

**OWNERSHIP CHANGES AND DOWNSTREAM INVESTMENT
BY UK GAS COMPANIES 1985-2005**

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1. OWNERSHIP UNBUNDLING & INVESTMENT: VIEWS FROM THE EUROPEAN COMMISSION & THE EUROPEAN REGULATORS GROUP

A document recently published by the European Commission¹ (COM 2007) and another by the European Regulators Group for Electricity and Gas² (ERGEG 2007) place strong emphasis on the fact that proposed reforms of the EU's energy markets and institutions must (and indeed, will) ensure adequate levels of investment in energy infrastructure. For example, ERGEG 2007 states that,

'Investment on a huge scale will be required in the coming decade to upgrade and reinforce networks' (ERGEG 2007, p.24).

The same document, referring to the need for a European-wide regulatory framework, states that,

'The heart of such a framework must remain the promotion of competition, and investment'. (ERGEG 2007, p.3, *our emphasis*)

Likewise the Commission's document states that,

'Creating a stable and attractive environment for investment must be a priority of future action at EU level.' (COM 2007, p.18)

Turning to the question of 'unbundling' – the Commission's demand that national gas and electricity companies separate their transmission system operations (TSOs) from their energy supply operations (with full ownership unbundling being the Commission's favoured option) – the Commission adds that, (In deciding whether full ownership unbundling or an alternative 'internal' form of unbundling should be adopted)

'The objective in both cases will be to ensure fair network access for all companies and ensure that sufficient incentives are in place for Transmission System Operators (TSOs) to provide adequate capacity, notably through new infrastructure.' (COM 2007, p.12)

¹ *Communication from the Commission to the Council and the European Parliament: prospects for the internal gas and electricity market*, COM (2006) 841 Final, Brussels 10/1/2007.

² *ERGEG's response to the European Commission's Communication 'An Energy Policy for Europe'*, Ref. C06-BM-09-05, Brussels, 6/2/2007

At the same time both documents argue that these essential investment requirements will be more likely to be made if there is full ownership unbundling (as has occurred in the UK).

For example, the ERGEG state that,

‘Economic evidence shows that ownership unbundling is the most effective means to ensure choice for energy users and encourage investment.’ (ERGEG 2007, p.12)

and similarly,

‘Effective unbundling ... is also essential to ensuring the necessary investment is forthcoming ...’ (ERGEG, p.4)

and again, where there are, ‘Affiliations between TSO and participants in the market’

‘It will be far more difficult to ensure that the TSO ... invests to expand where there is a need ...’ (ERGEG, 2007, p.35).

and,

‘The presence of affiliation between TSOs and network customers, even where no abuse has taken place could damage market confidence ...**Key areas where such concerns might arise include ... longer term system planning and investment’**. (ERGEG 2007, p.45)

Similarly, the Commission’s report refers to,

‘Disincentives to adequately invest in networks without ownership unbundling’ ... [which] cannot in any event be fully addressed by regulators (COM 2007, p.12)

In two previous papers relating to full ownership unbundling in the natural gas industry³ we called into question the assertion by the Commission that

³ *The advantages of full ownership unbundling in gas transportation and supply – how the European Commission got it wrong about the UK*, Briefing Paper, SERIS, Sheffield, April 2006, available www.seris.co.uk; and *A Reply to OFGEM’s criticism of SERIS’s Briefing Paper*, SERIS, Sheffield, June 2006, also available at www.seris.co.uk

'The UK market experience of full ownership unbundling suggests that it significantly changes the behaviour of the transport undertaking: a fully unbundled TSO will focus on optimising the network'. Since the Commission did not offer any definition as to the meaning of 'optimising the network' we selected five possible indicators of what 'network' optimisation' might reasonably mean. One of these five was 'adequate levels of investment' and we were able to demonstrate that, at the very least, there had been no improvement in this particular indicator since ownership changes and unbundling.

We are now in a position to take the argument one step further. The research, the results of which we are now publishing, clearly shows that when we divide the historical pattern (over 20 years) of downstream UK gas investment into three periods: public ownership 1985-86, Integrated ownership 1987-1996 (with internal unbundling during 1994-1996), and full ownership unbundling 1997-2005, the average annual level of investment in the system falls markedly. Moreover the fall in the period 1996-2005 would have been considerably greater had it not been for the intervention of the UK Health & Safety Executive as we explain below.

