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The Liberalization of Energy Markets in Europe and Italy

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The liberalization of energy markets in Europe and Italy[1]

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Abstract

In this paper we review the recent liberalization process in energy markets promoted by the European Commission in the late Nineties and implemented in all the member countries. The electricity and gas industries are characterized by a predominant role of network infrastructures, and by upstream and downstream segments that can be opened to competition. The key issues that must be addressed to design a liberalization plan include the horizontal and vertical structure of the industry, the access to the transport facilities, the organization of a wholesale market and the development of competition in the liberalized segments. We analyze the liberalization policies in the EU as a two step approach: the Directives and the national liberalization plans have focussed so far on the goal of *creating a level playing field* for new comers through Third Party Access to the network infrastructure, the unbundling of monopolized from competitive activities of the incumbent and the opening of demand. Today, within a heterogeneous picture, all the member countries are implementing this phase. The second step refers to the *development of a competitive environment* in the liberalized markets, a goal that requires, but is not implied by, the creation of fair entry conditions to new comers. The reduction of market power of the incumbent through divestitures and the entry process, and the design of the market rules are the crucial issues, and neither the Directives not the national plans have been in most cases very effective on this issue. As a result, while we can start appreciating the entry of new operators in both the electricity and the gas industry, the effects on consumers choice and final prices are rather limited, in particular in the gas industry.
In the second part of the paper we move our attention to the Italian case, describing the national liberalization plans and the policy issues still opened. Both the electricity and the gas reforms are more advanced than the minimum standards required by the Directives, and include in some cases interesting innovations. In particular, the Bersani Decree on electricity requires capacity divestitures in the generation plans and adopts a proprietary unbundling of the transport network, while the Letta Decree on gas introduces antitrust ceilings and a very quick schedule towards complete demand opening. Among the more relevant open issues, in the electricity industry the incumbent firm can maintain a market share of 50% in generation, with likely distortions in the wholesale market. There are two possible ways out of this central problem: a "market solution" that requires further reductions in the generation capacity of the dominant firm and an improvement in transborder interconnection capacity together with the start up of the wholesale market; an "administrative solution" that tries to limit the effects of the incumbent market power on prices by assigning the foreign low cost energy to some categories of (large) customers and introducing bid caps on prices, while delaying the opening of the wholesale market. It is not clear which choice has been made by the Government, even if the latter emerges from many recent decisions. In the gas industry the insufficient unbundling of the dominant firm is the most serious obstacle to developing competition. The antitrust ceilings may even determine perverse effects, with the new firms acting as (upstream) customers and (downstream) competitors of the dominant firm. Moreover, the access to international transmission capacity seems a crucial issue. Finally, the nature of competition with take-or-pay contracts suggests that a wholesale market for gas would be necessary. The last open issues are institutional: we argue that the recent assignment of the energy policy at the regional level and the prospected reduction of independence of the energy authority are two institutional reforms with a very negative impact on the liberalization process.

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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.

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 competition development.

In this paper we review the recent experience of liberalization policies in the European countries following this two steps approach. In section 2 we discuss the main economic issues that must be addressed in the design of a liberalization plan. Section 3 presents the main features of liberalization policies in the member countries, while section 4 gives a closer look to the Italian experience, with a discussion of the open issues in the liberalization process.

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 a 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.

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.

2.1.1 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[2].

The theoretical debate over the desirability of vertical integration is not very developed, in that the few contributions on the subject[3] 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 should be based on a careful account of the actual advantages and disadvantages of the two solutions.

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. Here we can only update 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 marginalisation; and so on…) are generally strengthened by two additional factors, which in energy markets play a potentially crucial role.

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 despatch 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 are supposed to require the need to minimise the uncertainty to sell the gas purchased in international markets. This claim certainly deserves more attention in that take-or-pay contracts are an important feature of gas markets at least for historical reasons. Take-or-pay contracts are signed between the owner of natural gas (often a large State owned firm from non-EU countries) and an equally large buyer who imports the gas into EU and then resells it wholesale. 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 positive marginal cost. This contract is meant to leave the upstream firm (producer) with some price risk (international prices may vary during the period in which contract conditions are set, but the contracted terms are usually indexed to other energy prices), while the importer entirely bears the quantity risk (i.e., the risk not to be able to resell the gas purchased). The

[2] 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.
[3] Vickers (1995); …

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.

It is often claimed that vertical integration would be the natural way to ensure the upstream firm to be able to resell the contracted gas in the final market, covering their t.o.p. obligations.

We think that, although t.o.p. contracts pose serious problems to competition in the retail supply, as we'll argue later on, they do not necessarely require to maintain vertical integration. The existence of these contracts for the import of gas does not necessarily require the importer and the seller in the national market to be the same economic entity. 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 the upstream-seller integration could be that the gas is sold 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 organisation 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". If access conditions are non-discriminatory (or possibly provide a particular guarantee to companies with these contracts) there is no particular reason why these long-term fixed-sum commitments should represent a problem for a firm which is not integrated *with the network*. An independent transport network should be able to provide a perfect guarantee that the gas can reach the final client.

