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Energy Efficiency Obligation Schemes in Europe — Overview and analysis of main features and possibilities for harmonisation

National foreword

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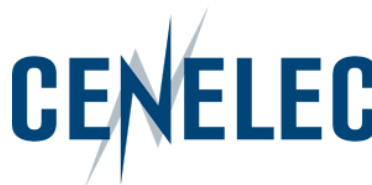
**Energy Efficiency Obligation Schemes in Europe - Overview and
analysis of main features and possibilities for harmonisation**

Mécanismes d'obligations en matière d'efficacité
énergétique en Europe - Vue d'ensemble et analyse des
principales caractéristiques et possibilités d'harmonisation

Energieeffizienzverpflichtungssysteme in Europa -
Überblick und Analyse der wesentlichen Merkmale und
Möglichkeiten zur Harmonisierung

This Technical Report was approved by CEN on 5 August 2013. It has been drawn up by the Technical Committee CEN/CLC/JWG 2.

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Foreword

This document (CEN/CLC/TR 16567:2013) has been prepared by CEN/CLC/JWG 2, Guarantees of origin and energy certificates, the secretariat of which is held by SIS.

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Introduction

The purpose of this Technical Report is to describe and analyse the energy efficiency obligation schemes and white certificate schemes which are in operation in some of the European countries. Based upon this analysis and taking into consideration the content of the newly approved energy efficiency Directive, a recommendation is given regarding the need for a possible harmonisation of the schemes through standard or other guidelines.

The interest in energy efficiency obligation schemes and white certificate schemes has increased very much since the European Commission presented its proposal for an energy efficiency directive on the 22nd of June 2011 and in which it was suggested to make this type of schemes mandatory for all EU Member States. In the Directive, approved by the Parliament on the 11th of September and the Council on the 4th of October 2012, it is stated that each country can either introduce an energy efficiency obligation scheme or use other policies and schemes in order to obtain the same energy efficiency improvements. Although all Member States can have their own energy efficiency obligation schemes, it could create some benefits if there were some kind of harmonisation of the schemes. Therefore CEN/CENELEC believe it is important to analyse the existing energy efficiency obligation schemes and white certificate schemes and come up with a recommendation if there are some advantages for Europe to write a standard or similar guideline.

The work with a technical report about white certificate schemes was initiated by Sector Forum Energy Management (SFEM), which is a CEN/CENELEC group for coordination of standardization work in the field of energy efficiency. SFEM was created in 2006 together with some joint work groups (JWGs) where the actual work to write standards take place. Besides coordinating the existing standardization work, SFEM also investigates the need for new standards. In line with this role, SFEM started a work group (WG) about Energy certificates already in 2007 that resulted in the recommendation to form a CEN/CENLEC JWG with the task to write a standard for Guarantees of origin and a technical report about white certificate schemes, see Figure 1. This group started up its work in June 2010 and during the first year the work was totally concentrated on writing the standard for Guarantees of origin but from September 2011 work has been going on with this Technical Report.

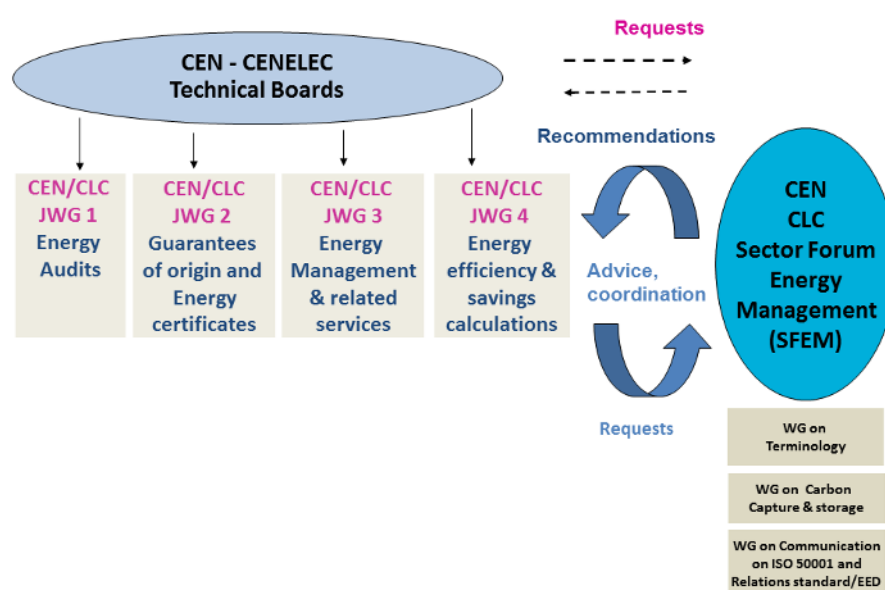


Figure 1 — Organisation chart CEN/CENELEC standardization work in the field of energy efficiency

1 Executive summary

This Technical Report describes and analyses different ways to achieve energy efficiency improvement through energy efficiency obligation schemes and white certificate schemes based on experiences in Europe. It also focuses on if there is a need and/or possibility to harmonise a system in Europe (i.e. to write a standard) as well as to look into why some countries are hesitant to introduce energy efficiency obligation schemes and white certificate schemes at the moment.

The terms energy efficiency obligation schemes and white certificate schemes can be somewhat confusing since they are used differently in different countries. There is no harmonised definition for these terms but an explanation of the design of the schemes is included in this Technical Report. It is not only that the terms “energy efficiency”, “obligation schemes” and “white certificate schemes” are not harmonised; these schemes are also used in different ways in the different countries and their purpose of use differs as well. Together with the fact that conditions for using these schemes and to achieve energy efficiency improvements differ very much from country to country makes it is complicated to harmonise these schemes. Furthermore, it can be noted that the same energy efficiency improvement action in the existing schemes very often is claimed to result in different amount of energy savings according to the calculation methods in the different schemes.

For this Technical Report mainly data and information about the energy efficiency obligation schemes and white certificate schemes in four different countries have been used. These countries are France, Italy, Denmark and Great Britain. The reason for selecting these countries is that their existing schemes have been in operation for some years (since 2005 in some cases) and information was easily accessible. There have been members of all these countries in the group producing this Technical Report and meetings have been arranged in Rome, Paris, Copenhagen and London during 2011 and 2012 in order to collect the best available information and data. However, in some tables a limited amount of information about similar schemes in some other European countries has been included. A general description about the energy efficiency obligation schemes and white certificate schemes in different countries can be found in Clause 6 and more detailed information regarding the schemes in the four specific countries, including experiences and further development, is included as an annex.

The Directive for energy efficiency states that each country can either introduce an energy efficiency obligation scheme or use other policies and methods in order to obtain the same energy efficiency improvements. It is therefore important for the purpose of this report to describe both the energy efficiency obligation schemes and the white certificate schemes which are in operation in some European countries taking into consideration also the other instruments used by some of them to reach energy efficiency. Illustrating the different ways to obtain the necessary energy efficiency this Technical Report gives voice also to objections moved against the energy efficiency obligation schemes. For some countries an EEOS seems to fit in and bring the desired benefits and results. In other countries, both local market conditions and the historical experience of implementing energy efficiency measures means that alternative measures to EEOS are preferred to facilitate the achievement of energy efficiency targets. More about this can be found in Clause 7 in this Technical Report. Regardless of which approach the Member State chooses the approach is to be evaluated by the use of the same methodology (Annex V in the Directive).

