ENSMOV PLUS

Catalogue of standardised measures

Improvement of energy saving support programs through the use of a catalogue of standardised measures

March, 2025

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The National Energy Conservation Agency (KAPE) is an advisory and consulting company operating in the field of effective energy management. It has been on the market since 1994. The company offers, for m.in, comprehensive, independent advice on the optimization of energy production and consumption, and performs audits for the industrial and construction sectors. It conducts national and international educational projects and provides services for local government units related to the implementation of a low-carbon economy. KAPE promotes European standards in the field of proper energy management and supports business representatives in the implementation of decarbonization strategies.

The ENSMOV Plus project assists European Union Member States in monitoring, revising, improving and implementing energy efficiency policies by developing material on practical and strategic issues related to the implementation of Article 8 (formerly Article 7) of the Energy Efficiency Directive (EED), dealing with Member States' energy savings obligation.

Dictionary and abbreviations

CEE

CEE 'Certificats d'Économies d'Énergie' (CEE) is a French term meaning 'Energy Efficiency Certificates'. The abbreviation 'cumac' comes from the words "cumulé" (cumulative) and 'actualisé' (actualised) and refers to the cumulative and actualised energy savings achieved through energy efficiency measures.

Cumac

In France, the unit used in the white certificate system is 1 kWh cumac. The term 'cumac' is an abbreviation of "cumulé" (cumulative) and 'actualisé' (updated), referring to cumulative and updated energy savings. 1 kWh cumac corresponds to one energy efficiency certificate (EEC). Energy savings are accumulated over the expected lifetime of the measure and then discounted at an annual rate of 4% to take into account the time value of money and any decline in the efficiency of the technology. Discounting is applied because certificates are issued immediately upon approval of the application, while energy savings are realised gradually over the lifetime of the measures. This takes into account the fact that applicants receive certificates 'up front' and that annual energy savings may decline over time, for example due to technology efficiency loss or market standard improvements.

The formula for calculating 1 kWh cumac is as follows:

1 kWh cumac (CEE) = kWh/year (annual final energy savings) × discount factor (Ca)[1]

The number of kWh cumac indicates the estimated energy savings compared to the amount of energy that would have been consumed if no energy reduction measures had been implemented (the so-called baseline scenario). For example, the savings expressed in kWh cumac achieved by installing an energy-efficient appliance correspond to the total annual energy savings over the entire lifetime of the appliance, assuming that in the baseline scenario the appliance would be replaced by another appliance with average market efficiency or the minimum required by applicable regulations.

Ministry (France) In 2024, the ministry responsible for standardised measures was the Ministry of Energy Transition.

[1] Discount factor = 1 + (1/0.04)*(1-(1/(1.04)^(lifetime-1)))

$$C_a = 1 + \frac{1}{a}\left(1 - \frac{1}{(1+a)^{n-1}}\right)$$

Ca: discount factor
a: discount rate
n: expected lifetime

PNCEE

Pôle national des certificats d'économies d'énergie – Krajowy Ośrodek Certyfikacji Energii: francuska jednostka odpowiedzialna za zarządzanie i nadzorowanie systemu świadectw oszczędności energii (Certificats d'Économies d'Énergie – CEE). System ten jest narzędziem polityki energetycznej Francji, mającym na celu promowanie działań poprawiających efektywność energetyczną w różnych sektorach, takich jak budownictwo, transport czy przemysł. Główne zadania PNCEE:

a. zarządzanie certyfikatami: przyznawanie i monitorowanie certyfikatów za zrealizowane projekty oszczędności energii,

b. nadzór nad uczestnikami systemu: kontrola podmiotów zobowiązanych (np. dostawców energii) do realizacji działań energooszczędnych,

c. weryfikacja projektów: Upewnianie się, że zgłoszone działania rzeczywiście prowadzą do oszczędności energii, promowanie efektywności energetycznej: Zachęcanie do inwestycji w technologie i rozwiązania ograniczające zużycie energii.

Introduction

The purpose of the document is to collect and present information on the French experience (information about the experience of other Member States experience can be found for example in the report "Status of energy savings calculations for priority actions in European countries"[2]) in the implementation of the catalogue of standardised measures (see chapter: "*What are pre-defined standardised measure", page 12*). This study is intended to be useful in the discussion on the possible preparation of such a solution in Poland. The document is prepared by the team of the National Energy Conservation Agency (KAPE – Poland) in cooperation with Institute for European Energy and Climate Policy (IEECP) and Association Technique Énergie Environnement (ATEE).

The need to improve the Polish system of white certificates stems from several important factors[3]:

- Underachievement: the current level of energy savings provided by the white certificate system is insufficient to meet the new EU energy efficiency targets.
- Risk of abuse: projects supported by the Polish white certificate system may not be additional (projects would be viable despite the support of the system).
- Risk that the reported savings might be overstated.
- Lack of independent assessments: There are no independent, evidence-based assessments of the white certificates system itself. The measurement and verification of energy savings are based on self-reported savings by companies, moreover there is no official specification for project lifetimes.

The introduction of a catalogue of standardised measures would simplify the costly procedure of assessing energy efficiency projects and make the procedure more transparent and credible. After the implementation of such system, the entity implementing the measure defined in the catalogue does not have to conduct an energy audit – a catalogue of so-called fiches (factsheets) provide for each type of standardised action a predefined ratio of energy savings. This ratio can be differentiated according to various criteria (e.g. climate zones, type of buildings etc). Applicants have to report a minimum set of information (e.g. action type, location of installation) only. Then the public authorities can calculate automatically the amount of white certificates (based on the savings ratios per action type).

Nevertheless, applicants are required to keep full documentation of the reported activities in case of an inspection. Furthermore, for the most common types of

[2] https://streamsave.eu/wp-content/uploads/2021/01/D2.1_StatusSavingsCalculationsEU-2ndRound_v3.pdf
[3] https://www.eceee.org/library/conference_proceedings/eceee_Industrial_Summer_Study/2020/1-policies-and-programmes-to-drive-transformation/evaluating-the-polish-white-certificate-scheme/

activities, applicants should commission independent inspections (including on-site inspections).

There is overall a significant cost reduction on the side of the regulatory authority, which does not have to carry out the costly and time-consuming audit verification procedure. As a large part of the approval of the applications can be automatized, which enables to process applications dealing with very large numbers of actions. Setting up and managing a system based on a catalogue of standardised measures has upfront costs (e.g. developing the catalogue, developing an IT system), but once in place, the processing cost per application is much smaller than preparing audits and evaluating/verifying for each and every, even very standard, investment. In addition, these costs are 'outside the system'. Nevertheless, a catalogue of standardised actions is a living framework that requires regular updates. Likewise, fine-tuning the M&V process is also an on-going task, that is more effective with quick feedback loops.

The main benefits of implementing a catalogue of standardised measures are:

- Increasing knowledge and raising awareness about typical opportunities for saving energy: the development of the catalogue implies to gather the most up-to-date and reliable data (that might otherwise be spread among various sources, not necessarily public or easy to find). Then the catalogue is commonly used as a reference to screen what energy efficiency actions can be implemented,
- Incentive for stakeholders to propose new action types or provide evidence about data needed to define standardised actions and related deemed savings,
- Facilitation of decision-making by being able to calculate the effect/benefit instantly,
- Reduction of the costs of preparation and verification of typical measures,
- Simplification of the process (for the end user, the obligated entity and the regulator),
- Improving the transparency of the system,
- Acceleration of the process of preparation, verification and other accompanying administrative activities,
- Making the system relatively easy to automate and computerize,
- Introduction of unified, clear assessment standards,
- Flexibility to achieve energy savings among different groups of end users,

A catalogue of standardised actions is particularly relevant to facilitate small standard energy saving projects or energy saving projects among small consumers (e.g. households). This is why it is commonly used for actions in the residential sector. One of the specificities of the French catalogue is that it has a broad scope, covering all end-use sectors (households, services, industry, transport, agriculture). But even the French catalogue does not cover all the types of energy saving actions: specific actions

(that do not correspond to a standardised action type) can also be reported, based on an energy audit[4].

It is important to remember that if a system is poorly designed or implemented, the market will take advantage of the flaws, or to choose a way of implementation that decision-makers would like to avoid (an example would be the distribution of LED that end users would not use and either store or sell). Such risks can be mitigated by the development of good policies, careful design, ensuring high quality of controls, verifications and evaluations, including regular adjustments to take into account changing market conditions and feedback from stakeholders. In France, a system based on standard operations has been in place since 2006, and the catalogue started to be developed from 2004 (ahead of the start of the scheme). It has therefore accumulated knowledge and experience that can help to successfully implement similar systems in other countries[5].

