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From the Editor

Ownership Unbundling of energy companies will only meet its goals if the European Commission's "3rd package" contains other harmonisation measures for: (1) efficient despatch, investment and regulation at the supra-national level; (2) common electricity market designs that promote efficient investment and risk management; and (3) stronger EU-wide legal protection for investors in regulated utilities. Without these three measures, inefficient conflicts will persist.

—Graham Shuttleworth, Editor

Three Measures to Help Ownership Unbundling Achieve its Goals

By Graham Shuttleworth

Background

The European Commission issued its proposed directives for implementing the 3rd package of energy sector liberalisation measures¹ on 19 September 2007, along with an impact assessment.² The primary element of the package is a proposal to force "Ownership Unbundling" (OU)—the separation of generation, wholesale and retail trading companies from (transmission) networks. Opposition has been mounting in a number of EU member states for some time. That should not be surprising. OU is intended to overcome conflicts of interest that harm some parties but aid others.

The goals of OU may be laudable. However, the 3rd package will not achieve them, unless it includes other measures designed to resolve conflicts between the national interests of member states, as well as conflicts between different members of the energy sector within each member state.

OU's Contribution to Resolving Conflicts of Interest

Under the EC's proposal, energy companies could own *either* businesses operating in the competitive arena (production, wholesaling and retailing) or monopoly networks and pipelines (transmission/transport for the time being, and distribution possibly at a later stage). However, the proposed directive would ban anyone from owning both kinds of business.³ Merely separating these businesses will not reduce concentration within energy markets. However, the EC says that the complete separation of trading businesses from networks is needed to remove conflicts of interest that are hindering competition.



Sectoral conflicts of interest

The EC acknowledges that one aim of OU is to remove the potential conflict of interest between (1) vertical integration and (2) transparent and non-discriminatory network access. Vertically integrated companies trade energy over their own networks. The EC fears that such companies have no interest in providing transparent network access, since transparency would help their competitors. The EC proposes Ownership Unbundling as a way to remove that conflict of interest (although the EC may stretch the term to include “Independent System Operators” that lease network assets from conflicted companies, as well as formal separation of ownership).

National conflicts of interest

Behind the 3rd package is a second aim that is not so widely acknowledged. National goals sometimes conflict with the goals of the single European energy market. The proposed directive awards additional powers to the EC (or to a formal EU-level agency overseen by a committee of national energy regulators). These powers are intended to remove (or at least reduce) the ability of national governments to favour domestic producers or domestic consumers over pan-European interests. See box on Page 3.

Thus, the 3rd package is intended to resolve conflicts of interest at two levels—vertical integration within national markets, and conflicts that cross state boundaries. In practice, the 3rd package will not resolve both these problems unless OU is combined with other—in some cases fairly radical—measures, as explained below.

The EC maintains that OU is necessary to guarantee transparent and non-discriminatory access to energy networks. Transparency and non-discrimination are necessary pre-conditions for efficient competition in the single energy market. However, these conditions may not be sufficient to achieve the EC’s long term aims. A major effort to impose Ownership Unbundling would come to nothing, if it fails to resolve the underlying conflicts.

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NERA Economic Consulting is an international firm of economists who understand how markets work. Our more than 45 years of experience creating strategies, studies, reports, expert testimony, and policy recommendations reflects our specialisation in industrial and financial economics. Our global team of more than 600 professionals operates in over 20 offices across North and South America, Europe, and Asia Pacific.

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Box 1: Conflicts of Interest: Sectoral vs National

Imagine an investment project to build a cross-border transmission line for exporting electricity from country A to country B. The effect of increasing exports from A to B is to increase demand in country A and to increase supply in country B. As a result, wholesale electricity prices rise in country A and fall in country B. Investors and governments will consider these effects when appraising the project and may take decisions that are economically inefficient.

Sectoral conflicts

A new transmission line from A to B would increase supply and reduce electricity prices in country B, thereby reducing the value of generation in country B. If the network companies responsible for building the new line also own generation capacity in country B, the investment destroys the value of their other assets. This loss of capital value will discourage investment, even if its total benefits outweigh its total costs.