The most drastic recommendation that could come out of this Technical Report would be to suggest an extensive standard that would require a totally harmonised energy efficiency obligation scheme or white certificate scheme to be used in all EU countries. But since several countries do not want to introduce energy efficiency obligation schemes or white certificate schemes it seems like the need and possibility to create this type of standard is rather small. Moreover, there appears to be little interest for a harmonised system among countries with existing energy efficiency obligation schemes or white certificate schemes as this will entail countries to make extensive changes in their own individually designed schemes. With this combination of very different conditions in different countries, a harmonised energy efficiency obligation schemes or white certificate schemes might not be suitable and it could be better to continue with the specially designed systems in each country.

Typical for all energy efficiency obligation schemes and white certificate schemes in operation today is that there is no common way to calculate the achieved energy savings. The result of this is that the same energy efficiency action will be valued differently even after local conditions, i.e. climate, have been excluded. Since the Directive does not specify the calculation methods to be used, this Technical Report concludes as its

recommendation that a harmonisation of the calculation methods used to achieve energy savings could be a possible way forward.

2 Scope

This Technical Report, analyses and describes the concept of energy efficiency obligation schemes and white certificate schemes for energy efficiency improvement, based on the experiences in Europe. It is mainly focussed on the current systems in use in Italy, France, Denmark and Great Britain. These national systems have been in operation long enough to gain some valuable experiences about the systems. Information about these experiences is easily accessible. Some additional information about the regional system in Flanders, Belgium, Poland, Ireland, Spain and Portugal have been included in this Technical Report when considered relevant.

This Technical Report also analyses the need and/or possibility to harmonise a system in Europe (i.e. to write a standard). It also includes an analysis of some countries' hesitation to introduce white certificate systems.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

energy

electricity, fuels, steam, heat, compressed air, and other like media

Note 1 to entry: For the purposes of this document, energy refers to the various forms of energy, including renewable, which can be purchased, stored, treated, used in equipment or in a process, or recovered.

Note 2 to entry: Energy can be defined as the capacity of a system to produce external activity or perform work.

[SOURCE: EN ISO 50001:2011, definition 3.21]

3.2

energy consumption

quantity of energy applied

[SOURCE: EN ISO 50001:2011, definition 3.7]

3.3

primary energy

energy that has not been subjected to any conversion process

Note 1 to entry: Primary energy includes non-renewable energy and renewable energy. The sum of primary energy from all energy sources may be called "total primary energy."

[SOURCE: CEN/CLC/TR 16103:2010, definition 4.1.6]

3.4

energy conversion

transformation of the physical or chemical form of energy

Note 1 to entry: The term "energy transformation" may be used with this meaning.

[SOURCE: CEN/CLC/TR 16103:2010, definition 4.1.7]

3.5

energy service provider

natural or legal person who delivers energy services or other energy efficiency improvement measures in a final customer's facility or premises

[Proposal for a Directive on energy efficiency and repealing Directives 2004/8/EC and 2006/32/EC, Article 2, definition 24]

3.6

obligated energy entities

some entity of the energy provision chain (e.g. the energy distributors or retail energy sales companies) that are bound by the national energy efficiency obligation schemes

3.7

energy distributor

natural or legal person, including a distribution system operator, responsible for transporting energy with a view to its delivery to final customers or to distribution stations that sell energy to final customers

[Proposal for a Directive on energy efficiency and repealing Directives 2004/8/EC and 2006/32/EC, Article 2, definition 7]

3.8

energy retailer

natural or legal person who sells energy to final customers

3.9

final customer

natural or legal person who purchases energy for his or her own end use

[Proposal for a Directive on energy efficiency and repealing Directives 2004/8/EC and 2006/32/EC, Article 2, definition 10]

3.10

energy end user

entity consuming final energy

Note 1 to entry: The energy end user may differ from the customer who might purchase the energy but does not necessarily use it.

[SOURCE: CEN/CLC/TR 16103:2010, definition 4.2.2]

3.11

energy audit

systematic procedure to obtain adequate knowledge of the existing energy consumption profile of a building or group of buildings, an industrial or commercial operation or installation or a private or public service, identify and quantify cost-effective energy savings opportunities, and report the findings

[Proposal for a Directive on energy efficiency and repealing Directives 2004/8/EC and 2006/32/EC, Article 2, definition 12]

Note 1 to entry: "Energy audit" is the normal expression in English but can cause confusion when translated due to the word "audit" having multiple meanings. Suitable expressions can be used when translating into other languages, for example: "diagnosi" in Italian, "diagnostic" in French

Note 2 to entry: An energy audit may include recommendations for energy efficiency improvement actions and a cost-benefit analysis.

[SOURCE: CEN/CLC/TR 16103:2010, definition 4.6.5]

3.12

white certificate

official certificate, tradable on an open market or bilaterally, issued by an authority or an independent certifying body, confirming the claims of energy savings by an entity consequent on energy efficiency improvement actions

Note 1 to entry: By 2009, a "white certificate" mechanism has been used by three European countries (Italy, France and United Kingdom) in three different ways.

[SOURCE: CEN/CLC/TR 16103:2010, definition 4.3.11]

3.13

energy efficiency

ratio between an output of performance, service, goods or energy, and an input of energy

Note 1 to entry: Both input and output need to be accurately defined in quantity and quality, and be measurable.

Note 2 to entry: Energy efficiency is commonly used with the meaning of "Optimum Energy Efficiency", namely: "To operate (an entity) with minimum energy consumption".

Note 3 to entry: Commonly used sense of energy efficiency is doing at least the same with less energy.

[SOURCE: CEN/CLC/TR 16103:2010, definition 4.3.1]

4 Summary of the Energy Efficiency Directive

4.1 Background

Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC [OJ 32012L0027].

This Directive includes a number of provisions with the aim to increase energy efficiency in the EU and to contribute to reach the EU target of 20 percent reduced primary energy consumption compared to a reference scenario of 1842 Mtoe by 2020.

The EU is, according to the European Commission, presently not on track to reach its objective and according to calculations only achieving about 10 percent, hence the need for more measures.

This Directive aims at closing the gap and resulting in a primary energy use of 1474 Mtoe by 2020, i.e. a reduction of 368 Mtoe.

4.2 Main measures in the Directive

The Directive covers a number of measures of energy efficiency together with measures aiming at promoting a more wide-spread use of high-efficiency cogeneration and efficient district heating and cooling in Member States.

Article 7, where the provisions regarding energy efficiency obligation schemes can be found, will be summarised below but first a very brief introduction to the other measures in the Directive.

- Member States shall set indicative national targets for energy efficiency taking into account the ceiling for energy use in 2020 (art 3).
- Public sector should set a leading example by *inter alia*, refurbishing 3 percent of the floor area of central government buildings annually (art 5) and establish a long-term strategy for mobilising investment in the renovation of the national stock of residential and commercial buildings, both public and private (art 4a).

