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A critique of the European Commission's evidence of the need for ownership unbundling of energy networks

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1. INTRODUCTION.....	3
2. BACKGROUND	3
3. INTEGRATION OF WHOLESALE AND RETAIL.....	3
4. PROBLEMS WITH LEGAL UNBUNDLING.....	4
5. THE COMMISSION'S EVIDENCE.....	4
5.1. UK EXPERIENCE WITH GAS	4
5.1.1. <i>Price-setting for networks in Britain: Setting the 'X' factors</i>	5
5.1.2. <i>Outcomes</i>	6
5.1.3. <i>Why does the regulated company invest?</i>	7
5.1.4. <i>Conclusions</i>	7
5.2. THE NETHERLANDS	7
6. OTHER EVIDENCE.....	7
6.1. ENSURING EFFECTIVE STEWARDSHIP OF THE ASSETS	7
6.2. THE COST OF UNBUNDLING	8
7. DIFFERENCES BETWEEN TRANSMISSION AND DISTRIBUTION.....	8
8. WEAK REGULATION.....	9
9. CONCLUSIONS	9
10. REFERENCES	10

1. Introduction

The Directorate General for Transport and Energy (DG TREN) published its analysis of the prospects for the European single markets in electricity and gas (European Commission, 2007a) in January 2007. At the same time, the Directorate General for Competition (DG Competition) published its own inquiry on this subject (Inquiry pursuant to Article 17 of Regulation (EC) No 1/2003 into the European gas and electricity sectors (Final Report)) into the functioning of the European gas and electricity markets. Both reports gave a strong recommendation that the energy networks be unbundled at an ownership level from the wholesale and retail activities in the gas and electricity sectors. The reports assert (European Commission, 2007a, p 12 and European Commission, 2007b, p: 12): 'Economic evidence shows that ownership unbundling is the most effective means to ensure choice for energy users and encourage investment.' However, there is no reference to the economic evidence that the Commission is referring to. In its Spring 2007 Competition Policy Newsletter (Lowe et al, 2007), the DG Competition staff attempt to justify this claim. While the article by Lowe contains a rider that the views expressed are not necessarily those of the European Communities, the lead author is Director-General for DG Competition.

This paper reviews the evidence brought forward by the Commission to support its assertion on ownership unbundling.

2. Background

The first EU Directives on Electricity of 1996 (96/92/EC) and Gas from 1998 (98/30/EC) required that owners of the networks publish separate accounts that covered just their network businesses and excluded their activities in competitive markets (wholesale and retail). The Commission later judged this separation insufficient to prevent network owners from discriminating in favour of their retail and wholesale businesses in accessing the networks. In the 2003 revisions, 2003/54/EC (electricity) and 2003/55/EC (gas), legal separation was required. This meant that the networks had to be placed in a separate company, although the owners of this company could also be the owners of retail or wholesale energy businesses. As noted above, the Commission is now pressing for revisions to the Directives that would require that the owners of the network companies have no interest in gas or electricity wholesale and retail.

3. Integration of wholesale and retail

In DG Competition's preliminary report (European Commission, 2006), the Commission identified 'vertical foreclosure' as one of the barriers to the creation of single European energy markets. For gas, the Commission found (European Commission, 2006, p 3):

Lack of liquidity and limited access to infrastructure prevent new entrant suppliers from offering their services to the consumer. The network of long term supply contracts between gas producers and incumbent importers makes it very difficult for new entrants to access gas on the upstream markets. Additionally, certain features of these contracts limit incentives for incumbents to provide liquidity on traded markets. Gas infrastructure (networks and storage) is to a large extent owned by the incumbent gas importers, and the insufficient separation of this infrastructure from supply functions results in insufficient market opening. Despite EU rules on third party access and legal/functional unbundling, new entrants often lack effective access to networks, the operators of which are alleged to favour their own affiliates.

For electricity, the Commission found:

Vertical integration of generation, supply and network activities has remained a dominant feature in many electricity markets. Vertical integration of generation and retail reduces the incentives to trade on wholesale markets. Low levels of liquidity are an entry barrier. The strong links between supply and network companies reduces the economic incentives for the network operators to grant access to third parties. Many respondents are highly critical of the efficiency of existing unbundling obligations, believing that discrimination in favour of affiliates continues, and calling for stricter measures.