Our primary aim in this research has been simply to present the facts: in this paper we do not attempt a detailed explanation of precisely why this investment decline occurred or its precise relationship to either privatisation or unbundling (full or partial). However, one general observation can be made. The regulation of private sector capital investment in gas pipeline industries presents some very serious problems of an 'agent/principal' nature which seriously challenge the rather glib statement of the Commission that,

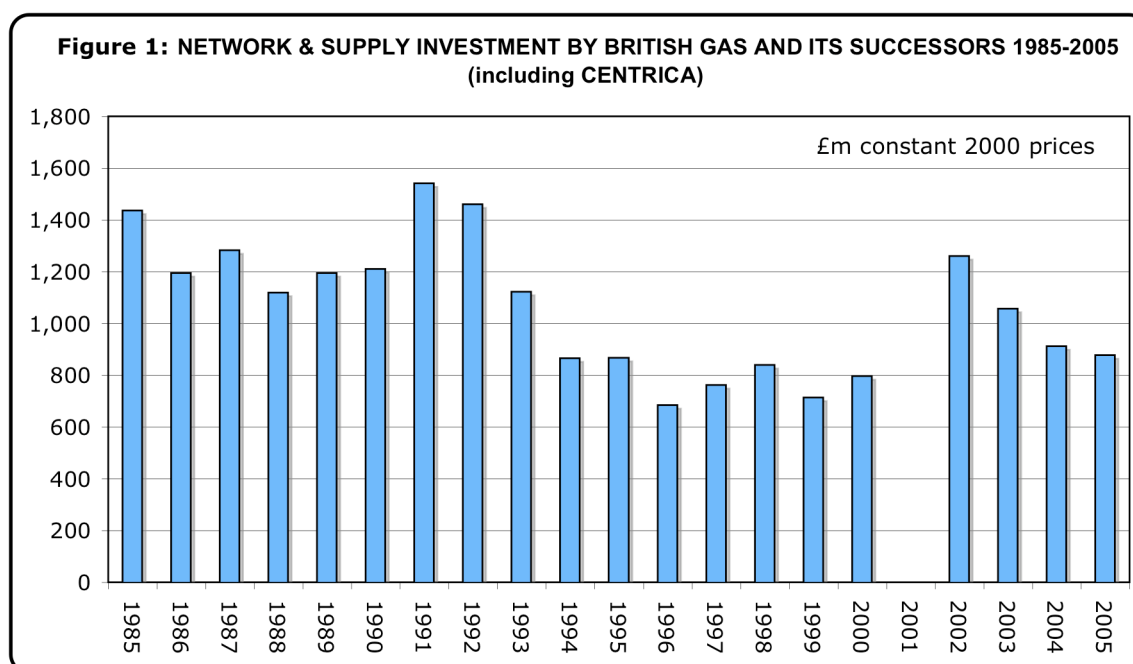
'Full ownership unbundling would reduce the need for increasingly burdensome regulation as the regulatory oversight could be less detailed' (COM 2007, p.11)

In fact the UK experience, post-ownership unbundling has, in many respects been quite the opposite, as a mere glance at the literally hundreds of pages of formulae in Transco's current transportation licence makes abundantly clear, together with the fact that most other participants in the UK gas industry, especially gas supply companies, are now having to employ considerable

numbers of specialist 'regulatory affairs officers' in order to meet the demands of what is now an extremely complex and arcane regulatory regime.