This document has been divided into three parts:

1. **General information** on the costs related to the preparation and verification of energy saving projects (transaction costs).

2. **Discussion of the French example**, presenting the organizational and administrative framework.

3. **Annexes**, which are translations of selected documents, characteristic of the French system, helping to understand the logic of the catalogue of standardised measures (collegiality and broad participation of stakeholders, scope of the action charter, list of action sheets).

In France, the catalogue has been prepared in the context of the white certificate scheme, but it is possible to consider that such a catalogue is applicable to standardised measures under, for example, subsidy schemes such as the Clean Air Programme.

[4] The case of specific actions in the French scheme has been described in this example available on the ENSMOV Plus' platform: https://energysavingpolicies.eu/wp-content/uploads/2023/09/ENSMOV-Plus-measurement-examples_France-EEOS_ATEE.pdf

[5] Market-Based Instrument for Energy Efficiency (iea.blob.core.windows.net), https://iea.blob.core.windows.net/assets/f2873e3b-b4cf-4af5-adf5-f20544e25cc3/MarketBased_Instruments_for_Energy_Efficiency.pdf

The expensive and work-intensive process of verifying effects in the Polish White Certificates Scheme

1.1 Polish White Certificates System – the snapshot

The methodology of the Polish white certificate system is illustrated in Figure 1.

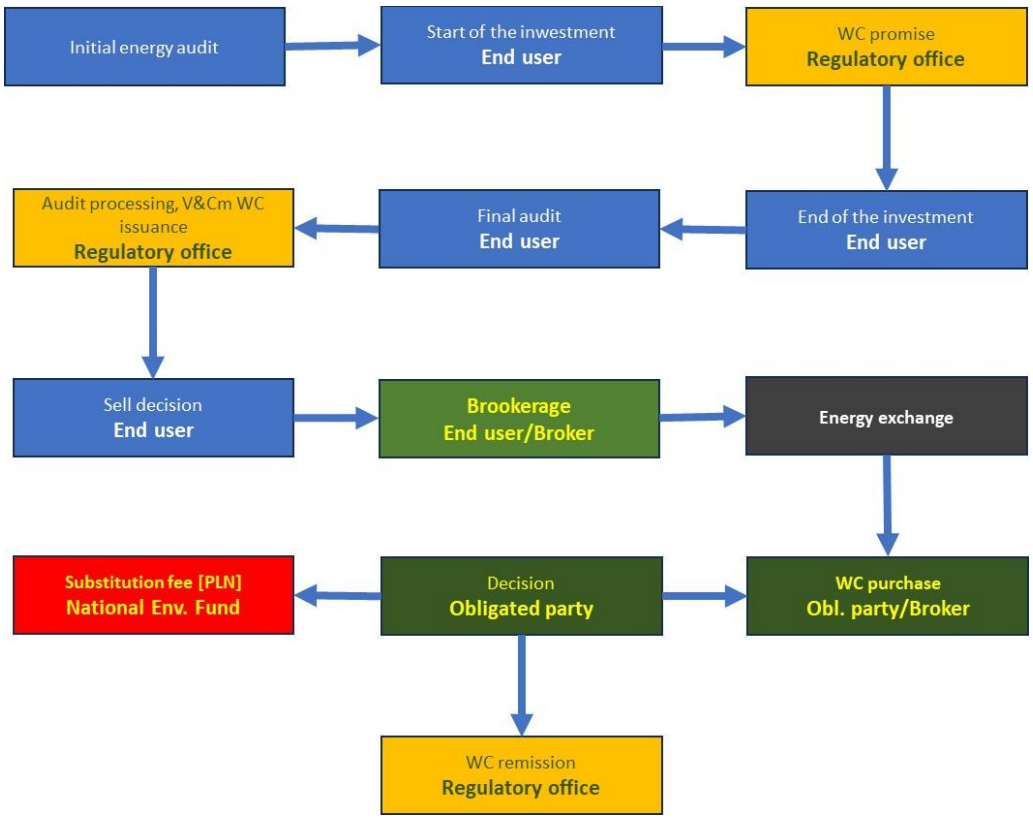

Figure 1 The Polish White Certificate Scheme in brief. Source: KAPE 2024.

Preparing the documentation, energy auditing (ex-ante and ex-post), verification of the documents, evaluation of the results, controls take place at several stages of the scheme, where the activities are carried out by several actors. There are several important reasons for the resource-consuming preparation of documentation, assessment and verification:

1. Credible specification of the planned outcome,
2. Clear form of communication between the investor and the regulator (audit),
3. Credible evaluation of the results already obtained,

4. Reliable reporting of the obtained results (i.e. for the European Commission)
5. Preventing abuse and fraud.

The assessment and verification of the effect obtained, in the form of reduced energy consumption, takes place in Poland (as of 2024) at the following stages:

1. Pre-audit - preliminary evaluation of energy consumption and options for energy consumption reduction (document prepared by the investor),
2. Audit/application verification/assessment (carried out by the Energy Regulatory Office),
3. Ex-post audit – an audit performed after the implementation of the investment, usually process much simpler than the pre-audit, as it is performed on its basis (a document prepared by the investor),
4. Random verification of ex post audits (implementation by the Energy Regulatory Office),
5. Recording and reporting of results (carried out by the Energy Regulatory Office and the Ministry of Climate and Environment as part of the CROEF database).

An important function of energy audits is clear communication that is understandable for all parties involved. The highly formalized procedure and standardised methodology of preparing the energy audit make it possible to present the information to the regulator in an understandable way, enabling relatively easy verification of the assumptions made and the data used. Moreover, an energy audit is specific to the building, site, process, etc. audited. Its recommendations provide a direct basis for investment decisions. Whereas values from a catalogue of standardised actions are simply a rough benchmark: these values are representative of the average of the stock (or other scope considered in the catalogue), but not relevant for a specific case.

The need for reliable, trustworthy reporting stems from the requirement for obligated parties (or other project holders) to report to the government (national level)[6] and for national governments to report to the European Union (where the energy efficiency targets pursue is reported[7]).

It is evident from the above short overview that identifying and verifying the energy savings requires effort from both the project holder and the system itself (in this case, the Energy Regulatory Office).

1.2 Transaction costs

Assessment and verification of energy efficiency measures can be costly and affects the final profitability of the investment (especially small measures, where the

[6] Central Register of Final Energy Savings (CROEF) https://croef.ios.gov.pl/
[7] National energy efficiency target: https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficiency-targets-directive-and-rules/energy-efficiency-targets_en?etrans=pl&prefLang=pl

percentage of non-investment costs can be relatively high). The assessment and verification costs depend on:

- the size of the investment,
- its complexity,
- standardisation of documentation,
- repetitiveness / replicability,
- access to data and documentation,
- formal requirements,
- others.

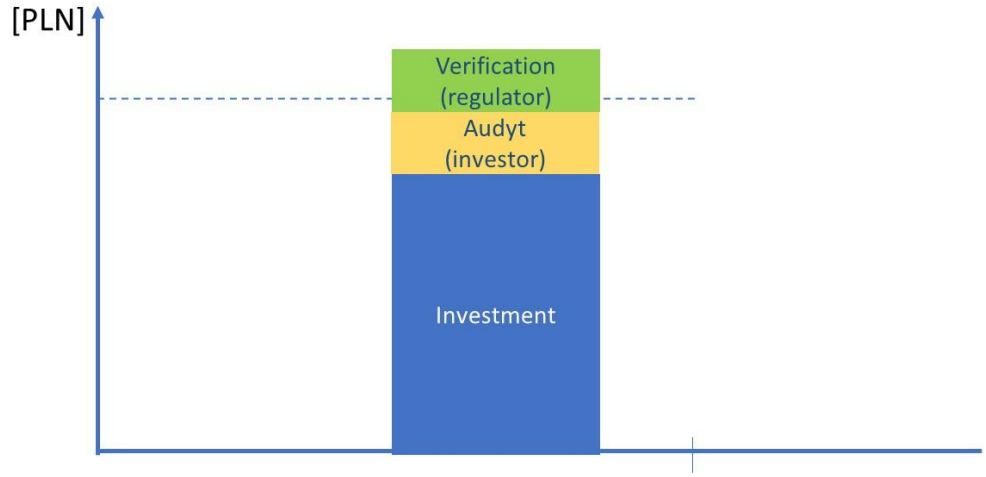

Figure 2 Simplified interpretation of transaction costs of energy consumption reduction projects, KAPE S.A 2024

From the investor's point of view, the total of investment costs (once deducted the incentive related to the white certificates) and audit costs (if not part of the incentive mechanism) must be within the profitability limits. For small investments the relatively high cost of an energy audit can be a barrier that effectively blocks the investment (the project turns out to be unprofitable or not enough profitable, for the investor and/or for the obligated party or ESCOs looking for cost-effective white certificates). However, it is important to note that conducting an audit is not the only cost on the side of the company that will manage the application file to get the white certificates. Other transaction costs, which are usually excluded in a formal cost-effectiveness analysis are real and should be considered. Such transaction costs include:

- Project preparation costs - learning about the white certificates scheme (e.g. about the documentation and M&V requirements, application process), initial analysis of feasibility
- preparation of the initial concept of the project, organization of meetings with stakeholders, preliminary legal or technical opinions,
- preparation of documentation needed for the energy audit (collection of data, bills, accounting statements, technical designs),

- other costs of involvement of staff: participating in the preparation of the project/audit (telephones, site visits, etc.),
- preparation of the audit,
- preparation of bank documentation (in case of bank cofinancing),
- handling stock exchange operations.

