Option 1	57	55	2	-2	25%	20%
Option 2	59	57	3	-3	20%	20%
Option 3	61	59	4	-4	20%	25%

Residual gas balancing costs

12.13 The gas balancing cost incentives covers balancing costs and revenues, imbalance costs and revenues and scheduling revenues. We have proposed that either the present separate incentives on the price of Transco's balancing actions and changes in linepack volumes could be retained or that this could be replaced by a single scheme with a target value for residual gas balancing costs.

12.14 If the current incentive structure is rolled over, Ofgem believes that Transco's exposure should be increased by raising the daily caps to £5,000 and the annual cap and collar to +/- £3.5m.

12.15 If on the other hand a cost target were to be set, Ofgem's initial proposals are shown in Table 12.5. Due to the changes in the cash-out regime implemented from 1 April 2001, Ofgem believes that Transco will earn sufficient revenues from shippers' imbalance payment that overall its gas balancing activities will result in a net revenue of around £23 million. On this basis, we propose the three gas balancing incentive schemes for 2002/3 shown in Table 12.5.

Table 12.5: Ofgem's alternative initial proposals for the residual gas balancing incentive

£m				Sharing factors	
	Target	**Cap**	**Collar**	**Upside**	**Downside**
Option A	-15	3.5	-5	20%	20%
Option B	-20	4	-4	25%	25%
Option C	-25	5	-3.5	30%	30%

Summary of proposals for SO external cost incentive schemes

12.16 Table 12.6 summarises our proposals for the three SO external cost incentive schemes for 2002/3.

Table 12.6: Ofgem's initial proposals with regard to SO external cost incentives for 2002/3 (£m)

Component	**Target**	**Upside sharing factor**	**Downside sharing factor**	**Cap**	**Collar**
Buy-back costs	100 to 175	20% - 50%	10% - 40%	15 to 30	-10 to –15
System balancing – shrinkage	57 to 61	20% - 25%	20% - 25%	2 to 4	-2 to -4
System balancing – system reserve	17.1*	100%	100%		
Residual gas balancing	-15 to -25	20% - 30%	20% - 30%	3.5 to 5	-3.5 to –5

*The target value for system reserve has been converted from 2000 prices to money of the day assuming an inflation rate of 1.25% per annum.

SO internal costs incentive

12.17 A summary of Ofgem's initial proposals on the levels of allowable operating and capital expenditure for the SO function are shown in Tables 12.7 and 12.8 respectively.

Table 13.7: Ofgem's initial proposals for SO operating costs (£m, 2000 prices)

2002/3	**2003/4**	**2004/5**	**2005/6**	**2006/7**	**Total**
23.1	20.7	19.1	18.2	18.1	**99.1**

Table 12.8: NTS SO Regulatory Value, depreciation and capital expenditure (£m, 2000 prices)

	2001/2	2002/3	2003/4	2004/5	2005/6	2006/7
Opening value	7.8	12.0	10.2	7.3	4.8	3.3
Capex	6.3	1.2	0.2	0.4	1.3	1.2
Depreciation	(2.0)	(3.0)	(3.1)	(2.9)	(2.7)	(1.9)
Closing value	12.0	10.2	7.3	4.8	3.3	2.7

12.18 Given the SO assets will still be funded from Transco as a whole, and that the NTS SO and the TO are not to be separately ringfenced, Ofgem believes it is appropriate to apply the same rate of return to both the TO and SO businesses i.e. a return in the range 6% to 6.25%.

12.19 In terms of sharing factors, Ofgem proposes to apply a weighted average of the sharing factors applied to the external costs components on the internal cost components. This reflects the fact that Transco may be able to make trade-offs between internal and external costs. Ofgem is not proposing to apply a cap or collar to this scheme.

Summary and views invited

12.20 In this chapter, Ofgem summarised its initial proposals with regards to Transco's SO incentive. Ofgem invites views on all of the issues raised in this chapter and Ofgem's proposals on the parameters of Transco's SO incentive.

13. Way forward

Summary of views invited

13.1 Ofgem invites views on any of the issues raised in this document. In particular, Ofgem invites views on:

- the form, scope and duration of the NTS entry capacity incentive scheme;
- our proposals to cap/collar Transco's and customer's exposure to potential upside and downside under the entry capacity incentive through a cap/collar on the rate of return for incremental investment decisions;
- the form, scope and duration of the incentive scheme on NTS exit capacity;
- the methodology and assumptions employed in estimating an allowed level of target costs for efficiently contracting for interruption and local storage;
- the form, scope and duration of the SO incentive regime for reducing the day to day external costs associated with:
  - buying back entry capacity that Transco has sold but cannot deliver;
  - Transco's system balancing activities; and
  - Transco's residual gas balancing functions and
- the methodology and assumptions used to derive target cost figures for the above external costs;
- the proposed parameters (caps/collars, sharing factors) for each of the day to day external cost schemes;
- the form, scope and duration of the incentive with regard to SO internal costs;

- the adjustments Ofgem has made to Transco's proposals for SO internal operating and capital expenditure;
- the overall level of exposure for customers and Transco as a result of the proposed SO incentive regime; and
- Ofgem's proposed GT licence amendments.

Way forward

13.2 In this document Ofgem has set out its current thinking on the baseline outputs underlying the TO control and its initial proposals for the SO incentives. Ofgem is intending to publish its final proposals on Transco's TO price control from 1 April 2002 later in September 2001. This document will set out Transco's TO allowance for operating and capital expenditure for a five-year period with respect to both the NTS and LDZs. The document will also set out Ofgem's decision on the NTS entry, exit and linepack output measures for the next price control.

13.3 Ofgem is allowing respondents eight weeks to respond to the proposals in this document. Following this consultation period, Ofgem will publish its final proposals on the SO incentives in December 2001. If Transco accepts our final proposals, they will take effect from 1 April 2002.

Licence changes, Network Code modifications and pricing consultations

13.4 In order to implement the SO incentives, a number of changes will need to be made to Transco's licence, the Network Code and Transco's pricing methodology. In our SO final proposals document, Ofgem will provide, for consultation, initial drafting for the licence changes that will need to be made to implement the SO incentives.

13.5 Ofgem expects that Transco will then propose to the industry any corresponding changes that will need to be made through the Network Code modification procedures and pricing consultations.

13.6 In addition, the NTS entry and exit incentives require a number of reforms to the existing arrangements to be effective. In particular, the entry incentive requires

the introduction of longer term capacity auctions to provide effective market signals. Transco, customers and the the industry has begun a Network Code modification development programme with regard to implementing longer term capacity arrangements.