2. TRENDS IN UK DOWNSTREAM GAS INVESTMENT

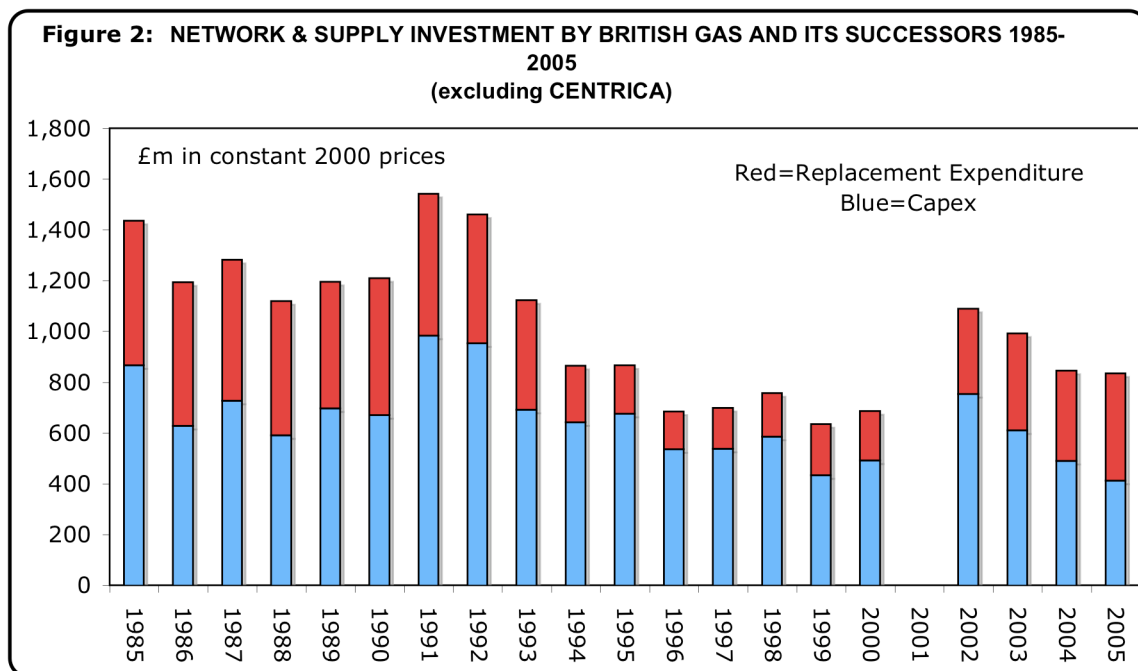
The following Figures look at the trends in real (after eliminating the impact of inflation) investment by UK Gas Companies between 1985 and 2005. **Figure 1** shows the behaviour of total annual investment (both capitalised and expensed) by British Gas and its successor companies. The gap in 2001 is caused by the data problems associated with the demerger of Transco from BGplc (for details see the next section which explains how the data was constructed). The apparent increase in 2002 was mainly a function of regulatory intervention: Transco's attempts to profit from underinvestment since 1994 (by investing below the regulatory settlement which informed the price cap) prompted a strong response from both OFGEM (in the 1997 Regulatory settlement and its aftermath) and the Health & Safety Executive, the latter in the aftermath of six deaths caused by gas explosions in December 1999, October 2000 and January 2001. In other words, this upward shift in investment observed in the data had nothing to do with ownership separation, competition or private sector initiative – except in a negative sense that the now separately owned transportation network was underperforming to the extent that regulatory intervention was required.



Note to Figure 1: Investment= 'Capital Expenditure' + 'Replacement Expenditure'. Capital Expenditure' refers to all investment in tangible fixed assets required to EXPAND the

