

6. Cross-cutting policies and measures

This section discusses both cross-cutting measures with sector specificities (e. g. energy taxation modulated by sector) and more general cross-cutting measures such as the innovative instrument of energy efficiency obligations and White Certificates. Energy taxes are part of more general, energy-related environmental taxes and make important contributions to improving energy efficiency across the final demand sectors. Energy efficiency obligations in combination with White Certificates are a new market-based instrument that integrates the price of energy efficiency into the products and aims to do for energy efficiency what the newly introduced EU-wide emission trading scheme does for CO₂ emissions.

6.1. Patterns and dynamics of cross-cutting energy efficiency measures

Cross-cutting policies and measures can be divided into two groups: those with sector-specific characteristics and general ones.

Cross-cutting measures with sector-specific characteristics: these are mainly energy or CO₂-taxation measures which are modulated according to the sector to which they are applied (Table 6-1).

Table 6-1: Cross-cutting measures with sector-specific characteristics (EU-15)

Residential Sector

Status:		Impact: L = Low, M = Medium, H = High, U = Unknown																
		AU	BEL	DK	EU	FIN	FRA	GER	GRE	IRL	ITA	LUX	NLD	NOR	POR	SPA	SWE	UK
Cross-cutting with sector-specific characteristics																		
44	Eco-tax on electricity/energy consumption or CO ₂ - emissions	M		U			LH					M	M			H		

Transport Sector

Cross-cutting with sector-specific characteristics																		
39	Eco-tax on electricity/energy consumption or CO ₂ - emissions						ML										H	

Transport Sector – Fiscal – Taxation

Fiscal																		
Taxation (other than eco-tax)																		
13	Tax on the purchase of cars (if linked to efficiency improvement)	H													H			M
14	Annual vehicle tax (if linked to efficiency improvement)	HH		U			L									H		M
15	Mineral oil tax			H								H						H

Industry Sector

Cross-cutting with sector-specific characteristics																		
24	Eco-tax on electricity/energy consumption or CO ₂ - emissions						ML			U		H	M			L	H	

Tertiary Sector

Cross-cutting with sector-specific characteristics																		
35	Eco-tax on electricity/energy consumption or CO ₂ - emissions	M					HM			L		M	M					H

Note: The signs in the cells of the table represent the estimated impact level (low, medium, high) as described in the introduction. Countries without such measures have empty cells.

Source: MURE database


























Several countries have such measures, e.g. Austria, Denmark, Germany, the Netherlands, Norway and Sweden. Many of these measures are characterised as high- or medium-impact measures. In addition to this type of measure, there are also fiscal measures in the transport sector (e. g. purchase taxes for cars, annual circulation tax, and mineral oil tax) as far as they are specifically linked to energy efficiency. The MURE database does not usually contain such general purpose measures, although they have an undeniable influence on energy consumption. In the current chapter, however, we will discuss both types of measures together because it is difficult to separate their influence.

General cross-cutting measures (see a selection in **Table 6-2**): are measures which may link all or most sectors via a particular mechanism, e. g.

- Heating planning (e. g. for district heating, gas)
- Priority access of CHP to the electricity grid
- Service obligations for supply distribution companies
- CO₂/ energy efficiency /renewables funds
- Energy efficiency obligations in combination with White Certificates for energy savings
- Emissions trading schemes (in case this instrument is extended to other sectors, e. g. the transport sector).

The most innovative policy instruments are the energy efficiency obligations in combination with White Certificates which are currently being applied in France and in Italy. The recent EU Directive on energy efficiency foresees White Certificates as one possible option for the further development of the Directive in the future.

