

Regulatory Reform in Italy

**Regulatory Reform in Electricity, Gas, and
Railroads**



ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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CHEMINS DE FER

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FOREWORD

Regulatory reform has emerged as an important policy area in OECD and non-OECD countries. For regulatory reforms to be beneficial, the regulatory regimes need to be transparent, coherent, and comprehensive, spanning from establishing the appropriate institutional framework to liberalising network industries, advocating and enforcing competition policy and law and opening external and internal markets to trade and investment.

This report on *Regulatory Reform in Electricity, Gas, and Railroads* analyses the institutional set-up and use of policy instruments in Italy. It also includes the country-specific policy recommendations developed by the OECD during the review process.

The report was prepared for *The OECD Review of Regulatory Reform in Italy* published in 2001. The Review is one of a series of country reports carried out under the OECD's Regulatory Reform Programme, in response to the 1997 mandate by OECD Ministers.

Since then, the OECD has assessed regulatory policies in 16 member countries as part of its Regulatory Reform programme. The Programme aims at assisting governments to improve regulatory quality — that is, to reform regulations to foster competition, innovation, economic growth and important social objectives. It assesses country's progresses relative to the principles endorsed by member countries in the 1997 *OECD Report on Regulatory Reform*.

The country reviews follow a multi-disciplinary approach and focus on the government's capacity to manage regulatory reform, on competition policy and enforcement, on market openness, specific sectors such as electricity and telecommunications, and on the domestic macroeconomic context.

This report was principally prepared by Sally Van Siclen, Principal Administrator, of the OECD's Division for Competition Law and Policy. It benefited from extensive comments provided by colleagues throughout the OECD Secretariat, as well as close consultations with a wide range of government officials, parliamentarians, business and trade union representatives, consumer groups, and academic experts in Italy. The report was peer-reviewed by the 30 member countries of the OECD. It is published under the authority of the OECD Secretary-General.

TABLE OF CONTENTS

ORGANISATION FOR ECONOMIC CO-OPERATION	2
FOREWORD	3
Introduction	6
Local public services	6
1. ELECTRICITY	7
1.1. Introduction to electricity.....	7
1.2. Policy objectives.....	8
1.3. Description.....	8
1.4. Reform.....	11
1.5. Gains from further reform and competition.....	22
1.6. Conclusions.....	23
1.7. Policy options	24
NOTES.....	26
2. THE GAS SECTOR IN ITALY.....	27
2.1. Introduction to the gas sector.....	27
2.2. Policy objectives.....	27
2.3. Regulatory institutions and regulation.....	28
2.4. Description of the sector.....	29
2.5. Reform.....	31
2.6. Conclusions.....	39
2.7. Policy options	40
3. THE RAIL SECTOR IN ITALY	41
3.1. Introduction to the rail sector.....	41
3.2. Policy objectives.....	42
3.3. Description of the rail sector.....	42
3.4. Regulation and regulatory institutions.....	43
3.5. The promotion of competition	49
3.6. Increasing efficiency in FS	54
3.7. Independent regulator	57
3.8. Conclusions.....	57
3.9. Policy options	59
NOTES.....	60
BIBLIOGRAPHY.....	61

Tables

1. Gross capacity and production by power plants in Italy
2. Transmission constraints within Italy
3. Geographic regions, electricity sales by ENEL, and production,
4. Characteristics of capacities of spun-off Gencos
5. ENEL's pattern of revenues
6. Structure of electricity costs in Italy
7. Number of employees
8. Efficiency measures
10. Structure of the gas sector in Italy
11. Average natural gas prices
12. Differences in costs between Italy and European Union producers
13. Summary of market structure in selected OECD countries
14. Recent regulations related to the control and governance of FS
15. Summary of track access charging structure in EU member states
16. Main railway gauge and electric current used in EU countries
17. Contractual wages and salaries per employee
18. Selected indicators of railway efficiency
19. Employment in main railways in selected EU countries

Figures

1. One and two firm concentration levels for selected countries or regions
2. International price comparisons: industrial electricity prices in selected OECD countries
3. International price comparisons: household electricity prices in selected OECD countries
4. Gas prices in selected OECD countries

Introduction

Italy is profoundly changing the role of the public sector in the “productive sphere.” Until the 1990s, the State was directly involved in production. Public utilities were organised in a monopolistic way, and the State granted concessions and subventions. Price regulation was not based on a coherent policy: some prices were low for social purposes, especially for transport and water, while other prices were very high, notably for electricity, natural gas and telecommunications. For those utilities or state bodies that did not receive enough revenues to cover costs, the shortfall was covered by general government revenues. These soft budget constraints and monopolies gave rise to the expected low level of efficiency.

This has been changing over the past decade. Many state bodies have been separated from government by separating their management, and have been transformed into joint stock companies and assigned objectives. In many cases, they have been partially or fully privatised. Independent regulatory bodies have been established for electricity and gas, for television and telecommunications. These bodies are working to implement coherent policies according to which regulated tariffs are regulated by price caps and intermediate services by pro-competitive access pricing. Moreover, they are responsible for regulation of service quality, safety, the meeting of universal services obligations and for the resolution of disputes between undertakings and consumers.

In other sectors, *e.g.*, railroad, water, waste treatment, and postal services, regulation is decided by the Government, CIPE (the Inter-ministerial Committee for Economic Planning), and the respective ministries, and is implemented by the ministries. Reform in these sectors is aimed at broadening the application of the price cap methodology where prices or infrastructure access are regulated, hardening the budget constraints, and more precisely specifying, and budgeting for *ex ante*, public service obligations.

Beyond improving regulation, Italy is also increasing competition *in* the market for a number of sectors such as networks and voice telephone and generation of electricity. In several sectors, competition *for* the market is being promoted. Auctions are being held in several services, such as mobile telecommunications licenses, electrical interconnection capacity with bordering countries, and for two motorways.

Italy has achieved important results by changing economic and legal regulation. However, the process needs to be expanded and sustained. In many markets, such as in several local public services, a concession system is not justified and should be suppressed. Procedures for issuing licenses should be more open and transparent, with all operators meeting objective criteria provided access to essential facilities. Further, public and administrative functions should be separated from the provision of services.

Local public services

The government has introduced a draft bill to reform local services — local transport, gas distribution, water distribution, waste treatment, and others — which would generalise franchise auctions and reduce the scope for privately negotiated licenses between firms and local government. In particular, local public services with an “industrial relevance” – those specifically named above – would be subject to competitive **tendering**. As a general principle, the concession system would not apply where competition in the market is feasible. Only if the local government showed that competition in the market was not feasible or desirable, would the concession system apply. For local public services where competition is possible, local government would choose among competitive bidding, direct assignment of the license to a

firm controlled by the local government, the use of a specific institution, or direct management. In each case, the infrastructure usually remains the property of the local government. Any company may bid, provided it has not been granted the license to manage public services on the basis of non-competitive mechanisms. Maximum duration of the contracts range from nine years for public transport and garbage collection, to twenty years for water distribution. A transition period allows the incumbent to be assigned the license for various durations (zero to five years), but the duration can be extended. Regional services are in general excluded from the draft bill.

The extension of competitive franchise bidding to local services should diminish the total cost of these services. However, experience in other countries suggests that competition in, particularly, local public transport by bus is feasible and results in lower prices and increased quality of service, such as through the reorientation of route networks. Hence, it is important to not foreclose competition in a market where it is feasible by awarding an exclusive contract. (Where competition is feasible, the concession system should not be used.) Second, the restriction that no company that has been granted the license to manage public services on the basis of non-competitive mechanisms may qualify for these tenders is a good start to limiting cross-subsidy. Since there seems to be no restriction on common ownership with such companies, the incentives to cross-subsidise are present and only careful monitoring of accounts might reveal its existence. This difficulty can be avoided by requiring that there be no common ownership. This is done in the Legislative Decree on gas. Third, the information provided by multiple local governments tendering similar contracts can be used in subsequent rounds to improve the tendering process. *E.g.*, the processes used by local governments with particularly successful tenders can be applied by other local governments in their subsequent tenders. Finally, the transition period and contract durations seem to be too long for some services, particularly if the period necessary to amortise investments is three or five years.

1. ELECTRICITY

1.1. Introduction to electricity

The Italian electricity sector, until now dominated by ENEL Spa, is being radically reformed. The structure is changing to promote competition in generation and supply. ENEL must divest a large part of its generating plant; has already spun-off transmission operation to an independent system operator; in practice, is in the process of selling its distribution assets that are within the boundaries of the larger municipalities to the municipal utilities; and allocate its remaining assets into separate generation, transmission and distribution companies. Large consumers may already choose their supplier, and a Single Buyer will purchase on behalf of captive consumers. Procedures for entry or expansion of generation are planned to be made quicker and simpler.

Transmission and distribution are being regulated by price caps, and the cost of other energy policy costs will be explicitly funded by users. Access to the international transmission capacity is now allocated through a *pro rata* process. The independent regulator, *l'Autorità per l'energia elettrica e il gas* (the Authority for Electricity and Gas) has been in operation since 1997. ENEL was partly privatised (35%) in late 1999, although the Treasury retains “golden share” powers. Reductions of over-manning and other costs are underway. Tariffs are becoming more cost-reflective (the scope of application of below-cost tariffs is scheduled to shrink), and revenue (price) caps combined with more flexible contractual terms allow terms that increase efficiency.

Italy has made great strides in redesigning the regulatory regime and structure of its electricity sector. These changes go well beyond the minima specified in the European Union electricity directive. Within the European Union, only the United Kingdom, in its England and Wales market, has acted more positively to create a structure of generation with the intent of promoting competition.

However, even after the divestitures electricity generation in Italy will be more concentrated than in Germany, the United Kingdom or Spain; the experiences of the latter two countries indicate that further divestiture is needed in Italy for effective competition to be likely. Ownership of transmission assets and the bulk of generation have not been separated out in Italy; separate owners will be necessary if the Transmission System Operator has difficulty in ensuring efficient maintenance, development or operation of the grid. Liberalised buyers seek low-cost energy, which provokes competition among generators; if the Single Buyer cannot be provided similar incentives to act for the benefit of captive consumers, then accelerated liberalisation all consumers is indicated. Achievement of the goal of cost-reflective regulated tariffs should be accelerated. Stranded costs and other policy costs are a heavy burden on electricity consumers: Shifting some of this surcharge to the usage-invariant component of tariffs would increase efficiency, and shrinking stranded cost payments would facilitate competitive entry.

1.2. Policy objectives

The main objectives of the regulation of the electricity sector in Italy are to improve the sector's economic efficiency and to protect consumers' rights. Lower prices for households and industrial users will help improve the performance and competitiveness of the broader economy and ensure security of supply throughout the country. These are to be achieved in harmony with good environmental performance and social equity.

The efficiency objective attained primary relevance in 1995, when Law 481 on "*Rules for competition and regulation of utilities and establishment of the regulation authorities*" was issued. It was reinforced by Legislative Decree 79/1999, which implemented in Italy the EU Directive 96/92 on electricity. Where other policy objectives conflict with the efficiency objective, the general principle the government intends to follow is to minimise the inefficiency. Prior to this, the primary objectives in this sector had been to achieve total and uniform coverage of supply, and national energy saving.

The Government pursues general policy objectives as well. These include increasing the role of the market and competition and to favour voluntary approaches, promoting sustainable development (*i.e.*, development that meets the needs of the present without compromising the ability of future generations to meet their own needs), and improving the balance between the north and the south of Italy with respect to infrastructure and quality of services.

1.3. Description

The electricity sector in Italy is dominated by ENEL Spa. ENEL generates almost three-quarters of the total. Industrial autogenerators and municipal utilities produce the remainder. About 14% of total production is sold by autogenerators to ENEL at high regulated prices. Import capacity is fully utilised, and most is allocated to ENEL for its long-term contracts for several more years. Thus, ENEL faces very little competition in generation in the short term. In addition, ENEL owns the transmission grid and 93% of the low-voltage distribution grid. However, the Transmission System Operator, a public company created pursuant to Legislative Decree No. 77/99, will operate and ensure the maintenance and development of the national grid. In 1987, Italy withdrew, after a national referendum, from nuclear power generation, which might bias its price levels compared to some other European countries.

Box 1. **Italian electricity sector at a glance**

Installed capacity:	1999: 73.9 GW; 2000: 75.9 GW
Annual generation:	1999: 266 TWh; 2000: 274 TWh
Annual consumption:	1999: 285.8 TWh 2000: 297.7 TWh
Peak demand :	1999: 47 850 MW; 2000: 49 000 MW
Growth rate:	1998-1999 +2.5%; 1999-2000: +4.1%
Fuel mix (capacity):	1999: thermal (71.2%), hydro (27.7%), geothermal (1.1%)
Fuel mix (capacity):	2000: thermal (71.7%), hydro (27.0%), geothermal (1.3%)
Fuel mix (generation):	1999: thermal (79.3%), hydro (19.5%), geothermal and other (1.2%)
Fuel mix (generation):	2000: thermal (79.8%), hydro (18.3%), geothermal and other (1.9%).
<i>Interconnections:</i>	
Imports:	1999: 42.5 TWh (21.7 Switzerland, 15.8 France, 3.4 Slovenia, 1.7 Austria)
Imports:	2000: 44.8 TWh (22.1 Switzerland, 16.2 France, 4.5 Slovenia, 1.9 Austria)
Exports:	1999: 0.52 TWh
Exports:	2000: 0.48 TWh

Source: *Dati provvisori del sistema elettrico per il 2000.*

In the longer term, it is expected that there will be more competition from domestic generation. To facilitate the rapid entry of competitors, the Government is requiring ENEL to divest sufficient capacity so that ENEL's share of production plus imports is less than 50%. The plants are being divested as three separate companies, each with a mixture of fuel types and locations. The other main sources of competition are likely to be ENI, the dominant natural gas and petrochemicals company, and Edison. ENI will be able to supply only about 15% of the market by 2003, and Edison can supply only about 10% of the market in 2000. Each may buy an ENEL spin-off. Other competitors are much smaller.¹

Table 1. **Gross capacity and production by power plants in Italy - 1999**

	Capacity (MW)					Production (GWh)				
	Hydro	Thermal	Geothermal	Total	Share	Hydro	Thermal	Geothermal	Total	Share
Enel	16 919	41 878	621	59 418	78%	38 278	146 293	4 403	188 974	71%
I. P. P.	1 950	11 050		13 000	17%	7 526	55 561		63 087	24%
Municipal utilities	1 347	1 555		2 902	4%	4 517	6 114		10 631	4%
Small producers	543	395		938	1%	1 700	1 300		3 000	1%
Total	20 759	54 878	621	76 258	100%	52 021	209 268	4 403	265 692	100%

Source: Government of Italy, communication to the OECD, 2000.

Transmission constraints within Italy mean that markets for electricity may be much smaller than the entire country. Thus, some markets are yet more concentrated than suggested by national concentration levels. During periods of peak demand, the transmission grid can carry no additional electricity, so generators located outside the area of demand cannot increase their supply and generators located in areas that usually import electricity have more market power. There are five critical sections in Italy where transmission limits are reached relatively frequently, separating large territories. It is estimated that the price differences between areas, during these periods, could be as high as 10 to 20L/kWh. Reflecting these regions as different pricing areas in the spot market would induce investment in generation nearer users, since they would be attracted by the higher expected prices, and this would reduce transmission constraints.

Table 2. **Transmission constraints within Italy**

Transmission constraint location	Percentage of hours constrained
North Italy → Florence region	30%
Florence region → Rome region	15%
Rome region → Naples region	15%
Sicily → Naples region	100%
Florence region → Sardinia	100%

Table 3. **Geographic regions, electricity sales by ENEL, and production, 1998**

Region		Sales		Production		
		TWh	Share of Italy	ENEL, municipalities, <i>et al.</i>	Autoproducers Sales	Own consumption
North Italy	Piemonte, Valle d'Aosta, Liguria, Lombardia, Trentino Alto Adige, Veneto, Friuli Venezia Giulia	104 498	47%	83%	8%	9%
Florence region	Emilia Romagna, Toscana	33 867	15%	87%	4%	9%
Rome region	Marche, Umbria, Lazio, Abruzzo, Molise	32 324	15%	82%	14%	5%
Naples region	Campania, Puglia, Basilicata, Calabria	29 324	13%	84%	0%	16%
Sicilia		12 684	6%	81%	1%	18%
Sardegna		8 533	4%	87%	0%	13%
Total		221 194	100%			

Note: Excludes sales to the National Railway and exports.

Source: ENEL Annual Report 1998, p. 23 (for sales), OECD calculations from data in ENEL *Dati statistica, sull'energia elettrica in Italia 1998* (for production).

1.3.1. Regulatory institutions

The sector is regulated by the *Autorità per l'energia elettrica e il gas* (Energy Authority) and by the Ministry of Industry. The *Autorità*, an independent regulatory agency, regulates final tariffs for captive consumers and grid access, regulates import procedures, regulates the Transmission System Operator, and presents to Parliament and Government recommendations and proposals on the structure of the sector. It also makes proposals for the renewal and possible amendment of individual licensing or authorisation

deeds, contracts and public policy implementation agreements. It also regulates service quality and resolves consumer disputes. The *Autorità* submits an annual report to Parliament and the Prime Minister. The *Autorità* is governed by a three-member commission. The commissioners are appointed to seven-year non-renewable terms by the President of the Republic, after proposal by the Minister for Industry, Commerce and Handicrafts, first submitted to the competent parliamentary commission for scrutiny. The *Autorità*'s decisions are made autonomously within the general policies made by the Government and Parliament and expressed in the *Documento di programmazione economico-finanziaria*. The *Autorità* is autonomous in terms of its internal procedures, and is funded by a fee paid by energy sector participants levied on a turnover basis at a rate set by the Ministry of Finance. The *Autorità* consults through a notice and comment system, according to Decision 61/97 of the *Autorità*.

If the *Autorità* suspects a violation of the competition law (No. 287 of 10 October 1990) it must notify the *Autorità garante della concorrenza e del mercato* (Competition Authority or AGCM). However, the *Autorità* has not yet made any notifications of this type.

The *Autorità* is viewed as being independent and is well-respected. Other OECD countries with empowered independent regulators include Australia, Finland, the United Kingdom and the United States. Germany and New Zealand use the competition authority to regulate electricity. Some participants in the sector consider that the *Autorità*'s consultation process could be improved by better co-ordination between publication dates and commentary deadlines, and by better clarification of how comments have been taken into account in final decisions.

The Ministry of Industry has regulatory powers, as well. For example, it issues concessions and authorisations, gives directives to the Single Buyer, and defines the "general system charges" which fund energy policies, with the *Autorità* being in charge of assessing the underlying cost to be recouped via the tariff structure. The Ministry of Industry is also responsible for approving the rules governing the power exchange, after seeking the opinion of the *Autorità*.

