

# Energy Savings Certificates (ESC) scheme in France: initial results

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## Abstract

In 2006, the French government decided to implement a new and innovative policy instrument (called energy savings certificates system) for promoting energy savings, mainly in the existing buildings sector. It compels energy suppliers to reduce energy consumption via their customers over a three years period. Providers are free to decide what type of action to implement and they can also use the market and buy certificates to others (companies and public bodies). At the end of the period, suppliers that will have failed to meet their obligation will have to pay a penalty. The financial risk for the suppliers equal to 1 billion Euro (the amount they will have to pay if they do nothing). As this first period of implementation is about to close (July 2009), what results and initial information are derived from these measures? To what extent have energy suppliers responded to this obligation? First quantitative results of this mechanism are here exposed covering programmes that have been implemented, equipments concerned and market price. Qualitative impacts are also tackled, e.g. advices development, suppliers' offers evolution and impact on the energy efficiency market.

## ESC system: principles and operation

The Energy Framework Policy Law of 13 July 2005 lays out the principles for the energy savings certificates scheme designed to generate consumer energy savings. To tap the wide array of

energy saving potential sources, the legislature requires energy suppliers to achieve or encourage residential savings amongst their customers.

### “OBLIGED” PARTIES: OBLIGATION IMPOSED ON ENERGY SUPPLIERS

At present, an obligation targets suppliers of electricity, gas, heating oil, and heating and cooling systems. They are affected if their sales exceed a certain threshold.

There are two types of obliged suppliers:

- a few dozen large companies that distribute energy (electricity, gas, oil, heating and cooling),
- a large number of small and medium-sized heating oil distributors integrated in the system in order to maintain competition in the sector. The legislature, however, has given suppliers permission to share this obligation by acting as a group.

Electricity and gas distributors account for most of the obligations – 57% and 26%, respectively. While there are a large number of heating oil distributors – 2,452 are targeted by the law – their obligation to save energy only represents 13% of total obligations. This breakdown is representative of energy consumption in the residential and service sectors in France, where gas and energy predominate.

### PREDETERMINED SAVINGS TARGET FOR STANDARDIZED ELIGIBLE ENERGY SAVING MEASURES

“KWh cumac” is the system's own unit of measurement. The term “cumac” is an abbreviation of the French terms for “cumulative” and “discounted”. The various parties undertake initiatives to generate savings, which are calculated in kWh of

**Table 1. Threshold and quantity of concerned energy suppliers (MEEDDAT / DGEC, 2006)**

Type of energy	Threshold of annual sales to residential and service sectors	Number of suppliers above this threshold
Electricity	400 GWh/year	20
Natural gas	400 GWh/year	12
Liquefied petroleum gas	100 GWh/year	7
Heating oil	No threshold	2,452 (of which over 1,700 belong to two mutual-interest groups)
Heating and cooling	400 GWh/year	11

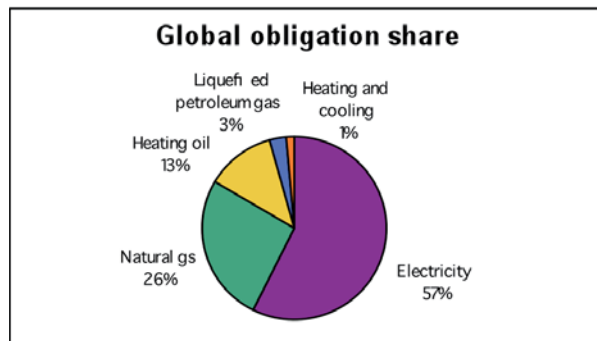


Figure 1. Global obligation share (MEEDDAT / DGEC, 2006)

**Table 2. Number of Standardized Operations (MEEDDAT / DGEC, 2006)**

Sector	No. of Standardized Operations	Operations
Residential buildings	58	Building insulation, heating, production of hot water, lighting, household appliances, ventilation, etc
Commercial buildings	80	Building insulation, heating, production of hot water, lighting, ventilation, etc
Industry	19	Lighting, electric utilities (motors, compressors), heat recovery, etc
Systems	8	Heating systems, public lighting, etc
Transport	5	Eco-driving, green tire, mobile case for combined transport

end-use energy, are cumulative over the lifetime of the project, and are then discounted. The discount rate, set at 4%, is both financial (the ESC has an economic value) and technical. The baseline improves over time, leading to a gradual decrease in savings.