Some of the above costs are performed as part of the day by day work and are difficult to estimate and therefore, even in the case of larger investments, they are omitted in viability assessment.

After taking into account other transaction costs (the preparation of an audit is one of them), the attractiveness of the investment decreases. Relatively high transaction costs can make an attractive investment unprofitable.

On the part of the system operator, there are also costly activities, among others.:

- evaluation of the effectiveness of the measures carried out and their cost-effectiveness,
- administration including storage, processing and transfer of information,
- reporting,
- control,

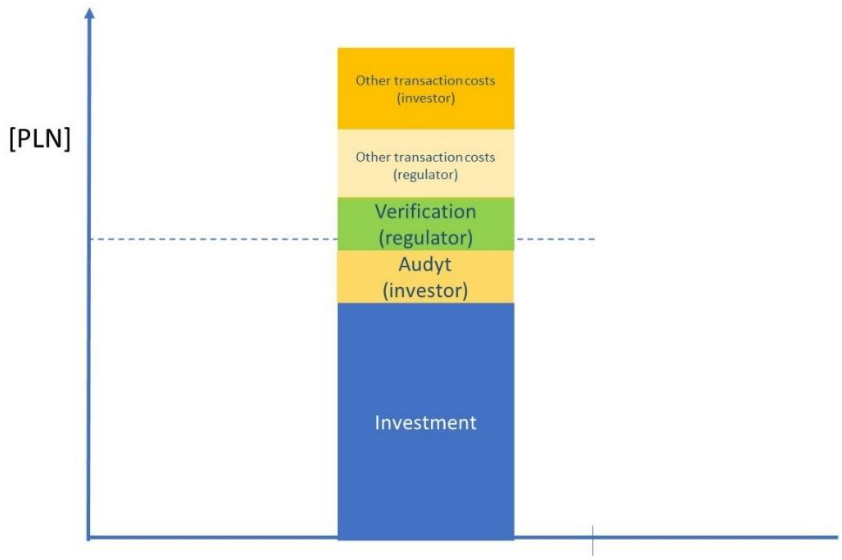

Figure 3 Extended interpretation of transaction costs of energy consumption reduction projects, KAPE S.A 2024

In other words, the benefit of the investment should justify bearing its costs, including transaction costs. For small investments, transaction costs can effectively hold back the realization of the investment. In the meantime, as mentioned above, transaction costs may also bring non-monetary benefits (e.g. providing a reliable basis for investment decision; quality insurance; securing the output, i.e. here energy savings).

There are several strategies to reduce transaction costs[8] on both the project holder's and the system administrator's sides, these include, for example:

- introduction of IT tools, e.g. certified energy audit software (very common for buildings),

- automatization of assessment processes (not always possible),

- reducing the number of audits, e.g. by introducing randomness (similar to controls in public transport),

- optimization of the scope of the energy audit (reduced to the minimum necessary),

- standardisation of requirements,

- for repetitive and relatively simple measures for which historical data exists, development of simplified assessment and verification procedures.

The last of these methods is the subject of this short study.

To learn more about strategies for reducing transaction costs, it is worth reading (Langner et al. 2014)[9], publication of NREL on this topic. The French example is elaborated on further below.

Note: after a literature review and interviews/discussions with the French institutions responsible for implementing the standardised measures system, no information on the amount and character of transaction costs were found.

This paper presents many years of French experience, where the concept of pre-defined standardised measures is proven, mature, and its implementation is considered as an unquestionable success. Despite the obvious benefits, the implementation of the system of standardised measures also has disadvantages. The analysis of benefits and disadvantages should contribute to the reflection on the feasibility and applicability of introducing a similar system in Poland.

What are pre-defined standardised measures?

Pre-defined standardised measures are those for which, in order to demonstrate the effect in terms of reduced energy consumption, the investor or the project holder does

[8] https://econjournals.sgh.waw.pl/KNoP/article/download/2534/2279

[9] Rois Langner, Bob Hendron and Eric Bonnema (2014). Reducing Transaction Costs for Energy Efficiency Investments and Analysis of Economic Risk Associated With Building Performance Uncertainties. Technical Report of NREL (National Renewable Energy Laboratory), August 2014. https://www.nrel.gov/docs/fy14osti/60976.pdf

not need to evaluate energy savings with the energy audit. For standardised measures, the project holder needs to carry out standard calculations or use 'standard values' described in standardised fiches/factsheets.

The introduction of standardised measures and calculations radically reduces the costs of project preparation on the investor's side. An example of a typical standard operation would be the replacement of a heating system. The baseline will be defined according to the market average or to minimum energy performance requirements set in the current ecodesign regulation, and according to average heating demand per climate zone and building type. Similarly, the parameters of the new heating system will also be pre-defined according to the technical requirements set in the factsheet. The amount of white certificates will thus be based on an average case, without the need to assess energy savings on a case-by-case basis. The data required about the action done will be limited to the minimum to enable controls that the action has been done and complies with the technical requirement (e.g. invoice), and to differentiate the standard values when relevant (e.g. location data to differentiate according to climate zones). The parameters used in the standardised calculation (e.g. baseline energy consumption, energy consumption with the energy efficiency action, action lifetime) are determined on the basis of historical data (e.g. statistics about the housing stock), average technical performance of devices available on the market and on the basis of experts' opinion.

Predefined standardised actions are operations for which it is possible to:

1. Define standardised specifications of the action (including scope and technical requirements)
2. Define a standardised, relatively simple calculation procedure,
3. Assume that the variability within the predefined scope is acceptable and that the expected number of actions will be enough so that the average characteristics of the whole reported actions will be close to the average values used to determine the deemed savings (i.e. variations among actions will compensate overall),
4. Define clear conditions/boundaries for calculation applicability,
5. Determine the baseline,
6. Determine the "lifetime" of the investment.

Defining a factsheet for a standardised action is sometimes sophisticated and requires the involvement and consensus of experts in assessing energy savings in a specific (sub-)sector, typically including the regulator / public authority, energy agency or institute, trade organizations and associations of stakeholders involved in the white certificates scheme.

The French example

1.3 French measures to reduce energy consumption [10]

The French (CEE) white certificates market is currently estimated to be worth around EUR 4-5 billion/year. In comparison, the Polish white certificates market value is about EUR 250 million/year (about 170 million PLN of white certificates and about 350 million PLN of substitution fee).[11]

In France, the value of the white certificate at the end of 2023 was EUR 7-9/MWh cumac (net) – approx. PLN 400/toe. Under Article 8 of the EED, the WCS generated 24 TWh of cumac of energy savings in 2023.

In France, CEE (French white certificates) can be obtained in three ways (data published for the fourth period of the scheme):

- Through standardised actions (88.1%),
- Accompanying programs (8.4%),
- Specific operations (3.6%).

"Accompanying programs" are activities aimed at preparing new types of projects (R&D) or those where the effect is difficult to estimate or not included in the catalogue of standardised actions(e.g. behavioural measures), or dealing with (sub-)sector or customer group more difficult to reach (e.g. energy efficiency in transport, energy poor households). The French ministry issues calls for programmes, defining general topics in line with policy priorities. For the selected programmes, the amount of white certificates is not proportionate to energy savings, but to the funding (predefined ratio of eurocents per kWh cumac). The ratio is higher than the average CEE price on the market, but lower than the penalty for missing target. The programmes are similar to Polish NFOSIGW (*National Fund for Environmental Protection and Water Management*) programmes, e.g. Clean Air.

