Current trends for Italian national and local power companies: prospects for Integrated Resource Planning?

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1. SYNOPSIS

This paper examines the prospects for Integrated Resource Planning policies at the national and local level in the context of the wider transformation of the Italian electric power sector.

2. ABSTRACT

The power industry is undergoing major changes world-wide. In Italy, reforms under way include changes in the form of utility ownership, creation of a regulatory body and definition of its tasks and powers, changes in criteria for setting rates, limited incentives for energy saving and renewables, and the possibility of coupling energy with other services such as water or waste management. The national power company, ENEL, one of the largest state companies and one which has dominated the Italian economic system for decades, is being privatised and vertical disvestiture is under debate. Several local energy companies have already or are in the process of changing their ownership structure.

The paper evaluates the prospects for adopting an Integrated Resource Planning approach in Italy - consistent with the strategy adopted by many other industrialised countries, notably the United States, and with the forthcoming European scheme for IRP (Colling 1994) - both at the national and local level.

Although the overall picture is still far from clear, our analysis suggests that the situation at the national level is different from the local one. One of the objectives of the privatisation of the national energy industry is the desire to increase the efficiency of the entire system by which energy is supplied and utilized. This could well accommodate more opportunities for introducing IRP. However, objectives other than efficiency (in particular, raising money to reduce the budget deficit) are also important and very high in the priorities of policy makers. These objectives seem to push toward different outcomes. For example, sale of monopoly franchise will raise more money than will sale of a number of smaller, more competitive firms. The final outcome will depend on the importance attached to each objective.

Although local utilities are affected by what happens to the national industry, their current organisation - one which often involves integrating several services - already appears to offer more opportunities for IRP.

3. INTRODUCTION AND SCOPE

In the United States, IRP arose from a breakdown in the traditional system of hands-off, rate regulation of privately owned utilities by professional staffed state regulatory utility commissions. The traditional system rewarded utilities for capital investment, which was consistent with the significant economies of scale that characterised much of the early history of the industry. The system worked with little regulatory oversight because it successfully aligned private utility financial interests (by increasing earnings through capital investment) with the goals of society (lowering the cost of electricity). The system began to break down in the late '70s when liquid fossil fuel costs rose dramatically and the historic trend of falling marginal costs was reversed. The system was stretched to the breaking point in the '80s when regulators denied utilities the ability to recover the costs of large nuclear power plants, whose final costs exceeded initial planning expectations by a factor of ten or more and whose output was no longer needed because demand had fallen off. Some utilities were bankrupted; many experienced severe financial stress. Utilities responded by refusing to build new plants and in doing so created opportunities for new entrants such as demand side

mangement (DSM) and independent power producers (IPPs). In their turn regulators responded by taking a more proactive stance toward utility resource planning, which became known first as least cost planning and now as integrated resource planning. By the end of the '80s, regulators began to recognize the inconsistencies between the rewards and incentives inherent in traditional rate regulation and goals of integrated resource planning. U.S. regulators are now rediscovering the need to modify their regulations to reconcile potential tensions between private utility financial interests and the social good.

While the experience with IRP is limited largely to the United States, we believe there are three features of IRP that are central to its success in any utility industry (Eto et al. 1994). First, a variety of resource options for meeting future energy services, including DSM and renewables, needs to be considered. Second, the choice among resources must be based on a social objective of minimizing the total societal cost of energy service. Third, to the extent that the utility is charged with acquiring these resources, regulation (of private owned utilities) or self-governance (for publicly owned utilities) must ensure that the incentives and rewards to the utility, monetary or otherwise, are consistent with the social objective.

The purpose of this paper is to explore the prospects for a wider application of IRP in Italy. We believe that the issue cannot be treated separately from the radical changes that are affecting the energy sector in the country both at the national and local level. Therefore, the following section provides an overview of the sector describing the evolution of institutional organisation over the years (4.1) and the key elements of the national energy policy (4.2). Section 5 deals with local utilities.