The real problem for an importer with take-or-pay contracts is: will this gas be sold? But this has nothing to do with the network ownership or control, as long as access is open: part of the real answer to the importer's problem could be the integration *with the final seller*. If the seller controls a group of captive clients, an integration between the upstream firm and the seller should grant that the gas is sold. Whether or not this integration is conducive to effective competition, is an issue that we shall analyse later in the paper.

In any case, notice that this issue is somehow similar to the one arising in the electricity market, where it has been recognised that – given the financial 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 analyse what kind of vertical market organisation is better able to favour 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 – 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 imbalancing 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.

2.1.2 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. Europe's tradition with (often State-owned) monopolies calls for a more pragmatic approach: we therefore start from the existence of (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[4]. The second one is to block the incumbent's expansion, relying on entry as the force which will reduce prices.

The first one 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, distinguishing the two sectors appears important.

[4] 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).

In the gas sector, all a firm needs to compete wholesale is a contract with a producing country and access to the network. If international networks are open – at least within the EU – the (big) remaining problem is finding a gas owner willing to sell gas to a new entrant at conditions, comparable with those offered to incumbent firms. The problem may appear banal, but it may be formidable in practice, because international networks are not necessarily under EU jurisdiction, because the allocation of transmission capacity is heavily dependent on ongoing relations in which the incumbent has a predominant role, and because the availability of gas is limited.

One ways to by-pass these constraint would be to ship the gas in the form of liquid natural gas (LNG), and then re-gassify it in terminals within the EU, but even this means having relatively high-cost gas. Therefore, availability and access to these terminals is as important as the access to the networks, but it does not guarantee that entrants will be very competitive. The limited number and capacity of these terminals represents a relevant physical constraint to the competitive process.

Some sort of 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. However, as we'll analyze in detail for the Italian market, there is no easy solution to this problem, and allowing entry is not equivalent to fostering competition.

In electricity, the story may be partially different. Building generating plants takes time, but (if environmental and more generally bureaucratic constraints are not insurmountable) an entrant can have a reasonable hope to have a competitive state-of-the-art, low-cost 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. What does "abroad" mean? Until now, EU authorities regard energy markets as national markets, because of their institutional as well as physical fragmentation. There is no reason why this should remain true for ever. Strengthening international interconnections should be an important element in the development of effective competition within Europe: once this will be a reality, obviously market concentration should be looked at from a totally different perspective.

2.1.3 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 neighbouring industries such as water, telecommunications, and so on. In this case, we talk about multi-utility firms. There are several examples of firms pursuing this strategy[5], in the hope to

a) save on costs

b) provide customers with an integrated set of services (one-stop-shop)

c) use their strong market position in one sector to induce "captive" customers to buy a bundle of services

[5] 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.

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[6] 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[7].

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.

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 one. 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.

2.2.1 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

[6] These economies are documented by several studies and in particular by Fraquelli *et al.* (2002) for the Italian case.
[7] Notice that the very notion of cross subsidy becomes less clear as the allocation of common costs is somehow arbitrary.

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.

Against the leverage theory, the Chicago school has proposed an argument, the Coase conjecture, that runs as follows: once signed the first contract, the network owner has an incentive to further give access to the infrastructure, with lower and lower access fees, to other downstream firms, in order to gain further rents on the residual demand in the final market. The possibility of renegotiation makes the initial contract(s) unprofitable for the downstream firms, because the access fees will be higher than the profits gained in the (fragmented) market that the network owner will create through its access policy. The only (renegotiation proof) access contracts will be those corresponding to the performance of the fragmented and competitive final market[8]. 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.

The first is by exploiting exclusive contracts, such that the network owner pays a high penalty if a second access is released. The second refers to repeated interaction and reputation: in an ongoing market the owner will prefer not to offer further contracts, gaining a high (monopoly) access fee every period, rather than renegotiating, fooling the firm the first time but being forced to charge lower (competitive) access fees in the future. While the former case can, to some extend, 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.

[8] See on this point Rey and Tirole (2001).

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. If the network owner does not participate in the downstream markets, it is neutral towards the applicants. The allocation of access slots can be organized by the owner, that will try to maximize revenues, or by the regulator, if some further goal concerning the overall market is pursued, as for instance guaranteeing a privileged access to new comers.

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. For instance, if the owner is active also in the upstream segment, it should be prevented from selling energy (electricity or gas) supply bundled with transmission rights, as it can lead to saturate the network capacity at crucial bottlenecks in favor of particular operators, foreclosing the market for others that do not buy energy from the incumbent. More generally, the allocation of transmission rights must be separated from the transactions between upstream and downstream firms. Even concerning the allocation of transmission rights, we find again that a stricter regulatory regime is needed when proprietary unbundling is insufficient.

2.2.2 Access price and the incentives to invest

The third 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[9], but simply to 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, and that 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 structure of charges has an impact as well, in terms of time length and of individual components. In a liberalized market we expect that the firms in the competitive segments might change their clients and suppliers according to the price movements. Since any trade requires the access to the network, the access tariffs should be sufficiently flexible to allow to change clients or suppliers (and therefore the geographical path of delivery) without paying each time an additional burden. A short time span and the distinction between entry and exit access charges can minimize the transaction costs, still preserving a cost reflective tariff structure.