- Member States shall ensure that central governments purchase only products, services and buildings with high-energy efficiency performance (art 6).
- Member States shall promote the availability to all final customers of high quality energy audits (art 8).
- Member States shall ensure a number of improvements regarding metering and billing information (art 9, art 10 and art 11).
- Member States shall carry out a comprehensive assessment of the potential for the application of high-efficiency cogeneration and efficient district heating and cooling and adopt policies which encourage that the potential of using efficient heating and cooling systems, in particular those using high efficiency cogeneration, is duly taken into account at local and regional levels (art 14).
- Member States shall *inter alia*, ensure the removal of those incentives in transmission and distribution tariffs that are detrimental to the overall efficiency (including energy efficiency) of the generation, transmission, distribution and supply of electricity and (art 15).
- Member States shall promote the energy services market and access for small and medium-sized enterprises to this market (art 18).
- Member States shall evaluate and if necessary take appropriate measures to remove regulatory and non-regulatory barriers to energy efficiency notably as regards the split of incentives between the owner and the tenant (art 19).
- Member States shall facilitate the establishment of financing facilities or use of existing ones for energy efficiency improvement measures to maximise the benefits of multiple streams of financing (art 20).
- By the 30th of April 2014, and every three years thereafter, Member State shall submit National Energy Efficiency Action Plans (art 24).

4.3 Summary of article 7 Energy efficiency obligation schemes

4.3.1 Result to be achieved

It is fair to say that article 7 is a central article in the Directive, not only because it lays down the principles for an energy efficiency obligation scheme, but because it lays down an obligation on Member States to achieve an equivalent result, even if such a scheme is not introduced. The result that member states shall achieve is new end-use energy savings equivalent to 1,5 percent of the annual energy sales to final customers by volume, averaged over the most recent three-year period prior to the 1st of January 2013. The sales of energy, by volume, used in transport may be partially or fully excluded from this calculation.

Besides excluding energy sales from the transport sector from the calculation, member states can for instance exclude energy sales in the EU ETS sector, use a lower percentage of annual savings the first years, allow energy savings achieved in the energy transformation, distribution and transmission sectors and energy savings resulting from early actions. The sum of these reductions cannot however exceed 25 percent of the 1,5 percent target.

According to article 7 Member States can either introduce an energy efficiency obligation scheme (EEOS) or other measures having an equivalent effect.

4.3.2 Energy efficiency obligation schemes (article 7 (1))

The EEOS or equivalent policies shall be evaluated with the use of measurement, control and verification systems that are carried out independently from the obligated parties. Obligated parties are energy distributors and/or energy retailers. A representative sample may be used when verifying the results.

Member States may include social aims in the EEOS (for instance targeting low income households) and can permit the obligated parties to use energy service providers or third parties to fulfil their obligation.

Member States shall annually publish the energy savings of each obligated party.

In Annex V common methods and principles for calculating the impact of energy efficiency obligations schemes or other policy measures under article 7 (1) and (9) can be found.

4.3.3 Other measures having an equivalent effect (article 7(9))

Member states have a substantial flexibility to introduce other measures to achieve the same effect as with EEOS.

This option in the Directive reflects the policy measures already in place in member states and the reluctance of some Member States to introducing EEOS. Such allowed measures are for instance energy or carbon tax, financing schemes, voluntary agreements, standards and norms, national energy labelling schemes and advisory programs. The key word, as for EEOS, is the obligation to verify the alternative policy measures effect and thus achieving the same result.

The same annex as for EEOS, Annex V, is to be used for calculating the impact of policy measures having an equivalent effect.

5 General description of energy efficiency obligations and white certificate schemes

5.1 General

In this clause¹ a general overview of white certificate schemes is provided. In the first sub-clause, the relationship between energy efficiency measures, energy efficiency obligations and white certificate schemes is stated. The rest of the clause concentrates on white certificate schemes in particular including the key elements of WC schemes.

5.2 The theory of energy efficiency obligations and white certificate systems

There are many different policies to incentivise the adoption of energy efficiency measures (an overview can be found in IEA, 2010². One of the measures for incentivising energy efficiency among end users is the energy efficiency obligation (EEO).

All EEOs operate to the same principle, i.e. authorities impose energy efficiency obligations on some part of an energy provider, which they shall fulfil by satisfying the administrator of the scheme that they have carried out sufficient energy efficiency activities among eligible end use energy customers to meet their obligation. A white certificate (WC) is awarded by the scheme administrator and used as the means to verify a certain amount of reduction in energy consumption and that obliged parties have sufficient number of WCs to meet their energy saving targets. The obligated parties can decide whether to implement energy efficiency measures to end-users themselves or to subcontract the work to energy efficiency specialists or purchase verified energy savings (white certificates), depending on their marginal costs and the price of the white certificates is either set in a spot-market or in a bi-lateral trading. The term tradable white certificates (TWC) in this report is used to describe the situation where others than the obligated parties can generate white certificates and there is a functioning market to trade them on.

White certificate schemes involve a number of design variables, and the choices made for these variables may have an important influence on efficiency and effectiveness of the system. The variables include: sources

¹ This clause is partly reproduced from the report *White certificate system and their applicability in Finland* (May 2011) by Pöyry Management Consulting available at http://energia.fi/sites/default/files/whitewcertificatesystemapplicabilitytofinland_report_final.pdf

² IEA, 2010. Energy Efficiency Governance Handbook.

of demand for certificates; defining and allocating targets; defining and certifying energy efficiency activities; monitoring and verifying energy efficiency activities; compliance procedures and enforcements and market characteristics and operation. The remaining sub-clauses explain the variables in more detail.

5.3 Sources of demand for white certificates

The choice of obliged party is between the distribution company or retailers in the case of electricity or gas market actors. A tradable white certificate system is optional in an obligation system. De facto, the minimum is the possibility to exchange obligations among obliged parties (UK) to the possibility for everybody to buy and sell certificates (IT, FR). Furthermore, the perimeter of actors that can generate certificates by implementing energy efficiency improvements can go well beyond the obliged parties if public authorities chose to do so (IT, FR). The sectors (residential, commercial, transport, ETS, etc...) where energy efficiency improvements can be generating certificates is also a design parameter.

Electricity and natural gas distribution companies act as natural monopolies and are thus under regulation. In that respect additional obligation could be relatively easy to implement on distribution companies. On the other hand regulation of distribution companies' right to collect costs related to the EEO from end users shall be in line and transparent with regulation of regular distribution tariffs. Also, unless legislation is in a place which decouples the energy distributors' profits from their volume sales of the energy distributed, there is clearly a dis-incentive for them to reduce sales through energy efficiency.

Energy retailers generally have a well-established and direct relationship with the end-users. That should give retailers incentives to promote services related to energy efficiency. Energy retailers unlike monopoly distributors have a direct relationship with the end use customer and in a liberalised energy market, offering energy efficiency measures may improve customer loyalty and retention. Furthermore, electricity retail being a competed branch ensures cost efficiency of energy efficiency measures and the costs of the EEO are regarded as "cost of business" like other environmental requirements. Competition and market concentration are 1 NERA (2005) however aspects that need to be addressed when imposing obligation on retailers. WC should not distort competition e.g. by favouring small or big companies or hindering development of new entrants and/or international retail markets.