The Competition Authority is active in the electricity sector both advocating for competition and enforcing the competition law. The sector is subject to the competition law. Article 8(2) of law 287/90, the competition law, states that the antitrust provisions, "do not apply to undertakings which, by law, are entrusted with the operation of services of general economic interest or operate on the market in a monopoly situation, only in so far as this is indispensable to perform the specific tasks assigned to them." This non-application has been interpreted narrowly. In one investigation (A263 *Unapace-Enel*), the AGCM learned that ENEL had offered eligible customers an exclusive supply contract, with a longer duration (three years instead of one) and a clause that would allow ENEL to meet the prices offered by other suppliers. The AGCM held that this conduct would be able to weaken or eliminate competition in the supply of electricity. ENEL decided to remove both clauses from the contracts.

1.4. Reform

Italy began reform from a position of very little competition. Until 1991 the electricity sector was a public legal monopoly, with all electricity activities reserved to ENEL through a sole concession. In that year, generation was opened to cogeneration and generators using renewable energy, who had to sell their output to ENEL at regulated premium prices. In addition, auto generators were allowed to sell electricity directly to ENEL. ENEL had a role in approving entrants, so could exert considerable influence. In fact, when the Legislative Decree No. 79 of 16 March 1999 implementing EC Directive 96/92 was enacted, ENEL contributed 83% of Italy's electricity and owned 55GW of installed capacity.

The main points of the reform are given below. This report mainly focuses on the structure of generation and import of electricity, the common ownership between generation and transmission, the incentives on the Single Buyer, stranded costs, and reform of regulated tariffs.

Box 2. Main points of the 1999 reform

Legislative Decree 79/99 introduces competition into generation and supply to liberalised customers. Its main points are:

Requires functional unbundling of the electricity industry.

Charges a public company established in 1999 (*Gestore della Rete di Trasmissione Nazionale*) with the management and dispatch of the national transmission system. Network access can be refused only on the grounds of lack of capacity and, for imports, where reciprocity conditions are not met.

Limit the generation and import by any single company to 50%, from 1 January 2003.

Gradually opens the Italian electricity market to competition for liberalised customers (mainly industrial customers, either singly or grouped in consortia).

Establishes a public company, the “Single Buyer,” to ensure electricity supply to all captive customers, *i.e.*, those small customers who are not eligible to participate in the free market.

Requires the Transmission System Operator to establish a company, “*Gestore del mercato elettrico*” (electricity market operator) responsible for organising and managing the electricity wholesale market. The market is expected to become active in 2001.

Grants concessions for distribution to the incumbents by the Minister of Industry until 31 December 2030, allows for only one concession on the territory of each municipality, and provides that distribution access tariffs are regulated by the *Autorità*. Large municipal distributors, *i.e.*, those with more than 300 000 final consumers, must be corporately separated from other activities.

1.4.1. Structure of generation and import of electricity

ENEL must divest 15 GW of capacity before 2002 to comply with the Decree. The divestitures will be made as three companies, “Gencos” accounting for 10%, 7% and 4% of total Italian generating capacity, respectively. They will be sold through a “beauty contest” – rather than by auction – in which bidders specify their investment plans and guarantees regarding employment and use of the site for generation. The Gencos are heavily weighted toward thermal plants: ENEL is spinning off about one-third of its thermal capacity, but only about one-tenth of its hydro capacity. It is difficult to predict the precise competitive impact of these Gencos because they are expected to be completely re-powered (conversion of the plants is compulsory) as CCGT (combined cycle gas turbine) plants, which will substantially change their costs and improve efficiency. However, this will require keeping the relevant units out of production for a time and it will further make competitive conditions on the market less favourable in the meantime.

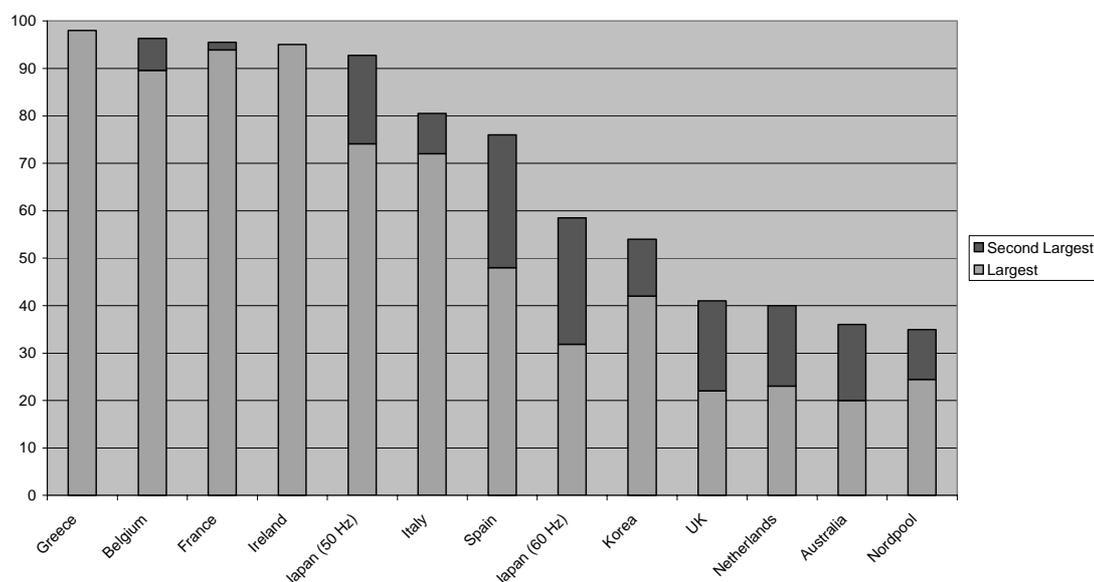
Table 4. Characteristics of capacities of spun-off Gencos

		Eurogen (MW)	Elettrogen (MW)	Interpower (MW)	Total Spin-off (MW)
Base load					
	Hydro	137	57	27	
	Thermal	580	580	580	
Mid-merit					
	Hydro	629	957	36	
	Thermal	5 662	3 844	1 968	
Total		7 008	5 438	2 611	15 886

Source: Government of Italy, communication to the OECD, 2000.

ENEL will retain a 50% share of the market after the divestitures. This structure makes effective competition unlikely. The comparisons with the markets in the United Kingdom and Spain—which are less concentrated than Italy’s will be, and where studies have shown prices to be above competitive levels—are instructive. In an October 24, 2000 statement before a parliamentary committee (*commissione attività produttiva*), the president of the *Autorità per l’energia* said that the capacity divestitures should be significantly accelerated and increased. Under European Union competition law, a company with a market share above 40% would usually be considered dominant and its actions subject to special scrutiny to ensure its dominance is not abused. Furthermore, the 50% level understates ENEL’s competitive position because much of the non-ENEL capacity is not immediately available to compete in the market. Instead, it is sold – formerly to ENEL but now to the Transmission System Operator – at premium prices under the CIP/6 programme and these purchases will not decline for several years. Finally, the divestitures of generation plant will not have much effect until at least 2003. The sale of the first Genco (*Elettrogen*, the mid-size firm) will take place during the first half of 2001. It takes at least two years to re-power and restart commercial operation.

Figure 1. One and two firm concentration levels for selected countries or regions, 1998¹



1. Data refers to 1999 for Greece and Ireland.

Source: OECD, IEA, Electrabel annual report (Electrabel + SPE), EdF and Charbonnage de France annual reports, Edison April 1999 presentation to shareholders, Spanish and Korean Ministry of Industry and Energy, Ofgem (NatPower and PowerGen in England and Wales 97/98), NEMMCO, Macquarie and Delta annual reports (SE market only), Nordpool annual report and Vattenfall, Statkraft.

Box 3. United Kingdom and Spain

Both the United Kingdom and Spain had electricity sectors with structures more conducive to competition than Italy will have after the divestitures, and in both countries there was evidence that market prices were well above competitive prices. The United Kingdom had three and Spain had two large electricity generators. In the United Kingdom, for some time the main generators were not vertically integrated, but in Spain they were integrated into distribution-supply, and partly owned the transmission grid.

In the United Kingdom, the Office of Electricity Regulation found that the two dominant non-nuclear firms had significantly increased prices and reduced output during the 1997/8 winter. Other competitors expanded output within the limits of their capacity. During that period, the two firms set the system marginal price 70% of the time. The Director-General concluded that the most effective way to increase competition in the short term was to transfer more of the two dominant firms' capacity to competitors (Office of Electricity Regulation, 1998, pp. 8-9).

In the Spanish market, the two largest firms owned 76% of production and, in 1998, provided the marginal capacity 59% and 24% of the time, respectively. Several analyses have been performed for or by the CNSE, the former independent energy advisory body. One, which took into account competition from imports, suggested that either company, acting on its own, could raise prices.² Another³ suggested that such behaviour could lead to an average price 39% above marginal costs. A more recent study of actual Spanish market operation identified market power problems. A study⁴ of the Spanish market in 1998 reached similar conclusions. Two reports released by the CNSE in July 1999 identify specific instances in 1998 where the two companies offered very high prices to the spot market for generators located in areas of high consumption and low generation.⁵

Imports will be, at best, a source of only marginal competition for some years to come because import capacity is very limited. About 50% of the physical capacity is taken up by ENEL under long term contracts; almost the entire France-Italy link is occupied by ENEL-EdF contracts until 2007 (Power in Europe, 22 November 1999), which are however due to be passed on to the Single Buyer. Interconnection capacity can be increased in five to seven years. The regulator allocated only 52% of capacity (2 800 MW corresponding to 22 billion kWh annually) to supply liberalised consumers in the auction for 2000 (NERA, Global Energy Regulation, December 1999). The auction for import capacity in 2001 would have allocated 80% of total capacity for the year, and the remaining 20% in monthly auctions. However, energy intensive users sued to block that auction, which was then formally repealed by administrative courts. This prompted the Authority to resort to a *pro-rata* allocation system. On this basis, in the auction for 2001 the regulator allocated the 55% of the import capacity to liberalised consumers (24.6 billion kWh annually).

Competition would be furthered if the interconnection capacity allocation mechanism and electricity contracts were compatible. If long term contracts are a cheaper way to buy electricity than spot purchases, then secondary trading in interconnection capacity and in long term contracts are logical developments, since this allows the two necessary elements for delivery of foreign generated electricity to Italy to be put together. Similarly, international trade is facilitated if the mechanisms for allocating what is, essentially, the same interconnection capacity on the two sides of the borders are compatible. A Europe-wide protocol on international transmission could induce more economically efficient use of the existing capacity, as well as induce investments that reduce European system costs.

In the long run, new entry will also increase competition. Estimates for the time to bring a generating plant – whether greenfield or brownfield – to commercial operation vary from a minimum of three years to five to seven years. (The authorisation and permitting process for repowering a plant is the same as for a greenfield plant.) The licensing procedures are, at present, slow and complex, but the government plans to speed and simplify them. Currently, authorisations for new plants total about 10 GW, mostly combined heat and power, and hydropower. A total of 24 GW has been proposed, of which 23 GW would be CCGT (combined cycle gas turbine).

Box 4. Licensing of generation plants in Italy

The licensing procedures for new electricity generating plants are very complex and differentiated by type of power source. Licences for plants using conventional sources require the intervention of the Ministries of Industry, Health and Environment, the regions and the municipalities. If the applicant is ENEL itself, the procedure is different and even more complex. New hydroelectric plants require a license from the Ministry of Public Works to use water resources, and new geothermal plants require a mining license from the Ministry of Industry. Plants using renewable energy need only building licences from the local authorities.

The government has plans to streamline the authorisation process to make entry faster and easier. There would be a standardised and simplified procedure for authorising the entire plant in a single act, and modification and repowering of existing plants would be subject to town planning rules only if they expand beyond the existing plant. However, the specific regulations have not yet approved as of May 2000.

Under the decentralisation programme, by 2001 plants with capacities under 300 MW will be approved by regional rather than national government. This would not have had much of an effect on those plants already proposed: only six of the twenty fall in this category, and they account for only a very small share of total proposed capacity.

ENEL will be a near monopolist in generation until 2003, taking into account the divestitures, imports, and entry prospects. Edison and ENI have, between them, very little energy available for sale and imports to supply the liberalised market are quite limited. In fact, only slightly less than two-thirds (59.3 TWh—of which 24.6 from imports and 34.7 from CIP/6 plants—of 92.3 TWh liberalised demand) of liberalised customers will be able to buy from anyone other than ENEL. By 2003, some of the spin-offs' new capacity and ENI's additional capacity could be commercially operating. By 2007, additional import capacity should be available, both because ENEL's long term contracts will have expired and the transmission import capacity could have been expanded.

Seven years, or even three, is a very long time to wait for competition. Further divestiture of plants that are commercially viable would have an immediate and long-lasting impact on competition. This makes it the preferred solution. Further, once the inherited advantages from its exclusive position have been diminished, and effective competition has developed, then in the longer term removing the antitrust limit would help competition. While it is in place, the limit segments the Italian market, thus can lead to situations where costs are not minimised. An interim solution to reduce the effect of the market power enjoyed by ENEL, which is planned, is to cap the price ENEL can charge even liberalised consumers.⁶ This solution retains the entire system under regulation until the price cap expires, thus only delays the full impact of ENEL's dominant status.

Box 5. Effects of competition in electricity

Significant time series on efficiency and prices after the introduction of competition are only available for the United Kingdom. Since 1990, productivity has skyrocketed (as output rose by 8% from 1988 to 1995, employment was reduced by 50%), and prices have plummeted. In real terms, over the 1990-1997 period, household ("domestic") prices decreased by 20%, and prices to other consumers fell 19 to 27%. (Littlechild, 1998, cited in IEA, 2000). In 1998, in real terms, the standard domestic tariff in England and Wales was 26% lower, and for industrial customers the price was 23 to 32% lower than in 1990. (Office of Electricity Generation, 1998, p. 58) Only shorter time series are available for other reforming countries. For example, 1997 prices in the Australian state of Victoria fell to less than half their 1995 level, reflecting the introduction of competition, privatisation and excess capacity. However, prices in Norway and New Zealand, where the sector remains state owned and there is a high reliance on hydropower – thus subjecting the system to cost variations due to hydrological variations – did not fall with the introduction of competition (IEA, 2000).

1.4.2. Common ownership between generation and transmission, and distribution

ENEL continues to be vertically integrated into both competitive activities – generation and supply – and monopolistic activities – transmission and distribution. Hence, it retains incentives to discriminate against non-integrated rivals, and to exercise market power. Three possible concerns are discriminatory operation of transmission, insufficient investment in transmission, and misattribution of costs to the regulated activity. Many of these same concerns arise also with respect to distribution. Discrimination discourages entry and increases total system cost, and competition in Italy is reduced by insufficient investment in transmission. Both the Energy Authority and the Antitrust Authority had urged transmission to be owned separately from generation, (Financial Times, 11 November 1998 for Energy Authority), but the government chose to retain ownership integration.

The shift of operational control of transmission to the public company *Gestore della Rete di Trasmissione Nazionale* (Transmission System Operator or TSO), together with regulated access tariffs (set by the *Autorità*), mean that discrimination in dispatch and other operations should not be possible. The relationship between the TSO and the owner of the transmission network is regulated by contract (*convenzione tipo*) that sets monetary fines and penalties in the case of ENEL non-execution of TSO's directives. This will help induce the grid owner to make timely grid investments that might reduce the profitability of its generating plants. Indeed, even when ENEL was entirely owned by the state, it was able to suspend work that would have increased transmission import capacity useable by competitors.⁷ While the TSO can hold competitive tenders for transmission expansion work, other firms may not be able to perform the work where it must be done on ENEL's property. Continued monitoring of the TSO by the Energy Authority should enable the detection of possible difficulties in inducing ENEL to make timely transmission investment, especially increased import capacity and relief of transmission constraints. Other monitoring should be aimed at detecting any possible misallocation of costs incurred for competitive activities to regulated activities. In the longer term, if the cost or failure rate of regulation of transmission turn out to be too high then the complete ownership separation of transmission from generation would be necessary.

The TSO, as a state-owned joint stock company controlled by the Treasury and overseen by the *Corte dei Conti*, is governed by a board appointed by the government. Since the functions performed by the TSO were formerly performed by ENEL, the staff and assets were transferred from ENEL. Like the Single Buyer, described below, it will be difficult to provide the TSO with incentives for efficiency. Being state-owned, it is unresponsive to profit-based incentive regulation such as price caps. Since the TSO should seek innovative ways to reduce system cost, command and control regulation is unsuitable. Like the Single Buyer, performance-related pay of managers and the credible threat of further structural change that eliminates its role may be the only tools available to induce desired behaviour. But even these tools may be too weak, since the weakness of the TSO stems from its poor information compared with ENEL; it is difficult to design incentives to reduce this asymmetry since it is inherently unmeasurable.

To overcome these inherent drawbacks, a conferral of the high-voltage grid, currently owned by Terna, an ENEL subsidiary, to the TSO has been suggested by independent observers, including the *Autorità* in parliamentary hearing in January 2001.

Distribution gives rise to corresponding concerns of possible cross-subsidy and under-investment. Concessions for distribution are granted to the incumbents by the Minister of Industry until 31 December 2030, according to the Legislative Decree 79/99. This contrasts with the duration of concessions for water (eight years) and gas (five to seven years). The *Autorità* regulates distribution access tariffs and enforces standards of quality of distribution service. However, tendering for electricity distribution, on a timescale corresponding to that of other local public services such as gas and water distribution, would bring forward the possibility to apply benchmarks or yardstick regulation to electricity distribution, thus increasing efficiency.

1.4.3. Consumers and the Single Buyer

Buyers promote efficiency by reducing the amount they buy when prices rise. If buyers do not reduce their purchases sufficiently in response to price increases, then sellers can compete less vigorously and market price is higher. In Italy, larger buyers can choose their supplier. The Single Buyer will make purchases on behalf of small, captive consumers. Two ways to increase efficiency of the market are to give the Single Buyer incentives to seek low-cost electricity, and to ensure that it raises consumers' price responsiveness by transmitting price changes to them.

Liberalisation is scheduled to extend to smaller buyers, either individually or grouped into consortia. At present, all final customers and consortia with a minimum annual consumption of 20 GWh are eligible; this corresponds to about 35% of total Italian demand. From January 1st 2002 the new threshold is fixed at 9 GWh, liberalising about 40% of demand. Moreover, according to the budget law for 2001, ninety days after the disposal of the first generating company by ENEL, the threshold for final customers will be lowered to 0.1 GWh, corresponding to a market opening of about 70%. Once the Single Buyer is operating, the energy component of the tariffs paid by captive consumers will be equal to the cost incurred by the Single Buyer. Since households will in general not have time-of-use metering or tariffs, the Single Buyer will purchase on behalf of demand that is insensitive to short term price variations. The combination of the Single Buyer passing through its cost of energy and buying for price insensitive demand means that it will be profitable for suppliers to charge higher prices.

