



Public Services International Research Unit (PSIRU)

www.psiru.org

Unbundling of electricity transmission networks: Analysis of the European Commission's position

by

Steve Thomas

Professor of Energy Policy, PSIRU, University of Greenwich, London

April 2007

Funded by: EPSU

PSIRU, Business School, University of Greenwich, Park Row, London SE10 9LS, U.K.

Website: www.psiru.org Email: psiru@psiru.org Tel: +44-(0)208-331-9933 Fax: +44 (0)208-331-8665

Researchers: Prof. Stephen Thomas, David Hall (Director), Jane Lethbridge, Emanuele Lobina, Vladimir Popov, Violeta Corral
Public Services International Research Unit (PSIRU) is part of the **Department of International Business and Economics** in the **Business School** at the **University of Greenwich** (www.gre.ac.uk). PSIRU's research includes the maintenance of an extensive database on the economic, political, social and technical effects of liberalisation, privatisation and restructuring of public services worldwide, on the multinational companies involved, and on the policies of international financial institutions and the European Union, especially in water, energy and healthcare. This core database is financed by **Public Services International (PSI - www.world-psi.org)**, the worldwide confederation of public service trade unions. **PSI** and the **European Federation of Public Service Unions (EPSU - www.epsu.org)** commission many of the reports of PSIRU. PSIRU is a member of the PRESOM and GOVAGUA networks, and coordinated the WATERTIME project, all funded by the European Commission. PSIRU is teaching a new Masters in Public Administration degree (MPA) at the University of Greenwich from September 2007.

1. INTRODUCTION	3
2. GEOGRAPHICAL SCOPE OF THE SYSTEM	3
3. THE NEED FOR UNBUNDLING.....	3
3.1. ACCOUNTING UNBUNDLING	4
3.2. LEGAL UNBUNDLING	4
3.3. OWNERSHIP UNBUNDLING.....	4
3.4. CREATION OF AN INDEPENDENT ISO	5
4. ARGUMENTS FOR THE DIFFERENT FORMS OF UNBUNDLING.....	5
4.1. ENSURING EFFECTIVE STEWARDSHIP OF THE ASSETS.....	5
4.2. THE COST OF UNBUNDLING	6
5. ARGUMENTS BY INTERESTED PARTIES.....	6
5.1. DG TREN.....	6
5.2. DG COMPETITION	7
5.3. THE COUNCIL OF MINISTERS	7
5.4. EURELECTRIC	7
6. THE ROLE OF REGULATION.....	8
7. CONCLUSIONS	8

1. Introduction

Modern electricity systems are totally dependent on a reliable and efficient transmission system. Perhaps more than any other part of the value chain, the reliability of the transmission system is crucial to security of supply. Power systems are designed to cope with the unavailability of a proportion of the power stations and the effects of failures in the local, low-voltage distribution can usually be localised. However, as blackouts in the past five years in Europe and the USA have demonstrated, failures in the transmission network can cascade almost instantaneously across large regions and across national boundaries leaving consumers without power. Transmission systems also have strong strategic dimensions. They are important in decisions on where to site power plants and international links. Whatever the form of organisation for the sector chosen, the network must continue to be maintained to the very highest standards to ensure a secure supply of electricity to consumers and all reasonable requests to be connected to the system should be met at a price that reflects the cost of the work needed. There is also the likelihood that governments will have a legitimate interest in the development of the transmission network, especially international links.

While strong transmission systems are crucial to the security of supply of electricity, they represent a relatively small part of the cost of electricity, perhaps about 5 per cent.

This paper deals with the transmission network rather than the distribution network. While the distribution network is also important to supply security, a failure in it usually has less dramatic and far-reaching consequences than for the transmission network. National strategic considerations are also less important for distribution networks. For networks where a significant proportion of the population is not connected, there might be strategic considerations in deciding which consumers are connected but this does not apply to Europe. However, the distribution network usually makes up a much larger proportion of the electricity bill, perhaps up to a third, so efficiency is a higher priority for this activity than for transmission.

2. Geographical scope of the system

A particular issue is what the geographical scope for the System Operator should be. In simple cases where the national system has historically been run as a national system (e.g., France, Greece, Republic of Ireland) the System Operator should be national in scope initially. However, for countries that have developed on a fragmented basis, the transmission networks may be sub-national in scope. For example, Germany has historically been composed of about eight regional systems with significant restrictions on how much power can be transferred between regions. For such cases, until the transmission system has been expanded so it can form a national system, it may be appropriate to have a number of sub-national System Operators.

