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RECOMMENDATION PAPER
OF THE REGULATORY AUTHORITY FOR ELECTRICITY AND GAS
ON THE STATE OF THE ELECTRICITY AND NATURAL GAS MARKETS AND RELATED ISSUES *

RECOMMENDATION
TO PARLIAMENT AND THE GOVERNMENT CONCERNING THE DEFINITION OF NATIONAL ENERGY POLICY **

* pursuant to art. 3, sub-paragraph 10 ter of decree law no. 185 of 29th November 2008, as converted into law no. 2 of 28th January 2009

** pursuant to article 2, sub-paragraph 12 of law no. 481 of 14th November 1995

Premise

This recommendation paper has been formulated pursuant to article 3, sub-paragraph 10 ter of Decree Law no. 185 of 29th November 2008, as converted into Law no. 2 of 28th January 2009, which provides that: "*With effect from 2009, the Regulatory Authority for Electricity and Gas provides the Ministry of Economic Development with a recommendation paper on the functioning of the energy market, for public release by 30th September each year. The paper may also contain recommendations concerning different measures to be applied to the price formation mechanisms in order to improve market organization by promoting competition and alleviating market anomalies. By January of the subsequent year, the Ministry of Economic Development may adopt one or more decrees based on the recommendations proposed by the Regulatory Authority for Electricity and Gas. The specific aspects to be addressed by said measures include: a) promotion of the integration of Europe's regional electricity markets by implementing joint negotiation platforms for the electricity market and allocating cross-border transport capacity with neighboring Countries; b) development of the physical and financial forward energy markets by cultivating new, long-term products in order to ensure widespread operator participation, sufficient liquidity and the proper degree of integration with underlying markets.*"

The present document also includes a series of recommendations that address the introduction of instruments intended for pursuing the general and specific objectives indicated in the national energy policy being defined by Parliament and the Government.

The first chapter summarizes the document's main contents to facilitate overall comprehension and understanding.

Content summary

The document begins with a European-level market analysis that serves to frame the national energy market's development in the context of the electricity and gas sector dynamics of the European Union.
This is followed by an analysis of the wholesale natural gas and electricity markets and the retail market. The document then addresses the state of development of electricity generation by renewable energy resources and their integration into the market by addressing, last of all, aspects of facilities development under this profile as well. Each chapter starts out by summarizing the main contextual elements of the market and related facilities, revealing the most critical issues and recommending a series of tools for overcoming these challenges, with useful insights being presented for policymakers in pursuit of the objectives set by national energy policy.

At the European level, the operational startup of the European agency for the cooperation of energy regulators (ACER) represents a major development in **the integration of European markets**, with guidelines being defined for the elaboration of European network codes, which will provide a regulatory reference point as the domestic electricity and natural gas market is being constructed.
The transport capacity allocation and congestion management mechanisms for gas and electricity and the rules on the connection of generation facilities were the subjects of ACER's first efforts.
Especially in regard to the electricity sector and allocation mechanisms for cross-border transmission capacity, the Authority must be entrusted the task of approving the technical rules used to conduct auctions with procedures agreed on with the other regulators involved, which also helps ensure optimal coordination at the European level.

With respect to the **wholesale gas market,** the new gas balancing regime, which is based on economic merit, is particularly noteworthy and scheduled to become operational on December 01st.
The persistence of appreciable differences between spot prices in the Italian market and Europe's main *hubs*, however, evokes the need for further improvement in facilities development (which also helps to handle high-consumption periods with sufficient safety margins, among other things, during the prolonged absence of import sources) as well as the management of available transport capacity between different European *hubs*.
Within this framework, this document indicates the procedures that would make it possible to establish a single, national operator to serve as the sole, independent interface for the access and supply of gas transport and balancing services and related metering services in order to alleviate the inefficiencies and administrative burdens associated with the current multiple-operator arrangement.
The new heat transfer facilities for gas entail a further need to assess how they fit in with the tariff-regulated system's set of guarantees by taking a system-wide perspective on the potential costs and benefits into consideration and by identifying the basic