The difficulty of regulating the Single Buyer is similar to that of the TSO, discussed below. Paying the managers of the Single Buyer for cost savings from bargaining toughly would better align their interests with those of captive consumers. One variation would be to create several divisions of the SB and reward the managers of each division on the basis of relative outcomes of their division. Competing Buyers would have even stronger incentives to bargain toughly for consumers. Indeed, liberalising all consumers eliminates the problem of the Single Buyer's weak incentives and will eventually make the very existence of the Single Buyer superfluous.

1.4.4. Stranded costs

Stranded costs in Italy are attributed to, and split about equally between, thermoelectric generation contracted prior to February 1997 and ENEL contracts for the import of gas from Nigeria.⁸ Costs attributed to generation from nuclear and renewable energy are calculated and paid under separate programmes, as are subsidies for the special low tariffs for the railway and aluminium producers, although all are paid as transmission tariff surcharges. A Decree from the Minister of Industry, 26 January 2000, specifies the calculation of the amount of stranded costs. Stranded costs are determined for each plant separately, and the owners of hydroelectric plants must make "stranded benefits" payments. These payments are related to the increased value, compared with the previous regime, of the electricity generated by hydroelectric plants. All payments for stranded costs from thermoelectric generation must be completed within 7 years of 1 January 2000, and within 10 years for the Nigerian gas contract.

The maximum total amount of stranded cost is L 15 000 billion. For comparison, at mid-year 1999, the book value of ENEL's generating plants totalled L 25 190 billion, of which L 15 176 billion was attributed to thermal plants and L 9 118 billion to hydroelectric plants (ENEL, Interim report 1H99, p. 109). Thus, given that the thermal plants account for about half of the total stranded cost, somewhat less than half of the book value of Enel's thermal plants are considered stranded.

Under that ceiling, stranded costs for thermoelectric plants are calculated as, roughly, the difference between the flow of revenues if there had been no reform and the actual flow of revenues, over seven years. That is, the *Autorità* will determine costs – which equal revenues under the non-reform scenario – and calculate the “reference production” which, along with the market prices that actually occur, determines an amount that proxies for the flow of revenues under reform. The stated intention of the “reference production,” adjusted bi-monthly, is to compensate companies if their market shares are lower under liberalisation: According to the formula, lower reference production raises the stranded cost payment. However the formula contains mechanisms that provides a disincentive for reducing production below a standard level which is company-specific. Also, lower market prices, as long as they remain above a limit defined by the *Autorità*, are compensated by higher stranded cost payments. This induces lower prices than otherwise, since the flow of revenues does not therefore much depend on market prices and low prices discourage entry.

The *Autorità*'s fixed cost calculations are based on a revaluation undertaken in 1993-4. The revaluation was made pursuant to a Treasury Decree for all state companies that were transformed into joint stock companies prior to privatisation. Two independent advisers made two valuations, replacement cost (taking into account the age of the plants) and the (lower) value of the revenues from the plants (taking into account possible regulation by price caps). The final valuation was an average of the two.

By logic, Enel cannot be expected to have stranded costs. Stranded costs are defined as unamortised costs, prudently incurred (*i.e.*, examined by the relevant regulator who agreed to their recovery under regulated prices) under the prior regulatory regime, that will not be recovered under the new, more market-based regulatory regime. In other countries, stranded costs are mostly attributed to private utility investments, often in nuclear generation. ENEL's costs do not qualify under the above definition. First, national accounts do not usually attribute flows of income to specific state-owned assets, and ENEL was entirely state-owned when these investments were made. Second, the regulatory regime did not change unexpectedly after the electricity assets were partially sold. The divestment plan was contained in a Decree on 4 August 1999 (ENEL Interim Report 1H99) and the 2 September 1999 Report of the Independent Auditors on the six-month report (ending 30 June 1999) called the effects of the Bersani Decree on ENEL's financial position and result of operation “currently, not predictable” (ENEL Interim Report). The shares were actually sold in late autumn 1999.

The stranded cost payments reduce efficiency. They distort consumption and investment decisions of consumers because consumers make their decisions not on the basis of the cost of electricity, but on the basis of the price including the stranded cost payment. By assuring investors of the stream of payments from consumers, the market price of shares of ENEL is higher, thus government revenues from its privatisation are higher. In this sense, stranded cost payments are not different from a tax on electricity.

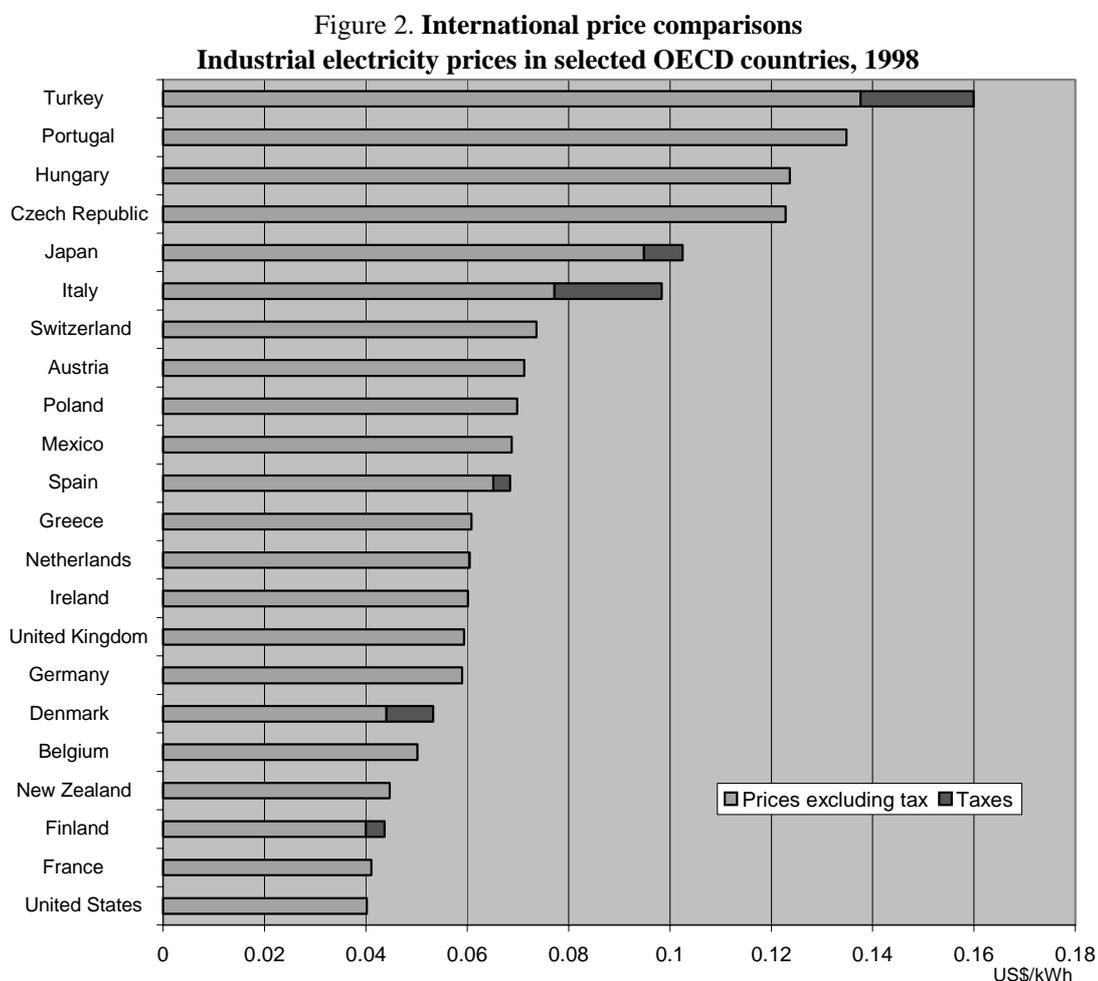
Further, to the extent that incumbents are compensated for lower market prices by higher stranded cost payments, entry is discouraged. The incumbent will be indifferent among market price levels in the short run, at least as long as the market price remains above the limit set by the *Autorità*, and will gain from lower market prices since this excludes entrants, who do not receive stranded cost payments.

Consumers in Italy pay for a number of other policies through surcharges on the transmission tariff. In 1999, the nuclear-related reimbursement was L8/kWh (up from L1.5/kWh in 1998) and the CIP/6 renewable energy programme payment was L11.1/kWh (up from L9.7/kWh in 1998).⁹ (ENEL, Annual Report 1998, p. 16). Additional surcharges pay for research and development, energy savings and quality of service programs (ENEL, Interim Report 1H99, p. 15). These surcharges compare with the average marginal cost of generation from thermal plants of 36L/kWh in the first half of 1999, and of 47L/kWh in the first half of 1998 (ENEL Interim Report 1H99, p. 19).

1.4.5. Reform of regulated tariffs

The *Autorità* regulates tariffs, using revenue and unit price caps, for captive consumers, transmission and distribution. The tariff system is intended to safeguard the interests of users and reconcile the economic and financial objectives of electricity companies with general social objectives, environmental protection and efficient use of resources. Tariffs offered must be uniform across the country.

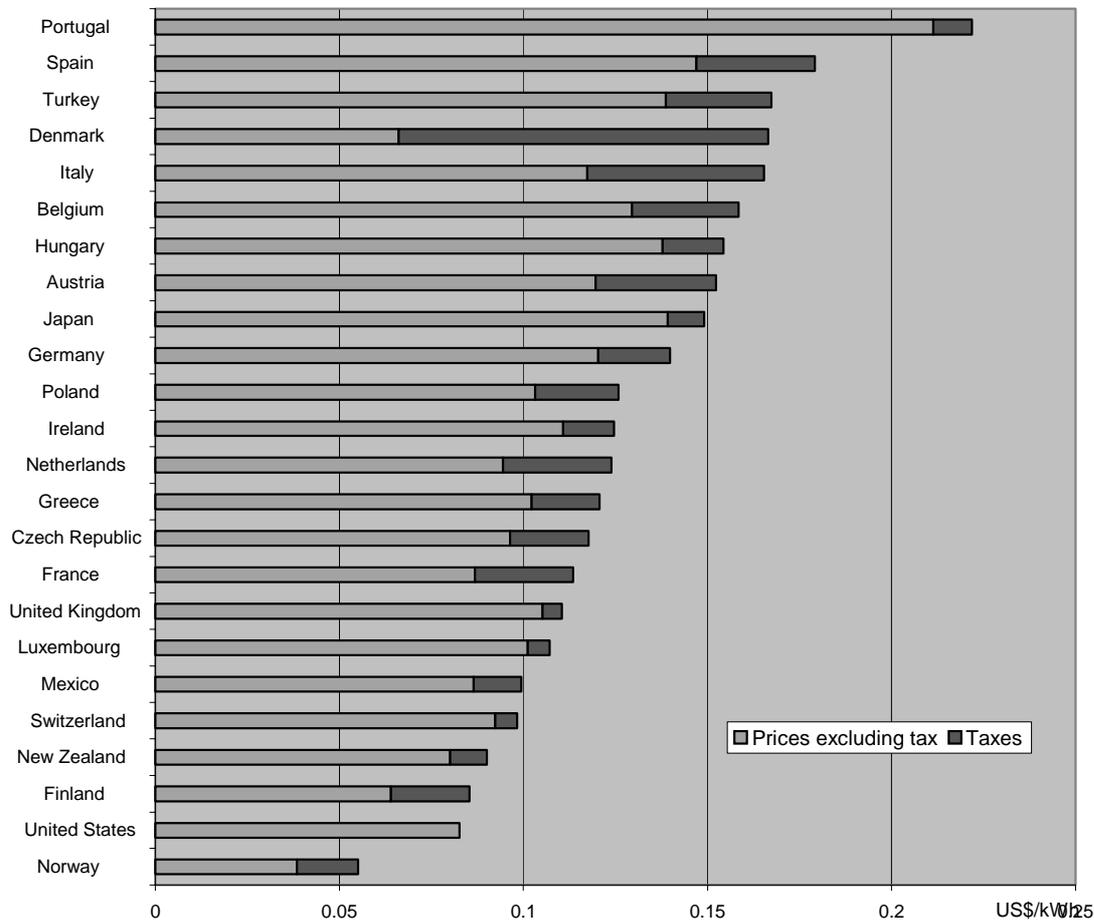
Both average household and industrial prices for electricity are higher in Italy than the average price in Europe-OECD. Of OECD countries, only three in Europe and Japan had higher average industrial pre-tax prices in 1998 (IEA, 1999). Traditionally, small households and large industrial consumers have low regulated tariffs, whereas small and medium enterprises pay regulated tariffs significantly above the cost to supply them (IEA, 1999). Tariff restructuring since 1997 has had the objective of reducing the average, all-band rate by 17% over four years in real terms (Power in Europe, 20 December 1999).



Note: Data not available for Australia, Canada, Korea, Luxembourg, Norway, and Sweden.

Source: IEA/OECD (2000), *Energy Prices and Taxes*, 3rd quarter, Paris.

Figure 3. **International price comparisons**
Households electricity prices in selected OECD countries, 1998



Note: Ex-tax price for the United States. Data are not available for Australia, Canada, Korea and Sweden.

Source: IEA/OECD (2000), *Energy Prices and Taxes*, 3rd quarter, Paris.

Tariff reform began in early 1997 with two changes.¹⁰ Surcharges not intended as state revenues were rationalised and incorporated into the tariff structure. The compensation for fuel costs changed from “pass through” to a standard fuel cost linked to the international prices of a representative basket of fuels used by Italian generators. In early 1999,¹¹ the technical and economic conditions for transmission and distribution and some ancillary services were defined.

A new tariff structure for supply to captive customers was introduced from January 2000 and, following a gradual implementation path, will bring the tariff structure to its eventual set-up by the year 2003.¹² The new structure greatly streamlines the previous one by narrowing the number of customer classes and, aiming at pursuing cost reflectivity, gradually phasing out the extensive preferences granted to sectors and specific users. It also allows flexibility in contractual relationships between electricity companies and customers, and provides to the electricity companies incentives for efficiency improvement.

Cost-reflectivity requires the phasing out of the existing special arrangements according to which some tariffs differ significantly from the cost of service. Only one subsidised “social tariff” band will be retained and fewer users will be eligible. In mid-2000, 18 million of the 22 million households in Italy qualify (IEA, 1999). A May 2000 Decree explicitly allows public utilities to use means testing to

determine which households are eligible for the social tariff, and this criterion is expected to be adopted in 2000. This system, which is used to determine eligibility for other subsidised local public services, is based on income, wealth, and size of household, rather than usage that currently defines eligibility. Phasing out of the old system is, at present, foreseen by the end of the year. The threshold to determine eligibility has not yet been set.

Other special arrangements concern the aluminium companies and the national railway. (Power in Europe, 20 December 1999) The contract providing for a special price for aluminium ends by 2005. Already, the price of electricity sold to other energy intensive users doubled during 1990-1999, as control over tariffs was switched from CIPE, where they formed part of industrial policy, to the market for eligible consumers or, for those who remain captive consumers, the *Autorità*. By contrast, tariffs for low-voltage, non-household consumers – which were above the cost of supply – were lowered by 30% on 1 January 2000.

Table 5. ENEL's pattern of revenues (first half year 1999)

Type of customer	Billion lire	Million kWh	Average L/kWh
High-voltage	772	19 101	40.42
Medium-voltage	3 567	38 364	92.98
Low-voltage	8 491	49 965	169.94
Railways for traction	70	2 352	29.63
Distributors and export	240	4 017	59.75
Total	13 140	113 799	115.47

Source: ENEL Interim Report for the Half-year to 30 June 1999, p. 78.

The use of price caps will likely encourage greater efficiency. The review period is three years,¹³ and the cap is adjusted for exogenous cost changes such as unforeseeable or exceptional events, changes in the legislative framework or in universal service obligations, or fuel costs. It is also adjusted for quality-of-service improvements towards predefined standards. For captive customers, each electricity company is subject to revenue limits for each customer class and for each customer. The two constraints allow some flexibility in the contracts between the electricity companies and captive customers, while protecting the latter. Thus, contracts could influence the short-term elasticity of demand, thus reducing the need for high-cost capacity and further reducing total costs.

The tariff component for transmission, distribution and supply is bound to decrease in real terms by 4% per annum from 2001 to 2003. (Wheeling charges will be treated similarly.) A 4% annual reduction is small for distribution. This segment accounts for one-quarter of total cost and the majority of employees, and this segment is where large cost savings are made in other liberalising countries. To comply with the prescription of nation-wide uniform tariffs, while maintaining incentives for efficiency, differences in distribution costs that cannot be influenced by the operators will be compensated by a network of payments. At the end of the first regulatory period (2004) a partial tariff realignment to costs is envisaged.

During 2000, the tariff component for generation reflects regulated wholesale price. In 2001, pending the takeoff of a full-fledged power exchange, that component has been lowered by some 20% on order from the *Autorità*. Once the Single Buyer is in operation, this tariff component will reflect its actual energy procurement costs. The table below breaks down the costs of supplying electricity. It illustrates the relative importance of generation costs.

Table 6. **Structure of electricity costs in Italy**

Activity	Share of total
Generation	60
Fuel	29
Transmission	6
Supply	34
Distribution	25
Sale	9
	100

Source: *Autorità*, Annual Report 1999, p. 94.

Tariff bands, where the tariff structure is insufficiently cost-reflective, create inefficiencies. This is because the bands group together customers with dis-similar usage patterns, thus different costs of supply. Even when the customers within a tariff band collectively pay their collective costs of supply, so there is no net subsidy or surplus to the group, there are cross-subsidies within the group. Where effective competition develops, those customers who fund the cross-subsidies will switch to other suppliers, rendering the arrangement unsustainable. Hence, a sustainable tariff structure requires tariffs to follow more closely the actual cost of supply. One example of better correspondence between tariffs and costs requires more widespread use of time-of-use meters and pricing. In Italy, customers are divided into 9 tariff bands, reduced from 52 in 1999.

The movement toward tariffs more closely reflecting costs, and the application of price caps, should move the sector closer to the economic efficiency policy objectives. Cost reflectivity is also necessary for sustainable regulated tariffs when a market operates in parallel. In light of the liberalisation of a large fraction of Italian demand in the medium-term, the phasing-out periods for special arrangements should be of comparable duration.

1.5. *Gains from further reform and competition*

Further reform, in view of the evidence provided by other thoroughly reforming jurisdictions, will likely provide lower prices that will also aid the competitiveness of Italian industry. One of the sources of lower prices would be greater efficiency. ENEL has already increased its efficiency by using fewer employees to perform the same functions and has lowered its input costs by more efficient purchasing. For example, in one year (1998 to 1999), ENEL decreased those transmission operating costs related to purchasing by 14%, and those related to capital investments by 38% (Enel Interim Report 1H99, pp. 22, 23). The number of employees has been falling, and the government expects ENEL to cut a total of 25 000 jobs – one-quarter of the total – by 2004 (CNN, 1999a). Many employees leave voluntarily through early retirement. (ENEL, Interim Report 1999, p. 12). Two measures of efficiency used to compare utilities are the number of employees per kWh and per customer. These have improved substantially in recent years.

