# THE COSTS OF MOVING TO A PERFECT WORLD:

# FORCED OWNERSHIP UNBUNDLING

# IN THE NATURAL GAS AND ELECTRICITY SECTORS

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## Introduction

The Commission is correct that a world of unbundled ownership is superior to one of integrated networks. Many people in the energy sector are hostile to the Commission's view, but the hostility often has simple explanations. Some hostility comes from integrated companies, whose obligations to shareholders compel a resistance to liberalization. Some hostility involves the desire for politicians to control the energy sector, as an instrument for implementing other policies than efficiency. Prominent examples of such objections include the complaint that unbundling will threaten credit ratings, and the alleged importance of national champions. After addressing the key objections to ownership unbundling, a general economic conclusion emerges. For anyone who believes in competition, there is no compelling synergy between the ownership of transmission networks and supply activities.

The key economic question is whether the Commission should insist on the transition to an ideal world, given the imperfect situation that Europe has inherited. At times the costs of moving towards perfection can exceed the benefits. The costs include the expense of political capital in the transition, and the costs of increased investor uncertainty. The transition is likely to undermine the property values of established companies, and compensation is not practical. Economists might call it "Pareto optimal" to compensate someone for the loss of a monopolistic advantage, but society finds it offensive. The key question is whether the expenditure of political capital and the possibility of investor uncertainty would together exceed the benefits of full ownership unbundling.

Experience suggests that the costs of moving to a perfect world are worthwhile. The costs of investor uncertainty should be considerably less than faced the British and North American gas industries in their transformation. Reform in those industries entailed rewriting contracts, undermining investor values, political turmoil, bankruptcy and close brushes with bankruptcy. However, the benefits of the transitions have been enormous, and now go largely unquestioned. With the Commission's legislative package, the key costs will be the loss of any ability to discriminate through network ownership. It is difficult to believe that these costs would have a lasting adverse impact on the investment climate that would exceed the benefits of greater competition.

The legislative package may impose unnecessary costs by offering ISOs as the only alternative to ownership unbundling. The costs of the ISO option are not limited to the complexity of regulation. ISOs impose a serious cost by assigning management to someone who lacks the long-term financial incentives of ownership. Experience has shown that a more modest version of management unbundling can support the development of effective competition in the gas sector while avoiding the inefficiencies of ISOs. The electricity industry is more complicated, and its experience is not yet clear.

The concept of partial ownership separation should pose a serious challenge to the ISO concept. Partial ownership separation entails the flotation of at least a minority share of network assets, plus provisions to protect the interests of minority shareholders. This approach can avoid the inefficiencies of ISOs, by preserving an alignment between the interests of management and the network owners. Partial ownership also reduces the burden of regulatory scrutiny, entrusting

the profit incentives of the minority shareholders to eliminate discrimination. Experience with partial ownership separation has been positive to date, and deserves serious scrutiny as an alternative to ISOs.

Partial ownership separation could also provide a superior platform for reciprocity with Russia. The Russian press has questioned whether the legislative package would preclude Gazprom from investing in Western Europe. Russia is in the early days of reforming the gas industry, and may not be ready either to split up Gazprom or adopt an ISO option. Floating a minority stake in the Gazprom pipeline network might prove more attractive to Gazprom, securing investment opportunities in Europe while improving the prospects for effective competition in the Russian gas sector.

## Full Ownership Unbundling: a Perfect World

If you ask an economist to design the electricity or gas industry for a new, unexplored planet, the resulting blueprint will likely involve full ownership separation. The debate over ownership structure has proceeded for decades, yet no one who believes in competition has identified a compelling synergy between the ownership of transmission infrastructure and the ownership of supply activities.

Interactions between the links in a vertical chain can inspire a list of possible challenges and problems. The unbundled owner of a pipeline network can take decisions that augment or reduce congestion in ways that affect supply businesses. An unbundled system operator might not particular care about the repercussions of congestion on supply businesses. Society could avoid such problems by having one company own and control all links of a supply chain. However, most economists would fear the market power of such a large company. The general preference is to let competition exert its discipline on the supply business, and to address the interactions with transmission separately. In the United Kingdom, formal programs give the operator of the pipeline system a financial incentive in reducing congestion costs. The UK approach might not be perfect, but economists broadly agree that efficient competition plus an incentive scheme is better than an integrated monopoly.