Foreclosure seemed to cover integration of generation with retail and networks with generation/retail, with the former at least as prominent as the latter.

From the policy point of view, the former would seem to be the more important problem. If wholesale markets are little used because retailers are buying their supplies from their wholesale divisions, the main justification for the reforms, turning the wholesale activity from a monopoly to a competitive market is heavily compromised. Price signals will not be reliable enough for power and gas to be bought in significant

quantities from the markets and will certainly not be reliable enough to provide signals that would be the basis for investments that might cost in the region of €1bn. By contrast, ensuring fair access to the networks is simply an enabling measure to allow the wholesale and retail markets to function efficiently. If, for other reasons, the markets cannot function efficiently, unbundling has little if any value.

However, the final report by DG Competition and the DG TREN reports concentrated heavily on the integration of networks and wholesale/retail with little mention of integration of wholesale and retail. This is in spite of DG Competition acknowledging the failure of the wholesale markets. It finds:

A chronic lack of liquidity, both in electricity and gas wholesale markets: the lifeblood for our markets is lacking and the market power of pre-liberalisation monopolies persists.

However, it proposes no remedies for dealing with what it had acknowledged in its preliminary report as one of the main causes of this lack of liquidity, corporate integration of wholesale and retail activities. Lowe et al (2007) ignore the issue of integration of wholesale and retail.

4. Problems with legal unbundling

Much of the paper by Lowe et al (2007) is taken up with examples that emerged during the DG Competition Inquiry of integrated companies distorting competition. Three issues are identified as problems resulting from the inadequacy of legal unbundling: discrimination with respect to third party access; information leakage; and investment incentives remain distorted.

‘Discrimination with respect to third party access’ and ‘information leakage’ are the expected results of inadequate separation of activities with integrated companies. Lowe asserts that: ‘there are various means through which such discrimination may take place, some of which are difficult to detect and/or expeditiously remedy and sanction, even for a specialized regulatory body.’ Yet the Competition Commission Inquiry was able to identify several examples of such practices. If a one-off inquiry covering all the Member States, by a body with no ongoing expertise in energy is able to uncover such practices, it is hard to understand why Lowe believes it would be so difficult for a regulatory body from a single country with a continuous mandate to monitor the energy sector to uncover such evidence.

‘Investment incentives remain distorted’ is the most difficult to understand. Investment programmes must be the subject of regulatory approval (either *ex post* or *ex ante*) and if investments are undertaken that are not optimal or investments that are needed are not undertaken, this again points to serious deficiencies in the regulatory regime. It is not clear whether these deficiencies are the result of inadequate powers or inadequate resources with the regulator.

5. The Commission’s evidence

5.1. UK experience with gas

Lowe provides as evidence, experience of unbundling the gas network in Britain. He identifies a price reduction of 50 per cent in network charges since 1990 and high levels of investment after unbundling (see Table 1). It is not clear what the investment figures represent, and unless they are better explained, with the underlying assumptions specified (for example, is inflation taken account of), they have no value.

Table 1. Changes in Investment levels in the British gas network

Year	Change of investment level (£m)
Transco	
1997/98	147
1998/99	191
1999/2000	140
Fully unbundled	
2000/01	228
2001/02	239
2002/03	182
2003/04	159
2004/05	128

2005/06	360
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Source: Lowe, P, Pucinskaite, I, Webster, W & Lindberg, P (2007) 'Effective unbundling of energy transmission networks: lessons from the Energy Sector Inquiry' Competition Policy Newsletter, no 1, Spring 2007, p 30.

The analysis is, however, misleading and sometimes inaccurate. The gas industry was privatised and liberalised in 1987, so it is not clear why 1990 was chosen as the base year since no major reforms took place in that year. British Gas was privatised in 1987 as a fully integrated wholesale/retail/network company.