If a network company owns generation capacity in country A, the situation is reversed—it may want to invest in a new transmission line, even if the project's total costs outweigh its total benefits. The new line would increase demand for generation and raise wholesale prices in country A, thereby increasing the value of its own generation in country A. This capital gain may encourage inefficient investment in transmission.

National conflicts

The government of country A may see it differently from the companies, if it cares more about (short-term) national consumers' interests. The project raises wholesale electricity prices and (most likely) prices paid by consumers in country A. The main beneficiaries are generators in country A, electricity traders and consumers in country B. The government in country A might decide that these benefits are insufficient to offset the harm to its consumers. The government would then find it difficult to justify authorising the new transmission line, and may even use its regulatory powers to discourage the project.

The Effect is Sub-Optimal Investment Across the EU

Thus, an investment in cross-border transmission lines might be efficient at European level, but local interests may combine to stop it from going ahead (particularly, government and consumers in country A, generation in country B).

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To ensure that the 3rd package makes a serious contribution to the single energy market, the EC needs to pursue three more policy goals—efficient cross-border despatch, security of supply and security of investment. Below I explain why these three policies are necessary.

Efficient Despatch and Investment at Regional Level

First, recognition of national conflicts of interest should lead to pressure for pan-European—or at least multi-state—efficiency in despatch. Currently, electricity markets allow traders to optimise the use of generation capacity up to a day ahead of delivery, or in some markets up to an hour to two ahead of delivery. However, many balancing “mechanisms” that determine despatch from that

time onwards operate with limited or muddled objectives and are constrained by short-term limits on cross-border flows. A truly efficient and transparent market would operate efficient despatch across an area (a ‘region’) that is wider than the national state. It would require the creation of regional system operators, charged with optimising the use of generation and reserve capacity across several states. In recent work for three TSOs who were dedicated to collaborating with one another, a NERA team still identified a number of national interests that would prevent effective regional optimisation, such as:

- Reluctance to alter cross-border flows after the end of trading and within an hour except in “emergencies”;

- Inability (therefore) to re-optimize despatch at short notice over the whole multi-state area;
- Reluctance to share and optimise reserve capacity (in case it might be more readily available to consumers in one country more to consumers in the other countries); and
- Inability to agree how to share total costs over all consumers in the multi-state area, rather than on a national basis.

Overcoming these obstacles to efficient operation of the energy system requires the creation of multi-state system operators that are not only independent of trading interests, but are also independent of national interests, and which therefore must be regulated by supra-national regulatory authorities.

Our Practice

NERA is at the forefront of the continuing transformation of energy industries worldwide. Our experts have developed approaches for introducing competition in segments such as power generation and gas supply, where competition is workable, and for improving the regulation of sectors where it is not. We work with companies, governmental bodies, and regulators worldwide to design competitive gas and electricity markets and to develop tariffs and rules of access for regulated transmission and distribution systems for electricity and gas, and the transport of oil and oil products.

NERA helps companies develop strategies for exploring new opportunities and minimising new risks, including issues related to climate change and other environmental initiatives. We also help our clients to develop new regulatory strategies, and support them with analysis and testimony before regulatory commissions, antitrust and competition policy agencies, and domestic and international courts.

Our work includes designing and conducting energy auctions and providing strategy and valuation advice on mergers and acquisitions, the financing of energy companies, and the financial restructuring of distressed companies.



The governments of Central/Western Europe (CWE) comprising Benelux countries, France and Germany, have initiated the Pentalateral Energy Forum (PEF) in order to improve cross-border electricity exchange and security of electricity supply in that region. This forum comprises governments and the European Commission, regulators, network operators and other market participants like electricity exchanges or market players.

In its memorandum of June 2007,⁴ the signatories of PEF committed themselves to provide resources and support to achieve the overall aim of enhancing market integration and security of supply in the CWE region. These are laudable aims, but the forum will only succeed if the member countries are willing to replace multi-lateral cooperation with a supra-national regional authority able to override their national interests.