$$\text{ESC (kWh cumac)} = \text{annual savings (kWh)} \times \text{programme lifetime (year)} \times \text{discount coefficient}$$

To make it easier for the parties to implement projects, an official “catalogue of standardized operations” has been published. To date, the catalogue includes 170 typical measures, each with a predetermined savings target in kWh cumac. The catalogue mainly covers energy consumption in existing buildings, and can be updated and expanded over time.

The kWh cumac for each standardized operation is calculated on the basis of an average national baseline. For example, the distribution of a low-energy light bulb earns an equivalent of 230 kWh cumac. Loft insulation entitles the party to 300 to 1,900 kWh cumac per sq.m of installed insulation, depending on the region, type of housing, and energy used for heating. The acquisition of a condensing boiler for a single-family household generates 64,000 to 140,000 kWh cumac based on the climatic zone and housing size. The standardized value thus does not

represent the savings generated by each operation alone but by the average baseline savings.

**OBLIGED AND ELIGIBLE PARTIES: A POSSIBLE TRADE MARKET**

“Obligated” parties are free to determine their own strategy for encouraging customer investments, such as technical advice or support, bonuses and financial services. To obtain ESCs corresponding to these programmes, they file requests with DRIRE<sup>1</sup>; invoices relating to the work performed or equipment purchased attest to the programme’s completion. Obtaining an ESC involves opening an account and registering kWh cumac in a national “Emmy” registry.

The system also provides an opportunity for “eligible” parties to undertake their own initiatives, obtain ESCs in the Emmy registry, then sell them to the obligated parties. Some regulatory rules have been defined, based on financial additionality issues. In definitive, eligible parties include companies carrying out improvements on their own premises as well as public authorities implementing programmes at their own facilities or those belonging to third parties operating in their region. To fulfil their obligations, obligated suppliers can also make use

1. Regional representative of the ministry responsible for energy.

Table 3. The ten first obliged companies (MEEDDAT / DGEC, 2006)

Obliged energy supplier	Type of energy supplied	Individual obligation (kWh cumac)
EDF	Electricity, natural gas	29,849,302,652
Gaz de France	Natural gas, LPG, electricity	13,424,901,026
Butagaz SAS	LPG	424,367,366
Electricité de Strasbourg	Electricity	383,690,963
Antargaz	LPG	371,625,595
Total Gaz	LPG	351,174,609
Bolloré Energie	Heating oil	344,368,004
CPCU	Heating / Cooling	296,322,331
Compagnie Pétrolière de l'Est	Heating oil	284,792,594
Primagaz	LPG	284,340,662
<b>TOTAL</b>		<b>46,014,885,802</b>

Energy Savings Certificates attribution (kWh cumac)

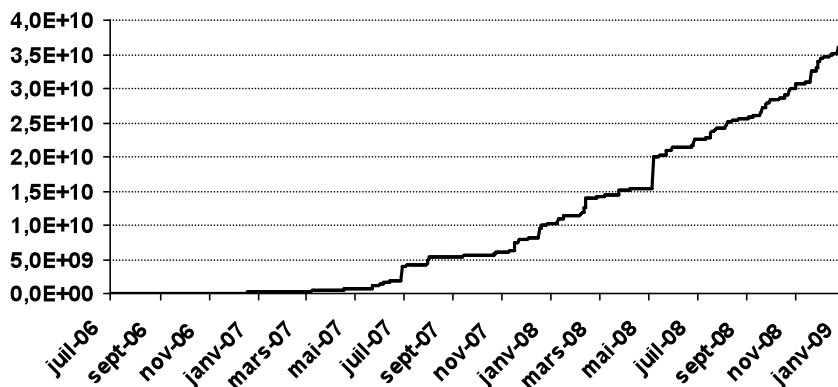


Figure 2. Energy Savings Certificates attribution from July 2006 to January 2009 (MEEDDAT / DGEC, 2009)

of a trade market, which is not organized by the government. Trading takes place between interested parties on the Emmy registry website, which facilitates contact between ESC buyers and sellers.