13.7 Ofgem will expect Transco to progress the necessary modifications and pricing consultations to develop and implement the new transitional exit measures from April 2002 in a timely manner.

13.8 As discussed in Chapter 4, Ofgem is also intending to modify Transco's licence to introduce an obligation on Transco to operate its system in an economic, efficient and co-ordinated manner. Ofgem raised these issues for consultation in its February 2001 gas balancing document[82] and respondents' views on the proposals are summarised in Appendix 1. Ofgem will seek to modify Transco's licence to include these new conditions at the same time as it is modified to incorporateTransco's overall SO incentive framework

[82] *The new gas trading arrangements. Further reform of the gas balancing regime*, Ofgem, February 2001.

Appendix 1 Obligation to operate system in economic, efficient and co-ordinated manner

Introduction

1.1 This appendix sets out a proposal to modify Transco's Gas Transporter (GT) Licence to introduce an obligation on Transco to operate its system in an economic, efficient and co-ordinated manner. Specifically, the proposal involves an amendment of Standard Licence Condition 11, obliging Transco to operate an economic and efficient transmission system, consistent with the obligation that has been introduced into the National Grid Company (NGC) transmission licence.

1.2 Ofgem raised this issue for consultation in its February 2001 gas balancing document[83] and respondents' views on the proposals are summarised in this document. Ofgem will shortly be undertaking formal consultation on the proposed licence amendment, as required under section 23(3) of the Gas Act 1986.

1.3 Ofgem believes that a new licence condition on Transco to operate its pipeline system in an efficent, economic and co-ordinated manner is necessary in order to formalise the industry's expectations regarding the manner in which Transco should carry out its system operator (SO) function and to reinforce Transco's SO incentive regime.

Background

1.4 In our February 2001 gas balancing document, Ofgem stated its belief that fundamental reform of the current arrangements is essential to enable customers to benefit from the operation of an efficient and competitive wholesale gas market.

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[83] *The new gas trading arrangements. Further reform of the gas balancing regime*, Ofgem, February 2001.

1.5 Ofgem presented its analysis of the current balancing regime, assessing the effectiveness of the incentives on shippers to balance their gas positions and on Transco to undertake the residual balancing of the system.

1.6 Ofgem put forward a proposal to introduce a new licence obligation on Transco as SO to ensure it operates its pipeline system in an efficient, economic and co-ordinated manner.

1.7 Ofgem invited interested industry participants to respond on the proposal put forward in the February 2001 consultation document and respondents' views are summarised in this document.

Rationale

1.8 Transco is currently required, under the obligations contained in Section 9 of the Gas Act, to develop and maintain an efficient and economical pipeline system for the conveyance of gas. Ofgem believes that, in order to fulfil the needs of the gas balancing regime, a new licence condition should be introduced to ensure that Transco *operates* its pipeline system in an efficient, economic and co-ordinated manner.

1.9 Ofgem believes the licence condition is required for a number of reasons, namely:

- to recognise and formalise the industry's expectations regarding the manner in which Transco should carry out its SO function;
- to ensure consistency with the regulatory safeguard placed on shippers under standard condition 2 of their gas shippers' licences to underpin the commercial incentives to balance set out in the Network Code;
- as an enforceable, regulatory safeguard in recognition that, as any SO incentive regime encompasses a cap and collar on Transco's costs and revenues, there could be instances where the scheme no longer provides a commercial incentive on Transco (i.e. once the cap or collar is reached) to continue to operate the transmission system efficiently; and

- to ensure consistency with the obligations imposed on NGC as operator of the electricity transmission system.

1.10 Ofgem believes that the proposed licence condition would provide market participants with some comfort that Transco would not be in a position to abuse its position as monopoly SO, if for example the cap or collar on its incentive scheme had been breached. Therefore, the licence obligation effectively supports any incentives that are placed upon the SO. Further, the new obligation provides Ofgem with the ability to take enforcement action should it become necessary.

Proposals for the modifications

1.11 In our February 2001 gas balancing document, Ofgem invited industry participants to submit views on the proposal to introduce a new clause 1 into the current Standard Condition 11 of Transco's GT Licence that places an explicit requirement on Transco to operate its pipeline system in an efficient, economic and co-ordinated manner. The proposed amendment to Standard Condition 11 is set out at the end of this appendix. A summary of the responses received is provided below.

Respondents' views

1.12 Nine respondents commented on the need to place a licence obligation on Transco to operate the pipeline system in an efficient, economic and co-ordinated manner. Seven respondents supported the proposal, with one stating that the obligation should be consistent with that in place on NGC. One respondent added that there should be a separate economic purchase obligation to prevent over-use of Liquefied Natural Gas. A further respondent commented that the licence obligation should be introduced even in the absence of a move to shorter balancing periods.

1.13 The one respondent opposing the proposal commented that Transco has an existing obligation under the Gas Act to develop and maintain the pipeline system 'efficiently and economically'. This respondent noted that it would have been useful to clarify which of Transco's activities would be defined as the

'operation' of the pipeline that could not be interpreted as part of 'developing' or 'maintaining' the pipeline (obligations Transco currently faces).

1.14 The Health and Safety Executive commented that there was a need to ensure that any additional licence obligation was consistent with Transco's duties under the Health and Safety at Work Act 1974.

Transco's response

1.15 In its response to the gas balancing consultation document, Transco indicated that it did not consider the licence amendment to be appropriate and would not be prepared to accept it in its proposed form. In particular, Transco indicated that the licence condition might create conflicts with the incentive structure thereby placing 'the system operator in an invidious position'.

1.16 Transco has indicated that it does not support the proposed amendment to Licence Condition 11 on the basis that the revised licence condition would duplicate existing licence provisions and the proposed SO incentive regime. Further, in so far as the proposed amendment refers to the physical operation of the system, Transco believes the concept of 'maintain' in section 9(1)(a) of the Gas Act already obliges Transco to 'operate' the system in an efficient, economic and co-ordinated manner.

1.17 Transco stated that if it were persuaded of the need for a revised licence condition, in line with the proposed provisions for electricity, it would seek an amendment to the shipper licence condition 2, to ensure that shippers did not prejudice the economic operation of the system.

Details of the Proposed Licence Changes

1.18 The proposal would introduce a new clause 1 into the current Standard Condition 11 of Transco's GT Licence that places an explicit requirement on Transco to operate its pipeline system in an efficient, economic and co-ordinated manner.

1.19 Amended Standard Condition 11 of Transco's licence is set out below, with the proposed amendments highlighted in bold.