"Specific operations" are energy saving projects that do not correspond to action types included in the catalogue of standardised actions. Energy savings from these

[10] Based on: https://www.ecologie.gouv.fr/operations-standardisees-deconomies-denergie
[11] Substitution fee in the Polish system of white certificates, KAPE 2024

operations are assessed with an energy audit, according to the methodology defined for the scheme[12].

In France, white certificates (CEE) are the primary tool for achieving the national energy savings obligation set in Article 8 of the EU Energy Efficiency Directive. The CEE scheme includes measures in the field of building renovation and addressing energy poverty, that are usually less cost-effective than energy efficiency projects in large industrial sites. Unlike in Poland, in France the financing of energy efficiency measures through white certificates can be combined with other available instruments (e.g. public grants), particularly for building renovation and measures tackling energy poverty. This feature has two important implications:

- under the French system of white certificates, it is possible to carry out tasks that would not be cost-effective with white certificates alone (such as thermal modernization of buildings or projects related to alleviating energy poverty),

- standardisation of procedures also applies to other instruments, which greatly simplifies and speeds up all procedures.

1.4Standardised actions

In France, the standardised actions address several important issues related to the implementation of the white certificate system:

- They reduce transaction and administrative costs for obligated companies and end-users,

- They simplify the assessment procedure, making the whole process easier to participate in (filling in a form with simple calculations is obviously simpler and less costly than performing an energy audit),

- They speed up and simplify the verification procedure, thus reducing the time and resources needed to perform these activities compared to the traditional approach,

- The catalogue itself has an important informative value, so that a prospective investors can learn what measures can be implemented at their sites even before the specialist is involved. The catalogue is placed on a publicly accessible website and can therefore be used as the free initial screening and selection tool,

- The process of development of standardised fiches has a participatory approach, allowing broad involvement in the preparation, increases the level of legitimacy, which translates into commitment to the programme,

[12] For more details about specific operations in the French scheme, see: https://energysavingpolicies.eu/wp-content/uploads/2023/09/ENSMOV-Plus-measurement-examples_France-EEOS_ATEE.pdf

- Broad stakeholder participation increases the credibility and transparency of the whole system.

Not all the technical information included in the fiches is publicly available, but access to the non-public is possible and relatively easy, simply by participating in the technical working groups where the fiches are prepared (more on the work of working groups is described later). In this way, stakeholders are mobilised to actively participate in the working groups.

The French standardised actions have been developed in the form of fiches, i.e. brief information sheets published by ministerial decree in the French official gazette after consultation with the Higher Council for Energy (CSE). The example of a fiche can be found in Annex: Annex 2: Example of a sheet (fiche) produced for the action 'insulation of the attic or roof (BAR-EN-106)', page 20.

The fiches set out the requirements for the issuing of certificates for the activities/technologies considered and the associated fixed energy savings values (deemed savings), expressed in kWh cumac. The catalogue is divided into six sectors, containing almost all areas relevant to end users: agriculture, housing, services, industry, networks (e.g. district heating, public lighting) and transport. Energy savings for measures and technologies not included in the catalogue must be verified by an energy audit (cf. "specific operations" mentioned above).

Residential buildings under the 'energy poverty' sub-target (BAR PR)	46,7%
Other residential buildings (CL BAR)	21,8%
Non-residential buildings (BAT)	7,2%
Industry (IND)	17,7%
Transport (TRA)	3,3%
Agriculture (AGRI)	2,1%
Networks (RES)	1,1%

Table 1 Shares of white certificates per sector (for white certificates from standardised actions, source: French Ministry of Energy Transition

Around 20 standardised action types (approx. 10%) account for 70-80% of the white certificates delivered from all standardised actions, of which the 5 'best' ones produce 50%, and all but one[13] **concern the housing sector**. The four action types with the largest amount of white certificates delivered between January 2022 and September 2024 are all action types in the residential sector (by decreasing order of amount of white certificates):

- heat pumps,

[13] The fifth action type in the top5 is an action type in industry, about heat recovery on cooling generators.

- roof insulation,
- deep renovation,
- wall insulation,

The catalogue of standardised actions applies to obtaining both :

- 'classical' CEE (–i.e. white certificates that count for the main targets of the obligated parties), and
- 'energy poverty' CEE (i.e. white certificates that count for the 'energy poverty' sub-targets of the obligated parties).

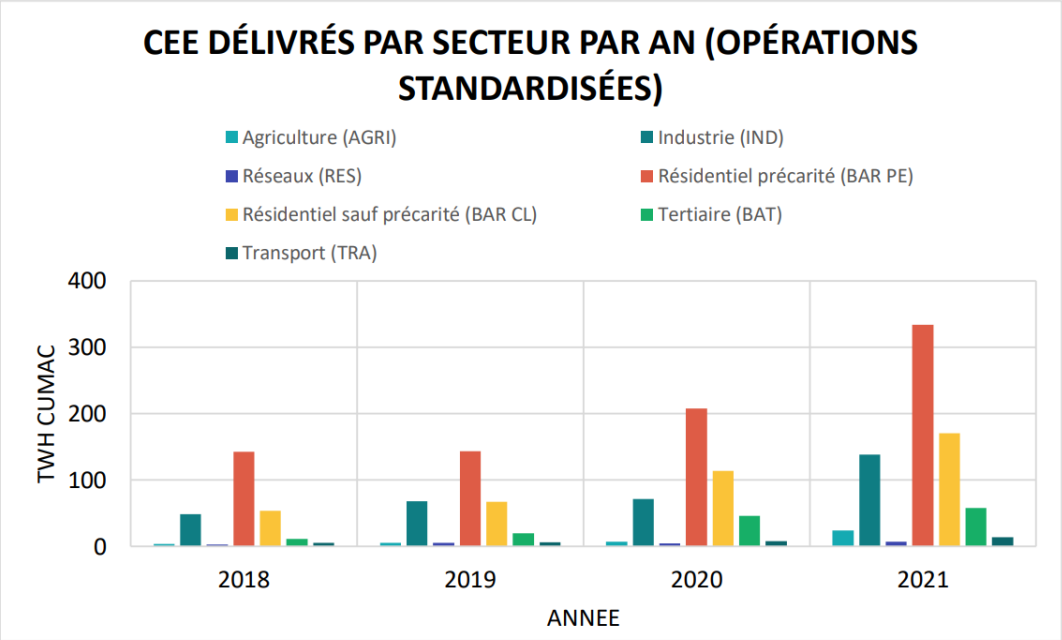

Figure 4 Changes in the number and structure of white certificates obtained by implementing standardised measures. Source: French Ministry of Energy Transition, 2022[14]

[14] Report on the implementation of phase 4 of the implementation of white certificates for the period 2020-2021 (BILAN DE LA 4EME PERIODE DES CEE 2018-2021, https://www.ecologie.gouv.fr/sites/default/files/2022-02-17-CEE-Bilan_0.pdf

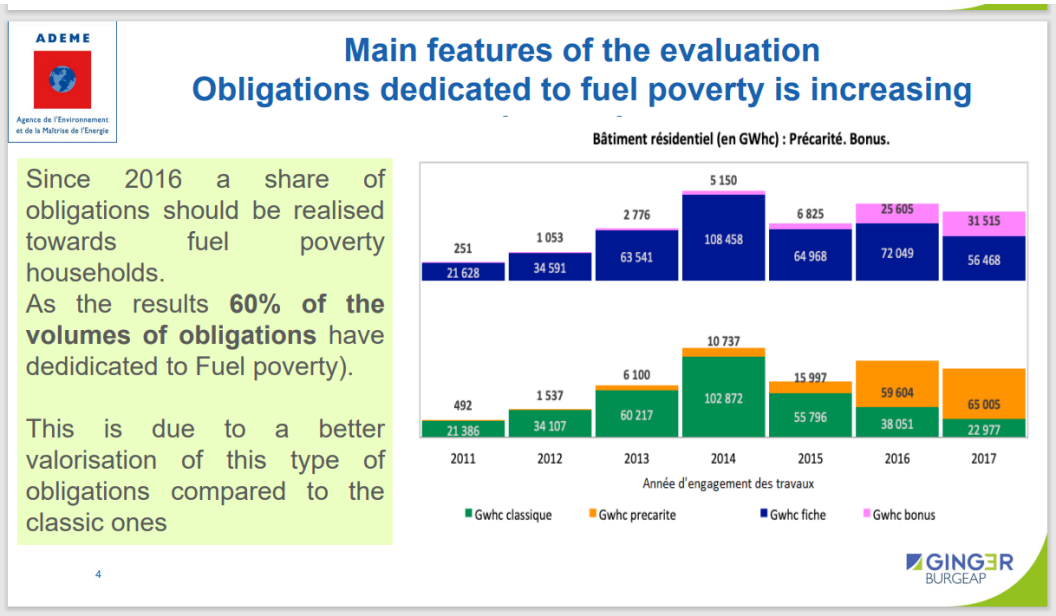

Figure 5 Increasing role of white certificates related to energy poverty in the French system, ADEME 2019[15]

The French catalogue of standardised measures was developed by the sectoral working groups of the Association for the Technical Energy Environment (ATEE) in consultation with specialists in the sectors and in collaboration with ADEME.