Over time, it has been broken up (Thomas, 2003). In 1997, the retail business was fully separated and continues to trade as Centrica. The wholesale and network business, BG Plc, continued as an integrated company until 2000, when the network business (the Transco division) was split off as a fully independent company, Lattice. Lattice, in turn, merged with the UK electricity transmission company, National Grid, to become National Grid Transco in 2002. In 2005, the British gas distribution network was split into eight regions, four of which were sold off at the instigation of the regulator. In terms of unbundling, the network has therefore only been ownership unbundled since 2000. It is not clear whether the large apparent increase in investment in 2005/06 may be related to this split. However, to make sense of these figures and understand how the 50 per cent reduction in prices was achieved, it is necessary to understand how network prices are set in Britain.

5.1.1. Price-setting for networks in Britain: Setting the 'X' factors

The original plan for the UK privatised network industries was that charges for the monopoly elements would be set using so-called 'incentive regulation' using the RPI-X formula. Thus, prices for network services after 1987 were set by this formula under which the price of the regulated service is allowed to increase by the rate of inflation (retail price index or RPI) minus an 'X' factor. In effect, this formula means that the owner of the network must reduce its real costs by X per cent per year if it is to maintain its real level of profits. If it can reduce its costs by more than X per cent per year, it can keep the extra efficiency savings as extra profit, hence the incentive.

Table 2 shows the 'X' factors that have been applied since 1987 and shows that real prices have indeed fallen by about 50 per cent.

Table 2. UK Gas transmission/distribution charges since 1987

Year	X factor	Transmission/distribution charge (1987=100)
British Gas		
1988	2	98
1989	2	96.1
1990	2	94.2
1991	2	92.3
1992	4	88.8
1993	4	85.4
1994	4	82.1
1995	4	78.9
1996	4	75.9
1997	21	60.0
BG plc Transco division		
1998	2	58.8
1999	2	57.6
2000	2	56.4
Lattice		
2001	2	55.3
2002	4	53.1
National Grid Transco		
2003	2	52.0
2004	2	51.0
2005	2	50.0
2006	2	49.0

Source: Thomas, S (2003) 'Gas as a commodity. The UK gas market: From nationalism to the embrace of the free market' in 'European Gas Markets in Transition' ed Maarten Arentsen & Rolf Kunneke, Elsevier, pp 181-212.

In practice, the 'X' factor was only set in the way envisaged for the initial 5-year period. Under this first method, the regulator would be required to make a judgement on how much the regulated company would be able to improve its efficiency – the 'X' factor. By 1991, when the regulator began to look at the 'X' factor that would apply for the following five years, it was clear this method would not work and the only sensible way to set prices was to go back to a form of rate-of-return regulation similar to that applied in the USA since the 1930s. Under this, charges would be set so that the regulated company would be able to recover its operating costs in full and make a 'fair' rate of return on the assets it built. So if operating costs were \$500m, the assets owned were worth \$5bn and the real annual fair rate of return was judged to be 10 per cent, the regulated company would be allowed to recover \$1bn from its consumers made up of its operating costs of \$500m plus 10 per cent of \$5bn. This produces an allowed revenue stream for the 5-year period, which is presented as an 'X' factor, but the methodology used is rate-of-return regulation, not incentive regulation.

Rate-of-return regulation has been criticised because it can, if inadequately regulated, lead to 'gold-plating' (the Averch-Johnson effect). The more the company invests the more money it is allowed to make so there is a strong incentive for the regulated company to overestimate its investment needs. Under the US *ex post* system, to prevent 'gold-plating' US regulators review all major capital additions once they are complete before allowing them to be added to the 'asset base'. If the investment is not a good one (it must be 'used, useful and the costs prudently incurred') the company is not allowed to recover some or all of cost of the asset and these disallowed costs must be paid for from its profits. The use of an *ex post* system means that it is the companies alone that make the investment decisions, not the regulator.

In the UK, rate of return regulation is through an *ex ante* approach. The regulator agrees a 5-year forward programme of investments with the regulated company and the charges the regulator sets are based on the assumption that the company actually makes these investments. 'Prudency' is therefore determined in advance and the regulator is effectively making investment decisions. The advantage of this approach is that companies have a longer time horizon to work with. The 'Averch-Johnson' effect still applies and large investment programmes may simply indicate that the company has been successful in convincing the regulator that it needs to invest more than is actually needed.