Amended Standard Condition 11: Conduct of transportation business

14. The Licensee shall operate its pipeline system in an efficient, economic and co-ordinated manner.

15. The Licensee shall conduct its transportation business in the manner best calculated to secure that neither –

(a) the Licensee or any such person as is mentioned in paragraph **(8)**, nor

(b) any gas shipper or gas supplier,

15.1 obtains any unfair commercial advantage including, in particular, any such advantage from a preferential or discriminatory arrangement, being, in the case of such an advantage accruing to the Licensee, one in connection with a business other than its transportation business.

16. Subject to paragraph (**4**), the Licensee shall use its best endeavours to secure that –

(a) no information relating to, or derived from, its transportation business is disclosed for the benefit of any trading business conducted by the Licensee or any such person as is mentioned in paragraph **(8)**, and

(b) no information derived from its transportation business is used for the purposes of any trading business conducted by the Licensee or (so far as the Licensee has powers in that behalf) of a trading business conducted by any such person as is mentioned in paragraph **(8)**.

(3A) Except where the Director consents to the Licensee not doing so, the Licensee shall use its best endeavours to secure that no information relating to, or derived from the Transportation Business (as defined in standard condition 2) is disclosed for the benefit or used for the purposes of the LNG Storage Business (as defined in standard condition 2).

(3B) Except where the Director consents to the Licensee not doing so, the Licensee shall use its best endeavours to secure that no information relating to, or derived from the LNG Storage Business (as defined in standard condition 2) is disclosed for the benefit or used for the purposes of the Transportation Business (as defined in standard condition 2).

(3C) Paragraphs 11 (2A) and (2B) shall cease to have effect on the date on which the derogations given by the Director from the provisions of Special Condition 8A.1 and Standard Condition 11(2) (as amended or any extension thereof) cease to have effect.

16.1 (4) Paragraphs (3), (3A) and (3B) shall not apply in so far as -

(a) the Director so consents;

(b) a gas shipper or gas supplier has, for the purposes hereof, consented in writing to the use or disclosure of information relating to that shipper or supplier;

(c) it is necessary or expedient that the information be used or disclosed to enable such a person as is mentioned in paragraph **(8)** to enter into arrangements for the connection of a facility for the storage of gas to the pipe-line system of the Licensee or to enter into transportation arrangements with the Licensee or to give effect to such arrangements;

(d) the information has been published or is required to be disclosed as mentioned in paragraph **(3)**(a), (**3**A) and (**3**B) in pursuance of any other condition of this licence;

(e) the information (otherwise than in consequence of a contravention of any condition of this licence) is in the public domain, or

(f) it is information of the kind to which sub-paragraphs (b) to (d) above refer and is disclosed to persons acting on behalf of the Licensee engaged in a trading business of the type described in sub-paragraph **(5)**(b) below.

(5) In this condition "trading business" means

(a) activities connected with the acquisition and disposal of gas in Great Britain,

(b) activities connected with the storage of gas at an offshore storage installation or storage cavities in natural strata, or

(c) activities connected with arranging with a public gas transporter for gas to be introduced into, conveyed by means of or taken out of a pipe-line system operated by that transporter,

16.2 other than -

(i) such activities relating to gas intended for consumption outside Great Britain as are designated for the purposes of this condition by the Director, or

(ii) in the case of the Licensee, such activities in connection with either the efficient operation of its pipe-line system or the replacement of gas lost from that system.

(6) In this condition "transportation business" includes LNG storage arrangements, the provision of Metering Services and of Meter Reading Services, and in sub-paragraph **(4)**(c) "transportation arrangements" includes LNG storage arrangements.

(7) If the Director, having regard, in particular, to any representations made to him by the Licensee and other persons as to the extent to which there is competition in relation to the storage of gas in LNG Storage Facilities and his view on that question, considers it appropriate that this condition should be modified by the omission of paragraph **(6)** then the paragraph shall be omitted with effect from a date specified in a notice published by the Director for that purpose and the reference thereto in the definitions of "transportation arrangements" and "transportation business" in standard condition 1(1) shall cease to have effect.

(7A) If the Director, having regard, in particular, to any representations made to him by the Licensee and other persons as to the extent to which there is competition in relation to either metering or meter reading and his view on that question, considers it appropriate that references to either the provision of Metering Services or of Meter Reading Services should be deleted for the purpose of paragraph **(6)** of this Condition, those references shall cease to have effect from the date or dates specified in a notice by the Director for that purpose.

(8) The persons referred to in paragraphs **(2)**(a), **(3)**(a) and (b) and **(4)**(c) are –

(a) any related person of the Licensee, and

(b) without prejudice as aforesaid, where the Licensee is a body corporate, any body corporate in which the Licensee or any subsidiary of the Licensee, within

the meaning of section 736 of the Companies Act 1985, has a participating interest, within the meaning of section 260 of that Act.

(9) The Licensee shall take all reasonable precautions against the risk of failure to comply with paragraph **(3)**, **(3A)** and **(3B)** including –

(a) restrictions on the communication of information to persons engaged in any trading business conducted by the Licensee or any such person as is referred to in paragraph **(8)**;

(b) restrictions on access by persons engaged in any trading business conducted by the Licensee or any such person as is referred to in paragraph **(8)** to –

(i) premises or parts of premises occupied by persons engaged in the transportation business, and

(ii) recorded information relating to the transportation business;

(c) the prevention (so far as the Licensee can require it) of any person who has ceased to be engaged in the transportation business from being engaged in such a trading business until the expiry of the appropriate period since he ceased to be engaged in the transportation business.

(10) The Licensee shall ensure that –

(a) at all times it employs a competent person (hereafter referred to as "the Compliance Officer") for the purpose of facilitating compliance by the Licensee with paragraphs **(3)**, **(3A)**, **(3B)** and **(9)**;

(b) it consults the Director before employing any person as the Compliance Officer, and

(c) the Compliance Officer is provided with such staff and facilities as he may reasonably require to perform the tasks assigned to him pursuant to this condition.

(11) The Licensee shall assign the following tasks to the Compliance Officer –

(a) the establishment of procedures, after seeking representations from gas shippers and gas suppliers and after consulting the Director, for ensuring –

(i) that the precautions referred to in paragraph **(9)** are effectively complied with, and

(ii) compliance on the part of the supply successor with its corresponding obligations;

(b) the investigation of any matter which is the subject of a representation made by a gas shipper or gas supplier that the Licensee or any such person as is referred to in paragraph **(8)** may be contravening paragraphs **(2)**, **(3)**, **(3A)**, **(3B)** or **(9)** or that the supply successor may be contravening its corresponding obligations or that the procedures established under sub-paragraph (a) are not being complied with or are defective;

(c) the giving of advice to directors and employees of the Licensee or any such person as is referred to in paragraph **(8)** for facilitating compliance with paragraphs **(2)**, **(3)**, **(3A)**, **(3B)** or **(9)** and the procedures established under sub-paragraph (a) and, in particular, as to whether any information is information to which paragraph **(4)** applies;

(d) the giving of advice to directors and employees of the supply successor for facilitating compliance with its corresponding obligations;

(e) the giving of information or advice as to the procedures established under sub-paragraph (a) to any gas shipper or gas supplier requesting it.

