

# 1 The Liberalization of Energy Markets in Europe and Italy<sup>1</sup>

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## *1.1 INTRODUCTION*

The electricity and gas market are experiencing since the second half of the Nineties a wide and complex liberalization process across Europe. The European Directives and the national plans have designed a common path for energy markets built on the principles of Third Party Access to the transport networks, of unbundling of the incumbent activities and of demand opening.

Several key points must be addressed in the implementation of the liberalization process, that pose both theoretical and political challenges. Among them, we can mention the redesign of the horizontal and vertical structure of the industry, the privatization of the incumbent, the separation of the network segments from the potentially competitive ones, the role of regulation in guaranteeing a non discriminatory access to the network infrastructures, the development of a competitive environment.

The experience of liberalization policies can be analyzed according to two steps, that have a temporal and a logical link. The first is the creation of a level playing field for new entrants through the principle of Third Party Access. However, this is only a necessary condition for the second step, the development of competition in energy markets, since entry is not synonymous of competition. There are, in fact, many ways in which a small new entrant can find profitable market niches that do not really threaten the incumbent market power while sharing with it monopoly rents. The liberalization policies, therefore, have to closely monitor the two phases of market opening and of

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<sup>1</sup> Paper presented at the Conference "Monitoring Italy". We would like to thank Maria Maher and Pippo Ranci for their comments and the Conference participants as well as seminar audience in Padova for helpful comments.

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competition development.

In this paper we review the recent experience of liberalization policies in the European countries, with a particular focus to the Italian experience, following this two steps approach. In section 1.2 we discuss the main economic issues that must be addressed in the design of a liberalization plan. Section 1.3 presents the main features of liberalization policies in the member countries, while section 1.4 gives a closer look to the Italian experience, with a discussion of the open issues in the liberalization process.

## *1.2 LIBERALIZING THE ENERGY MARKETS: THE KEY ECONOMIC ISSUES*

In this section we review some of the main controversial issues in the liberalization of the energy markets. Most of them will be treated again in section 3 with a focus on policy practice at the European and national level, and in section 4 with a reference to the Italian experience. However, we think that, before moving to the description and evaluation of the liberalization policies, a brief summary of the main economic themes underlining these processes is useful and needed.

### **1.2.1 Vertical and horizontal structure**

Large and integrated firms can often enjoy considerable economies of scope, of scale or of co-ordination depending on the degree of conglomerate (e.g., multi-product or multi-service), horizontal or vertical integration. This (supposed) pursuit of efficiency may sometimes be at the expense of competition, in that large firms are likely to acquire a strong if not dominant market position. Energy sectors display considerable problems of this type, especially as most of the times their current set-up has its origin in a long tradition of State monopolies, where horizontal as well as vertical integration were the rule.

Now we can separate and identify different issues on vertical, horizontal and conglomerate integration, which have been brought to the centre of the debate over the liberalisation of energy sectors.

#### ***Vertical integration***

It is widely recognised that competition is feasible in at least two segments of energy markets, i.e. the upstream (especially in electricity) and the final segment

(supply), while monopoly elements persist where networks (transport/transmission and distribution) are a key element. Competition upstream in the gas market is complicated by the concentration of gas fields in few countries, while the possibility to generate electricity makes things considerably simpler<sup>4</sup>.

The few theoretical contributions on the subject<sup>5</sup> acknowledge that while there may be some reasons why integration leads to greater efficiency, the development of competition is helped by separation. Therefore the relative desirability of integration is ultimately an empirical matter, and the debate between supporters of vertical integration and those who believe that only vertical separation can foster competition (and that this should be the decisive factor in deciding vertical structures) will probably never end. Let us review the pros and cons of the two approaches on the basis of the current experience.

In energy markets, the traditional benefits from vertical integration (lower transaction costs; no double marginalization; and so on...) are generally strengthened by two additional factors.

The first one is the need for better *technical co-ordination* of different phases of the production process. This is particularly true in the electricity market, where continuous balance between demand and supply is necessary; however, the functioning of an independent dispatch function (the Independent System Operator) seems to guarantee the required balance without particular problems even when vertical integration is abandoned. In the gas sector technical problems are relatively less prominent, and co-ordination is rarely regarded as a key issue.

The second one, that is mostly claimed in the gas industry, is the burden of *long-term investment in the upstream phase* (gas contracts; infrastructures), which supposedly require to minimize the uncertainty to sell the gas purchased in international markets. This claim certainly deserves attention, in that take-or-pay contracts are an important feature of gas markets at least for historical reasons. Take-or-pay (t.o.p.) contracts are signed between the owner of natural gas (often a large State owned firm from non-EU countries) and an importer who then resells the gas. These contracts – although several additional clauses may be introduced – envisage a fixed payment to the gas owner with the right for the buyer to get up to a pre-specified quantity of gas at zero marginal cost. If the buyer needs a larger quantity, this may then be purchased at a

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<sup>4</sup> Even if gas is a major input in the production process of electricity, and this implies a strict interdependence between lack of competition in gas and the development of competition in electricity – we will return on this point later in the paper.

<sup>5</sup> Vickers (1995); ...

positive marginal cost. The argument usually put forth is that the extractors need (and have the power to impose) to be covered from the market risk when they sink huge investments in extraction and transportation.

Although t.o.p. contracts pose serious problems to competition in the retail supply, as we'll argue later on, they do not necessarily require vertical integration. By breaking up the import contract into several subcontracts, there are ways to guarantee the commitments that the importer has *vis à vis* the foreign country without implying that the importer also plays a significant (and often dominant) role in the national markets. Another alternative to integration could be to sell the gas into a wholesale market where the payment system could be set-up in order to provide the necessary guarantee that take-or-pay obligations are fulfilled. We will later speculate on the type of wholesale market organization that can yield such a result, but it appears quite clear that there is no need to completely by-pass market mechanisms to guarantee that fixed costs are covered.

Finally, the advocates of the vertical integration solution should specify more carefully "integration with what". In particular, an independent transport network should be able to provide a perfect guarantee that the gas can reach the final client. Notice that this issue is somehow similar to the one arising in the electricity market, where it has been recognized that – given the nature of the problem that integration is trying to solve – long term contracts are very good substitutes for vertical integration, while vertical integration *per se* (i.e., without dominant positions upstream) is not a terrible problem for competition.

Having commented on the particular features of energy markets which potentially affect vertical integration, and having concluded that these reasons seem very weak, we can now take the other perspective, i.e. to analyze what kind of vertical market organization is better able to favor competition. The general current creed is that vertical separation of functions makes sense when it regards the network, which represents an essential facility. The principle of Third Party Access to the essential facilities is an almost general feature of energy markets, but – as we will see in more details in the section 2.2 – it is not sufficient to ensure that producing firms will actually be able to reach the final clients, competing on equal footing with the owner of the network. If the manager of the network is integrated with a firm which competes against others *through* the network, it has several means of unbalancing competition. To delay the permission to have access to the network, to claim that capacity is not available, to provide different levels of service quality to different entrants, are only examples of how a firm can make entry into its network complicated to its rivals.

Having an independent operator managing the transport network is considered a key aspect in the transition towards a reasonably competitive supply market. On the other hand, as long as gas and electricity are easily available wholesale, an integration between the upstream and the downstream segments is not a priori an equally serious concern.

The separation of ownership and control of the network is a less delicate issue, in that the actual key is the management of the system, not its ownership, as long as the owner is unable to hinder an efficient management. We will anyway return on this issue when dealing with access conditions and network development.

### ***Horizontal integration***

There is little of specific in the energy sector as regards the desirability of a de-concentrated industry structure. Economies of scale are limited in electricity generation, and even more so in the supply sectors. There may be some scale economies due to risk diversification in the research for gas fields, but in continental Europe gas is largely imported, and this is an activity where size may have as sole justification the apparent desire of the non-European gas owner to have only one counterpart in the transaction.

Competition downstream (supply) simply requires two conditions: access to the network and the availability of the product to be sold (gas or electricity). It is mainly an intermediation business, where the specificity of energy is limited: competition downstream is very easy, once competition upstream is sufficiently developed and network access is open. Competition upstream is both crucial – as it is the key for competition elsewhere in the sector – and more complicated, as it deals directly with the technical aspects of the production processes in these sectors.

In this field, the relevant policy issue is a bit less abstract than the one about the (non) existence of considerable economies of scale. Italy's tradition with State-owned monopolies calls for a more pragmatic approach: we start from (politically as well as economically) powerful monopolies and ask what is the most effective way of reducing their power, compatible with such power and entrenchment in the countries' industrial structure and energy policy. Two "extreme" alternative routes may be followed from this starting point. The first one is to force the incumbent to divest capacity (generating plants; gas contracts) until a "sufficiently" competitive structure has been achieved<sup>6</sup>. The second one is to block the incumbent's expansion, relying on entry as the force which will reduce prices.

Forcing an existing firm to divest until it reaches a size compatible with effective

competition is extremely difficult, but seems to guarantee the most immediate results. With a fragmented structure, prices are – somehow optimistically, perhaps – supposed to be set near the competitive benchmark. On the other hand, the second approach is more gradual and accepts that in the short run prices will be high, and that exactly such high prices will attract new firms in the market.

How effective is the entry process in such industries? Here, the difference between the two sectors might matter.

In the gas sector, in order to enter the market, a firm needs gas and access to the network. Both problems may appear banal, but may be formidable in practice, because international networks are not necessarily under EU jurisdiction, the available capacity is often limited and because the availability of gas itself is limited. One way to by-pass these constraint would be to ship the gas in the form of liquid natural gas (LNG), and then re-gasify it in terminals, but this yields high-cost gas: availability and access to these terminals is as important as the access to the networks, but does not guarantee that entrants will be very competitive. Some antitrust ceilings on imports may be a useful way to force the incumbent to divest part of its contracted gas, leaving room for new operators in the final market.

In electricity, the story may be partially different. Building generating plants takes time, but (if environmental and bureaucratic constraints are not insurmountable) an entrant can have a reasonable hope to have a competitive plant in 2-3 years since the decision to enter. Reliance on entry has been a main ingredient in the regulator's strategy in the UK, and at least in the medium run it seems to have been a reasonably successful bet. Notice that competition can also come from abroad. Strengthening international interconnections should be an important element in the development of effective competition: once this will be a reality, market concentration should be looked at from a totally different perspective.

### ***Conglomerate integration and multiutilities***

Finally, we have to mention that many firms in energy sectors tend to be present in both electricity and gas at a time, as well as in neighboring industries such as water, telecommunications, and so on. In this case, we talk about multi-utility firms. There are

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<sup>6</sup> When is an industry “competitive enough”? This is a very difficult question, which in theory should probably be answered on the basis of indices such as the Herfindahl index, which implicitly corresponds to a price-cost margin. It is hard to provide a theoretical basis for some of the answers given in practice (setting a maximum “antitrust” ceiling to the size of the largest firm in the market).

several examples of firms pursuing this strategy<sup>7</sup>, in the hope to:

- save on costs;
- provide customers with an integrated set of services (one-stop-shop);
- use their strong market position in one sector to induce “captive” customers to buy a bundle of services.

Again, apparently we face a trade-off between firm size (or scope) with potential efficiency gains due to scope economies, and the development of competition. However, if one considers more closely the situation, one can see that, if potentially competitive sectors are sufficiently open to competition, the presence of multiutilities should not represent a serious concern.

The first regulatory principle that should apply in cases where regulated firms are active in competitive markets as well is the separation of accounts, which allows to avoid cross subsidies. The risk exists, that regulated tariffs do not reflect solely the cost of the regulated segment, and that the multi-service firm manages to make regulated services' customers pay for costs not pertinent to the service. This would help the firm to compete with lower costs, and – cutting the link between prices and costs – would jeopardise efficiency. The separation of accounts helps a correct allocation of costs, and the question arises whether a deeper separation would be useful.

In this respect, total separation of firms operating in different sectors would prevent the exploitation of existing economies of scope<sup>8</sup> and is potentially inefficient; on the other hand, economies of scope exist because some activities involving different sectors are run jointly, and these common costs make an efficient cost allocation more difficult to achieve<sup>9</sup>.

From the viewpoint of competition, it would seem possible that a regulated firm, which operates in a market as a monopolist, leverages on its market power to obtain a dominant position in the market open to competition. This is a danger when this strategy cannot be replicated by other rivals; when other firms can do the same and there is sufficient competition, consumers will end up benefiting from the cost savings due to economies of scope. The key is therefore to guarantee the replicability of multi-utility strategies, which depends on actual market openness.

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<sup>7</sup> The list of firms could be very long. Enel, Edison, Vivendi (F), Centrica (UK) RWE (D), etc. Notice that the multi-utility strategy does not always lead to success stories. The recent withdrawal of the Snam group from the water business is only an example of this.

<sup>8</sup> These economies are documented by several studies and in particular by Fraquelli *et al.* (2002) for the Italian case.

<sup>9</sup> Notice that the very notion of cross subsidy becomes less clear as the allocation of common costs is somehow arbitrary.

### **1.2.2 Network access and network development**

The access to the transport and distribution infrastructures is a fundamental piece in the design of liberalization in energy markets. Although some technical features differ between electricity and gas, implying different solutions in the two cases, some common principles apply. In the short run, it is crucial to eliminate the incentives to foreclose the market for the owner of the network infrastructure. This issue entails both structural elements and behavioral ones. In a longer perspective, appropriate incentives must be designed to ensure that the investment is sufficient to maintain and develop the infrastructure. We briefly describe in the following the main problems and trade-offs.

#### ***Regulated network access and allocation of transmission rights***

Opening the network infrastructure to competitors is the core idea of the Third Party Access principle that has been adopted in the European Directives and in the national Plans. Here, we want to summarize the main economic and policy problems that must be solved in order to ensure a level playing field to the new comers.

The first crucial issue is the redesign of the proprietary and industrial structure of the industry, in order to eliminate the incentive of the network owner to distort competition downstream. It is well known that the basic externality comes from the fact that the access to the network enhances competition in the retail supply markets, modifying the distribution of market shares and profits. Hence, if the owner of the network participates also in the final market, giving access to a competitor implies a reduction in the downstream profits. Refusing the access, on the other hand, allows to keep the final market monopolized: an excessively high access price or a simple refusal to supply can obtain this result. But even if the dominant firm avoids complete foreclosure, for instance because it would trigger an antitrust intervention, high access prices can put the competitors in the final market at a disadvantage, reducing their ability to reach high market shares and preserving the incumbent profits.

The network owner has much lower incentives to foreclose if it has no direct activity in the final market, an example of proprietary unbundling. In this case its revenues depend on the access tariffs and its incentives to distort competition downstream may change. Here we can imagine different competitive scenarios. At one extreme, the network owner might offer a two part tariff to a single downstream firm, setting the access price equal to the marginal cost of the network service and the access fee equal to the monopoly profits of the final market. In this case, the equilibrium prices and profits are the same of the full monopolization case previously analyzed. This is an instance of

the so called leverage theory that predicts that an upstream monopoly will extend its dominance also to the downstream markets.