Table 7. **Number of employees**

	End 1996	End 1997	End 1998	Mid 1999
Corporate		1 150	1 031	
Generation Division		20 928	20 154	19 401
Transmission Division		4 003	3 860	3 632
Distribution Division		54 298	51 928	49 104
Others		8 578	7 965	
TOTAL	95 464	88 957	84 938	81 041

Source: ENEL Annual Reports 1997, 1998.

Table 8. Efficiency measures

	1994	1995	1996	1997	1998	April 2000
Customers per employee (number)	277	296	306	332	349	378
Electricity sold per employee (MWh)	2 016	2 198	2 277	2 507	2 691	2 936

Source: ENEL Annual Report 1998; figures for April 2000: ENEL.

The effect of higher prices on Italian industry demonstrates the benefits in terms of competitiveness of lower prices. These effects are greatest on energy intensive industry. One example is a plant making an iron alloy. It had to stop production in 1999 because the price of electricity rose to too high levels. At the beginning 2000, it contracted for 20 MW of energy from Germany and re-started production. After three months, finding that it could increase sales, the company wanted to increase production 50% but was not able to do so since no import capacity was available. In other cases, plants producing calcium carbide, electrolytic zinc, magnesium, and sodium chloride have closed in the past five years. It may be that these plants were only economic so long as they received electricity, under the former industrial policy, at prices below cost. But if they would have been economic using competitively priced electricity, then their closure is an economic loss. Other effects of high electricity prices are harder to detect, such as when a company increases production at another plant in the same group but in another country.

1.6. Conclusions

Italy has taken a courageous step to require the divestiture of some of ENEL's generation plant and access to part of the import transmission capacity. The reduction of legal barriers to entry, once implemented, will also be a positive step. However, experience in other countries indicates that effective competition is unlikely to develop in Italy for at least several years, and that further divestiture is needed. Augmenting import capacity and relieving domestic transmission constraints would help increase competition by making supply from more distant generators feasible. However, once effective competition is established, an artificial limit on the shares of any single company can have the effect of segmenting the market thereby raising costs.

The continued common ownership of generation and transmission, despite the operation of the grid by the Transmission System Operator and its regulation by the Energy Authority (which includes non-discriminatory access tariffs) raises the risk that access to the transmission grid may not, in fact, be non-discriminatory and efficient, and that investment in transmission may not be timely. Hence, in the longer term the complete ownership separation of transmission from generation may be necessary.

Ensuring efficient behaviour by both the TSO and Single Buyer is difficult because they are not profit oriented, so are impervious to incentive regulation by *e.g.* price caps, and because they engage in activities that require innovation, so are unsuited to command and control regulation. Liberalising all consumers would eliminate the difficulties of regulating the Single Buyer.

Reform of the tariff structure is proceeding in a direction to promote more efficient use of electricity and generation capacity, which has positive environmental benefits. The introduction of price caps will provide generators with greater incentives for cost reductions. The phasing down of the "social tariff," so that it is targeted at those households who really need it, will help make the tariff structure sustainable despite a lower threshold for liberalised consumers. An explicit surcharge on all consumers to fund this subsidy would allow liberalisation of all consumers.

Stranded costs and other policy costs are a heavy burden on electricity consumers. The stranded cost surcharge acts like a tax, in that funds flow from users to the state as owner, and as a barrier to entry, in that incumbents can sell electricity at low market price without suffering the corresponding financial penalty since they are compensated through higher stranded cost payments. Shifting these payments toward the usage invariant part of the tariff and reducing their size would reduce both of these effects.

Overall, Italy is reforming its electricity sector in a direction that will bring it closer to achieving its policy objectives. However, it needs to take advantage of the reform opportunity and go further with respect to creating a structure that promotes competition and thus greater efficiency. Italy is now in a good position for further reform, as it already has in place one of the key ingredients for success. In particular, it has an independent regulator, that is well-respected and well-resourced. This not only will aid the further reform in the electricity and gas sectors, but it is also a positive and valuable example for regulatory authorities for other sectors.

1.7. Policy options

1. Take measures to increase competition in the market for electricity.

Require, in the short term, further divestitures of generation plant by ENEL.

If market prices remain above competitive levels after 2003, and if the amount of entry then expected and import capacity are together insufficient to make effective competition likely, then negotiate further divestitures. If, on the other hand, effective competition is clearly developing, then remove the antitrust limits on ENEL so that all generators can compete across the entire market.

Require divestiture of transmission from generation if transmission constraints are not relieved or if there is discrimination in access.

Increase the capacity of transmission of electricity from other countries, so that Italian consumers can enjoy the benefits of vigorous competition elsewhere.

Shorten the concessions for electricity distribution and consider allocating them through competitive tendering (as is done for other local services).

2. Increase the efficiency of the buyers in the market.

Provide strong economic incentives for the Single Buyer to procure least cost power and energy. These might take the form of incentives on its managers. Ensure that any long term contracts signed by the Single Buyer do not block further liberalisation of consumers.

Liberalise all consumers as soon as practical, at least within the medium term.

3. Modify the tariff structure to improve efficiency in the sector.

Make tariffs more cost-reflective. This both reduces energy waste, where tariffs were too low, and avoids under-usage, where tariffs were too high. Consider eliminating the requirement that tariffs be geographically uniform in light of the non-uniformity of cost of supply.

Shift surcharges for stranded costs and other policy costs toward the usage-invariant part of the electricity tariff.

Review the basis upon which stranded costs are defined, with a view to reducing them significantly.

APPENDIX

Table 9. **Proposed new generating plans in Italy**

Region	Capacity (MW)			Total
	Technology			
	Combined cycle	Renewables	Others	
Valle D'Aosta		2	2	4
Piemonte	8 442	32	31	8 474
Liguria	2 380	0		2 380
Lombardia	7 240	131	82	7 253
Trentino Alto Adige		55		55
Friuli Venezia Giulia	2 000	15		2 000
Veneto	3 042	73	13	3 115
Emilia Romagna	3 690	25	31	3 690
Toscana	2 030	50	36	2080
Umbria	896	192	1	1 088
Marche	800	420	3	1 220
Lazio	5 190	30	42	5 220
Abruzzo	2 780	40	24	2 820
Molise	3 200	78	2	3 278
Campania	4 970	226	10	5 196
Puglia	7 350	529		7 879
Basilicata	3 006	625		3 631
Calabria	4 230	41		4 271
Sicilia		168		168
Sardegna		542	3	542
ITALY	61 246	3 059	279	64 305

Source: Government of Italy, communication to the OECD, 2000.

NOTES

1. ENI, the second or third largest Italian generator, produces electricity for its own use and that of co-located companies at its refineries and petrochemical plants. The “antitrust limit” on ENI’s share of gas production plus imports excludes gas it uses for generation. Hence, ENI plans to increase its electricity generation capacity so that by about 2003 it will have 3.5 MW available for commercial sales, or enough to supply about 15% of the liberalised market.

Edison, the other large fringe generator, had only about 6 TWh available to sell to liberalised customers in 1999. This represents less than 10% of liberalised demand in April 2000. The rest is sold under long-term contracts, which do not begin to expire for a few years, to the independent system operator (Gestore della Rete di Trasmissione Nazionale) under the CIP/6 renewable energy programme.

As regards other generators, autogenerators are constructing about 2 TW, or less than 3% of installed capacity of additional plants, and they generally sell only a fraction of the electricity they generate. Many industrial plants cannot feasibly generate electricity because their processes involve insufficient amounts of steam. Of the municipal utilities, only Milan’s has excess generation available for sale.
2. Frankena, Mark (1997), *Market Power in the Spanish Electric Power Industry*, Report prepared for the Comisión del Sistema Eléctrico Nacional, Madrid, March.
3. Ocaña, Carlos and Romero, Arturo (1998), *A simulation of the Spanish electricity pool*, CNSE, Madrid, June.
4. London Economics (1999), *El sector eléctrico español, Análisis del poder de mercado*, Madrid, February.
5. CNSE (1999), Análisis de la participación de Endesa en ciertos episodios anómalos en los mercados de energía eléctrica gestionados por el operador del sistema and Análisis de la participación de Iberdrola en ciertos episodios anómalos en los mercados de energía eléctrica gestionados por el operador del sistema, Madrid, 28 July.
6. For efficiency, the level of these maximum tariffs should not be so low as to discourage entry, *i.e.*, not lower than the total cost of new generation.
7. Upgrading the Bernina Pass interconnector, a long-standing bottleneck, had been planned, but ENEL stopped building its part (Power in Europe, 8 November 1999).
8. ENEL had signed a contract to buy gas from Nigeria, planning to locate a regasification plant in Italy. However, the plant was refused by local authorities and it was relocated to France. The stranded costs are the extra costs connected with the forced change of location of the re-gasification plant.
9. Authority resolution 161/98, on 22 December 1998.
10. Deliberation No. 70/97 of 26 June 1997.
11. Deliberation No. 13/99 of 18 February 1999.
12. Deliberation No. 204/99 of 29 December 1999.
13. The Autorità set the initial level of tariff parameters by analysing the average unit costs actually incurred by ENEL and the other major companies in the sector. This enabled the definition of allowed cost levels for each stage of production, for the purpose of tariff regulation. Allowed costs include costs of external sources (personnel, procurement of materials and services), depreciation and fair return on net invested capital. The revenue constraints enable producers to cover their allowed costs and to finance activities carried out in the general interest (*i.e.* promotion of renewable sources, phasing out of the nuclear plants, financing the social tariff and special tariff arrangements, stranded costs, research and development activity).

2. THE GAS SECTOR IN ITALY

2.1. *Introduction to the gas sector*

The gas sector in Italy is dominated by ENI through its wholly-owned subsidiary SNAM. Demand for natural gas is growing rapidly in Italy, from 3 to 5% annually over the next decade.

Italy is greatly revising the regulation of the gas sector, notably by the May 2000 Legislative Decree¹ that implements the European directive on natural gas. Many aspects of the Decree are very positive, bold and innovative. The liberalisation of consumers is extensive and quick, with all consumers over 200 000 m³ annual consumption liberalised immediately (represents roughly 60% of all demand), and all consumers liberalised by the beginning of 2003. (Distribution companies will be liberalised from 2001.) This unleashes powerful forces for lower costs. It is both positive and innovative to require public tendering for gas distribution, since this allows competition *for* the market where otherwise a natural monopoly would not be subject to such pressures. The Legislative Decree also requires corporate separation between many of the activities in the gas sector. The Energy Authority may oblige owners of gas transmission, local distribution, and storage to grant access, access which is necessary for competition to develop in this sector. The concept of imposing temporary “antitrust limits” on shares that any single company can have of potentially competitive activities is also innovative. In sum, the Decree seems to go far beyond the minima required under EU gas directive toward a more competitive environment.

However, the reforms could go further. One can expect only subdued competition to develop where one firm has 61% to 75% of imports-plus-production. The retention of a vertically integrated structure retains, also, the incentives to discriminate in providing access to essential facilities, although these incentives can be partly managed through intensive and costly regulation. Not requiring divestiture of storage means that a potentially competitive activity remains monopolised. By developing effective competition, Italy can experience lower gas prices, which in turn would help its industrial competitiveness.

2.2. *Policy objectives*

Development of competition is the primary objective of regulation during the liberalisation phase. Other objectives of regulation include increasing industrial competitiveness, ensuring strategic security and continuity of supply, and increasing the number of customers. Competitiveness of the system in the medium term is inextricably linked to liberalisation and competition. Lower gas prices translate into lower costs for firms in other sectors, and Italian gas firms exposed to competition earlier will develop a competitive advantage on the international gas market by being compelled to increase their efficiency and to research new markets. Strategic security and continuity of supply is to be achieved through a mixture of market forces and regulation. The Decree obliges network owners to connect new customers.

A shift in policy objectives in the past five years is evident. In particular, Law No. 481 of 1995 assigns three objectives to the regulator, the Authority for Electricity and Gas: 1) promote competition and efficiency in the regulated industries; 2) guarantee adequate quality for the regulated services and their homogenous provision throughout the country; 3) set up a pricing system enabling the economic and financial viability of market operators as well as the attainment of the social and environmental objectives set by the Government (OECD, 2000a; Italian submission)

2.3. *Regulatory institutions and regulation*

The sector is regulated by an independent authority, the *Autorità per l'energia elettrica e il gas* (the Energy Authority). Overall policy regarding the sector is set by the Ministry of Industry. The Competition Authority applies the competition law to the sector. The State's shares in ENI are held by the Treasury.

The *Autorità per l'energia elettrica e il gas* is an independent statutory entity established by Law 481/95 to regulate and control the electricity and gas sector. (See the section on electricity for a description of its governance.) According to the Decree implementing the European gas directive, the *Autorità* will:

- Fix tariffs for transmission, storage, and distribution.
- Oblige owners of the transmission network, storage facilities, and local networks to grant timely access where access has been denied and the denial is unjustified.
- Monitor adherence to the Network Code drawn up by the owners of the network (*i.e.*, ENI) conforming to the *Autorità*'s criteria.
- Guarantee non-discriminatory access to storage when it is not needed for production purposes.
- Fix the price of gas for captive customers until 2003, the date when all consumers will be liberalised.
- Notify the Competition Authority in case it detects anti-competitive practices.

The Ministry of Industry has primary responsibility for energy policy and, under the Decree, significant regulatory powers in the gas sector. The Inter-Ministerial Committee for Economic Planning (CIPE) coordinates national energy policy with overall economic policy. For both the Ministry of Industry and CIPE, the decentralisation process means that policy making responsibility is being progressively transferred to the regions and their role is moving towards co-ordinating national economic and energy policy with the corresponding regional policies. The Ministry of the Environment, along with the regional and local authorities, has environmental protection responsibilities.

The competition law applies to the sector and the Competition Authority enforces it. Where the Energy Authority suspects a possible violation of the competition law, it is to notify the Competition Authority. No such notification has been received to date by the Competition Authority. Nevertheless, the AGCM has recently investigated the gas sector and found SNAM (an ENI subsidiary) to have abused its dominant position by unjustified refusal to grant access to its transmission line. The decision has been appealed.

Traditionally, the sector had not been explicitly economically regulated. Instead, ENI was state-owned and was granted exclusive rights. Liberalisation began with Legislative Decree 625/96, a Decree which eliminated ENI's exclusive rights to gas exploration, underground storage and the construction of transport infrastructure in the Pianura Padana, the region of the main domestic gas fields. Law 9/91 defined the criteria for setting the transmission tariff. Only the distribution margin for sales to consumers using less than 200 000 m³/year is currently regulated by the *Autorità*.

2.4. Description of the sector

ENI dominates all phases of the gas sector in Italy. The structure of the sector is shown in Table 1 below. ENI has been a joint stock company since 1992; although 64% has been sold since November 1995, the State remains the controlling shareholder. (OECD, 2000a; Italian submission) The majority of Italian local distribution companies (LDCs) also distribute other local services, particularly water and less often electricity.

Table 10. Structure of the gas sector in Italy

Production and Imports	<ul style="list-style-type: none"> • Around 70% of total natural gas used in Italy is imported. ENI owns 100% of the import infrastructure, 92% of import contracts and makes 95% of imports. ENEL has almost all of the remainder. The remaining gas is produced domestically, mostly (87%) by an ENI division, AGIP. The rest is produced by a number of small producers, Edison among them.
Storage	<ul style="list-style-type: none"> • ENI owns 99% of the storage facilities, consisting mostly of depleted gas reservoirs, which can contain up to 28 billion cubic meters.
Transmission	<ul style="list-style-type: none"> • SNAM (controlled by ENI) is the dominant transmission company, owning 96% of the national high-pressure gas transmission network. Around 9% of total gas transmitted by SNAM is carried for third parties (mainly for ENEL, the electricity company). • Edison Gas owns around 3% of the national gas transmission network.
Distribution	<ul style="list-style-type: none"> • A very large number of local distribution companies (more than 800) are active in gas distribution. More than 60% of these are directly managed by local authorities. • Italgas Spa (controlled by ENI through SNAM) accounts for 33% of distribution to small consumers. • ENI has 80% of large customer distribution.
<p>Measures (1998)</p> <p>Imports: 42.7 bcm (Russia 16.7 bcm, Algeria 22.8 bcm, Netherlands 3 bcm, Abu Dhabi 0.2 bcm).</p> <p>Domestic production: 18.9 bcm.</p> <p>Gas stored variation: 1 bcm.</p> <p>Total supply: 62.6 bcm.</p> <p>Network leakage: 0.7 bcm.</p> <p>Total demand: 61.9 bcm (Electricity generators: 15.6 bcm, Industrial users: 21.8 bcm, Residential users: 24.5 bcm).</p> <p>About 60% of transmitted gas goes to large users and 40% to distribution companies which supply smaller final users.</p>	

Source: *Autorità garante della concorrenza e del mercato* (OECD, 2000a) and Presentation of Bernardini at the 10th European Gas Summit (2000).

Box 6. The natural gas sector

Like many other industries, the natural gas industry comprises a number of distinct “stages of production”, differing in the nature of their regulation and the scope for competition. It is possible to distinguish five broad stages of production, from the point of extraction (the “well-head”) to the point of consumption (the “burner-tip”).

- (a) Production – which can be further broken down into the exploration, drilling, extraction and processing of gas. For the purposes of this paper, re-gasification facilities for gas in its liquid form (known as LNG), can be included within this stage of production.
- (b) Transmission – the high-pressure transportation of gas to high-volume customers such as distribution companies, large industrial customers and power stations.
- (c) Distribution – the low-pressure distribution of gas to small and medium-volume gas customers.
- (d) Storage – the smoothing of the flow of gas through the transportation network by pumping gas into holding facilities at off-peak times, and withdrawing the gas at peak times.
- (e) Retailing or Marketing – the provision of services of contracting with production, transmission and distribution companies on behalf of gas customers and associated billing and metering services.

In most cases, competition between gas producers is feasible. Competition may not be effective in practice, as one or a few producers may own all the viable independent sources of gas. This is especially of concern when the independent sources of gas are under the jurisdiction of a foreign country.

While gas transmission pipelines exhibit sizeable economies of scale, competition between pipelines may nevertheless be feasible in some countries, according to the magnitude and the geography of demand for gas flows. As a rule, however, it seems likely that for the foreseeable future effective inter-pipeline competition even in fully liberalised markets will be limited to a few geographic locations.

While some gas customers, particularly very large ones, are supplied directly off the high-pressure transmission network, most smaller customers are supplied through local gas distribution companies, known as “LDCs”. Like many other network industries, local gas distribution exhibits economies of density – once the costs have been sunk of installing a gas main down a street, the marginal cost of connecting another house or building to the gas main is very small. Because of these economies of density, local gas distribution is, generally speaking, a natural monopoly. Competition would not normally be expected to be feasible in gas distribution.