[9] See for a general reference Amstrong, Cowan and Vickers (1999) and Laffont and Tirole (1993).

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, 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.

2.3. Wholesale markets

The wholesale segment of these industries is usually recognised as a potentially competitive one, but the current debate revolves around several questions. The first two have to do with the organisation of the market:

a) should the market be organised in the form of a compulsory "exchange", or should interested parties be free to buy and sell energy outside an organised set-up?

b) In case one prefers the organised solution, should the exchange be centralised, with a "walrasian" auctioneer setting a unique price, or should parties be allowed to decide prices independently (*pay as bid*)?

The third question is instead related to the balance between market and public intervention:

c) when a unique price is set, is price regulation totally ruled out, or are price cap mechanisms conceivable devices as part of a market set-up?

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, we also know that 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 aforementioned issues are those which are actually at the core of the debate, for the market to produce the first result, the key aspect is how much competition there is in it, not its organisation in the sense we outlined above. The past experience seems to indicate that the answers to some of the above questions (which market set-up is better able to keep prices in line with costs and to provide incentives to investment) are neutral to these ends.

Indeed, most markets do not operate through organised exchanges. Exchanges – when they exist – may be State-owned, private or self-regulatory ("recognised") organisations, may or may not be unique (for instance, there are several stock exchanges in the US, even more in the EU). When do markets need exchanges, rather than relying on decentralised non-recorded and non-coordinated transactions? This is a very general question mark, whose answer is beyond the scope of the present paper, but one that should remain at least in the background of the discussion, given 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.

2.3.1 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 centralised 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 centralised market where only one (official) price is formed in each period is probably particularly important in the initial phase of liberalisation, when sellers and buyers are learning the rules of the game, and when the outcome of liberalisation is still uncertain.

Having a compulsory market is often considered as a way to increase its liquidity, forcing market operators to trade through the exchange. This should imply that the equilibrium price does not only reflect marginal, residual transactions, but the whole demand and supply, making market price responsive to all market transactions, probably less volatile and therefore more significant.

However, notice having a compulsory exchange does not mean forbidding financial hedging contracts such as the contracts for differences[10]: 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 marginalised, 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.

[10] See Armstrong, Cowan and Vickers (1999).

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[11].

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 *necessary* (by definition, market participants cannot predict the imbalance) and the participation should probably be compulsory, as there is a general public interest that these imbalances are settled without uncertainties[12]. 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.

On the other hand, collusion may be enforced more easily with a *pay as bid* market, where the punishment of a deviation from a collusive strategy is less costly to other firms (Fabra, 2000). Moreover, a bidding behaviour aimed at manipulating prices would be fairly easily detected by an antitrust authority and could be sanctioned as abuse of dominant position[13]. 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 observed, in the same way as we can observe the marginal firm (responsible for the price, which may possibly be too high). When transactions are decentralised, 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.

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. Traditional structural aspects seem to have an impact, while institutional engineering has probably had a mainly cosmetic effect.

[11] 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.

[12] Moreover, different conditions applying to the same difference between day-ahead plans and their actual realisations would be hardly justifiable.

[13] 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).

2.3.2 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[14]. 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 moments where energy is not provided. This may or may not be optimal, as providing energy in peak times can make it necessary to employ inefficient plants and may thus be very expensive; the answer depends on the value one attaches to non-supplied energy (the Value of Lost Load in the UK Pool market) and the probability that such an event occurs. If the expected value of non-supplied energy is higher than the cost of the necessary additional plants, then it seems preferable to set-up a system of incentives, such that investments will take place.

This leads us to the second mechanism, through which fixed costs may be covered. Around the times where electricity is rationed, markets 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 prices peaks.

What is the best way to pay for fixed costs? On average, both ways lead to Rome, and there is no evidence that average prices are different. Capacity payments or other explicit capacity incentives seem to guarantee that price volatility is under control, in that price spikes are not justified (and typically do not occur) but at the same time are mechanisms which interfere with the purest version of market competition, introducing a systematic wedge between prices and marginal costs. 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 Australian style.

2.3.3 Price regulation in an open market

A major concern in markets initially characterised 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.

[14] 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).

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[15]. 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 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.

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[16]; 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[17], 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.

[15] Borenstein, Bushnell and Wolak (2001).
[16] See Compte, Rey (2000)
[17] See Gelman and Salop (199?).

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 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.

2.4.1 Competition in wholesale electricity markets: supply function equilibria

We start our discussion from a market organization that reminds the textbook competitive markets: firms and customers do not trade individually, but face an aggregate market and a single price, set by an auctioneer. It is well known that the wholesale electricity market has been organized since recently along these lines in the UK, and that a pool market is considered the more natural way to ensure a coordination in balancing electricity supply and demand.

Competition in these markets has been modelled in the IO literature as related to a particular class of strategies: firms do not set simply 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 strategy space closely mirrors the way the electricity pool market is organized, where the generators are asked to submit to the dispatcher their offers in terms of price and output pairs.

Klemperer and Meyer (1989) 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 in 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, proving that the asymmetry in market shares that characterized the first phase of the experience enhanced the monopolistic bias of competition in supply functions.