5.4 Defining and allocating targets

The authorities shall set the size of a white certificate target. The size of the target depends on the level of ambition of the authorities and this shall be balanced against costs of the obligation ultimately borne by end-use customers. In addition, it needs to be decided what type of target is to be used, i.e. relative or absolute savings of energy, whether the saving is of primary or delivered savings and whether the target is set in terms of annual or lifetime energy savings. In addition, a decision on whether the target should be increased over time, and on the length of the period the target is valid for, shall be taken. These questions need to be addressed regardless the mechanism that is selected for increasing energy efficiency and do not, per se, relate to a particular WC-mechanism.

The individual obligations are placed on all the relevant energy providers based on their share of the volume of energy they provide, although variants have been used e.g. residential customer numbers or a combination of energy delivered and its value. Allocating an energy efficiency target to certain actors does not necessary require inauguration of white certificates. The purpose of the certificates is firstly to document transparently achieved energy savings and secondly create a tool to efficiently take advantage of energy efficiency potential where appropriate. The degree to which these efficiency gains are sought should be compared to transaction costs related to widening the scope and nature of the TWC-scheme.

Creating a market for TWCs can attract new energy services business and serve as source of income from actions that are triggered by such external support.

5.5 Defining and certifying energy efficiency activities

A key issue in TWC schemes is the eligibility of projects that generate certificates. A key step is to decide if approved energy saving measures should be standardised (rights-based support) or based on applications for all measures (application-based support) or a combination of the two. In summary the systems differ in the

way in which a predefined target for energy saving (compared to a baseline would be met. Under an application based system, eligible projects would be evaluated and those projects that were the most economically efficient would be financed first. This would help to ensure technology neutrality (in theory) because the most economically efficient projects (i.e. projects with the greatest energy savings per unit of money spent) would be financed first, regardless of the technology involved. Under a rights based system, certain energy saving measures would be defined for certain sectors at the outset of the scheme. Both application based systems and rights based systems have advantages and disadvantages and the choice of scheme depends on the sector that is targeted.

When targeting especially small end-users, the trade-off between “mechanism accuracy” and transaction costs related to application processes become more crucial. Small savings per unit of action in e.g. household segment is a strong argument in favour of a system based on standard actions. Minimising administrative effort might out-weigh efficiency gains from action/technology neutrality. In principle, application-based system attracts innovative solutions, whereas a system based on standard actions can be used as a tool to selectively favour certain energy efficiency measures or sectors. Strict requirements to ensure the genuine additionality of the energy saving values awarded for energy efficiency measures requires regular update on baseline definitions in savings calculations relating to standard measures as well as application based calculations.

5.6 Monitoring and verifying energy saving activities

The monitoring and verification of energy-saving projects within white certificate schemes is less straightforward than for example the monitoring of renewable electricity generation within a green certificate scheme. This is because the quantity of energy ‘saved’ cannot be directly measured, but shall be estimated by comparing measured or calculated energy consumption with a counterfactual baseline. Introduction of standard lists facilitate monitoring and verifying burden ex-post. Ex-ante definition of energy savings achieved from a measure that is qualified as “standard action” requires calculating an action or technology specific baseline. Standard lists are thus vulnerable to embedded favouring of selected activities and calculation based energy savings can diverge from actual energy savings achieved, particularly in households. However, the average energy saving from many households should be available in the ex-ante assumptions in order to make possible energy savings evaluation for the end-user and for the policy maker.

5.7 Requirements for trading certificates

In some TWC schemes white certificates work as an incentive for energy efficiency measures, due to their selling price from voluntary parties to the obliged ones. Their price will change during different selling sessions due to the different trends of supply and demand. For this reason it is not possible to know the cash flow in advance, unless the white certificates associated to an implemented project are delivered in one-trading session, as happens in France. For schemes in which white certificates are delivered annually over a number of years, like the 5 years basic duration in Italy, trade practices become important and TWC markets work as stock exchanges.

It is then advisable to implement an effective statistics system, in order to give up-to-date information about issued certificates, available certificates, and demand and supply indexes. This way both voluntary parties and obliged parties will be able to efficiently manage their actions and financial operators can produce financial services (like futures, cash advances, or fixed price bilateral contracts). This ensures that the TWC scheme will provide a good incentive scheme, even if compared with feed in tariffs and other guaranteed price incentives. Otherwise operators will have difficulties in anticipating price trends and banks will avoid financing projects whose cash flow are based on a not negligible white certificates amount. In that case white certificates will be an effective incentive only if high price are provided and the cost effectiveness of the TWC scheme is somehow sacrificed.

A system that provides for online real time data about the approved and submitted projects, the implemented energy efficiency measures, and the price for market and bilateral contracts (as monthly averages, for example) will ensure a good answer to these needs.

5.8 Compliance procedures and enforcement

Adequate compliance and enforcement mechanisms will be necessary to ensure both the credibility of the TWC scheme and the effective operation of the certificate market. Participants shall comply with the monitoring, verification and reporting protocols for projects and the trading rules for certificates, as well as meeting their individual energy saving targets. Compliance with targets shall be enforced through a financial penalty that can be specified as a fine for each kWh of energy 'not' saved. Setting or not the value of the penalty in advance is a design feature of the scheme.

5.9 Market characteristics and operation

5.9.1 General

Allowing trade with the certificates creates more room for market efficiency. If the market for TWC functions well the question of equal obligation burden becomes less crucial. In order to function well the market needs to be fluid and deep enough, it seems difficult to obtain on an energy efficient market. Trading can either be permitted between obliged parties or enable third parties to enter the market. The introduction of trading is more beneficial and cost effective if the scope of eligible sectors in the scheme is broad and also if also non-eligible parties are allowed to generate and trade certificates, although this is only valid if the cost of saving energy to energy producers is the same in all end use sectors.

Additional rules may be required on the best possible functionality of a white certificate market. The banking and borrowing of certificates and the registration and tracking of certificates are some important market design features. An Implementer is a market actor who carries out measures on the premises of an end user. The measures can be ordered and financed by the obliged party who then receives certificates corresponding to the calculated or pre-defined (standard actions) savings. The more the right to implement is widened the more room is left for new business to emerge and innovations to be found. In a system where TWCs are granted on standard lists basis certain degree of monitoring or permitting is however essential for quality control purposes. In application based systems it is less important to regulate implementers' ex-ante, whereas the verifying process is more burdensome and more costly.

5.9.2 Banking and borrowing

Banking refers to the allowance of energy providers to carry forward any excess savings from the current obligated period to the next. Borrowing is the converse whereby any shortfall in the target of the energy retailer could be met by adding the missing contribution to the target to the next period's obligation. The reason behind the introduction of banking was to overcome some of the stop/go implications for the energy efficiency industries which had occurred in the transition between energy efficiency obligation phases.

5.9.3 Minimising free riders

Free rider in this context is not the same as the classical economic definition. It means the obligated energy parties giving subsidies to those customers that would have installed the energy efficiency measure anyway. Free riders can be minimised through careful project design e.g. "local area insulation blitzes" such that multiple installations in the neighbourhood clearly were as a result of the energy provider and/or its agent's activities. As the energy efficiency obligations expand or for promotional activities with appliance retailers, picking up free riders is inevitable.

The alternative approach is for the Government to set the energy saving target to include what it estimates is likely to be the extent of free riders. The energy retailers meet their targets which include an element of free ridership. However, the Government, in its evaluations of the effectiveness of the energy efficiency obligations, looks in detail at the actual extent of the free riders and removes them from the considerations of national cost effectiveness and actual energy savings; thus the final energy and economic saving numbers are additional to "business as usual".