Demand for gas is highly seasonal. Demand at peak times can be several times higher than at off-peak times. Gas storage facilities smooth the flow of gas through the network, which are filled at off-peak times and drawn down at peak times. Gas is stored in a number of different types of facilities, such as depleted gas reservoirs or disused mines. Although access to certain key facilities (such as depleted gas reservoirs) can be limited, the economies of scale in gas storage are small. As a result, there remains scope for effective competition in gas storage services, with the possible exception of regions with low population density.

Natural gas is imported to Italy via pipeline from Algeria, Russia and, to a much smaller extent, the Netherlands. Imports are expected to increase to 75-80% of total consumption by 2005, because demand is expected to surge and domestic production to subside. Consequently, ENI has recently entered into new long-term import contracts with Libya and Norway, substantially expanding its portfolio of contracts. ENEL and Edison are expected to increase their imports, ENEL’s from Nigeria and Edison’s from Russia and Libya.

Import contracts generally have durations of approximately 20 - 25 years and around 60% of them contain take-or-pay clauses which guarantee producers minimum revenue levels, independently of the gas volumes actually delivered. Buyers usually maintain the right to spread the take-or-pay obligations across the duration of the contracts. ENI's import contracts will cover about 66 billion cubic meters of gas per year from 2008 onwards (Russia 28.5 bcm, Algeria 21.5 bcm, the Netherlands 10 bcm, and Norway 6 bcm) (ENI Annual Report 1998, p. 14) It expects to have contracted for nearly 75 bcm of gas in 2010 (IEA 1999, p. 76). Another constraint on the contracts signed by ENI is that they require the gas to be sold within in Italy. This requirement effectively separates the Italian market from the rest of Europe; if other national gas companies sign contracts with such a provision then they would collectively amount to a market division.

Prices of gas in Italy are relatively high (see below). According to Confindustria, using Eurostat data, Italy has relatively high prices for households consuming larger amounts of gas, and for industry. However, for households consuming very little, Italy has a low price, indeed generally the lowest price, among EU countries. (Household prices within Italy vary in relation to the development of the distribution network.) Prices to industry are higher in Italy than in other EU countries: For the smallest industrial category, the price in the United Kingdom is about half the price in Italy, and for the largest industrial consumers, those in the United Kingdom pay 15% less than those in Italy.

2.5. *Reform*

The May 2000 Legislative Decree is expected to radically change the Italian gas sector. Its main points are described in the box below. The Decree, which implements the EU gas directive, is in many important respects more pro-competitive than the minimum requirements of the EU gas directive.

Box 7. **Main aspects of the Decree on the Italian gas sector**

(Decreto Legislativo di attuazione della direttiva 98/30/CE relativa a norme comuni per il mercato interno del gas)

The main aspects of the Decree are:

First, the Decree places two ceilings, during the eight-year period 2003 to 2010, on the share that any single company may have. No firm may, directly or indirectly, exceed a ceiling of 75% of the total of imports and domestic production, excluding use of gas for its own purposes. This ceiling descends at 2% per year to 61% in 2010. No firm may exceed a ceiling of 50% of sales to final consumers in Italy (Art. 19).

Second, the Decree specifies the minimum type of separation between the various activities in the gas sector. Transmission and dispatch activities must be carried out in legally separate corporations from all other activities, except for storage. Storage must be accounting and managerially separated from transmission and dispatch. These separations must be in place within one year of the Decree coming into effect (Art. 21).

Third, the Decree specifies that access to infrastructures shall be regulated.

Fourth, the Decree specifies the import regime for gas from outside the European Union. Any importer must arrange that 10% of its annual imports should be stored on Italian territory. Import must be authorised by the Ministry for Industry, which must apply several criteria—diversity of gas sources, contributes to strengthening distribution, can adjust to the seasonal need of the system and has access to the above-mentioned strategic storage.

Fifth, gas distribution must be allocated by competitive bidding, after a transition period, and the duration of franchises for distribution cannot exceed 12 years.

Sixth, consumers with annual consumption exceeding 200 000 m³ will be free to choose their gas supplier immediately, and all consumers will be free by 2003.

Both the Electricity and Gas and the Competition Authorities submitted reports advocating for reform of the natural gas sector. The main points on which their proposals differ from the Decree are:

1. The imposition of a lower ceiling on production plus imports, 60% by 2003 and 40% by 2006, and the obligation on ENI to divest and sell to competitors part of domestic and imported natural gas supplies currently controlled by the firm.
2. Noting that accounting or administrative separation of ENI's potentially competitive and natural monopoly activities was insufficient to guarantee effective competition
3. Noting the need for a cost-based and non-discriminatory access to essential facilities, and how this requires direct regulation rather than bargaining between the parties.

2.5.1. Market share limits

The 75% limit – or 61% limit in 2010 – on imports plus domestic production is high, if the intent is to create a market structure where prices are relatively competitive. This level meant that the issue of how to deal with ENI's existing take-or-pay contracts could be avoided. While all the relevant facts would need to be examined, under most competition laws a company with these market shares would be considered dominant or monopolistic and its actions subject to special criteria to ensure they are not abusive or anti-competitive. Indeed, under European Union competition law standards, a company with more than 40% can be found dominant, depending on the facts of the particular case. Particularly in light of the relatively high price of gas in Italy and the fact that consumers with demand over 200 000 m³/year will not benefit from price regulation, the precise terms of ENI's long term contracts with gas producers should be re-examined with a view to reducing significantly ENI's import share.

The effect of excluding, from the upstream limit, gas for own consumption is to provide incentives to ENI to increase its use of gas to generate electricity. This is likely to have a positive effect on competition in electricity generation by further promoting ENI's expansion in that market.

The 50% restriction on sales to final consumers means that ENI must reduce its share at that stage in the sector by selling a large part of the gas it imports to other firms. Competition at this stage in other countries often involves forms of risk-shifting – firm versus interruptible gas contracts, multi-fuel contracts, various payment options. While 50% remains a high share, experience in the United Kingdom suggests that, once liberalised, even households switch away from the incumbent relatively rapidly in response to competitive offers. In light of the plan to liberalise all customers by the beginning of 2003, this antitrust ceiling does not seem unreasonable.

It should be noted that a monopsonist does not have increased bargaining power vis-à-vis a monopoly when the monopsonist is a monopoly in the next market downstream. Instead, competition in the downstream market improves the bargaining position of the company buying the intermediate good, since that company faces greater elasticity of demand under competition rather than monopoly. The downstream demand seen by a competitive firm has a higher elasticity than that of total demand because its customers will desert it for rivals if it offers a higher price. Facing higher elasticity of demand, the firm has higher profit incentives to reduce the cost of inputs, thus to bargain toughly. Thus, if Italy had competing gas importers, then they would bargain more toughly with gas producers.

2.5.2. Vertical integration

The vertical integration of ENI, so that it is active in both potentially competitive activities and monopoly activities, gives the company incentives to discriminate against its non-integrated rivals. This discrimination can be subtle, such as the way capacity is allocated or the timing of provision of information. Discrimination can be limited by intensive independent regulation. However, this regulation can be intrusive and costly, both for the State and the company. The longer-term solution is to introduce effective competition in activities where this is possible, and to separate the ownership of the participants in those activities from the ownership of the participants in natural monopoly activities (which a monopoly provides at lowest cost). While the monopoly activities would still need to be independently regulated to prevent abusive pricing, the regulator would no longer have the difficult task of detecting and preventing discrimination.

Storage, for example, is a potentially competitive activity. Access to storage, at efficient and non-discriminatory prices and terms, is key to the ability of other companies to provide effective competition against ENI. In Italy, gas is stored at depleted gas fields that have been modified to allow more rapid withdrawal. There are numerous depleted gas fields, and there are no physical or technological connections among them. Hence, there would be no loss of economies of scale for them to have different owners. Further, there is no technological connection between having been the producer of a specific gas field and being the owner/operator of that field when it is depleted and turned into a gas storage facility. Geological information, for example, is easily transferred. However, under the Decree, storage requires an authorisation from the Ministry for Industry. Whereas previously a company had to have gas production in Italy in order to get an authorisation – and AGIP (in the ENI group) is almost the only gas producer in Italy – that requirement has been removed

ENI now owns essentially all the gas storage in Italy. Thus, to introduce competition in storage, both divestiture and lower entry barriers are required. The Ministry of Industry is, under the Decree implementing the EU gas directive, to conduct a survey of existing production sites in order to assess their suitability for storage and then auction concessions for new storage sites. To ensure non-discriminatory access to storage until that service becomes competitive, the Energy Authority can oblige ENI to grant timely access to storage.

Competitors also require access to ENI's transmission facilities, both in Italy and "before the border." There are no alternative facilities, and competitors would find it uneconomic and extremely difficult to build their own. Under the Decree, access to transmission would be regulated by the *Autorità*. Among dimensions to be regulated are the conditions under which access can be refused. For example, one basis on which ENI can refuse to grant to transmission is that it would cause economic harm because of its take-or-pay contracts. Where the same company has control over decisions regarding both capacity investment and take-or-pay contracts, then it controls "available capacity." A more symmetric allocation rule should be sought.

While only a large fraction of gas demand goes through the distribution networks (the rest is taken off at higher pressure from the transmission network), after all consumers are liberalised those companies who compete to supply customers taking gas from the distribution networks will also require access to those networks. At present, there is no third party mandatory access to the local distribution network (OECD 2000a; Italian submission).

Where there is an access dispute, the vertically integrated company gains at the expense of the non-integrated rival because the rival remains discriminated against or excluded during the period until the dispute is resolved. Quick resolution is therefore an important attribute of a regulatory system. In Italy, the Energy Authority resolves disputes regarding access to gas transmission, storage and local distribution.

The Energy Authority was given that responsibility in order to resolve access disputes quickly. By comparison, it took more than a year for the Competition Authority to reach a conclusion on a complaint about transmission access. Far better is clear *ex ante* access regulation that complies with the competition law, and quick dispute resolution, which makes entry by non-integrated competitors more attractive.

Box 8. Abuse of dominance by SNAM

SNAM was alleged, in 1997, to abuse its dominant position in the markets for the transport of natural gas in the national gas pipeline network and the primary distribution of natural gas. In 1999, the Competition Authority found that SNAM had indeed abused its dominant position and imposed a fine of L 3.6 billion, or 9% of its 1997 turnover from transporting gas for third parties.

In particular, Snam was accused of the following:

- i) Snam's refusal to grant Assomineraria (the natural gas producers' association) access to its national network for gas for uses other than those referred to in Article 12 of Law No. 9/1991, that is for electricity generation and own consumption;
- ii) Snam's refusal to accept Assomineraria's request to revise the agreement of 22 December 1994 with regard to the transmission of natural gas produced in Italy, with special reference to the price of the service; and
- iii) Snam's practice of monitoring the final destination of the gas carried on behalf of Edison Gas Spa.

The Authority found that Snam had a dominant position in the market for the transport of natural gas, and that access to its transport facilities was essential to enable other companies to compete. Hence, the Authority concluded that SNAM was not justified in refusing access to its national network of gas pipelines to actual and potential competitors and that those competitors therefore had the right to the carriage of natural gas in cases other than those referred to in Article 12 of Law No. 9/1991.

Moreover, the Authority found that the method of calculating the charge for carriage laid down in the 1994 agreement allowed Snam to fix the price level independently of the effective demand for the transport of third parties' gas was likely to lead to the imposition of unjustifiably burdensome contractual conditions, in violation of Article 3 of Law No. 287/1990.

Snam appealed the decision by the Authority to the Administrative Court of the Latium Region which has suspended the implementation of the decision. The Court will rule on the case in the next months.

2.5.3. Barriers to imports

The import of gas from outside the European Union is, according to the Decree, subject to stringent control. First, the criteria to be applied by the Ministry to determine whether to issue a licence cumulate to creating barriers. Second, all importers are required to be able to store 10% of their annual imports within the territory of Italy.

The policy objective toward which these requirements are imposed is ensuring security of supply. Security of supply can take a number of meanings. The definition that means, "continuity of supply even during periods of high demand," can be handled through markets. In particular, interruptible supply contracts allow for the market pricing of continuity of supply, and contract prices that vary with spot prices help to ensure that the capacity constraints do not often bind. Already, about one-third of all industrial supplies are supplied under interruptible contracts, meaning the supplier can unilaterally temporarily suspend deliveries of gas. The definition that means, "sufficient investment before the capacity is needed," is also handled in liberalised countries like the United Kingdom and United States through markets. Finally, there is the definition that relates to political risk. The government states that it believes market

liberalisation will increase the number of countries from which Italy imports gas. If that is so, and given that much of Italian capacity is multi-fuelled, then the 10% storage requirement is superfluous. Clearly, there will be some significant storage capacity in Italy because companies will want to have storage for commercial reasons, to buffer the difference between the relatively even flow of gas from production and the seasonally varying flow of gas to consumers. Especially for those consumers who use a constant flow of gas, such as for industrial plants, the 10% strategic storage requirement is costly.

2.5.4. *Independence of regulation*

Independent regulation provides a safeguard to competition especially in sectors where there is an essential facility to which all firms need access. Independent regulation is used to overcome the concern that ministers, in many countries, tend to be subject to greater day-to-day political pressure, and to be replaced more frequently, than are regulators who are given a specific public mandate and appointed for fixed terms. Ministers may also make trade-offs that discourage investment. Thus, ministers find it more difficult to maintain predictable policies over longer periods of time, whereas regulators maintain policies unless Parliament instructs them otherwise. Unpredictable regulation discourages private investment, and changing regulation renders investment less efficient. .

The *Autorità per l'energia elettrica e il gas* is a well-respected and well-resourced independent regulator. In both the electricity and gas sectors, it is the primary regulator. However, the Ministry for Industry is involved in regulating elements of the gas sector related to “energy security.” The Ministry authorises imports, gives instructions on stock building, and has a general role of strategic co-ordination of the Italian gas sector. The Ministry authorises the sellers to final clients, which is done by the Energy Authority in the electricity sector.

2.5.5. *Comparison with other countries*

Prices in Italy, before tax, are substantially higher than the average in the European Union, and much higher than in the United Kingdom and Netherlands. Costs are also higher. These comparisons with other countries, especially the countries with competition in the gas sector, indicate the savings that can be achieved by an effective reform in Italy.

Table 11. **Average natural gas prices (before tax, mid-1999)**

	Industry (Lire/m ³)	Small consumers (Lire/m ³)
Italy	310	625
Average European Union	285	580
Average European Union excluding United Kingdom and Netherlands	295	615
Average United Kingdom and Netherlands	220	525

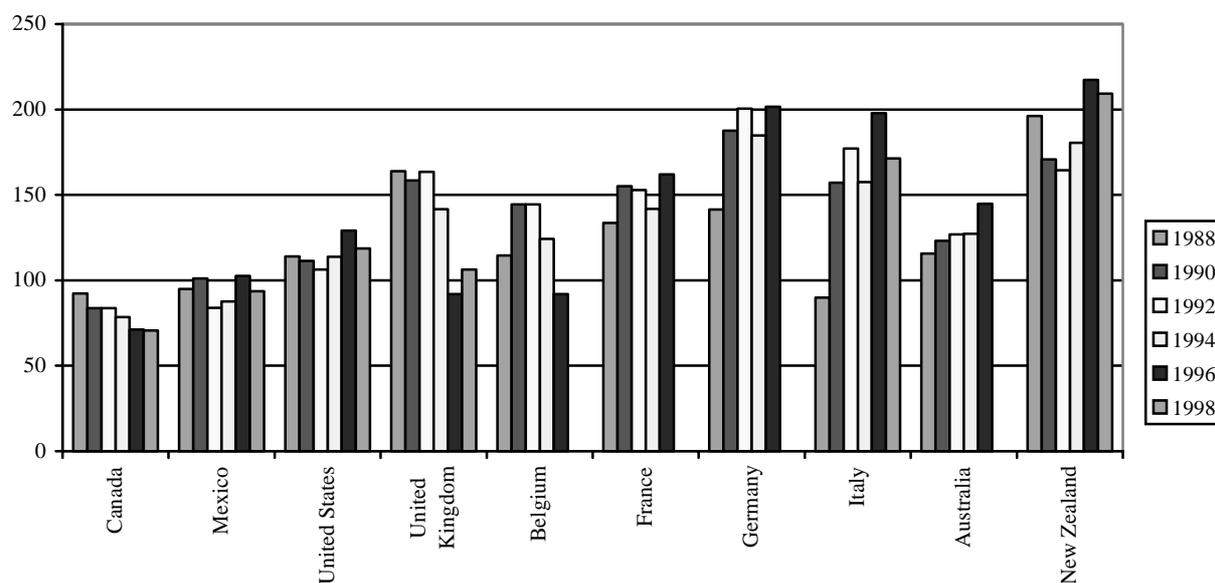
Source: Bernardini (2000).

Table 12. **Differences in costs between Italy and European Union producers**

Activity	Cost difference (Lire/m ³)
Production and international transport	20-30
National transport	5-7
Storage	5-6
Local distribution	10
Total	40-53

Source: Bernardini (2000).

Figure 4. Gas prices in selected OECD countries



Average price per 10b kcal on a gross calorific basis. All prices in US Dollars
 Source: IEA, Natural Gas Information (1999), Table 17

1. Decreto legislativo di attuazione della direttiva 98/30/CE relativa a norme comuni per il mercato interno del gas, 23 May 2000.

Table 13. Summary of market structure in selected OECD countries

	Netherlands	Belgium	Italy	Germany	France
Transmission	A single transmission company (Gasunie) supplies 46% of the gas market directly.	Like the Netherlands, Belgium has a single transmission company (Distrigaz) supplying about half (54%) of the total gas market directly. Distrigaz was privatised in 1994.	In Italy, SNAM, controlled by ENI, is the dominant transmission company (with around 97% of total transmission capacity) and is the only company to have a nationwide natural gas transmission network. EDISON GAS, the second Italian transmission company, has a transmission capacity of around 3%.	Ruhrgas is the dominant transmission company, carrying 70% of the total gas supplies, but there are 17 other transmission companies. Collectively these transmission companies directly supply 32% of the total gas market.	In France there is one dominant transmission company (Gaz de France, "GdF") along with two other smaller subsidiaries (Gaz de Sud-Ouest and Compagnie Française de Méthane). About 30% of the market is supplied directly off the transmission network.
Distribution	35 LDCs, all of which are owned by regional and local authorities.	There are 23 distribution companies, the majority of which (19) have private shareholdings (although even in the cases where private shareholders are in a majority, the public shareholders keep the majority of votes on the company boards).	A very large number of LDCs (more than 800) are active in the distribution of gas. Around 50% of these are directly managed by municipal local authorities. ITALGAS Spa, the largest company, with a 30% share of distribution nationwide, is controlled by ENI. SNAM supplies directly around 92% of the demand of natural gas for electricity production.	There are also a large number (673) of distribution companies. "there is no clear distinction between different types of gas supply companies in the gas chain. Many companies mainly active in distribution are also involved in transmission and vice versa". ¹ Of these distribution companies, the majority are state-owned. Less than 25% of the companies have some degree of private ownership.	Although GdF is by far the largest company in the gas distribution sector, supplying the bulk of the gas demand of residential/commercial and small industrial customers, there are also 15 state-owned and private distribution companies which supply 2.8% of the market.
Vertical Integration	There are almost no ownership links between Gasunie and the LDCs, or between the LDCs and gas producers. The only exception is the minority shares (10%) held by Gasunie in two LDCs (Intergas and Obragas).	There are no ownership links between Distrigaz and the LDCs.	ENI is vertically integrated in production, transmission, and distribution activities. ENI, through SNAM, has a 91% share in the Italian market for natural gas. ENI owns gas import facilities, transmission networks and the largest distribution company ITALGAS. EDISON GAS is also vertically integrated in production, transmission and distribution activities through ownership links.	Most of the transmission companies have ownership interests in LDCs. Some of the gas producers have ownership interests both in transmission and distribution companies.	GdF is highly vertically integrated. The other two transmission companies are owned by Elf, Total and GdF.
Horizontal Integration	Only 11 of the LDCs are pure gas companies, the majority also distribute electricity and heat.	Of the LDCs only 6 are pure gas companies, the others usually also supply electricity and cable TV signal distribution..	The majority of the LDCs also distribute other services, particularly water and less often electricity.	Only around 20% of the LDCs are pure gas distribution companies. The majority distribute both gas and water or gas, water and electricity.	GdF is a specialised gas company, but the 15 independent LDCs are usually involved in activities other than gas distribution, such as water distribution.