#### SAVINGS OBJECTIVE OF 54 TWH CUMAC WITH AN UNSURPRISING DISTRIBUTION

The system is designed to operate for multi-year periods. The first period, fixed at three years, began on 1 July 2006. For each period, the public authorities set an overall objective in TWh cumac – 54 TWh<sup>2</sup> cumac for the first period – which represents the amount of energy that obliged parties must save. This obligation is then broken down by type of energy, according to its respective share of residential and commercial consumption. It is then divided into individual obligations between sellers on a pro rata basis in proportion to their market share.

Table 3 shows the 10 obliged companies with the largest individual obligations. These suppliers account for 85% of the overall obligation, or more than 46 TWh cumac. Not surprisingly, EDF and Gaz de France come out on top, totalling 80% of obligations.

The ESC system is a regulatory scheme. Energy suppliers must comply with an obligation to save energy, failing which they must pay a penalty of 0.02 Euro per kWh cumac missing

at the end of the first period. The system therefore represents a “financial risk” for energy suppliers, estimated at 1.08 billion Euro<sup>3</sup>. Suppliers will not take this risk if they can invest in energy management programmes at a lower cost.

#### ESC in France: initial results

##### QUANTITATIVE RESULTS AT 1 JANUARY 2009

Definitive results cannot be established until after 30 June 2009. The ministry responsible for energy, however, will periodically distribute a progress report with interim quantitative results. The results presented below were those available at 1 January 2009. At this time, 36.0 TWh cumac have been delivered to 147 beneficiaries.

With the end of the first period several months away, only 66% of the final objective has been achieved. It is believed, however, that the parties will eventually meet their obligations and that the overall objective of 54 TWh cumac will be reached by 30 June 2009. Since July 2006, allocation of ESCs has been continually on the rise and the system has recently entered its “productive” phase.

This very strong growth in the granting of ESCs at the end of the period can be explained by the gradual implementation

2. 54 billion kWh cumac.

3. product of 54 TWh cumac and the penalty.

Table 4. Breakdown by sector (MEEDDAT / DGEC, 2009)

Sector	% kWh cumac
Residential building	88.1%
Industry	6.0%
Commercial building	4.4%
Systems	0.9%
Transport	0.6%

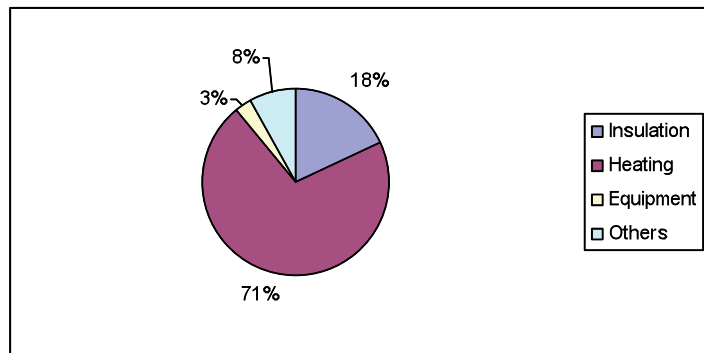


Figure 3. Breakdown by operation (MEEDDAT / DGEC, 2009)

Table 5. The ten major standardized measures (MEEDDAT / DGEC, 2009)

Reference no.	Name of standardize operation	% kWh cumac
BAR-TH-06	Residential condensing boiler	14.6%
BAR-TH-08	Residential low-temperature boiler	11.1%
BAR-TH-07	Commercial condensing boiler	10.4%
BAR-TH-29	Air-to-air heat pump	9.3%
BAR-EN-01	Insulation of lofts and roofs	6.8%
BAR-EN-04	Window or French door with insulated glass	6.4%
BAR-TH-09	Commercial low-temperature boiler	4.0%
IND-UT-02	Electronic speed variator	3.6%
BAR-TH-24	Residential solar water heater	3.5%
BAR-TH-04	Air-to-water heat pump	3.5%

of programmes over time: the obliged suppliers first defined their strategy, then went on to establish partnerships, train their employees, develop products and services and support investments and renovation work. Lastly, they must gather the information necessary to complete ESC requests since the certificates are granted after implementation of the programme. It is therefore normal that ESCs are only being awarded at the end of the period implementation.