4. AN OVERVIEW OF THE ITALIAN POWER SECTOR

4.1. Institutional aspects

4.1.1. The early decades: textbook examples of market failures

Although the Italian power sector is currently dominated by a large, vertically integrated, national power industry - ENEL (Ente Nazionale per l'Energia Elettrica) is second only to Electricite de France in the European market - the situation was quite different less than fifty years ago. Up to the '50s the composition of the Italian power companies was made up by 6 major private companies, which controlled about 60% of the market, and about 1400 smaller private ones, which controlled slightly less than 15%; autogenerators and municipal power companies shared the rest of the market (respectively with about 20% and 6%). There is agreement among commentators that both technical and allocative performance were bad enough to justify a shift to a more regulated organisation [1]. Despite widespread perception of the need for change, industry structure was not actually reformed for several decades. The magnitude of necessary investments as well as the weight of the private stakeholders, were among the factors that delayed the transition to a different organisation to the early '60s.

Throughout the period, examples of publicly owned companies existed at the local level. About 46 municipal companies were operating, mainly in the largest cities (see section 5).

4.1.2. From the '60s to the '90s: the goods and bads of a national power industry

The prevailing oligopolistic cartel was replaced by public monopoly in 1962 when ENEL was established, selecting nationalisation among the possible instruments to deal with private inefficiencies.

Since 1962 ENEL has had the almost exclusive right to operate in the power sector. It is based on a central operating unit - with planning, R&D, financial and coordinating tasks - and several regional units mainly in charge of generation, transmission, distribution and customers' service. Other companies allowed in the market were municipal companies, autogenerators consuming at least 70% of produced electricity and minor private companies (providing that they did not produce or distribute more than 15 million kWh per year).

Table 1 shows the ownership structure of the system before and after nationalisation.

Table 1. Share of electricity production and distribution before and after nationalisation (Fazioli 1994)

	1960 Production	1990 Production	1990 Distribution
Private/holdings	74,3%		
ENEL		83,6 %	92,7 %
Municipalities	5,9 %	3,5 %	7,0 %
Others (Autoproducers + minor private companies)	19,8 %	12,9 %	0,3%

Nationalisation brought about several improvements: transmission and distribution grids, previously very limited and inefficient, are now national in scope with much lower distribution losses; supply was constantly expanded to meet growing demands due to industrial development and improvement in living standards; nation-wide uniform rates were set.

4.1.3. '90s: a new transition toward the market?

According to (De Paoli 1993) there are three main events underlying the recent shift in Italian Energy Policy: the Kuwait war, the move away from centralized planning in general, and the budget deficit. As far as the first is concerned, the implications of the Kuwait war in terms of energy policy were radically different from those of previous international oil crises. Whereas the events of the '70s and '80s, which motivated fear of increasing instability and scarcity of resources in the international energy markets, justified strong public intervention in the sector, this time the very limited consequences on oil supply and prices reduced the importance historically attached to energy security. Second, similar to other West and East European countries, Italy started to recognise the limitations of centralized planning in general; in particular, the principles stated in the National Energy Plans (NEPs 1988 and 1991) have rarely been implemented [2]. Finally, the huge Italian public sector encompasses several economic activities ranging from utilities to banks, insurance and manufacturing companies. Although there are notable exceptions, it is characterised by inefficiencies, excessive reliance on public funds and politically rather than economically based management criteria, all which have led to considerable public pressure for a radical change.

The first important reform occurred in 1991, when laws n.9 and 10 allowed independent power producers (IPPs), particularly those producing electricity from renewables, to play a more significant role in electricity generation [3]. All power produced is sold to ENEL. More details on the kind of facilities that qualify to the requirements of the laws as well as on the prices paid by ENEL to IPPs will be provided in the next section.

In July '92 ENEL became a Ltd, although currently the sole shareholder is the Treasury Ministry. The objectives of privatization can be summarised, following (De Paoli 1993), in economic, financial and political terms. Economic priorities favour the maximum efficiency and customers' satisfaction. Achievement of this objective is thought to require a complete restructuring of the sector modifying its horizontal and vertical degrees of integration. The financial objective aims at maximazing the revenue from the privatization. This would be best achieved by selling the entire company. The final objective, of a more political nature, consists in limiting the degree of political influence in the company management and requires, as a first step, the creation of an independent regulatory body with well defined tasks.