If national markets are replaced by super-national regional markets, it may be appropriate for there to be regional control of the network. This has already happened to some extent in the four Nordic countries, which operate a single wholesale electricity market. The transmission systems are still owned by four separate transmission companies but the system is controlled by a single organisation, NordPool. If there is progress towards a single European electricity market with regional markets as a stepping stone, there may be a need for Regional System Operators, perhaps still working with individual national System Operators.

This raises significant issues of governance and regulation. An RSO would have significant powers and would need to be accountable to the public and would need regulatory oversight. New forms of governance and regulation would be needed for this.

3. The need for unbundling

The issue that is receiving a great deal of attention by the European Commission in its reviews of the Electricity Directive is what measures are needed to ensure that all generators have fair access. The organisation whose job it is to determine access to the network is known as the System Operator, Transmission System Operator (TSO), for the transmission network. Where control of the network is in the hands of a different organisation to the ownership of the assets, the System Operator is often known as an Independent System Operator (ISO).

A pre-condition to the successful introduction of competition to electricity generation and electricity retail is that the networks be open to all competing companies on equal and fair terms. The measures to achieve this, usually some form of unbundling, in other words, making some form of corporate separation between the network and competitive activities. Unbundling is therefore an enabling measure, and has no value unless it

allows the creation of a genuinely competitive market that brings net benefits to consumers. If competitive generation markets cannot be achieved, the main justification for unbundling is lost.

The transmission system is of most relevance to generating companies with large power stations and retailers, not final consumers. Only the very largest consumers take their power direct from the transmission network. Relatively small generators of, say 50MW or less, for example, most renewable generators and combined heat and power (CHP) generators feed directly into the distribution (low voltage) network and so the transmission network is also of limited importance to them. Where transmission systems are integrated with other activities in the electricity sector, it is generally with a generation business or an integrated generation/retail business. There are few, if any, examples of a transmission system being owned by a retail business.

The need for unbundling arises only if the intention is to make generation a competitive market. If generators are to compete on equal terms, access to the network should be available to all companies on non-discriminatory terms and at prices that reflect the costs that are actually incurred. The price might vary according to location of the power plant but, all things being equal, should not vary from company to company. Equally, retailers should be able to source their power from any reasonable source regardless of the ownership of the retailer or the generator they wish to deal with.

Some form of 'unbundling' is usually thought to be necessary to achieve this. Unbundling requires that the business that controls the network is separated from the commercial activities, generation and retail to final consumers, in a liberalised electricity system.

There are two main potential problems if there is not sufficient 'distance' between the competing firms and the System Operator (the organisation that determines access and conditions of access to the network). First, an integrated company owning the network and commercial activities might deny access to the network or apply unfair terms to generators or retailers that compete with the generation or retail business of the integrated company. Second, the integrated company might allocate costs more properly attributed to generation or retail to the network business. This would make the apparent costs of their generation or retail businesses artificially low and would give them an unfair advantage in these activities. There are a number of ways that have been suggested to overcome this problem: accounting separation of network activities; legal separation of network activities; ownership unbundling; and separation of operation of the assets from ownership.

3.1. Accounting unbundling

This is the most basic form of unbundling and requires that an integrated company keeps separate accounts for its network business. This was the minimum requirement specified in the 1996 Electricity Directive. The risk if unbundling is only required on an accounting basis is that it will be possible to allocate costs inappropriately to the advantage of the company. For example, there could be common activities where the costs are shared between the two businesses and these costs could be allocated disproportionately to the network business. Of course, where there are activities common to both businesses, this sharing of cost should result in scale economies which would be lost if a more rigorous form of separation was required.

3.2. Legal unbundling

This is a more rigorous form of separation and requires that the network be owned by a company whose only activity is the operation and ownership of the network. This company could however be a subsidiary of a parent company that also owned a company (ies) active in generation or retail. This was the minimum requirement specified in the 2003 Electricity Directive. Legal unbundling would mean that the problem of misallocation of costs should not arise because legally separate companies must have separate staffs, premises and procedures. There might still be an issue that since the regulated and unregulated companies were under common ownership, there would still be an incentive from the parent company for the network company to treat its sister company in generation or retail better than companies with which it had no ownership connection.

3.3. Ownership unbundling

Ownership unbundling requires not only that the network be owned by a separate company, but that this company is not a subsidiary of a company that has interests in generation or retail. It is the most complete form of separation and is the form of unbundling being recommended by both the Energy and Competition

Directorates of the Commission in their reports on their 2006 investigations into energy markets. Since there would be no connection between the network company and the competing companies, there would be no reason for the network company not to treat all the companies on the same basis.

3.4. Creation of an independent ISO

The previous three approaches treat the ownership and control of the transmission network as indivisible. However, arguably, for the purposes of accessing the network, it is not the ownership of the network that is important; it is the organisation that determines access and conditions of access to the network. In this light, an alternative solution might be to retain ownership and maintenance of the network with an integrated company but spin-off the ISO function to a fully independent company. This would mean there was no incentive with the ISO for favourable treatment for one particular player.