The current debate has raised two interesting objections to full separation. One is a general desire for national champions, justified by the perception that financial strength at home will translate into some advantage abroad. The other objection involves fears of credit downgrades if integrated companies divest their activities.

### The National Champion Argument

The national champion argument is a rather clumsy attempt to cloak political goals in economic arguments. In most countries, efficiency does not rank highly among the various policy goals for the energy sector. Higher ranking goals tend to include employment, regional development, stability, and independence in the event of war. Such goals tend to explain phenomena like the Spanish subsidies to its coal industry, the French preference for nuclear power, and the Dutch Government's policy to exhaust its gas reserves more slowly than market forces would warrant. Some of these policies may have proven economically advantageous, others not, but all were essentially political decisions. Most politicians find it difficult to resist the energy sector's ability to influence so many different policy goals. Efficiency often takes the back seat, in part because it is difficult to measure, and because it has a modest impact on everyone all the time. Policy goals tend to rank higher in importance if they have dramatic impact on small but politically important groups, or if they affect everyone dramatically at particular times such as wartime.

European legislation has raised the prominence of efficiency as a goal, and of competition as the instrument for achieving efficiency. Accommodating competition makes it more difficult to implement some of the higher ranking political goals for the energy sector. If EdF faces effective competition, it loses the luxury of building the types of power stations that the French Government might always prefer. Effective competition might prevent EdF from affording to

employ so many people or to pay certain categories of workers such high benefits. In the presence of competition, EdF might have to raise energy prices at times that are less convenient for the Government. As national champion, EdF might be able to tolerate losses at times when the Government needs to keep inflation low, retaining confidence in the ability to postpone price increases to more favorable times. More generally, having a national champion extends the government's political influence over the energy sector.

National governments cannot comfortably justify their desire for national champions in terms of the political goals described above. Instead, the governments appeal to economic concepts. The most common justification is that a national champion will prove more effective competing internationally.

Professor Michael Porter of the Harvard Business School has studied the determinants of competitive advantage. He has examined successful and poorly performing industries in various nations. He found that intense domestic rivalry was critical for establishing a company's comparative advantage internationally. A lack of domestic rivalry was associated with failures. Professor Porter explicitly rejects the national champion theory.

The national champion theory ignores the ability of smaller domestic firms to achieve scale economies by expanding operations abroad. The theory also ignores the important role of domestic competition in motivating improved performance and innovation. Domestic competition is particularly important because of its intense visibility. The failure of a domestic firm's foreign venture attracts less scrutiny, and more easily finds excuses. Below I provide relevant excerpts from Professor Porter's book:[1]

> Among the strongest empirical findings from our research is the association between vigorous domestic rivalry and the creation and persistence of competitive advantage in an industry. It is often argued that domestic competition is wasteful, because it leads to duplication of effort and prevents firms from gaining economies of scale. The right solution is seen as nurturing one or two firms who become "national champions," with the scale and strength to compete against foreign rivals.
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> A look at the successful industries in the ten nations we studied casts grave doubts on this viewpoint. Nations with leading world positions often have a number of strong local rivals, even in small countries such as Switzerland and Sweden.
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> These examples belie the simple notion that world leadership grows out of one or two firms who reap economies of scale in the home market. In global competition, *successful firms compete vigorously at home and pressure each other to improve and innovate. Additional scale is obtained by selling worldwide.*
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> * * *

[1] Michael Porter, *The Competitive Advantage of Nations* (1990), pp. 71, 117-22, 169.

*Vigorous local competition not only sharpens advantages at home but pressures domestic firms to sell abroad in order to grow. Particularly when there are economies of scale, local competitors force each other to look outward in the pursuit of greater efficiency and higher profitability.* In pencils, for example, the number two German competitor, Staedtler, concentrated very early on foreign markets because the industry leader, Faber-Castell, had a strong hold on the domestic market. Faber-Castell was, in turn, motivated by Staedtler's success to expand internationally as well. With little domestic rivalry, firms are more content to rely on the home market.

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The national champion argument is weakest when applied to the union of two different businesses: transportation and supply. Ownership separation has not reduced the scale of transportation businesses in Europe. Enagás, TenneT, and the National Grid remain national champions in control of their country's transmission networks, despite separation from supply businesses. Separation has not affected their scale or status as national champions, nor has it undermined the effectiveness of their former supply businesses. If their former supply businesses have lost the status of national champion, it is only due to someone else entering the market and providing the same service more cheaply. Unseating a national champion undermines the notion of efficient scale, since the challenger must have started from a smaller customer base in the relevant market. The general advantages of scale remain unclear, but achieving the optimum scale in generation or gas supply clearly does not require the ownership of transmission assets. The differences between transportation and supply render the scale in either of the two businesses irrelevant for competitiveness in the other.