In November 1994 the Government announced a plan aimed at splitting production between several companies by June 1995; ENEL was meant to keep control of the generators in a first stage, and to sell a substantial quota of its share within three years; distribution activities were also planned to be opened to several companies; notably, although the proposal gave rise to different interpretations, a new body was established for dispatching and transmission activities. The 1994 plan was never put into practice due to the political turmoil that led to a new Governement in February 1995. A totally different plan has recently been put forward by the new Industry Minister, Prof. Alberto Clo', who announced that it would make more economic sense to sell ENEL as a whole.

In order for the picture to be complete, the role of the regulatory body has to be specified. Currently details of the tasks of three Authorities for public utilities - the first of which for energy and gas - are under discussion within Parliament. The latest draft includes three main objectives: to ensure quality of the service and low costs to individual customers; to ensure reasonable profits to new shareholders; to ensure revenue maximization to the State from the sale of the utilities. Other societal goals, such as environmental protection or efficient resource use are not even mentioned in the draft.

The text on the Energy Regulatory Authority includes new criteria for setting tariffs. The proposed system is based on the price-cap method, with the following parameters: the change in the retail price index, expected productivity variation, a "quality" component and one for unexpected costs. The law under discussion also calls for consideration of variations in the costs of fuels, costs due to the use of renewables and to decommissioning of nuclear plants.

4.2. Some elements of the current national electric policy

This section reviews some trends in the country energy policy for the electricity sector with the aim of identifying the underlying criteria and implications for resource management.

4.2.1. Supply and demand overview

In recent years electricity production capacity has increased in three ways. First, ENEL's own generation capacity is being expanded; new investments consist mainly of combined cycle coal and gas turbines (CCGTs), multifuel power stations, and repowering of existing stations. These additions amounted to 1338 MW in 1991, 3370 MW in 1992 and 1049 MW in 1993. Second, imports of electricity from neighbouring countries (Switzerland, France and Austria)- now representing about 16 % of total supply - are recognised as a resource option to be pursued as long as it is economically worthwhile. This, of course, could be affected by the lira's prolongued weakness on international exchange markets.

Third, new investments by IPPs are forecasted to account for 9% of total national generating capacity by 2000. Approved IPPs investments include "pure renewables" as well as processes regarded as "quasi renewables" such as cogeneration [4]. Electricity produced by these IPPs will be sold to ENEL at prices that have two components: the avoided cost (0,031 ECU/kWh or 72L/kWh) and an incentive. Incentives are only paid for the first eight years of life of the plant and vary according to the type of fuel used and process efficiency. As Table 2 shows, a large quota of new investments is made up by gas fuelled cogeneration plants while renewables still have a rather low share.

Table 2. New generation plants by IPPs up to 2000*

Type of power plant	Power (MW)
Biomass/waste	257,3
Wind	184,3
Hydro	224,5
(a) Total renewables	*666,1*
Process fuels	592,6
TAR gassification	1430,0
Cogeneration	3205,8
(b) Total "quasi-renewables"	*5228,4*
Total (a) + (b)	**5894,5**

Source: Ministry of Industry , 1994.

A recent study, (Ferrari and Terrinoni 1994), evaluates a levelized cost of 0,045 ECU/kWh (103 L/kWh) for good wind sites in Italy. Taking into account the fact that after 8 years the price paid to producers falls from 0,065 ECU/kWh (150 L/kWh) to 0,031 ECU/kWh (72 L/kWh), Internal Rate of Return is around 6-7%. The authors suggest that an increase of 40% of prices (up to 0,092/0,065 ECU/kWh or 210/150 L/kWh) is required in order to stimulate the development of the 300-600 MW forecasted by the 1988 NEP from the 12 MW wind power already installed in 1995. The situation is better for electricity from biomasses, which receives 0,097 ECU/kWh (222 L/kWh).

At present (1993) the resource mix of the italian electric system, taking into account also imports, is described in Table 3.