Table 6-2: Overview of general cross-cutting measures (EU-15)

Status:						Impact: L = Low, M = Medium, H = High, U = Unknown																	
																							
		AU	BEL	DK	EU	FIN	FRA	GER	GRE	IRL	ITA	LUX	NLD	NOR	POR	SPA	SWE	UK					
Legislative/Normative Measures																							
4	Heating Planning (e.g. for district heating, gas)																			L		U	
6	Priority access of CHP to the electricity grid							H		H											M		
7	Service obligations for supply distribution companies																						
Fiscal Measures/Tariffs																							
9	Preferential feed-in tariffs for CHP							H															
Financial Measures																							
10	CO ₂ / energy efficiency /renewables funds					U		H							H		M						
Co-operative Measures																							
11	Voluntary DSM measures of energy suppliers and distributors			U							HL												
Market-based Instruments																							
12	Incentives facilitating Third Party Financing / ESCOs					U					HL												
13	White certificates						M				H												
18	Incentives for the producers of innovative technologies																						
19	Technology deployment schemes										L												

Source: MURE database

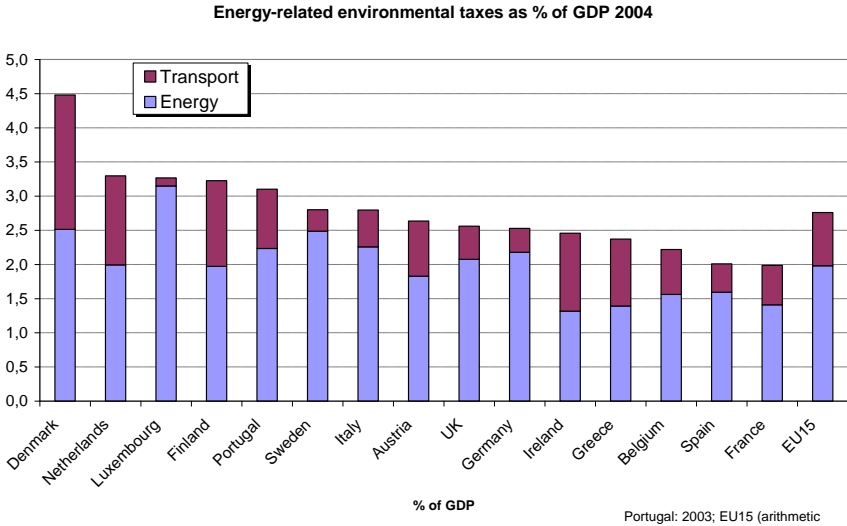
6.2. High-impact cross-cutting energy efficiency measures: energy-related environmental taxes

Energy-related environmental tax reforms gained increasing support during the 1990s. The basic idea was that increases in energy/environment taxes⁸⁹ constitute an attractive instrument not only to reduce resource consumption, but also to achieve a reduction in the taxes on labour. At the same time, care had to be taken to protect producers from any negative effects on competitiveness arising from increases in the costs of inputs, most particularly energy. **The key question of whether the central objective of reducing environmental impacts (while reducing labour costs) has been achieved or at least initiated so far** will be debated in this section.

In 2004, revenues from energy-related environmental taxes in the EU-15 (in the GDP-weighted average) accounted for 2.5 % of GDP and for 6.4 % of total revenues. For comparison: revenue from labour amounted to 20.1 % of GDP (50.6 % of total tax revenue) and revenue from consumption to 11 % of GDP (27.7 % of total tax revenue) in the same year. This already implies that the second objective mentioned above of lowering labour costs will only be achieved to a minor extent as long as energy/environmental taxes remain at their present level.

Figure 6-1 shows the tax-to-GDP ratio and the type of tax for energy-related environmental taxes in the Member States. Note that this includes all taxes on energy such as the mineral oil tax on transport fuels (but not Value Added Taxes on energy).