A more subtle variant of the national champion theory has recently circulated in the European natural gas industry. Some people justify large gas companies as a counterweight to large gas producers such as Sonatrach and Gazprom. However, there is no reason to believe that a producer like Gazprom would sell gas at lower prices to companies that owned pipeline networks. Uniting a pipeline network with a gas supply business does not increase the amount of prospective business to negotiate with Gazprom, and therefore does not create any purchasing power. The leverage to negotiate with Gazprom derives from the availability of other gas sources. Gazprom would be negligent if it ignored the economics of competing gas sources, and instead sold gas at lower prices to customers who owned pipeline networks, passing up the opportunity to sell gas at higher prices to supply businesses like Centrica that have divested their networks.

**Fears over Credit Downgrades**

The press has reported the prospects of credit downgrades if energy companies separate the ownership of their transmission and supply businesses. The prospect of downgrades, however, does not inform the debate over ownership separation. The only relevance of the downgrades is to suggest the existence of cross-subsidies between transmission and supply. The Commission would naturally want to prevent cross-subsidies irrespective of the unbundling option chosen.

Imagine an integrated transmission and supply business: the integrated business has a credit rating of A-, while separating the two businesses would produce an "A" rating for transmission, and a "B" rating for supply. Some people might call the B rating for supply a downgrade, but appearances can be deceiving. If the supply business had the risk of a B-rated bond, then it

should have been paying a yield consistent with its rating prior to ownership separation. The concept of a downgrade should not apply. If the supply business had the good fortune to pay an interest rate consistent with the A- rating of the integrated company, then the supply business was enjoying a cross-subsidy provided by the financial strength of transmission. Only then would it be accurate to speak of a downgrade for supply.

The issue of a downgrade reveals one potential weakness in the existing unbundling rules. The Directives require structuring transmission and supply as separate legal entities, but do not explicitly address the links of debt financing among affiliated businesses. If the supply business wants to borrow money, the parent company should not offer the lenders the ability to tap the cash flow of the transmission business in the event of default. The supply business should borrow based solely on the full faith and credit of its own operations. The debate over credit downgrades was raised in the Netherlands, where the Government is requiring ownership separation of the gas and electricity distribution networks. Management of the distribution companies complained about prospective downgrades. The Government responded by portraying downgrades as evidence of inappropriate cross-subsidies.

## The Costs of Moving to a Perfect World

### Political Capital

In the absence of a compelling synergy between transmission and supply, opposition to ownership unbundling would appear to reflect political goals. An economist cannot presume to say that governments should attach primary importance to efficiency above the other political goals that typically shape the energy sector. Unless economists want to enter the political field, the most they can say is rather limited.

The principal contribution of economists is to point out that protecting national champions imposes a significant cost on society, and that the existence of a national champion opens the door to less transparent policy-making. If the goal is to protect workers in the energy sector or diversify the mix of power stations, it can still happen with full ownership unbundling and competitive supply markets. In a competitive supply market, the key difference is that the government must resort to more transparent measures to implement such policies, such as the systems for subsidizing renewables already implemented in the United Kingdom and Spain. Transparency tends to ensure better recognition of the costs and benefits of regulation, although it also sacrifices the flexibility to act quickly.

After pointing out the costs to national champions and the implications for transparency, economists cannot question the legitimacy of political concerns in France or Germany over ownership unbundling. If the countries are committed to opposing ownership unbundling, then the expenditure of political capital in the debate is a true cost for consideration. It may not seem intuitive, but abandoning an efficient reform can itself be efficient, if the expenditure of political capital would be excessive. Unfortunately, economists cannot quantify this aspect of decision-making. The Commission’s package already seems to anticipate this issue by offering the fall-back option of ISOs. The fall-back option signals that the fight for full ownership unbundling may not be worthwhile in certain countries.