1. IEA (1998b), p35.

Table 13. Summary of market structure in selected OECD countries (cont.)

	<i>United Kingdom</i>	<i>Australia</i>	<i>New Zealand</i>	<i>USA</i>	<i>Argentina</i>
Transmission	<p>BG Transco (formerly the pipeline operating part of British Gas) provides an integrated transmission and distribution network. There are no other companies providing these services. British Gas was privatised in 1986.</p> <p>BG Transco also operates the distribution network.</p>	<p>Arrangements differ in the different states. Most transmission pipelines are state-owned, except in Victoria and New South Wales.</p>	<p>One major transmission pipeline network in the North Island owned and operated by NGC (Natural Gas Corporation).</p>	<p>About 45 privately-owned interstate pipeline companies provide transmission services. These are privately owned and regulated entities.</p>	<p>Two new pipeline companies where formed in 1992, in the north (IGN) and the south (TGS). These companies are privately owned.</p>
Distribution	<p>Several distribution companies, many of which are private.</p>	<p>Two main distribution companies - NGC and Orion - distributing primarily in the northern half of the North Island. 4 smaller companies. A mixture of private and local government-owned.</p>	<p>Distribution is carried out by local distribution companies which are usually privately owned and regulated.</p>	<p>8 distribution and supply companies were created in 1992. These are privately owned.</p>	<p>The Gas Act 1992 prohibits producers and storage companies from owning a controlling interest in a transportation or distribution company.</p>
Vertical Integration	<p>The gas distribution system in Great Britain has historically been the most highly integrated in Europe. In addition to being a considerable gas producer, British Gas was completely integrated from the beach to the burner tip until the early 1990's when competition was introduced. However, in 1997 British Gas separated into a production and marketing company (Centrica) and a transmission/distribution company (BG Transco). BG is also heavily involved in production, with ownership of a significant proportion of the North Sea gas fields.</p>	<p>Vertical separation between transmission and distribution in Victoria, whereas transmission is integrated into distribution in New South Wales. There is no integration between production and transmission.</p>	<p>NGC is vertically integrated between transmission and distribution. It also has a significant gas marketing business. All but two of NZ's gas distributors also have a gas retail business.</p>	<p>There is little integration between transmission and gas production and between transmission and distribution.</p>	<p>Some distribution companies are integrated with electricity companies.</p>
Horizontal Integration	<p>Neither Transco nor Centrica are involved in other industries although many of the new competitors in the gas marketing sector also provide electricity or water services.</p>	<p>NGC and some other distribution companies are integrated with electricity companies.</p>	<p>Some distribution companies are integrated with electricity companies.</p>	<p>Some distribution companies are integrated with electricity companies.</p>	<p>Some distribution companies are integrated with electricity companies.</p>

Source: Government of Italy, communication to the OECD, 2000.

Box 9. EU gas directive key features

Third-Party Access Requirement: Member states must allow certain gas customers to buy gas from the supplier of their choice and to have it transported through the existing pipeline network at regulated rates. This right will only be available initially to very large gas customers. For the first five years, only gas customers taking at least 25 million cubic metres (mcm) of gas per year will be eligible; for the next five years the threshold reduces to 15 mcm per annum; in the final 3 years, this threshold reduces to 5 mcm per annum. Member states can choose between “negotiated access” and “regulated access”. Under negotiated access individual customers enter into commercial negotiations to determine the precise terms and conditions. Gas companies are required to publish their “main commercial conditions” for the use of the system. Under regulated access, gas customers have a right of access on the basis of published regulated tariffs.

Independent Regulatory Institutions: Member states are required to designate competent authorities, independent of the parties, with access to the internal accounts of the natural gas undertakings to settle access disputes expeditiously.

Unbundling: Natural gas undertakings are required to keep separate accounts in their internal accounting at least for their gas transmission, distribution, storage and consolidated non-gas activities “as they would be required to do if the activities were carried out by separate undertakings”.

New Investment: Member states must allow a general freedom to build and operate natural gas facilities via objective, non-discriminatory and transparent authorisations.

Public Service Obligations: Member states are allowed to impose on gas utilities, in the general economic interest, public service obligations which may relate to security of supply, regularity, quality and price of supplies and to environmental protection.

Capacity Rationing: Natural gas undertakings may refuse access to their system on the basis of lack of capacity, or where the access to the system would prevent them carrying out the public service obligations that are assigned to them.

Derogations: A natural gas undertaking may apply to a Member state for a derogation from the obligation to provide access if it considers that it would encounter serious economic and financial difficulties because of its take-or-pay commitments. The granting of the derogation is overseen by the Commission. The directive allows a derogation of the market opening requirements for those markets (Finland and Greece) which are dependent on one main external supplier and are not interconnected with the system of another Member State.

Source: OECD (2000a).

2.6. Conclusions

Italy is revising the regulation of the gas sector. Much of the reform, expressed in the Decree implementing the European Union gas directive, are very positive, bold and innovative. The liberalisation of consumers is extensive and quick, with all consumers over 200 000 m³ annual consumption liberalised immediately (represents 60% of all demand), and all consumers liberalised by the beginning of 2003. This unleashes powerful forces for lower costs. Requiring public tendering for gas distribution allows competition for the market where otherwise a natural monopoly would not be subject to such pressures. The Decree also requires corporate separation between many of the activities in the gas sector. The Energy Authority may oblige owners of gas transmission, local distribution, and storage to grant timely access at regulated prices. The imposition of temporary “antitrust limits” on shares that any single company can have of potentially competitive activities is also innovative. In sum, the Decree goes far beyond the minima required under EU gas directive toward a more competitive environment.

However, the reforms could go further. In particular, the market share threshold of 75% – or even 61% – is too high: ENI will retain significant market power. Only a significantly lower threshold will make the development of effective competition likely. Further, given the pattern of expected growth of gas sales, the lower threshold need only be in place for a short period of time. Once the advantages of having had exclusive rights are diminished, then competition should take place on the merits.

Storage could also be a competitive activity in the gas sector in Italy, but the development of effective competition requires divestiture. More generally, retaining a vertically integrated structure retains, also, the incentives to discriminate in providing access to essential facilities. While corporate separation can help provide information to regulators who can act to reduce discrimination, it does not solve the problem of incentives to discriminate. The long run solution to preventing perhaps subtle discrimination in access to essential facilities is to have separate owners for the competitive and the monopoly parts. This eliminates the incentive to discriminate. To ensure non-discriminatory access to storage until that service becomes competitive, the Energy Authority can oblige ENI to grant timely access to storage.

Security of supply is an important policy objective. However, the efficiency with which this objective is attained could be increased. In particular, the strategic storage requirement is probably not the least costly means. A clear articulation of the precise objective would help identify just where markets would fail to deliver the appropriate level of supply security, and then the instruments for correcting this market failure can be finely designed.

The price of gas in Italy is high relative to the price in other European countries. By developing effective competition, Italy can experience lower gas prices, which in turn would help its industrial competitiveness and improve the welfare of its citizens.

2.7. Policy options

1. Reduce barriers to entry for gas importers and sellers.

Require the divestiture, at least in large part, of storage, which is needed by importers.

The corporate separation of transmission should be a first step toward ownership separation of transmission from the potentially competitive activities.

Articulate the precise security of supply objectives. Limit state intervention to those areas where markets do not provide appropriate solutions. In particular, eliminate the legal requirement to store 10% of annual usage within Italy, since seasonal pricing, interruptible contracts and pursuit of credible reputation with buyers provide sufficient incentives for suppliers to arrange appropriate balancing. Similarly, establish clear criteria under which import licenses will be granted and refused. Imports should not be unnecessarily restricted.

2. Promote, directly, a more competitive structure for gas imports.

Reduce the anti-trust threshold for ENI to a level that allows substantial new competitive entry. Shorten the duration of the threshold to a few years so that new entrants can become established and ENI is not constrained unnecessarily. Re-examine options for restructuring ENI's take or pay contracts, perhaps selling the gas to other countries.

3. THE RAIL SECTOR IN ITALY

3.1. *Introduction to the rail sector*

Ferrovie dello Stato SpA (FS) is a state-owned joint stock company responsible for rail infrastructure and services in Italy. Under a sixty-year concession, FS owns and manages the infrastructure and rolling stock, enforces safety regulations, and provides transport services for freight and passengers throughout the country. A small part of the network is privately run by private railways. Rail and road compete to transport freight; a main objective of Italian government policy is to reverse the multi-decade trend in which rail loses modal share to road.

The rail sector has been and remains a big drain on the public purse. In 1996, fares covered only a quarter of total operating cost in Italy, as compared to over three-quarters in the United Kingdom and about half in Germany and France. The difference was paid by the general budget. Government transfers are L 15 950 billion annually (1999, down from L 16 650 billion in 1998), or about 1% of GDP, making them the highest rail subsidy per capita in Europe (OECD, 1999, p. 85). Despite these transfers, there has been under-investment in infrastructure.

The government of Italy has begun to address reform in the rail sector, and has advanced more quickly than most European countries. The main objectives relate to improving the rail sector's efficiency, reducing the public contribution to the sector, promoting a shift from road to rail, and devolving competence over local rail transport to the regions. The government reduced legal barriers to entry into the rail transport markets by *inter alia* introducing third party access in Art. 131 of Law 388/2000, and earlier for international groups and single undertakings providing combined international freight transport. A ministerial Decree of 23 May 2000 granted to Trenitalia (ex-FS) a license for transport services thus, *de facto*, liberalising the market for all types of operators since the license automatically eliminates FS's previous concession. A network code for non-discriminatory allocation of capacity and a price cap with quality of service have made possible the entry of six new licensees. By the end of 2003, competitive bidding for franchises to operate local rail transport will have been introduced.

The government is also taking steps to improve FS's efficiency. It is tightening FS's budget, significantly reducing public transfers to FS, and allowing it greater pricing freedom. Senior managers' pay is now performance-related. In 1999, accounting separation was established between four newly-created divisions (passenger, freight, regional transport and rolling stock). In June 2000, FS split into two companies, infrastructure and transport services (*Trenitalia*), within a single holding company.

These are significant and positive steps. Their implementation should not be delayed. Further steps in the same direction should be taken. First, further reduce barriers to entry into the rail and multi-modal transport markets. These include moving the regulatory powers now held by FS to the ministry or regulator, creating secondary markets for key inputs, and ensuring access to freight terminals and other infrastructure. Second, ensure that the franchises for local passenger transport enable competition *in* the markets where it is feasible, and that further efficiency incentives based on comparisons among these franchisees are provided. Third, the relevant ministries should collect and analyse appropriate data for making policy and regulatory decisions. Fourth, in light of the continued predominance of FS, regulatory and structural actions must be taken to induce it to be more efficient to better meet the government's policy goals. One such action is more extensive use of competitive tendering for services such as maintenance and construction, and for meeting public service obligations, defining these in terms of the final transport service provided rather than in terms of the technology used to provide them. However, a sustained improvement requires further changes in the governance and regulation of FS. In particular, the

government should at least partially privatisation of FS in order to bring private sector disciplines to its management. And the government should establish a regulatory body, perhaps in the form of an independent Transport Authority. This regulator would regulate *inter alia* the rail sector as regards infrastructure access, apply arms' length economic regulation to FS and other rail companies, and provide information to the regions to facilitate economic regulation of the operators of local passenger services. Further review and evaluation of the reforms should be planned so that best practice can be identified and applied more widely.

3.2. Policy objectives

The main objectives of recent rail regulation in Italy are:

- Economic and financial recovery of FS SpA and the other franchisees;
- Reduction of public contributions to the rail sector;
- Improvement of efficiency and quality of rail service;
- Rebalancing between road and rail transport modes;
- Devolution to the Regions and local authorities of competence over local transport, including rail.

Market liberalisation is the tool to be used to achieve these objectives.

3.3. Description of the rail sector

The sector consists of two main parts, infrastructure and transport services. Transport services can be further divided into passenger and freight, where passenger can be divided between local and long-distance. In all European countries, the great majority of rail infrastructure is owned by a single entity. There are significant economies of density, *e.g.*, expanding from single to double track roughly quadruples capacity with a less than doubling of cost. A large fraction of total cost of infrastructure is sunk, that is, irrecoverable in other uses. By contrast, rail and multi-modal transport services are potentially competitive.

In Italy, as elsewhere, much freight can be transported by rail, road, water, pipelines or a combination of modes. However, rail has some market power in the transport of bulk commodities where its price advantage outweighs reliability and speed in buyers' choice among modes. Rail has been losing share, down to 9.5% of freight tonne-kilometres in 1997. Road had 85.2%. In the European Union, the share of rail in the total freight market has fallen from 32.7% in 1970 to 14.5% in 1997 (EC website). Total rail freight in 1998 in Italy was 24 700 million tonne-kilometres, down 2% from 1997 (ECMT). Governments want to reverse this trend to relieve road congestion and reduce the environmental costs of transport. Multi-modal transport, where both road and rail are used, is one way to reverse this trend, and indeed now multi-modal and container transport accounts for 40% of the traffic, though only 20% of the revenues, of FS's freight transport. For local transport of passengers, rail competes with and complements busses, trams, and private cars, and for long distance transport of passengers could, between some city pairs, compete with air. Since both freight and passengers may switch between modes or combinations of modes, an integrated transport policy is indicated.

Italy is moving towards the introduction of competition in rail transport. Two types of competition are envisaged: Competition for franchises to provide local passenger transport and “in the market” competition for freight transport. The unevenness of network use, where one-fifth of the network absorbs 80% of the traffic (OECD 1999, p. 82) means that some services now provided by FS on low-usage parts of the network are not commercially viable, thus will not attract entry and therefore competition. It should be noted, also, that the entry of a joint venture partner of the incumbent does not increase the level of competition in a market since the partners can be expected to have a common, rather than independently competitive, commercial strategy.

3.4. Regulation and regulatory institutions

FS is both regulated by and, through the exercise of ownership rights, governed by the State. FS is also subject to European Union rules. FS has been a joint-stock company since 1992. The Treasury owns 100% of the shares, but the ownership rights are exercised jointly by the Ministries of Treasury and Transport which appoint the Chairman and the Board of Directors. The relationship between State and FS are also regulated by a *Contratto di Programma* (master plan) and a public service contract. The master plan provides investment guidelines, and the public services contract defines the unprofitable services FS will perform and the criteria for its compensation. (These contracts are described in more detail below.) Finally, the CIPE (Interministerial Committee for Economic Planning) and the Ministry of Transport regulate prices of freight and long distance passenger services, and charges for access to the tracks. The CIPE sets the basic guidelines and the Ministry implements the regulation. The complexity and evolution of the relationship can be deduced from the descriptions of recent regulations in the table below.

The sector is also subject to the competition law enforced by the *Autorità Garante della concorrenza e del mercato* (AGCM). Article 8(2) of law 287/90, the competition law, states that the antitrust provisions, “do not apply to undertakings which, by law, are entrusted with the operation of services of general economic interest or operate on the market in a monopoly situation, only in so far as this is indispensable to perform the specific tasks assigned to them.” This non-application has been interpreted narrowly, and indeed FS has been investigated four times and once received a warning. In these cases, FS had tried to extend its dominant position into adjacent but competitive markets (*e.g.*, combined container transport), or had discriminated in favour of companies that it controlled. Moreover, the Competition Authority has used its advocacy powers to recommend: operational separation between transport services and infrastructure management; access rights to railway infrastructure; allocation of railway infrastructure capacity and of safety certificate by a body independent from commercial interests; and the elimination of the concession system for local services.

Table 14. Recent regulations related to the control and governance of FS

Decree of the Prime Minister (DPCM Jan. 30 th , 1997 – “ <i>Direttiva Prodi</i> ”): “Linee guida per il risanamento di FS”	This directive provided for: the elaboration and approval of a business plan, including an investment plan; the disinvestment from non-strategic activities; the reduction of production costs and labour costs; and the revision of the passenger tariff regime by the application of a price cap model.
Decree of the Prime Minister (DPCM Dec. 30 th , 1998 –: “ <i>Schema di riferimento per la carta della mobilità</i> ”	A former regulation (DPCM Jan. 27 th , 1994) provided guidelines for the measurement system of the quality of public services. This directive indicated the quality factors to be considered for each transport mode. It also provided for the adoption of a “ <i>Carta dei Servizi</i> ” for each company operating within the industry and for an yearly evaluation of the gap between planned quality and expected quality, and between planned quality and achieved quality.
Decree of the Prime Minister (DPCM March 18 th , 1999 - <i>Direttiva D’Alema</i>): “Risanamento di FS”	This directive provided for: the elaboration and approval of a business plan for the years 1999-2003, including an investment plan; the complete accounting separation between the Infrastructure Management and Transport services; the re-organisation of FS into Divisions (by May 31 st , 1999); the legal separation between the Infrastructure Manager and Transport Manager, by January 1 st , 2000; the creation, by December 31 st , 2003, of a transparent tendering system for local and regional railways transport; the elaboration of the Safety Plan; the reduction of production costs and operating costs (also including the holding company); modal rebalancing; the control over service quality, also by a particular statement to be added to the business plan; the disinvestment of non-core business assets and activities; the revision of the tariff regime; and the adoption of an annual audit of the business plan achievements.
Decree No. 422/1997, modified by Decree No. 400/99	The Decree provides for the devolution to the Regions and local authorities of the competence over local transport. The new regulatory framework provides for a separation between public and administrative functions (including financing support) and the production of services, on the local level. The adopted system builds up a progressive liberalisation of the markets that will lead – by 2003 – to the assignment of local transport services concessions by means of public tendering.
<i>Delibera CIPE</i> 173/99 “Tariffe ferroviarie per la media e lunga percorrenza”	The act regulates the tariff regimes. Price-caps are linked to the achievement of quality objectives.
<i>Delibera CIPE</i> 180/99 “Tariffe di pedaggio per l’infrastruttura ferroviaria”	The act regulates the access price regime to rail terminals and to the use of the tracks.
<i>Decreto Legge</i> (a form of Delegated Legislation) No. 70/2000	This allows the Minister of Transport to grant railways licenses beyond the limitations of the former Decree 146/99 (see below). In other words, it eliminates the monopoly of FS on all railway transport services and allows entry of firms complying with the national requirements for service production (DPR No. 146/99). The Decree will have to be converted into law by the Italian Parliament.
DPR 277 July 8 th , 1998	Adopts European Directive 91/440, which granted access rights to international multi-modal operators and transit rights for international groupings of railway undertakings. It also required accounting separation between infrastructure and operations.
DPR 146 Mar 3 rd , 1999	Adopts Directives 95/18 and 95/19, related to the licensing of railways undertakings, to the allocation of infrastructure capacity and to the levying of charges for the use of the infrastructure.