Figure 6-1: Energy-related environmental taxes as % of GDP 2004 (EU-15)



Source: EU Commission 2006⁹⁰

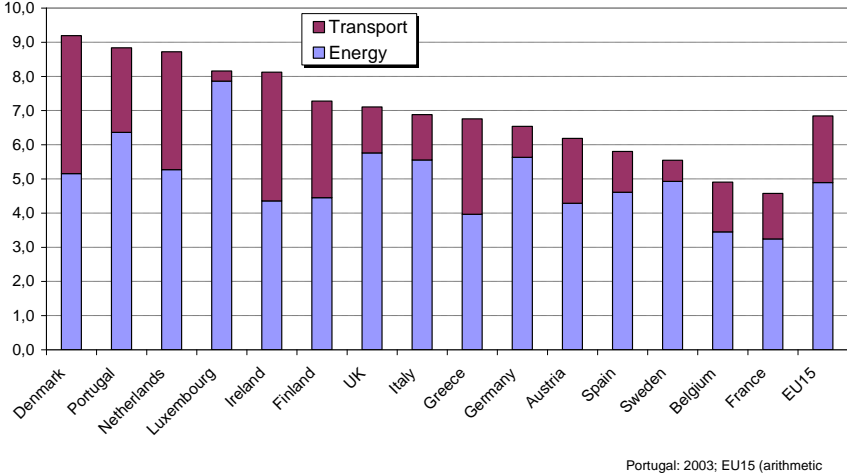
The relative importance of each type varies significantly across countries. At 4.5 % in 2004, Denmark had by far the highest tax ratio followed by the Netherlands (3.3 %) and

⁸⁹ This includes **energy taxes** (taxes on energy products for both mobile and stationary purposes, CO₂-taxes) and **energy-related transport taxes** (taxes related to the ownership and use of motor vehicles, taxes on other transport vehicles, e. g. planes, and related transport services, e. g. duties on charter or scheduled flights).

⁹⁰ http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/index_en.htm

Luxembourg (3.3 %)⁹¹. The lowest energy-related environmental tax revenues in relation to GDP are found in Spain (2.0 %) and France (2.0 %). The predominance of energy taxes is common to almost all Member States; only in Ireland do transport taxes account for nearly half of the environmental taxes. Another way of presenting the energy-related environmental tax revenue is to express the revenue in relation to the total tax revenue (**Figure 6-2**).

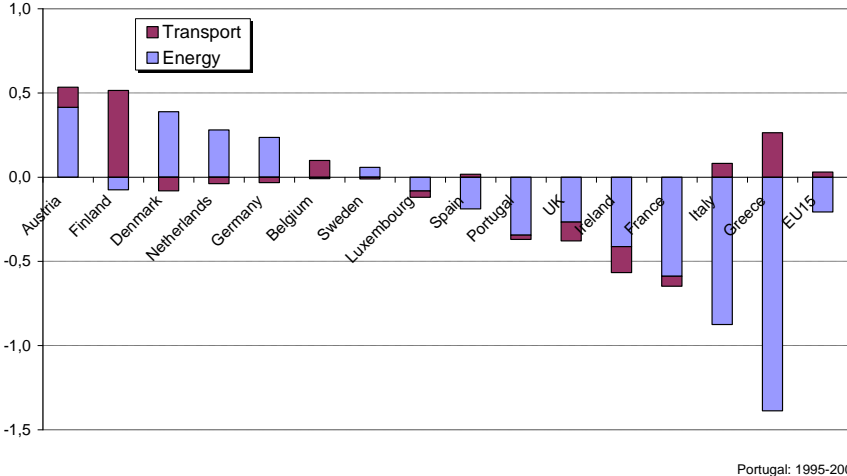
Figure 6-2: Energy-related environmental tax revenue as % of all tax revenue (EU-15)



Source: EU Commission 2006

Regarding energy-related environmental taxes, Greece, Italy, France and Ireland experienced declines of half a point of GDP or more during the period 1995-2004, while equivalent increases were recorded only in Austria and Finland (**Figure 6-3**). Energy and transport taxes, each individually, increased in 5 Member States. Only in one country however, Austria, did both taxes increase at the same time. At the EU-15 level, energy-related environmental taxes decreased by 0.2 %, mainly due to the drop in energy taxes.

Figure 6-3: Variation in energy/environmental taxes (EU-15, 1995-2004, in % of GDP)



Source: EU Commission 2006

⁹¹ The high tax revenue-to-GDP ratio for energy taxes in Luxembourg is partly due to non-residents purchasing petrol here.