(12) The Licensee shall, as soon as practicable after the end of each financial year, furnish to the Director and publish in such form and manner as the Director may direct, a comprehensive report on the Compliance Officer's activities during that year and so that in respect of 1996 such report shall include the activities of the Compliance Officer under the corresponding condition of the authorisation in the period prior to the appointed day.

(13) In paragraph **(9)**(c) "the appropriate period" means –

(a) a period of 3 months, or

(b) such shorter or longer period as, following a recommendation by the Compliance Officer, the Director may direct in respect of any person or class of persons.

(14) In this condition –

16.3 "corresponding obligations" in relation to the supply successor means one or more of its obligations under paragraphs 1, 3 and 4 of Special Condition 9A (for so long as the same may continue in effect in accordance with paragraph (7) thereof) of the licence treated as granted to the supply successor under section 7A(1)(a) and (b) of the Act;

16.4 "supply successor", when used in relation to the Licensee and subject to paragraph **(16)** bears the same meaning as in Part II of Schedule 5 to the 1995 Act.

(15) For the purposes of paragraph **(4)**, any consent given by the Director to the Licensee under the corresponding provision of the authorisation shall have effect, with any necessary modifications, after the appointed day, and for the purpose of this paragraph "authorisation" means the authorisation treated as granted to the Licensee pursuant to section 7 of the Act as in force immediately prior to the appointed day.

(16) References in this condition to the supply successor shall not have effect (and this condition shall be construed accordingly) if and for so long as the Licensee shall own directly or indirectly a legal or beneficial interest in less than one per cent of the issued share capital of such company.

Appendix 2 NGC's Procurement Guidelines

Introduction

Purpose of document

2.1 This document sets out the Procurement Guidelines ("Guidelines") which The National Grid Company plc is required to establish in accordance with Licence Condition 7B of its Transmission Licence. The purpose of these Guidelines is to set out the kinds of Balancing Services which we may be interested in purchasing, together with the mechanisms by which we envisage purchasing them.

2.2 The Guidelines are not prescriptive of every possible situation that we are likely to encounter, but rather represent a generic statement of procurement principles we expect to follow.

2.3 The reminder of this document is structured in four parts. Part B sets out the broad definitions of Balancing Services, together with the general principles we intend to follow in procuring them. Part C describes the kinds of Balancing Services we expect to procure, with Part D setting out the procurement mechanisms we expect to utilise in procuring such Balancing Services. Part E describes the information we will provide to ensure that appropriate signals are available to the marketplace.

2.4 In the event that it is necessary to modify these Guidelines in advance of issuing an updated version of this document, then this will be done by issuing a supplement to these Guidelines.

2.5 We have developed the Guidelines in consultation with the Authority/Director. The Guidelines may be modified in accordance with the processes set out in Transmission Licence Condition 7B. We will continuously monitor the validity of these Guidelines and intend, in discussion with the Authority/Director, to periodically review the form of these Guidelines and, where appropriate, make such revisions as necessary.

2.6 The Guidelines make reference to a number of definitions contained in the Grid Code and Balancing and Settlement Code. In the event that any of the relevant provisions in the Grid Code or Balancing and Settlement Code are amended it may become necessary to modify the Guidelines in order that they remain consistent with the Grid Code or Balancing and Settlement Code.

2.7 In any event, where the provisions of the Grid Code and/or the Balancing and Settlement Code are considered inconsistent with any part of these Guidelines, then the Grid Code or Balancing and Settlement Code provision will take precedence.

General principles

Balancing services

2.8 The services we need to procure to operate the transmission system constitute Balancing services.

2.9 The Transmission Licence defines Balancing Services as:

2.10 "(a) Ancillary Services;

- offers and bids made in the Balancing Mechanism; and
- other services available to the Licensee which serve to assist the Licensee in operating the Licensee's Transmission System in accordance with the Act or the Conditions and/or in doing so efficiently and economically."

Ancillary services

2.11 These services are described in the Grid Code Connection Condition 8 and are services procured from Authorised Electricity Operators (AEOs) or persons that make Interconnector transfers. These services can be mandatory or commercial in nature. They are not procured from electricity consumers.

2.12 Balancing Mechanism offers and bids:

2.13 These are commercial services, offered by generators and suppliers, procured through arrangements set out in the Balancing and Settlement Code. They

represent a willingness to increase or decrease the energy output from Balancing Mechanism Units in exchange for payment. Accepted services are used to control the national and local balance of generation and demand.

Other services

2.14 These are commercial services, that can be entered into with any party, which are classified neither as Ancillary Services nor as Balancing Mechanism offers and bids. This category would include any service provided by parties that are not signatories to the Balancing and Settlement Code. Other services may also include the procurement of energy for balancing purposes.

Procurement principles

2.15 When procuring Balancing Services, we will apply the following principles.

2.16 In contracting for the provision of Balancing Services we will purchase from the most economical sources available to us having regard to the quality, quantity and nature of such services at that time available for purchase.

2.17 Without prejudice to the factors above and after having taken relevant price and technical differences into account, we shall contract for Balancing Services in a non-discriminatory manner.

2.18 Where there is, or is likely to be, sufficient competition in the provision of a Balancing Service we will seek to procure that service via an appropriate competitive process or market mechanism. In such instances we shall provide a statement indicating the processes and terms under which contracts shall be awarded.

2.19 If we consider that there is insufficient competition in the provision of a Balancing Service (e.g. where there is some form of local monopoly) we shall contract for such provision on a negotiated bilateral basis.

2.20 If Balancing Services are required over a relatively long term, we shall advertise that requirement as appropriate through the communication media set out in Part D of this document.

2.21 If a third party requires Balancing Services, and if we secure provision of such services on their behalf, the associated costs of provision will be fully recharged to the party requiring such services.

Balancing services relationships

2.22 Both Ancillary Services and Other Services will be procured against the principles set out in this statement. It should be recognised that the volume of services procured will be constrained by economic and technical factors, including the level and nature of services delivered through Balancing Mechanism offers and bids.