In practice, the UK regulated companies seem to be distorting this procedure to maximise their profits. They seldom if ever invest the full amount they have negotiated and they tend to make the investments towards the end of the five-year period. At the end of the regulated period, the regulator adjusts the asset base for the next forward period to reflect the investments actually made. But the company keeps the additional rate of return on the investments it did not make in that 5-year period. Investing later than anticipated also allows the company to start making a return on investment before the investment takes place. Regulators argue that to claw back this unearned profit from not investing or from delaying investment would mean that the company would have a disincentive to look for efficiencies in investment. So the companies have so far been allowed to keep these unearned profits.

A major problem for the UK regulator when the change was made in 1991 from incentive regulation to rate-of-return regulation was how to value pre-privatisation assets. British Gas had been sold for much less than its asset value, as shown in its pre-privatisation report and accounts, and to value the assets at their full pre-privatisation level (minus of course usual depreciation) would have been to give the new owners a rate of return on much more than they had paid for the assets. The regulator therefore gave the pre-privatisation assets a much lower rate of return than the post-privatisation assets. This effectively wrote off much of the value of the pre-privatisation assets and led to large price cuts not related to efficiency gains. These price reductions are of course temporary as the pre-privatisation assets will have to be replaced at their full cost, so now in the UK, 'X' factors are close to zero and in some cases are positive (i.e., prices rise in real terms).

5.1.2. Outcomes

Table 2 now begins to make more sense. The effect of the change from 'incentive' regulation to 'rate-of-return' regulation is seen in the large price reductions from 1992-96 and the huge one-off cut in 1997. So of the 50 per cent price reduction that the Commission notes since liberalisation (1987, not 1990 as the Lowe mistakenly states), nearly all of it (85 per cent of the reduction) occurred before ownership unbundling. Peaks of investment occur in the last year of the 5-year regulatory cycle (2001 and 2006). Both these years occurred after ownership unbundling. The three years that Lowe shows for the 'integrated' company do not

contain the last year of a 5-year regulatory cycle. On these grounds alone, Lowe's evidence is massively distorted.

5.1.3. Why does the regulated company invest?

Lowe's analysis is clearly meant to imply that the regulated company makes autonomous decisions on where and how much to invest. This is a travesty of the truth. A 5-year investment programme is agreed in advance with the regulator in a complex negotiation lasting nearly 3 years. The regulated company always starts with a very high investment need because the larger the investment programme it can negotiate, the higher the profits it can make. While intuitively, a company making large investments in the network seems a good thing, in practice, it is only useful if the assets are needed and costs are kept down to a minimum. Consumers invariably pay the price for investment programmes. Over the three year negotiating period, the Regulator assesses the regulated company's programme, trimming out investments that the regulator believes are not necessary.

So from a strategic point of view, a large investment programme may prove very little and certainly not that ownership unbundling is better than legal unbundling.

5.1.4. Conclusions

Lowe's evidence from Britain is confused and suggests that he does not understand the system of regulation. He is muddled about whether the criterion for judging the reforms is price reductions or level of investment. These tend to be mutually exclusive. Price reductions are likely to be possible only if investment levels are low, while large investment programmes must be paid for by consumers, tending to increase prices.

5.2. The Netherlands

Lowe's other evidence is from the Netherlands, apparently based on the fact that the unbundled network operator has started work on an LNG terminal. However, since the network operator has only been unbundled since 2005, it seems far too early to draw any conclusions. Lowe also asserts that the boom (sic) of LNG terminals in Spain was 'significantly facilitated by (progressive) unbundling'. Without evidence to back up that the terminals would not otherwise have been built and that they were a good use of consumers' money, such assertions are worthless.

6. Other evidence

The Commission provides little independent evidence to back its assertion that 'Economic evidence shows that ownership unbundling is the most effective means to ensure choice for energy users and encourage investment.' The main support comes from Newbery (2005). While Newbery is a highly respected and independent commentator, there are other arguments that favour retention legal unbundling. These relate to scale economies and transaction costs and include (Dahlman, 1979) 'search and information costs, bargaining and decision costs and enforcement costs'.