A high ratio of energy-related environmental tax revenues to total taxation does not necessarily indicate a high priority on energy savings. Energy taxes, for instance, were originally used purely as revenue raising instruments without environmental purposes. Neither does the level of this indicator reveal anything about the achievement of energy policy goals, since an increase of its value could result from shifts in the economy towards more resource-intensive production and consumption patterns which therefore result in even higher energy consumption. Moreover, if green taxes really act as an efficient disincentive, over time they will reduce the use of environmentally harmful goods and thereby erode the tax base, leading to a gradual fall in revenue. Furthermore, if there are tax breaks for energy-efficient products or processes, the same objective – saving energy- results in lower tax revenues. In both cases, the tax-to-GDP ratio would fall for energy-related environmental taxes despite an increase in energy savings. It is also worth pointing out that the decrease in energy-related environmental tax revenues in recent years, if measured as a percentage of GDP, could be due in part to policy instrument innovations. One example is the increased use of road pricing systems accompanied by a reduction in the annual car circulation taxes (which have a lower impact on emissions since they do not affect the cost per kilometre). In this case, energy-related environmental tax revenues – specifically, the car registration tax – are reduced. The revenues of the charges for using roads increase, but this does not translate into higher tax revenues because these are not booked as taxes. CO₂ emissions trading might also translate into lower energy-related environmental tax revenues and a diminishing tax-to-GDP ratio.

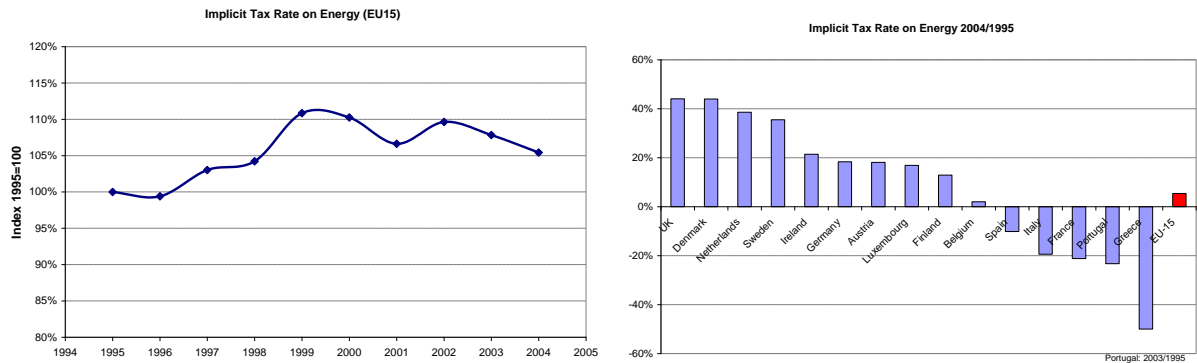
One way of dealing with these problems is to introduce an effective or implicit tax rate (ITR). These rates are computed as the ratio of total tax revenues of the category (e. g. consumption, labour, or energy-related environmental taxes) to a proxy of the potential tax base:

- In the case of energy taxes, this is the **(real) Implicit Tax Rate (ITR) on energy impacts**. This tax rate is defined as energy tax revenues in relation to final energy consumption (Euro per ton of oil equivalent, deflated by a final demand deflator).⁹²
- With regard to labour, this is the **Implicit Tax Rate on employed labour** which is defined as the direct taxes, indirect taxes and compulsory current social contributions paid by employers and employees on employed labour income, the sum of which is then divided by the sum of wages and wage bill/payroll taxes.

Interpreting an ITR is generally straightforward because this indicator is not affected by erosion in the base; a properly defined implicit tax rate remains constant. This adjustment shows that, in real terms, energy taxation has actually been stabilising and then declining on average for the EU-15 since 1999 (**Figure 6-4**, left). The data highlight the fact that the real burden of taxation on energy has decreased considerably, especially in some large Member States (France, Italy and Spain), which has by and large offset increases in the majority of other countries (**Figure 6-4**, right).