2.23 Offers and bids within the Balancing Mechanism will be accepted in economic order, taking account of system technical limitations and dynamic parameters associated with the offers and bids. Taking account of these constraints, when all available offers/bids that can be accepted have been exhausted, emergency action may need to be initiated.

2.24 Ancillary Services and Other Services can be considered collectively as services procured outside the Balancing Mechanism. We will need to procure Ancillary Services and Other Services for:

- System security - services may be procured outside the Balancing Mechanism if we consider that there will be insufficient offers and bids available within the Balancing Mechanism to balance the system and maintain security of supply.

- Cost - services may be procured outside the Balancing Mechanism if we consider that it would provide an economic alternative to purchasing services through the Balancing Mechanism.

- Differentiation – services may be procured outside the Balancing Mechanism if the required technical characteristics are not available through Balancing Mechanism offers and bids.

Taking actions outside the Balancing Mechanism

2.25 Our consideration of whether to undertake actions within or outside the Balancing Mechanism will be based on a forecast of the level and cost of services expected to be available within the Balancing Mechanism. Contracts will be entered into outside the Balancing Mechanism when we anticipate a shortage of appropriate offers and bids in the Balancing Mechanism to meet system security requirements, or if we consider that such contracts will lead to a reduction in overall cost.

Balancing services required

Types of balancing services

2.26 We are interested in procuring the following types of Balancing Services:

- Ancillary services;
- System Ancillary Services (Part 1), the mandatory services, required from all licensed generators, of reactive power and frequency response.

2.27 System ancillary services (Part 2), the necessary services, required from some generators, of black start capability and fast start capability.

2.28 Commercial ancillary services, the necessary services, required from some generators, of enhanced reactive service and commercial frequency response service.

2.29 Reserve services, comprising of: fast reserve, standing reserve, warming, commercial intertrips, and emergency assistance.

Other Services

2.30 Other services, other than those provided as an Ancillary Service, comprise of:

- Reactive Power
- Frequency Response
- Standing Reserve

- Demand Intertrip
- Energy Related Products.
- Description of Balancing Services
- Ancillary Services

2.31 There are two broad types of Ancillary Service, as defined in the Grid Code. System Ancillary Services, which are divided into two parts: Part 1 System Ancillary Services are mandatory services required from all licensed generators; Part 2 System Ancillary Services are necessary services provided by some generators, on a site by site basis, to meet specific system requirements. Any Ancillary Service, which is not a System Ancillary Service, and which is provided by an AEO is termed a Commercial Ancillary Service.

2.32 System Ancillary Services comprise the services as set out in and described in Grid Code Connection Condition 8.1:

- Part 1 System Ancillary Services - All licensed generators are required to provide these mandatory services, which ensure the provision of a minimum technical capability to deliver voltage and frequency response services.
- Part 2 System Ancillary Services - Some generators are required to provide black start capability and/or fast start capability service. Our additional requirements for these services depend on the actual and expected provision of such services by existing providers.

2.33 We are interested in discussing arrangements with potential new providers of the Black Start Service. However, there is no requirement for any additional Fast Start Capability beyond the current provision from all existing providers.

2.34 Commercial ancillary services comprise the services as set out in Grid Code Connection Condition 8.2. Commercial Ancillary Services are not defined in the Grid Code as an exhaustive list of the services that we may contract for. The services we expect to procure are:

- Enhanced reactive service which exceeds the minimum technical requirement set out in Grid Code Connection Condition 6.3.2. We will contract for such services as described in the relevant reactive power market arrangements (see Part D).

- Commercial frequency response service - which provides for combinations of different technical characteristics (compared to mandatory frequency response services), together with alternative pricing arrangements. We contract for such services when the anticipated cost is lower than the alternative service provision.

- Reserve services - these are instructed services required over a variety of time frames to deal with the matching of generation with demand. The services we expect to procure can be broken down into the following components:

- Fast reserve - which is a fast acting dynamic service, provided by synchronised plant, capable of delivery within 2 - 5 minutes, required to provide a load correction and frequency following service.

- Standing reserve - which is provided by plant that is not synchronised but which can start within a defined time period. The details of this service will be described in the detailed statements associated with its procurement via tender (see Part D).

- Warming - which is required prior to Gate Closure. This may be required to ensure that there is sufficient flexible plant available at Gate Closure. It involves contracting with plant to reduce its notice to deviate from zero and be available to submit a Balancing Mechanism offer. This service may be required where there is a reasonable expectation that the plant dynamics are likely to exceed the timing of Gate Closure.

- Commercial intertrip - this service is required to reduce the output of a generator following the tripping of a transmission line when a fault occurs. There is very limited and localised requirement for such a service.

- Emergency assistance - this service provides for mutual support of the transmission system with other interconnected systems. These services are only required via Interconnectors.

Other services

2.35 As indicated in Part B, "Other Services" include services which are not classified as "Ancillary Services", but technically can provide the same effect from different service providers. Other Services may also include the purchase of energy in connection with operating the transmission system and/or doing so economically and efficiently. Purchases via bilateral forward contracts or through a recognised exchange will fall within this category.

Prohibited activities

2.36 We are prohibited from speculative trading. Ofgem has defined this as 'actions taken in order to profit from the specific directional price move of a futures or options contract, or energy contract'. Therefore, any energy purchases (or sales) that we undertake will comply with this restriction.

Buying energy or selling energy related contracts

2.37 Reasons why we may buy or sell energy or energy related contracts forward include:

- To meet our mean forecast requirement for balancing energy.
- To provide options to meet potential variations from the mean forecast. The Reserve Services described above may fulfil this requirement.
- To reduce the total cost of balancing the system using the Balancing Mechanism. For example, if a certain volume of offers are forecast to be required in the Balancing Mechanism (e.g. for the purposes of establishing spinning reserve), it may be economic to purchase a volume of energy forward such that a reduced volume of offers and bids are required.

2.38 Direct Arbitrage between different balancing instruments in order to yield a lower overall balancing cost. In order not to breach the restriction on

speculative trading, this would only be valid if an immediate cost saving can be obtained by directly replacing one balancing instrument to fulfil a specific requirement with another which replaces the same requirement.

Procurement mechanisms

Procurement process

2.39 As indicated in Part B of these Guidelines, where sufficient competition exists, we will seek to contract for Balancing Services via some form of market mechanism. In other circumstances, Bilateral contracts will be entered into the service providers.

Market mechanism

2.40 This will normally be a tender based process for the selection and award of service contracts. In each case, the mechanism will include:

- a statement of our service requirements;
- the issuing of Invitation To Tender documentation, providing sufficient information to allow the provision of a service offer to be made, including standard contract terms and conditions;
- arrangements for governance of the process;
- a statement of principles and criteria that we will consider when evaluating the awarding of contracts; and
- a report providing information on previous tenders.