Access to rail infrastructure in Italy is priced at short run average variable costs (operating costs), including congestion costs. (CIPE *Delibera* 180/1999, adopted by Ministerial Decree 43/2000) Hence highly congested tracks are priced higher at peak times than in off peak times. Train paths going through congested areas (“*nodi*”) such as Rome, Milan, Naples, Bologna, etc. at peak times are priced higher than paths in rural areas at peak or off peak times. Published tariffs vary with train speed and weight as they influence congestion and maintenance costs respectively. This complies with the relevant EU Directive, which is not very constraining as regards infrastructure charges. Other European countries price their infrastructure at or above marginal cost, with wide variations between countries in the level and structure of price. In Italy, as in other European countries, the difference between the resulting revenues and total cost is absorbed by the State. Leaving aside below market return on investment, this subsidy amounts to L 3 000 billion annually, of which half is maintenance.

Table 15. Summary of track access charging structure in EU member states

Country	Fixed charge Euro/route km /year	Fixed charge as % of total charge	Euro / 1 000 gross tonne km	Variable charges: Euro/ train km	Other charges	Cost coverage	Comments
Austria	-	1997: 27% 1998: 8%				Operation and maintenance cost plus 40% of investment costs, intended to reach 100% eventually	
Belgium	-	0%	-	depends on: - traffic volume; - time of day; - track characteristics; - train weight; - priority.		May be close to marginal cost	
Denmark: -Kastrup- Padborg	400/line km	Not known	-	2.7	Capacity charge Kobenhavn – Fredericia (200km) for variation in average speed from 100 kph	20-25%	
-Other	200/line km	Not known	-	0.4	-	-	
Finland: -Freight	-	0%	1.7	-	Euro 0.13/ net tonne	75% of marginal cost	Marginal cost includes accidents and emissions but reduced because HGVs/buses fail to cover their marginal social cost
-Passenger	-	0%	1.5	-	-	78% of marginal cost	

Country	Fixed charge Euro/route km /year	Fixed charge as % of total charge	Euro / 1 000 gross km	Variable charges: Euro/ train km	Other charges	Cost coverage	Comments
France: -Suburban -High speed lines -Major interurban -Other lines	1 700 10 000 40-10 000 -	About 5%		3 – 15 2.5 – 8 0.3 – 6 -	0.25/ train km (reservation charge)		Charge/train km reflects congestion costs and varies by time of day
Germany	Varies with length and quality of line, kind of traffic and duration of contract	Not known	-	0.5 – 2.0 (depends on capacity utilisation)	Additional fee for sidings, marshalling and shunting yards	100% of overall cost (less allowances by state, especially for investments)	Low frequency users may pay alternative one tier tariff (VarioPreis)
Greece	-	-	-	-	-	-	No charges
Ireland	-	-	-	-	-	-	No charges
Italy	-	-	-	Average: 2.27 Depends on: - time of day; - track characteristics; train characteristics.	-	Direct costs (about 35% of overall costs)	Caution money for reservation up to 50% of charge
Luxembourg	-	-	-	-	-	-	No charges
Netherlands: - Freight	-	0%	-	2000: 0.05 rising to 2007: 0.93	-	Marginal cost only (Euro 0.93/ thousand train km) covered for freight in 2007, for passengers in 2005.	All figures according to 1999 plans. Lower charges for freight are based on ability to pay given relative competitive position with regard to other modes.
- Passenger	-	0%	-	2000: 0.14 rising to 2005: 0.93	Charge per station stop: Euro 1.5		
Portugal	-	-	-	-	-	-	Charges to be introduced from 2000
Spain	-	-	-	-	-	-	No charges

Country	Fixed charge Euro/route km /year	Fixed charge as % of total charge	Euro / 1 000 gross km	Variable charges: Euro/ train km	Other charges	Cost coverage	Comments
Sweden	-	0%	0.31 (freight) 0.45 (passenger)	0.10		Maintenance cost only (100% in 1998)	
United Kingdom: ² - freight and non franchised passenger operations - franchised passenger operations	Figure not known but large Figure not known but large	85%	Not known -	Not known Ranges from Euro - 0.1 to Euro 6.0 per vehicle km, depends on type of rolling stock and length of train	Not known	100% of costs plus profit margin (about 15%).	Variable charges depend on use of the network and performance

Source: ECMT 2000 based on An Examination of Rail Infrastructure Charges, Report for European Commission, NERA, 1998, supplemented by updated data obtained from infrastructure managers and Italian Ministry of Transport and Navigation.

2. Refers to Britain only. Northern Ireland Railways not privatised.

Maximum freight prices are regulated by the Ministry of Transport. FS is allowed to, and in practice does, negotiate prices below the maximum.

Prices for long-distance passenger transport are regulated by price caps. Until November 1999, FS had a very simple and demand-insensitive pricing system. Revenues covered only 35% of operating costs, *i.e.*, excluding return on investments. The fare between any origin and destination at any time depended on the distance, with the amount per kilometre declining with distance. There was also a distance-determined supplement for a fast train. Since November 1999 fares for long distance passenger (*media e lunga percorrenza*) services are under price-cap regulation (*Delibera CIPE 173/99*). FS can vary the price for each origin-destination pair, time, quality and speed, so long as the basket of prices remains below the price cap. Real prices are allowed to increase – the average price was allowed to rise 4.7% when the system was put into place – because increases in rail fares have long lagged behind inflation. The cap is also subject to annual revision linked to the achievement of predetermined quality standards and prices were allowed to rise by 5.2% in 2000. When the new price system was put into place, FS increased prices on services with inelastic demand, as would be expected of a profit-maximising firm.

The prices of local passenger services are defined in the regional franchising contracts. Hence prices may vary across regions, depending on the amount of subsidies each region is willing to pay, FS's costs, and demand.

FS is not subject to legal restrictions on the scope of its activities. The imminent separation into separate infrastructure and transport companies exceeds the EU Directive requirement that these activities be accounting separated. The "rail package" of new Directives approved in principle by the EU Council in December 1999 requires the allocation of train paths and infrastructure capacity to be the legal responsibility of an entity that has no train operation activities.

3.5. *The promotion of competition*

There are two types of markets in which competition could be increased or introduced, those for rail transport and those for multi-modal freight transport, for which rail transport is an input. In both types of markets, there are two types of impediments to the development of competition, the absence of non-discriminatory and efficient access to essential inputs such as infrastructure or rail transport services, and other barriers to entry. This section discusses these impediments and possible strategies for overcoming them. It should be noted that some markets now supplied by FS have insufficient demand for competition to develop.

Entry into multi-modal transport can be the first step to entry into rail transport. An analogy might be made with the telecoms markets, where entrants initially offered services, generally value-added services, using the facilities of the incumbent. Over time, entrants built their own facilities. In rail, the analogy would be for entrants in, *e.g.*, multi-modal transport, to have access to FS's trains, with their associated locomotives, train paths, and so on. This allows entrants to learn and build their reputation with buyers, while incurring lower sunk costs. The key feature of telecommunications, which unfortunately does not seem to apply for rail infrastructure, is that technological change eliminated the natural monopolies.

One of the main policy objectives is to induce more freight to be switched to rail from road. Freight customers choose the transport mode on the basis of price, reliability, and speed. The prices upon which customers base their choices among modes are net of subsidies and taxes. Hence, to achieve the stated goal of increasing the use of rail, the subsidy and tax regimes for all the competing modes – rail, truck, water – should result in relative prices that are compatible with the objective. In particular, subsidies

to trucking where it competes with, rather than complements, rail increase the amount of subsidy needed to induce a given share of rail in the transport mix. Regarding reliability and speed, the second and third dimensions influencing consumers' choice, these are influenced by the relatively low priority given freight service in the use of the tracks. Decreasing slightly the priority of passenger service would boost reliability, and perhaps speed in some circumstances.

A separate problem for the development of competition is the reduced incentives other European rail companies have to enter markets traditionally served by another company. So long as companies have no or diminished profit incentives, on the one hand, and cannot be driven into exit or bankruptcy by a superior competitor, on the other hand, the persistence of the *status quo* can be expected.

3.5.1. Access to infrastructure

As in other sectors, non-discriminatory, efficient access to infrastructure is required for development of competition. Various types of infrastructure are important for freight transport. These include the tracks and signalling, the freight terminals where freight is transferred between truck and rail, and the locomotives and rolling stock themselves. The corresponding infrastructure is important for passenger transport. Both require access to locomotives and rolling stock (for which the secondary market is undeveloped in the EU) and depots for maintenance. In addition, both require access to qualified drivers. Despite the limited open access right to infrastructure set out in European Directive 91/440, there has not yet been entry by competitive companies in Italy. This might improve with the Network Code recently (October 2000) proposed by FS-Infrastructure and approved by the Ministry of Transport, which sets general conditions for access to the infrastructure and non-discriminatory criteria for the allocation of infrastructure capacity.

An essential difficulty for the development of competition in the rail sector is the continued vertical integration between monopolistic and potentially competitive activities. This vertical integration allows and provides incentives to discriminate against companies that are not vertically integrated. Having separate companies under common ownership is not sufficient to prevent this discrimination. This is illustrated by three antitrust cases in which FS was found to be discriminating in favour of its multi-modal subsidiary, and against that of other multi-modal shippers who needed access to FS's rail transport services. (FS/Fremura 1993, FS/Fremura 2000, Italcontainer/TCF 1995).

Vertical separation is an efficient solution when competition can flourish in one of the separated activities. The structural remedy is to restrict those businesses that the owner of the monopoly parts can engage in so that they do not include markets where the control over monopolies can impede the development of competition.

In the rail sector, this is particularly important throughout the chain of complementary services: infrastructure services, rail transport services, and multi-modal transport services. The monopoly on supplying infrastructure services allows FS privileged access to this input for rail transport services, which in turn allows it privileged access to this input for multi-modal transport services. The decision to separate infrastructure and transport services should be taken only if sufficient competition can be developed in transport services, a development that is open to question especially for many passengers services. A possible separation should then involve transport services and, if transport were not to become competitive, then this would mean complete ownership separation of the multi-modal businesses from the purely-rail businesses.

A train-operating entrant would also need locomotives and rolling stock. Most locomotives from other European countries cannot operate on Italian infrastructure, and vice versa, because European countries have incompatible standards for power, signalling and gauge of the tracks themselves. (A few locomotives, those built and used for international services, can operate on multiple standards.) Most rolling stock is incompatible with Italian infrastructure. The result is that even other European rail companies, who would, in the face of it, seem to be the most likely entrants into the Italian rail sector, would face large barriers to entry. Harmonisation of standards in the course of renewal of infrastructure would, in the long term, reduce these barriers and promote competition across the whole of Europe.

An indication of the incompatibility of standards is provided in the following table. Note that this table only addresses two aspects, gauge and electric current used. Other attributes of the infrastructure also must be compatible with the locomotive and rolling stock for safe operation.

Table 16. Main railway gauge and electric current used in EU countries

Power supply	Gauge			
	1435 mm	1524 mm	1600 mm	1668 mm
DC, 3 Kv	Belgium, Denmark, Italy			Spain
DC, 1.5 Kv	France, Netherlands		Ireland	
DC, Contact rail	United Kingdom			
AC, 25 kV, 50 Hz	Denmark, France, Luxembourg, United Kingdom	Finland		Portugal
AC, 15 kV, 16.7 Hz	Germany, Austria, Sweden			

Source: European Commission, http://europa.eu.int/en/comm/dg07/tif/2_infrastructure/ch2_length_rail_lines_ms.htm.

To promote entry by competitors, and in light of incompatible European standards, a secondary market in locomotives and rolling stock compatible with Italian infrastructure would be needed. A secondary market reduces the amount of cost that are sunk (*i.e.*, irrecoverable) because it provides a means for an exiting company to recover some of its equipment cost by selling it to someone else. The spread between purchase price and selling price of equipment is the sunk cost of that investment. For a market to significantly reduce the amount of initial costs that is sunk, the market needs a significant number of buyers and sellers. Where there are few buyers, the selling price can be expected to be low relative to the purchase price. As the number of buyers and sellers increases, the buy-sell spread shrinks, the sunk cost shrinks, entry is made easier, so competition in rail transport can be greater. Initially, however, only FS and a few potential entrants would be interested in buying this equipment; such a market would develop over the medium- to long-term as other rail transport providers develop.

Competitors in the multi-modal freight business need access to terminals where freight is transferred between rail and road or rail and water. The value of a terminal largely depends on its location. Some new terminals are being built, but the most convenient locations are already occupied. Many terminals cannot be feasibly shared; due to congestion and the need to co-ordinate the use of the terminal with the trains, the allocation of the terminal's capacities among multiple users can be too difficult. On the other hand, entrants need access to a network of terminals in order to be able to offer customers a service that can induce their switching from FS. If entrants cannot share terminals outside main cities for at least some time after initial entry, then the cost of entry is high. Under the present plan for splitting assets between the two FS companies, some terminals have gone into FS Cargo. The Ministry should review whether the assignment of terminals between FS Cargo and FS Infrastructure is appropriate if new entrants into multi-modal transport are to be encouraged.

3.5.2. Increasing capacity of infrastructure

The capacity of the infrastructure could be increased at relatively low cost. In Italy, the average usable load of a train is 330 tonnes, as compared to the usable load in the United Kingdom of 2 300 tonnes. In order to increase this capacity, sidings would need to be lengthened, electric power supply reinforced, and some other relatively small investments would be needed. In addition, capacity on the secondary lines could be used more heavily by freight trains, provided train paths to ensure reliable delivery could be designed.

By not making these investments in infrastructure, the quantity of rail transport services that FS can sell is more limited and “room” for new entrants is reduced. But investment decisions are made in the context of the contracts with the state that control investment and the services that must be provided, as well as the allowed pricing for the use of infrastructure. If FS were provided with greater profit incentives and greater freedom to choose how to provide specified services, then it should have greater incentives to discover and make profitable investments. Under the new *Contratto di programma* (Business Plan), an ‘inefficient’ (inability to complete investment projects within the *ex ante* fixed budget) use of resources by FS is punished with fines on the management. While under-investment to exclude rivals or to enjoy higher prices from the scarcity value of the capacity is possible, access regulation limits the ability to exclude rivals and competition from other transport modes limits feasible prices.

3.5.3. Reducing barriers to entry

Italy has reduced the legal barriers to entry. According to Decree 70/2000, F.S. is no longer the only company entitled to run its trains on the national rail network. Other companies may have a licence either for freight or long distance passenger services, provided they get a safety certificate and are allocated some slots (train paths) on the network. Access pricing has been clarified. Slots pricing (access charges) and allocation criteria were defined by a government act in November 1999 (*Delibera CIPE*, 180/99). Further, it is proposed to change the definition of the parties that can legally seek access to railway infrastructure capacity.

The above-mentioned actions to make access to infrastructure easier would reduce economic barriers to entry. One way in which economic barriers to entry can be raised is to increase the cost of inputs, especially those paid by rivals. The extension of the company labour contract, between FS and the rail unions, to a sector labour contract would have this effect. The table below shows that the state railways pay relatively high wages.

Table 17. Contractual wages and salaries per employee

April 1996, industry=100

	Blue-collar employee	White-collar employee
Services	99	103
Transport	118	125
State railways	134	136
Private railways	111	108
Private bus	115	108
Aziende speciali	119	105
Air transport	136	164
Maritime transport	88	147

Source: CER (1997), Rapporto No. 2, p. 84, cited in OECD (1999).

Reducing barriers to entry are good short term goals. The question arises: What should be done if competition in rail freight services nevertheless does not develop? Two possible answers are (1) that intra-modal competition is infeasible, that trucks are the better transport technology for most freight, and (2) that competition within the rail market can be created by splitting FS Cargo. Until better data about the minimum efficient scale for a freight transport company is available, a definitive answer cannot be given. If the minimum efficient scale is large relative to the Italian freight market, then effective competition is very unlikely, even if an oligopoly across all parts of a European market might someday develop. Hence, it is important to get the data to make an informed decision about the likely minimum efficient scale for a rail transport company.

3.5.4. Local passenger transport services

Responsibility for local passenger transport services will, under the broad programme of regionalisation, be transferred to regional governments. They will receive funds from the central government, and then be free to arrange for and subsidise local services including transport. According to a draft law, by the end of 2003 the operation of transport services will be decided by competitive tenders held by the regions.

Most regions are expected to tender a single contract for rail transport, or even for buses and rail together. A reason given for this is to facilitate schedule and route co-ordination, since many passengers use a combination of routes and transport modes. However, other countries, notably the United Kingdom, have found that competition between bus companies results in lower prices and increased quality of service, such as through the reorientation of route networks, although it also gives rise to a number of competition problems. Competition in buses, like competition from private cars, constrains price and quality of service in rail. Regions should be encouraged to investigate whether it is technically feasible to introduce competition on the same bus and train routes, especially heavily used routes. And they should be encouraged to investigate whether minimum efficient scale for the operation of local rail and bus transport is sufficiently small to allow for more than one competitive tender for the same city. Finally, guidelines on the length of the franchise period should ensure that they are not overly long, but do indeed promote the widest possible participation in the tenders and adequate incentives for investment especially near the end of the franchise periods.

One reason regions might tend to use tenders that have a large scope is that they intend for profitable services to cross-subsidise unprofitable services. By tying profitable and unprofitable services together, however, the least-cost supplier may not win the tender. For example, a taxi or a minibus or a bus may be able to provide transport services that is higher quality and lower-cost than that provided by the rail operator, but if those services are tied to the operation of the main rail lines of a city, this solution may well not be chosen. Where tenders for unprofitable routes are auctioned separately, bids would be for minimum subsidy. In principle, the winning subsidy is lower than the implicit subsidy when many services are auctioned together in one contract. Administrative costs limit the size of the smallest feasible tender, of course.