**Investor Uncertainty**

Another cost of moving to a perfect world involves investor uncertainty. If the national champion of a Member State enjoys the monopolistic advantage of vertical integration, then either ownership separation or the introduction of an ISO will erode its asset value. The Commission's legislative package would change the rules of the game to create some clear losers. In theory we could design a system of payments that compensated the national champions for their loss of market power, and that still left consumers better off. This concept has inspired stranded cost compensation mechanisms in the energy sectors of many countries. However, society will not likely tolerate compensating a company for the loss of its ability to use the transmission network as a tool for discrimination. The most likely result from the Commission's package is the exposure of some national champions to financial downside without compensation.

When a change in law or regulation undermines asset values, society bears a general cost stemming from the resulting uncertainty. There have been clear losers in the transitions to competitive natural gas markets in the United States and the United Kingdom. Regulatory risk increased following the liberalization of the US natural gas industry. The share prices for regulated pipeline companies witnessed a substantial increase in volatility, and became more closely correlated with the volatility of the stock market as a whole, implying an increase in the cost of capital. Authors from The Brattle Group documented these changes in a textbook,[2] and have published extensively on the issue of regulatory risk.

A definitive evaluation of regulatory risk is impossible. However, the Commission's legislative package would impose substantially less regulatory risk than in the traditional context where regulators and governments have granted stranded cost compensation. A classic stranded cost problem arises when a power company has built a nuclear power plant under a regulated regime, which cannot recover its costs in a deregulated market. With the legislative package we are not talking about potentially stranded investments, but just the loss in value stemming from the abuse of networks. Companies cannot complain about this issue without confessing to a crime. Investors are unlikely to respond so strongly if they understand that losses in asset values relate chiefly to the lost ability to discriminate. Moreover, several European markets have made substantial progress in implementing non-discriminatory access regimes. Where third-party access regimes are strongest, ownership unbundling will tend to have less impact.

The key costs of forced ownership separation would entail a possible decline in asset values associated by a flood of assets to the equity markets. If the European market witnesses the simultaneous flotation of the French and German electricity and gas transmission businesses, the acquisition prices may be lower than under an orderly transition. Timing will be an important issue to consider when deciding upon the implementation of the legislative package.

[2] Kolbe, Tye and Myers, *Regulatory Risk: Economic Principles and Applications to Natural Gas pipelines and Other Industries* (Boston: Kluwer Academic Publishers), 1993.

**The Inefficiency of ISOs**

The Commission has discussed the costs of the complex regulation entailed in implementing and monitoring ISOs. Another source of inefficiency involves the absence of incentives to maximize the quality of operations at minimum cost.

International experience in both gas and electricity confirms that independent system operators will operate networks inefficiently unless provided financial incentives. Strong evidence comes from the success of incentive regulation schemes in the UK. In the first four years after privatization, the National Grid Company (NGC) had no financial incentive to reduce the costs of transmission constraints on the system. NGC exerted some control over such costs through its capital expenditures, maintenance activities and contracts for ancillary services with generators. NGC had faced financial incentives concerning service quality and the reduction of administrative costs, maintenance and capital expenditures, but had no direct incentive to reduce the costs of constraints. The cost of constraints more than doubled in real terms. The regulator, *Offer*, introduced an incentive scheme that offered NGC rewards for reductions in the costs of constraints, and potential penalties for increases. The costs of constraints fell by more than 20% over the first three years of the program, a savings of roughly £100 million per year. The scheme remains in operation in a revised form that is compatible with the new electricity trading arrangements.

In May 1998 the gas regulator published a report on gas balancing costs. *Ofgas* noted that [3]:

> Transco currently has no incentive to minimise balancing costs and yet has a very strong influence on costs borne by Shippers. On some occasions…it took balancing actions which had an extremely large impact on market prices, but negligible impact on the overall system balance.

In October 1999 *Ofgas* introduced financial incentives for Transco to minimise balancing costs,[4] using a scheme similar to NGC's. Transco would pay part of the excess if system balancing costs exceeded a target, but would retain some of the savings if balancing costs were less than the target. System balancing costs dropped from £12.4m in winter 1998/99 to £7.9m in winter 1999/2000, a reduction of more than one third.

In a shop that contains fragile objects, the owner often applies a strict policy to the customers who browse: "if you break it, you buy it." People accept this type of policy as an equitable allocation of responsibility. Economists have applied to this policy the notion of efficiency: it is efficient to impose on someone the costs of any damage caused. Creating an ISO introduces someone into a shop with equipment that is sometimes worth billions of euros. The ISO will not have efficient incentives to care for the equipment and deploy it properly unless the ISO is liable for the consequences of poor maintenance or use. Above I discussed two examples of inefficiency in the UK, which entailed interactions between transmission markets and supply. Typically, these

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[3] *Ofgas, An On-the-Day Commodity Market for the Gas Balancing Regime: A Consultation Document* (May 1998).