Table 3. Resource mix of electric energy delivered to end users in 1993*

	% contribution to end user consumption	
coal	6	
gas	15	
oil	42	
other fossil fuels	2	
total fossils		***65***
hydro	18	
geothermal	1	
wind	0	
hydro import	6	
total renewables		***25***
nuclear energy import		***10***
TOTAL		***100***

**Source: D. Bianchi, Ambiente Italia 1995, analysis from ENEL statistical data*

Now, under the proposed Public Utilities Authority Bill, incentives to IPPs might be abolished, both for renewables and "quasi renewables". One of the main reasons for the recent change was the concern expressed by new Industry Ministry A. Clò that continued incentives would impair the prospect for a truly competitive market. Seen from another point of view the abolition of incentives means the abolition of the only existing mechanism for internalizing at least part of environmental external costs of electricity production.

4.2.2. Evolution of Italian Electric System and CO2 emissions as devised in the ENEL supply expansion plan and scenario to 2010

A new investment plan was announced by ENEL in June 1994 (from Staffetta Quotidiana Petrolifera July 22 '94). The document forecasts a demand for energy to the ENEL grid of 290 TWh at 2002 (slightly less than forecasted in 1993) and calls for an ENEL capacity increase of around 11.000 MW (net of old plants dismission) and investments in the order of 19,22 Billion ECU (44.000 BŁ) in 5 years. (instead of 24,03 Billion ECU or 55.000 BL devised by the previous plan). The main objectives of the plan are the reduction of the cost of kWh and the achievement of a more balanced mix of resources; this means that coal will have to increase its share from present situation and revert the declining trend of last decade.

Table 4. Evolution of Italian Electric System as devised by ENEL supply expansion plan (S.D.C. 1993)*

	actual		forecasted	
	1992	1993	1994	2002
Available power from Enel	47.200	49.200	50.200	61.200 to 62.400
Guaranteed from abroad	3.400	3.600	3.600	2.500
National third-party producers	1.850	2.100	2.400	6.000
Non availability due to environmental interventions	-1.000	-1.500	-1.500	0
TOTAL availability	52.450	53.900	54.700	69.200 to 70.400
WINTER PEAK DEMAND (minimum)	39.600	40.500	41.500	53.900

* *All data are expressed in MW.*

Recently ENEL also presented a scenario for the evolution of the system up to 2010 (G. Carta et al. 1994), based on the MEDEE methodological approach. Some of the assumptions on key parameters during 2000 to 2010 are: GNP + 2.4%/y, electricity fraction from 36 to 41% (33,4% in 1992), and the scenario looks like:

- yearly ENEL peak demand in 2010: 65GW
- needed capacity (reserve margin 24%) : 73 GW. This means a growth of almost 50% from present capacity of around 50 GW
- incresead share for coal and gas, stabilization of oil
- revival of nuclear up to 4 GW (20 GWh)

According to this scenario, if no nuclear plant are built, CO_2 emissions by electric sector will grow by 48% (reaching 215 Mt) from 2000 to 2010. ENEL proposes that this increase in emissions could be limited to 40% if 4 GW of nuclear could be gradually commissioned starting in 2005. In 1990 the electric sector contributed to the total CO_2 emissions by 30% (120 out of 413 Mt). So not surprisingly the report states that «Such projections are strongly diverging from the theoretical "stabilization" target at the 1990 level, and show that in Italy this is unrealistic.»

4.2.3. Rates

Until the end of 1993 electricity prices were set by the Intergovernmental Price Committee (CIP) , through a very loose form of rate of return regulation. The Tariff Department of CIP was formed by three professionals. Although the allowed rate of return was never explicitly defined, tariffs tended to grow according to the rate of inflation.