⁹² Note however that the ITR on energy treats all kinds of energy consumption equally, regardless of their environmental impact; an energy unit produced from hydroelectric power has the same weight as a unit produced from coal. If tax rates were differentiated according to the environmental impact of different energy sources, this phenomenon would be partly or totally offset since a country with environmentally-friendly production would tend to show a low ITR on energy.

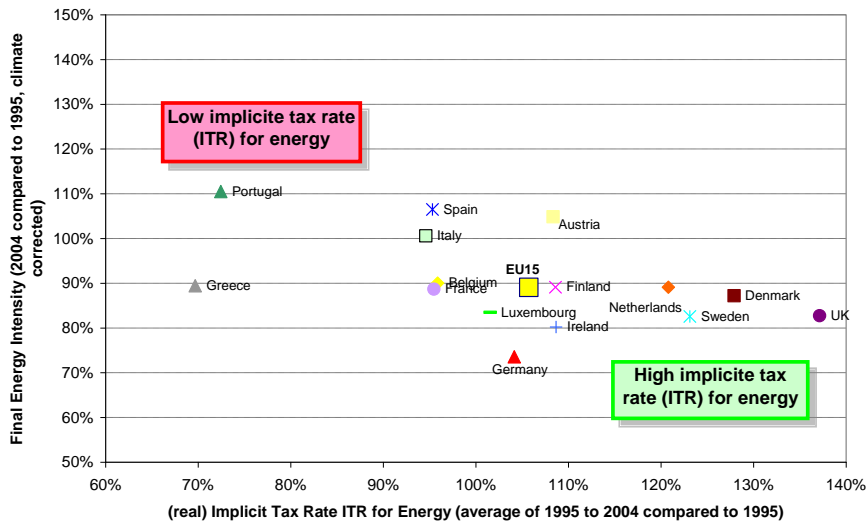
Figure 6-4: Evolution of the Implicit Tax Rate ITR for energy



Source: EU Commission 2006

The main question raised in the context of energy taxation is whether this has had an impact on energy intensity⁹³. **Figure 6-5** compares energy taxation levels in the form of the Implicit Tax Rate (ITR) for energy with the final energy intensities taken from the Odyssee database. Although it is clear that energy intensities are also influenced by other factors and in particular also by policies other than energy taxation, **Figure 6-5** suggests that there is a connection because countries with average increases in energy taxation levels such as the UK, Sweden or Denmark also show the largest decrease in final energy intensities. In contrast, Portugal, which has low taxation levels, shows energy intensities which are actually increasing. One additional explanation for such a correlation might be that countries with higher energy taxation also have other important policies for energy efficiency.

Figure 6-5: Variation in final energy intensity and the energy taxation rate (Implicit Tax Rate for energy) – is there a link?



The case of Germany is atypical because the strong decrease observed here in final energy intensity was still partially due to the restructuring of the former East German economy.

⁹³ It is more suitable to consider energy intensity rather than the ODEX which measures energy efficiency more closely, because energy taxation also has impacts on the structure of the economy and possibly also on the development of economic and social activity levels.

Therefore, despite fairly modest changes in energy taxation rates, the decrease in energy intensity in Germany was more important than in other countries.

6.3. Innovative cross-cutting energy efficiency measures: energy efficiency obligations in combination with White Certificate Schemes

Energy efficiency obligations in combination with White certificate schemes are certainly the most innovative type of energy efficiency measure to emerge in recent years. Several countries have implemented such a scheme in Europe (although not always in combination with certificate trading) or are seriously considering doing so. The United Kingdom began its Energy Efficiency Commitment (EEC) in 2002 and combined its obligation system for energy savings with the possibility to trade obligations and savings. However, trading did not take place due to the fact that most obliged parties were able to over-fulfil their targets. Italy started a scheme in January 2005; France a year later (Table 6-3). France is also introducing a national register of White certificates. Denmark and the Netherlands are debating the introduction of a White certificate scheme in the near future.