[4] *Ofgas, A Reform of Gas Trading Arrangements: Proposals and Consultation* (Feb 1999).

interactions account for a small percentage of total transmission costs. The inefficiency could be much greater if someone runs the network assets without owning them.

The natural solution would be to structure ISOs as for-profit companies with financial incentives to save costs. This approach offers the same sort of promise as the incentive mechanisms for independent system operators in the United Kingdom. However, incentive schemes for ISOs would confront a serious problem that does not exist for investor-owned transmission system operators in the United Kingdom. Any incentive measure could create distortions unless it replicates an ownership interest in the underlying assets.

An incentive to save on operation expenses could motivate the ISO to curtail the maintenance of capital equipment, reducing its useful life. The ISO might be indifferent to the degradation of equipment that it does not own. A comprehensive incentive scheme should therefore give the ISO more money if its behaviour also saves on capital expenditures. The independent ISO would then begin to care about the way that different types of operations affect the condition of the equipment. The independent ISO would begin to resemble the owner of the equipment.

It may seem straightforward to provide the ISO an indirect ownership interest via comprehensive financial incentives. However, in the process we would inadvertently reduce the ownership interest of the integrated utility. The integrated owner might not care so much about the condition of the machines, if the benefits of their good condition flow to the ISO.

An ISO incentive scheme could create a situation where neither the ISO nor the utility have a full ownership interest in the plant and equipment. Efficiency would therefore require movement to an extreme situation, where the passive network owner's interest resembled debt financing, far removed from the upside or downside associate with actual network performance. A rigorous incentive scheme would indirectly transfer the equity interest in the assets to the ISO. To succeed, such a scheme would require the ISO to raise significant capital. No one has the true interests of an owner unless it stands to lose money. To risk money you must first bring it to the table. Recall the analogy of the policy for customers in a shop: "if you break it, you buy it." Such a policy does not work unless you ensure that the person in the shop has the financial resources available to pay for the potential losses. The capitalization requirements of an efficient ISO could represent a significant cost to society, because investors in the ISO would reasonably demand a return on their committed capital. Consumers must pay for such returns in the regulated tariffs. In effect the perfect ISO must place a lot of equity capital at risk, which represents a waste given that the owner has already funded the network.

If an efficient ISO must bring capital to the table, then the only way to eliminate waste is to pay down the owner's equity capital in its network assets. Otherwise network users must fund returns on two investments: the owner's capital and the ISO's. However, eliminating this inefficiency would complete a circle. If the ISO brings capital to the table, and the owner reduces its capital simultaneously, all may be efficient but we have in effect forced a sale of the network, and implemented forced ownership separation.

To summarize, ensuring ISO efficiency implies an end state that approximates forced ownership separation. We can reach the end state more directly with a sale of the equity interest in a network. It makes less sense to arrive at the same end state circuitously, through a succession

of ever more comprehensive and efficient incentive programs for the ISO. If society stops short of the most comprehensive incentive programs, it will pay the cost of continued inefficiency—a cost that has not yet received prominence in the legislative debate.

## Possible Alternatives

### Distinguishing Between Natural Gas and Electricity

Pessimism concerning independent ISOs may seem unwarranted given the apparent popularity of the concept in the United States. Many power markets have involved the creation of independent system operators, which operate the high-voltage electricity transmission network. However, high-voltage transmission involves unique issues.

Evidence suggests that it is more difficult to ensure the competitive neutrality of network ownership in the electricity industry compared to the natural gas industry. In the United States the FERC has advocated the use of Independent System Operators (ISOs) in the electricity industry, but not the gas industry. In its March 2002 working paper on electricity market design, the FERC complained about continued discrimination in electricity transmission despite strict unbundling requirements and non-discriminatory access rules.[5] The FERC concluded that:[6]

> [t]o assure fairness and transparency for all market participants, an entity independent of the market participants must administer the imbalance energy markets that are to be part of the standard market design[.]

The FERC's concern with independence arises in part from the daily intervention of transmission system operators in generation markets.[7]

> [e]lectricity [transmission] systems must balance supply and demand in real time. In electric networks, this balance is generally achieved by adjusting generator settings (energy production) rather than controls on the electric transmission network itself (….).