The same applies to decisions on investment in cross-border transmission capacity. At present, such decisions are subject to national considerations. Every electricity market needs a transmission planner with the power to direct someone to make an investment. A truly pan-European market

requires both an Independent Regional System Operator (“IRSO”) subject to a duty to appraise investments at regional level, and a regional regulatory authority (“RRA”) that will take the same regional (i.e., supra-national) view.

The 3rd package foresees the creation of more independent national regulatory authorities and an “Agency for the Cooperation of Energy Regulators” (ACER). However, it will not give the ACER power to override national governments or regulators who continue to exercise their powers in a purely national interest.⁵

Market Designs to Promote Security of Supply

Increasing concern about European security of supply in the European energy sector needs to be converted into action on the design of electricity markets. So far government-sponsored incentives to invest have been limited to favoured types of projects which would not survive in a competitive market—primarily the various forms of generation using renewable energy. However, other forms of generation also need efficient investment incentives and so far governments have given little attention to this part of the market, as opposed to energy trading. Closer attention to market design would

ensure that prudent investors build the right kind of capacity in the right place at the right time.

Electricity markets can provide such incentives in a number of different ways. Some markets rely on capacity obligations, whereby each retailer must build or contract for a share of total capacity requirements. Some markets provide a capacity payment to all capacity—a sort of centralised “option fee”.⁶ Some markets have no explicit schemes for rewarding capacity and only put a price on energy. However, even if electricity market designers rely solely on energy prices to encourage investment, they need to ensure that market incentives are not being undercut by low (or arbitrary) pricing of imbalances.

Imbalances are the inevitable differences between (1) contracted power flows into and out of the market (i.e., generation or consumption) and (2) actual power flows into and out of the market. The pricing of these imbalances is determined centrally by formal rules, not by bilateral negotiations. Market participants may not control their imbalances completely, but they can take steps that either increase or decrease them—which is equivalent to buying from or selling to the balancing mechanism. Through the



normal rules of arbitrage, the prices of imbalances compete with the prices in all other markets. Thus, even if the markets for electricity contracts are competitive and liquid, they will not provide incentives for efficient investment in generation if the prices for imbalances are too low or otherwise distorted.

The rules for setting imbalance prices need to meet three conditions:

1. Imbalance prices must signal the marginal cost of producing energy (or of reducing consumption) at any time;
2. Imbalance prices must reflect the high marginal costs of building capacity to produce energy (or of shedding high value load) when the market is short; and
3. Imbalance pricing rules must let traders sign contracts that hedge against the risk of imbalance prices to avoid encouraging autarky.

The success of Nord Pool can be attributed largely to its ability to meet these conditions. Several other European imbalance markets do not meet them yet. Some imbalance markets still use fixed tariffs, although that is becoming less common. Some markets apply rules that keep imbalance prices below marginal costs.⁷

To provide efficient incentives for efficient investment in generation capacity, wholesale market prices—and prices for imbalances—must also signal the different value of electricity in different locations. The definition of these locations is not straightforward. Defining different prices for every node on the network has proven successful in some parts of the US, but such computerised pricing methods may create anomalies or lack transparency. On the other hand, grouping traders into large “virtual” markets covering wide areas is not always desirable. Electricity at different points within a wide area is not always equivalent. Hiding real differences will create inefficiency.⁸

Market prices should therefore be differentiated enough to promote efficient choices about the location of production capacity, transmission capacity and energy production. This may require reconsideration of the current tendency to unite separate areas into a single market, without giving much thought to the effect of transmission constraints between them. The 3rd package could have encouraged market splitting where it increases the efficiency of investment and production of energy (rather than focusing on trading).⁹

The 3rd package could also have included obligations on the relevant national (or regional) authorities to adopt efficient—and common—designs for the institutions that support wholesale electricity markets. These designs could include: balancing markets; despatch rules; the pricing of energy imbalances; and the pricing of capacity incentives (if deemed necessary). Instead, the draft directive on electricity markets only expresses a desire for “harmonisation” of market rules and obliges national regulators to pursue a European electricity market (without any specific recommended design).