Table 6-3: Current or discussed (tradable) White certificate schemes (TWC)

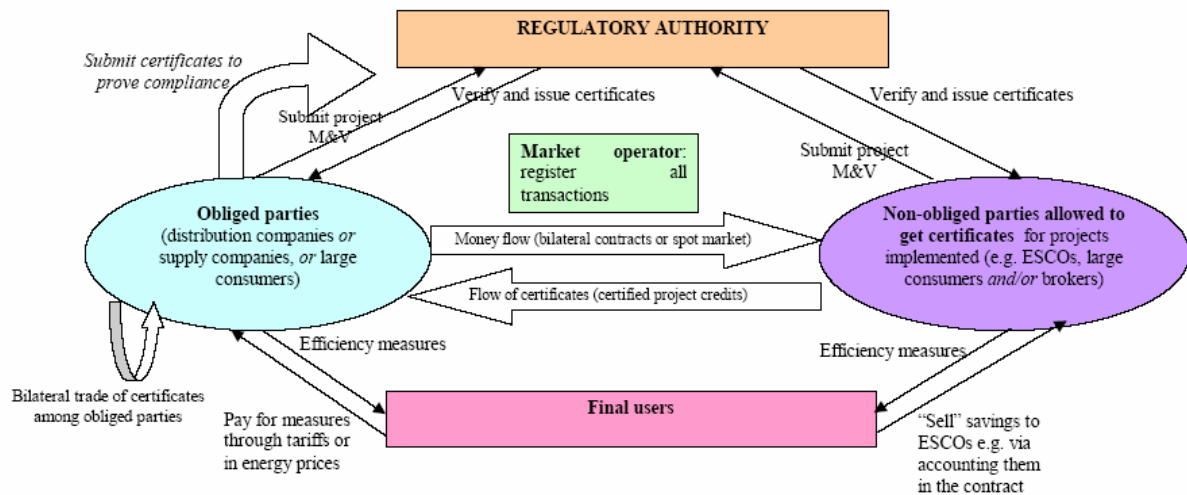
Country	
Belgium	Energy saving obligation in Flanders without tradability of certificates
Denmark	Considering energy saving obligations, possibly with a TWC system.
France	Started a full TWC system with energy saving obligations in Jan. 2006
Italy	Started energy saving obligation with TWC system in Jan. 2005
Netherlands	Planning to start a TWC system. Design options for a White certificate scheme discussed
United Kingdom	Scheme started April 2002. Trade in obligations allowed; no certificate trade so far.

Source: EuroWhiteCert (2006)⁹⁴, own additions

The new EU Directive on Energy Efficiency and Energy Services proposes discussing the EU-wide introduction of such a scheme several years from now. Current White certificate schemes are new market-based instruments and benefit from experiences with similar types of schemes such as the EU Emissions Trading Scheme and "Green certificate" schemes for renewables. Up to now, White certificates have been used in combination with an obligation scheme. Market actors (usually retail energy suppliers or distributors) are obliged to achieve a certain amount of energy savings. Target compliance requires the submission of a sufficient number of certificates to fulfil the energy saving target. Certificates can be generated from projects that result in energy savings beyond the business-as-usual level, by target market actors or by Energy Service Companies (ESCOs). Market actors receive certificates for the achieved savings which can be used for their own target compliance or sold to other obliged parties (Figure 6-6). A White certificate scheme does not necessarily involve the possibility of trading, nor does this aspect feature in some of the current or planned schemes.