The scheme was launched in July 2006 with a regulation specifying the standard actions for energy savings. The regulation includes a detailed catalogue of standardised action fiches. This catalogue is not fixed once forever, it is subject to updates and revisions when needed, i.e. following technologies, market and legislation changes. Sometimes the catalogue is modified several times a year - for example, in 2019 it was modified twice and in 2023 it was modified nine times[16]. There are currently (year 2024) 218 standardised action types in the catalogue.

The system is administered by the ministry responsible for energy matters through its dedicated organizational unit (PNCEE), with support from ATEE and ADEME.

Practically any stakeholder (sometimes up to 50 people) can participate in the work on standardised action fiches. Participation in the working groups is coordinated by ATEE. The Association Technique Energie Environment (ATEE) has 2,500 members and brings together natural or legal persons involved in energy efficiency markets (as well as biogas, power-to-gas and energy storage), in particular:

- companies and their associations that consume energy; that produce or distribute energy; that produce, distribute, install equipment, systems or materials; that provide services and advice,

[15] Ex-post evaluation of the french white certificates schemes in France, ADEME 2019, https://www.odyssee-mure.eu/events/workshops/berlin/33-evaluation-white-certificate-scheme-france-dec-2019.pdf

[16] Lista zmian w katalogu jest dostępna na stronie francuskiego Ministerstwa Transformacji https://www.ecologie.gouv.fr/operations-standardisees-deconomies-denergie

- local authorities, their groups and agencies,
- universities and educational or research institutions, technical centers, associations and individual members,
- non-governmental organizations.

Anyone can become an ATEE member and thus gain access to all documentation, including detailed assumptions and calculations, even if they are not a participant in the relevant working group.

The work in the working groups means involvement in the acquisition of market data, participation in discussions and work on the reliability of the data, the development and verification of assumptions and, finally, the development of standardised action fiches. This extensive and collaborative procedure for developing fiches is specific to the French system. In most other countries, these studies are outsourced by governments to universities or relevant institutes or agencies, with the expectation that the resulting studies will be independent of business. Allowing (in France) the participation of any stakeholder increases the engagement, but also the transparency and legitimacy of the fiches. The number of people participating in working groups is steadily increasing. Participation in working groups allows different interests, viewpoints and contributions (e.g., data, studies) to be taken into account and is a place for negotiating the solutions being developed. The French national agency for ecological transition, ADEME, has the role to provide an independent expertise, to ensure the public interest, and thereby to balance the representatives of business seeking to maximize the profitability of future actions. Similarly, there are NGOs representing the civil society (e.g. in the case of lighting, an environmental organization raising the issue of the impact of lighting on animals living around cities). The participatory model of preparing fiches for standardised actions is considered a key factor in the success of the French system.

Once developed, the fiches are approved by the General Energy and Climate Directorate (DGEC)[17] part of the ministry in charge of energy, and reviewed by the Higher Energy Council (CSE)[18] (information on the composition of the SCE can be found in the appendix: *Annex 1: Composition of the Higher Energy* Council*page 28)*. Such a complex procedure, involving a broad and transparent representation of stakeholders, leads to a consensus that ensures the political stability of the system. If

[17] The Direction générale de l'énergie et du climat (DGEC) coordinates, in agreement with associations, economic and social partners and with the support of all the ministries concerned, the preparation and implementation of the French programme for climate change prevention and adaptation https://www.ecologie.gouv.fr/direction-generale-lenergie-et-du-climat-dgec

[18] Le Conseil supérieur de l'énergie (CSE), the Higher Energy Council (CSE) is an advisory body created in 2006 to replace the 1946 Higher Council for Electricity and Gas. It ensures regular dialogue and close inclusion of the main stakeholders of the energy sector in the construction of the Government's energy policy. The Council meets on average once or twice a month to consider texts submitted to it by the minister responsible for energy. The General Secretariat of the Council is run by the Directorate-General for Energy and Climate (DGEC). https://www.ecologie.gouv.fr/conseil-superieur-lenergie-cse

a decision cannot be reached, the disputes are resolved by arbitration, and the final decision is always made by the ministry.

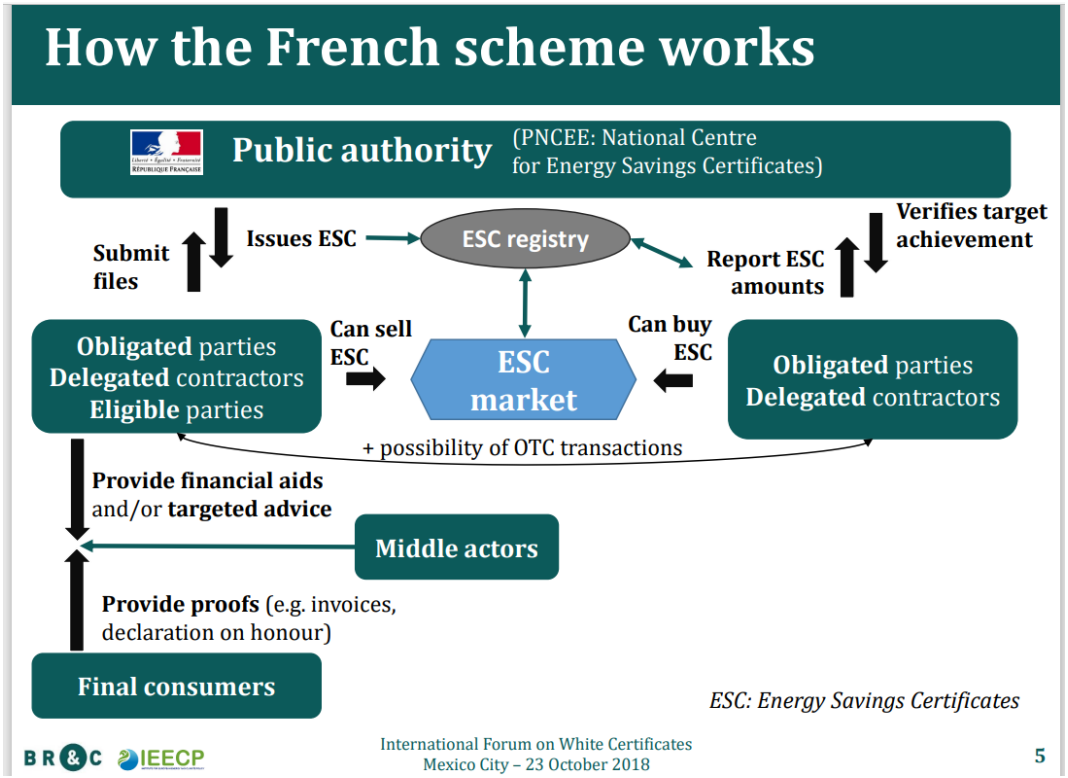

Figure 6 Scheme of operation of the French white certificate system. Source: https://iki-alliance.mx/wp-content/uploads/White-certificates_The-French-experience-v3_BROC.pdf

An important element of a system based on a catalogue of standardised actions is monitoring and verification. There are two types of monitoring and verification. The first type is carried out by the obligated entities. The French government defines a checking procedure that includes a list of activities to be controlled, the percentage of activities that must be verified either by on-site visits or by contacting the beneficiaries. These requirements apply especially to the action types representing the largest shares of delivered white certificates. The second type of control is carried out by the government. A first level of verification looks at the documentation that the certificates' owners need to store and provide upon request. If the government suspects fraud or detects suspicious activity related to a particular operation or operator, then it may commission government-paid inspectors to investigate. This investigation can result in either an amicable resolution of the problem or the identification of problems with the operation or operator. Depending on the severity of the problem identified, the government may take disciplinary action against the obligated or delegated parties, including cancelling certificates issued, imposing a fine or temporarily removing the possibility for an entity to submit application files for white certificates. The controls may also lead to sanctions to verification bodies contracted

by the obligated or delegated parties. This may for example include the cancellation of their accreditation.