Competitive tendering, provided there is indeed sufficient competition for the contracts and that subsequent re-negotiation is limited, is a major step toward more efficient provision of these services. The lowest cost supplier should, in principle, win the competition, have incentives to increase its efficiency, and will pass some of these savings onto consumers. However, the change in structure of the sector can be used to promote yet more efficiency gains. Information on the performance of the regional rail operators should be used in a form of yardstick competition, where more efficient operators are rewarded. Defining appropriate benchmarks will require some innovative work. This would also provide information to regions to help improve the design of their tenders and regulatory framework.

3.6. Increasing efficiency in FS

A number of potentially conflicting objectives coincide in the governance, ownership, and regulation of FS. As owner and provider of funds to FS, the government wishes for FS to become more economically efficient. But as government, with broader policy objectives, it has assigned to FS a variety of non-commercial tasks (*i.e.*, public service obligations), has used it as a tool to achieve macroeconomic objectives, notably to reduce inflation and has used, or allowed FS to be used, for employment objectives. As sole owner and regulator, government has tremendous power to specify how FS operates. But in a potentially competitive environment, opaque regulatory relationships – especially the identity of owner and regulator – can discourage entry and investment in the sector by others.

By many measures, FS is inefficient although steps to improve have already been taken. *E.g.*, the number of staff has fallen substantially, but one analyst says it should fall further to 85 000. Managers' terms are three years, and their pay is partly performance-related. Internal restructuring – the imminent creation of two companies – infrastructure and transport – and, within the latter, of four divisions corresponding to four different customer groups can increase management control. The transformation of FS into a public enterprise (*ente pubblico economico*) in 1985 and into a stock company in 1992 were intended to strengthen its independence and to give it more responsibility over its economic performance. Efforts to harden FS's budget are being made.

Table 18. Selected indicators of railway efficiency

	1990	1996	(last)
Fares as a percentage of costs			
Italy (FS)	18.0	25.3	
United Kingdom (BR)	67.6	77.3*	
Germany (DBAG)	40.5**	53.0	
Spain (RENFE)	34.9	41.1	
France (SNCF)	48.8	48.7	
Operating costs per unit of traffic (per V-km and T-km, L at purchasing power parity)			
Italy (FS)	294.7	272.0	
United Kingdom (BR)	204.1	206.2*	
Germany (DBAG)	187.0**	191.6	
Spain (RENFE)	160.9	191.8	
France (SNCF)	133.9	192.0	
Labour costs per unit of traffic (per V-km and T-km, L at purchasing power parity)			
Italy (FS)	153.0	153.0	
United Kingdom (BR)	110.0	130.0*	
Germany (DBAG)	116.0**	111.0	
Spain (RENFE)	86.0	87.0	
France (SNCF)	77.0	100.0	
Labour costs per employee (millions of lira purchasing power parity)			
Italy (FS)	49.5	87.4	
United Kingdom (BR)	39.9	53.7*	
Germany (DBAG)	39.0**	55.0	
Spain (RENFE)	45.3	59.4	
France (SNCF)	43.5	61.0	

* 1995 data.

** 1990 data includes the East German railway, which at the time was a separate entity.

Source: FS, Direzione Strategica, Analisi di benchmarking sulle principali ferrovie europee, various issues, quoted in OECD 1999.

Table 19. **Employment in main railways in selected EU countries**

(staff in thousands)

Year	Italy	Germany		France	Spain	United Kingdom
		West	East			
1970	197.6	392.7	252.6	303.0	85.1	274.3
1980	220.7	329.0	237.9	254.4	71.5	241.9
1990	200.4	236.0	246.3	202.1	49.7	135.3
1995	129.8	294.9		181.1	39.0	90.2
1997	121.8	233.5		175.0	36.4	
1998	111.3	209.6		175.0	35.0	

Source: European Commission, http://europa.eu.int/en/comm/dg07/tif/1_general_data/ch1_employment_railways.htm.

To further increase FS's efficiency, however, the sources of its inefficiency should be identified and addressed. One fundamental source is its governance-regulatory structure, under which FS faces a soft budget constraint and does not have the power to make independent management decisions. FS's independence and responsibility are limited in a number of ways:

- Prices are regulated under price cap rules.
- The Budget Law, drafted by the Treasury, determines the amount that will be spent in various ways, including investment in infrastructure and rolling stock .
- The business plan, complying with the budget law, must be approved by the Ministers of Treasury and Transport (OECD, 1999, pp. 82-3).
- Regions have the right to veto closure of low-traffic rail lines in their territory (OECD, 1999, pp. 82-3).
- Decisions about the scope of FS's non-strategic activities are approved by the Minister.

In addition, employment restrictions imposed by organised labour whose role in FS has been likened to a hidden shareholder (OECD 1999, p. 83) limit FS's independence.

A recent OECD roundtable concluded that a soft budget constraint in railways represents the major obstacle in many countries preventing improved railway performance. In Italy, the State Budget Act establishes the amount that is available for investments to modernise and upgrade the rail infrastructure and for covering costs of services that are not covered by revenues. Two agreements between the State and FS, a *Contratto di Programma* (master plan) and a public service contract, then regulate their relationship. The *Contratto di Programma* allocates the funds among the railway investments approved by the shareholders and the renewal and maintenance of lines. The public service contract establishes the quantity of non-commercial services paid for by the State and the criteria for their compensation. The general budget transfer to FS also covers, for example, the difference between the prices of combined and traditional transport, which operates in competitive markets. The budget constraint is said to be hardening. On the other hand, *ad hoc* legislation (*i.e.* laws in favour of certain underdeveloped districts, interventions for Jubilee 2000) can be issued specifying the amount and the purpose of additional resources to be invested. Hence, the hardness of the budget is limited by the political cost of passing *ad hoc* budget-increasing legislation.

FS's total costs are being constrained by the price caps and by the hardening or tightening definition of transfers from the State budget to FS. For economic efficiency, however, more is required: Both the cost of supplying each service needs to be minimised, and the portfolio of services provided needs to include only those for which the additional revenues exceed the additional costs. Where particular services are desirable for wider policy objectives, but would not collect enough revenues to cover their costs, then general public funds can provide those additional revenues.

Entry into potentially competitive markets now supplied monopolistically by FS would not necessarily induce FS to become more efficient. FS may simply lower its prices and cross-subsidise from other markets, or subsidise from the State transfers. Long term pricing below a company's marginal cost is economically inefficient and doing so, or credibly committing to do so, discourages entry by more efficient competitors.

The fundamental issue is the commitment by the Italian State to FS, that FS can never go bankrupt. This guarantee means that FS has weak incentives to negotiate toughly with input providers, or to seek less costly ways of using resources. It also can price below marginal cost without the financial consequences that would be borne by private companies. By circumscribing and, by degrees, further constricting the scope of this guarantee, more of the rail sector can be made subject to efficiency inducing pressures.¹

There is evidence that transferring ownership of the railways to the private sector can have a considerable impact on the efficiency and competitiveness of rail services, especially when private ownership is combined with deregulation. However, where there is private ownership of infrastructure that is owned separately from operations, it is essential to provide adequate contractual and regulatory incentives to ensure that investment is at an optimum level. This has already proved to be a difficult regulatory issue in Britain following restructuring and privatisation of the railways and may prove to be the toughest to resolve (ECMT, 2000).

In the absence of structural change, much can nevertheless be done to increase the efficiency within the rail sector. The greater use of competitive tendering – like that which will be used for local transport services – would have a large effect, both because much of the activities can be made subject to tender and because the expected cost savings are large. For example, a large part of the infrastructure cost is maintenance. Much of maintenance can be made subject to tender. Provided the tendering is competitive, the winning bid should approach the minimum cost to perform the maintenance. So long as the infrastructure company can review that the maintenance was in fact performed correctly, it can be put out for tender. The tendering of some of the work for some of the high-speed lines is expected to result in substantially reduced costs, compared with the procurement procedure used formerly. Indeed, tendering was requested by the Antitrust Authority in some of its earliest decisions (Consorzio Capri 1993; Consorzio Trevi 1994, FS/Fercomit 1996). After these decisions, FS partially changed its policy, which resulted in important cost savings for customers and taxpayers (General fact-finding investigation on High-Speed Trains, 1996, item 16).

Privatisation could also provide FS with more incentives to upgrade the infrastructure, especially in ways that increase capacity. One analyst points out that only a limited investment would be needed to increase infrastructure capacity. So long as FS is vertically integrated, it has little interest in creating capacity that could be used by a rival rail transport company. And so long as FS is not rewarded for making economically valuable investments, expansion of capacity is unlikely even where profitable.

3.7. *Independent regulator*

To ensure non-discrimination, a regulator, independent of commercial interests in the sector, should be assigned all responsibilities for regulation in the rail sector. At present, the infrastructure operator, FS, enforces safety and technical standards, ensuring that entrants comply. (Safety standards are set by the Ministry of Transport.) It is important that safety standards be strongly enforced. But, where FS is also the competitor of these entrants, they may be concerned that these standards could be applied in discriminatory ways. The regulator should also be charged with the task of regulating access to infrastructure including allocating train paths² – like airport take-off and landing slots – and seeking to create new ones. (The moment-to-moment management of trains would probably need to remain in the infrastructure company.) Clearly, the regulator needs to have the technical, administrative, and information resources to perform these tasks.

The decision about where to locate the regulator depends on a number of factors. How important is stable regulation to the rail and, more broadly, transport sector? To what degree does government take into account the effect of regulatory decisions on the value of state companies? Are independent authorities more or less subject to capture? There are independent regulators in other sectors in Italy and in rail in a few other OECD countries, such as the United Kingdom and United States. Where regulators are independent, policy making remains with the government. An advantage of independent regulators is that they are able to apply regulation that does not respond to day-to-day political pressures. Instead, the regulator is subject to the disciplines of receiving a clear policy mandate from government, transparency (*e.g.*, publishing decisions) and accountability (*e.g.*, appealable decisions, public scrutiny of expenditures). Further, organisational autonomy means that independent expertise and sources of information can be developed. Independent regulation may encourage private investment in two ways, first by making regulation more predictable and second by diminishing the basis for concern that potential entrants may receive less consideration than the state-owned incumbent.

Thus, the concern about inflation of independent regulators in Italy is perhaps outweighed by the advantages, in this sector, of ensuring regulated non-discriminatory access to infrastructure. The Competition Authority has been vigilant in prosecuting discrimination by FS in access to rail transport services, but this is necessarily an after the fact, case by case corrective. In instances of discriminatory access, during the period until the decision is made and the remedy is implemented, the incumbent gains at the expense of the entrant. Further, repeated investigation and finding of similar anti-competitive behaviour is costly to the state as well both directly and in terms of foregone activities by the Competition Authority. Hence, the before-the-fact decisions of regulatory authorities can be more appropriate in these cases.

3.8. *Conclusions*

The government of Italy has substantially reformed the rail sector, surpassing most European countries. The main reform objectives relate to improving the rail sector's efficiency, reducing the public contribution to the sector, promoting a shift from road to rail, and devolving competence over local rail transport to the regions. Already, the internal company structure of FS is changing, the relationship between state transfers to FS and services provided by FS are becoming tighter, FS is gaining greater pricing freedom under a price cap. The rail sector is now open to new competitors, and indeed six licenses were issued by early 2001. There is also a network code for non-discriminatory allocation of capacity. By 2003, local passenger transport will be subject to competitive bidding for franchise contracts. The results have been a reduction in the over-manning of FS, and pricing that is more reflective of the value of the service to consumers.

However, by many measures FS remains inefficient compared with other European rail companies. State transfers remain high, although declining. In addition, return on investment for FS as for many railways is far below market rates. Further reforms are planned. Competition in some rail transport markets is feasible, and the government plans to take steps to reduce barriers to entry and already regulates access to infrastructure. However, for some rail transport only monopoly or supply as a subsidised public service are feasible. Competition, in whatever form, should not compromise safety.

The recommendations made here would address some of the fundamental sources of the inefficiencies of FS, its governance and regulation. These reforms are aimed at providing FS the incentives to bargain toughly, to make commercial decisions, and to make more efficient investments in infrastructure. They are also aimed at removing government control to one of arm's length. By freeing FS and putting it under greater commercial pressure, it will have incentives to increase its efficiency, which will in turn allow it to compete more effectively with road transport and reduce public contributions.

Market liberalisation is not, by itself, sufficient. Further reform is called for. Privatisation would add shareholders – who will press for profits that result *inter alia* from greater efficiency and greater success in competition with trucks – and the reporting disciplines of stock market listings. Independent regulation would allow consistent economic regulation, and allow for regulation of access to infrastructure and of train paths to be clearly independent of commercial interests. The former allows FS to make efficient investments, and the latter reassures potential entrants and thus promotes competition where it is feasible. The greater use of competitive tendering would both promote efficiency and provide a route for entry by new companies. Separate owners of infrastructure and rail transport services would eliminate the incentives of the company to discriminate in favour of its own company, thus making easier the task of the regulator. Separating ownership of multi-modal transport companies from the rail transport company would have a similar effect. But the value of such vertical separation must be balanced against the value of vertical integration, such as co-ordination and investments that depend on corresponding investments by the other part of FS, as well as, in the case of some rail services, the possibility that competition would not develop.

Finally, information is a key ingredient in effective policy decision-making and regulation. Regulatory Impact Analysis, defining the cost of public service obligations, monitoring relative costs to implement yardstick competition, assessing the scope of natural monopolies and measuring the minimum efficient scale of cargo services all require data that should be created within FS. Historically, the Ministry of Transport has not received this information. Cutting this information asymmetry should be a priority long-term goal, progress towards which should begin immediately. Changes in incentives likely must be applied to achieve a change in information gathering and disclosure behaviour. Investors and stock exchange disclosure rules have been successful elsewhere in instigating the greater disclosure of information, perhaps because the penalties for information non-disclosure are credible and high. Here, too, at least partial privatisation would have a long-term positive effect.

There is significant room for improvement in the Italian rail sector, as comparison with other railways indicates. Italy has made a good start, but substantially more reform is needed both in the short and long terms in order to meet the government's objectives of efficiency, reducing the public contributions, and shifting freight from road to rail.

3.9. Policy options

1. Reduce barriers to entry to promote competition.

To encourage competition in multi-modal transport, ensure access, at non-discriminatory and efficient conditions and prices, to the necessary infrastructure.

2. Encourage competition in the local passenger transport markets.

Take steps to ensure that where competition in a market for local passenger transport is feasible, this is not foreclosed by tendered contracts. Ensure that other conditions of the contract, such as duration and size, do not reduce the level of competition in the tenders.

3. Increase incentives for efficiency on FS.

Make better and greater use of competitive tendering for services, like maintenance and construction, that could be out-sourced as well as for public service obligations, where these are defined in terms of the final service provided rather than in terms of the technology used to provide them.

Commit to, and implement in the medium term, partial privatisation of FS transport in order to bring private sector disciplines to its management. Consider the complete privatisation of FS transport in the long term.

4. Improve the information available to regulators and policy-makers.

Establish a regulatory body, perhaps in the form of an independent Transport Authority, independent of commercial interests, to *inter alia* regulate the rail sector as regards access to infrastructure and the allocation of train paths, safety, apply arms' length economic regulation to FS and other rail companies, and to provide the information to the regions to facilitate economic regulation of the operators of local passenger services.

In the short term, define and collect the data required by the Ministry of Transport and the future regulator for *inter alia* Regulatory Impact Analysis, estimating the cost of individual public service obligations, and the scope of natural monopolies.

5. Review the sector with a view to continue reform.

By 2003, review the advantages and disadvantages of additional structural and regulatory changes. Particular issues to review include the development of competition in multi-modal and rail transport, possible barriers to entry, what steps – structural or regulatory – to take to address any shortcomings, the efficiency of Italian rail companies compared with other rail companies, and the effect of non-rail transport policies on the rail sector.

NOTES

1. Evidence from other sectors in other countries shows that it is not sufficient for the government to announce that it would allow a state-owned enterprise to go bankrupt. These companies are lent capital at a discount, indicating that lenders do not take the announcement at face value.
2. A train needs a path through space, analogous to aeroplanes needing take-off and landing slots at congested airports. The Italian rail network is congested; a train-operating entrant would need access to a portfolio of train paths. The congestion is partly due to the network being shared by passenger and freight trains; since the two types of train travel at different speeds, a train of one type reduces capacity available to trains of the other type. Rather than allocating capacity according to their economic value, capacity is allocated to applicants according to administrative rules fixed by EU directives 440/91, 18/95, 19/95 and D.P.R. 277/98 and 146/99. According to these rules, local passenger services have the highest priority, freight services second, and long distance high-speed passenger services third. When there is excess demand from trains with the same priority, capacity will be allocated to trains that maximise revenue for the rail track operator, *i.e.* the longest distance trains. At present there are neither grandfather rights nor preferential treatment for new entrants. One analyst says that a slight decrease in the priority given to local passenger services would greatly increase the quality of service for freight. While a competitive market for train paths would ensure that they were used for their most valuable uses, the starting point of a monopoly means that entry would be discouraged since the monopolist could charge high prices for train paths.

BIBLIOGRAPHY

- Autorità garante della concorrenza e del mercato (Competition Authority) (1996), IC7, provvedimento del 10 gennaio 1996 di chiusura dell'indagine conoscitiva sul settore dell'alta velocità, Bollettino n. 1-2/1996. (General fact-finding investigation on High-Speed Trains, 1996, item 16)".
- Autorità per l'energia elettrica e il gas (1999), Relazione annuale sullo stato dei servizi e sull'attività svolta, Annual Report, 3 June.
- Bernardini, Oliviero (2000), *Country Review: Italy*, presentation at 10th European Gas Summit, Rome, 4-5 April.
- ENEL, *Interim report for the half year to 30 June 1999*.
- ENI (1999), *Annual Report 1998* available at http://www.eni.it/english/notizie/rapporti/ar_98/ra_1998.pdf on 14 March 2000.
- ENI (1999), *Fact Book 1998*, available at http://www.eni.it/english/notizie/rapporti/fact_98/index.html on 14 March 2000.
- European Conference of Ministers of Transport (ECMT) (2000), *Trends in the Transport Sector, 1970-1998*, OECD, Paris.
- Financial Times (1998), 11 November.
- International Energy Agency (1999), *Energy Policies of IEA Countries: Italy 1999 Review*.
- OECD (2000a), *Promoting Competition in the Natural Gas Industry*, Paris.
- OECD (1999), *Economic Survey: Italy*, Paris.
- Office of Electricity Regulation (1998), Annual Report 1998, at <http://www.ofgem.gov.uk/elarch/index.htm> on 10 May 2000.
- Power in Europe (1999), "Over-priced and over-managed?", 22 November, p. 310/10.
- Power in Europe (1999), "Step change for Italy," 20 December, p. 315/3.