criteria and conditions under which new facilities (and the storage and regassification plants in particular) are entitled to have their own tariff-regime profits covered by the guarantees.
Other elements that could make significant contributions to increasing the competitiveness of the market include the evolution of storage capacity allocation, through the adoption of market mechanisms in conformity with Regulation (EC) no. 715/2009 provisions, and an appeal to market-based systems, as much as possible and in conformity with Regulation (EC) no. 994/2010, to replace the current methods used to manage critical situations in the gas system, methods which are in essence based on exceptional administrative measures, such as the maximization of the use of imported transport capacity.

Up to now, the **wholesale electricity market** has shown a higher concentration of supply than would be associated with an ideal competitive equilibrium, although admittedly less deviant than witnessed in the natural gas market and exclusively in reference to specific zones of the national electricity system (SE). In this regard, the insufficiency of transmission capacity in various geographical contexts merits consideration for how it truncates the full deployment of the pro-competition effects of investments in new generation capacity.
The wholesale electricity market in the large islands continues to necessitate careful monitoring, and various competition-related criticalities are likely to persevere in the market for dispatch services in any case. In this case, the identification and regulation of the plants that are essential to system safety and the Authority's careful monitoring of the market are fundamental instruments for preventing and/or identifying cases of the unilateral or collective exercise of market power on the part of the producers.
Caution, therefore, is recommended as the day-ahead wholesale market is being subjected to structural changes, such as the possibility of introducing the *pay-as-bid* price formation mechanism, due to the potential repercussions in terms of efficiency and the level of competitiveness. This is also suggested by the need for compatibility with European markets.
The timing and coordination of the permit procedures for constructing generation facilities and grid-related infrastructures play a fundamental role (as will be seen) in the orderly development of renewable energy resources, and they also play an important role in the development and proper functioning of the market in productive capacity, which demands precise timeframes in the context of permit procedures so that newly-constructed plants are able to participate in the market for productive capacity - a fundamental dimension for guaranteeing competitiveness.

The need to ensure appropriate forms of protection for consumers after the **retail electricity and natural gas market** has been fully liberalized, the punctual regulation of access to grid services and information flows between different operators in support of inter-operator competition, and the careful monitoring of the evolution of the market have been the primary focal points of Authority activities in recent years. The high level of openness in the retail market, commensurate with the levels witnessed in more developed European markets, is also demonstrated by the data on the percentages of customers served in the free market.

The identification of a subject with the capacity to ensure an unbroken supply for each customer in need of a supplier represents an important element, both in terms of providing direct protection for the consumers and for containing the risks faced by free market sellers whenever they are forbidden to interrupt the service for customers who default on the contract (non-detachable customers). The document also contains several recommendations for a comprehensive approach to this issue in reference to customers connected to the transport network, and signals the need for various regulatory clarifications in order to ensure the proper identification of which consumers have the right to natural gas coverage services.

The evolution of the wholesale gas market and the launch of the balancing market described above may make a revision of the economic terms and conditions of the natural gas protection service possible as soon as the next thermal year, by identifying the methods for determining the supply component that can replicate market dynamics as closely as possible.
In regard to the need to improve the information flow between operators, it is crucial to implement the integrated information system (IIS), which is scheduled for activation as soon as next year. The IIS's contribution will also be crucial in the battle against consumer delinquency, a growing phenomenon and central issue for the development of the retail market. The establishment of a data bank of customer contract defaults is in the planning as per law no. 129/10, along with other Authority actions designed to ensure effective shut-off procedures for application to delinquent consumers.
The management of non-detachable customers is particularly important, and a regulatory intervention is required to specify detailed criteria for identifying the uses that fall in this category in order to minimize the degree of discretion of the operators involved in identifying them.
The Authority also intends to promote (as much as possible and in conformity with the primary regulations) small-sized company integration and clustering processes in order to ensure the achievement of economies of scale and the harmonization and simplification of network management. The plan to replace gas metering units, a plan which the Authority is in the process of redefining to incorporate electronic metering units that enable remote readings and management, aims to ensure the timeliness, transparency and accuracy of metering data and represents yet another contribution to the cultivation of competition in the retail market.