Changing market systems to create new market areas and new prices will change the value of investments in generation. The beneficial effect of efficient incentives will be lost, if investors can only hedge against these changes in market rules by spreading their risks, that is by investing in different types of generation in different locations. Regulators should be obliged to help individual investors recover the stranded costs of investments which lose value simply because of regulatory changes in market rules. Such obligations minimise regulatory risk and maintain efficient investment incentives, which raises a final point—the need for greater security of investment against regulatory risk.

Security of Investment

In the European Union’s electricity and gas sectors, investors in long-term assets have little legal protection against regulatory decisions that deny them the right to recover their investment and to earn a normal rate of return. This lack of protection discourages investment (or raises the rate of return investors will demand before investing). National regulators and the EC may fret about lack of investment in cross-border transmission, but little will change until investors have stronger protection against arbitrary regulatory decisions. Private investors will prefer to take the short-term profits from congestion management, rather than the promise of a long-term return on investment in relieving congestion. Investment in networks will in the meantime rely on state-owned companies and state-sponsored projects.

The long, drawn-out legal battles that eventually defined investors’ rights in the US utility sector are outlined in the box to the right. These rights do not provide a guarantee of cost recovery. Instead, they provide a rational basis for investing in monopoly network assets whose returns depend entirely on future regulatory decisions.¹⁰ Providing such security of investment requires some restriction on national regulators’

freedom of action. Consumers benefit from this counterweight to the regulatory risk, because it makes investors more willing to commit funds to irreversible investments (i.e., it lowers the cost of attracting capital into the sector).

The proposed directive says in Article 22b that all national regulatory authorities must, among other things, ensure “the development of secure, reliable and efficient systems”, from

which might be derived a need to promote efficient investment and hence the same need to attract capital that underpins US regulatory systems. Europe therefore seems to be struggling with the same battles—but could short-circuit the process by adopting all the elements required to attract capital at the same time (i.e., comparable rate of return, opportunity to recover all costs, open and transparent and evidence-based decision-making procedures).

Box 2: Defining Investment as Property Rights

Experience in the US is instructive. A long battle in the 19th century between the energy industry and government ended with a Supreme Court case confirming the government’s the right to regulate the prices of monopolies (*Smythe vs. Ames*, 1898). There then followed another long battle to define what rights were associated with ownership of investment in regulated utilities.

The US Supreme Court established first that regulators should offer utility investors a return that was comparable with the returns offered by other sectors of the economy, after allowing for differences of risk, location, etc (*Bluefield Water*, 1923). Another US Supreme Court case confirmed that government agencies were obliged to give investors the *opportunity* to recover the costs of their investments after recovery of operating costs (*Hope Gas*, 1944).

Taken together, these two decisions are usually described as the obligation of regulators to offer a rate of return sufficient to *attract capital* into regulated businesses. The Administrative Procedures Act 1946 ensured that regulators’ decisions met this standard, by ensuring they were open, transparent and based on evidence.



The EC wants to overcome the disincentive to invest in transmission, but there is immense confusion about investment incentives in Europe. Some fear that transmission companies would not invest to relieve congestion, because they would lose revenues they earn from auctioning constrained capacity. However, few (if any) transmission companies are allowed to keep those revenues. In practice, transmission companies compensate for such receipts by lowering charges to other network users, so that their total revenues stay within a limit. What matters for investment incentives is how regulators set those limits on total revenues, and how they include the reward for investment in those revenues.

Some EU documents say networks must set tariffs that reflect their costs,¹¹ but regulators face no equivalent obligation to provide an opportunity for cost recovery, as long as investors have acted in a prudent or reasonable manner.¹² Instead, monopoly networks remain vulnerable to regulatory policies and methods that put long-term cost recovery at risk *without good reason*.