4. Arguments for the different forms of unbundling

If the only criterion was ensuring non-discriminatory access to the network, ownership unbundling would be the preferred option as it offers the greatest assurance of non-discriminatory access to the networks. However, there are other important considerations including:

- Ensuring effective stewardship of the assets on a long-term basis;
- The potential one-off and continuing cost of unbundling;

4.1. Ensuring effective stewardship of the assets

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 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 distribution assets have changed ownership several times in the past decade, but transmission assets have not yet been regularly bought and sold.

This raises two important questions: if traditional utilities are not allowed to own networks, what sort of company will take up the ownership of the networks; and what measures are possible to ensure the safe long-term stewardship of the assets?

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. For example, in the Nordic countries, 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. This is a particular problem for electricity because adverse trends in network performance are difficult to detect and when the neglect is apparent, the cost of remedying the problem may be disproportionately high.

4.2. 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 of 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, the cost of capital might be higher for a small company, a small company might be less effective in carrying out the necessary training and might have less scope to carry out R&D. This would be particularly the case for the transmission systems of small countries and for small distribution networks.

5. Arguments by interested parties

5.1. DG TREN

Much of the DG TREN report is taken up with analysis of the failings of the unbundling measures¹. It lists six deficiencies in the implementation of the Directive, including: ‘Insufficient unbundling of transmission and distribution system operators which cannot guarantee their independence’ and ‘Discriminatory third party access to the network, in particular as regards preferential access being granted to incumbents for historical long term contracts’.² Under obstacles to competition, it lists ten shortcomings, including:

- Large and/or vertically integrated companies are at a considerable advantage in terms of the information which they are able to use to formulate their trading strategy. By contrast, smaller companies find out too late about, for example, generation outages, to be able to adjust their positions.
- In some cases there remains confusion within the vertically integrated group about responsibility for the basic functions of the transmission system operator (TSO), for example dispatch and balancing services.
- TSOs have often, especially when vertically integrated, failed to create conditions conducive to liquid competitive markets – for example by maintaining localised separate balancing zones rather than facilitating the integration at national and cross border level. This may be a result of a lack of trust between TSOs that are fully unbundled and those that are not.
- TSOs appear to have been slow to act to increase cross border capacity, either through investment or other means. This is often the result of inadequate incentives provided through the regulatory framework.
- There is evidence that both TSOs and regulators tend to be over-oriented to short term national concerns rather than pro-actively trying to develop integrated markets. For example, congestion has been in some countries shifted to national borders and cross border capacity is the first to be constrained. Some regulators have been slow to agree how to implement the basic provisions already contained in the legislation – for example, market based capacity allocation.

The DG TREN report implicitly favours ownership unbundling of DSOs and TSOs. It believes legal unbundling is inadequate because³

Inherently, legal unbundling does not suppress the conflict of interest that stems from vertical integration, with the risk that networks are seen as strategic assets serving the commercial interest of the integrated entity, not the overall interest of network customers.’

Partly, this is because the network owner still has an incentive to discriminate, but DG TREN claims⁴:

‘... investment incentives are distorted. The vertically integrated network operators have no incentive to develop the network in the overall interest of the market with the consequence of facilitating new entry at generation or supply levels. There is considerable evidence that investment decisions of vertically integrated companies are biased to the needs of supply affiliates.’

It is not clear why the regulatory system cannot deal with such problems. If companies are being discriminated against, any good Regulator should be able to intervene to prevent the discrimination. Similarly, if the network company of an integrated group is not investing sufficiently in the network or not in the right places, the Regulator should have the powers to force them to carry out the investment – or they risk losing their right to own and operate the network.

¹ European Commission (2007) ‘Prospects for the internal gas and electricity market’ {SEC(2007) 12}, Brussels. http://eur-lex.europa.eu/LexUriServ/site/en/com/2006/com2006_0841en01.pdf

² European Commission (2007) ‘Prospects for the internal gas and electricity market’ {SEC(2007) 12}, Brussels, p 6.

³ European Commission (2007) ‘Prospects for the internal gas and electricity market’ {SEC(2007) 12}, Brussels, p 10

⁴ European Commission (2007) ‘Prospects for the internal gas and electricity market’ {SEC(2007) 12}, Brussels, p 11

On the option of separating the DSO/TSO function from the ownership of assets, DG TREN has two main arguments⁵:

‘Economic evidence shows that ownership unbundling is the most effective means to ensure choice for energy users and encourage investment. This is because separate network companies are not influenced by overlapping supply/generation interests as regards investment decisions. It also avoids overly detailed and complex regulation and disproportionate administrative burdens. The independent system operator approach would improve the status quo but would require more detailed, prescriptive and costly regulation and would be less effective in addressing the disincentives to invest in networks.’