In regard to **the development of renewable energy resources**, the fundamental importance of incentive tools is also shared by the permit procedures, the regulation of access to system services (understood as the connections to power grids and the transport, dispatch and metering of electricity) and the definition of the procedures for delivering the electricity that is produced.
Regarding permit procedures, legal and regulatory instruments will need to be tailored to ensure greater reliability (in terms of timing) and homogeneity. Positive developments under this profile include the recent approval of the permit simplification guidelines for facilities powered by renewable energy resources and the new elements introduced by Legislative Decree no. 28/11. These permit-related interventions will also provide for an effective solution to network capacity "reservation" problems, which are

considerable at present and not commensurate with the potential construction of power plants. This phenomenon constitutes an entry barrier for new operators who, in at least some cases, are unable to connect quickly once the new generation facilities have been completed, even if the grid is saturated only "on paper." This type of situation has grown exponentially and reached worrisome dimensions.
Given the urgency of the issue and the fact that most of the virtual grid saturation phenomenon can be attributed to connection requests submitted prior to 2011, connection requests that are already under way for generation facilities yet to receive authorization will also need to be subject to the interventions if the Authority's recommendations are to be effective.

In relation to the definition of incentive tools, the Authority has marked the opportunity to preserve the competency of Government and Parliament to lay down quantitative and temporal objectives for energy, environmental and industrial policymaking that are distinct for each source, giving the Authority itself responsibility for defining the instruments needed to achieve the above objectives at the lowest cost.

Italy has already adopted incentive tools for promoting energy efficiency and the production of thermal energy from renewable energy resources. In particular, the white certificates mechanism (or energy efficient credits - EEC)[1] has up to now made it possible to exceed the initial energy efficiency objectives that were set by the Government (ministerial decrees 20th July 2004) at very reasonable costs, much lower than the costs of promoting electricity generation by renewable energy resources.
Considering the results to date, it seems advisable for the Authority to continue contributing to economic regulation, general technical regulation (the so-called guidelines) and the verification of conformity.

High-efficiency cogeneration, for which two ministerial decrees were recently passed, plays a major role in the context of energy efficiency. The management aspects are complex, it should be noted, because this type of facility requires the application of several different definitions of co-generation.
Furthermore, while the objective of the European directive is to promote the maximum recovery of useful heat, since this is how cogenerative units function to maximize on primary energy savings, in the ministerial decree of 04th August 2011 the concept of "full cogeneration regime" has failed. Certain units that fall far short of maximum heat recovery, therefore, could be allowed to access the benefits foreseen for high-efficiency cogeneration, in contrast to the provisions of European regulations. It should also be reiterated that the ministerial decrees need to be brought into alignment with European regulations for certain profiles, given the lack of a precise regulation that can easily and unequivocally identify the sizes necessary for calculating the indexes used to derive the definition of high-efficiency cogeneration in the first place. It would be consistent for

[1] At present, this instrument is also being used to encourage the heat production by renewable energy resources. This type of production, in fact, engenders a lower usage of fossil fuels that is acknowledged with equivalent numbers of energy efficiency credits. It should be pointed out, however, that as of now the proportion of energy efficiency credits associated with heat production by renewable energy resources is still relatively inconsequential.

the Authority to fulfill a role of this nature, given the activities it has conducted so far on the basis of resolution no. 42/02.

With respect to checks and controls, lastly, impartiality/ownership unbundling needs to be guaranteed by ensuring that facilities powered by high-efficiency renewable and/or cogenerative energy resources and that benefit from the incentives are being inspected by third parties, and not by the same subject that issues qualifications or manages the incentivized alienation agreements.
In this regard, the Authority finds it necessary in any case to ensure appropriate forms of autonomy in the execution of control activities in relation to the GSE's other statutory activities.

