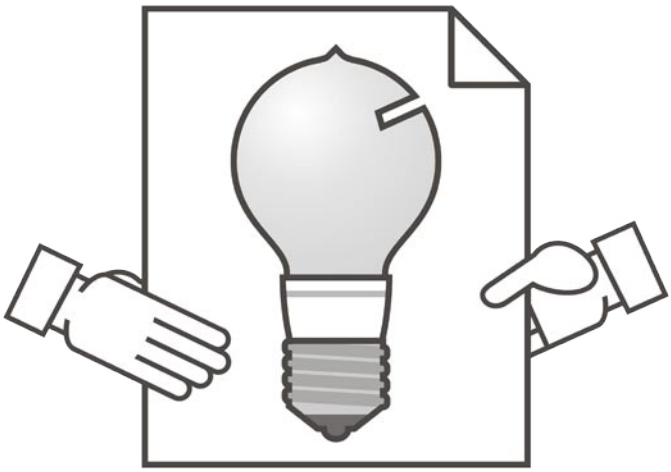

EuroWhiteCert
PROJECT

White Certificates: concept and market experiences

This brochure is printed in the scope of the EuroWhiteCert project.
For more details on the project and its project partners please visit the project website or contact the project manager at **nicola.labanca@polimi.it**.

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Introduction

The European Institutions (Commission, Parliament and Council) are declaring a new committment to strongly enhance the uptake of energy efficiency in the European Union. New Directives have been formulated (e.g. the Directive on promotion of energy efficiency and energy services) and the Green Paper on energy efficiency was issued to act as a catalyst to this renewed policy uptake.

The white certificate scheme is one of the key new instruments that is foreseen to support energy efficiency improvements. A (tradable) white certificate scheme does not replace but complements existing policies and measures, and aims to contribute to achieving current or newly formulated energy efficiency targets in a cost-effective way. As a representative of a set of market-based instruments in the European internal market it builds upon experiences with similar types of schemes such as the EU emissions trading scheme and green certificate schemes.

This brochure provides further information on the experiences obtained with the system and the key design elements at national and European level. It therewith explores the possibilities for implementation of such a scheme at European level.

Goals

The objective to increase energy saving in Europe serves multiple goals. Lowering energy demand will increase the security of energy supply, reduce greenhouse gas emissions and improve air quality. Introduction of new energy-efficiency technologies could make a major contribution to EU competitiveness and employment.

A white certificate scheme is meant to facilitate achieving energy saving targets. By means of certification it aims to guarantee the achievement of a claimed amount of energy saving. The tradability aspect enables to meet the objective in a cost-effective way.

Key benefits of a TWC system:

- Certification guarantees meeting the agreed target.
- Introduction of tradability aims at least-cost achievement of targets.
- The system could unlock energy saving potentials and actors that are currently not unlocked by other instruments.
- Can reduce pressures on public budgets
- Can stimulate the market for ESCOs

Possible drawbacks of a tradable white certificate scheme:

- Might target only efficiency increases, not overall reduction of energy consumption
- Could involve large transaction costs
- Might favor mainly actions easy to implement and measure
- A European system may require substantial harmonization in energy policies.

Implementation

White certificates have up to now been used in combination with an obligation scheme. Market actors (usually retail energy suppliers or distributors) are obliged to reach a certain amount of energy saving. Target compliance requires submission of a number of certificates commensurate with the energy saving target. Certificates can be created from projects that result in energy savings beyond business as usual, by target market actors or by Energy Service Companies (ESCOs)

The market actor receives certificates for savings achieved, which can be used for their own target compliance or can be sold to (other) obliged parties. It should be noted that a white certificate scheme does not necessarily imply introducing the possibility of trading.

Design of the White Certificate Scheme

Establishment of any certificate scheme is not an easy task. The illustration below sketches the key steps in setting-up a certificate scheme.

Choices made on a large number of design elements will strongly influence the success and operability of the scheme.

Key issues to be dealt with include:

- How can appropriate target levels be defined?
- For what period should targets be specified?
- What party will get the obligation to meet targeted savings?
- How can it be ensured that all customer groups contributing to funding the scheme will also receive benefits?
- What is the most appropriate period of compliance?
- What will be the validity of the certificates, and will banking and/or borrowing be allowed?
- What types of projects, in what sectors are eligible to receive certificates?
- What interactions will exist with other policy instruments?
- How can double counting with other policy instruments be avoided?
- What type of measurement and verification system should be adopted to optimally balance costs and accuracy of the energy savings as well as simplicity and cost-effectiveness of the verification?
- How can it be ensured that the entity issuing the certificates is independent and technically qualified?
- How can it be assured that the market created is sufficiently liquid?
- How can the system assure acceleration of innovative energy saving technologies?
- How can energy savings from behavioral programs be evaluated and included into the scheme?