It is not apparent what this economic evidence is, nor, as argued above, why proper regulation should not be able to deal with these issues in a ‘non-burdensome’ way.

5.2. DG Competition

On unbundling, or vertical foreclosure of markets as it terms it, the DG Competition’s arguments are essentially the same as those of DG TREN. Its report states⁶:

‘The current level of unbundling of network and supply interests has negative repercussions on market functioning and on incentives to invest in networks. This constitutes a major obstacle to new entry and also threatens security of supply.

New entrants often lack effective access to networks (in gas, also to storage and to liquefied natural gas terminals) despite the existing unbundling provisions. The operators of the network/infrastructure are suspected of favouring their own affiliates (discrimination). Vertical integration also leads to a situation where operational and investment decisions are not taken in the interest of network/infrastructure operations, but on the basis of the supply interests of the integrated company (including grid connection for competing power plants). This is highly damaging to security of supply.’

5.3. The Council of Ministers

The European Council of Ministers met on March 8-9, 2007 to discuss, amongst other things, the DG TREN and DG Competition reports. On unbundling, the Council recommended⁷:

[The Council] taking account of the characteristics of the gas and electricity sectors and of national and regional markets, agrees on the need for: effective separation of supply and production activities from network operations (unbundling), based on independently run and adequately regulated network operation systems which guarantee equal and open access to transport infrastructures and independence of decisions on investment in infrastructure.

This was widely interpreted in the press as allowing countries reportedly against ownership unbundling, such as Germany and France, latitude to avoid the need to enforce ownership unbundling. Despite the Council’s statement, Commissioner Kroes (DG Competition) restated her preference for ownership unbundling and the Assembly of European Regions also was critical of the ambiguity of the Council position⁸.

5.4. Eurelectric

Eurelectric took a rather different position in its comments⁹. It argued that since the desired trajectory of the Commission towards a Single European Electricity Market was through regional markets that the priority was to set up Regional System Operators (RSOs). It argued that the 2003 provisions (legal unbundling) were adequate if enforced. It stated:

The advantage of such a model over ownership unbundling or a national ISO is that it would be a driver for market integration while limiting the role of vertically-integrated companies to that of asset owners.

Under this model, no further unbundling beyond that required by the 2003 Directive would be needed. The issues of governance and regulation, noted above, are not addressed.

⁵ European Commission (2007) ‘Prospects for the internal gas and electricity market’ {SEC(2007) 12}, Brussels, p 12.

⁶ 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 6.

⁷ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52006DC0851:EN:NOT>

⁸ http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ec/93135.pdf p 16.

⁹ ‘Energy: Regions step up pressure for unbundling’ European Report, March 22, 2007, No. 3273,

⁹ Eurelectric (2007) ‘Position Paper on the European Commission’s approach to market developments (10th January energy package)’ Ref 46683, Eurelectric

6. The role of 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, including¹⁰:

- 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'.¹¹ 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 report¹².

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.

The Commission does not provide an answer on how to ensure democratic control and representativeness of regulatory bodies. It is not sufficient to decree more powers for regulators while not addressing the issue of accountability and control, checks and balances need to be in place to allow the public proper oversight over these unelected bodies.

7. Conclusions

While, all things being equal, it is desirable for transmission costs to be as low as reasonably achievable, the small proportion of the electricity price made up by transmission costs and the imperative of not compromising service standards mean that economic efficiency is not the priority for this activity.

The recommendation by the European Commission TREN and Competition Directorates that the unbundling requirement for transmission networks should be ownership unbundling is premature. Any increased requirements should wait until competent regulatory regimes are in place and the 2003 Electricity Directive has been implemented and tested in Member States. It will only be then that a judgement can be made on the effectiveness of existing measures.

A requirement for ownership unbundling is likely to increase costs for consumers initially, setting up the companies and perhaps on a continuing basis if scale economies are lost. Ownership unbundling also raises the issue of how to ensure that the new set of companies that will come in to the sector will maintain and operate the network to the high standards that are required.

In the longer term, if progress towards a Single European electricity market is achieved through the development of regional markets, the need to separate the network at a national level will become redundant because new super-national organisations, RSOs, will be needed to operate these regional markets.

¹⁰ 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.

¹¹ European Commission (2007) 'Prospects for the internal gas and electricity market' {SEC(2007) 12}, Brussels, p 7.

¹² http://ec.europa.eu/energy/energy_policy/doc/10_internal_market_country_reviews_en.pdf