The leverage result is challenged using the Coase conjecture: once set the first contract, the incumbent has the incentive to offer additional contracts to exploit the residual demand not served by the first downstream producer. This latter anticipates that the incumbent will renegotiate, and will not accept contracts that prescribe output and payments different from the competitive level<sup>10</sup>. The argument concludes that the network monopoly cannot be extended to the (competitive) downstream segment.

How relevant is the Coase conjecture, and its optimistic implications on proprietary unbundling, depends on the ability of the network owner not to renegotiate its initial commitments: if no further contract is issued after the first one, we are back to the leverage theory argument of complete monopolization. Theoretically, there are at least two cases in which the commitment not to renegotiate can be realized : through exclusive contracts with the first producer, or by exploiting the incentives coming from repeated interaction, i.e. building up a reputation. While the former case can, to some extent, be discouraged through antitrust intervention, being based on verifiable contracts, it is much more difficult to identify the distortions coming from repeated interaction, where the private incentives of the owner are the only ingredient of the story.

To sum up, without proprietary separation the network owner has very high incentives to preclude, or at least limit, the access of competitors in the downstream market, vanishing the perspectives of liberalization. Once proprietary unbundling is introduced, the incentives are diminished, and in some cases an ex-post antitrust intervention might be sufficient, but still the possibility of foreclosure remains high. Overall, the need of access regulation seems a long run necessary solution for energy markets.

In a regulated access regime, we have to further consider the allocation of transmission rights, in particular in those circumstances when capacity is insufficient to satisfy all the requests as it is more common in the gas industry. If the network owner does not participate in the downstream markets, it is neutral towards the applicants. If the owner, however, participates to other segments of the market, managing limited capacity episodes can enhance its market power, and the regime of exemptions must be carefully scrutinized. Hence, the allocation of transmission rights should be separated from the transactions between upstream and downstream firms, either through proprietary unbundling or through regulation.

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<sup>10</sup>See on this point Rey and Tirole (2001).

### ***Access price and the incentives to invest***

Another fundamental problem with TPA is the appropriate level of access charges. Here we do not want to go through the wide literature on (optimal or practical) price regulation that applies also to the problem of access<sup>11</sup>. We simply point out the different problems that enter into the price setting issue. We shall discuss the variable and the fixed access charges.

The access charge variable component should be non discriminatory and cost-reflective. When the network owner does not participate in the other markets, this condition ensures that all the firms pay the same access terms, with no undue advantage of some competitors; moreover, the access price reflects the underlying cost conditions, with no double marginalization effect. If no proprietary unbundling has been realized, the two requirements imply that the competitors have the same access costs as those of the network owner affiliates active in the downstream market, with no competitive bias.

On theoretical grounds, variable access charges should reflect the cost of the transmission service, where the distance traveled should play some role. This is an important signal for firms when they decide their location, and therefore their point of delivery. However, this principle is not always easy to translate into a manageable rule, since the flow of the energy product, in particular in case of electricity, does not correspond to the contractual path implicit in the locations of the seller and the buyer. Moreover, additional effects on the transmission costs occur at the aggregate system level, in terms of balancing or unbalancing the overall flows.

The tariff structure should not only ensure non discriminatory and cost reflective terms to the competitors, but it should also give the right incentives to the network owner to maintain and develop the infrastructure. The fixed component of the access charge can be used for this purpose. The issue is complex, since the fixed fee should not only give the incentive to maintain and improve the existing network, but also be targeted to solve particular bottleneck problems. Once again we find that the task is made extremely hard in case of insufficient vertical separation: a bottleneck in the national transmission network can help preserving some local markets from competition when the incumbent also participates in the competitive segments. And a limited interconnection capacity with other countries prevents low cost foreign operators from supplying extensively the national market.

The multitask nature of access charges, both in the variable and fixed components,

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<sup>11</sup> See for a general reference Armstrong, Cowan and Vickers (1999) and Laffont and Tirole (1993).

remains one of the more formidable challenges for regulators, and has suggested to some commentators that the same goals might be reached more easily if the transmission networks would remain state owned and directly managed under the TPA principle.

### **1.2.3 Wholesale markets**

The wholesale segment of these industries is usually recognized as potentially competitive, but several questions remain open. The key issue is what we expect a market to produce and how we can realistically achieve these results. Let us start from some very simple points. First of all, we would like a market to yield prices in line with marginal costs. Moreover, fixed costs – when they exist – also need to be covered for firms not to stop production, and therefore competition must generate some mark-up over marginal costs or must envisage some specific payments to cover these costs. This is closely related (especially in electricity) to the incentive to build new generating capacity and to the need to have some reserve available, because demand varies over time and equilibrium must be achieved every instant.

Although the debate often revolves around market rules, for the market to be “efficient” the key aspect is how much competition there is in it, rather than its organization: the past experience seems to indicate that market organization is neutral relative to the answers to some of the key questions (which market set-up is better able to keep prices in line with costs and to provide incentives to investment).

Notice that the existence of exchanges in the electricity market is taken for granted in most cases, while it is rarely considered in the discussions about the gas sector. Probably the reason is that coordination problems are crucial in electricity – where continuous balance between unstorable supply and uncertain demand is necessary – while gas is storable and is therefore technically more similar to other commodities. For this reason, we will develop the discussion referring to electricity, although we will later argue that the introduction of an exchange in the gas market may contribute to a development of competition in that market.

### ***Compulsory exchanges and pricing rules***

Taking for granted that an (electricity) exchange ought to exist, we first want to ask whether it should be compulsory, i.e., whether all energy should be sold through it. The answer is not simple, although probably the relevance of the decision should not be overstated.

A relevant component of the public interest for a well functioning market lies in the informational role of prices. It is well known at least since Hayek that market prices play the crucial role of aggregating and transmitting information on the relative scarcity of goods, and a centralized market with one “equilibrium” price performs this important function. This could also happen when several prices are set in different transactions, but the clarity of the information embodied in “the” price is clearly superior. Having a centralized market where only one (official) price is formed in each period is probably particularly important in the initial phase of liberalization, when sellers and buyers are learning the rules of the game, and when the outcome of liberalization is still uncertain.

Having a compulsory market is often considered as a way to increase its liquidity, forcing operators to trade through the exchange. This should imply that the equilibrium price reflects the whole demand and supply, making market price responsive to all market transactions, probably less volatile and therefore more significant.

However, having a compulsory exchange does not mean forbidding financial hedging contracts such as the contracts for differences<sup>12</sup>: hedging is a natural way of dealing with risk, and price volatility can be very high in electricity markets. If a firm produces energy and hedges it through contracts of this type, however, it will be (almost) neutral to the result of the market game, in that its price is set by the contract, not by the market (Green, 2001). Therefore, that firm will not bid in the same way as firms whose energy is really paid the market price. As a consequence, a “compulsory” market where firms are allowed to sign financial contracts for differences may be not very different from a market where firms trade through long-term contracts and use the spot market only for residual transactions. The difference may be purely nominal.

On the other hand, declaring that a market is not compulsory may induce firms to decide “strategically” whether and when to bid into it. A non compulsory market may be completely marginalized, unless bidders believe that bidding into it is in their interest. It is a bit hard to figure out what the outcome of such “game” might be. And the necessary coordination among production decisions may not be achieved.

Is there a “better” alternative? The apparent lack of a convincing answer probably lies in the fact that the question may be badly set-up. There is not only one electricity market. To keep things simple, we usually have a spot *energy* market (also called day-ahead market), forward markets, a *power* market and a *settlement* (energy) market, where the imbalance between day-ahead transactions and actual demand and supply is paid for<sup>13</sup>.

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<sup>12</sup> See Armstrong, Cowan and Vickers (1999).

While the debate often revolves about whether or not the *spot energy* market should be compulsory, the most relevant issue is probably the settlement market. The spot market is *by its nature* residual: most buyers cannot wait until few hours before consumption to buy the energy they need. The settlement market is instead almost *necessary* (by definition, the imbalance between expected demand and production cannot be predicted by market participants) and the participation should probably be compulsory, as there is a general public interest that these imbalances are settled without uncertainties<sup>14</sup>. However, notice that the equilibrium price formed on the settlement market would not really reflect the scarcity of energy in a traditional sense, but rather the ability to predict demand, the size of last moment shocks and so on.

As for the debate between supporters of single price markets (*Poolco* systems) and *pay as bid* markets (*Neta-type* systems), current evidence does not provide any support to the thesis that *Poolco* systems bring about higher prices. The idea is that, given that all plants are paid the same price, a firm may increase the bids on marginal (high cost) plants. If they are not dispatched, anyway the firm does not lose much (the margin on those plants would be low), while the gain from a higher price may be substantial for the non-marginal (base load) plants the firm owns. Moreover, collusion may be enforced more easily with a *Poolco* market (Fabra, 2000).

Furthermore, a bidding behavior aimed at manipulating prices would be fairly easily detected by an antitrust authority and could be sanctioned as abuse of dominant position<sup>15</sup>. Finally, a *Poolco* market has the great advantage of transparency: in every part of the day, we have a unique price, which we can easily observe, in the same way as we can observe the marginal firm (responsible for the price, which may possibly be too high). When transactions are decentralized, there is a large number of prices, which are typically private information.

A *Poolco* market is probably more suitable in the first period of market operation, where market operators would like to see prices in order to understand to what extent the market works properly, and in any case where market power – whose abuse is more easily detected – is an important concern.

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<sup>13</sup>We also probably want an infra-day market, to allow adjustments once the bids have been accepted and the day-ahead merit order has been established; a system – possibly another market – to solve possible congestions; a system to settle in real time the technical constraints (reserve; primary, secondary and tertiary energy regulation) that might emerge almost at the last moment.

<sup>14</sup>Moreover, different conditions applying to the same difference between day-ahead plans and their actual realisations would be hardly justifiable.

<sup>15</sup>Notice that the existence of a dominant position may be established not only with reference to the whole market, but also referring to submarkets (e.g., a particular part of the day).

The limited relevance of the change in market rules on market performance is confirmed by an empirical analysis (Bower, 2002) which indicates that a dummy variable applied to the introduction of the New Electricity Trading Agreements (NETA) has no significant effect on prices in the UK, whereby the main reason for the decrease in wholesale prices has been the remarkable decrease in market concentration<sup>16</sup>. Traditional structural aspects seem to have an impact, while institutional engineering has probably had a mainly cosmetic effect.

### ***Competition and incentives to invest***

The classic trade-off between allocative efficiency and technical efficiency returns here with its full strength: the market should not only keep prices in line with costs, but also provide appropriate incentives to invest. This is a problem whenever production requires fixed costs, unlikely to be covered when the market is competitive<sup>17</sup>. For most plants, covering fixed costs is not necessarily a problem in a *Poolco*: prices reflect the marginal cost of the marginal (high cost) plant and are usually above the variable costs of other plants. Unless the market supply curve is very flat, this allows base load plants to cover their fixed costs. Infra-marginal and marginal plants have smaller rents at the margin and therefore covering their fixed costs is less easy.

Traditionally, there are two ways to cover these costs. The first one is to incorporate in the final price paid for energy a component aimed at covering the fixed costs of plants available for production. The value of this payment may be determined administratively (in which case, we typically talk about an *uplift* in the price for energy or about a *capacity payment* – terms that may evoke technically different mechanisms to achieve similar results) or through an additional market, the market for capacity.

A market without explicit capacity incentives will tend to display phases when energy is not provided. If the expected value of non-supplied energy is higher than the cost of the necessary additional plants, then setting up a system of incentives to investments seems preferable. This leads us to the second mechanism, through which fixed costs may be covered. Around the times where electricity is rationed, markets

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<sup>16</sup> Similar results are obtained by Evans and Green (2003), who however suggest that if collusion is less easy with Neta the passage from the Poolco system to a pay-as-bid one should end the collusion that was likely to exist in the UK before 2001.

<sup>17</sup> In energy markets, notice that we are *not* talking about incentives to develop the network (which are dealt with separately, through the regulation of the monopolistic segment), but rather about incentives to build production plants (not terribly relevant in gas, where the exploration phase has a totally different nature).

display massive price spikes of an order of magnitude of hundreds of times higher than normal, which are necessary to cover the fixed costs (especially of marginal plants). This has been the case in Victoria (Australia), with limited episodes of extremely high price peaks. The choice between the two systems has to do with the relative weight one attaches to price variability and in particular to the (political) acceptability of the price spikes.

### ***Price regulation in an open market***

A major concern in markets initially characterized by large incumbent monopolists is that market power is likely to remain as a long lasting feature of competition. As a corollary, the fear that prices will not decrease as much is quite common, and the consequent call for further public intervention even in these newly created markets is strong. This fear is supported by the British experience, where two dominant firms shared the market for several years, keeping price at levels, well above any conceivable competitive benchmark.

If the market power of the dominant operator is the main cause of worries, the most direct way would be breaking it up and/or encouraging entry. However, the Californian experience tells us that when capacity is limited, even relatively small firms may be “pivotal”, i.e. are decisive to serve the whole markets and therefore have the power to increase prices<sup>18</sup>. Moreover, in certain cases, breaking up the incumbent is considered politically impossible (or undesirable if international competition is relevant and size matters in international deals), and so the proposal is put forward, to introduce price caps, such that bids higher than a given value will be automatically cut to the level specified in the cap.

Any intervention in “free” markets is looked at with suspicion by the vast majority of economists, and here we have little to add to this general perplexity. Only three comments are in order. First of all, referring to the previous discussion of incentives to invest, notice that having price caps may prevent the spikes which – absent *capacity payments* or the like – allow firms to cover their fixed costs. Therefore, they seem consistent with security of supply only when some capacity incentives are envisaged, which make price spikes totally unnecessary. Second, production costs are “more or less” known, but in a market with the technical complexity of the electrical one asymmetric information is still widespread. Therefore, setting a “competitive” benchmark

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<sup>18</sup>Borenstein, Bushnell and Wolak (2002).

which firms are not supposed to trespass is an extremely difficult exercise. Finally, this is also a *risky* exercise. Price caps – below which the market is “supposed” to behave competitively – often work as coordinating devices, which make it easier for firms to single out a reasonably high price on which to co-ordinate their bids.

#### **1.2.4 Competition**

The creation of non discriminatory access conditions to the network infrastructure, eliminating barriers to entry in the competitive segments of the energy industries, is a necessary, but not a sufficient condition for a competitive market. New entrants, in particular when they face a dominant incumbent, have very low incentives to challenge the market position of the large firm. The Industrial Organization literature suggests several ways in which competition can be relaxed in such situations.