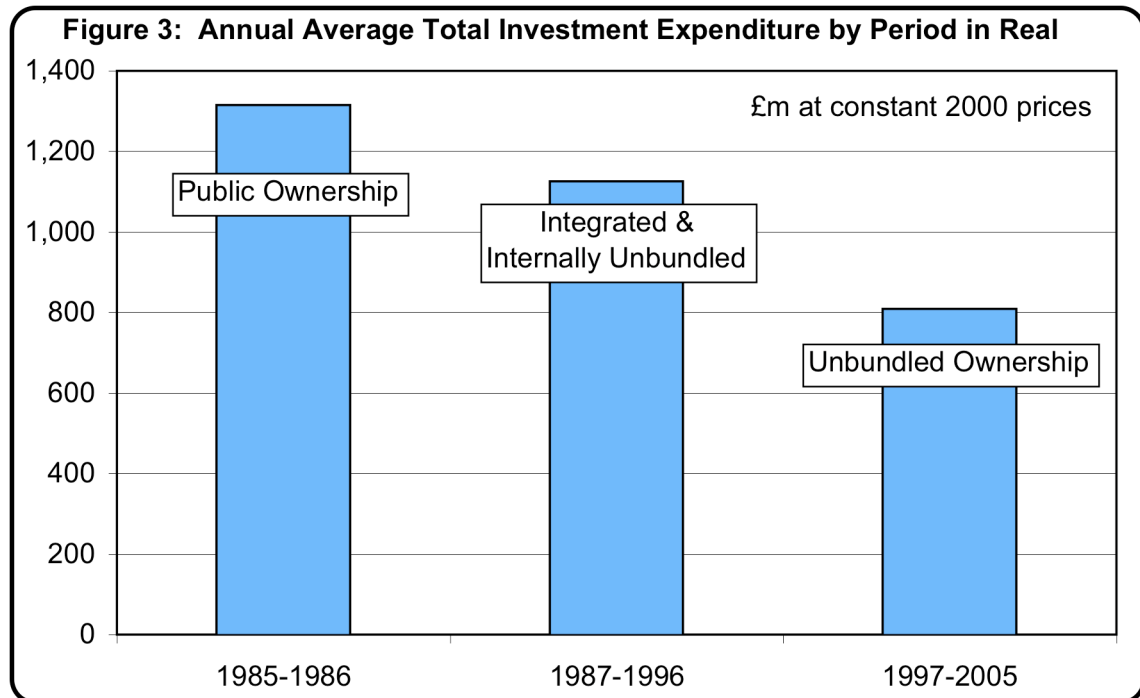
system. Such expenditure is therefore capitalised and depreciated. 'Replacement Expenditure' refers to investment in mains pipelines, service pipelines (from the mains to the household etc.) and gas meters, which require replacement due to physical deterioration. While such expenditure is expensed in the UK, it clearly forms part of investment. From 1994 onwards the replacement of old meters was reclassified as 'capital expenditure' and therefore no longer expensed but capitalised.

Figure 2 breaks down the investment by British Gas and its successor network company (Transco) into capital expenditure (blue) and expensed replacement expenditure (red). It is important to consider the latter, because unlike typical practice in North America, replacement expenditure is not capitalised in the UK. Moreover, replacement expenditure provides some perspective on whether the industry's assets were being 'sweated' by its owners (encouraged by the Regulator). Clearly replacement expenditure was being squeezed from 1994 onwards (when Transco was internally unbundled within British Gas). More detail about the reasons for the sharp increase in 2002 is that because the explosions referred to above were caused by the corrosion of old iron gas mains, from 2002 onwards Transco was obliged to increase its replacement rate of 2000 km/year to around 3,500 km/yr and to maintain this higher rate of replacement for 20 years.