The monitoring and verification system is managed by the PNCEE (dedicated unit within the ministry in charge of energy). The means dedicated to controls have been repeatedly increased since 2019, as more frauds have been observed, sometimes being highlighted in medias (not only specialized, but also mass medias). In 2022, 6400 on-site inspections and 380 000 with questionnaires were carried out, with a budget for inspections amounting to EUR 5 million (approx. PLN 22 million).

In parallel, problems encountered by final customers (e.g. quality issues, scams) are handled by the administration in charge of consumer protection.

1.5 Main challenges

The most obvious challenge is the definition of standardised savings (cf. "deemed savings" in the EED) and the definition of a framework/conditions for the use of fiches. Many companies and institutions are involved in developing savings estimates, including the Ministry, ATEE, ADEME, manufacturers, distributors, NGOs, auditors. Experts and organizations specialized in a specific field, e.g. energy poverty, are invited to work on specific problems. For almost every stakeholder (with the exception of government and government agencies) it is beneficial to maximize the demonstrated results. The risk of overestimation of the deemed savings is one of the criticisms of the system. The problem of overestimated, outdated standard calculation procedures is managed by reviewing and updating the fiches. This process is usually slow and difficult, due to the reluctance of those involved to reduce the effect shown and therefore reduce the financial benefit.

The process of reaching consensus in the development of French standardised measure fiches is complex and time-consuming. It requires the involvement and coordination of usually 20-30 stakeholders in a working group (working groups are organized per sector). The participation of so many stakeholders is crucial, as the aim is to have representation of different viewpoints and backgrounds. The resulting standardised action fiches is supposed to be relatively neutral, not favouring any technology or point of view. This is complemented by the review by ADEME and the final approval by the ministry. On the other hand, as knowledge and experience are gained, the fiches are revised and refined. As the number of standardised fiches grows year by year, the process becomes more complex and time-consuming. However, not all fiches are revised each year. Revisions are targeted according to the needs identified. And ATEE worked with the ministry, ADEME and the stakeholders to define minimum requirements for proposals of new fiches to be considered. This is important to limit the discussion on new fiches for action types that represent a significant potential, with enough data. As manufacturers or companies would otherwise submit

a high number of proposals for new fiches, to increase the visibility of their products or services on the market. Management of the entire process and communication must be transparent, precise and clear. This is why, over the years, templates, requirements and guidance were developed.

To have a good, correct estimation of the error with which standardised calculations are performed, the structured experience of the organization developing the calculation standards is needed. Standardisation is possible with access to many actual results of operations. A good practice in this field should be the implementation of relatively simple IT tools to obtain such information, e.g. by registering individual measures in a central register (e.g. through an energy auditor). In France, such analyses are carried out by, among others, the French Energy and Environmental Management Agency - ADEME.[19]

The use of standard calculation procedures may be limited to certain conditions (e.g. architectural forms, room types, etc.). The precise definition of such conditions will radically reduce the calculation error and therefore contribute to the reliability of the method.

An important principle underlying the use of deemed savings is that it is assumed that it will be used for a large number of actions. This is essential so that it can be assumed that the average characteristics of the buildings or sites where the actions are implemented will tend towards the average characteristics of the building stock or whole sites within the scope of the fiche. This assumption corresponds to the Law of big numbers (probability law). In other words, this means that the value of deemed savings defined in the fiches will not correspond to the value of energy savings from one action implemented in one building. However, when considering a large enough number of actions of the same type / fiche, then the average savings from this large number of actions should be close to the deemed savings defined in the corresponding fiche. The use of deemed savings is then appropriate for monitoring at the scheme level, but is not appropriate for estimating the energy savings for a given project or final customer.

One of the challenges for determining deemed savings is how to determine the baseline conditions that the energy savings will be calculated against.. In the French scheme, the general rules to define the baseline situation are aligned with the requirements of the EED (and more specifically its Annex V). Therefore, apart from actions dealing with the building envelope, the baseline situation should be defined according to the market average or the current minimum energy performance requirements set in the ecodesign regulations (or other applicable regulation). This is to ensure that the deemed savings correspond to additional savings as defined in the EED.

[19] https://www.ademe.fr/en/frontpage/

In the French scheme, the determination of the standard lifetime of an action type, like the definition of a baseline, is crucial as the white certificates are credited according to lifetime-cumulated and discounted savings. The standard lifetime is defined as the time over which the energy saving effect is demonstrated. It can be equal to e.g. the catalogue 'life of the device' or an agreed value, based on experience, accepted practice, statistics etc., e.g. the technical depreciation period of the technology in question (often country-specific).

Another challenge is to have control over the flow of money. In the French context, multiple intermediaries (between the obligated entity and the end customer) are involved in the implementation of tasks. At each level, the companies involved take their margin, the French government's concern is to ensure that the end recipient gets the maximum benefit in terms of real investment. The government may try to control the flow of funds by, for example, certifying equipment, such as heat pumps. Such measures are judged to be relatively ineffective. Additional studies and analyses funded by other programmes are sometimes necessary.

An important challenge affecting the credibility of a system based on standard measures is its careful design to prevent irregularities and fraud - gaps are quickly exploited.

1.6 The procedure for the development of an information package (fiche) for a standardised action type

The process of developing the standard operation documentation package consists of four phases[20]:

Phase 1: Proposal, preparation and discussion within the working groups

When a proposal of a new action type is made by a stakeholder or a group of stakeholders, then the working group of the corresponding sector (coordinated by ATEE and including an expert of ADEME) assesses the 'applicability' of standardising this action type and its potential, based on the following criteria:

(a) maturity of the technology,

(b) dissemination beyond a small number of potential investments,

[20] See the description (in French) of the process on the website of France's ministry in charge of energy: https://www.ecologie.gouv.fr/politiques-publiques/operations-standardisees-deconomies-denergie#procedure-delaboration-des-fiches-doperations-standardisees-1
And the webpage about standardized actions on the ATEE website: https://atee.fr/efficacite-energetique/club-c2e/fiches-doperations-standardisees

(c) overall assessment of energy savings,

(d) actual market, system actors interested in promoting the operation,

(e) cost-effectiveness assessment (e.g. cost of the action, likely remaining cost for final customers).

To streamline this first step, ATEE, in close cooperation with ADEME and the French ministry, developed a template named '*fiche d'opportunité*' ('opportunity fiche') that is used to submit packages of new proposals to ADEME and DGEC (General Directorate in charge of the scheme at the ministry in charge of energy).

When there is an agreement on the interest of a new action type, then ATEE appoints one or more professionals specialized in the field. These experts will be responsible for the complete drawing up of the fiche and leading the preparatory process for the new fiche.

Particular attention is paid to the universality of the technology and the absence of market monopoly (the technology/activity should have more than one supplier in the French market). In addition, the fiche must not favour a brand of equipment or an economic activity (market neutrality).

In practice, a new fiche is a set of three documents:

- The **calculation sheet** includes all the details of the specifications of the action type (scope, technical requirements), the different steps of the calculation of the deemed savings (baseline situation, annual energy savings, lifetime-cumulated and discounted savings) with the data used and the assumptions made, and possibly an annex with complementary information and explanations when needed. This calculation sheet is not publicly available. It is restricted to the ministry, ADEME, ATEE and the members of the working groups. This provides an incentive for stakeholders to take part in the working groups. This is also because some of the data used may be sensitive data (for example for commercial reasons, e.g. data from commercial databases) and cannot be made publicly available.
- The **summary sheet** includes all the data needed by stakeholders to prepare applications for white certificates or to comply with scheme requirements: the scope, specifications and technical requirements (e.g. minimum energy performance requirements, standards to comply with, required qualification of the installer), the information to be included in the application and the documentation to be stored for possible controls. The summary sheets are publicly available on the website of the ministry in charge of energy[21], and published by by-laws in France's Official Journal.
- The **template for the declaration on honour**, to be signed by the final customer receiving an action. This template includes the information to be filled

[21] See the summary sheets (in French) here: https://www.ecologie.gouv.fr/politiques-publiques/operations-standardisees-deconomies-denergie#catalogue-des-fiches-doperations-standardisees-cee-2

in by the final customer or the installer, and shall be signed by the final customer. This is for the legal status of the data included in the application file, enabling controls when needed.

ATEE, ADEME and the ministry developed templates for each of this document. The members of the working groups can provide feedback to improve the templates.

When a first draft of the new fiche is completed, it is submitted to the members of the working group for comments. It is then discussed at meetings of the working group, possibly with iterations until an agreement can be reached within the working group.