6 Four examples of national schemes

6.1 Description of Italian national scheme

The Italian white certificate (WhC) scheme or TEE (acronym of the Italian legislative definition “titoli di efficienza energetica”, meaning “energy efficiency titles”) is one of the most complete examples of baseline and trade incentive schemes existing in Europe. It is been created by the Ministerial Decree on the 20th of July 2004 with the aim of promoting energy efficiency measures on final energy uses.

The scheme is based on the obligation for electricity and natural gas distribution system operators (DSOs) with more than 50 000 customers to achieve specific energy savings targets through energy efficiency actions certified by a corresponding number of WhC (one WhC equals to one tonne of oil equivalent “toe” primary energy). Currently the Italian WhC scheme is at the end of its second obligation period. The third obligation period will start in 2013 until the end of 2016. Each obligation period establishes yearly energy savings targets which are share out among obliged DSOs. The current obligation period sets the following yearly energy savings targets:

Table 1 – Energy savings targets (Mtoe/year)

Year	Electricity DSOs	Gas DSOs
2008	1,2	1,0
2009	1,8	1,4
2010	2,4	2,4
2011	3,0	3,1
2012	3,5	3,5

As shown above, the energy savings targets increase over the years and obliged DSOs have to meet their specific target either by implementing energy efficiency actions among end users or by buying WhC from other entities involved in the WhC scheme. In the scheme also voluntary subjects operate such as energy services companies (not necessarily ESCO as defined in 2006/32/EC directive), and companies which have appointed an energy manager as provided by Italian law 10/1991 and not obliged DSOs.

There is a refund mechanism based on standard allowed cost without any pass-through. The reimburse threshold is updated every year on the basis of the average percentage increase in the prices of energy for residential customers (electricity, natural gas, and gas oil for heating). The value of reimbursement increases when energy prices (i.e. the avoided energy cost) fall and vice versa, so as to stabilise the overall incentive to invest in energy efficiency. The reimbursement value is currently worth 86,98 Euro/toe. It ranged between 88,92 and 100,00 euro/toe from 2005 to 2011.

To obtain WhC is necessary to present to the Italian Authority for electricity and gas (AEEG) an energy efficiency project. According to the AEEG rules, if the project involves an efficiency improvement in the final consumption is generally considered eligible under the scheme.

The process of qualification of projects is currently managed by the AEEG in cooperation, for some activities, with the technical support of ENEA – the Italian Energy Agency. If the project satisfies the rules set by AEEG the project's owner receives from Gestore dei Mercati Energetici - GME - (the Italian Energy Exchange) a number of WhCs corresponding to the recognised savings. The WhCs are issued by the GME upon request by the AEEG and they are traded either on the real time GME market or over the counter (OTC) through bilateral contracts registered on the GME's platform. The voluntary subjects, which cannot present WhC projects, may join the market as traders. Currently there are five type of WhC:

- type I: electricity savings;
- type II: natural gas savings;

- type III: savings of other fuels (LPG, diesel oil, etc.) for other purposes than transportation;
- type IV: savings of other fuels (LPG, diesel oil, etc.) for transportation with simplified measurement and verification methods;
- type V: savings of other fuels (LPG, diesel oil, etc.) for transportation with energy monitoring plans.

In 2011 WhC price trend varied from value around 95 €/WhC to 105 €/WhC

The WhC scheme has evolved over the years, according to the legislative development which modified the scheme with ad hoc legislative and regulatory acts. In particular with the EEN 9/2011 resolution the AEEG has introduced a multiplier “tau factor” which changes the energy savings recognition process taking into account the technical life of different energy saving measures.

Further innovations related to the WhC scheme have been introduced by the legislative decree n. 28/2011, transposing the 2009/28/CE directive, which assigns the whole qualification and energy savings certification activities for issuing WhC to GSE Spa – the Italian Energy Service Operator establishing that a new joint decree from the Ministry of economic development in cooperation with the Ministry of environment will define the new GSE tasks, harmonising them with the tasks of other involved institutions.

During the first phase of WhC operation scheme the majority of savings has been achieved through the deemed savings files, in particular with “compact fluorescent lamps”. However, in the last few years there is a growing use of energy monitoring plans “metodo a consuntivo”. In this case the project's owner has to propose a methodology to calculate the savings based on appropriate metering. Currently most of the projects, such as many industrial projects, are presented utilising this procedure.

6.2 Description of French national scheme

The French energy saving obligation scheme or CEE (Certificats d'Economies d'Energie) has been set by the law of the 13th of July 2005. A first compliance period of obligation of 3 years has run from mid-2006 until mid-2009, the second period of 3 years has started on the 1st of January 2011. This description refers to the second period scheme.

The French public authorities have chosen to oblige energy retailers defined as legal entities who sell electricity, natural gas and district heating and cooling to end consumers as well as natural persons or legal entities who sell heating oil to end consumers and wholesale suppliers of automobile fuels. Thresholds are set for each energy to limit the number of obliged entities. There are an estimated 2 000 obliged entities but over 60 % of the energy savings required is covered by EDF and GDF SUEZ. The French administration wanted the energy retailers to evolve from sellers to service providers and designed the system to target at first the residential sector.

The French system uses the kWh cumac as the counting unit. « cumac » is defined as cumulated energy savings over the lifetime of the considered energy saving action and actualised at a 4 % discount rate from the second year. For example an action saving 1 MWh over 10 years is worth 8,43 MWh cumac.

The saving target for the second period has been set to 345 TWh cumac (245 TWh cumac for the first period obliged entities and 90 TWh cumac for the second period obliged transport sector). This target has been used to set an energy saving obligation coefficient for each energy kind (e.g. 0,168 kWh cumac / kWh for electricity). These coefficients will be multiplied by the actual sales of energies of each obliged entities at the end of the period to define its exact obligation. In this way obligation are linked to actual sales but the exact target for an individual energy provider is unknown till the end of the period.

Obliged entities, local authorities, state-owned bodies, social housing landlords and the ANAH (National Housing Agency or Agence Nationale de l'Habitat) are allowed to apply for energy saving certificate (CEE). Only obliged bodies are sanctioned if they do not comply with their individual obligation at the end of the period. The penalty is set to 2 c€ for each kWh cumac not delivered and exempts them from the obligation.

Energy savings can be claimed in any sector of activity as far as they go beyond the enforced regulation and do not apply to installations under the CO₂ emission trading scheme. Fuel substitution is only considered if it does bring energy savings.

Certificates can be obtained directly through different ways: standardised measures (248 deemed saving measures mid-2012), non-standardised measures, contribution to the funding of fuel poverty, public awareness, skill training or innovation programs. Contribution to the three last activities (or "*programmes*" in French), are valued 1 kWh cumac for every 1,5 c€ funded, whereas certificate are traded around 0,4 c€/KWh cumac. Standardised measures account for 98 % of the energy savings actions.

In March 2012, French public authorities have chosen to promote implementation of ISO 50001 "Energy management" through their obligation scheme. Two standardised actions have been created for commercial buildings and industry, and energy savings actions done within the ISO 50001 certification perimeter get a bonus of 50 % or 100 % savings according to their level of certification.

Certificates can be traded. Registered trading was very low during the first period (<3 %), it remains small but is increasing during the current period. Banking over three compliance periods is allowed.