6.1. Ensuring effective stewardship of the assets

There is also the issue of who should own the networks if the traditional gas and electric utilities are disqualified from doing so. Ownership of the transmission network has, in the past, always been in the hands of the dominant generation company for the region or the nation for which the franchise company has its territory. Such companies almost invariably operated as single mission companies in their given territory. This arrangement gives the company a very strong incentive to maintain a transmission system to the highest standards with a long-term time horizon. Any weakness in the system will expose the company's customers (final consumers for a fully integrated company or distribution companies for partly integrated companies) to poor service, which will damage their reputation and will ultimately put in jeopardy the company's right to serve their given territory.

The break-up of integrated companies means that the link between company and consumers is much weakened and also that the nature of the companies involved in network management will change. Where ownership unbundling has occurred, the traditional companies have tended to opt to divest their network activities and choose to concentrate on their generation/retail activities. The companies involved in electricity have also expanded their scale and scope, moving into new territories and new activities. For example, companies like E.ON and EDF now have interests in markets across Europe as well as their traditional home bases. This may increasingly apply to network companies if they follow National Grid Transco's example. National Grid Transco, the electricity transmission company for England & Wales now

operates much of the electricity transmission network in New England (USA) and has taken over ownership of most of the British gas transmission and distribution network. These changes in corporate policy mean that assets in the electricity industry have become much more mobile. In liberalised countries such as the UK, some network assets have changed ownership several times in the past decade.

There is little evidence yet on what type of company will move into the transmission sector. The longer established independent electricity transmission companies, e.g., National Grid (UK) and RED (Spain) have not yet been subject to takeover bids, but there is no reason to assume this will not happen. Some countries have chosen not to take the risk that transmission networks might fall into the hands of companies that will exploit the assets to the detriment of service by taking (or retaining) the transmission sector into public ownership. In the Nordic countries, the unbundled transmission companies are nationally owned.

The mobility of assets raises the fear that assets will be 'sweated' by owners with short-term time-horizons and sold on before the extent of their neglect is apparent. Adverse trends in network performance are often difficult to detect because variations in weather from year to year cause a large amount of variability in performance indicators. When the neglect is apparent, the cost of remedying the problem may be disproportionately high.

Even amongst MEPs that support ownership unbundling, there are concerns about networks being owned by private equity funds. For example, UK MEP Eluned Morgan was reported as wanting hedge funds and private equity groups to be barred from buying infrastructure unless they guarantee investment. While this is well-meaning, it assumes that investment guarantees can be made to stick and that public companies will not exploit their ownership of monopoly facilities unfairly. The Spanish company, Ferrovial, has come under severe criticism from the UK Competition Commission for its lack of investment since it took over the main UK airport operator BAA.

6.2. The cost of unbundling

Legal and ownership unbundling will inevitably have initial costs and may well have ongoing costs. The initial costs will be the cost of setting up a new company, including the recruitment of a new management team, setting up headquarters and creation of new operating systems where these were previously shared with a generation or retail business. There may be ongoing costs from loss of scale economies. If the company is relatively small compared to the previous arrangement there may be other costs. For example, a small company is likely to have a higher cost of capital than a large one, a small company might be less effective in carrying out the necessary training and might have less scope to carry out R&D.

7. Differences between transmission and distribution

The Commission and Lowe do not distinguish between the transmission and distribution systems in terms of unbundling and does not recognise that differences might lead to changes in the way they are treated. The transmission systems are highly strategic and require important decisions to be taken on the siting of power plants, the use of gas import facilities (pipelines and LNG terminals). The integrity of national transmission systems is also vital. If the national transmission system is not capable of meeting the requirements imposed upon it, the national consequences will be extremely serious.

In terms of its contribution to the overall cost of electricity, transmission is a relatively small element, accounting for perhaps 5 per cent of the price of electricity for small consumers, less for larger consumers. This compares to perhaps 30 per cent for the distribution charge. Transmission also employs relatively few people, for example, in Britain, a couple of thousand people are employed to operate and maintain the transmission system, while the distribution system employs perhaps ten times as many. The distribution network is the vital link for final consumers but while a weakness in a local distribution network is not acceptable, it will have limited national consequences. The distribution network also has limited strategic considerations. For gas, where the network is incomplete, there are decisions to be taken on which consumers to connect and when. For electricity, effectively all consumers are connected and the only strategic decisions are on small-scale generation sources, which are usually 'embedded' in the distribution network rather than feeding in to the transmission network. However, this requires only that new sources can feed into the network at a fair price, not the need to choose between options.