In comparison, gas transmission networks do not require constant interference with the gas production or storage market. Competition has developed successfully in the United States gas industry without ISOs. The FERC's strategy in the gas industry has relied exclusively on non-discriminatory open access rules, legal unbundling, and management unbundling. Although the market is not perfect, complaints of discrimination have been relatively few.

In the United States, ISOs also seem necessary to ensure inter-operability between connected electricity networks. In contrast, the United States gas industry has successfully ensured inter-operability by developing operational standards and relying on agreements between connected networks. Inter-operability is a far greater challenge in the United States electricity transmission

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[5] The Federal Energy Regulatory Commission, "Working Paper on Standardized Transmission Service and Wholesale Electric Market Design" (March 15, 2002), p. 2.

[6] *Ibid.*, p. 5.

[7] *Ibid.*, p. 12.

industry because of the number of different networks involved. Integrated electricity markets can include the transmission networks of up to 40 different companies.[8] The interactions between connected electricity networks can be much more complex than for interconnected gas networks. The FERC highlighted that:[9]

> [e]lectric [transmission] systems are affected by the operation of other electric systems in the interconnection (i.e., loop flow and parallel flows as externalities affecting all transactions on the grid)[.]

In contrast:[10]

> [g]as pipelines rely on controls on the gas transmission network to balance supply and demand and do not face significant interaction and interdependency effects.

The FERC concluded that:[11]

> [T]hese differences in the operations of the systems argue for different systems for handling imbalances. On a gas system with storage, a small daily imbalance may have little or no operational effect and not threaten service to other customers. But on an electric transmission system, a similar imbalance could threaten service reliability unless the imbalance can be cured in real time. Consequently, while there is no need for centralized regional coordination on a gas system, such a need exists for an electric system[.]

International experience suggests that the alternative of ISOs may be reasonable for the electricity industry, but it is clearly not necessary for the success of competition in the natural gas industry. Some reinforcement of unbundling rules would be desirable in the natural gas sector, such as a restriction on funding a supply business with debt that has recourse to the credit-worthiness of the transmission business. However, the degree of unbundling in the gas sector need not proceed to the level of creating an ISO. A useful avenue for compromise is to consider distinctions between electricity and gas when the European Parliament and the Council finalize the legislative package.

### Partial Ownership Separation

Partial ownership separation would involve the creation of separate equity shares for the supply and transmission businesses, which investors could buy and sell separately. However, a holding company could retain full ownership of the supply business, and majority ownership of the transmission business. Figure 1 illustrates the concept assuming the forced sale of 20% of the transmission shares.

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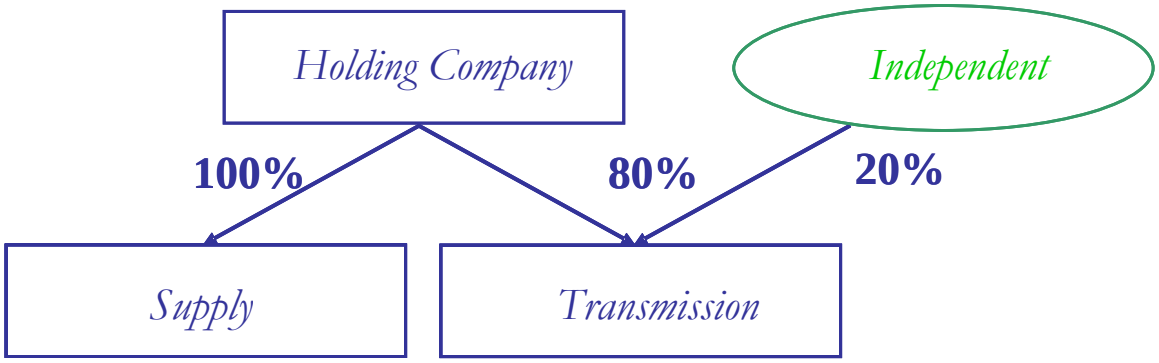
[8] There are: 6 member systems in the New England ISO; 7member systems in the New York ISO; 15 member systems in PJM; 40 member systems in the MidWest ISO.

[9] The Federal Energy Regulatory Commission, "Working Paper on Standardized Transmission Service and Wholesale Electric Market Design" (March 15, 2002), p. 12.