Collusion between the incumbent and the new firms is a possibility, although we have to point out that in liberalized markets we find both favorable and negative effects. On the negative side, the asymmetry in market shares is usually considered as a factor that makes an agreement less likely to reach and sustain<sup>19</sup>; on the other hand, the existence of a recognized dominant firm makes it easier, even without an explicit agreement, to solve the coordination problems that are endemic in a cartel.

Another interesting reference that can shed some light on the interaction in newly liberalized markets is the so called “judo economics” model<sup>20</sup>, dealing with a market where an incumbent faces the entry of small firms, characterized by a limited capacity and decreasing returns. The dominant firm faces an alternative between pricing aggressively and forcing the exit of the rivals, or tolerate them. This latter is the more profitable option, provided that the fringe of small competitors is able to supply only a limited fraction of the market. The incumbent, in this case, becomes a price leader, acting as a monopolist on the residual demand once the small firms have used their capacity. Even in this case, market prices do not fall with entry, as in the case of collusive practices.

Cartels and price leadership are two examples, drawn from the general IO literature, of the difficulties we meet in creating a competitive environment in liberalized markets. We discuss now in more details two models that have been developed to analyze explicitly the issue of competition in energy markets; the first, supply function

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<sup>19</sup> See Compte, Rey (2000).

<sup>20</sup> See Gelman and Salop (1983).

equilibria, has been used to discuss the wholesale electricity market case, while the second, market segmentation, is built on some key features of the natural gas retail supply.

***Competition in wholesale electricity markets: supply function equilibria***

The electricity market in the pioneering British experience has been organized as a centralized wholesale market until recently, and similar choices have been taken later on by most of the European countries. In this setting, the generators sell “to the market” and the clients (distributors, eligible customers) buy “from the market” with a single price set to equate demand and supply: The coordination is left to the dispatcher, that collects the supply schedules and selects the plants that must be active along the day to meet the demand.

The generators do not simply set a price or a quantity, as the standard Bertrand or Cournot models suggest, but rather they design a full supply curve, i.e. a set of prices and related quantities they are ready to supply. This competitive environment can be analyzed with a reference to the work of Klemperer and Meyer (1989) on supply function equilibria. Designing a supply curve, that not necessarily corresponds to the marginal costs and that can include margins, a firm commits not to undercut the rivals, and prices higher than marginal costs can be sustained in equilibrium. The authors have shown that when firms compete in supply functions, there exists a wide multiplicity of equilibria, including monopolistic allocations, that can be implemented in a non cooperative one shot game. The set of equilibrium allocations can be narrowed once uncertainty in demand is considered, but still can contain solutions quite close to the monopoly outcome. Green and Newbery (1992) applied this framework to the electricity industry, with a close reference to the British post-privatization generation market, showing that the asymmetry in market shares that characterized the first phase of the experience enhanced the monopolistic bias of competition in supply functions, while fragmentation of the supply side might limit these distortions.

The theoretical literature on supply functions and the British experience suggest that competition in wholesale electricity markets is not guaranteed, and that a sufficiently fragmented structure must be created on the supply side to limit these distortions.

**Competition in decentralized gas markets: take-or-pay contracts and segmentation**

So far, we have considered competition in the generation segment of the electricity industry, with a centralized pool market organization. As a consequence, all brokers, distributors, eligible customers and retail suppliers buy the electricity at the same price, and consume it or resell it to the final customers. We move now to the downstream segment and consider competition among operators that buy and resell energy products. In their activity they select the customers to approach, or those to serve if required of an offer. The economic relation, in this case, becomes bilateral, as the supply contract comes out from an agreement between the seller and the buyer.

The retail suppliers are endowed with a capacity, deriving from their purchase on the wholesale market or from long term contracts with the producers, and their cost function is shaped according to the features of these purchase conditions and on the cost of the additional delivery and commercial services they provide. For instance, if retail suppliers buy electricity at the pool price, they will have a marginal cost corresponding to the wholesale price plus the marginal cost of retail services. If there exists some sort of differentiation among retailers in the location, commercial services, etc., the retail market can be described according to a monopolistic competition paradigm, and a relatively fragmented market structure with low margins over marginal costs can be expected as the long run equilibrium. This is the basic reason why we want to create competition in the retail supply electricity segment.

The situation is different if we consider the competitive perspectives in the retail gas markets. The key feature of this industry, in fact, is that no wholesale market is at work, and the retail suppliers buy the gas directly from the producers, usually foreign extractors, under long term contracts with take-or-pay (t.o.p.) clauses. According to these obligations, the gas purchaser (i.e. the retail supplier) is committed to pay a certain percentage (70-90%) of the contracted capacity no matter if it receives (and resells) it or not. These clauses are usually considered as a financial warrant for the extractors that have to sink huge investments in the extraction fields and in the international pipelines. T.o.p. clauses, however, strongly modify the cost structure of the retail suppliers: they face a zero marginal cost and a huge fixed cost up to the t.o.p. obligations.

In such a situation competing for the same customers becomes very unprofitable, since a reasonable mark up on the (negligible) marginal costs does not allow to cover the total cost of the retail service, and in particular the huge cost of the t.o.p. obligations. On the other hand, if a firm is left alone to serve a segment of the market covering its

t.o.p. obligations, it has no incentive to further compete for additional customers with the (low marginal cost) rivals still burdened with t.o.p. obligations<sup>21</sup>. As a consequence, market segmentation and monopoly pricing replace the competitive environment previously envisaged.

The key ingredient of this result is the effect of t.o.p. obligations on the marginal cost of the retail suppliers, that makes competition a very unprofitable solution and produces selective entry as a self-enforcing pattern of marketing practice. We already discussed that implementing the TPA principle is not an easy task, in particular in the gas industry where limited international transport capacity is very frequent. This result adds additional concerns: even when the TPA policy will be fully realized, the creation of a competitive environment seems quite difficult in those countries where the gas supply is characterized by t.o.p. obligations.

Setting antitrust ceilings to the incumbent market share, or forcing it to resell part of its t.o.p. contracts, can shift market shares towards the entrants, but does not modify the weak incentives to compete for the same customers that t.o.p. clauses determine<sup>22</sup>. Consequently the segmentation result is not avoided with these instruments.

A possible way out of this problem might be that of creating a wholesale market where the suppliers, burdened with t.o.p. obligations, sell the gas. The demand side, including eligible customers and retailers, is aggregated and a single pool price is determined<sup>23</sup>. In such a wholesale market, there is a separation between the agents that bear t.o.p. obligations (producers and importers) and those that deal with the final customers (retail suppliers). In this case, the pool gas price would reflect the unit cost of gas provision, as long as total t.o.p. obligations do not exceed total demand, and will become the marginal cost for the retail suppliers when competing for the final customers.

The segmentation result would not emerge in this case, because the retailers contracting with the customers have no more t.o.p. obligations, and pay the price at its unit cost (plus margins!) as determined in the wholesale market. As a consequence, their marginal cost now reflects all the cost components and the equilibrium price if

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<sup>21</sup> More precisely, the zero marginal cost firm still burdened with t.o.p. obligations has more incentives to gain the market, i.e. it is willing to price below the high marginal cost of the firms with no more obligations. Hence, there is no chance of making profits when competing for the same customer with a firm with t.o.p. obligations. See Polo and Scarpa (2002).

<sup>22</sup> See Polo and Scarpa (2002).

<sup>23</sup> The arguments discussed in the previous section on the possible monopolistic distortions in pool markets remain valid, suggesting that in this case we might avoid the segmentation result in the retail segment but we still have problems with a competitive environment in the wholesale market for gas.

competing for the same customers allows to cover costs and make profits. Generalized entry and competition, as in the example initially discussed, might be now restored.

### *1.3 THE LIBERALIZATION PROCESS IN EUROPE*

We continue our discussion of the liberalization process with a review of the policies implemented in the European Union. The common framework has been designed through the Directives that the Commission approved in the second half of the Nineties, and the national plans have been further developed in the member Countries with relevant differences and a more or less advanced approach. Finally, in November 2002 the Commission has issued news proposals on electricity and gas that refine the approach followed in the liberalization process.

We distinguish in our discussion a first step in the liberalization process, concerning the definition of non discriminatory access conditions to the network infrastructures of transport and distribution, and a second phase, focussed on the development of a competitive environment in the market. The first issue has been extensively addressed in the Directives and in the national plans through the notion of Third Party Access. We argue that, instead, much is still to be done to reduce concentration in the liberalized markets and to design the rules and market institutions that can better help creating competitive markets.

#### **1.3.1 The European Directives**

In the second half of the Nineties the European Commission has promoted the liberalization of the main public utility industries, namely telecommunications, electricity and gas, defining through several Directives a common framework of principles and rules. Within this framework, the member Countries were required to define within a given deadline the national liberalization policy. The relevant documents for the energy markets were the Directive 92/92/CE on electricity, that set a deadline on February 1999 for the design of the national plans, and the Directive 98/30/CE for the natural gas, dating on August 2000 the definition of national policies.

The central problem that is addressed in the Directives is the creation of a level playing field for new entrants in industries that in most cases were previously dominated by a single incumbent. The technological constraints along this process in the electricity and gas industries present many points in common, besides the industry specificities.

The transport and distribution infrastructures are one-way networks with no relevant network externalities, characterized by natural monopoly and with possible capacity bottlenecks. The production and sales segments exhaust the economies of scale quite soon, admitting a relatively fragmented structure. The industrial structures that can be imagined in a liberalized energy market require therefore to combine competitive markets in production and sales linked through a monopolistic network segment.

The general principle that the Directives promote is Third Party Access (TPA), by which the owner of the network is obliged to give access to all the delivery requests through the network by the production and sales operators, setting a cost reflecting and non discriminatory access price. The Directives allowed the member Countries to choose between an access price negotiated by the parties and a regulated price set by some public institution.

The Directives accept some exceptions to the general principle of TPA, when the network owner can refuse to give access to third parties. In both the electricity and the gas industry a technical condition on congestion is introduced: this seems particularly relevant for the gas industry, since the existing international pipelines were usually constructed as part of a long-term provision of gas, and the transport capacity was therefore tailored to the amount of gas contracted by the former incumbents.

Moreover, in the gas industry a second case, beyond insufficient transport capacity, is admitted. If the incumbent, giving access to the competitors, is unable to deliver its own gas to cover the take-or-pay obligations, it has the right to refuse access due to financial motivations. Given the widespread use of take-or-pay clauses and the huge portfolios of long term contracts held by the incumbent operators, this exception can create non trivial problems to the implementation of the TPA principle in the gas industry.

Third Party Access alone cannot avoid the distortion that the incumbent firm can create to foreclose the entry of new competitors. Some sort of separation of activities is therefore promoted, under the general heading of unbundling. Different solutions are left to the member Countries, from the most radical, that prescribes proprietary separation of the monopoly activities from the competitive ones, to a milder legal separation, reached through the creation of different companies under a common holding, to the weakest version of accounting separation. The strategic opportunities to foreclose the market vary considerably in the three cases, as we discussed previously, and they are hardly reduced in case of a simple accounting separation. Consequently, the scope and powers of the regulators cannot be defined without taking into account the degrees of freedom left to the incumbent.

The third cornerstone of the Directives is the opening of the demand side, through

the notion of eligible customers, i.e. electricity or gas clients that have the right to seek for the most convenient supplier. These customers are identified by their yearly consumption and a timetable is set to widen the portion of liberalized demand by defining lower and lower consumption thresholds. Moreover, a Single Buyer for the franchise customers is suggested among the possible solutions.

Many other important elements of the picture are not adequately treated, leaving their definition to the discretion of the member Countries: among them, the desirable degree of fragmentation of the competitive segments of the industry, the kind of market organization (centralized pool markets, mandatory or not, vs. bilateral trading) of the industry, the role of State ownership in the different segments.

This brief summary of the European Directives on the energy industries suggests some comment. The main focus of the documents is on preventing foreclosure of new comers by granting access to the monopoly segment on non discriminatory terms. The ability of the incumbent to block entry by refusing to give access to the essential infrastructures is correctly considered as the first obstacle to liberalization. However, creating a level playing field is not the only condition to promote a competitive environment, in particular when the liberalization process starts from a situation dominated by a vertical integrated state owned monopolist.

Among the issues not sufficiently addressed, we can point out the relation between the timing of privatization and liberalization in the utility markets, the desirable degree of (de)concentration in the liberalized markets and the instruments to reach it (incumbent divestitures, asymmetric regulation to favor new entrants), the design of a centralized or decentralized market.

We argue that these elements are today of key importance not only to enhance the entry process in the utility industries, but also to ensure that entry will bring in the market arena a more intense competition rather than adaptive niche strategies of small new comers. In the following section we shall discuss the national plans of the member Countries and the first phase in the implementation of the liberalization policies. The picture that will emerge confirms at the national level a stronger attention to the creation of a level playing field, and still many unsettled issues regarding the promotion of competition in the utility markets.

### ***1.3.2 The national plans in the member Countries: creating a level playing field***

Almost all the member Countries have set up and approved the national liberalization plans within the deadlines set by the Directives, February 1999 for

electricity and August 2000 for gas. Within the general boundaries designed in the Directives we can find more or less advanced choices on the different issues concerning market liberalization, and a relatively heterogeneous picture characterizes both the plans and the successive implemented policies. In Table 1 and 2 we describe the main features of the liberalization plans of the member countries with respect to the three main areas of reform: the access to the network, the unbundling of monopolized activities from the competitive ones, and the opening of the demand side.

On each of these issues we find a range of different solutions across countries, with a more or less effective impact on the liberalization process.

Regarding the implementation of the TPA principle in the electricity industry, three were the main issues to be set in the national plans:

1. the determination of the technical and commercial conditions for access, that according to the Directive 96/92 can be implemented under a regulatory (i.e. centralized and uniform) or negotiated (i.e. decentralized and bargained between the parties) regime: We see in Table 1 that Germany is the only country that opted for a negotiated regime.
2. the solution of the disputes, that, with the notable exception of Germany, where the antitrust manage the issue, are left to the sectoral regulator or the Ministry of Industry.
3. the kind of regulatory regime, distinguishing between ex-ante and ex-post regulatory intervention.

We argue that an ex-ante intervention by the sectoral authority, entitled also for dispute resolution, and a regulated access regime reach the more effective package to promote TPA.

The second crucial issue in the design of the liberalization plan is the unbundling regime to be chosen. From Table 1 we can see that the most effective proprietary solution has been chosen only in a minority of cases (UK, Finland, Sweden, Netherlands and, in part, Italy). Two of the major countries, France and Germany, have opted for accounting separation, that hardly prevents distortion by the incumbent.