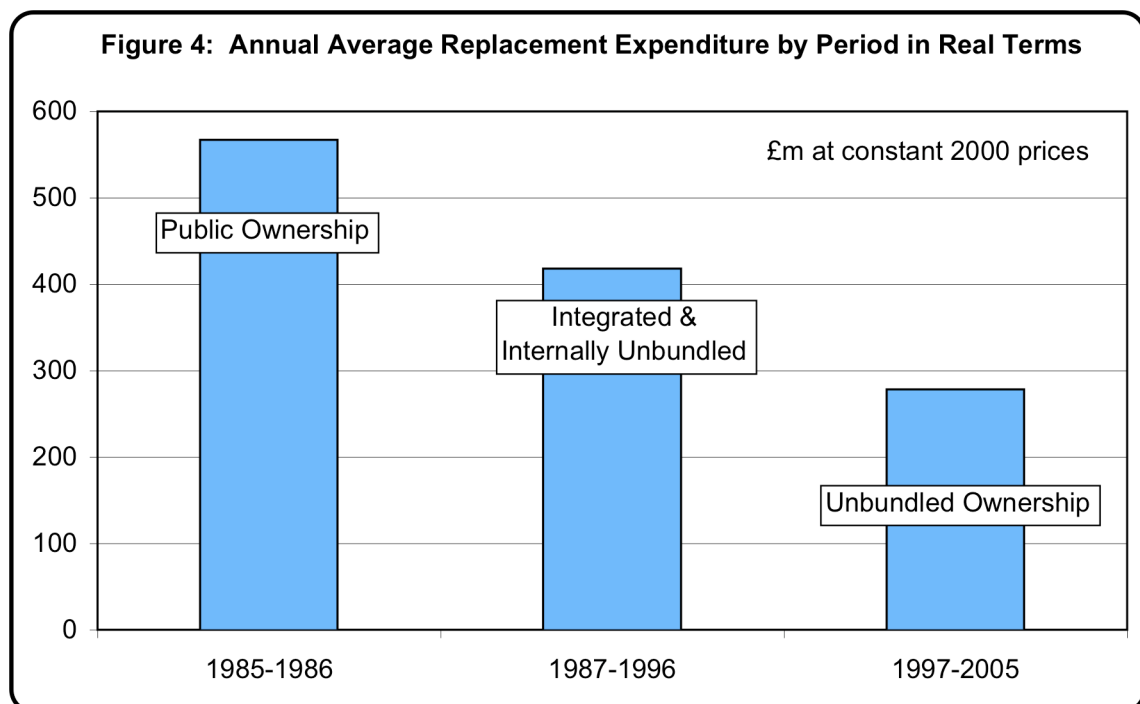


To the above **Figure 3** now adds 2001 investment data for both Centrica and BG Storage (totalling £74 million - see next section) and groups it according to three periods of ownership: when British Gas was still a publicly-owned company (the 1985 and 1986 financial years), when British Gas was still

vertically integrated, with transportation being internally unbundled from 1994 onwards (1987-1996), and finally for the period when British Gas fragmented



into a number of different companies, but principally into companies which held the supply function in their portfolio, and companies which held the transportation function in their portfolio (1997-2005). **Figure 4** does the same, but just for the data for replacement expenditure. The picture which emerges is clear: as ownership becomes more fragmented investment declines.



In addition, there is evidence that, whatever the particular level of investment, its timing (too late) was seen as causing a threat to security of supply of supply. Despite the increases in investment being required by regulators, the following observations were still being made around 2002. Even Transco itself was concerned about whether the timing of investment would be adequate.

From the ILEX Consulting group:

'There is an urgent need to address the long term investment signal issue and ensure that Transco builds sufficient entry capacity ... we are not convinced that the solutions proposed will ensure that gas producers will be able to explore for gas and land it in the most cost efficient manner.'

(ILEX, January 2001)

From Transco:

'If market mechanisms are relied on as the basis for the planning and funding of new network capacity, the overall capacity would, at best, lag the needs of the network users ...it would fail to provide insurance against lower probability events. (Lattice Group, June 2002)'

From Jonathan Stern (Royal Institute of International Affairs):

'The industry has become progressively less able to cope with the potential consequences of ... supply disruptions because of the transition from a monopoly to a liberalised market promoting maximum efficiency of operation, and the inability of network operators to earn a rate of return on any assets with low utilisation capacity.' (Stern, May 2002)

From the Royal Academy of Engineering:

The Government should reassess the limitations of the market and market mechanisms as the basis for planning and funding new capacity that would lead, rather than lag, the needs of network users. (Royal Academy of Engineering, August 2002)

In addition, in 2002 the Energy Contract Company, a UK consultancy, tested the ability of Transco's pipeline and storage network to cope with the 1-in-50 winter. Its conclusion was that unless there was major policy change with respect to gas infrastructure construction, not only would the level of demand substantially exceed the ability of the system to deliver gas to customers, but there would also be major knock-on effects for the electricity industry.⁴

⁴ See Energy Contract Company (2002), *UK Gas Market Review 2002*, The Energy Contract Company, Twickenham. The full sources for the quotes are: ILEX (2001), *What influences gas prices in the UK and why have they increased through 2000?*, ILEX Energy Consulting Ltd; Lattice Group (2002), Initial Response to the Government's Consultation on UK Energy Policy, (June); Stern J. (2002), *Security of Natural Gas Supply*, Response to Consultation Document: Energy Policy: Key Issues for Consultation, DEFRA, DTI, DTLR, May 2002, (August); Royal Academy of Engineering (2002), *An Engineering Appraisal of the Policy and Innovation Unit's Energy Review*, Royal Academy of Engineering, August

Fortunately the country has not experienced a 1-in-50 winter during the last 5 years, but there have been numerous supply side shocks which may be linked to inadequate levels of investment, and these did of course result in dramatic increases in prices over the autumn and winter months of 2003/2004, 2004/2005 and 2005/2006.