Bilateral contracts

2.41 Bilateral contracts may be required where limited competition exists in the supply of a service (taking into account locational factors). This may be due to special technical requirements of the desired service, where some form of monopoly exists or the unique characteristics of certain individual providers.

2.42 Where we consider there to be a limited degree of competition, we will

- contact those service providers we believe to be capable of providing the required service or who have expressed an interest in providing the service in order to establish whether they wish to enter into a contract for the service in question; and

- offer non-discriminatory terms for the acquisition of the service.

2.43 However, if there is insufficient time to identify and contact other providers, we reserve the right to contract as appropriate to meet system security requirements.

2.44 Where we consider that no competition exists (such as the provision of a locational service), we will offer non-discriminatory terms for the acquisition of the required service.

Procurement communication media

2.45 We shall communicate any service requirement by contacting those parties that we believe may be interested in providing the service, including any existing or past service providers, and anyone that has expressed a prior interest in providing such services for the future. In addition, notification of tenders will normally be advertised in trade magazines, Financial Times and via the Internet.

Procurement summary

2.46 This summary sets out the procurement mechanisms by which we expect or intend to procure those Balancing Services, set out in Part C, section 1 of these Guidelines.

BALANCING SERVICE	MEANS OF PROCUREMENT
ANCILLARY SERVICES	
Mandatory Services (i.e. Part 1 services)	
Reactive Power	Contracts derived from Market tenders and Bilateral contracts [see MCUSA Schedule 5]
Frequency Response	Bilateral contracts
Necessary Services (i.e. Part 2 services)	
Black Start	Bilateral contracts
Fast Start	Bilateral contracts
Commercial Ancillary Services	
Enhanced Reactive Services	Contracts derived from Market tenders [see MCUSA Schedule 5]
Commercial Frequency Response	Bilateral contracts
Reserve	
Fast Reserves	Bilateral contracts
Standing Reserve	Contracts derived from Market tenders
Warming	Bilateral contracts
Commercial Intertrip	Bilateral contracts
Emergency Assistance	Bilateral contracts
OTHER SERVICES	
Reactive Power	Contracts derived from Market tenders [see MCUSA Schedule 5]
Frequency Response	Bilateral contracts
Standing Reserve	Market tenders
Demand Intertrip	Bilateral contracts
Energy Related Products	Procured via Markets/Bilateral contracts

BALANCING SERVICE	MEANS OF PROCUREMENT
BALANCING MECHANISM OFFERS AND BIDS	Services are procured under the provisions of the Balancing and Settlement Code

Information provision

General Provisions

2.47 We shall publish information on the balancing services we procure. In doing so we seek to provide market participants with sufficient information without compromising the commercial position of any contracting party.

2.48 As part of the provision of information we will provide Balancing Services Adjustment Data (BSAD). The calculation methodology used is set out in a separate document.

Information provision detail

2.49 We have agreed the detail of the information provided within these Procurement Guidelines with the Director. In the circumstances where tenders are held we publish information on the outcome of these processes via market reports. This is currently the case for reactive power and standing reserve. In other cases we publish some aggregated cost and volume information on the NGC Website.

2.50 The provision of other information by NGC is contained within the BSAD Calculation Methodology.

Appendix 3 Ofgem's alternative gas balancing proposal

Modelling methodology

3.1 To model the various costs and revenues associated with gas balancing, we:

- identified the variables (model parameters) that best describe the revenue or costs being modelled;
- assessed whether the model parameters:
  - exhibited any relationship with other explanatory variables;
  - varied over time; or
  - exhibited seasonality.
- From historic analysis, determined what proportion of the movements in costs could be explained by the above factors and then fitted distributions to reflect the volatility of the unexplained variation.

3.2 We used historic data to derive distributions of the key model parameters apart from prices and throughput for which we created forecast distributions as described below. In each case the models were tested for their sensitivity to key assumptions and input data.

SAP Forecast

3.3 The SAP forecast is based on recent forward gas prices. To remove any single day trading bias, we have taken the average of forward prices prevailing on the twenty days starting 1 August 2001. This gives us an estimate of future SAP levels that suggests the average value of SAP for 2002/3 will be 0.724 p/kWh. To translate these into daily values, we have scaled the daily SAP values for the year to 31 March 2001 so that the quarterly average prices equate to the quarterly forward prices we have calculated.

3.4 To incorporate the predictive uncertainty implied by the volatility of the forward price, a set of distributions have been applied to the quarterly average prices included within the model. The standard deviation of these distributions has

been set equal to the standard deviation of the forward price, calculated over the period 21 August 2000 and 20 August 2001[84].

3.5 In order to ensure that the particular SAP values obtained are not having a significant impact on the predicted values, a number of simulated SAP series were obtained from Transco and adjusted for both their mean values and volatility, as above. The sensitivity of the predicted values to these scenarios is included within the confidence intervals reported in the relevant sections below.

Throughput forecasts

3.6 Throughput has been modelled in a similar manner to SAP. The current forecast throughput figure of 3316 GWh/d has been used as the midpoint for the model inputs. Daily throughput from the year to 31 March 2001 has been adjusted to ensure that the mean is consistent with this current forecast. A series of scenarios, based on a number of Transco forecasts of daily throughput, have also been used to test for sensitivity to actual series of daily throughput figures included within the model.

3.7 To incorporate the uncertainty of throughput around this forecast value, an additional distribution has been applied to scale throughput by +/- 5%, using a normal distribution with mean of one.

Balancing costs and revenues

3.8 Transco, as NTS SO, takes actions on the OCM to ensure that system linepack remains within safe operational limits. When linepack is too low the SO buys gas, prompting shippers to bring gas on to the NTS or curtail gas consumption. In addition, this will typically set the marginal cash-out price (the system sell price) and send a price signal to shippers who are short of gas. When purchasing gas on the OCM, the SO incurs costs which are then recharged to all system users via "neutrality" charges.

$$\text{Forecast SAP on day } x_i, 2002/03 = \frac{(\text{Observed SAP on day } x_i, 2000/01) \times X}{(\text{Relevant Quarterly Average of Observed SAP})}, \text{ where}$$

[84] $X \sim N(\mu, \sigma^2)$

μ = Relevant Quarterly Forward Price

σ = Standard Deviation of the Observed Forward Prices for the Relevant Quarter

3.9 Conversely, the SO sells gas when linepack is predicted to approach the upper bound of the operational limits, again typically setting the marginal cash-out price and signalling to the shippers who are long to reduce gas landings. Again, in the first instance the SO will receive payment for the gas sales, which is distributed to system users via neutrality.