ESC breakdown by sector shows that residential buildings make up the overwhelming majority (88.1%).

Table 4 and Figure 3 illustrate the strategic choices of obliged parties, who mainly target residential customers to fulfil their obligations. This strategy can undoubtedly be explained by the concurrent launch of a tax credit for residential customers, which has sparked investment in this target. At this stage, it is relatively difficult to conclude on the free riding effect. It is an evidence that energy suppliers have developed their programs and offers (see below: Changes in energy suppliers' services) by taking advantage of the tax credit. But the success of the

fiscal instrument and the development of the energy efficiency market are partly due to the energy savings certificates scheme that help the market to structure and promote the energy savings towards the consumers. On this first period, the tax credit and the energy savings certificates scheme can be considered as complementary, not simply additional.

When the ESCs are broken down by type of operation, energy-efficient heating systems rank first, representing 71% of ESCs, ahead of building envelope improvements and efficient electrical equipment (mainly electronic speed variator and low-energy bulbs):

Figure 3 presents the ten standardized measures most often used by suppliers and specifies each measure's share of the total volume of ESCs granted (36.0 TWh cumac):

- residential condensing boilers and low-temperature boilers account for 25.7% of ESCs,
- the same commercial boilers represent over 14.4%,
- 12.8% of ESCs were granted for installing heat pumps,

- building improvements (13.2%) mainly involved replacing doors and windows and insulating lofts and roofs.

Most of these measures are eligible for tax credits. At this stage, there are few examples of building envelope projects even though some of them are cost-effective. It appears that the insulation sector's lack of organization hinders obliged suppliers from initiating programmes of this nature.

Overall, improvements have an average lifetime of around 20 years (lifetime of standardized operations, averaged according to volumes of kWh cumac achieved). The impact of currently certified programmes (36.0 TWh cumac) on energy end-use can thus be estimated at approximately 2.5 TWh per year, i.e. 0.31% of buildings' overall consumption or 0.14% of national consumption across all sectors. This estimate is consistent with the expected results given the low level of requirements during this initial period.

#### CHANGE IN ENERGY SUPPLIERS' SERVICES

The quantitative results indicate that most ESCs were awarded to obliged energy suppliers for initiatives undertaken for residential customers.

Obliged parties' strategy during the first period has thus focused on households. As part of their traditional business relations, energy suppliers have sought to directly encourage residential customers to carry out energy efficiency improvements. Suppliers have incorporated new services in their offerings designed to support, encourage and initiate energy efficiency projects in the residential sector. They are then able to obtain ESCs for these operations after providing invoices and other supporting documents.

Energy suppliers' response to the system has been consistent with its initial objectives. The French system was established to reach wide-ranging sources of energy savings, including households. The public authorities also sought to improve energy suppliers' commercial practices by encouraging them to sell less energy, but in a more efficient manner.

A study (BASIC, 2008) has examined the way in which energy suppliers' commercial products and services gradually have evolved toward more efficient-energy management.

- Advice on saving energy: all companies now provide at least a basic level of advice on how to save energy, mainly through their websites. Heating oil and propane suppliers, whose fuel is considered more costly, have a rather practical message: "energy savings mean financial savings". Suppliers new to the market often use this environmental message as a way to stand out from the competition.
- Energy assessments: half of the energy providers surveyed intend to offer this type of service to their customers. The major companies perform this service themselves; their sales staff had previously received relevant training. There seems to be a fairly sizeable presence of small local companies (public utilities, local suppliers) in this service segment; some of them have entered into agreements with specialized third-party companies.
- Energy consumption audits and monitoring: other than online posting of energy consumption figures, few other services have been developed, such as analyses of energy use, benchmarks and remote meter reading. One electric-

ity company offers an online service in which customers can consult advisors about their energy concerns. Several companies say, however, that their projects are under development.