Experiences in Europe

In Europe several countries have already implemented a white certificate scheme or are seriously considering doing so. Italy has started a scheme in January 2005; France a year later. Great Britain has combined its obligation system for energy savings with the possibility to trade obligations and savings (only among the obliged parties and through bilateral contracts). Denmark and the Netherlands are seriously considering introduction of a white certificate scheme in the near future. Flanders (Belgium) has implemented an energy saving obligation for energy grid companies without tradability of certificates.

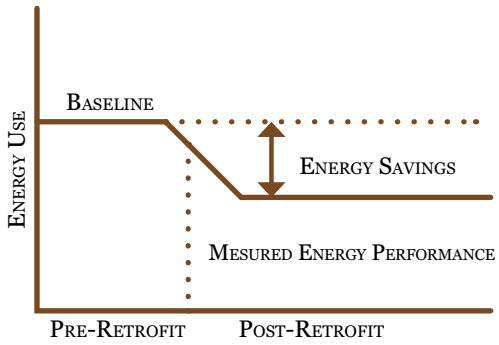
Demand in most schemes is created from an obligation on electricity and gas retail suppliers, with the exemption of Italy that has chosen to obligate its distribution companies.

Country	Target and period	% of annual demand
Denmark	7.5 PJ/yr in 2006-13	1.7% (end year)
France	194 PJ total in 2006-08	1% (average)
Great Britain	468 PJ total in 2005-08	1% (average)
Italy	230 PJ total in 2005-09	0.5% (average)
Netherlands	65 PJ total in 2020	1.8% (end year)

The sector and technology coverage of the schemes varies largely. Whereas in France in principle energy saving measures in all sectors and for all types of fuels are eligible as long as they are not already covered by the emissions trading scheme, Great Britain restricts itself to measures at households and has a specific requirement to realize at least half of the savings in the social housing sector. Italy again includes all energy end-use sectors as well as intermediate uses in the gas sector. Italy has a special provision that at least half of the savings should be achieved via a reduction in electricity and gas end-use.

Measurement and verification

Measurement and verification (M&V) is the key for effective tradable certificates mechanism applied to the promotion of energy efficiency in end-use sectors. As savings cannot be measured they need to be calculated by comparing measurements of energy use and/or demand before (i.e. the baseline energy use) and after implementation of the saving measure, see the figure below.



However, baseline conditions can change after the saving measure has been installed. Such changes could include changes in baseline conditions, in equipment performance, and in external conditions (e.g. weather conditions). Clearly a methodology for verifying and certifying the projects and their savings is a necessity for a sound certificate system. Various systems are in place; each with different levels of exactness and costs. These range from engineering methods based on detailed calculations that are calibrated with onsite data to end-use metering where energy use is actively measured with specialized equipment and expertise. The more sophisticated the method, the higher the costs. There is no overall preferred method for all projects.

Clearly extensive and complicated M&V can be way too costly for the small and medium-size projects. Parties have therefore developed ex-ante M&V protocols that pre-define saving factors for each type of project. Using these methods the costs of M&V – and therewith total certification costs – are significantly lowered. Three countries have successfully developed and tested a number of ex ante formulae covering most of small and medium size projects. For example the use of Compact Fluorescent Lighting in Italy uses a single saving factor per bulb that has been tuned to represent the likely energy savings, taking into account limited time of use, non-additionality, failure and breakage, etc. All calculations have been dealt with in statistical manner.

No matter whether ex-ante or ex-post methods are used, harmonisation of the verification process is crucial to avoid uncertainty, duplication of effort and a potential loss of credibility in the market. M&V methodologies could be standardized for certain specific projects and for some specific sectors.

Key actors in white certificate schemes

- Government bodies, setting up the system and appointing bodies to control the operation of the system.
- Retail energy suppliers or distributors, usually the targeted market actors that are assigned an energy saving target.
- Energy service companies that can create certificates from energy saving projects.
- Housing corporations that can create certificates from among others building renovations.
- ETS participants that need credits for compliance with the EU emissions trading scheme.

Tradability and liquidity of certificates

Tradable market systems are usually set up to achieve the targeted goals against the lowest price. In order to realize this cost-efficiency, the market needs to be sufficiently transparent and liquid. The optimal market would have a large number of trading parties that have sufficient information on products and prices and sufficient opportunities to trade.