Modelling of net balancing costs

3.10 A distribution for balancing costs was derived by combining:

- A distribution on the price of Transco's balancing actions calculated as a percentage margin above/below SAP;
- A distribution on the volume of Transco's balancing actions taken from historic data; and
- A distribution on the frequency with which the SO has to take balancing actions taken from historic data.

3.11 Statistical analysis showed that the most appropriate model for the price of Transco balancing actions was a margin (expressed as a percentage) above SAP for purchases and below SAP for sales. The unexplained variation around the mean margin was modelled using the distribution observed from historic data.

3.12 Although there is some evidence to suggest that the volume of the SO's balancing actions have been declining, there is little evidence to suggest that such a trend will continue in the future. Consequently, the volumes of SO actions were modelled by using the actual distribution of historic volumes ignoring the historic downward trend.

3.13 The frequency of SO balancing actions was modelled by applying a probability distribution to describe the likelihood that actions are taken on the sell, buy or both sides of the market on any given day. Historically, this distribution has been stable and we have assumed that it will continue to be so.

Source Data

3.14 In our analysis, gas balancing costs covering the period from the introduction of NGTA (1 October 1999) to 31 March 2001 were used. However, for the

purposes of constructing the distributions used in the model only the data from 1 April 2000 to 31 March 2001 was used, reflecting the desirability of capturing the most recent calendar year of data, avoiding the distortions that any seasonality would have over the results.

3.15 The changes to NGTA implemented on 1 April 2001 including the introduction of a linepack incentive on Transco and the removal of all tolerances with the exception of forecast deviation tolerance) may effect the validity of the assumptions underlying the models but so far, there is insufficient data to analyse the effect of the changes. If these reforms prove to have had a significant impact upon the distributions included within the model, it will be necessary to revise the forecasts presented before the final proposals are published.

Results

3.16 Ofgem's analysis suggests that the distribution of balancing costs and revenues for 2002/3 will be as shown in Table A3.1. The mean value of our distribution for 2002/3 is very close to the actual net balancing revenues earned by Transco in 2000/1.

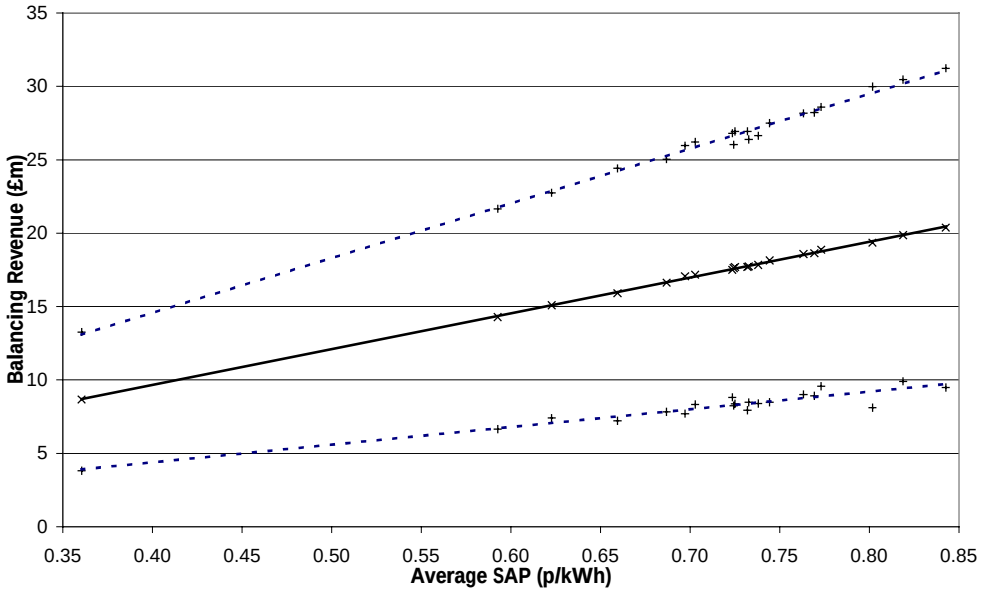
Table A3.1: Estimated balancing cost and revenue distributions

	Net Balancing Revenues / (Costs)	**Cost of System Buy Actions**	**Revenue From System Sell Actions**
	£m	£m	£m
Actual			
Year to 31 March 2001	18.1	(22.8)	40.9
Forecast			
Year to 31 March 2003			
Mean	**17.8**	**(23.4)**	**41.2**
Standard Deviation	4.81	2.74	3.90
2.5 Percentile	8.2	(18.2)	33.6
97.5 Percentile	27.1	(29.2)	48.7

3.17 Table A3.1 is based on an average annual SAP value equal to that derived from our forward curve analysis (0.724 p/kWh) and there is inevitably uncertainty over what the actual average value of SAP will be. Whilst the distribution of net balancing revenues is quite wide (its standard deviation is equal to 26% of the

mean), Figure A3.1 shows that the mean value for net balancing revenues is relatively insensitive to the average value assumed for SAP – an increase in average SAP from 0.6 p/kWh to 0/8 p/kWh only increases mean net balancing costs by around £5m.

Figure A3.1: Balancing revenue by SAP – 95% confidence interval shown (dashed lines)



Imbalance costs and revenues

3.18 Shippers who have entered more gas into the system than they have supplied to customers i.e. are long gas, receive payment for the excess gas deliveries at SAP, for imbalances within the allowed tolerances, and the System Marginal Sell Price (SMP_S) for the volume of imbalance outside allowable tolerances. The SO pays the imbalance charges to shippers who are long gas.

3.19 Similarly, shippers who fail to enter sufficient quantities of gas to match their offtakes i.e. are short gas, will be exposed to the cost of the shortfall. This is charged at SAP and SMP_B, as above. The SO receives the imbalance payments from shippers who are short gas.

3.20 In both cases the SO incurs / receives the cost / revenue associated with cashing-out shippers who are long / short. At present, the net cost of the cash-out regime incurred by the SO is recharged to all users as part of the neutrality charge.

Model of net imbalance costs

3.21 The following parameters were used to model cash-out costs and revenues:

- the sum of positive shipper imbalances;
- the sum of negative shipper imbalances;
- the margin between SMP and SAP; and
- the proportion of shipper imbalances cashed-out at SMP.