Key players of the French scheme are: the Ministry of Ecology, Sustainable Development and Energy that sets the scheme rules and the level of obligations, the PNCEE (Pole National des CEE) under the control of the Ministry that validate certificate application files and delivers the certificates, ADEME (French Agency for Energy and Climate) that delivers the scientific expertise to the Ministry, ATEE (Energy and Environment Technical Association) a forum gathering obliged entities and interested third parties to propose scheme evolution, deemed savings, organise conferences and publish documentation on the CEE scheme, Locasystem administrating the national registry of certificate www.emmy.fr, and of course the obliged bodies and the entities allowed to apply for certificates.

Funding is a discussion issue between EDF, GDF SUEZ and the public authorities. This two obliged bodies are selling electricity and gas to households under a regulated tariff. It is unclear for the energy retailers if the scheme costs are integrated into the regulated tariff as stated by the law. Other obliged bodies do not have regulated prices and are able to set their costs into their selling prices as they wish.

The first period had a target of 54 TWh cumac and obliged entities exceeded it by 11 TWh cumac on the due date. On the 31st of May of 2012, 225.4 TWh cumac have been delivered in excess of the first period and can be used to comply for the second period. Compared to the 345 TWh cumac target of the second period and the time elapsed since the end of the first period: 65 % of the certificates have been delivered in 65 % of the available time.

As expected, since the beginning 82 % of the certificates have been delivered for actions in the residential sector. It is followed by tertiary buildings 8 %, industry, 5 %, network 3 %. Transport and agriculture remain marginal with less than 1 % each. Boilers account for 36 % of the actions, insulation for 16 %.

Public authorities expect to define the third period scheme before end of 2012. Consultation meetings took place from May 2012 until October 2012.

6.3 Description of Danish national system

The Danish scheme (from 2006) consists of an energy efficiency obligation with an annual binding energy efficiency target for all energy distribution companies, i.e. electricity, district heating, natural gas and oil for heating. The EU internal market legislation does not allow DSOs to implement savings themselves, they have to pass the implementation task on to third party companies. The third parties are e.g. energy service providers, energy service companies, private companies such as installers, craftsmen, engineering companies, lighting companies etc. It may be another company in the same company group but very often it will be a private engineering company or a plumber. Only DSOs can trade energy savings between themselves.

The 2006-2009 Energy saving target was 2,95 PJ which corresponded to 0,7 pct. of consumption in the sectors included (transport is not included). From 2010 to 2012 the target increased to 6,1 PJ, which

corresponded to 1,2 pct. of final consumption in the sectors included and losses in grids. In 2012 the energy saving target is increased with 50 %. The target on energy companies corresponds to 50 % of the total expected savings from all energy efficiency measures implemented in Denmark. The recently adopted energy policy in Denmark will increase the target even more in the years leading up to 2020.

The savings achieved shall be well documented and they shall be verifiable by an independent source. There are clear rules for savings that are categorised as accountable, direct savings and deemed savings (a catalogue). Energy savings may only be traded between energy companies. The main methods to assess savings are standard values, and average savings are calculated for standard activities. These are however primarily used for households. Specific calculations – engineering methods - are used for all big projects, which are especially carried out in industry and public sector.

The average utility costs for implementing the energy efficiency obligation on energy distributors in Denmark for 2006-2009 was 4,5 Euro Cents per kWh, which includes costs of the consumers, administrative costs in DEA and cost for administration and quality assurance in the DSO. In 2011 the average cost was 5,6 Euro Cents per kWh. The total cost of the implemented savings for the year 2010 is approximately 100 million Euros.

6.4 Description of British national scheme

The British energy efficiency obligations have been in place on electricity retailers since 1994 and gas retailers since 2000. During that period, they have grown from €33 million to an estimated €1,4 billion per year being spent. The current version obligates the electricity and gas retailers (now reduced from 15 to 6 major entities) to promote energy efficiency only in residential properties³.

The electricity and gas retailers can save any end use fuel and are not restricted to saving that fuel in their own customers' properties. However, some of the promotional offers are aimed solely at their own customers, particularly for insulation measures. The energy saving target is set in statute by the British Government and the energy regulator, Ofgem, administers the programme on behalf of the Government and ensures that the energy savings claimed by the energy retailers are genuine and of sufficient quality to merit counting towards their target. The energy retailers advise Ofgem about their planned activities to ensure that they are consistent with the Ofgem rules and at the completion of the project a final report is submitted to Ofgem with claimed energy savings. Provided Ofgem is satisfied that the measures are eligible, as are the customers and that they have been carried out to sufficient quality standards, they are awarded energy savings for that project – note that a project may consist of many tens of thousands of insulation activities or promotion of energy efficient appliances, etc.

Although there is no explicit trading market currently operating in GB, the energy retailers may trade excess energy savings to other energy retailers once they have met their own target. In practice, there has been little activity as not only have all retailers met their targets but in general they have exceeded them and the energy savings have been carried forward to the next phase of the energy efficiency obligation. The Government has signalled that an obligation will remain in place until at least the next decade.

The next phase of the energy efficiency obligation which will run from January 2013 marks a break in the traditional role of the activity as primarily an environmental programme with safeguards to ensure that low income households are not neglected. With the cancellation of the Government funding for the fuel poverty programme as part of the austerity measures, the responsibility for this activity is transferring to the energy retailers. Thus the next phase of the GB energy efficiency obligations will have three goals and dedicated sub-programmes. One will target fuel poverty in the most disadvantaged households living in private accommodation with the objective of creating affordable warmth. There will be a carbon saving communities' programme designed to target insulation measures in households in the 15 % of the most deprived communities and finally a carbon saving programme aimed at reducing carbon dioxide emissions which will inevitably target mainly those non low income households. It is the intention that the carbon savings activity will work alongside the new programme called Green Deal which is a loan scheme whereby the loan is repaid through the electricity bill and the energy savings are expected to exceed the loan repayments. In this way,

³ Till 2000, small businesses were also targeted.

the carbon saving obligation will be used to provide initial subsidies such that the more expensive insulation measures can have energy savings which are greater than the loan repayments.

Finally, although details are still unclear, there will be a brokerage mechanism introduced to provide fair and transparent access to eco-subsidy and the energy retailers will be required to purchase a significant part of their energy savings through the brokerage mechanism from market actors outside their energy group.