Phase 2: Review of the draft fiche by ADEME and the ministry

Once an agreement is reached within a working group, the fiche can be submitted for review by ADEME and the ministry.

At ADEME, the review is first done by the coordinator in charge of the technical support provided by ADEME about the white certificates scheme. When needed, the ADEME coordinator may ask complementary reviews by sectoral experts at ADEME.

At the ministry, the review is done by the unit in charge of monitoring the scheme (PNCEE – '*Pôle National des Certificats d'Economies d'Energie*').

Phase 3: examination of the package by a review committee

The review committee includes ATEE, ADEME, DGEC (ministry) and the lead authors of the fiches. If the committee agrees on a decision for a fiche (either for a new fiche or a revision), then this fiche is either validated or rejected, according to this decision. If no agreement is reached, then the fiche is referred to arbitration by the Head of the Climate and Energy Efficiency Department at DGEC.

Phase 4: ministry' opinion and publication of the by-law

When a new fiche or a revision has been validated, the ministry (DGEC) prepares an opinion and the a draft by-law (ministerial order) for the official publication and enforcement of the fiches. This draft is submitted to the High Energy Council before signature by the ministry representative and publication in the Official Journal.

What a standardised measure fiche looks like

The standardised measure fiche consists of several sections: a general description, conditions and restrictions for application (e.g. territorial limitation), a description of the method for calculating the effect in terms of reduction of energy consumption.

Given the regulatory nature of standardised action sheets for energy savings, it has become necessary for the DGEC, ADEME and ATEE to adopt common principles for

their development and review and to harmonize their content in order to ensure that they are well understood by the stakeholders of the system and that they are legally solid. Work on the fiches is ongoing, as the fiches need to be adapted to the changing market and also because of the need to catch errors that could lead to abuse.

Types/sectors of standardised measures[22]

In total, there are 220 standardised operating sheets. They are grouped into six different sectors. (Figure 7 represents the number of standardised measures described for each sector).

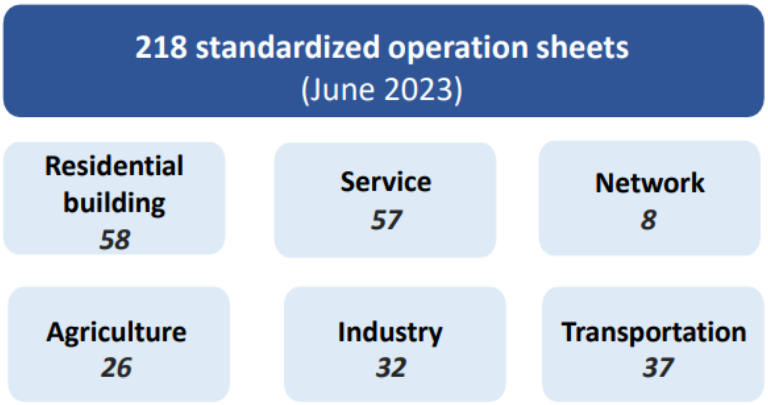

Figure 7 The number of standardised measure fiches prepared for individual sectors. Source: energysavingpolicies.eu

1.7 Housing – BAR

The CEE BAR fiches apply to the entire housing stock, i.e. collective housing such as condominiums and individual flats. There are 58 sheets available, including for example:

- - BAR-EN-101 for attic insulation;
- - BAR-TH-104 for the installation of a heat pump in a condominium or single-family home;
- - BAR-TH-112 for setting up a wood cooker, etc.

[22] https://opera-energie.com/fiches-standardisee-cee/

1.8 Services – BAT

For the service sector, 57 standardised measures have been developed to improve the efficiency of a building, equipment or process.

- Examples of BAT technologies for which standardised measures fiches have been developed:
- - BAT-TH-102: High-efficiency boiler in the service sector,
- - BAT-TH-112: Electronic speed variation of an asynchronous motor,
- - BAT-TH-134: Controller in a cooling unit,
- - BAT-EQ-133: Water saving systems.

1.9 Industry – IND

IND-listed fiches are defined for activities dedicated to process improvement in the industrial sector, and apply to buildings as well as equipment or technological processes. There are 33 sheets in the IND category, including, for example:

- IND-UT-115: Control system in a cooling unit with low variable pressure
- IND-UT-133: Electronic control system for an electric motor with energy recovery
- IND-UT-136: Installation of a new motor control system on a plant

1.10 Networks – RES (RES-CH)

RES-CH measures are designed to improve the efficiency of heating and cooling systems. There are 8 sheets available, including:

- RES-CH-104: Renovation of the district heating station of a residential building
- RES-CH-108: Waste heat recovery for recovery to a district heating system or to a third party (Metropolitan France)

1.11 Transport – TRA

Standardised measures in the transport sector (TRA) include 34 cases. These include:

- TRA-EQ-117 : Replacement of vehicles with new high performance vehicles for individuals or communities
- TRA-EQ-121 : Electric bicycle

1.12 Agriculture – AGRI

In the area of agriculture (AGRI), 26 fact sheets have been developed on measures to reduce energy consumption in the agricultural sector, such as:

- AGRI-EQ-109 Greenhouse efficiency cover
- AGRI-SE-101: Recommendations for the control and adjustment of the tractor engine
- AGRI-TH-113: Air-to-air heat exchanger with heat recovery in a poultry barn

Appendices

1.13 Annex 1: Composition of the Higher Energy Council[23]

The Higher Energy Council is made up of five colleges:

- The College of Parliamentarians, consisting of three deputies and three senators:
- The College of Local Authority Representatives, composed of:
  - Association of Mayors of France (AMF);
  - Assembly of the Regions of France (RDF).
  - National Federation of Granting and Governing Communities (FNCCR);
  - Urban France;
  - National Association of Local Energy and Gas Companies (UNELEG).
- College of representatives of energy consumers and approved environmental associations, consisting of:
  - Two positions for consumer representatives proposed by the National Consumer Council (CNC);
  - CLEEE;
  - CLER – Energy Transition Network;
  - Climate Action Network (RAC);
  - Union of Energy Industries (UNIDEN).
- The College of Representatives of Companies from the Electricity, Gas, Oil, Renewable Energy Sources, Energy Efficiency and Agriculture Industries, composed of:
  - French Independent Association of Electricity and Gas (AFIEG)

[23] https://www.ecologie.gouv.fr/conseil-superieur-lenergie-cse

- French Gas Association (AFG);
- National Association of Retail Power Operators (ANODA);
- Electricity of France (EDF);
- Enedis;
- Enerplan;
- ENGI;
- Federation for Energy and Environmental Services (FEDENE);
- French Federation of Combustible Materials, Fuels and Heating (FF3C);
- Chambers of Agriculture – France
- France Hydrogen;
- GPCEE;
- GRDF;
- France Wind energy (FEE);
- RTE (electricity transmission network operator);
- Renewable Energy Union (SER);
- Total energies;
- Managers of natural gas transmission networks (GRTgaz and Térega);
- French Electricity Union (UFE);
- French Union of Petroleum Industry, Energy and Mobility (UFIP-EM);
- Trade Union of Private Gas Industry (Uprigaz).

- The College of Representatives of Employees of the Electric and Gas Industry, composed of:
  - General Confederation of Labour (CGT) – two mandates;
  - French Democratic Confederation of Labour (CFDT);
  - Force Ouvrière (FO);
  - French Confederation of Managers – General Confederation of Directors (CFE-CGC).

The members of individual colleges, with the exception of the college of parliamentarians, are appointed by the minister responsible for energy. These members can have three alternates each.

The Chairman and Vice-Chairman of the Council are appointed by the minister in charge of energy from among the members of the Parliament.

No remuneration or compensation shall be provided for the work performed within the Higher Energy Council.

1.14 Annex 2: Example of a fiche developed for the measure "attic or roof insulation (BAR-EN-106)"

The following text is a translation from French with the help of AI. The French language fiche is available at: https://www.ecologie.gouv.fr/sites/default/files/BAR-EN-106%20v%20A33-4%20%C3%A0%20compter%20du%2001-09-2020.pdf

1. Application area

- Existing or new residential buildings in France in the overseas territories, except new buildings in Réunion
- Buildings located at an altitude of more than 600 m.

2. Name

- Installation of thermal insulation in the attic or roof slope.