3.22 Our analysis of historic data suggests that the sum of positive shipper imbalances has declined over time. This trend was included within our model, to reduce the size of the unexplained variation, but was not assumed to continue into the future. No trend was identified in shipper negative imbalances. In both cases a distribution was fitted to the observed values in order to include in the model the unexplained variation.

3.23 From 1 April 2001, daily system marginal prices have been subject to a minimum absolute margin from SAP. SMP_S is set equal to the lower of Transco's lowest priced sell action or SAP less 0.0324 p/kWh. Similarly, SMP_B is set equal to the higher of Transco's highest priced buy action or SAP plus 0.0287 p/kWh. This represents a material revision to the cash-out regime and meant that it was inappropriate to derive a distribution of the margin between SMP and SAP using data from before 1 April 2001. Instead, we concentrated on the relatively small sample of data covering the period 1 April 2001 to 13 August 2001. A larger data sample, particularly one covering winter months might change the shape of this distribution, so we will review this analysis prior to the publication of the SO Final Proposals.

3.24 We investigated the possibility of modelling imbalances at a shipper specific level but we concluded that the marginal improvement in the quality of the forecast that would have resulted did not warrant the additional complexity that would have been involved. Further, it is reasonable to assume that the distributions of individual shipper imbalances are independent and of the same form and hence that they can readily be combined into a single aggregate distribution.

3.25 Consequently, it was necessary to include within the model a variable that reflected the proportion of aggregate imbalances cashed-out at marginal prices. As part of the change in the cash-out regime both the Absolute Tolerance Quantity (ATQ) and Cumulative Imbalance Tolerance Quantity (CITQ) were removed from 1 April 2001. Thus, as for the (SMP-SAP) distribution, we only used data from 1 April 2001 to 13 August 2001 to create this distribution. Again, the small sample size may affect the robustness of this analysis.

Results

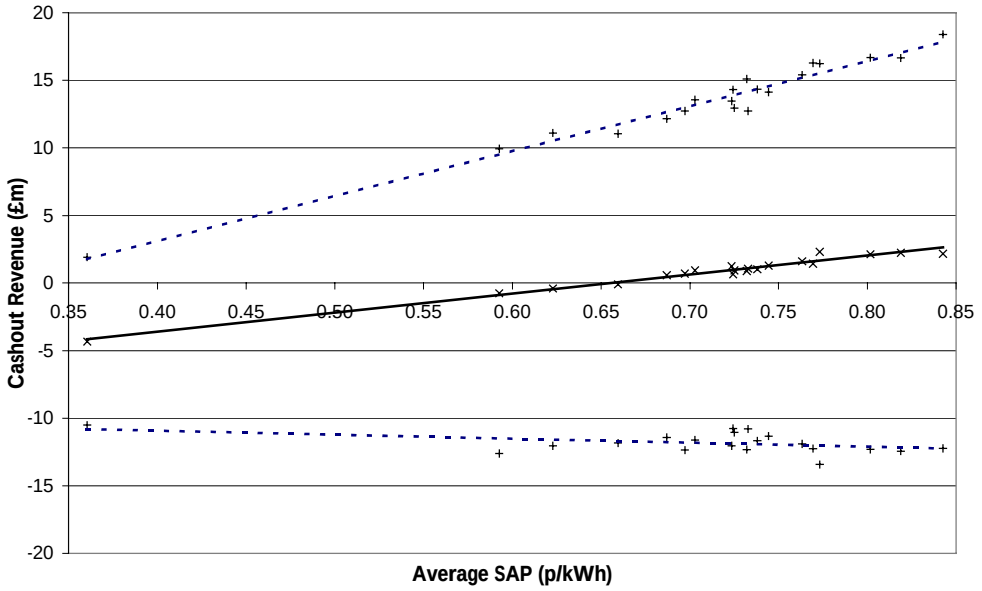
3.26 Ofgem's analysis suggests that the distribution of cash out costs and revenues will be as shown in Table A3.2, again based on our forward curve projection of SAP. In contrast to previous years, our analysis suggests that Transco will earn revenues from cash-out costs in 2002/3, primarily due to the imposition of a minimum margin between SMP_B and SMP_S (see above).

Table A3.2: Estimated cash-out cost and revenue distributions

	Net Cash-Out Revenues / (Costs)	**Cost of System Buys from (long) Shippers**	**Revenue from System Sells to (short) Shippers**
	£m	£m	£m
Actual			
Year to 31 March 2001	(26.1)	177.6	151.5
Forecast			
Year to 31 March 2003			
Mean	**1.0**	**158.5**	**159.5**
Standard Deviation	6.5	8.0	8.2
2.5 Percentile	(11.1)	(174.4)	174.9
97.5 Percentile	14.5	(142.6)	142.6

3.27 The distribution of net cash out costs and revenues is quite wide (its standard deviation is equal to 27% of the mean), reflecting the effect of netting off two distributions with large means. However, Figure A3.2 shows that the mean forecast of net cash out costs and revenues is relatively insensitive to the average value assumed for SAP.

Figure A3.2: Cash-out net revenue / cost by SAP – 95% confidence interval shown (dashed lines)



Scheduling Revenues

3.28 Scheduling revenue results from two charges levied on shippers:

- Input scheduling is collected on the basis of the difference between end of day nominations and final allocations by entry terminal. Absolute differences between 3% and 5% attract a charge equal to 2% of SAP and those greater than 5% are charged at 5% of SAP.
- Output scheduling is levied on a site-specific basis, with different charges for different site categories.

3.29 Given the degree of complexity involved in modelling input scheduling at a shipper level and output scheduling at a site level, scheduling charges were modelled on the basis of total daily scheduling revenue. Statistical relationships were established with daily system throughput and SAP. These were assumed to hold into the future.

Results

3.30 Ofgem's analysis suggests that the distribution of scheduled revenues will be as shown in Table A3.3. As for net balancing costs, the mean value of our

scheduling revenue distribution for 2002/3 is very close to the actual scheduling revenues earned by Transco in 2000/1.

Table A3.3: Estimated scheduling revenue distribution

	Scheduling Revenue
	£m
Actual	
Year to 31 March 2001	4.2
Forecast	
Year to 31 March 2003	
Mean	**4.4**
Standard Deviation	1.30
2.5 Percentile	1.6
97.5 Percentile	7.0

3.31 Again, the distribution of scheduling revenues is quite wide (its standard deviation is equal to 29% of the mean). Figure A3.2 presents of the sensitivity of scheduling revenue to changes in the average value of SAP – an increase in average SAP from 0.6 p/kWh to 0.8 p/kWh only increases mean scheduling revenues by around £3m.

Figure A3.2: Scheduling revenues by SAP – 95% confidence interval shown (dashed lines)