The basic intuition of competition in supply functions comes from the idea that the generators, endowed with plants of different technology and efficiency, have a sort of stepwise marginal cost curve. But this is only the lower bound of their supply possibilities, and margins can be added to cost when designing the “real” supply curve. Low cost plants, that will be often used, will bring to the generator a rent in most of the time intervals of the day. High cost plants, belonging to the higher portion of the supply curve, will be strategic, since the market price in the peak demand phases will be determined by that portion of the supply curve. By committing to a supply curve a firm has no way to undercut the supply curves of the rivals, and prices higher than marginal costs can be sustained in equilibrium.

A potentially delicate element in the supply function model refers to the ability of the firms to commit to their announced supply schedule. When no realistic commitment tool exists that prevents a firm from deviating from the announced quantity-price pairs, the supply function framework does not seem a good description of market interaction. However, in a centralized pool market the generators, once submitted their availability schedules, have to stick to their commitments, and penalties for withdrawing capacity are usually introduced. Hence, the need to rely on a credible supply schedule in order to coordinate and balance the market implicitly gives the firms a tool to make their commitments credible.

The performance of the wholesale pool market in the UK has been judged quite unsuccessful, with a wholesale price that steadily remained quite high and did not reflect the more and more fragmented market structure and the improvements in the efficiency of the generation plants. This seems not surprising once we keep in mind the supply function paradigm.

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

We have considered so far competition in the generation segment of the electricity industry, considering a centralized pool market organization. As a consequence, all the 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. This process can be rather standardized, as in the case of small customers or households accepting the contract terms of a retail supplier, or it can take the form of a bargaining round between the supplier and a large client.

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 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, i.e. their (zero) marginal cost does not reflect the total cost for the purchase of gas.

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[18].

[18] More precisely, the zero marginal cost firm still burdened with TOP 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).

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. This result adds additional concerns relatively to the gas industry: 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.

No attention, to the best of our knowledge, has been devoted so far to this problem in the policy debate, and a much deeper analysis of possible solutions is needed. 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[19]. 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[20]. 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 competing for the same costumers allows to cover costs and make profits. Generalized entry and competition, as in the example initially discussed, might be now restored.

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 approved new Directives 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

[19] See Polo and Scarpa (2002).

[20] 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.

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.

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.

These documents represent the final stage of a long and complex political process, and summarize a compromise among different situations and approaches, with the UK and France at the two extremes of the political spectrum. In order to cope with such differences, the Directives often adopted general principles that can be translated in more or less innovative measures, leaving a broad area of discretion to the member Countries on some key elements.

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 the electricity industry a technical condition on congestion is introduced, while 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 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.

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. We start our comparison from the electricity case.

3.2.1 - Electricity

Regarding the implementation of the TPA principle, three are the main issues to be set: the determination of the technical and commercial conditions for access; the solution of the disputes of access and the kind of regulatory regime.

The Directive 96/92 left the member Countries free to choose between a negotiated and a regulated regime; in the former the parties, i.e. the owner of the network and a generator or a retail supplier agree over the technical and commercial terms of the access service, the bargaining power of the two agents being crucial in determining the cost and the scope of access. Alternatively, the price and technical conditions for access are set centrally by an authority that can be a sectoral regulator or a Ministry, and are the same for all trades. In Table 1 we can see that most of the member Countries have chosen a regulated access regime, that offers more protection and a more uniform treatment to the new comers. The only relevant exception is Germany, where a negotiated regime has been chosen, and where there is no sectoral authority.

Table 1 - National liberalization plans - Electricity

Countries	Third Party Access			Unbundling	Demand opening		Score (*)
	Access Price Setting	Disputes Solution	Type of Regulation		% eligible (2001)	Complete opening	
Austria	Regulator	Regulator	Ex-ante	Legal	100	2003	**18**
Belgium	Regulator	Regulator	Ex-ante	Legal	35	2007	**14**
Denmark	Regulator	Regulator	Ex-post	Legal	90	2003	**17**
Finland	Regulator	Regulator	Ex-post	Proprietary	100	1997	**22**
France	Ministry	Regulator	Ex-ante	Accounting	30	Unspecified	**8**
Germany	Negotiated	Antitrust	Ex-post	Accounting	100	1999	**13**
Greece	Ministry	Regulator	Ex-ante	Accounting	30	Unspecified	**8**
Ireland	Regulator	Regulator	Ex-ante	Legal	30	2005	**14**
Italy	Regulator	Regulator	Ex-ante	Proprietary	65	Unspecified	**18**
Luxemburg	Ministry	Ministry	Ex-ante	-	50	2007	**10**
Netherland	Regulator	Regulator	Ex-ante	Legal	33	2003	**15**
Portugal	Regulator	Regulator	Ex-ante	Legal	30	Unspecified	**12**
Spain	Ministry	Regulator	Ex-ante	Legal	45	2003	**15**
Sweden	Regulator	Regulator	Ex-post	Proprietary	100	1998	**22**
UK	Regulator	Regulator	Ex-ante	Proprietary	100	1998	**23**

Source: European Commission (2002)

Scores:

- Access Price Setting: Regulator (3), Ministry (2), Negotiated (1)
- Disputes Solution: Regulator/Antitrust (2), Ministry (1)
- Type of Regulation: Ex-ante (2), Ex-post (1)
- Unbundling: Proprietary (8), Legal (4), Accounting (1)
- % Eligible 2001: 90-100 (4), 50-90 (3), 36-50 (2), <36 (1)
- Complete Opening <2000 (4), 2000-2003 (3), 2004-2007 (2), >2007 (1)

A second key aspect of TPA refers to the institution that deals with the disputes and acts as an arbitrator. With the notable exception of Germany, where the antitrust authority intervenes in the disputes, in the other countries the sectoral regulator or the Ministry of Industry is in charge for

dispute resolution. Although in these latter cases we expect that the required technical competencies are provided, we consider more appropriate, in the delicate role of arbitrator, an independent regulatory authority devoted to the liberalization of the industry rather than a Ministry, which is typically responsible of a broader range of political objectives.

Finally, the national liberalization plans differ also in the kind of regulation that is adopted on TPA: the majority of the countries have chosen an ex-ante regulation, where the regulator sets the price and technical conditions in advance, rather than an ex-post regime, in which the regulator intervenes ex-post on the tariffs communicated by the firms. Although in both cases the regulator has the final word on the access conditions, we argue that the ex-ante regime, requiring the regulator to act as a first mover, forces him to reach a better and independent knowledge of the cost data. Hence, we consider the ex-ante regime more effective.

The second crucial issue in the design of the liberalization plan is the unbundling regime to be chosen. We have already commented on the weak effectiveness of the accounting solution, as compared to the legal and, mostly, proprietary separation. From Table 1 we can see that the proprietary solution, that may remove the incentive of the owner of the network to foreclose the new entrants, 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 the 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.

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. To try and summarize an overall judgement on the effectiveness of the liberalization plans by countries we have therefore used a scoring procedure, with higher scores corresponding to a more advanced solution. The details are reported below the table, while the reasons for our relative evaluations come directly from our comments above.

We find that the more advanced solutions have been adopted in the UK, Finland and Sweden, highlighted in green in the Table, that obtain the top scores in all the three key issues of liberalization. A yellow mark identifies the 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, Luxemburg, Ireland and Portugal (white color) 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.

3.2.2 - Gas

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

Table 2 - National liberalization plans - Gas

Countries	Third Party Access			Unbundling	Demand opening		Score (*)
	Access Price Setting	Disputes Solution	Type of Regulation		% eligible (2000)	Complete opening	
Austria	Negotiated	Regulator	Ex-post	Accounting	49	2001	**10**
Belgium	Regulator	Regulator	Ex-ante	Legal	59	2005	**16**
Denmark	Regulator	Regulator	Ex-post	Legal	30	Unspecified	**11**
Finland	Regulator	Regulator	Ex-post	Proprietary	90	2003	**21**
France	Unspecified	Unspecified	Ex-ante	Accounting	20	Unspecified	**4**
Germany	Negotiated	Antitrust	Ex-post	Accounting	100	2000	**12**
Greece	Unspecified	Unspecified	Ex-ante	Unspecified	Unspecified	Unspecified	**2**
Ireland	Ministry	Ministry	Ex-ante	Legal	75	2005	**14**
Italy	Regulator	Regulator	Ex-ante	Legal	65	2003	**17**
Luxemburg	Ministry	Ministry	Ex-ante	Accounting	51	2007	**11**
Netherland	Negotiated	Regulator	Ex-ante	Accounting	45	2004	**10**
Portugal	Unspecified	Unspecified	Ex-ante	Unspecified	Unspecified	Unspecified	**2**
Spain	Ministry	Ministry	Ex-ante	Legal	72	2003	**15**
Sweden	Regulator	Regulator	Ex-post	Accounting	47	2006	**11**
UK	Regulator	Regulator	Ex-ante	Proprietary	100	1998	**23**

Source: European Commission (2002)

Scores:

- Access Price Setting: Regulator (3), Ministry (2), Negotiated (1)
- Disputes Solution: Regulator/Antitrust (2), Ministry (1)
- Type of Regulation: Ex-ante (2), Ex-post (1)
- Unbundling: Proprietary (8), Legal (4), Accounting (1)
- % Eligible 2001: 90-100 (4), 50-90 (3), 36-50 (2), <36 (1)
- Complete Opening <2000 (4), 2000-2003 (3), 2004-2007 (2), >2007 (1)

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.

Table 3 below summarizes the relative ranking in the evaluation of the electricity and gas national plans of the member Countries. The correlations of the two industry plans by countries are confirmed also using the aggregate scores, as well as the differences between the two policies in some cases.

Table 3 – A comparison of the Electricity and Gas liberalization plans.

Gas\Electricity	Unsatisfactory (<10)	Low (10-14)	Medium (15-19)	High(>19)
Unsatisfactory (<10)	France, Greece	Portugal		
Low (10-14)		Germany, Ireland, Luxemburg	Austria, Denmark, Netherlands	Sweden
Medium (15-19)		Belgium	Italy, Spain	
High(>19)				Finland, UK

3.2.3 – Third Party Access: further issues

Within the general framework of the national plans, the implementation of the TPA principle needs to address some additional issues that play a crucial role in effective liberalization, as already discussed in the previous section. They pertain the level and structure of network charges, the access to the balancing services and the cross border interconnections.