The treatment of demand opening, the third element to create a level playing field, has been rather different across countries, although in most cases, with the notable exception of France, the process has been quicker than the original thresholds set in the Directive. The Scandinavian countries and the UK had already completed their process before the Directive was issued, while in most countries the complete opening will be reached within 2005. However, in some important countries, including Italy and France, a final date for the process has not been set.

Moreover, a development in cross border capacity and a harmonization of the transport tariffs across member countries is still a crucial and unsettled open issue in the unification of European energy markets.

Tab. 1 NATIONAL LIBERALIZATION PLANS - ELECTRICITY

Countries	Third Party Access			Unbundling	Demand opening	
	Access Price Setting	Disputes Solution	Type of Regulation		% eligible (2001)	Complete opening
Austria	Regulator	Regulator	Ex-ante	Legal	100	2003
Belgium	Regulator	Regulator	Ex-ante	Legal	35	2007
Denmark	Regulator	Regulator	Ex-post	Legal	90	2003
Finland	Regulator	Regulator	Ex-post	Proprietary	100	1997
France	Ministry	Regulator	Ex-ante	Accounting	30	Unspecified
Germany	Negotiated	Antitrust	Ex-post	Accounting	100	1999
Greece	Ministry	Regulator	Ex-ante	Accounting	30	Unspecified
Ireland	Regulator	Regulator	Ex-ante	Legal	30	2005
Italy	Regulator	Regulator	Ex-ante	Proprietary	65	Unspecified
Luxembourg	Ministry	Ministry	Ex-ante	-	50	2007
Netherlands	Regulator	Regulator	Ex-ante	Legal	33	2003
Portugal	Regulator	Regulator	Ex-ante	Legal	30	Unspecified
Spain	Ministry	Regulator	Ex-ante	Legal	45	2003
Sweden	Regulator	Regulator	Ex-post	Proprietary	100	1998
UK	Regulator	Regulator	Ex-ante	Proprietary	100	1998

Source: European Commission (2002).

The heterogeneous picture just commented does not arise from systematic differences by country, with some situations consistently more advanced than others. On the contrary, we often find countries that have chosen very open solutions to some of the issues while remaining very closed on others. The more advanced solutions have been adopted in the UK, Finland and Sweden, that realized advanced solutions in all the three key issues of liberalization. A second group of countries, that includes Denmark, Netherlands, Austria, Italy and Spain, whose plans are very effective on two of the three issues. Germany, Belgium, Luxembourg, Ireland and Portugal show a satisfactory solution only on a single issue while in the low end of the sample we find France and Greece, whose plans are consistently characterized by the less effective solutions.

The same exercise has been performed for the gas industry, with a reference to the three relevant issues of the liberalization problem, TPA, unbundling and demand opening. We have already commented on the role of the different items and the impact on the process of the different solutions. Some countries, as Belgium, Finland, Germany, Ireland, Spain and UK, have designed a liberalization plan for gas that closely follows the same approach and solutions of the electricity case, confirming the

relative ranking already discussed. There are, however, some relevant cases in which the gas plan seems less advanced than the electricity one. Namely, Austria, Italy, Netherlands and Sweden have adopted a solution on the unbundling issue less effective than in the electricity case and Denmark and Sweden designed a slower time path for demand opening. Finally, France, Greece and Portugal have left unspecified most of the key topics of their plan, designing a very unsatisfactory solution.

Tab. 2 NATIONAL LIBERALIZATION PLANS - GAS

Countries	Third Party Access			Unbundling	Demand opening	
	Access Price Setting	Disputes Solution	Type of Regulation		% eligible (2000)	Complete opening
Austria	Negotiated	Regulator	Ex-post	Accounting	49	2001
Belgium	Regulator	Regulator	Ex-ante	Legal	59	2005
Denmark	Regulator	Regulator	Ex-post	Legal	30	Unspecified
Finland	Regulator	Regulator	Ex-post	Proprietary	90	2003
France	Unspecified	Unspecified	Ex-ante	Accounting	20	Unspecified
Germany	Negotiated	Antitrust	Ex-post	Accounting	100	2000
Greece	Unspecified	Unspecified	Ex-ante	Unspecified	Unspecified	Unspecified
Ireland	Ministry	Ministry	Ex-ante	Legal	75	2005
Italy	Regulator	Regulator	Ex-ante	Legal	65	2003
Luxembourg	Ministry	Ministry	Ex-ante	Accounting	51	2007
Netherlands	Negotiated	Regulator	Ex-ante	Accounting	45	2004
Portugal	Unspecified	Unspecified	Ex-ante	Unspecified	Unspecified	Unspecified
Spain	Ministry	Ministry	Ex-ante	Legal	72	2003
Sweden	Regulator	Regulator	Ex-post	Accounting	47	2006
UK	Regulator	Regulator	Ex-ante	Proprietary	100	1998

Source: European Commission (2002).

International transmission capacity is a key problem in the gas industry, where in most cases the gas is imported from a few countries: the capacity and the ownership of the existing international pipelines reflect the original long term provision contracts of the extractors and the national incumbents, and in many cases are insufficient to bear the additional requests of the new entrants. The infrastructures for a unified European market are still incomplete.

### **1.3.3 The creation of a competitive environment**

Our comparison of the national liberalization plans focused on TPA, unbundling and demand opening, the three key areas of intervention to create a level playing field. We move now to evaluating the competitive environment in the electricity and gas markets. The Directives have left to the member countries the issue of reducing the market power of incumbents, and in most cases no effective intervention has followed. Consequently, we still find today very concentrated markets in the upstream segments (generation for electricity and production/import for gas).

Table 3 and 4 show the situation for electricity and gas respectively. In the first case we have the aggregate market share of the first three firms, both for the generation and the retail supply segments. The British markets are the only ones where the process of de-concentration has reached an effective result, but Finland, the Netherlands and Germany seem on the right way. In most countries, however, the generation market shows a level of concentration incompatible with a real competitive environment. The picture does not change when we look at the retail supply segment, where only in a few cases, interestingly not always corresponding to a competitive structure in generation, the market is fragmented.

Tab. 3 DEVELOPMENT OF A COMPETITIVE MARKET: ELECTRICITY

Countries	Large users switching rate (%)	Average final price July 2001 (€/MWh)		Concentration (C3)	
		Large users	Small users	Generation	Retail suppliers
Austria	5-10	n.a.	98	68	42
Belgium	5-10	68	120	97(2)	100(1)
Denmark	n.a.	56	68	75(2)	32
Finland	30	36	55	54	n.a.
France	5-10	51	87	98	96
Germany	10-20	61	122	63	62 (2)
Greece	0	54	76	100(1)	100(1)
Ireland	30	60	101	97(1)	97(1)
Italy	10-20	77	110	79(2)	93(1)
Netherlands	10-20	62	94	64	80
Portugal	<5	59	106	85	90(1)
Spain	<5	52	88	79	94
Sweden	100	34	52	77	52
UK	80	58	91	44	37

Source: European Commission (2002).

A similar pattern can be found in the gas markets, where we used the Herfindahl index to measure industry concentration: only UK and, partially, the Netherlands and Denmark, correspond to a competitive market structure, while in most cases the degree of concentration is extremely high.

In the two tables we have also reported some data on market performance, namely the percentage of large customers that switched to a new supplier, the percentage of gas (table 4) delivered under TPA and the average price for large and small (households and small commercials) users. The first two variables give an idea of the impact of new firms on the transactions in the market: in the electricity markets the impact of new competitors on customers' choice is more pronounced in Sweden and the UK, but a promising start up can be found also in Finland, Ireland, Germany, Italy and the Netherlands, i.e. the same ordering that we found by evaluating the effectiveness of the electricity liberalization plans through our aggregate score. Gas customers' switching is

less relevant in most of the countries, apart from UK, the Netherlands, Ireland, Italy and France, that in almost all cases are also the countries where the delivery of gas under TPA has developed more.

Tab. 4 DEVELOPMENT OF A COMPETITIVE MARKET: GAS

Countries	Gas transported by TPA (%)	Large users switching rate (%)	Average final price July 2001 (€/MWh)		Concentration (HHI) upstream
			Large users	Small users	
Austria	<5	<5	22	n.a.	7.598
Belgium	<2	<5	21	39	10.000
Denmark	0	0	19	40	2.841
France	3	10-20	19	41	5.932
Germany	2	<5	27	43	2.405
Ireland	25	20-30	21	32	5.883
Italy	16	10-20	25	46	4.916
Netherlands	17	>30	24	29	2.634
Spain	7	5-10	20	48	9.761
Sweden	0	<5	24	43	10.000
UK	100	90	20	30	894

Source: European Commission (2002).

Finally, we report some data on prices to large and small users, the former being those that, in general, became eligible from the beginning of the liberalization process. Interpreting data on final prices for the member Countries is not easy, because differences in level may reflect different costs and not different margins; moreover, the impact of ongoing regulation may be different across countries in the different segments of demand.

Large users electricity prices in July 2001 are very dispersed, ranging from 34€/MWh in Sweden to 77€/MWh in Italy. It is difficult to find any relation with the extent of the liberalization process, as summarized in our discussion above. The availability of low cost generation (i.e. nuclear and hydro) is very different across countries<sup>24</sup>, and the liberalization and cost effects go in the same direction in some countries (Sweden, Finland), but are conflicting in others, as the UK, open to liberalization but endowed with only 26% of low cost generation plants, or France, that has 91% of low cost generation and is still a very closed market. Heterogeneity is even more pronounced in small users prices.

A relatively more uniform picture characterizes gas prices to large and small users. But it remains quite difficult to notice systematic better performances of the countries that have designed a more advanced liberalization plan. This is particularly striking if we look at the British data, that reflect almost a decade of liberalization process. Although in

<sup>24</sup> See Autorità dell'Energia Elettrica e del Gas, Relazione Annuale 2002.

the lower range of prices, the large users gas prices are not significantly different from those of much less advanced situations, as France, Denmark, Belgium or Spain.

Moving to the evolution of prices in the second half of the Nineties, Table 5 reports for the largest countries the electricity and gas prices relative to the EU average in January '95 and July '01. By measuring the price relative to the European average we eliminate common cyclical trends as those coming from the oil price variations; by comparing two points in time we can observe the evolution in the relative performance of the main European countries.

Tab. 5 ELECTRICITY AND GAS PRICES (EU=100)

Countries	Electricity						Gas			
	Large users (24 GWh/Y)		Small users (50 MWh/Y)		Households (7.5 MWh/Y)		Large users (420.000 GJ/Y)		Small users (84 GJ/Y)	
	Jan '95	Jul '01	Jan '95	Jul '01	Jan '95	Jul '01	Jan '95	Jul '01	Jan '95	Jul '01
GE	143	108	159	144	137	126	130	110	108	107
FR	105	100	91	92	110	100	83	87	108	101
IT	96	148	98	83	155	163	97	108	117	114
UK	92	108	93	94	97	108	63	85	85	74
SP	117	102	105	106	111	89	93	88	129	118

Source: European Commission (2002).

Germany is above the European average in all the categories for both gas and electricity, although reduced its relative overpricing in particular for large users. France came closer to the European average price when initially overpricing, while still maintaining its positive performance in other segments of the market. Electricity and gas relative prices in Italy have a sharp increase for large users over the period, and a worsening of relative electricity prices can be found also in the UK for large users and households. Spain consistently reduces its overpricing in all the segments of the energy markets.

We conclude this review of the liberalization policies in Europe by remarking that the Directives and the national plans have devoted so far too little attention to creating a more fragmented market structure and a competitive environment in the segment where TPA has been realized. The effects of actual competition and, ultimately on final prices, are still rather fuzzy and limited.

### 1.3.4 New Directives proposed on electricity and gas

Between the end of 2002 and early 2003, the European Commission has put forward Common Positions and Draft Directives on Electricity and Gas that, on the basis

of the recent experience, propose some adjustments of the approach followed so far. The proposals summarize a debate among member Countries that has been quite harsh in some passages, and represents therefore on several topics a compromise, which at the moment still leaves some issues quite open. In any case, some advances can be appreciated, with clear winners and losers. The general focus is still on ensuring a full access to the network, and the attention to the creation of a competitive environment remains insufficient.

On unbundling, the proposals require as a minimum standard a legal separation within a holding group for the network activities: having observed the widespread adoption of the milder accounting separation in many countries, this measure clearly binds, and represents a step forward in the right direction. Still, the more effective proprietary separation is not imposed, perhaps also due to a lack of power and jurisdiction of the Commission<sup>25</sup>.

On TPA, the negotiated access regime has been abandoned, in favor of an access regime based on prior publication of tariffs, or at least of the methodology for their calculation. Moreover, the Directives amend a previous grey zone of the reform, requiring each member Country to establish a regulatory authority for the energy markets, in charge for tariff review. Both these measures will have a significant impact on the German situation, where the liberalization process took place under negotiated access prices and in the absence of a regulatory body.

On demand opening, the timetable for complete opening is shortened, with a final deadline for all the retail markets by July 1<sup>st</sup> 2007 and for customers other than households by July 1<sup>st</sup> 2004. We have already discussed that at least some of the member Countries have already adopted a more stringent timing. But the new standards clearly have a major impact in France and, for household electricity customers, in Italy.

On other key issues, as market de-concentration in competitive segments and the development of cross border trades, the new proposals remain along the previous path, with no real impact on the national markets.

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<sup>25</sup> However, even if the Commission cannot force the dominant firms to dismiss their network infrastructures, the UK and US experience shows that it is possible to impose further regulatory restrictions that make vertical integration too costly, inducing, rather than forcing, divestitures.

## *1.4 THE ITALIAN EXPERIENCE*

We move now our attention to the Italian experience following the same two step approach of the previous section. We start from a description of the Italian liberalization plans for electricity and gas, that have often chosen solutions more advanced than the standards of the European Directives and present some interesting and original measures. We move then to a closer discussion of the open issues in the electricity and gas industries, concluding with some observations on the relevant institutional issues involved.

### ***1.4.1 The liberalization plans***

In 1999 and 2000 the Italian Parliament has approved the liberalization plans for electricity and gas prepared by the Government according to the deadlines set in the European Directives. Although the two policies share the same general approach, they present significant differences. We start in the following section with the electricity plan, followed by a discussion of the gas policy<sup>26</sup>.

#### ***Electricity: the Bersani Decree and the later developments***

The implementation of the EC Directive on electricity was given by the Bersani Decree (Law 79/99) in February 1999. The previous monopoly of Enel has been dismantled, and several principles have been introduced. Some of them have been confirmed later, while others are already under threat (a reform of the reform, before the original one is actually implemented).

The management and full control of the transmission network was given to an independent system operator (the Gestore della rete di trasmissione nazionale, Grtn) which remains state owned. However, the ownership of the network still remains with Enel (a company called Terna). Access to the transmission network is open to third parties on the basis of conditions set by the regulatory Authority.