- Financial services: nearly all companies offer low-interest loans for equipment purchases or building renovations. The lowest rates can drop below 1% and climb to 3-4% for a 10-12 year payment period.
- Support for energy improvements: in addition to low-cost loans, bonuses are sometimes awarded and range from several hundred to 1,000 Euro. Recipients are mainly propane and heating oil suppliers and local companies. In certain cases, support takes the form of putting an individual in contact with the building's energy providers. Setting up a network of partners is one of the strategies developed by the major energy suppliers (such as EDF and the Bleu Ciel network; Gaz de France and the Dolce Vita network; and Primagaz and the Primalliance network).
- Provision of equipment: at present, there is little meaningful supply of energy-saving equipment. But this situation could improve: some providers have announced the publication of equipment catalogues (solar, heat pump, heating), some of which are available online (energy-saving adapters, low-energy bulbs). For the time being, there has been only limited development of "boxes", automated home systems that perform energy management functions.

The ESC system has therefore spurred energy suppliers to improve their services by including an "energy management" component. These suppliers have had to develop or expand their current partnerships with equipment manufacturers, installers and construction industry professionals – and even with banks – in order to offer their end-customers support services for their projects.

But the ESC scheme is probably not the only engine driving this trend. Liberalization of the electricity and gas markets, as well as consumers' growing concern about energy prices, have also helped changed the way energy suppliers do business.

#### ESC TRADE MARKET

The system permits obliged parties to take advantage of the market and buy ESCs that eligible parties have themselves obtained. These trades between interested parties are registered by the national certificate registry, "Emmy", which tallies the volumes traded and their average price on a monthly basis:

Between 1 July 2006 and 1 January 2009, the register recorded a total traded volume of approximately 1.4 TWh cumac, or 4% of all ESCs granted (MEEDDAT / DGEC, 2009). The financial volume of these trades stood at around 4.48 million Euro, with an average transaction value of 0.32 cEuro/kWh cumac. The trades, however, covered a wide range, varying from 0.3 to 1 cEuro/kWh cumac.

It is thus apparent that, at this stage, the ESC trade market remains marginal during this first period. The trade market's weakness can largely be explained by energy suppliers' lack of demand for ESCs. These suppliers have decided to undertake initiatives on their own with their residential customers without obtaining ESCs from eligible parties.

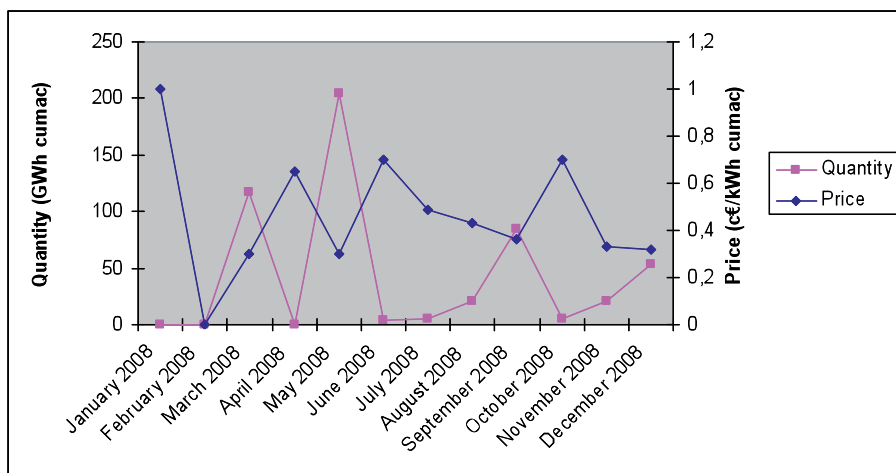


Figure 4. Monthly average quantity of certificates traded and price (Emmy, 2009)

The supply of ESCs also remains weak, reflecting the marginal involvement of eligible parties in the system (public authorities and companies). Supply has not been stimulated by demand given that the major energy suppliers announced at the beginning of the period that they did not plan to position themselves as ESC buyers. The low involvement of eligible parties also results from insufficient understanding of the system, which is an innovative scheme that can seem complex.