3. Conditions for issuing certificates

- The installation is done by a professional.
- The thermal resistance R of the installed insulation is greater than or equal to 1.5 m2 *K/W.
- The thermal resistance is assessed in accordance with NF EN 12664, NF EN 12667 or NF EN 12939 for non-reflective insulation and in accordance with NF EN 16012+A1 for reflective insulation

At the latest before the cost estimate is determined, the professional conducts a visit to the building, during which he finds that the installation of insulation in the attic or on the roof of the building is consistent with the description. A minimum period of seven days (insulation installation) is maintained between the date of acceptance of the valuation and the date of commencement of work. For the works carried out until December 31, 2020, the contractor has: a quality mark that meets the requirements set out in Article 2 of Decree No. 2014-812 of July 16, 2014, the application of the second paragraph 2 of Article 200 of the Law of the Tax Code and the last paragraph 2 of Article 244, Part U of the General Tax Law and accompanying documents. This quality mark corresponds to work covered by Article 4(I) of Article 46 AX of Annex III of the General Tax Code.

For operations undertaken from 1 January 2021, the contractor has: a quality mark corresponding to the requirements set out in Article 2 of Decree No. 2014-812 of 16 July 2014 applying the second paragraph 2 of Article 200 of the General Tax Law and the last paragraph 2 of I Article 244 Part U of the General Tax Law and the texts

adopted for its application. This quality mark corresponds to work covered by Article 11° or 14° I of Article 1 of the said Decree.

The work completion report includes:

- installation of insulation;
- surface area of the laid insulation;
- assessed thermal resistance of the installed insulation depending on the type of insulation, in accordance with NF EN 12664, NF EN 12667, NF EN 12939 or NF EN 16012;
- the date of the visit to the building;
- arrangements necessary for the installation of insulation (formwork or protective screen around the ducts).
- chimneys and built-in lighting devices; rigid extension above the manhole).

In the absence of adequate information, the report must include information on the installation of the material with its brand, the area and the relevant document of the manufacturer or a recognised organisation in the European Union, accredited in accordance with the NF EN ISO/IEC 17065 standard by the French Committee, the accreditation body (COFRAC) or any other accreditation body that is a signatory to the multilateral European agreement appropriate under the European coordination accreditation bodies. This document shows that the installed material (of a given brand) is an insulator and defines its properties, gives thermal properties (thermal resistance or thermal conductivity and thickness), depending on the type of insulation, according to one of the above standards. If the expiry date of the certificate is given, this document is considered valid for one year from the date of its expiration. In the case of references for different thicknesses, if the thermal resistance for the thickness corresponding to the installed insulation is not specified in the document, such information must be provided for the given thickness.

A supplementary document is the specialist's decision on qualification or certification after the completion of the works.

4. Life time: 30 years.

5. Number of certificates in kWh cumac

	Installed insulation area (m2)			
	Old apartments	New apartments	**X**	Installed insulation area (m2)
Individual buildings	320	210		S
Collective buildings	380	250		

Appendix No. 1 to the unified operational card BAR-EN-106, specification of the content of part A of the statement

A) BAR-EN-106 (ext. A33.4): Installation of thermal insulation in the attic or roof slope

*Effective start date (e.g. quote acceptance date): ...../...../.....

*Date of the specialist's initial visit to the building where the work took place: ...../...../..... ..

*Date of commencement of work (installation of insulation): ...../...../.....

Date of work (e.g. invoice date): ...../...../.....

Invoice number: .....

*In the case of legal entities: name of the place of work or name of co-ownership: ....

*Address of the work site: .....

Additional address: .....

*Zip code:.....

*City:.....

*Residential building in overseas France: □ YES □ NO

On Réunion, the building is not located in an area above 600 m above sea level.

* Facility type:

□ Existing

□ New

□ Individual house

□ Collective housing

Characteristics of the installed insulation:

*Installed insulation area (m²): .....

*Thermal resistance: R (m². K/W): .....

To be filled in only if the thermal resistance is not specified in the work completion report:

*Thickness (mm): .....

To be completed only if the brand and reference number of the installed insulation are not specified in the completion protocol:

*Brand(s): .....

*Source of information : .....

Note 1: The thermal resistance R must be ≥ 1.5 m². K/W.

Note 2: Thermal resistance is assessed in accordance with NF EN 12664, NF EN 12667 or NF EN 12939 for non-reflective insulation and in accordance with NF EN 16012+A1 for reflective insulation.

Note 3: if several layers of insulation are laid, the brand and reference of each of the materials used must be indicated, as well as the total R, and for the surface area of the insulation to be laid, and the surface area resulting from the application of the insulation.

For operations carried out before 31 December 2020, the person carrying out the work must be certified as a member of the quality and comply with the requirements set out in Article 2 of Law No. 2014-812 of 16 July 2014 adopted for the application of the second paragraph 2 of Article 200 of the Fourth General Tax Law and the last paragraph 2 of Article 244 of the Fourth U General Tax Law, and the accompanying texts adopted for its application. This quality mark corresponds to the work covered by Article 46 4 of Part I AX of Annex III of the General Tax Law.

For works undertaken from 1 January 2021, the contractor is certified as quality in accordance with the requirements set out in Article 2 of Decree No. 2014-812 of 16 July 2014 adopted for the application of the second paragraph 2 of Article 200 of the General Tax Law and the last paragraph 2 of Article 244 U of the General Tax Law and the accompanying texts adopted for its application. This quality certificate corresponds to the work described in points 11 or 14 of the above-mentioned law.

Data of the contractor holding the quality certificate who carried out the operation, if he is not the person signing the certificate (for example, a subcontractor):

*Surname:.....

*Name:.....

*Company Name: .....

*SIRET number: _ _ _ _

1.15 Annex 3: Catalogue of standardised measures

https://www.ecologie.gouv.fr/sites/default/files/Groupes%20de%20competences%20-%20Inspection%20CEE%20-%20Catalogue.pdf

Card title	Ref.
Temperature integration module installed on the climate PC	AGRI-EQ-101
Double heat shield	AGRI-EQ-102
Side heat shields	AGRI-EQ-104
Stop & Start for Agricultural Motor Vehicles	AGRI-EQ-105
Ventilation regulation of silos and bulk grain storage	AGRI-EQ-106
Greenhouse wall insulation	AGRI-EQ-107
Water storage in a bioclimatic greenhouse	AGRI-EQ-108
High Performance Greenhouse Cover	AGRI-EQ-109
Solar drying by insufflation of agricultural and forestry products and by-products using hybrid solar panels	AGRI-EQ-110
Recommendations for checking and adjusting the tractor engine	AGRI-SE-101
Open Buffer hot water storage device.	AGRI-TH-101
Hot water storage device	AGRI-TH-102
Milk pre-cooler	AGRI-TH-103
Heat recovery system in the cold production group outside the milk tanks	AGRI-TH-104
Heat recovery in the milk tank	AGRI-TH-105
Air-to-water or water-to-water heat pump	AGRI-TH-108
Condensation heat recovery in horticultural greenhouses	AGRI-TH-109
High Energy Efficiency Boiler For Horticultural Greenhouses	AGRI-TH-110
Air/air heat exchanger with heat recovery in poultry house	AGRI-TH-113
Recovery of waste heat from an industrial process for heating a greenhouse or livestock building	AGRI-TH-116
Thermodynamic greenhouse dehumidifier	AGRI-TH-117
Double Heating Tube For Greenhouse	AGRI-TH-118
Outdoor air dehumidification system	AGRI-TH-119
Drive of a permanent magnet or reluctance synchronous motor	AGRI-UT-101
Electronic speed change system in an asynchronous motor	AGRI-UT-102
Cold group control system for low floating pressure	AGRI-UT-103
Cold production group control system to enable high floating pressure	AGRI-UT-104
Attic or roof insulation	BAR-EN-101

Wall insulation	BAR-EN-102
Floor insulation	BAR-EN-103
Window or French window complete with insulating glass	BAR-EN-104
Insulation of terrace roofs	BAR-EN-105
Attic or roof insulation (overseas France)	BAR-EN-106
Wall insulation (overseas France)	BAR-EN-107
Isolation closure	BAR-EN-108
Reduction of solar energy gains through the roof (overseas France)	BAR-EN-109
Window or French window complete with parietodynamic glazing	BAR-EN-110
Compact Class A fluorescent lamp	BAR-EQ-101
A++ or A+++ household washing machine	BAR-EQ-102
Class A++ or A+++ household refrigeration appliance	BAR-EQ-103
Modular LED luminaire with driver for common areas	BAR-EQ-110
A+ class LED lamp (< 01.10.2017) - A++ class lamp (> 01.10.2017)	BAR-EQ-111
Water saving systems (Metropolitan France)	BAR-EQ-112
A device for displaying and interpreting electricity consumption in electrically heated buildings	BAR-EQ-113
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