The wholesale market is supposed to be organized as a Pool market, run by the Gestore del mercato elettrico, Gme (owned by Grtn). All transactions are supposed to be bid. Bilateral physical contracts may be exceptionally allowed by the Authority. The market was supposed to start operating at the beginning of 2001; more than two years

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<sup>26</sup>For a general analysis of the recent Italian experience on liberalization see OECD (2001).

later, operations have not begun yet.

To reduce Enel's market power upstream, no firm is allowed to have more than 50% of total installed power or to sell more than 50% of total energy, including imports. To this end, Enel has formed three companies which have been sold in public auctions. The buyers are consortia of smaller Italian independent producers or public utilities, with the participation of some foreign producers such as Endesa, Edf, Tractebel.

Thresholds for eligibility were established, aimed at accelerating the process of market opening relative to the dates set in the Directive. Eligible clients represent at the moment about 50% of total energy sold in the country. No date has been set for an opening of 100% of the market.

Distributors selling energy to franchise (non eligible) customers must buy the energy for these customers through a Single Buyer, which is also part of the State owned Grtn group. About four years since the Bersani decree, the Single Buyer has not yet started its activity.

The privatization process, started short after the Bersani Decree, is at a standstill, and about two thirds of Enel is still in the hands of the Italian Government.

Among the several interventions after the Bersani Decree, the following are worth mentioning.

The Grtn has stressed the existence of the risk of a shortage of electricity in Italy, where the age and efficiency of generating plants appear as problematic. In March 2002, a new Decree was issued, to make the building of generating plants easier, making the authorization process quicker in the hope to help the entry process. A second goal to be reached through this provision is an increase in the degree of competition in the wholesale market.

In September 2002 the Government decreed to block the price dynamics decided by the Authority, also deciding that from that moment onwards – against what was decided in 1995 – the Government had the right to set principles that the Authority had to follow in deciding future price adjustments.

Most of the electricity imports, which amount at about 16% of total consumption, have been reserved to large “interruptible” customers (large industries), and the allocation is managed by the Ministry of economic activities through the Grtn. The implication is that this energy will be kept out of the Pool market. Notice that this is probably the cheapest energy available in Italy, and this decision to allocate it through an administrative mechanism entails excluding the cheapest energy from the market.

**Gas: the Letta Decree**

The Italian liberalization plan has been presented in February 2000 after a debate among operators, Institutions and political parties. It is worth mentioning that the gas market was dominated, at the date of the reform, by the ENI group in all its segments: 90% of national production and of imports; almost 100% of long distance transport capacity and storage facilities, 73% of primary distribution to large industrial clients and 67% of that to generators, 33% of secondary distribution. Moreover, in the second half of the Nineties 64% of the shares of the ENI group have been sold to private investors, with the Treasury still retaining a control position with 36% of the shares. We briefly summarize the main elements, that closely remind the European framework, but that presented also some innovative solutions.

The unbundling principle has been implemented through legal separation of the different activities within the ENI group. Transport and storage are run within a separate company, with accounting and managerial unbundling of the two activities; local distribution and sales activities cannot be provided by the same company; finally, production and import of gas are run by a separate company.

Third Party Access is introduced with regulated tariffs defined by the regulator; the access can be denied if there is insufficient capacity; moreover, transport capacity requests by operators burdened with take-or-pay obligations must be given precedence in defining the access order.

Antitrust ceilings are introduced in the interim period of liberalization: beginning from January 2002 no single operator can enter more than 75% of gas into the national transport network; this threshold will be reduced by 2% each year until 2010, with a final market share of 61%. Moreover, from January 2003 to December 2010 no firm will be permitted to sell more than 50% of gas to final customers.

From January 2003 all the customers (commercials and households) will become eligible, with complete demand opening.

The tariffs for franchise customers and for the transport, distribution and storage activities are set by the regulatory authority (AEEG) according to a non discriminatory and cost reflective standard. The Ministry of Industry retains many competencies on several specific issues, and the Authority implements its intervention within the general lines of the energy policy designed each year by the government.

Some brief comments are due on the Italian liberalization plan, in comparison with the minimal requirements of the European Directive 98/30 and with the policy chosen the year before for the electricity industry.

Unbundling is spelled out under a less advanced flavor, maintaining all the activities with the ENI group. This lack of separation seems particularly problematic if we take into account that exceptions to the TPA involve a reference to take-or-pay obligations, that entitle importers to privileged access in case of transport capacity constraint. Since ENI has a portfolio of t.o.p long term contracts quite large, having an independent operator managing the definition of the access order seems a crucial point.

The Italian plan introduces some measures to reduce the role of the incumbent firm in the liberalized segments, through antitrust ceilings in the import and sale activities. We shall discuss in depth this issue in the next section. Here we want to point out that the Letta decree does not consider the alternative solution of forcing ENI to divest part of its t.o.p. long term contracts, a measure reminding the divestiture of capacity in the electricity liberalization plan.

The timetable of demand opening is much quicker than the electricity one, extending to all customers and not only to the commercial ones the ability to choose the gas provider. The implementation of this principle at the local level, however, requires to solve complex interactions with the reform of local public services that is still not completed.

Finally, the institutional design of the Letta decree is not entirely convincing, with a distribution of checks and balances in part to the regulator and in part to the Ministry. The law 481/95 on the regulation of public utilities attributed the role of tariff regulation to a sectoral authority specifying the general approach (non discriminatory and cost reflective tariffs) and the method (price cap). The Letta decree and some successive measures have tried to move back the role of designing tariffs in the energy markets, or at least of setting the operational principles to be followed, towards the Government.

In the last two years the AEEG has reformed the structure of gas tariffs for franchise customers under a cost reflective approach, and it will continue to define a reference tariffs also after January 2003, when all the clients will become eligible. The average national gas tariff (November 2002) can be decomposed in three parts: raw cost of gas (21.5%), fixed costs of transport, storage and distribution (32.3%) and a very high burden of taxes (45.4%). Low consumption household tariffs are at the lower bound compared to the other European countries, but the tariffs net of taxes for higher levels of consumption move to the top segment in the sample, and result disproportionately high if we include the tax burden<sup>27</sup>.

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<sup>27</sup> See on tariff regulation after the liberalization AEEG (2002).

### **1.4.2 Open issues**

Once described the main features of the Italian liberalization plans and the subsequent developments, we move now to a more detailed discussion of the open issues in the electricity and gas industries<sup>28</sup>.

#### ***Electricity***

Let us start from structural issues, in particular from the **vertical organization** of the sector. It is widely recognized that the current unbundling, where the transmission network is in public hands and managed neutrally under the supervision of the regulator, works quite well and provides sufficient guarantees that all competitors have access at fair conditions. The transmission network is owned by Terna (part of Enel) and Enel's presence is usually not perceived as a relevant problem for competition.

On the other hand, the separation between ownership and management of the network does not yield any particular benefit, while raising transaction costs and possibly creating obstacles to an optimal development of the network. The (unofficial) rationale for this separation was, at the beginning, that Enel owned the telecommunications company Wind which had to build its tlc network over Enel's transmission pylons. Now that this project has been completed, and that Wind has long term contracts guaranteeing the possibility to use the tlc wires, the project of unifying ownership and management of the network finds little opposition. This seems to be a way to rationalize the system, where the debate solely revolves around the ownership of the new "grid" company.

A second issue relative to the vertical structure is the role of demand. At the moment non eligible customers are served by their local distributors. These in turn are not allowed to buy their electricity independently, but have to go through the Single Buyer, which acts as a compulsory intermediary, whose role is very dubious. According to the Bersani Decree, the SB should serve to "guarantee" non eligible customers.

Two remarks are on order. First, it is unclear why distributors should need such a "protection" and should not be considered eligible customers on behalf of the non eligible customers they serve. A limited pass-through of the cost of wholesale energy should provide these distributors sufficient incentives to minimize purchase costs, therefore guaranteeing final customers against the possible slack of distributors.

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<sup>28</sup>At present, the Parliament is considering a reform of the energy sector, put forward by Minister Marzano, which apparently focuses almost entirely on the electricity sector. The situation is too unclear to lend itself to predictions.

Second, the logic of the Bersani Decree is such that, the SB should disappear once all customers were made eligible. On the contrary, the current proposal put forward by the Government indicates a new role for the SB even in the gas sector, discouraging the hope that the public presence in energy markets will fade away as the market opens.

Turning to Enel's market power and the performance of the **electricity exchange**, the Bersani Decree has indicated that 50% is the "antitrust" threshold that the Parliament considers sufficient to have a workable competition in the wholesale market. This has certainly not been a particularly brave decision, leaving Enel with considerable market power. For instance, it has been estimated that for several years Enel's plants will be the marginal plants (i.e., will "make" the price) for most of the times during peak hours<sup>29</sup>. How to intervene in such situations?

A few years after Enel's listing in the stock market, it is dubious that the time is still appropriate for further restructuring and forced divestments. As we have already seen, incentives to entry work only in the medium run, and the recent Government interventions aimed at fostering entry are unlikely to produce tangible results for at least a couple of years. Another proposal that the Government has put forward (but never made official) has been the introduction of two types of price caps in the Pool. The first one would be a maximum level for each of the 48 daily prices; the second one would be a maximum level for the average price set over a longer period (possibly, a year). The first cap would become automatically binding and would immediately operate in case the marginal bid goes above it. The respect of the second constraint would be verified ex-post, and its violation might trigger the closure of the market even for a period of several months.

Bid caps (or price caps in the Pool market) have been considered in different cases, but as we have pointed out they are justified only when some other mechanism to cover fixed costs has been envisaged<sup>30</sup>. In any case, the informational requirements for the setting of such constraints are extremely heavy and unlikely to be met.

Alternative possibilities – supported for instance by the energy Authority – would require to safeguard Enel's ownership of the plants that the Bersani Decree decided do not violate antitrust concerns, but expropriating Enel the power to bid for certain amounts of energy. This is possible by appropriate devices called Virtual Power Plants (VPP) already used in France and Ireland. These are contracts that can be auctioned

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<sup>29</sup> See AGCM(2002).

<sup>30</sup> It is reassuring that the current version of the Marzano proposal does contain a proposal – however indeterminate – of introducing capacity payments.

out and award the winner the right to bid for pre-specified amounts of energy (or dispose of amounts of power), obtaining the returns from such bids, even if the energy is actually produced by plants owned by another agent<sup>31</sup>. In this way, Enel could remain owner of its plants even if the decisions on how to bid for some of the energy produced by them are taken by whoever buys these contracts. This may have an impact on final prices if they refer to energy produced by mid-merit or high cost plants (whose bidding behavior does have an impact on prices).

Another sensitive issue is the development of the set of **generating plants**, which is relevant for environmental reasons as well as for competitive ones. Italian generating plants are fairly old, and often make intensive usage of obsolete technologies. A clear symptom is that, relative to other European countries, besides the absence of nuclear power, Italy is characterized by the relevance of fuel oil as an input.

Tab. 8 FUEL MIX IN ELECTRICITY GENERATION – YEAR 2000

	Germany	UK	Italy	Spain	France	Netherlands
Nuclear	19,9%	19,0%	0,0%	14,4%	54,9%	2,2%
Carbon	42,1%	42,3%	7,9%	22,0%	8,9%	20,2%
Natural gas	17,7%	27,1%	23,2%	12,5%	8,0%	75,0%
Fuel Oil	6,7%	4,1%	40,7%	14,5%	6,3%	0,0%
Hydro	8,4%	6,2%	28,0%	33,3%	21,9%	0,0%
Others	5,1%	1,2%	0,3%	3,3%	0,0%	2,6%
Total MW	112.116	68.288	73.108	53.694	115.100	20.675

Source: Intesa-BCI: Tendenze monetarie, nr.81, March 2002.

The average age of Italian plants is considered quite high, and it is known that – to provide an example – many of the plants that Enel included in the three generating companies (“Gencos”) sold are in desperate need of re-powering or anyway of substantial investments to make them economically viable<sup>32</sup>. Moreover, the Grtn has recently pointed out that at present there is a substantial risk of electricity shortage, and has asked some producers to delay re-powering programs, which would have made generating plants unavailable when the reserve margin was not considered sufficient<sup>33</sup>.

<sup>31</sup> VPPs should not be confused with Auctioned Biddable Contracts used in Alberta (Canada), which are contracts which award the right to command the energy produced in actual plants, and not only to bid an “anonymous” amount of energy.

<sup>32</sup> Prof. Ranci, Chairman of the energy Authority, stressed in November 2001 “The cause of high electricity prices in Italy is not just the high weight of oil products in electricity generation, equal to 51% against a European average of 41%. The limited efficiency of many obsolete generating plants, with conversion yields also matters.”. See Aeg, hearing at the Camera dei Deputati, 13<sup>th</sup> November 2001.

<sup>33</sup> Grtn (2002).

The development of investments in electricity generation in Italy is thus needed both to foster competition and to guarantee security of supply. In this situation, as already pointed out the Government has intervened in March 2002 with a decree named “sblocca centrali”, aimed at speeding up the authorization process for new generators. However, in the same period, the following decision have been made (proposals have been put forward):

- proposal to introduce bid caps, aimed at reducing the risk of very high prices in the Pool;
- proposal to reform independent regulatory authorities, in order to curb their power and to increase the weight of political decisions in the energy sector;
- proposal to require that generators may shut down their plants only if some public authorization is given;
- decision to temporarily freeze energy prices and to decide possible later increases within a global anti-inflationary effort.

These are only examples of the general tendency to return energy policy within the political decisional sphere, which inevitably makes future regulatory interventions less predictable and credible and therefore increases regulatory risk. Moreover, two years after the date set in the Bersani Decree, the electricity wholesale market has not yet begun its operations.

There is a large number of potential projects: requests for new generators have been estimated, for a total power greater than the current total installed capacity of the country (about 100,000 MW). Most of these projects are bound to remain on paper (many are duplications of requests on the same site, put forward by competing firms; many are requests put forward with a “portfolio diversification” policy, aimed at trying several projects in order to have at least a few approved; and so on). A recent estimate indicates that about 31,000 MW of extra capacity (including re-powering) may be realized by 2008<sup>34</sup> if adequate funding can be provided. However, given current uncertainties potential entrants are unable to make reasonable forecasts about their future returns, and this raises immense problems with the financing of these projects. Therefore, we face a very awkward situation, in which Italy is in desperate need of investments in generation, but policies aimed at encouraging investment lack consistency.

Another example of lack of consistency in the current national energy policy is

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<sup>34</sup> Intesa-BCI: Tendenze monetarie, nr.81, March 2002.

provided by the debate over the **role of imports** in the national market. At present energy markets are usually considered by the EC as “national” markets, being segmented by limited interconnections and institutional differences. This was the case for most goods and services before the creation of the EEC and even more of the implementation of Single European Act at the end of 1992, and could and should be changed by appropriate policies. This is often recognized in the EU, for instance in the final declaration of the European Council in Barcelona in March 2002. In particular, it has been stressed quite clearly – and quite rightly – that with the creation of a unified electricity market security of supply would require less reserve capacity relative to what we have now, when each country can almost only count on its own plants.