As a result of these differences, transmission is often seen as a strategic national asset that should be under public ownership, even where the rest of the system is being privatised. For example, Denmark and the Netherlands have chosen to bring the electricity transmission network into national public ownership.

The strategic nature of the transmission network also has consequences for regulation. Regulators do not have ‘perfect’ information and must strike a balance in setting network tariffs. The targets must be tough enough to force companies to be as efficient as possible and not so tough that there is a risk that the owner will not have the resources to operate the system reliably. It is probably no exaggeration to say that the only time a regulator will know that they have not been too lenient is when the system collapses or the owner files for bankruptcy. Clearly for transmission, the regulator needs to err in favour of the network owner to avoid any risk of compromising the security of the network. Excessive profits for the network owner (especially if publicly owned) or not maximising pressures for efficiency will be a small price to pay to reduce the risk of network failure.

Regulators, in an attempt to emulate large cost reduction achieved by their international counterparts or to demonstrate that liberalisation does work, may be tempted to force down network charges below their sustainable level. Networks can be neglected for a few years with little sign of the neglect in terms of system reliability, but while squeezing down network charges in this way may seem to produce benefits for consumers in the short-term, in the long-term, consumers will pay heavily for these short-term gains. A particular issue, especially if networks are fully unbundled is instability of ownership. In Britain, some of the distribution networks have passed through several changes of ownership in just a few years. Particular care needs to be taken with new owners with unproven track-records that these companies are not just ‘sweating the assets’, keeping the savings under incentive regulation schemes, for high short-term profits expecting to sell before their neglect becomes apparent.

8. Weak regulation

The Commission in both its reports is highly critical of the capability of some of the regulatory bodies. For example, the DG Competition report recommends a strengthened regulatory framework, including¹:

- enhanced powers for independent national energy regulators,
- reinforced coordination between national energy regulators,
- reinforced cooperation between Transmission System Operators (TSO), and
- substantially enhanced consistency of regulation in cross-border issues.

DG TREN found ‘Insufficient competences of the regulators’.² Privately, the Commission is scathing in its views on some of the regulatory bodies and this is apparent in some of the country reviews that accompany the DG TREN report³.

Intuitively, it would seem that ensuring fair access to the networks was a rather basic task for a competent regulatory authority. If a regulator is unable to enforce this, there must be serious doubts as to whether it will be able to regulate the sector adequately in other respects. The obvious priority would appear to be to strengthen the competence of the regulatory bodies so that the existing provisions of the Directive are enforced. Until this has been done, it is premature to judge that the existing Directive is inadequate.

9. Conclusions

The evidence presented by Lowe to support DG TREN and DG Competition’s assertion that ‘Economic evidence shows that ownership unbundling is the most effective means to ensure choice for energy users and encourage investment’ is weak and confused. The examples from UK, Netherlands and Spain are anecdotal and, in the case of the UK, betray a lack of understanding of the British system of regulation of networks.

Lowe and the Commission continue to make arguments based on their interpretation of experience with transmission and then assume, with no supporting arguments that the same logic will apply to distribution. There is no recognition that unbundling has costs as well as theoretical benefits much less any analysis whether the benefits outweigh the costs. The issue of whether a fully unbundled company can be sure to provide good long-term stewardship of the network is also ignored.

The Commission is highly critical of the capabilities and powers of national regulatory bodies. The first priority would appear to be solving this issue. Competitive energy sectors that do not have a competent and

¹ European Commission (2007) ‘Inquiry pursuant to Article 17 of Regulation (EC) No 1/2003 into the European gas and electricity sectors (Final Report)’ {SEC(2006) 1724}, Brussels, p 13-14.

² European Commission (2007) ‘Prospects for the internal gas and electricity market’ {SEC(2007) 12}, Brussels, p 7.

³ http://ec.europa.eu/energy/energy_policy/doc/10_internal_market_country_reviews_en.pdf

effective regulatory body are likely to suffer many problems, with lack of fair access to networks unlikely to be the most serious.

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