6.5 Comparison of the different national systems

6.5.1 General

Table 2 gives the main activities in the EU in 2011 for five Member States which have been in operation for at least 4 years and for which evaluation data are available. It is immediately obvious that there is considerable variation in which energy providers are obligated and which customers are eligible. In terms of the obligated companies, only electricity is the common feature and only the residential sector is an eligible sector in all obligations. Again there was considerable difference in whether the obligation was placed on the distributors (Flanders, Italy, Denmark) or on retailers. Although both France and Italy in principle could save energy among the transport sector, neither country has actually achieved any significant energy savings from transport⁴

Table 2 — Comparison of the obligations on energy providers in the EU as of 2011

Country	Obligated Energy Provider	Eligible Customers	Administrator
Belgium - Flanders	Electricity distributors	Residential and non-energy intensive industry and service	Flemish Government
France	Retailers of non-transport energy + importers of road transport fuel	All (including transport) except EU ETS	Government
Italy	Electricity and gas distributors	All including transport	Regulator (AEEG)
GB	Electricity and gas retailers	Residential only	Regulator (Ofgem)
Denmark	Electricity, gas, fuel oil and heat distributors	All except transport	Danish Energy Authority

Table 3 is an attempt to look at the different nature of the energy saving target, the current size of the target and the estimated annual spend by the energy providers in meeting that target. As the Member States are of very different sizes, this has been converted into euros per person to facilitate easier comparison of the relative size of the activity in each Member State. It is immediately obvious from Table 3 below, that there is no common agreement on the metric of the saving target, varying from primary energy, as in Flanders and Italy, or delivered energy, as in France and Denmark, or the recent move from delivered energy to carbon dioxide in GB. Again comparing the targets is extremely difficult not just because of the differing nature of the energy saving target but also the use of different discount factors (or not) in different countries. The final column shows that although the annual spend by companies in 2011 differed by a factor of 24, in terms of

⁴ At the end of May 2012, French transport savings accounted for 0,63 % of savings achieved.

annual expenditure per head of population, the range is less than 5 to 1. The greater magnitude of the GB expenditure reflects the fact that this has been running since 1994 for electricity and since 2000 for natural gas. The final column of Table 2 only gives a rough comparison of these European schemes. To go deeper into comparing these schemes from a cost effective perspective, overall efficiency, or level of policy achievement lays outside of the scope of this Technical Report.

Table 3 — Comparison of the Target and Size of the Energy Efficiency Obligations in the EU as of 2011

Country	Nature of saving target	Current size of target	Estimated annual spend by companies €M {€/person}
Belgium - Flanders	1st year primary energy	0,6 TWh annual	60 {14}
France	Lifetime delivered energy	345 TWh cumac over 4,5 years to end 2013	345 {5}
Italy	Cumulative 5 year primary energy	5,3 Mtoe in 2011	530 {9}
GB	Lifetime CO ₂	293 MtCO ₂ in 4,75 years to end 2012	1440 {24}
Denmark	1st year delivered energy	6,1 PJ annual	100 {18}
NOTE Although the second phase of WC's was for 3 years from 1 January 2011, during the 18 month interim period between the end of the first scheme and the start of the second, the energy retailers continued to save energy under the same rules.			

Although there are many different end use sectors which are open to the energy obligations, in practice most activity has happened in the residential sector. This is shown clearly in Table 4 and is due to the use of deemed energy savings which simplify the monitoring and verification costs and also provide opportunities for mass marketing and promotion. This combination is seen to be a cost effective way for the energy companies to deliver their objectives. Denmark is the only country which actually had less than half the energy savings coming from the residential sector. In part, this reflects the evolution of their programme which was preceded by earlier activities with electricity distributors in the industrial and commercial sectors.

Table 4 — EEO activity in residential sector

Country	Period	% energy savings from residential sector
Belgium - Flanders	2010	58 % (mandated)
Denmark	2008	42 %
France	2006–9	87 %
Italy	2009	81 %
GB	2008–12	100 % (mandated)
NOTE The percentage figures relate to the savings required to meet the target not necessarily the percentage of the lifetime savings achieved.)		

Interestingly, even within the residential sector, there are tremendous differences between end uses that the energy companies use to meet their targets. This is shown clearly in Figure 2 for the four countries which have published data on such savings. While at first sight this might seem surprising, the different end uses across the EU reflect the different energy saving opportunities, the different rules or deemed energy saving values and the nature of the energy delivery systems. Note the percentage figures in Figure 2 relate to the savings required to meet the target.

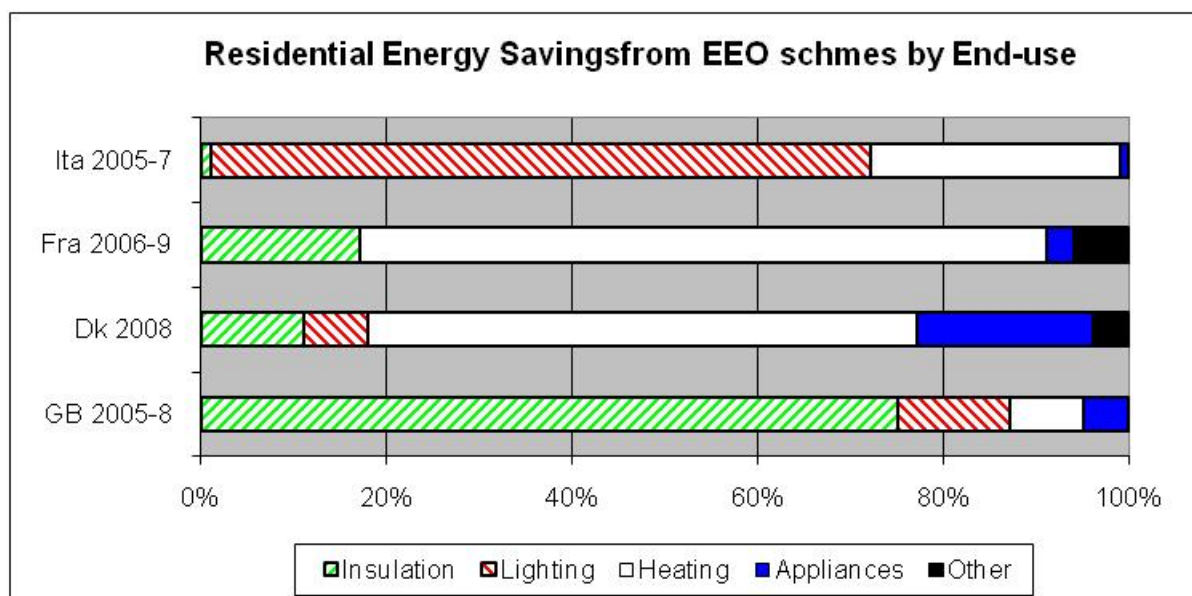


Figure 2 — Residential Energy Savings from EEO schemes by end-use

6.5.2 Recent trends

There is growing recognition that by setting a target which only counts the first year energy savings from that energy efficiency measures undervalues those measures with longer life times. For example, insulation has a thirty to forty year life time, depending on the measure, compared to say a ten to twelve year life time for appliances; if the target is first year energy savings only, then in terms of the total energy savings realised, the three to four times longer life time of insulation is not valued. Thus, if the measures are similar or indeed slightly cheaper for the appliances, then there will be an incentive for the energy company to invest in the shorter lived measures rather than the longer, more cost effective energy saving measures. To counteract this problem Denmark has introduced weighting factors dependent on the life time of the energy efficiency measure and Italy has introduced similar options to value longer lived measures such as insulation and industrial projects.

Another development is that France is pioneering from January 2011 an obligation on companies involved with road transport fuels. Unlike the rest of the French obligations, this is being placed on the oil importers rather than the retailers of transport fuel because of the large number of such retailers. Although transport energy savings have been eligible to be counted against EEOs in Italy and France, there has been little activity to date. In France, in the first phase of the French white certificates, 0,4 % of the energy savings came from transport activities.

Globally, most of the EEOs have focussed on stationary end uses of energy and so it will be interesting to monitor the extent to which EEOs can be modified to deliver cost effective energy savings in transport.