Conclusion

Evidence from the UK provides no empirical support for the European Commission's view that ownership unbundling has or will result in more investment. Moreover, the significance of this evidence increases once its context is also taken into account: while investment was falling during nineteen nineties, UK gas demand was rising by almost a quarter.

3. HOW THE DATA WAS CONSTRUCTED

3a. Investment in What?

This research is focused on **downstream investment in gas** which means that, as far as is possible using the data provided by the above companies, **we exclude:**

- Investment upstream in gas production
- Investment in electricity generation

This means that **we are including:**

- Network and network-related investment
- Investment in storage
- Investment in the supply function

3b. Investment by Which Companies?

The Incumbent Company and Its Successors

The key ownership change during the period was the separation of British Gas into two companies, BGplc and Centrica plc, which was announced in February 1996 and approved by shareholders in February 1997. These two companies provided separate homes for the transportation network (Transco as part of BGplc) and the supply function (British Gas Trading within Centrica plc). However, both companies also had a range of other assets within their portfolios.

Subsequently, Transco demerged from BGplc into the Lattice Group in October 2000, which then merged with National Grid in July 2002. Meanwhile,

in November 2001, BG Storage was sold to Dynegy Inc and then, when Dynegy exited the UK market, the Rough storage facility was sold to Centrica plc and the Hornsea storage facility was sold to Scottish & Southern Energy.

As far as the incumbent companies are concerned, this therefore means that we are concerned with:

- Pre-1997: British Gas
- 1997-2000: BGplc, Centrica plc
- 2000-2005: Lattice Group, Centrica plc, BG Storage, Dynegy Inc, Scottish & Southern Energy and National Grid

However, we omit:

Dynegy's ownership of storage (on the grounds that it only lasted a few months and therefore did not involve any significant investment) and Scottish & Southern's ownership of Hornsea (on the grounds that its investment was an acquisition and has not therefore involved significant new investment).

The incumbent companies and their investments to be considered are therefore:

- Pre-1997: British Gas
- 1997-2000: Transco (for which separate accounts are available), BG Storage, Centrica plc
- 2000-2005: Transco (for which separate accounts continued to be available), BG Storage (one year only), Centrica plc

New Entrants Investing in New Assets

In addition to the incumbent company and its successors, we also need to consider investment by new entrants to the UK gas market. This falls into 3 categories:

- Investment in new Interconnector infrastructure
- Investment in gas import terminals (LNG terminals at Isle of Grain on the Thames and Milford Haven in South Wales)
- Investment in new storage by new entrants
- Investment in the supply function by new entrants

We have decided to exclude the first two categories on the grounds that this investment is linked to the depletion of UKCS production and would therefore have to have been made anyway, whatever the form of ownership of the UK gas industry. However, some comment has been made on the timeliness of this investment.

Storage investment could be regarded as falling into the same category (the need for new storage also being linked to the depletion of UKCS

production, particularly of the dry gas fields whose winter 'swing' has previously provided an important seasonal storage substitute for the UK). In any event there is very little investment which (a) falls within the period up to 2005 and (b) for which data is available.

It should also be noted that the private sector was only willing to build these new assets as long as they were granted exemption from the EU Gas Directive Third Party Access requirements. In other words, they would not have been undertaken if the EU, Governments and Regulators had insisted on Third Party Access. They would certainly not have been undertaken if the EU had insisted on both Third Party Access AND ownership deintegration.

With respect to investment in the gas supply function by new entrants, we also exclude this on the following grounds (a) that all of the new entrants who now dominate the supply of gas alongside British Gas are former incumbents in electricity supply, and as such their investments in gas supply cannot be separated from their investments in electricity supply (b) investments in the supply function are generally minor compared with those in the network and (c) there is some compensation because Centrica's investment in supply, which we do try to estimate, inevitably includes investment in electricity supply.

