

## **Green Certificates in Italy. Incentive for renewable energy in Italy.**

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The new Italian energy policies, according to the swift technological development to exploit Renewable Energy Sources, is providing more and more incentives for companies operating in this field.

Thanks to important incentive strategies, the Italian energy policy is supporting the production of green energy both to respect the Kyoto Protocol, and to respect European energy policies.

During the decade 1992-2002 the government supported renewable energy mainly by grants provided for the CIP6/92 Programme. Then, through the issuance of Green Certificates (GV), that encourage a market connected to securities allotted to electricity produced from renewable sources. This system wants to promote the development and the cost-efficient diffusion of technologies that were not competitive yet. It has been recently updated and made more stimulating, thanks to the identification of specific tools to support renewable sources.

### **The CIP 6/92 Programme**

In the early 1990's the Italian energy panorama, characterized by the 30-year Enel monopoly, began to look towards new policies that aimed at starting a free competition process and at easing the entry of new private subjects in the electricity production field. These interventions, first of all, favoured the privatization process of Enel, then led to the deregulation of electricity production made from renewable sources.

These can be summarized in three categories:

- Deregulation of the electricity market. It started at European level by the 91/96/EU Directive that was introduced in Italy through the Legislative Decree no. 79 of 16th March 1999.
- Operation by private investors in the electricity production field as a solution for the chronic deficit in the capability to produce electricity in Italy;
- Promotion of investments in the renewable energy sector.

In particular, the legal instrument to promote the renewables was represented by the CIP 6/92 Program (Resolution n. 6 of the 29<sup>th</sup> April 1992), an incentive outline based on subsidies that allowed a faster return of the invested capital and attract investments to construct renewable sources plants. It promoted the exploitation of either Renewable Energy Sources or those sources incorporated by plants that had begun working after January 30th 1991 and it guaranteed the purchase of electricity by ENEL at favourable prices leaving open the quantity offered.

The price for the transfer of electricity produced from renewable sources was defined by two components:

- the cost component was prevented: for plant, activity, maintenance and fuel
- the incentive component: was based on the additional cost estimate per single technology.

There were differences in the two items due to time terms: while the incentive component was recognized only for the first 8 of the plant working, the cost component was permitted throughout the supplying contract that could last until 15 years.

Furthermore, the programme updated other cost components for the transfer of electricity like opportunity cost for the plants maintenance and management, general expenditures and fuel cost.

Through the Cassa Conguaglio del Settore Elettrico (Compensation Fund for the Electricity Sector), consumers directly paid for the cost of this incentive, as they still do. In this way, the risk for the investors was very low because both the components were yearly linked to the consumer price index.

Under this incentive scheme, in the last 10-15 year, the technology used to exploit renewable energy sources had a considerable development. The major results concerned the production from wind sources and biomass. In fact, the CIP 6/92 created an investment opportunity for a more than 10 billion Euro volume and encouraged about 6 GW of new nominal capacity. The programme effectiveness is further shown by the emergence of the first independent energy producers.

On the other hand, the cost of the Programme during the period 1992-2012 would be about 13 billion Euro (keeping into account only the incentive component attached to renewable plants). This Programme was, in other words, very expensive for consumers in economic as well as in time terms. An other problem concerning CIP 6/92 Programme was linking to the incentive of plants for assimilated sources. It means that efficient plants powered by fossil origin sources with a low environmental impact were also boosted: a 70% or more securities of the contributions was directed to this type of plants, instead of the renewable source plants. It considerably favoured the larger national electricity and industrial groups.

In conclusion, the experience of the CIP 6/92 Programme, although it showed clear application limitations, produced positive effects and created the market to produce electricity by renewable sources in Italy.

### **The Bersani Decree: the Green Certificates system**

The Legislative Decree 79/99, known as Bersani Decree, applied the Directive 96/92/CE on the unique European electricity market. This decree, at the article number 11, establishes new incentive mechanisms for the production of electricity energy from renewable sources and, at the same time, meets the market liberalization process.

It sets priority dispatching for renewable energy through GRTN (Gestore della Rete di Trasporto Nazionale - National Grid Operator) and the transition from a direct incentive system to an indirect and market oriented one.

Since 2002 there has been a new system for market incentive that is based on Green Certificates, or securities allotted to energy produced from renewable sources that has, progressively, replaced the previous system based on subsidised incentives linked to the 6/92 CIP Programme.

The objectives of this choice were: adopting a competition tool to support renewable sources and settling between their promotion and the creation of an electricity market. Each Green Certificate, under the Bersani Decree, corresponded to 100 MW/h produced by renewable energy source plants. Recently, the size was reduced to 50 MW/h. with the Marzano Law, which will be later discussed.

While the CIP 6 incentives were set by the authorities, the Green Certificates are set by fixing a percentage by law of the green energy to produce and it lets the price vary according to the market.

From a theoretical point of view the Green Certificate system is a cost-effective procedure in order to encourage the development of renewable sources.

In fact, it:

- lowers the cost of producing renewable energy, by favouring competition among producers
- attracts new operators in the market by obliging to produce a set quota of renewable energy over time.