The Italian attitude is somehow peculiar. On the one hand, the Grtn recognizes that one important way to create competition and better guarantee security of supply is to strengthen the interconnections between Italy and neighboring countries. This emphasis is even more striking, as Italy, importing about 16% of total electricity consumed, is already one of the most open and interconnected countries in the EU.

On the other hand, the recent law “Collegato alla Legge finanziaria 2002” – approved in November 2002 – states that most of the imports will not be put in the market, but rather will be allocated by the Ministry (through the Grtn) to large interruptible users. The rationale of such decision is hard to identify; security of supply is usually invoked, but most market observers are extremely skeptical that favoring interruptible customers in this way is necessary or even useful to this end. The main consequence of this decision is that, given that imported energy is probably the cheapest one available in Italy, its exclusion from the energy which contributes to wholesale prices concentrates the benefits in the hands of large industrial users, at the expense of the general public. Notice that this happened more or less at the same time, when the Government decided to freeze final energy prices for three months.

The particular interest of large customers, that has so far prevailed, clashes with the general interest, and this decision should be reversed as soon as possible. Imported energy represents the most serious competitive threat to Enel's market power: it seems totally inappropriate to put forward proposals to distort the competition in the Pool as a way to restrain Enel's market power, and then to neutralize the most natural way to keep prices low.

This decision on imports has major consequences on actual market opening as well. In 2002 it is estimated that a bit more than 93 TWh were sold in the free market, i.e. with prices determined by the two parties. At the moment the potential size of the free market is about 115 TWh/year, and will become about 150 TWh/year since the

beginning of May 2003. The difference between potential and actual free market is striking; probably buyers' choices and awareness are partially responsible for this, but this difference is certainly also determined by the difficulty to have electricity wholesale in a market. This is because of several factors, such as the relatively small reserve margin of the Italian system and the fact that a considerable amount of electricity is linked to long term contracts with favorable conditions (in particular due to the previous system of incentives to renewable energy CIP 6). The decision on imports makes the whole situation decidedly worse: there is a substantial risk that wholesale energy can be obtained almost only from Enel, which has its own trading company. Most non-Enel traders already declare they are short of energy, and it is hard to see how the increase in potential market size can become effective if the (already limited) amount available energy is kept out of the market.

This leads us to the final theme, **competition for eligible customers**. At the moment the situation can be illustrated on the basis of the following table. The data indicate that the market increases quite rapidly, that competition is substantial among incumbents, with Enel losing quite rapidly its traditional dominant position and that substantial entry is taking place. Among the entrants, we have some large foreign firms (among others, Elektra, EnBW, Atel) and some Italian firms (e.g., Edison) with substantial cross-participations of foreign firms in Italian consortia (e.g., Verbund in Energia). Notice that the situation in 2003 should start showing substantial effects of the sale of the three Gencos and might therefore look even more different from the traditional Enel monopoly.

However, as already pointed out, several firms complain that demand is rationed and that suppliers encounter difficulties in finding the energy that the market demands. The key point seems to be the delay in the beginning of the operations of the Pool. Now, Enel is still the main generator and final sellers of electricity might need to buy from Enel Produzione to compete against Enel Trade. Several allegations against Enel have been made, and an official inquiry by the Italian antitrust authority (Agcm) is currently under way (Agcm, 2002). Once the wholesale market will be operating as envisaged by the Bersani Decree, all sellers should be able to buy energy in the market, and the current apparent shortage of energy "for the free market" should cease. Notice however that the (already mentioned) allocation of imported energy to large customers by the Ministry will certainly not help in this direction.

The delay in the start of the Pool operations seems to be the most crucial point of the whole system. This two-years delay is due to some mistakes in the technical design of the system, but especially to the postponement of some crucial political decisions. On

the one hand, many operators claim that no competition will start before the wholesale market starts working. At the same time, other operators (mainly, large customers) claim that the start of the electricity exchange in Italy will bring about an increase in prices (better: in the prices *they* are paying, given that many large customers still benefit from particularly favorable tariffs). The provision favoring large customers in the allocation of imports responds to these concerns, and the apparent victory in the political arena of these pressures seems – unfortunately – coherent with the delay in the beginning of the Pool operations.

Tab. 9 THE MARKET FOR ELIGIBLE CUSTOMERS

	Year 2000		Year 2001		Year 2002 (1)	
	TWh	%	TWh	%	TWh	%
Enel Trade	20,8	47,7%	27,1	38,0%	30,0	32,0%
Edison	8,1	18,6%	11,1	15,6%	15,9	17,0%
Lumenergia /Assoenergia	4,0	9,1%	5,0	7,0%	7,5	8,0%
Egl		-	3,3	4,7%	3,7	4,0%
Energia	1,4	3,2%	3,8	5,3%	3,7	4,0%
Aem Trading		-	2,5	3,6%	2,8	3,0%
Atel		-		-	3,7	4,0%
Eni Power		-	1,9	2,6%	4,7	5,0%
Others	9,3	21,4%	16,6	23,3%	21,7	23,0%
Total TWh	43,5	100%	71,3	100%	93,7	100%

Sources: Enel, GRTN, and Staffetta quotidiana.  
(1) Data for 2002 are preliminary estimates.

To sum up, the beginning of the Pool market operations should be the main priority. Enel's market power is undeniable, but it is also true that Enel's operations are totally visible, and that the risk that an abuse in this market power will remain unobserved on unverifiable seems quite low. However, to minimise the risk of abuse, bid caps may be introduced, only when an appropriate system of capacity payments provides the mean to cover fixed costs and thus provides the incentives for the new entrants.

In any case, the best way to keep electricity prices in line with costs is *not* to exclude cheap energy from the market. It is hard to think of any serious legitimate argument for allocating imported electricity via an administrative procedure; blocking final prices to protect small customers, while taking cheap energy away from them is totally contradictory.

More in general, it appears that a final decision should be taken, either in favor of an electricity market, where firms operate freely and competition is the main driving force, or in favor of an administered system, where public presence is paramount. The first route – albeit tempered by a small number of light and non-pervasive regulatory

constraints – is the only one consistent with the European process and with the restructuring that has taken place in Italy during the Nineties. Unfortunately, the fear that the second one will prevail finds continuous support in the observation of Italian energy policy.

### **Gas**

The partial unbundling of the ENI group, that will operate with different companies in all the segments of the industry, maintaining an extremely high market share all over the market, represents the more pervasive problem in the liberalization process. The ability of ENI to compete at the same time in different segments of the market with new comers, in fact, gives the incumbent a very strong advantage and makes the public policy intervention quite hard.

The most important structural measure that would be needed is therefore the **proprietary separation** of the national transmission network and storage facilities from all other activities. The shares of the ENI group in the international pipelines should be assigned to this new and independent company as well. Through these measures, all the national and international assets in transport activities would be separated from both the upstream gross provision of gas and the downstream retail supply to final customers. It should be stressed that this structural reform is still possible, given that the Treasury is the control shareholder in the ENI group. On the other hand, it must be said that this measure should have been done many years ago, before starting the listing of the ENI shares. Proceeding with such a drastic reorganization when 64% of the share have been privatized can pose serious problems of credibility to the government, but a gas sector based on the evident current imbalance does not represent an “equilibrium” likely to last for long.

The evolution of competition in the liberalized gas industry will be strongly influenced in the next years by the effects of **antitrust ceilings** both on final sales and entry of gas into the national network. The impact of these constraints will be relevant, as the table above shows.

The second row shows that the maximum contracted capacity, including national production and import, of ENI and the existing third parties (Enel, Edison, Dalmine, Plurigas and Energia) is sufficient to cover demand up to 2010<sup>35</sup>. This supply capacity is computed at the maximum annual provision specified in the international contracts, that

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<sup>35</sup>The data do not include the supply capacity of new LNG terminals that will be working by 2010.

is larger than the minimum capacity covered by t.o.p. obligations. The ENI minimum import supply as defined by the long term t.o.p. contracts available (third row) is larger than the maximum injections of gas into the national network allowed by the antitrust ceilings (fourth row). Therefore, the dominant firm will not be able, from 2002 to 2010, to cover all its t.o.p. obligations with sales in the Italian market. Conversely, third parties will have an increasing portion of future demand at their disposal as gross providers. The gas provisions currently contracted (January 2001) by the main existing third parties (seventh row) are insufficient to cover this residual demand, that consequently would be "free", i.e. with no supplier already equipped with contracted provision capacity.

These figures suggest that antitrust ceilings open a possibility of new entries in the national market, reducing the market share of the incumbent by an amount larger than the initial supply capacity of the existing competitors. Many different solutions can be imagined.

ENI might sell part of its long term t.o.p. contracts, that correspond to a maximum supply larger than the minimum provision capacity reported in the third row above. In this case, the new buyer would pay to the extractor the same prices originally contracted by ENI, with no additional margin. Moreover, the new gross provider would have no further link or relation with the ENI group, and would be therefore completely independent.

ENI might resell abroad part of its gas to other existing or new Italian operators, that will import the gas into the national system; in this case the new buyers will close the supply gap generated by the antitrust constraints, as before, but presumably they will pay the gas at a higher price, that includes also the ENI margin. Moreover, an important component of their cost would be determined by ENI, that will act as a competitor in the final market. Finally, an ongoing relation would take place between ENI, as a gross gas provider, and those latter. Overall, the new buyers would be continuously in a mixed position of clients (upstream) and competitors (downstream) with ENI.

ENI might keep all its portfolio of long term contracts but try to sell its gas in other European markets. In this case the supply gap created in the Italian market by the antitrust ceilings would leave room for fresh new entrants with no direct link with the existing incumbent. This is potentially a first step towards the creation of a European market for gas. By entering foreign markets, in fact, ENI would gain market shares of other European firms, that might find it attractive to enter the Italian market. Whether this scenario results in enhanced competition or simply in a coordinated reallocation of national markets among the largest incumbents is still an open question.

Tab. 10 EFFECTS OF THE ANTITRUST CEILINGS (BLNS OF M<sup>2</sup>)

	2002	2006	2010
Demand	75.3	83.9	90.6
Max. contracted supply (ENI+T.P.)	84.9	97.7	98.6 (1)
ENI minimum supply (t.o.p)	60.5	63.4	61.7
Antitrust ceilings	57.2	59.9	59.6
ENI supply surplus	3.3	3.5	2.1
Residual Demand	18.1	24.0	31.0
Third parties contracted supply	12.0	19.3	19.2
"Free" residual demand	6.1	4.7	11.8
Innovative sales	6.5	5.3	5.3

Source: AGCM (2002).  
(1) 2009.

We think that some restrictions on ENI regarding the gas contracts exceeding the antitrust ceilings should be set. More precisely, we think that the ENI group should be left free to choose between the first (sale of long term contracts with the extractor) and the third (sale of gas into other national markets), while the second alternative (sale of gas to national retail suppliers) should be forbidden. No such measure, however, has been prescribed in the liberalization plan.

Antitrust ceilings produce further effects since the threshold on final demand (50%) is lower than that on gas provisions into the national network (from 75% in 2002 to 61% in 2010). Hence, a consistent share of the gas that the incumbent firm will enter into the national transport network will be sold to other operators active in the retail supply segment. We find again the double relation with the incumbent firm, as clients and competitors at the same time, that gives the dominant firms an opportunity to impose lax competitive conditions.

The three cases discussed above involve a reallocation of market shares in the international gross provision of gas, with ENI supply capacity in the national market being replaced by some new operator. Since the provision of gas would be delivered from abroad (Netherlands, Norway and Russia), a reallocation of **international transmission capacity** is needed as well. Hence, an important piece of the story is the ownership and management of the international pipelines towards Italy.

Gas provisions from Norway and Netherlands reach Italy through two international pipelines, TENP from the Netherlands into Germany up to the Swiss border, which is owned with equal shares by ENI and Ruhrgas, the main German operator, and TRANSITGAS, that reaches Passo Gries (Italy) through Switzerland, owned by Swissgas (51%), ENI (46%) and Ruhrgas (3%). Russian gas is delivered by the pipeline TAG, that passes through the Check Republic and Austria reaching Tarvisio (Italy); the transport rights are owned by ENI (89%) and the Austrian OMV (11%).

It is therefore evident that the ENI group has a relevant control on the international pipelines towards Italy, together with the incumbent operators in important close foreign markets. The choice of one of the three possible solutions to the antitrust constraints described above is strongly influenced by this fact. Given the demand for additional gas provision in the Italian market (Table 10, row 8), ENI would be in competition with other foreign gas providers or extractors. Having the ability to pair the provision of gas with transmission rights towards Italy, however, ENI can gain a competitive advantage and extract some surplus from the buyers by charging a margin over the gross gas provision. Hence, selling gas, rather than long term contracts, to Italian operators becomes the more profitable solution<sup>36</sup>. The third scenario (selling the exceeding gas capacity on foreign markets) would still be an alternative, but the strong links with some European incumbents, e.g. Ruhrgas, suggest that this solution might be more in the spirit of a coordinated market reallocation across countries rather than of real competition.

During 2001 ENI has sold to a group of Italian operators (Dalmine, Plurigas, Edison and Energia) significant provisions of gas taken from its Dutch and Norwegian t.o.p. obligations, the so called "innovative sales" (last row table 10). The contracted price clearly includes a margin over the original price paid to the extractors. Moreover, the annual supply is burdened by t.o.p. obligations and it is sufficient to cover up to 2006 the Italian demand for gas. This gas provision contracts were endowed with full priority transmission rights on the international pipelines<sup>37</sup> that ensured the delivery of gas in any circumstance<sup>38</sup>. Taken together, these elements make the entry of additional competitors in the final market very unlikely in the next years.

If we look at the effects of antitrust ceilings with this episode in mind, we can say that entry without competition is the likely result: in the next years all the residual supply capacity created by the ceilings will be covered by a limited group of small operators, that will buy most of their gas from ENI<sup>39</sup>, receiving it through international pipelines

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<sup>36</sup>This argument is reinforced if we take into account the further advantage of having captive competitors in the retail supply market, that we discussed above.

<sup>37</sup>In case of capacity constraints, the allocation is realized giving priority to t.o.p. contracts signed before August 1998, then other t.o.p. contracts, annual contracts and other contracts.

<sup>38</sup>The Italian Antitrust Authority alleged ENI of abuse of a dominant position, claiming that the "innovative sales" will have the effect to foreclose the market, preventing new retail operators from entering, since no transmission capacity is available to buy gas in the next years. Among the remedies, ENI committed to improve the transmission capacity of the pipelines. See for details case n.11421 (A329) Blugas-Snam, 21.11.2002, [www.agcm.it](http://www.agcm.it).