As a general rule, regulatory laws should oblige regulators to set revenues at a level that offers networks a reasonable prospect of recovering their total costs

(meaning their operating expenses, depreciation and the cost of capital, i.e. total costs including the required return on assets). The EU's 3rd package could have enshrined a statement of this kind in EU or national laws. That would have given investors more confidence to invest in network businesses whose future revenues depend entirely on regulatory decisions.¹³

Conclusion

OU will offer a number of potential advantages, if it removes conflicts of interest within the energy sector and helps to provide transparent, non-discriminatory access to energy networks. However, OU won't achieve these goals unless it is combined with a number of additional policies. The 3rd package provides a useful opportunity to discuss a pan-European rule on OU. However, it could usefully have gone further, by discussing pan-European measures to override or constrain national interests in three significant areas:

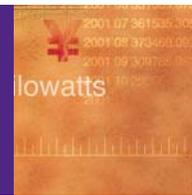
- by imposing a requirement (and creating the means) for efficient despatch, investment and regulation at the regional (i.e., supra-national) level;
- by setting down some common EU-wide standards for the design of electricity markets that promote both efficient investment and efficient risk management; and

- by providing investors in regulated utilities across the EU with common legal protection of their investments against unnecessary regulatory risk.

With these three measures in place, EU energy markets would begin to offer a stable and predictable environment for investors, with less inefficiency caused by conflicts between narrow national interests. Ownership Unbundling could then achieve its full potential to promote efficiency by removing conflicts of interest within the sector.

NOTES

- 1 Proposal for a directive of the European parliament and of the council amending Directive 2003/54/EC concerning common rules for the internal market in electricity (presented by the Commission) COM(2007) 528 final 2007/0195 (COD), Brussels, 19 September 2007.
- 2 http://ec.europa.eu/energy/electricity/package_2007/doc/2007_09_19_impact_assessment_en.pdf.
- 3 Ownership unbundling in this way means that a person or company cannot hold shares in both a (transmission) network operator and a supply undertaking. But an individual investor can still have a minority stake in both supply undertakings and transmission network as long as these shares represent a non-controlling minority interest.
- 4 Memorandum of understanding of the Pentilateral Energy Forum on market coupling and security of supply in central/western Europe, signed at Luxembourg on 6 June 2007.
- 5 The 3rd package could provide a basis for creating such 'regional' authorities with supra-national powers – i.e., a regulatory authority bound by supra-national legal obligations and functioning independently of any national political interests. However, national governments rejected proposals for a supra-national regulator. Instead, the 3rd package includes the proposal to set up an "Agency for the Cooperation of Energy Regulators" (ACER). The ACER would only have limited decision-making powers over new infrastructure