Market transparency and liquidity can be enhanced by among others:

- Exchange platforms which publish volume and price of transactions
- Broadening the geographic scope of the market (e.g. linking to other systems, allowing for imports and exports of certificates)
- Allowing (limited) banking and borrowing of certificates
- Providing certainty on demand (e.g. by formulating both long-term and intermediary targets)
- Development of a forward market
- Introduction of financial products

Interaction with other schemes

White certificate schemes may interact strongly with other important schemes and objectives within the EU energy policy framework. Their contribution to generating additional energy savings results in reduced primary energy demand and hence reduces greenhouse gas emissions. Therefore a white certificate scheme may lower the costs of the EU emissions trading scheme.

As targets for renewable electricity are generally formulated in relative terms (as a share of overall electricity demand), the energy saving effect of white certificates may also reduce the total cost of the achievement of European targets to increase the share of renewable energy.

On the other hand, when falling electricity demand leads to falling average wholesale prices of electricity, the costs of meeting renewable energy targets may rise again.

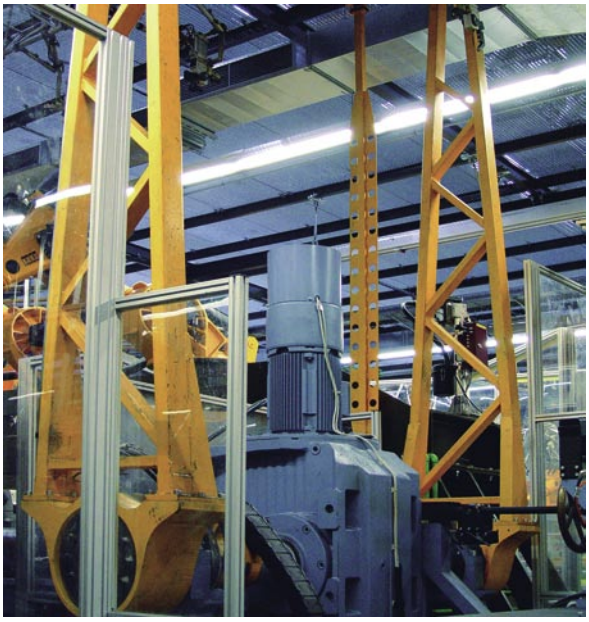
A white certificate scheme reduces the need for energy saving subsidies, but at the same time it reduces the revenues from energy taxes (if rates remain unchanged). It is recommended that supporting measures (such as energy surveys and/ or information about relevant cost-effective energy saving measures) that aim to enhance market transparency and inform both obliged parties and end-users about saving options, potentials and costs are stepped up.

Example projects

What kind of projects would result in the creation of white certificates? Below follows an illustration showing what types of projects that have actually been implemented could have qualified for a white certificate scheme, the parties involved and the amounts of savings involved.

Application of high-efficiency motors in a Portuguese industrial glass company.

Instead of the cheaper option of repairing its existing motors the company applied new and more efficient motors, realizing total savings of 144,060 kWh/year.



Example projects

Promotion of Compact Fluorescent Lights

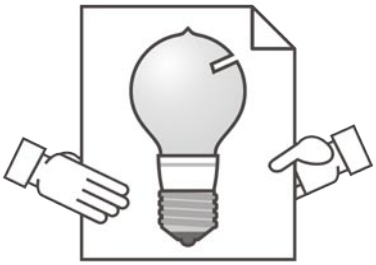
French Municipal bodies have promoted the use of CFLs. F.e. local energy agency ADUHME decided to diffuse 10,000 CFLs in a town of 22,000 inhabitants, Clermont Ferrand. A total of 12,396 CFLs were sold by the local supermarkets and associations of employees corresponding to nearly 6,000 MWh saved over 6 years.

Renovation of schools in Hungary

The municipality of Óbuda (III district of Budapest) has 127,000 residents and 108 municipal buildings with an average age of 30-40 years. Six of its buildings (schools) were renovated, including replacement of 4721 m² window frames, 1794 m² front wall insulation and 8466 m² roof insulation. Expected annual primary energy savings after refurbish-ment amount to 6,276 GJ/y, 30% of total primary energy consumption before the renovation.

Terminology explained

- *Additionality*: projects realized in white certificate schemes should realize savings in addition to savings that are realized anyway because of other existing supporting policies.
- *Base line*: the reference developments in energy use in a specific project
- *End use energy*: a measure of the energy content of fuels at the point where they are consumed.
- *Ex-ante calculation of energy savings*: a calculation method that pre-defines the amount of energy used and saved by a measure before its implementation.
- *Ex-post calculation of energy savings*: calculation of savings after the measure has been implemented.



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