<sup>39</sup>From 2004 the new pipeline from Lybia to Sicily will be operative. The entire gas provision (8 blns m<sup>2</sup> per year) has already been sold by ENI to Edison, Energia and Gas de France.

owned by ENI. This is not exactly the portrait of a strong competitor of the incumbent firm in the final market.

The access to the international pipelines is therefore one of the crucial points that condition the development of competition in the Italian market. In the year between August 2001 and August 2002 the transmission capacity at the entry points from Northern and East Europe (Passo Gries and Tarvisio) was completely allocated, as well as that of the LNG terminal at Panigaglia, while the entry point from Northern Africa, Mazara del Vallo, had some unused capacity (15%). The Italian regulator (AEEG) has decided in 2001 incentives to new capacity investment also in liquefied natural gas terminals, giving the investors priority in the access to the realized facilities<sup>40</sup>. The AEEG has devoted attention also in designing the access tariffs to the national transmission networks and storage facilities, in order to remove the bottlenecks to third party access<sup>41</sup>. The predominant role of the ENI group in the transport and storage infrastructures, however, makes the implementation of these measures extremely difficult.

The second important issue in market development refers to the organization of the retail supply market. The Italian liberalization plan, as most of the other European reforms, has chosen a **decentralized market organization**. In other words, the retail suppliers buy gas from the extractors or from gross providers and resell it to the final customers. The contract relation upstream involves t.o.p. obligations on a certain amount of the contracted gas.

In the Italian retail segment the arguments we developed in section 2.4.2 fully apply. Due to the decentralized market setting, the retail suppliers will have to cover t.o.p. obligations on a relevant part of their contracted capacity, and therefore will have strong incentives to avoid competing for the same customers, a commercial strategy that would expose to very low prices and high losses on t.o.p. payments. We remind, in fact, that in this case if two firms with zero marginal cost compete for the same customer they will set very low equilibrium prices and will obtain revenues insufficient to cover their t.o.p. obligations. The most likely outcome in this case is market segmentation, in which the market shares left by the incumbent are covered by a small group of competitors, each serving a different segment of the market with no real competition.

We already argued that this outcome is not avoided with antitrust ceilings, and a different and more competitive equilibrium in the retail segment can occur only if the

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<sup>40</sup> From 2005 the new Edison LNG terminal in the Adriatic sea will start processing liquefied gas from Qatar.

<sup>41</sup> See AEEG (2002), p.191-204.

suppliers to the final customers have no t.o.p. obligation on purchase of gas i.e., if they have marginal costs reflecting their full costs conditions. In this case, in fact, competing for the same customer is not disruptive and generalized, rather than selective, competition would result. This is the case if a **wholesale gas market** is organized, in which a market clearing price is set to equate total demand and total supply, with the retail suppliers buying “from the market” with no t.o.p. obligations and the gross providers selling “to the market” and covering their t.o.p. obligations in this way.

We are not able to work out in details the technical problems involved in the organization of a wholesale gas market, and we argue that, in the new market organization, additional tools to distort price competition can be used (see section 2.4.1). However, we think that market segmentation is a real danger in the retail gas market, and that a wholesale gas market would offer a possible solution that has not yet been explored in the policy debate. We strongly support further discussion and research on this point.

### ***Institutional Issues***

The Italian institutional set-up is at the moment in transition, and the allocation of powers between the political power and an independent administrative authority and between central State and Regions is an ongoing and unsettled issue. As for the first point, since 1995, Law 481/95 attributed an independent authority (AEEG) the power to regulate energy sectors, setting among other things the conditions for access to energy networks and the final prices in the franchise markets.

As for the center – periphery debate, notice that energy is a sector that has long been recognized as central to a country’s foreign policy and overall growth strategy. Energy has been at the center of a recent document discussed and signed by the European Council in Barcelona in March 2002, with the idea that reaching a co-ordination in these policies is crucial within the European scene. This notwithstanding, in spring 2001 the Italian Parliament approved a Constitutional reform which determines that energy policy is largely the Regions’ responsibility; somehow paradoxically, this includes the management of *national* transport infrastructures, where the central State can only issue laws containing general principles, but not specific regulations. The country’s energy policy is thus totally in transition, with some observers hoping that this reform will be recognized as a mistake, and others that try to painfully draw the new boundary between central competencies, regional ones and areas where the State and the Regions are supposed to share responsibility.

A recent law proposed by the Minister Marzano and endorsed by the whole Government tries to re-define the boundaries of competencies between State and Regions, and to re-set the political power in the center of the management of the energy sector, shifting the balance of power against the authority, whose independence is under attack.

Moreover, a general reorganization of the independent Authorities is in the policy agenda in the last year: in June 2002 a Parliamentary Committee, known as the Frattini Committee, issued a document with the general principles to be followed, and introducing a distinction between “first class” Authorities, those which are entitled to guarantee Constitutional rights, and “second class” bodies with regulatory or monitoring duties. While the former, that include the Antitrust Authority, should maintain their independence status, the others, including the energy Authority, should be transformed into operative agencies under a strict control of the Ministries.

Other proposals, including one by MP Tabacci and one by MPs Amato and Letta, maintain a status of independent administrative agencies and propose a reorganization of the competencies, that today are dispersed among too many authorities according to sectoral distinctions that do not correspond to the evolution of real markets<sup>42</sup>.

It is under discussion in these days within the Government a final draft on the reorganization of the Authorities, that seems, from partial disclosures, more in the spirit of the Frattini Committee than of the other proposals mentioned above. Overall, we find that there is a clear intention of the Government to reestablish a direct political control over energy markets.

We find this approach wrong and in contrast with a liberalization policy for several reasons. First of all, the main reason to move powers from a Ministry to an independent authority is not the need to guaranteeing Constitutional rights, the kind of crucial distinction that is adopted in the Government approach. We think that an independent Authority is much more committed to the goals of efficiency and liberalization than a Government, that has to trade off among different objectives and is much more exposed to the pursuit of political consensus<sup>43</sup>. Assigning regulatory or monitoring tasks to an independent authority acts as a pre-commitment to pursue these objectives and solves the time inconsistency problem of a direct involvement of the government in the

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<sup>42</sup> It is claimed in both proposals that the monitoring activities over financial intermediaries should be grouped together under a single regulator, as well as the regulatory activities on network industries (energy, tlc, water, postal services).

<sup>43</sup> The recent decisions of the Government to bypass the energy authority imposing a freeze in electricity and gas tariffs in order to limit the inflation rate is a clear example of this problem.

implementation of the liberalization policies<sup>44</sup>. Hence, we think that the distinction among agencies of different ranking according to their link to Constitutional rights is misleading, and that an independent authority is the more effective solution to promoting and implementing the liberalization policies in the energy markets.

Secondly, liberalizing the markets does not entail only a change in the forms of public intervention, from direct provider as state owned company to regulator of private companies. The former monopolist has to learn how to behave in competitive markets, with a strict budget discipline and with compliance to competition and regulatory policies. The incumbent has to move within a framework of common rules, with no possibility of seeking special treatments and discretionary measures tailored on their needs, building on long lasting relations with the administrative and political institutions. Moving from lobbying and political protection to competition is a serious challenge for the former monopolists, and requires a more distant and independent institution as an authority rather than the traditional counterparts of the Ministry bureaucracy.

Thirdly, ENI and Enel, the former monopolists, are still under the control of the Government and their complete privatization has not yet been scheduled. We think that a distinction of roles between control shareholder and regulator is welcome in this situation, requiring to assign to an independent authority the regulation of tariffs, access and quality standards.

For both these general and contingent reasons we conclude by strongly supporting the need of an independent authority for the energy markets and we look with serious concerns at the attempts to limit the powers of the AEEG.

## *1.5 CONCLUSIONS*

The liberalization process in the energy markets is under way in all the European countries, pushed by the Directives in the second half of the Nineties and implemented through national plans that share a common approach but that show also a significant heterogeneity. In the Italian case, on some, if not all, of the relevant issues the electricity and gas liberalization plans have chosen more advanced solutions than the standard ones prescribed in the European Directives. In particular, in the electricity plan divestitures on the incumbent generation capacity and a (almost) proprietary separation of the transmission network are among the plus, while in the gas plan a very quick

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<sup>44</sup> On this point see Polo (2002).

demand opening schedule can be appreciated. Still, there are several open issues that are to be settled, and that represent the present debate on liberalization in Italian energy markets.

In the electricity industry, notwithstanding the capacity divestitures imposed to Enel, the incumbent can maintain a 50% market share in generation, with likely distortions in the competitive process. To cope with this potential problem many different and contradictory solutions or proposals have been put forward in the last year by the Government: setting bid caps to limit the level of prices in the wholesale market; assigning to a small group of large (industrial) customers the low cost imported energy that would be subtracted from the wholesale market; postponing until today the start of the wholesale pool market, that was scheduled to start by January 2001. It is evident that no clear choice has been made by the Government either in favor of an electricity market, where firms operate freely and competition is the main driving force, or in favor of an administered system, where public presence is paramount. The first route is the only one consistent with the European process and with the restructuring that has taken place in Italy during the Nineties. Unfortunately, the fear that the second one will prevail finds continuous support in the observation of Italian energy policy.

This unclear perspectives have a negative impact also on the second relevant issue of the electricity industry in Italy, that is the need to re-power most of the existing plants and to construct new and more efficient generators.

In the gas liberalization process, the insufficient level of unbundling of the incumbent firm is the major problem. Given the pivotal role of ENI in all the segments of the industry, the antitrust ceilings set up in the liberalization plan can bring about perverse effects, with the new entrants acting as ENI's customers in the gross provision of gas while being ENI's competitors in the retail supply market. Moreover, the control of the dominant firm on the international and national transport network and storage facilities can exacerbate its control on new comers. Finally, in order to prevent market segmentation and monopolistic pricing it is necessary to separate those agents that are burdened with take or pay obligations (gross providers) from those that deal with final customers (retail suppliers) through the organization of a wholesale market for gas.

Finally, crucial institutional issues are still open and require a coherent solution. The Constitutional reform approved in 2001 has assigned, within a general Federalist reorganization of the State, the competencies on energy policy mainly to the Regions, in sharp contrast with the prevailing national nature of the industry. Moreover, the present Government is in the process to reforming the independent Authorities, downgrading the status of the energy regulator, that should become subordinate to the Industry Ministry. Both these developments appear to be quite in contrast with the needs of liberalization policies and add new concerns to the perspectives of this process in Italy.

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## *COMMENT*

by Andrea Boitani<sup>45</sup>

Although I'm not a great expert of electricity and gas markets I accepted to be a discussant of Polo and Scarpa's paper (P&S hereafter) because I think it is useful to compare what is going on in the electricity and gas industry with what is going on in the railways industry. After all, the session is dedicated to the process of liberalisation of great network utilities in Italy and the railway is, undoubtedly, a great network utility.

P&S adopt a very useful, albeit standard, procedure: they start up by outlining a benchmark model of an 'ideal' liberalised energy industry in order to accurately measure the distance between the real world – i.e. the actual Italian and European experience - and the benchmark. I try to summarise P&S's benchmark as I think it is applicable (with minor adaptations) to other network utilities, hence to the railways. In so doing I shall also make some scanty comment.

According to P&S an ideal model of the energy industry is built around three pillars. The first pillar is *unbundling* between production and sale of energy on one side and transport/transmission and distribution on the other side. However, it might be appropriate to point out here that one of the major European experts on the subject, David Newbery, in his recent contributions<sup>46</sup> seems to be very cautious on the economic efficiency of vertical separation, advancing interesting arguments both theoretical in nature and drawn from the British experience. His balanced view is that vertical separation is advisable only when its higher transaction and regulation costs are more than balanced by more effective competition. P&S and Newbery share the opinion that in an ideal unbundled model the owner of the network does not participate in production and in the final market, in order not to distort competition downstream. P&S convincingly

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<sup>46</sup> D.M. Newbery, *Privatisation, restructuring, and Regulation of Network Utilities*, Cambridge Mass., MIT Press, 1999; "Economic Reform in Europe: Integrating and Liberalising the Market for Services", *CEPR Discussion Paper* n. 3183, 2002.

argue that proprietary separation is to be preferred to accounting separation and even to legal separation, as with two or three different companies belonging to the same holding. Either under legal separation and under accounting separation, the network owner/operator has a strong incentive to preclude the access of companies competing with its 'sister' branch or company. I agree with P&S that the European directives are rather ineffective on the crucial issue of unbundling. However, knowing the European decision making process, such an ineffectiveness should not come as a surprise.

The second pillar is access charge. It should be a two part charge. The fixed component of the charge should provide the right incentive to maintain and improve the existing network and to overcome bottlenecks. The variable component should be *cost based*, but sufficiently flexible to allow for changes of clients and/or suppliers. P&S mention that the multitask nature of access charges makes such a formidable regulatory task that public ownership of the network, directly managed under the TPA principle, might be preferred. This notwithstanding they appear to be neutral between private ownership of tightly regulated networks and publicly owned and directly managed networks. As the national transmission grid is a non contestable natural monopoly, I would argue that the choice between public ownership and regulation is a matter of costs and benefits. The benefits of public ownership of the network (with privately owned production and sale companies) are: a sort of 'natural' neutrality towards upstream and downstream companies, and a guaranteed effort in maintenance and improvement of the network, with no need of multitask access charges. The costs of public ownership arise, quite obviously, from giving up the incentives that an (hopefully) efficient capital market gives to managers of privately owned companies and from the possible use of State ownership of the network to hiddenly tax consumers through high access charges on suppliers.

However one may think about network ownership, the choice of the Italian government to sell a relevant amount of shares of *Snam Rete Gas* before completing the privatisation of Eni is surprising.

The third pillar of P&S's model is very simple: *competition* in production (upstream competition) and sale (downstream competition). P&S regard the creation of a competitive environment as more relevant than the technical organisation of markets. The same view advanced by Joseph Stiglitz in his 1999 Beijing conference on "Promoting competition and regulatory policy: with examples from the network industries". P&S seem to favour antitrust ceilings, but do not mention alternative pro-competitive solutions. One of this solutions in Italy is dismissingly labelled "spezzatino". Well, "spezzatino" can be an exquisite dish. In England and Wales a "spezzatino" was

actually implemented, by dividing the old SGB into three gas production companies. Were such an arrangement implemented in Italy before privatisation I believe many difficulties would have been avoided: it is more difficult to force a privatised company to sell some of its assets (generation plants, for instance). This is just to say once more that the restructuring of network utilities should come before privatisation.