- located in more than one member state; otherwise, the ACER can only encourage cooperation between national regulatory authorities, review decisions and offer proposals and opinions. It will be supervised by a board of national regulatory authorities, not a separate EU-level institution. The proposed directive would also allow the European Commission to reject the appointment of transmission system operators by national regulatory authorities, if they did not meet the conditions of unbundling. However, the EC would not acquire any role in the continuing regulation of transmission system operators.
- 6 The capacity payment is an option fee, in that it pays for the right, but not the obligation, to take electricity from generation capacity at a certain price. Markets that make a capacity payment also put a cap on energy prices as a quid pro quo. The cap is like the exercise price of the option, limiting the exposure of customers to high short-term market prices. This cap on short-term prices is inefficient relative to unconstrained market prices—but it may be less inefficient than other forms of regulatory intervention intended to prevent consumers from being exposed to high prices.
- 7 In 2001, the designers of the new market rules for England and Wales abandoned the principle of setting prices equal to marginal cost, in favour of an average price rule. Although it worked sufficiently well in conditions of surplus capacity, it quickly became apparent that the rule was underpricing electricity during periods of shortage and giving poor incentives to generators that were “supporting” the system (i.e. running a surplus when the system was in deficit and vice versa). Since 2001, therefore, the regulator has replaced the original rule with rules that are closer to the principle of marginal cost pricing. The price for imbalances that support the system is taken from short-term electricity markets. The prices for other imbalances now reflect the average price of the last 100 MWh of energy taken in the balancing market, effectively the marginal offer or bid. This rule has produced higher imbalance prices on some occasions, although it will probably not set prices high enough to reflect the value of capacity in a real shortage. The remaining problem concerns the multiplicity of imbalance prices. Market participants still receive one price for a surplus and pay a different price for a deficit. As a result, no two parties can be sure they are exposed to similar risks and they cannot sign financial contracts to hedge their exposure to imbalances. This problem harms market liquidity and also the prospects for market entry by independents, by encouraging large companies that rely on their own resources instead of trading.
- 8 It is often claimed that creating wider market areas will promote “liquidity”, because more generators, consumers and traders will be brought together in one “place”. In fact, the reverse is often true, as combining market areas reduces the need for trading to unite producers with consumers. Moreover, there is little point in promoting “liquidity” or even “competition” in a market for an imaginary product (i.e. non-equivalent output on different parts of the network).
- 9 This suggestion applies directly to electricity markets, where market splitting is common. Promoting correct locational signals in the gas sector requires several reforms too complex for detailed discussion here. The gas sector equivalent of splitting electricity markets is the creation of long-term tradeable contracts in point-to-point transmission capacity. Gas pipeline capacity can be defined much more easily than in electricity networks, so it is possible to create legal rights over transmission capacity on certain routes. Gas then acquires a different value, depending where it is located within these routes, and the value of gas will emerge through trading. Traders’ need to link gas supplies with a changing portfolio of gas consumers over fixed routes prompts them to reorganise gas contracts and pipeline contracts by trading. This trade creates much more liquid gas markets than entry-exit systems, in which all gas is deemed equivalent. (Compare the vibrant US markets with those in the EU.) The creation of tradeable rights over pipeline capacity also creates a market price for the capacity which encourages efficient decisions about use of existing capacity and investment in new capacity—provided that capacity is divided among sufficient competing contract holders. “Functional” unbundling of trading from networks does nothing to increase the number of potential competitors. However, “physical” unbundling of distribution networks from transmission networks would create powerful adverse interests. Independent distribution companies could hold long-term contracts for gas transmission capacity and could even decide where new investment in pipeline capacity should take place. The 3rd package does not consider these possibilities and indeed the proposed directive contains a new Article 17 that specifically permits combined transmission and distribution system operators.
- 10 This discussion focuses on returns to investment in networks, but investment in other parts of the energy sector depends in part on regulatory decisions, and so is covered by the same principles.
- 11 See for instance, Regulation (EC) 1775/2005 of the European Parliament and of the Council of 28 September 2005 on conditions for access to the natural gas transmission networks.
- 12 Indeed, some documents, including Regulation 1775/2005, suggest that networks should only recover their costs if they achieve a highly efficient level of operation. Applying that standard would give them less chance of recovering their costs than other sectors, including competitive sectors, where prices reflect only a normal level of efficiency. Hence, universal application of this standard would make it impossible for networks to attract capital for new investment.
- 13 As an extension of this principle, the EC should also permit recovery of sunk or fixed costs that are “stranded” due to regulatory decisions that (1) replace monopoly with competition or (2) change the rules on competitive market pricing. Such decisions often change the price that investors can achieve for the output of a productive asset, such as a generator, or a long-term contract (such as for the purchase of gas). Where the price falls, investors may find themselves unable to recover sunk or fixed costs. The risk of such decisions discourages efficient investment in favour of under-investment (high variable costs) and risk-spreading (investing in a variety of locations, instead of following signals to invest where it is needed). Moreover, a lot of the opposition to OU is driven by concerns over its effect on cost recovery (as well as the loss of monopoly profits). Allowing investors to recover sunk and fixed costs (which are not affected by incentives for efficiency anyway) would diminish opposition to reforms, since existing investors would have less to lose.

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