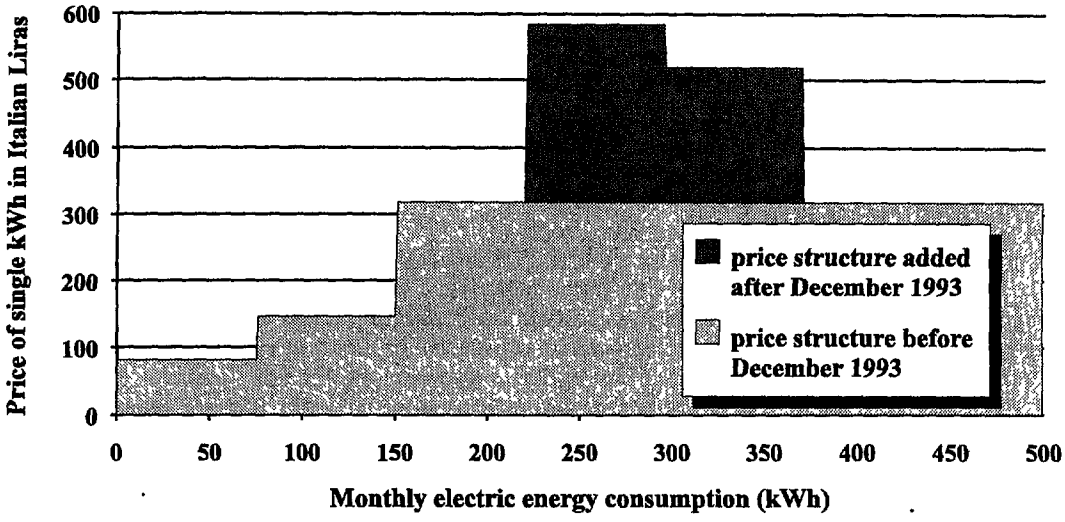
Rate making in Italy has traditionally had a macro rather than a micro objective, the main target being the control of inflation. More recently, rate increases were used to reduce the company's budget deficit. Other objectives, such as promoting energy conservation have never been seriously considered.

Time of use rates and interruptible rates were first introduced in 1980. Access was initially limited to industrial customers using high voltage, and then subsequently extended to medium voltage customers. The total number of industrial customers now served under these tariffs is about 9.600, and their consumption represents 70% of total industrial consumption. To date, about 6% of total industrial consumption has been shifted from peak to off-peak hours. Interruptible loads contracts are now under revision because "in the transient from now to 2002 the combined effect both on the supply and demand sides makes the ENEL generation system in overcapacity" (G. Carta et al. 1994).

Time-of -use rates for households (with a difference between night and day) are only available to customers with a contract for 6kW or more and aren't much common. Contracts for each household specify the maximum power allowed. Most of the customer have a contract for 3kW maximum demand, other options being 1,5 kW, 6 kWand 10 kW.

Traditionally, household tariff structure has been very progressive with consumption and maximum power installed. Recently, the progressive aspect has been dramaticaly increased but not widely publicized. At the end of December 1993, a tariff reform (carried with the stated purpose, inter alia, to make ENEL more attractive for future buyers) reduced the price differentials between customer classes, but greatly increased the price for high consumption levels. As Figure 1 shows, for a 3kW contract, the new tariff structure includes a very sharp increase of price when monthly consumption exceeds 220 kWh. From our analysis of consumer bills performed in cooperation with the energy utility of Rome (ACEA) more than 40% of customers currently exceed this limit and therefore pay a marginal price for electricity of nearly 0,258 ECU/kWh (590 L/kWh), compared with an average price of 0,073 ECU/kWh (167 L/kWh). However, we believe many customers are not aware of this dramatic change in tariffs. ENEL has not, to our knowledge, widely publicized the change, which is in contrast to several local utilities (e.g. ASM Brescia, AM Modena...) that have provided information on the new rate.

Figure 1. Price of single kWh for domestic use with power limitation to 3kW.



4.2.4. Non tariff related ENEL DSM policies

In addition to tariff-related DSM policies, ENEL has implemented several DSM programs, which are listed in Table 5.

The cost of conserved energy can be compared with ENEL's avoided costs (0,031 ECU/kWh or 72 L/kWh) or average price of kWh sold (0,073 ECU/kWh -167 L/kWh- in 1993), but also with prices to domestic customers (which can be as high as 0,258 ECU/kWh -590 L/kWh- for higher consumption levels). In most cases the DSM programs appear to be cost effective, except solar heaters. No explicit mention is made to new DSM projects in the investment plan approved in 1994. In another document, the "Contratto di programma", which regulates the State Concession to ENEL, the Utility is expected to invest at least 4,37 million ECU per year (10 BL/year) in information activities on energy efficient use of energy, while revenues amounted to 15,3 Billion ECU (35.000 BL) in 1994. Utility estimates of savings by the year 2000 vary from 17-21 TWh (Carta 1992) to 5 TWh (Viezzoli 1994). Table 5 shows an analysis by authors of data reported to the Parliament in October '94 by F. Viezzoli, President of ENEL.