The rhythm at which the intermittent renewable energy resource facilities installed in the SE are growing is creating a highly critical situation for the **grid facilities and dispatch service**.
The approximately 5,000 MW of wind-power plants and 11,000 MW of photovoltaic plants currently installed (and expected to grow past 12,000 MW by the end of the year), which are concentrated in specific parts of the country (Center-South and the Islands) and destined to grow considerably in the coming years, demand that the grid management paradigms of the past be subjected to radical changes. The distribution networks need to be transformed into "active grids" and the diffuse generation facilities, given their overall significance in terms of installed capacity and consequent system-wide impact, need to be outfitted with control instruments that are at least capable of handling extraordinary problems in the system.
Grid facility development, which is fairly urgent in parts of the country that are characterized by high energy potentials and low local electricity loads, and the evolution of dispatching are essential for ensuring sustainability from an SE perspective on the development of renewable energy resources.
Concerning the SE defense plan in cases of serious grid accidents with major fluctuations in frequency, the current calibration of the distributed generation facility protections could result in generation losses amounting to the entire distributed generation (with photovoltaic plants alone, as mentioned above, representing an installed power of about 11,000 MW), which would in fact require the activation of the SE defense plan and the load lightening plan, in particular, as occurred recently in Sicily's electricity system. This means that the compulsory recalibration of protection systems in order to ensure that disconnection only happens when the frequency exceeds the 47.5 - 51.5 Hz range, as already provided for in major facilities (with powers of over 10 MVA) including wind-power plants, needs to be extended to all distributed generation plants.
Under the profile of the resource supply for dispatch services, the high penetration of facilities powered by renewable energy resources entails the reduction of residual loads with a consequent increase in the difficulty of supplying the necessary reserve margins, which could make it necessary to introduce grid service supply obligations, which as of now are applied to major wind-power plants, for small-sized facilities, or Terna's selective reduction of distributed generation beginning with the one connected in MV.
For the same reasons, the prescriptions on the *inverters* for photovoltaic facilities (already scheduled for 2013 by the interministerial decree of 05th May 2011) need to be applied in advance to facilities that become operational in 2012.

To encourage better programming by the facilities, the rules that shift the costs of imbalances onto the owners of the facilities actually responsible for the imbalances need to be applied to renewable energy resource facilities as well. Without this measure, in fact, the market price for energy would be inflated due to the failure to discount the production by those renewable energy resources that are not subject to programming, while inevitable growth would be witnessed in the demand for modulation capacity due to the uncertainty of its production.

It would be advisable for Terna to quantify, on a regular basis, the maximum penetration of generation by non-programmable renewable energy resources (with special reference to wind-power and photovoltaic plants) in relation to the system's current organization, and for Terna to assess the interventions that would be needed to ensure, under conditions that are safe for the national electric system, the development of renewable energy resources from the perspective of the 2020 objectives. In other words, Terna needs to assess the compatibility margins of generation distributed via the SE and the means needed to increase these margins in response to the increase in connection requests for this type of generation.

The diffusion of *smart grids* will also contribute both to more effective exploitation of diffuse renewable energy resources and to the development of an innovative dispatch system on the distribution grids, one that can guarantee programmable load profiles to the interface with the national grid in order to reduce the need for backup generation facilities, most of which run on fossil fuels.

In the scenario depicted above, the independence of the operators who manage the networks in the market's interest is critical for fostering the development of competition, especially through the adequate development of nationally-significant strategic facilities.

Interventions such as increasing the IRES (+10.5%) have a negative impact on investment, and any reduction in investment, wherever investment costs are lower than the benefits generated for consumers, entails a de facto reduction in value for consumers (which can be understood as a translation of this implicit tax's effects onto the consumers themselves) that potentially cancels out the revenue gained from the tax itself. For the same reasons, these interventions reduce the companies' profitability and cause their value to depreciate, making it less advantageous for current owners to transfer them.