6.5.3 Evaluations of energy efficiency obligation schemes in the EU

All countries have undertaken evaluations of their own activities but comparison between the different Member States is complicated because of the different targets, energy saving values, etc. as outlined above. An independent comparison was attempted by Bertoldi et al. 2010⁵ who tried a comparison for France, Italy and GB. In all cases, the total cost estimates of saving a unit of electricity or gas are lower than the electricity and gas residential prices by a factor varying between 2 and 6.

Denmark has evaluated the cost of saving a unit of energy for the phase that ran between 2006 and 2009 to be around 0,45 eurocents per kWh.

In GB, the phase which ran from 2005 to 2008 resulted in a benefit (not a cost) to the nation of saving a ton of carbon dioxide or €60 after correcting for increased comfort taking (e.g. not all the energy savings are realised from insulation) and also for free riders (i.e. those that would have done it anyway). The GB evaluation also showed that the target for 2005-2008 was met 23 % cheaper than the government estimate and that the cost to customers of the energy company activities was equivalent to 3,6 % of annual fuel bills. While more than two out of three low income households benefitted directly (mainly through free CFLs and retail appliances), over 1,1 million low income householders benefitted from more substantial energy saving measures (mainly insulation). For every euro raised from householders, either through their energy bills or their direct contributions to the energy efficiency measures, householders will benefit over the longer term by €9⁶. Table 5 attempts to track the national cost of saving a unit of electricity or gas in the GB EEOs since 1994.

Table 5 — Tracking the cost to all parties (i.e. energy companies and others) of saving a unit of electricity or gas through the various phases of the GB energy efficiency obligations

Fuel	1994–1998	1998–2000	2000–2002	2002–2005	2005–2008
Electricity	1,8	1,4	1,3	1,0	0,9
Gas			1,0	0,6	0,5
NOTE All values have been expressed in pence/kWh and converted to 2001 money and methodology					

This task is complicated by the fact that the accounting rules (values of comfort factors and discount rates and life times of the energy efficiency measures) changed over the period. Nevertheless the Energy Saving Trust, Ofgem and latterly the DECC evaluations have attempted to gain an indication for what has been happening over time as the EEOs have expanded in scale. It is clear from Table 4 that in real terms the cost of saving a unit of electricity or gas has roughly halved.

Figure 3 shows for the Italian EEOs the avoided energy costs for participating customers for the three main fuels of electricity, natural gas and gas oil for heating. Despite rising energy prices over the period 2002 to 2008, the distribution price allowance has awarded the distributors €100 per ton of oil equivalent whereas the value for the participating customers of the energy saved is between 8 times and nearly 14 times that value.

It is also worth noting that in Italy, since the introduction of the Italian white certificates, the allowance in the distribution price remained at €100 until 2008 at which point their price allowance was reduced to €85 per ton of oil equivalent (all prices in historic cash terms)⁷ indexed with the cost of energy since 2008. In other words, despite the general increases in historic costs through this period, the costs of saving energy in the Italian white certificate system has also reduced as the scale of activity and experience of the energy companies has increased.

⁵ Bertoldi, P, Rezessy, S, Lees, E, Baudry, P, Jeandel, A, and Labanca, N (2010): Energy Policy 38 (1): pp. 145-69

⁶ Report to DECC "Evaluation of the Energy Efficiency Commitment 2005-08" <http://www.eoinleesenergy.com/>

⁷ Source AEEG

Avoided energy costs for participating customers in Italian WCs (Source AEEG)



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energy efficient
economy

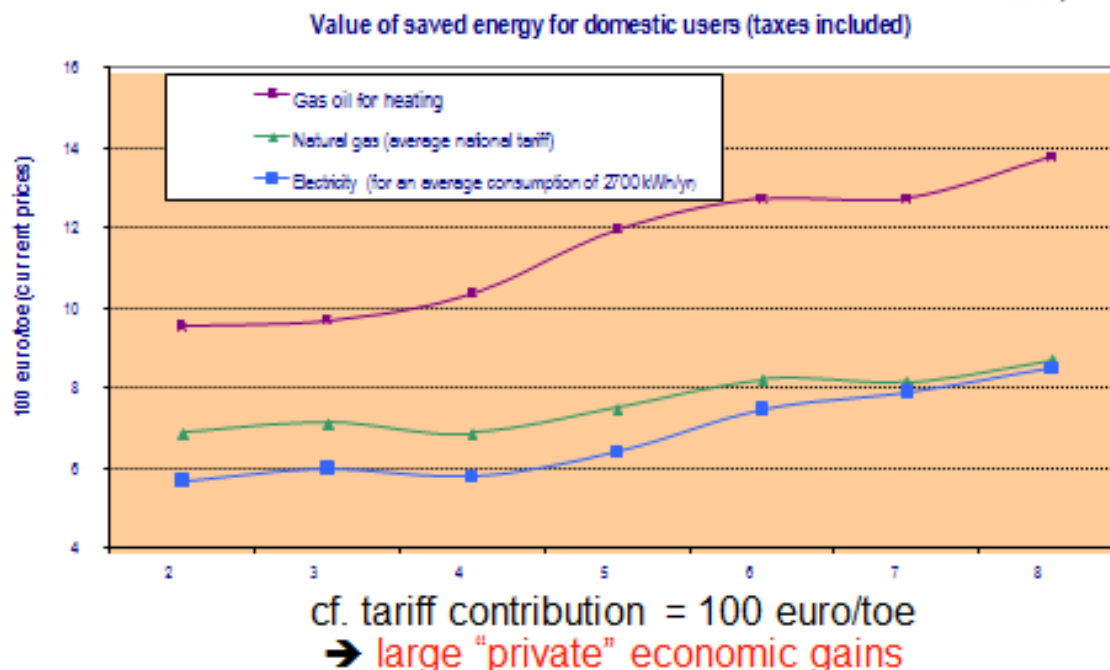


Figure 3 — Avoided Energy Costs for Participating Customers in the Italian White Certificate Scheme for the Three Main Fuels in the period 2002 to 2008 (Source: AEEG)

Finally, the cost in the first phase of the French white certificates for energy suppliers was 0,4 eurocents per kWh cumac (ADEME estimation). This is equivalent to 20 % of the value of the fine that was set by the French Government for any energy company missing its target⁸.

6.5.4 Some observations on energy efficiency obligations schemes in the EU

The core element in all the EEOs is the energy saving obligation backed by legally enforceable penalties if companies fail to meet their targets. This is in no small measure due to the fact that those governments with such obligations in place do not believe that voluntary markets will emerge in the near future. However, there are relatively few schemes in place (five Member States currently with two imminent) and although they vary quite a lot, they are all judged to deliver successfully by their governments.

The initial energy saving goals were fairly low and have been achieved at costs below the expectation of the policy makers. Over the years, the schemes have expanded to currently requiring obligated energy companies spend around €2 billion per year. Perhaps the most striking aspect is that in around 50 years of operational experience of EU EEOs in 5 Member States, no major energy provider has failed to meet its overall energy saving target⁹.

⁸ http://www.eceee.org/eceee_events/energy-efficiency-obligations/2_ademe_slide_18

⁹ One small Flemish distributor met its overall energy saving target but failed to meet its mandated share for the residential sector as it distributed electricity in an industrial area; in France, some of the smaller heating fuel retailers claimed not to know they were obligated and were sanctioned.