Marcella Pavan

NEW TRENDS IN ENERGY REGULATION: THE INTEGRATION OF COMMAND AND CONTROL APPROACHES, TARIFF REGULATION AND ARTIFICIAL MARKETS FOR DEMAND-SIDE RESOURCES

Autorità per l'energia elettrica e il gas (Italian Regulatory Authority for Eletricity and Gas)
E-mail: mpavan@autorita.energia.it

Overview

Recent events and developments at the international level (e.g. rising energy prices, environmental concerns and commitments, electric system reliability crises in a number of countries), coupled with increasing energy consumption, have led to a new rise of Demand-Side Management as an important component of a balanced energy policy approach. Demand-Side Management (DSM) programs include both so-called "demand response" policies (particularly in the electricity sector), designed to achieve load reductions primarily at times of peak load, with little or no effect on total energy consumption, and "energy efficiency" programs aimed at reducing the overall energy consumption of specific end-use devices and systems by promoting high-efficiency equipment and building design (with beneficial impacts also in terms of both average and peak electricity load reduction).

Uniquely among energy policy options (both supply-side and demand-side), energy efficiency can tackle all the major energy policy goals, i.e.: security of supply, by reducing the demand for imported energy; reducing polluting emissions; reducing the costs of the services derived from energy such that comfortable households are affordable for all and business international competitiveness is improved. This makes energy efficiency key to any sustainable energy policy.

Traditional policy approaches to the promotion of end-use energy efficiency include "command and control" type of regulation (e.g. mandatory efficiency product standards, minimum efficiency requirements) and various forms of fiscal incentives. However in a liberalised market framework new types of policy and regulatory approaches have to be defined to promote end-use energy efficiency by reducing or overcoming the traditional barriers to the development of a competitive market for energy efficiency products and services. Two basic constraints hold: cost-effectiveness and coherency with a competitive market framework. The latter requirement in turn calls for approaches and tools that are transparent, not distorsive and not discriminatory.

The paper discusses the advantages and possible drawbacks of an "integrated" regulatory approach that combines traditional tools with more innovative market-based ones. The discussion is developed from both a theoretical and an empirical point of view, on the basis of an indepth analysis of the Italian experience with an integrated regulatory scheme that includes energy savings targets, "energy efficiency certificates" trading and elements of tariff regulation in the electricity and natural gas sector. While the latters have been gradually introduced by the Energy Regulator (Autorità per l'energia elettrica e il gas) since 2000, the overall scheme is in operation since January 2005. The analysis of the results of the first year of operation allows the author to draw some conclusions on the effectiveness of such an integrated regulatory model in achieving the expeted results.

Methods

The introductory part of the paper is devoted to a brief discussion of the role of demand-side management programs and measures as key components of a sustainable energy policy.

The paper then describes the rationale of an "integrated" policy approach to the promotion of end-use energy efficiency based on a combination of comand and control regulation (i.e. mandatory energy efficiency targets), market mechanisms (e.g. energy efficiency certificates

trading) and elements of tariff regulation for electric and gas utilities. The rationale is discussed via a comparison of the major theoretical advantages of such an approach with respect to alternative, more "traditional" ones.

The author then focuses on the major technical issues and challenges associated with the introduction of such an integrated policy tool-kit. These include:

- design issues related to each component of the kit (e.g. target setting, choice of obligated subjects and elibible measures, measurement and verification issues, certificates market design, proper tariff design aimed at ensuring adequate incentives for both regulated utilities and consumers to improve end-use energy efficiency);
- issues related to the interactions among the various components of the scheme (e.g. need to avoid that the enforcement mechanism via non compliance sanctions distort the certificates market, for example, by establishing a sort of reference-price for market transactions);
- issues related to the interactions among the "integrated" scheme and other policy instruments possibly in place to achieve similar energy policy objectives (e.g. mandatory efficiency product standards, minimum efficiency requirements, green certificates for the promotion of renewable generation, feed-in tariffs).

The paper discusses how these issues, challenges and the (sometime) related regulatory trade-offs have been tackled in the design of the Italian regulatory framework for the promotion of end-use energy efficiency: a combination of mandatory energy efficiency targets as a part of the public service obligation on electricity and natural gas distributors, an energy efficiency certificates market (also referred to as "white certificates market"), a tariff system based on a price-revenue cap formula for regulated electric and gas utilities aimed at reducing disincentives and introducing incentives for both utilities and consumers to improve energy efficiency, plus a public benefit charge that finances a cost-recovery mechanisms for utilities investing in energy efficiency progams. This is the first scheme of this nature introduced and currently in operation at the international level. The general legislative framework (national energy efficiency targets, the choice of obliged actors and the introduction certificates trading) was introduced by Government Law in 2001. The technical and economic regulation governing the scheme have been defined by the national Electricity and Gas (*Autorità per l'energia elettrica e il gas*), which is also in charge of the administration and monitoring of the scheme.

The introdution of energy efficiency certificates trading is currently under discussion or investigation in a number of other EU member states (e.g. France, UK, Germany, the Netherlands), and is being debated by the policy-making and research community also in the United States. The European Commission has expressed interest is such an approach and will carefully monitor the results of the ongoing practical experiences as a basis for future policy decisions to this regard (cf. COM(2003)739). The Government of New South Wales (Australia) has allowed demand-side management measures to be eligible in the State-wide emission trading scheme. Where deemed relevant and useful to the discussion, reference to these experiences/political debate will also be made in the paper.

Results

The Italian integrated policy framework for the promotion of end-use energy efficiency (including the "white certificates" trading scheme) entered into force the 1th of January 2005. National annual primary energy saving targets have been set by the Government for a five year period, with futher targets for the post-2009 period to be defined by the end of 2006.

The paper will present the results achieved in the first year of operation of the scheme in terms of:

- efficacy in achieving the annual quantitative target and market signals concerning the potential for achievement of the targets for the following years;
- cost-efficiency (both in terms compliance and administration costs, including a comparison between the types of energy efficiency measures actually implemented and the outcomes of an empirical investigation just concluded by the Regulator on the marginal costs of end-use energy savings in Italy and abroad);
- enhanced development of a competitive energy services market, including a preliminary evaluation of the extent to which the scheme is promoting the entrance in this market of new actors (such as energy service providers and ESCOs-energy service companies), as well as the supply of innovative financial solutions for energy efficiency projects.

(These results will become available in the first two months of the current year).

Conclusions

Based on the previous theoretical discussion and on the above empirical results from the Italian experience, the author will draw some conclusions on the peculiarities, potential advantages and drawbacks of an integrated regulatory approach to the promotion of end-use energy efficiency such as the one described in the paper.

In theory and under strict assumptions this approach allows to combine the guaranteed results of regulation with the economic efficiency of market-based instruments. But this does not need to be the case in practice. A number of conditions must hold and the regulator might have to face relevant trade-offs.

The extent to which these trade-offs can be, at least partially, overcome so as to allow the scheme to deliver its theoretical advantages with respect to more 'traditional' approaches will be discussed.