P&S also point out that competition in the gas and electricity markets may be thwarted by the very nature of these industries, because of the monopolistic bias of competition “in supply functions” and of the anti-competitive nature of take-or-pay contracts prevailing in the gas industry. I would just add the potential anti-competitive role of multi-utilities, whenever in at least one of the industries there is some vertical integration. Such difficulties lead to caution. Competition (even “reasonable” competition) is not the “natural” outcome of liberalisation in network utilities: competitive markets must in some way be “contrived”<sup>47</sup>.

Now I shall use P&S’ benchmark to attempt an assessment of the liberalisation process in the Italian railways industry<sup>48</sup>. As in the cases of gas and electricity the process was triggered by a European directive (n. 440/91). The provision of such a directive can be summarised as follows: 1) there must be at least accounting separation between network management and train operation; 2) third-party access must be guaranteed on a non discriminatory basis; 3) long-distance services (intercity, eurostar, etc.) must be operated without government subsidies and eventually open to competition “within the market”; 4) local and regional services can be subsidised and operated under state monopoly, yardstick competition or competition “for the market”, according to the autonomous decision of each member state; 5) international freight services must be open to competition.

For quite a long time the directive was substantially ineffective. Although many countries formally adopted it well before Italy (DPR n. 277/1998), no restructuring of the market took place outside the United Kingdom. Even in that country, competition “within the market” was confined to freight transport (rail-freight has a meagre 7% of the total UK freight market); seven-years franchises are competitively awarded for both long distance and local passenger services. In continental Europe no new entrant was registered before 1997, when a few German “länder” opened up some of their local services to competitive tendering. As for electricity and gas also in the case of the

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<sup>47</sup>The expression “contrived markets” is from T.C. Schelling, *Micromotives and Macrobbehavior*, New York, Norton, 1978, pp. 33-34.

<sup>48</sup>More on this topic in A. Boitani, “Liberalizzazione e regolazione dei servizi ferroviari”, *Economia Pubblica*, 2002, n. 4.

railways there are some doubts about vertical separation being preferable to vertical integration. In Japan, for instance *horizontal* (i.e. regional) separation was adopted, whilst each regional company stays vertically integrated. Of course each regional company must guarantee free access to other regional companies for their long-distance services. However, the access problem is less relevant in Japan than in Europe because many Japanese regions are islands.

Whatever one thinks of vertical integration and separation, the EU chose for vertical separation. Italy, as I already said, adopted directive 440/91 very late, at the same time as it adopted directives 18/95 and 19/95 (concerning access to the network). However, the restructuring process accelerated between 1998 and 2001. Unbundling took place in 1999, but it was decided to implement only legal separation of the network operator (*Rete Ferroviaria Italiana, RFI*) from a single train-operating company (*Trenitalia*). Both companies belong to *FS Holding*. The Italian State owns the network, but *RFI* is concessionary for 70 years. Small local networks are usually owned by regions and are operated under different regimes. Recently, Mr. Lunardi's proposal to switch from legal to proprietary separation was turned down by the Treasury for reasons which have not been clarified.

The rolling-stock is owned by *Trenitalia*, that is the incumbent in forecoming market. The creation of *Roscops* (*Rolling stock companies*) separated from train-operators was discarded, as it was discarded a "spezzatino" solution with more than one train-operating companies. *Trenitalia* was also attributed the operation of ticket-counters, cargo-terminals, train-stations and train movements within stations. In short, the incumbent was endowed with all of the crucial assets but the network. Just to make entry by potential competitors easier!

Another barrier to entry is due to limited capacity, at least as far as day-time passengers services are concerned, because European directives state that local and regional subsidised services have a higher priority ranking over track-capacity, and the Italian government chose to fix such a priority-right up to two thirds of capacity. Moreover, any company can sign long term contracts for up to 70% of capacity and up to 85% of a single track. Therefore, *Trenitalia* is able to get all the profitable capacity in a stroke, for a long period of time. As for the high speed tracks (yet to be built) private investors pretend to have take-or-pay contracts with train operators. Take-or-pay track-contracts may be used strategically by the incumbent in order to subtract potentially profitable capacity to new entrants.

Having over-protected the incumbent in the ways I mentioned above, CIPE (which plays the role of rail regulator) laid down a suitable method for access charges. Train

operating companies are only charged for short run costs (one third of total costs), whilst maintenance and investment costs (two thirds of total costs) are born by the State, that is by the owner of the network. Costs are weighted by coefficients allowing for the wear and tear cause by differently weighing trains and the economic value of each track. Hence, some sort of peak-load and “desirability of the rail-capacity” correction of the simple cost criterion was adopted. However, willingness to pay has no role in rail capacity allocation. If there is some excess demand for a rail-slot, rationing takes place according to a priority rule (local services have pre-emption rights, as already said) and according to a sort of “revenue maximisation rule”, which means that priority goes to trains asking for longer rail-slots on the same route (hence paying higher charges to the network operator).

Albeit imperfect, the capacity allocation rules are acceptable and probably less anti-competitive than those adopted, for instance, in Germany. However, as P&S and Stiglitz say, allowing effective competition is more important than the technical arrangement of markets. And, as already mentioned, the restructuring of the rail industry arranged by the Italian government were not pro-competitive. Moreover, there is no independent regulatory authority for the rail industry. This implies that *RFI* has some discretionary power in capacity allocation procedures. A new European directive (14/2001) states that member countries create regulatory bodies for rail-capacity allocation which are independent of the rail-track operator. The adoption of such a directive is still under way.

Since 1999 long-distance passengers fares are formally under price-cap regulation (CIPE 193/1999). I say formally, because in December 2001 fares were “frozen” by a decree of Treasury Minister Mr. Tremonti, fearing that a train fare increase might spur inflation. Although, several simulations conducted by CIPE officials show that Mr. Tremonti’s fear was ill-founded, the freeze was confirmed in December 2002. The credibility of price-cap regulation has been jeopardized, whilst Trenitalia barely breaks-even with present fares. The risk for Trenitalia of running into losses in the near future is high. Political bargaining over train fares – which was common practice in the eighties and early nineties - is likely to spread again, undermining the restructuring process started in 1998.

Summing up, the Italian railways restructuring and liberalisation process is far from ideal, probably farther away from any benchmark model than the restructuring and liberalisation of gas and electricity has ever been.

## COMMENT

by Maria Maher<sup>49</sup>

The paper by Polo and Scarpa is very informative and it provides an excellent overview of the critical issues in energy markets. In particular, it addresses the issues and challenges arising from liberalizing and opening up energy markets in Europe and in Italy. Polo and Scarpa also look at recent developments in Italy and compare Italy's performance in energy markets with that of other European Union countries.

One of the main features, not only in electricity and gas markets, but also in all network industries, is that there are segments of the market or the industry that are potentially competitive. It is often the case that the upstream and the downstream markets can sustain competition, whereas the network or essential facility is characterised by economies of scale giving rise to a natural monopoly. Thus, it is in the network that market power lies, and will remain a problem even after liberalisation.

Given the natural monopoly network component and the existence of potentially competitive upstream and downstream markets, what are the key issues that policy makers need to address in the liberalisation of these markets? The paper proceeds to answer this question by looking at four critical issues that need to be addressed by liberalisation. These include:

- the industrial structure, both horizontal and vertical structure of the industries;
- access to the network or essential facility;
- the organisation of a wholesale market;
- and the development of competition in the segments of the market where competition is feasible.

The paper takes a two-step approach towards analysing liberalisation policies. Polo and Scarpa first start off by discussing the issue of creating a level playing field for new entrants through third party access. And then secondly they turn to the development of

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<sup>49</sup> Organization for Economic Co-operation and Development (OECD)

competition in the markets itself. Polo and Scarpa rightly point out that the first, granting third party access (or what I would prefer to call “open access”) does not necessarily imply the development of competitive markets. Even if you have open access, this does not mean that entry will occur and there's still plenty of opportunity for dominant or incumbent firms to try to foreclose the markets. In this respect, the organisation of the industry is critical with regards to how do policy makers facilitate the development of competition in these markets? I'm therefore going to take things in a slightly different order than that taken in the paper, by starting first with the access of the network, and then turning to the structural issues. Access to the network is key and there's really not much of a debate here. The general consensus is that access charges should be cost-based and non-discriminatory in nature. So the critical issue is how do we go about achieving cost-based and non-discriminatory access?

Given the incentives for foreclosure, how the industry is actually structured will have a huge impact on the incentives for granting of access by the network operator. In this respect, I think the paper places the correct emphasis on vertical separation as the key. Accounting separation and legal separation don't provide the correct incentives to provide non-discriminatory access. With accounting separation the incentives are too weak to ensure non-discriminatory access. There is too much scope for cross subsidisation and the incumbent network firm have every incentive to abuse its dominant position in order to give preferential access to its upstream component. Accounting separation also doesn't get around the issue that in these industries there is large common cost. So there are a lot of different ways in which the firm can strategically allocate these common costs to the benefit of its upstream and downstream components.

Legal separation is also not sufficient, and I agree with the authors on this point. Even if you have separate legal entities, the companies are still under common ownership. The network company therefore still has an incentive to grant priority access to the upstream company that's held by the common owner. Incentives for closure remain strong and the only way around this is through vertical separation. Given the problems of cross subsidies and incentives for closure, it's surprising that not more countries have opted for a full ownership separation of the upstream and downstream markets from the network.

One solution to this problem, which is (as the authors point out) the approach taken in Italy is the separation of ownership and control. In other words, although there is only legal separation between the network and generation, there is an additional separation of the ownership and control of the transmission grid by an independent system

operator. While this approach goes a long way towards overcoming the incentives to discriminate in the provision of access, in the long run it doesn't provide the right incentives for investment in transmission capacity. This is because the independent system operator (ISO) or "*gestore della rete*" who has control over the network does not have ownership. Current proposals for reforms include the possibility of moving towards full separate ownership, and giving the ownership and control of the network to a single firm, separate from generation. This would provide the correct incentives for investment and will be a move in the right direction.

So up until this point, all of these issues on the vertical separation have to do with mainly the granting of non-discriminatory access. The other point is that we would want the network access cost to be cost-based. The network is still a natural monopoly and there remains a need for regulation of the network component. So the idea that the need for regulation in these markets would disappear as they are opened up to competition is just something that's not going to happen. There will remain a need for strict regulatory oversight of the natural monopoly component in these industries, be it in electricity, gas, railroads, or telecoms, etc.

Secondly, I believe that in Italy the electricity sector is subject to price-cap regulation. Most other countries have opted for some type of cost-based regulation when it comes to electricity prices. And the reason for that is cost in electricity fairly easy to estimate and they're well known. Unlike telecommunications, where there is a lot of uncertainty as to what the underlying cost structure is and there's a lot of technological innovation. So the need for price caps in providing incentives for efficiency improvements in telecommunications is very important, whereas there's less of a need for it in electricity. Therefore, it is possible to have some type of cost-based regulation of access prices in electricity.

Let me turn to a third point, and perhaps it's the only part of the paper in which I might have wanted more of a debate and more of a discussion. It concerns the organisation of the wholesale market or exchange market in electricity. The development of a wholesale market is imperative and it's an important aspect of opening up competition. That's not the issue. The question is whether the wholesale market should be compulsory or not. Polo and Scarpa seem to lean on the side that the market should be compulsory. However, if you look at the California experience and with what happened in California, that might be a lesson in point.

The authors seem to suggest that the institutional arrangements are not as important as the structural arrangements. But I think what the California experience taught us is that in fact the institutional arrangements can be critical. Regulation in

California initially eliminated the use of long-term contracts and all power had to be sold compulsory through the wholesale power exchange. Wholesale prices were also deregulated but retail prices remained strictly regulated. There were two developments that made things worse. As oil prices tended to increase, wholesale prices in California sky-rocketed, but since the downstream retail markets were price capped this led to a situation that became non-sustainable. This could have been avoided if the wholesale power exchange were not compulsory and if the institutional arrangements allowed for the use of long-term contracts in conjunction with purchases from the exchange market. In markets like electricity and gas, where you have huge fixed costs that need to be underwritten, this can be accomplished through the use of long-term contracts and long-term contracts in this case can be viewed as a market solution to underwriting investment.

The authors put a great deal of emphasis on marginal cost pricing, but don't make a distinction between short-run and long-run marginal cost. If you do have a compulsory exchange where all power has to go through the market, you would have a lot of volatility in the prices arising from short-run marginal cost pricing at all times. When the system is capacity constrained, prices act as a signal and should be high enough to cover the fixed costs of investment. You can contrast that to some type of underwriting of those fixed costs through long-term contracts where the price in the contract reflects long-run marginal costs. Contracts in this instance often contain a component for fixed costs and would lead to much less volatility. Polo and Scarpa are right in that over the long-run the two average out to the same. But I think long-term contracts are also a market solution to problems of investment in this industry. Making the power exchange compulsory is imposing one type of solution on the market, whereas I prefer to let the market decide to what extent purchases are made through the use of long-term contracts and the extent to which purchases are made through the wholesale market. So while I'm in favour of having a wholesale market, I don't think it should be compulsory.

Lastly the paper goes on to discuss the development of competition in the horizontal structure of the industry, and the authors mainly argue for divestiture to lower concentration in these markets. Polo and Scarpa are right in pushing for this as both empirical and theoretical work has shown that lower concentration can lead to substantial benefits. For example, Green and Newbury show that in fact if upon divestiture the generation companies in England and Wales had been broken up into I think five companies as opposed to two, that prices would have been significantly lower. With only two generation companies, market power was still sufficient and firms were

able to manipulate the pool price. Work by Borenstein also shows that market power on the part of generators played a role in the California crisis. However, we need to be a little bit careful in how we interpret concentration indices in these industries and perhaps not want to impose too much of a fragmentation that might lead to an inefficient market structure. The work of Sutton shows that in industries with high fixed costs, that are in this case exogenous, the natural market outcome will be, to some extent, a market structure exhibiting a fairly high level of segmentation.

Regarding recent developments in Italy in energy markets there are some concerns. Recently the independence of the regulator has been weakened in that the government interred with prices set by the Energy regulator. Not only has government interference occurred in energy but it has also occurred in telecommunications. My understanding is that the government has taken away the right to issue licenses away from the Communications Authority, and has given it back to the Ministry. One of the key tools at the disposal of the regulator to determine the level of competition in this sector is power to issue licenses. In light of this, I'm a bit surprised that the paper doesn't take up more of the issue of incentive and the role of state ownership. I think the paper could use more of a discussion on the disincentives that arise from the government having a different set of objective functions than would a privately owned, but regulated, company.

Lastly, I think the paper could benefit from a discussion about the interrelation between the gas and electricity industries – and this is particularly important in the case of Italy. One of the areas where new entry in electricity will occur and where a cheaper source of electricity will come from is in combined cycle and gas turbine generation plants. Therefore, having cheap sources of gas is very important for the development of competition in the electricity generation market. The need for enforcing competition in the gas market will have important implications for the development of competition in the electricity market.