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**ENERGY EFFICIENCY AND MARKET-BASED MECHANISMS:
ANALYSIS OF ITALIAN EXPERIENCE AND POTENTIAL DEVELOPMENTS IN EUROPE**

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Overview

The last three years has been characterized by an increase of energy peak demand in several European Countries especially in summertime, which caused two direct consequences: the raise of energy prices and greenhouse gas emissions. This problem, actually, makes the Kyoto objectives very difficult to beat. The energy demand management actions seem to be the right way to reduce this continuous increase and to boost the end use energy efficiency. According to the most important energy sector experts, market-based mechanisms are considered one of the best solution to promote energy efficiency because they are strictly connected with the new energy policies adopted by Europe referring to an increase of competitiveness between Member States through the liberalization and an high level of concurrency of internal markets.

The *Green Paper on Energy Efficiency* underlines the importance of White Certificates System, recognized as one of the most powerful mechanism for „doing more with less”.

This system combines the guaranteed results of setting obligations with the economic efficiency of market based mechanisms: the main aim is to reach both goals of reducing the costs of energy and lowering the greenhouse gas emissions. Within Europe, White Certificates have been introduced in Italy and in France and with a precursor scheme, called Energy Efficiency Commitment in UK. The absence of application limits characterizes the Italian and French system in comparison with the English one. In particular, the Italian mechanism of energy efficiency is a system open to any interventions, which can provide primary energy savings in end uses, through a demonstrable methodology.

Methods

The paper describes the research activities concerning the analysis of the potentialities of Italian White Certificates mechanism, also evaluating the results coming from the first market sessions which show a strength participation of actors involved in the Italian energy efficiency system.

The research has initially analyzed the Italian market-based mechanisms and then a comparison with other European experiences has been done. Among them the English one has resulted to be the most consolidated.

Furthermore, the analysis has underlined the peculiarity of Italian system in terms of flexibility and opening to the new energy saving technologies and saving evaluation methodologies. That gives to the Italian market-based mechanisms an enormous potentiality of development of the targets from both qualitative and quantitative points of view.

To explain more clearly the Italian market-based mechanisms, some examples of energy saving applications have been carried out. The first one is related to the lighting systems. The second is relevant to cogenerative systems in domestic sector and it follows the concrete perspective of development in a wide range of the distribute power generation.

Starting from the above mentioned applications, an energy auditing methodology has been implemented in order to optimize the White Certificates approach.

The methodology has been also tested in the large-scale retail trade sector, that is very significant in the energy consumption analysis.

Results

The results of theoretical and experimental analysis show that the performance of energy saving application can be enhanced by exploiting the White Certificates.

As mentioned, the outputs achieved have been validated by considering some practical applications in the field of energy efficiency. The energy saving level result to be very encouraging.

For example the innovative lighting systems in some particular application have yielded a White Certificates quota of about 4000 Toe, equal to the annual national target of a big distributor.

Good perspectives come also from the application of cogenerative system to the domestic sector. That could provide an energy saving value five time bigger than the total national amount of the White Certificates system target for the first five years.

The analysis has been applied also to an important large-scale retail trade firm, and the result have been substantially confirmed.

Moreover, through a detailed analysis of relations and collaborations between suppliers, public administrations and law authorities involved in system, it has been possible to evaluate the next-years scenarios of energy efficiency boosting in Italian liberalized energy markets.

At this regard, good indication comes by the first White Certificates transactions, started in March 2006. The White Certificates exchanged were about 10.000 (the same value of Toe saved). That is more interesting considering that the value reached in only one month represents 10% of the annual target (0,1 Toe).

Conclusions

Until today, the development of an effective policy of the energy efficiency in Europe has been slowed down by the very low economical sustainability of the energy saving interventions. Also the reduction of the cost coming from the technological development, has been not enough to collect investments from the stakeholders.

Italian experience demonstrates, on the contrary, the high sustainability of the market-based mechanisms, as tools for the energy efficiency promotion. This research offers some good starting points for the future application at the European market of the Italian mechanism.

References

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