[10] *Ibid*.

[11] *Ibid*.

**Figure 1: Partial Ownership Separation**




The holding company would retain the option to sell supply and transmission either together or separately. However, regulations would prevent any owner or owners of the supply business, either alone or collectively, from owning more than a certain percentage of the transmission business.

Partial ownership separation relies principally on shareholder protection laws to prevent discrimination. Any preferential treatment of the supply company would tend to reduce the share price of the transmission company. Deliberately reducing the value of the transmission company would violate corporate law, which requires managers and directors to act solely in the interests of their company's shareholders. The majority shareholder in the transmission company might not mind, since the abuse of the transmission company would simultaneously increase the value of supply-company shares. However, the minority shareholders would certainly mind, and could threaten law suits.

It may not be obvious why discrimination in favour of the supply business would harm the transmission company. While financial abuse or deliberate underinvestment would clearly harm the transmission company, the abuse of confidential information may not seem to impose any immediate costs. However, minority shareholders will see no potential for financial benefit from such conduct. Minority shareholders would only see the potential for financial harm, including the possible payment of penalties if someone could prove such conduct in court or to a government authority with the ability to impose fines. Minority shareholders would also fear damage to the reputation of their company, and would put pressure for managers and directors to behave appropriately. Even if managers and directors did not fear personal financial liability, pressure from minority shareholders would increase the risk of public chastisement and damage to careers and reputation.

Partial ownership separation does not find its inspiration solely in the potential for conflict or antagonism by minority shareholders. Managers of the transmission company would logically receive some equity shares as part of their compensation. Share ownership would align the financial interests of managers with those of the minority shareholders. Managers would have

independent financial motives to avoid cross-subsidies and to refrain from behaviour that might expose the transmission company to allegations of discrimination.

Partial ownership separation offers some advantages relative to 100% forced ownership separation. Forcing 100% ownership separation would presumably require a wave of sales of companies within a limited time frame, which could depress share prices and require the payment of large fees to investment banks. If energy companies only sell minority shares in their transmission businesses, then the stress on the market would logically be smaller. Investment bank fees should be smaller as well, since they typically depend on the size of the transaction. Partial ownership separation could also avoid the costs of inefficiency associated with ISOs. The same company would both manage and own the transmission system. Finally, partial ownership separation could avoid the costs of excessive regulation associated with ISOs. Monitoring costs should be lower if managers have natural financial incentives to refrain from discrimination, and if minority shareholders have natural financial incentives to avoid inappropriate conduct.

A cynic might fear continued discrimination and the abuse of minority shareholders under partial ownership separation. Perhaps a cynic would fear inappropriate conduct by the board. Board members appointed by the holding company could in theory invent excuses to dismiss managers who acted with excessive independence. The threat of lawsuits might not thwart inappropriate action by the board. Litigation can be expensive and protracted, and its outcome is never certain. Even when liability is certain, the prospective receipt of damages is not. Damages from certain types of abuse can defy easy quantification.

Companies in Belgium, Italy, and Spain have partially separated the ownership of their natural gas transmission and supply businesses to address concerns of discrimination. In each country the natural gas transmission network has created some shares that trade freely on the stock exchange, while a holding company continues to own other shares jointly with a national supply business. Each company has adopted supplementary rules to protect minority shareholders.

The Commission has indicated that dawn raids and the sectoral inquiry have revealed the persistence of discriminatory conduct in certain companies. An interesting question is whether such conduct occurred in the TSOs that have implemented partial ownership separation. If so, then the next step would be to compare the arrangements among the TSOs with partial ownership separation, and to see whether different corporate governance rules or the different proportions of floated shares made a difference. Exploring partial ownership separation, and testing its power by reference to existing experience, could offer an attractive alternative to TSOs.

Partial ownership separation could also provide a superior platform for reciprocity with Russia. The Russian press has questioned whether the Commission’s legislative package would preclude Gazprom from investing in Western Europe. Russia is in the early days of reforming the gas industry, and may not be ready either to split up Gazprom or adopt an ISO option. Floating a minority stake in the Gazprom pipeline network might prove more attractive to Gazprom. A partial flotation would raise some capital to facilitate further Gazprom investment in Europe, would satisfy the reciprocity requirements with the European Member States, would permit Gazprom to retain majority ownership of its transmission network, and would improve the prospects for effective competition in the Russian gas sector.