3c. Definition of Investment

This research is about capital investment and therefore excludes financial investments in acquisitions and joint ventures.

However, in the case of network and network-related investment it is important to understand that this is not only reflected in 'additions to tangible fixed assets'. This is because, in contrast to their treatment under US and Canadian accounting standards (US GAAP and Canadian GAAP), UK GAAP has allowed network replacement expenditures to be registered as operating expenses rather than as capital expenditure (as they are in the US and Canada).

In the case of British Gas and its successors we have therefore added 'replacement expenditure' to 'additions to tangible fixed assets' in order to arrive at an accurate figure for 'investment'. Indeed, it could reasonably be said that the behaviour of replacement expenditure provides the best indicator of investment for the purpose of this research – because it provides the best indicator of behaviour towards existing assets (additions to fixed assets may be conjuncturally influenced by any number of factors).

The precise definitions of/distinction between Capital Expenditure and

Replacement Expenditure are as follows 'Capital Expenditure' refers to all investment in tangible fixed assets required to EXPAND the system. Such expenditure is therefore capitalised and depreciated. 'Replacement Expenditure' refers to investment in mains pipelines, service pipelines(from the mains to the household etc.) and gas meters, which require replacement due to physical deterioration. While such expenditure is expensed in the UK, it clearly forms part of investment. From 1994 onwards the replacement of old meters was reclassified as 'capital expenditure' and therefore no longer expensed but capitalised.

The additions to tangible fixed assets are gross rather than net because no disaggregated depreciation data is available to allow the calculation of net figures. However, this would mainly affect levels rather than time series trends.

3d. Other Methodological Issues

Centrica data

The Centrica data between 1997 and 2003 (inclusive) is problematic. Firstly, investment specifically in gas supply and storage cannot be isolated. Investment in the upstream and in power generation can be excluded but the remaining total still includes both Centrica's investment outside the UK (Direct Energy and Avalanche Energy in North America) and non-gas investment (in electricity supply, in the Automobile Association and in telecommunications). The approach adopted was to therefore to use additions to tangible assets (other than in the upstream and power generation) between 1997 and 2000 because during this period non-UK and non-gas investment was not significant. For 2004 and 2005, in contrast, there is a full breakdown such that we could identify investment in residential and business supply (but British Gas' investment in electricity supply still cannot be separated from its investment in gas supply) and gas storage. For the years 2001 to 2003 we were able to identify annual investment in information systems associated with new customer relationship management (CRM) infrastructure, and therefore used this data as representative of the majority of investment in the supply function (although this investment would have been for electricity as well as for gas supply). In matching Centrica's December year-end data with Transco's March year-end data, we decided that using a lag to achieve a closer overlap fit was unnecessary.

Financial Years 2001-2002

These financial years are problematic both because of the 15 month accounting period resulting from Transco's demerger from BG plc, and because of consequent matching problems with the Centrica data. As a result we decided to annualize the 15 month Transco data to create data to year ending March 2002. This means that a gap appears in the Transco data for 2001 (but 2001 data is still included in the annualized 2002 March year-end

data). There is consequently a gap in the annual graphs for 2001 (to avoid giving a misleading impression). However, Centrica's 2001 investment and the small amount invested by BG Storage in 2001 is included in the grouped periodised data (Figure 3).

Deflators

We considered several possible deflators and decided to use an implied GDP deflator as most appropriate for deflating investment expenditure. This is matched to the different financial years as required.

3e Data Sources Used

The data sources available to us were as follows:

British Gas Corporation Annual Report & Accounts, 1985
British Gas plc Annual Report & Accounts, 1987-1997
British Gas plc, Financial & Operating Statistics (FOS), various years
British Gas plc, Annual Report for US SEC on Form 20-F , various years
BG plc, Annual Report & Accounts, 1999, 2000
Transco plc, Regulatory Accounting Statements, 2002-2005
Centrica plc, Annual Report & Accounts, 1997-2000