Table 5. DSM programs performed by ENEL from 1983 to 1992 (Viezzoli 1994)

	time frame	*Total Investment (million ECU)*	*savings (kTep/year)*	*saved peak power (MW)*	*Cost of Conserved Energy (ECU/kWh)*
solar heaters	1983-86	52,42 (120,00 BL)	14,00	15,45	0,083 (190 L/kWh)
power factor correction *	1979-92	26,21 (60,00 BL)	175,00	110,35	0,0026 (6 L/kWh)
heat pumps *	1989-92	43,69 (100,00 BL)	175,00	257,48	0,0061 (14 L/kWh)
CFLs	1990-	0,17 (0,40 BL)	0,50	1,10	0,033 (76 L/kWh)
Total		***122,49 (240,40 BL)***	***364,50***	***384,39***	

**Total investment includes both utility and customer costs. However, we are unsure whether incremental customers costs are included for these two programs.*

5. LOCAL UTILITIES

Table 6 describes features of local, municipally owned companies involved in electricity production and distribution. They were created in the early part of this century in the larger cities mainly in the Northern part of the country. At that time, the need to keep electricity costs low - also motivated by the development of electrically driven public transport system - was better met by municipalities better than by private companies. Out of a total number of around 120 local municipalities currently selling electricity, only 20 generate a significant amount of electricity, the rest are primarily distributors. As shown in the table, local municipalities provide many services other than electricity, including water, heating, waste management and public transportation.

Local companies have been run according to a law dating back to 1925. In the majority of cases, the local authority has direct control of the utility. Recently law 142/1990 introduced important changes including: incentives for "consortia" - joint management - of public services; the possibility of establishing a Ltd, either with the majority of the shares held by the public sector or setting up a partnership with private stakeholders; qualitative as well as quantitative limits on the costs paid by the public sector to the utility; and restrictions that limit financing socially motivated services. In principle, the new law is expected to provide incentives for more efficient management.

Some local utilities have been more active than ENEL in pursuing aspects of IRP. ASM in Brescia has developed cogeneration and district heating and waste recycling; some local utilities have provided ample information on tariff changes. Some, such as as ACEA, serving about 50% of the city of Rome, are initiating DSM programs. The utility in Bologna is planning to build a wind farm and has actively joined its city government in the Urban CO_2 reduction project.

Reasons for these differences in policies can be traced to variuos factors: local utilities are controlled by local governments who are more responsive to their citizens than are officials of a large national utility; most are primarily distribution utilities, and don't rely on earnings from supply side investments for profits; many distribute different energy sources and so aren't affected when customers eventually shift from one to another.

Table 6. Other companies in the electricity sector (Fazioli 1994)*

	Electricity		**Other services**			**Total**
	Employees (a)	**Turnover (million ECU) (c)**	**Services**	**Employees (b)**	**Turnover (million ECU) (d)**	**Employees (a) + (b) Total income (c) + (d)**
Other companies electricity generation	7.618	690,52	Heat	335	54,14	13.235
			Water	1.747	124,79	
			Sewage	41	2,48	
			Treatment	618	81,44	
			Gas	2.118	311,23	
			Transport	431	5,82	
			Urban waste	273	35,14	1.318,39
			Others	54	12,83	
Other companies electricity distribution	1.320	152,96	Heat	13	4,14	2.866
			Water	542	42,79	
			Sewage	4	0,22	
			Treatment	16	1,18	
			Gas	561	157,86	
			Transport	209	3,28	
			Urban waste	151	4,97	368,87
			Others	50	1,47	

**from data of 1992*

6. THE PROSPECTS FOR IRP IN ITALY

Evidence suggests that there are many currently overlooked opportunities for energy savings (for example most commercial premises are currently designed in Italy with installed power for lighting ranging from 30 to 60 W/m^2, while in the USA this is limited by law to less than 20 W/m^2; the share of electric resistance water heating is still high: 40-60% through the country, etc.). A recent study (Pagliano and Grossi 1993) indicates that 30% of energy use in the domestic sector of Regione Lombardia could be saved at a cost of conserved energy to the customers ranging from 0,0044 to 0,052 ECU/kWh (10 to 120 L/kWh); similar to costs documented by past ENEL DSM activities. Finally, the recent very progressive tariff structure make efficiency very attractive for many household customers.