Since in most countries the separation of the network from the competitive activities has been only partial (legal or accounting unbundling), the incumbent still retains the possibility of setting high network charges to competitors, reducing their ability to compete in the liberalized segments. Ensuring a non discriminatory access to the network through a transparent and cost reflective tariff structure is therefore a crucial step in the implementation of the TPA principle.

In the electricity industry, the charges usually distinguish between entry (from generators) and exit (to customers or distributors) prices that in most countries (with the exception of Greece, Ireland, Italy and UK) are postalized, i.e. not related to distance. Moreover, the tariff is defined with a reference to a combination of capacity and flow. On average, the network charges correspond to a high percentage of the final bill, and in this sense they are relatively high, with possible foreclosure effects on the independent competitors. In particular, the distribution charges of the medium voltage networks are, in absolute terms, more relevant than the transmission tariffs and they look particularly high in some countries as Austria, Germany and Spain[21]

Potential problems for new entrants arise also for the gas network tariffs. With the exception of Italy and UK, where tariffs are defined on a zonal base, network charges are not cost reflective; moreover, a further element of rigidity derives from the transport capacity between two points being usually assigned on a minimum period of one year, although there are significant variations in demand within this interval. Finally, it often happens that no transport capacity is available at certain entry points, limiting to some local submarkets the scope for competition and protecting the incumbent in other areas. The level of gas transmission tariffs is particularly high for Italy and Sweden and, to some extent, Spain and Ireland[22]

The second important issue in the implementation of TPA refers to balancing. Since new comers have to purchase supply capacity before knowing the amount and characteristics of demand, they can find themselves unbalanced, with an excess or a gap in supply. The balancing regime, and namely the prices for imbalances, therefore, can represent a serious problem for new comers, mostly when there is no wholesale liquid market where additional capacity can be bought. The length of the balancing period, that varies between 15 minutes and 1 hour, plays a role as well, a shorter period requiring a stricter balancing and a higher burden on new comers.

Since in the electricity industry no storage is possible, balancing supply and demand over time involves a central role of the transmission system operator (TSO), that in most countries invites bids to increase or decrease capacity, but in some cases directly fixes the imbalance prices. The access to the storage facilities, instead, is the key element in the gas industry: in some countries (France, Belgium, Netherlands) the storage capacity is sold together with the transmission capacity, an element of rigidity in the system, while in Germany, Italy, UK and Spain a separate market for the access to storage facilities exists.

[21] See European Commission (2002), p.10 and Appendix A.
[22] See European Commission (2002), p. 13 and Appendix B.

The third relevant problem with TPA concerns cross border transactions and interconnections. Foreign capacity is crucial under two respects: the possibility of buying supply capacity abroad gives more degrees of freedom to small new entrants in a national market; moreover, cross border transactions can be a way for large European incumbents to start competing on the other markets. Hence, sufficient interconnection capacity and a non discriminatory and cost reflective tariff structure can help creating an effective competition at the European level.

Several unsettled problems still remain to be solved on cross border transactions, concerning a harmonization of the transmission tariff systems across countries and the allocation of interconnection capacity. Designing an efficient and cost reflective tariff structure is not an easy task, since the contractual path of international trades does not reflect the physical path of electricity and even of gas. Moreover, in some cases the inflow of electricity or gas from abroad can reduce congestion, with a benefit rather than a cost for the system.

The allocation of capacity is still far from settled under market based standards: in electricity the process is more advanced, but still many countries apply different schemes. In the case of gas, a serious lack of transparency on the availability of transport capacity is endemic. Moreover, we find both temporal rigidities as well as geographical ones, where the import contracts contain destination clauses that prohibit to resell the gas in other member countries. Finally, in a medium term perspective, the development of cross border transactions will require huge investments to increase the capacity of interconnectors.

On the three key areas of network charges, balancing and interconnection, many improvements are still needed before the TPA principle will be fully implemented.

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. We already argued that the compromise of the European Directive has been particularly cautious when dealing with the possible tools to reduce the market power of the incumbent in the potentially competitive markets.

The issue has been left to the member countries, 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 4 and 5 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 deconcentration 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.

Table 4 . 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)
Netherland	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 Herfindhal 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 5) 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 were the delivery of gas under TPA has developed more.

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 aggregate score discussed above. The availability of low cost generation (i.e. nuclear and hydro) is very different across countries[23], 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

[23] See Autorità dell'Energia Elettrica e del Gas, Relazione Annuale 2002.

91% of low cost generation and is still a very closed market. Heterogeneity is even more pronounced in small users prices.

Table 5 - 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
Netherland	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)

A relatively more uniform picture characterize 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 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.

To further explore this point, we have run some regressions on the average price (PRICE) by countries in July 2001, using the liberalization plans ranking as a control (SCORE). For electricity we have further controlled for the composition of the generation plants by technology, using as an indicator the percentage of low cost (hydro and nuclear) generation on total electricity production in 2000 (COST). We have focussed the analysis on large users prices, those that should be influenced by the opening of the market, while small users prices are in most countries still set by the regulators: Table 6 shows the results. The more interesting result refer to electricity where we find a significant effect of the cost variable but also a significant (at 10% level) impact of the liberalization plans.