The 2% of the electricity introduced into the grid by the thermoelectric producers and importers of electricity (for quantities 100 GWh or greater), have to be generated from RES. The standard involved also the electricity imported the previous year and after electrical power plant consumption, cogeneration, production from gasification plants that even use fuel of national provenance are subtracted.

The percentage of electricity generated from renewable energy plants (2%) increases yearly by 0.35% from the period 2004 – 2006.

This *producer-based system* is against to the Danish model that is based, instead, on a *consumer-based system*, where consumers have to respect the minimum quote obligation, which is calculated on the total electricity consumed.

There are three procedures to satisfy the obligation:

- purchase of Green Certificates (equal to the quota subject to the obligation) that are granted to producers of energy from new renewable source plants
- put in operation new renewable source plants (that will be awarded the related Green Certificates)
- import new renewable source from countries that adopt similar incentive tools on the bases of reciprocity.

Green Certificates are issued for an 8-year period after the plant starts working and is tested, and they are distinguished from the physical energy that they represent. Plants qualified to issue such securities have to have gone into operation after April 1<sup>st</sup> 1999, subsequent to strengthening, reconstruction, putting back into service or a new constitution, and receive the *Impianto Alimentato con Fonti Rinnovabili (IAFR – Plant Powered by Renewable Sources) Certification*.

In addition, the securities can be issued by following two alternate procedures:

- *on an estimate*, on request by the producer on the basis of the plants expected energy capability;
- *on the expenses held*, on the basis of the energy actually produced.

### **Market and pricing of Green Certificates**

Green Certificates can be negotiated through two kind of procedures:

- *reciprocal contracts*, free agreement between shareholders and producers, or importers, who are subject to the obligation
- *free exchange* in a market organized and regulated by the Electricity Market Operator (GME – Gestore del Mercato Elettrico)

Each operator that is authorized to take part in the market is granted a *property account*, where all operations related to the issuance and purchase of a Green Certificates are calculated and recorded. In order to guarantee a positive result for the transactions made on the market, the various participants have to pay to the GME a *caution money on the total amount*. Such amount corresponds to the number of Green Certificates that the subjects want to purchase multiplied by the *minimum conventional price* published by the GME at least five days before each session. If the counter value of the securities purchased is greater than the caution money paid, the operator has to make an additional

payment for the portion not covered by the caution. This has to be done within two working days subsequent to his receiving the GME confirmations. Bargaining takes place according to a continuous negotiation.

Prior to March 31st of each year, furthermore, producers and importers subject to the obligation have to transfer the quantitative equivalent to the National Grid Operator (GRTN). On the basis of the self-certification related to the quantity of electricity imported or produced through conventional sources and received the previous year, the GRTN checks the obligation compliance and, after a positive result, voids and removes the Green Certificates.

If a subject under obligation doesn't respect the minimum quota, it has 30 days, after the GRTN communication, to purchase and transfer the necessary quantity.

Market logic is at the basis of the process of pricing. If the Green Certificates issued from a renewable source are not able to cover the demand, the lacking quota is put on the market by the GRTN. In this case, the GRTN itself has to sell the Green Certificates at a price equal to the average of the invoice cost of green energy, purchased at the conditions set by the 6/92 CIP, once the revenue for the energy transfer is subtracted

In 2002 the demand was equal to 32,566 Green Certificates which amounts to 3.3 TWh, while the offer from private producers was equal to 9,144 Green Certificates (about 0,9 TWh). The remaining demand of 23,422 Green Certificates is covered by the Green Certificates of the GRTN. There has been during the year 2003 an additional increase in the amount of renewable energy to put on the network that is equal to 3455.1 GWh (+6.9% compared to 2002) and that is to say 34,551 Green Certificates. The greater burden weighs on producers who represent about 91.9% of the demand. To compensate and sustain the system as expressed by the GRTN in these first months a reference price equal to 8,418 € c/kWh has fixed for 2002 and of 8,240 € c/kWh for 2003.

In 2004, 20'439 certificates, 2.044 TWh, were exchanged on the market: Out of the total, 20'419 were generated in 2003 and 20 in 2004. The GRTN sold 19'452 of these certificates. The cash flow of these operations amount to 202 million euro. The average price of each certificates was for 2003, 9.888 € c/kWh and for 2004, of 9.725 € c/kWh.

### **The Legislative Decree no. 387 of 29<sup>th</sup> December 2003: changes to the Green Certificates system**

The Green Certificates system started with the Bersani Decree did not differentiate incentives among the various energy sources. The experience gathered in developing plans in this field highlighted how the system seemed to be asymmetric in its efficient support of some sources, such as wind source. It poses some difficulties in the construction of plants that exploit less competitive resources and technology, such as biomass, thermo-solar and photovoltaic. In such a perspective, the Legislative Decree no. 387/2003, issued to put into place the European Directive 2001/77/CE relating to encouragement of electricity produced from Renewable Energy Source, tries to offer a valid solution to the problem by promoting a sustainable and fair development of plans through specific support tools.