However the future of IRP in Italy is uncertain. The degree and form of privatization and the associated form of governance or regulation, some form of which will be inevitable under any scenario, are not completely specified at this time. For example Industry Minister A. Clò wants to mantain vertical integration of ENEL, while Giuliano Amato, the President of the Antitrust Authority, states that separation among production, transmission and distribution is "a minimum prerequisite" for the privatisation process. What we can say with certainty is that the prospects for IRP will depend largely on the extent to which private and public interests can be successfully aligned through whatever form of governance or regulation is employed. Without such alignment, it is unlikely that the objectives of IRP will be met.

At this time, we can only contrast the factors that tend to support adoption of IRP principles by Italian utilities and those that tend to work against their adoption.

The factors that tend to support adoption of IRP principles include:

(1). Environmental objectives, such as agreements to mitigate GHGs emissions, that will place a premium on non-polluting energy resources. Italy has formally agreed to stabilization at 1990 levels in 2000, but seems slow in implementing the policies needed to meet this goal.

(2). Increased price transparency and the elimination of subsidies in electricity pricing in order to send a clearer signal to consumers regarding the true costs of electricity use to society. In Italy there are still substantial cross-subsidies in favour of large industrial consumers.

(3). Vertical disvestiture, open transmission access, and non-discriminatory pricing, which will encourage distribution companies to choose least cost suppliers for their customers and also allow distribution companies to evaluate supply vs. demand side resource options on a consistent basis. As already mentioned, only the AntiTrust Committee President, G. Amato, clearly supports vertical disvestiture.The trade unions are also more inclined to maintain vertical integration.

(4). National security objectives that seek to reduce dependence on imports (of fossil fuels and electricity). The experience of the Kuwait oil war appears to have reduced the importance of this objective.

(5). Potentially, horizontal disvestiture to instill even greater local control over utility policies; possibly integrated with other local municipal services. This was favoured by former Industry Minister Gnutti, but is opposed by the present Minister.

The factors that tend to work against adoption of IRP principles include:

(1). Forms of price regulation, such as price caps, that penalise utilities for pursuing DSM or renewable investments, which may raise rates. Price caps can be used in circumstances when DSM or renewable or environmental objectives are incorporated in the quality factor. To be effective, however, their incorporation must at least fully offset the negative financial impact they may have on the utility. We would also argue for the use of positive incentives (e.g. shared savings schemes) that reward the superior performance of utilities in meeting these social objectives. Only small political groups are presently supporting these options in the Parliament.

(2). Taxation or other macro-governmental policies that skew the costs of supply-side and demand-side resource options away from their true costs to society.

(3). Resource acquisition decision-making processes that do not allow for public input to offer differing points of view regarding the social worth of various resource options. These opinions are especially important in areas where

there is little consensus regarding what the social objectives are. Open debate provides for the greatest public accountability.

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8. ENDNOTES

1. Fazioli (Fazioli 1994) points out to several inefficiencies: high losses in electricity distribution often resulted in failure to meet the rapidly growing demand; the industry could rely on high and increasing over time monopoly rents deriving mainly from information asymmetries on costs data.

2. As for the demand side for example, only a part of planned State incentives to energy saving (2,600 BL through years '91-'93) have actually been funded. New investments of about 5,000 BL planned for '95-'97 have not been funded at all. Out of 300-600 MW wind power plants planned for year 2000, only 12 have been installed till '95. The use of coal is not growing as planned.

3. The laws were meant to devise instruments to achieve the objectives of the 1988 National Energy Plan (NEP) - the traditional tool of Italian Energy Policy - particularly with respect to development of domestic energy sources, increased energy conservation and environmental protection. A previous law, 308/1982 - that aimed at enlarging the scope for energy conservation and production from renewables - found a major obstacle in the scarcity of incentives provided to generators.

4. A power plant is classified as "quasi renewable" if the weighted sum of thermal and electric energy produced out of the quantity of fossil fuels used (this ratio is called energy index) is above a certain level.

5. Throughout the paper the assumed exchange rate is: 1 ECU = 2.289 L (April 1995).

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