The electricity prices are lower the higher the percentage of low cost production and the more advanced the liberalization policies, consistently with our priors. Although cautious in assessing the quantitative impact of these effects, the effect of liberalization seems non negligible: reforming the national policies towards a more effective liberalization (improving the score from 10 to 20) would decrease the price of electricity b 5.8 euros, corresponding to 10% of the average price in the sample[24].

[24] We used a dummy for Italy and Belgium, two relevant outliers in the regression: it comes out that given the other controls, the large users electricity prices in these two countries are 20 euros higher than in the other member Countries.

Interestingly, no effect at all can be so far appreciated for the gas industry, as our previous comments on the relative standing of the two processes suggested. The second column in Table 6 shows that the liberalization plan score has no effect on the level of large users gas prices.

Table 6 – Liberalization and Prices

PRICE	Electricity	Gas
	Large users	Large users
C	70.53 *** (5.59)	19.37 *** (4.09)
SCORE	-0.58 * (0.34)	0.86 (1.62)
COST	-0.22 *** (0.05)	
IT-BE	20.40 *** (4.34)	
R^2 adj	0.76	0
Obs.	13	11

OLS estimates. Standard errors in parenthesis.
***: significant at 1%
** : significant at 5%
* : significant a 10%

Moving to the evolution of prices in the second half of the Nineties, Table 7 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.

Table 7: 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.

3.4 The new 2002 Directives on Electricity and Gas.

In November 2002, the European Commission has approved new Directives for Electricity and Gas that review in parallel the experience of the recent years and propose some refinements within the approach so far followed. The Directives summarize a debate among member Countries that has been quite harsh in some passages, and represents therefore on several topics a compromise. In any case, some advances can be appreciated, with clear winners and losers. The general focus, however, 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 Directives 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 [25]. Moreover, the Directives do not require the network segments to be financially autonomous from their parent companies, leaving room for cross subsidies.

On TPA, the negotiated access regime has been abolished, in favor of an access regime based on prior publication of access 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 have a major impact on the German situation, where the liberalization process took place under negotiated access prices and in the absence of a regulatory body. While recognizing that the new Directories address a widespread concern in one of the main continental markets, still "the evil is in the details", and it may be that the real impact of the new standards be less effective than expected. Admitting that regulatory review can apply to methodology of calculation rather than tariffs leaves room to maintain a reference to the industry tariff codes actually used in Germany; and a regulatory authority can be really independent, or subject to the supervision or ratification of a superior political institution.

[25] 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.

On demand opening, the timetable for complete opening is shortened, with a final deadline for all the retail markets by 1 July 2007 and for customers other than households by 1 July 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. While welcoming these measures, we cannot avoid to notice a possible way out of the more binding framework that is left to the late comers. Annual reports, and a final report by 2006, will monitor the evolution of the liberalized markets. If there will be clear evidence that markets are not performing competitively and efficiently, a delay in demand opening might be renegotiated.

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

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.

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[26].

4.1.1. 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.

a) 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.

b) The wholesale market is organised as a Pool market, run by the Gestore del mercato elettrico, Gme (owned by Grtn). All transactions are supposed to bid. Bilateral physical contracts may be

[26] For a general analysis of the recent Italian experience on liberalization see OECD (2001).

exceptionally allowed by the Authority. The market was supposed to start operating at the beginning of 2001; two years later operations have not begun yet.

c) 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.

d) 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.

e) 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.

The privatisation 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 authorisation 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 energy imports, which in Italy amount at about 16% of total consumption, have been reserved to large interruptible customers, and the allocation will be 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.

4.1.2. 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.

a) The unbundling principle has been implemented through legal separation of the different activities within the ENI group. The 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.

b) 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.

c) 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.

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

e) 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 sectorial 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 disproportionally high if we include the tax burden[27].

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 isdustries.

4.2.1 Electricity

Let us start from structural issues, in particular from the **vertical organisation** of the sector. It is widely recognised 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 rationalise 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 minimise purchase costs, therefore guaranteeing final customers against the possible

[27] See on tariff regulation after the liberalization AEEG (2002).

slack of distributors. 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[28]. 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[29]. 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 who can be auctioned 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[30]. 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 behaviour 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 characterised by the relevance of fuel oil as an input.

[28] See AGCM(2002).
[29] It is reassuring that the Marzano proposal does contain a proposal – however indeterminate – of introducing capacity payments.
[30] 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.

Table 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 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[31]. 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[32].

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 authorisation process for new generators. However, in the same period, the following decision have been made (proposals have been put forward):

a) proposal to introduce bid caps, aimed at reducing the risk of very high prices in the Pool;
b) proposal to reform independent regulatory authorities, in order to curb their power and to increase the weight of political decisions in the energy sector;
c) proposal to require that generators may shut down their plants only if some public authorisation is given;
d) 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 that 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

[31] Prof. Ranci, Chairman of the energy Authority, declared in November 2001 "Non è solo l'elevata incidenza dei derivati del petrolio nella generazione elettrica, pari al 51 per cento contro il 41 medio europeo, la causa degli alti prezzi dell'energia elettrica in Italia. Vi concorre la scarsa efficienza di un parco di generazione in parte obsoleto, che presenta rendimenti di conversione modesti.". See Aeeg, hearing at the Camera dei Deputati, 13th November 2001.
[32] Grtn (2002).