⁹⁴ Work package 2: Certificate Systems in Europe Report in scope of task 2 "Review and analysis of national and regional certificate schemes"

Figure 6-6: Energy efficiency obligations in combination with White certificate schemes



Source: Bertoldi/Rezessy (2006)

So far, it seems too early to draw conclusions about such types of systems and their impact on energy efficiency, although the UK Energy Efficiency Commitment's impact on energy savings (a system without trading) has been described intensively and seems significant⁹⁵. Nevertheless, White certificate schemes have become a recent focus of numerous studies^{96,97,98,99}. The main issues debated here concern:

- Specificity and effectiveness of a certificate trading mechanism to promote energy efficiency projects
- Who can buy and who can sell?
- Which sectors and which energy efficiency programmes should be targeted?
- How to create demand for White certificate trading
- Possible cost-recovery mechanisms
- Competition issues
- Interactions with other policy tools
- Interactions with other trading schemes: Green vs. White certificates; interaction between Green/White Certificates and emissions trading
- Prospects for an enlarged EU-wide market for tradable certificates.

⁹⁵ Lees, E.: Evaluation of the Energy Efficiency Commitment 2002-05, Final Report to Defra, 28 February 2006 <http://www.defra.gov.uk/environment/energy/eec/pdf/eec-evaluation.pdf>

⁹⁶ Bertoldi, P. and Rezessy, S.: Tradable Certificates for Energy Savings (White Certificates) - theory and practice, European Commission, Directorate-General Joint Research Centre, Institute for Environment and Sustainability, Ispra 2006 <http://energyefficiency.jrc.cec.eu.int/pdf/publications/White%20cert%20Report%20final.pdf>

⁹⁷ EuroWhiteCert Project (<http://www.ewc.polimi.it/index.php>)

⁹⁸ Vlasis Oikonomou, V and Patel, M.: White and Green Phase II, Utrecht University, report in the frame of the "White&Green" project http://www.iiiee.lu.se/files/whiteandgreen/pdf/WG_WC.pdf
http://www.iiiee.lu.se/QuickPlace/whiteandgreen/Main.nsf/h_Toc/695a3dfe0be56ce1c1256eba00356cb1!OpenDocument

⁹⁹ IEA DSM: Task XIV - Market Mechanisms for White Certificates Trading <http://dsm.iea.org/ViewTask.aspx?ID=16&Task=14&Sort=0>

Farinelli (2006)¹⁰⁰ drew some first conclusions on the future of White certificate schemes:

- While the EU ETS system appears adequate to cover the energy-intensive industrial sectors, the White certificate system now considered for residential and commercial buildings seems more suited to reaching sectors with medium and low energy intensity.
- The transport sector is still waiting for market-oriented mechanisms to improve energy efficiency; the possible extension of a White certificate-like system to include transport should be evaluated.
- Energy Service Companies (ESCO) are the backbone of a White certificate system. However, the market has been slow to encourage the launch of such companies, or the expansion of those which already exist. The obligations from the new EU Directive on Energy Services should be used to stimulate this market.
- Financial barriers have been recognised as one of the main obstacles to the introduction of energy saving measures, even when these are cost-effective. Provisions should be introduced by the banking system with government backing to facilitate the financing of such measures by bundling similar projects or by guarantees through a rotating fund.
- Schemes to remunerate energy efficiency as “power credit” should be explored.

6.4. Conclusions

- Cross-cutting measures for energy efficiency include (1) cross-cutting measures with sector-specific characteristics (mainly energy or CO₂ taxation which are modulated according to the sector to which they are applied) and (2) general cross-cutting measures such as CO₂/energy efficiency/renewables funds or energy efficiency obligations in combination with White certificates for energy savings.
- Energy taxation does seem to have an impact on energy efficiency but the importance of this instrument has fallen at the EU-15 level since 1999 because of the relative decrease of energy taxation in large EU Member States such as France, Italy and Spain.
- Energy efficiency obligations in combination with White certificate schemes promise to be the most important recent innovation for cross-cutting energy efficiency measures and experiences with such schemes are currently being made in several EU Member States, with or without the possibility of trading. Generally the obligation is imposed on energy suppliers and/or distributors. These national experiences will provide important insights into this instrument which can be used for the future development of White Certificates at the EU level and their interaction with other policy certificate schemes such as Green certificates for renewables or the EU Emission Trading Scheme.

¹⁰⁰ http://www.iiiee.lu.se/files/whiteandgreen/pdf/Farinelli_Conference_Introduction.pdf