As said before, the Legislative Decree boosts the Green Certificates system by a 2% increase of the minimum condition quota: the percentage of electricity from renewable source that must be put into the national electric system is yearly increased by a 0.35% factor during the 2004-2006 period. Subsequently, the Ministry of Productive Activities shall define additional increases for the three-year period 2007– 2009 and 2010.

It is interesting to compare the development of the demand for Green Certificates in two different scenario. On the basis of the variations recorded during the last 10 years, we can

hypothesise an annual growth of electricity consumption equal to about 2% considered a taxable base of 173 TWh

In the first scenario the obligation quota is fixed and the increase in demand for Green Certificates is solely established by the increase of demand for power; likewise, in the another scenario the annual constant increase of the obligation quota is hypothesised.

In the first case, beginning with a demand for 3,46 TWh Green Certificates in 2003, there is an increase of 0,21 TWh (about +6%) of the Green Certificates demand for 2007. In the second case, however, the increase is of 1,5 TWh (about +43%); on a chart, this difference becomes quite evident.

### **Term of the Green Certificates and Penalties**

The possibility of increasing the term of the Green Certificates beyond eight years is a measure that allows to provide better incentives to technology that is less supported by the Green Certificates system: biomass or waste systems, with specific reference to the plants that received no incentives in capital account.

But this measure has to be applied without doubts and or perplexities. Investors has to manage to choose and organize the financing plan by requiring a contribution in capital account or the extension of the term of the issue period for the Green Certificates. For this reason a penalty measure towards defaults to the obligation has been introduced. This feature supplies the system with the strictness necessary to stabilise the system, above all with investors and financial backers within the renewable energy field.

### **Green Certificates Eligibility**

Legislative Decree no. 387 allows, furthermore, increasing to three years the eligibility of the Green Certificates. In this way it reduces the volatility of the securities price with important repercussions on the plans financing. If we hypothesise about a year characterized by Certificates over production not balanced by demand, the price would not lean toward zero but would be close to the zero expected for the subsequent year which is itself determined on the *forward* market (if we take the *forward* as a correct estimator of future expectations). If the Certificates validity were to be extended to more years, we would be heading towards a greater stability because the price determination process in short term would reduce the expectations of long term prices.

The financial derivatives can be applied as options or futures to cover a possible negative price fluctuation because Green Certificates can be compared to *commodities*. Nevertheless, at this time, creating a market of derivatives does not seems to be easily applicable: the market is going through its initial development phase and it is necessary to wait for its maturity stage and it has individuals with heterogeneous expectations, a high enough exchange volume and greater liquidity.

### **Marzano Law: Law n°239 of 23<sup>rd</sup> August 2004**

The Marzano Law arrange the Italian energy sector and involve, also, the renewable energy sources. Under this regulation electricity generated by hydrogen and fuel cells and the energy produced by cogeneration can emit Green Certificates. Not only, as said before, the recent law have changed the Green certificates size from 100 MWh to 50MWh

### **Differences between CIP 6/92 Program and Green Certificates**

In synthesis these are the main differences between the two incentive mechanisms.

CIP 6/92 Program is based on these points:

- guarantee acquisition of produced energy put on the grid
- green energy purchasing price is defined by law
- incentives costs is paid by consumers

Green Certificates mechanism is based on these points:

- Energy produced by certificated IAFR plants applies to Green Certificates
- Energy transfer is separate from Green Certificates
- Energy and Green Certificates are regulated by market mechanism
- Electricity wholesale dealers are obliged to purchase Green Certificates

Thermoelectric producers are obliged to buy a quota of 2%, of their total production, of Green Certificates. This can stimulate investments of renewable energy plants by thermoelectric producers.

### **Conclusion**

In the furrow of the strict regulatory approach begun by the Bersani Decree and by the application standards compiled by the AEEG (Authority for Electrical Energy and Gas), Italy finally rid itself from the ambiguous incentive policy towards the so-called “assimilated sources”. The Legislative Decree no. 387 of 29<sup>th</sup> December 2003 took an additional step toward the creation of a virtuous mechanism to support renewable energy sources, which is moved more by the market than by the public sector.

In the financial organization of a renewable source plant, the contribution offered by Green Certificate systems is crucial and offers the guarantee of economic sustainability. As already seen, despite the current limitations, the price of Green Certificate is, and will become more in the future, subject to market fluctuations. We can certainly expect, as it happened with the introduction of the Bersani Decree, that new professional figure will emerge and have a role in the future Green Certificates system. With the sale deregulation and electricity importing, for the first time, the Italian scene saw private electricity *traders*, consumption consortiums and *advisors* with expertise on regulation topics. We think that in the future Certificates market there will be some space for *advisors* whose expertise role is in Green Certificates negotiation, management and coverage.

Even if it is still in a limited manner, new figures of this type are emerging in Italy. On behalf of developers of renewable source plants, they perform support activity in the management of Green Certificates produced, such as Green Certificates *trading*, both on the *spot* market and through negotiating long term contracts (PPA) that are necessary for plans eligibility from the plan financing perspective