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 realised by 2008[33] 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 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 recognised 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 recognises that one important way to create competition and better guarantee security of supply is to strengthen the interconnections between Italy and neighbouring 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, a recent law "Collegato alla Legge finanziaria 2001" – 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 sceptical that favouring 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 neutralise the most natural way to keep prices low.

Finally, we should look at **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 its traditional dominant position and that substantial entry is taking place. Among the entrants, we have some large foreign firms (among others, Elektra, EnBW) and some Italian firms (e.g., Edison, Dalmine) with substantial cross-participations of foreign firms in

[33] Intesa-BCI: Tendenze monetarie, nr.81, March 2002.

Italian consortia (e.g., Verbund in Energia). Notice that the situation in 2002 will start showing the effects of the sale of the three Gencos and might therefore look even more different from the traditional Enel monopoly.

Table 9: The market for eligible customers

	Year 2000		Year 2001	
	TWh	%	TWh	%
Enel Trade	21,0	50,0%	20,7	30,9%
Edison	6,0	14,3%	12,6	18,8%
Lumenergia	3,8	9,0%	5,1	7,6%
Egl			4,1	6,1%
Energia	1,6	3,8%	3,0	4,5%
Dalmine	2,1	5,0%	3,0	4,5%
Elektra-E.On	1,2	2,9%	3,0	4,5%
Others	6,3	15,0%	15,5	23,2%
Total TWh	42,0		67,0	

Source: Enel and Staffetta quotidiana

However, besides these data we must point out that several firms complain that demand is rationed, in that suppliers encounter difficulties in finding the energy that the market demands, and this is the reason why not all eligible customers have actually opted for the free market. At the end of 2001 1442 clients had been recognised as eligible, for a total estimated consumption of 115.8 TWh; even considering own consumption, it appears clearly that several eligible clients are only potentially eligible and are actually out of the free market.

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 favourable tariffs). The provision favouring 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.

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 favour of an electricity market, where firms operate freely and competition is the main driving force, or in favour 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.

4.2.2 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 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[34]. This supply capacity is computed at the maximum annual

[34] The data do not include the supply capacity of new LNG terminals that will be working by 2010.

provision specified in the international contracts, that 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.

Table 10 – Effects of the antitrust ceilings (blns of m^2)

	2002	2006	2010
Demand	75.3	83.9	90.6
Max. contracted supply (ENI+T.P.)	84.9	97.7	98.6*
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). *:2009*

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.

1. 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.

2. 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 and known 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.

3. 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 of 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.

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[35]. 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 Norvegian 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

[35] 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.

endowed with full priority transmission rights on the international pipelines[36] that ensured the delivery of gas in any circumstance[37]. 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[38], receiving it through international pipelines 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 realised facilities[39]. 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[40]. 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 decentalized 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 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

[36] 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.
[37] 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.
[38] From 2004 the new pipeline from Lybia to Sicily will be operative. The entire gas provision (8 blns m^2 per year) has already been sold by ENI to Edison, Energia and Gas de France.
[39] From 2005 the new Edison LNG terminal in the Adriatic sea will start processing liquefied gas from Quatar.
[40] See AEEG (2002), p.191-204.

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.

4.2.3 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 centre – periphery debate, notice that energy is a sector that has long been recognised as central to a country's foreign policy and overall growth strategy. Energy has been at the centre 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 recognised as a mistake, and others that try to painfully draw the new boundary between central competences, 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 competences between State and Regions, and to re-set the political power in the centre 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 MP 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 sectorial distinctions that do not correspond to the evolution of real markets[41].

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[42]. Assigning regulatory or monitoring tasks to an independent authority acts as a precommitment to pursue these objectives and solves the time inconsistency problem of a direct involvement of the government in the implementation of the liberalization policies[43]. 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 burocracy.

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.

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. We have analyzed this process distinguishing two logical and temporal steps: the creation of a level playing field for new

[41] 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).
[42] 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.
[43] On this point see Polo (2002).

entrants, through the implementation of a non discriminatory access of third parties to the transport infrastructures, and the creation of a competitive environment in the liberalized segments of the industry.

We argue, drawing on the European experience, that the liberalization policies have been focussed so far mainly on the first step, succeding in many countries to guarantee an open access to the monopoly transport infrastructures and promoting the entry of new operators in the upstream and downstream segments of the industries. The policies, both at the European and at the national level, have been instead less effective in the creation of a competitive environment, through a reduction in the incumbent market shares and the design of the market organization rules. As a consequence, the effects on consumers' switching and on final prices are in most countries rather limited, in particular in the gas industry.

Moving to the Italian case, the electricity and gas liberalization plans have chosen on some, if not all, of the relevant issues more advanced solutions than the standards 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 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 distorsions 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 favour of an electricity market, where firms operate freely and competition is the main driving force, or in favour 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 than 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 by the previous Government 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. We argue that both these developments are 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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