In view of the low volume of trades in the registry, the “kWh cumac listing” has little relevance. It would thus be problematic at this stage to infer an energy source’s acquisition cost or an obligation’s average cost for all obliged suppliers.

### Major changes on the way

While the first period will end on 30 June 2009, any system modifications are still under discussion as part of the Grenelle de l’Environnement process. It has been decided, however, that the scheme will be renewed for a second period, with expanded objectives and an overall streamlining of operations. Review of key changes that will be discussed in 2009:

#### SCOPE OF OBLIGED PARTIES

The system currently comprises a large number of obliged parties (more than 2,400 companies), generating a significant administrative workload for the public authorities. Plans have therefore been made to reduce the number of obliged suppliers, particularly in the heating oil segment, which accounts for 13% of obligations and 98% of obliged companies. If the government set a minimum sales threshold, only the sector’s largest companies would remain.

Moreover, the scope could expand to include new obliged parties by bringing in companies that market automotive fuel. This measure would therefore mark a significant expansion of the system, which would become an energy management scheme extended in force to the transport sector.

#### LEVEL OF OBLIGATION

Determining the obligation level for the second period is the current focus of discussion. Energy suppliers propose doubling the first period’s obligation, while ADEME wants to multiply

the initial obligation by a factor of 10 to 18. In fact, the system’s “*additionalité*” effect and cost recovery are the two key issues:

- **Additionality:** the market for energy efficiency improvements is growing, particularly under the impetus of measures like the tax credit and future zero-interest-rate bank loans. Setting the bar too low for obligations in the interest of “business as usual” and other incentives could create a “windfall effect”, in which the various players need only support the energy-saving improvements that would have been done anyway, for the purpose of receiving ESCs. The ESC obligation level will determine the impact of the additionality on market growth and other measures.
- **Cost recovery:** the economic rationale for an obligation-based system relies on energy suppliers’ ability to recover operational costs through energy prices. Because the State regulates electricity and gas tariffs, any discussion about obligation levels must be addressed through tariff negotiations between the government and energy suppliers.

#### ELIGIBILITY RULES

Lastly, the eligibility rules may undergo substantial revision:

- Public authorities’ eligibility may be limited to improvements they make to their own property. They would no longer be eligible for projects in their region that they encourage third parties to undertake.
- Companies currently eligible for improvements of their own premises would lose all eligibility.

This eligibility restriction, and thus the possibility of using the trade market for obliged parties, is proposed by the public authorities to prevent the overcounting of ESCs, streamline the system and manage the administrative workload.

2009 will therefore see complex decisions concerning the future of the ESC system. The regulations could be considerably revised and the quantitative objectives significantly broadened.

## References

- MEEDDAT / DGEC, 2006: official texts on the web site ([http://www.industrie.gouv.fr/liste\\_index/index\\_cee-clics.htm](http://www.industrie.gouv.fr/liste_index/index_cee-clics.htm))
- MEEDDAT / DGEC, 2009: bimonthly newsletter on scheme progress « La Lettre d'information Certificats d'Economies d'Énergie – Janvier 2009 » ([http://www.industrie.gouv.fr/liste\\_index/index\\_cee-clics.htm](http://www.industrie.gouv.fr/liste_index/index_cee-clics.htm))
- BASIC, 2008: study conducted by BASIC for ADEME (« Analyse du développement des services incitant aux économies d'énergie proposées par les fournisseurs d'énergie aux particuliers – Mai 2008 »)
- Emmy, 2009: official monitor's data available on the web site ([www.emmy.fr](http://www.emmy.fr))

## Glossary

- ESC: Energy Savings Certificates
- DGEC: MEEDDAT Direction in charge of energy and climate issue
- DRIRE: French Regional Directorate for Industry, Research and the Environment
- MEEDDAT: Ministry in charge of ecology, energy, sustainable development and territory management