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Energy Efficiency:
Challenges and Solutions

THE SUBSTITUTION FEE
in the Polish White Certificate Scheme

Prepared by the ENSMOV+ Project Team
at the Polish National Energy Conservation Agency (KAPE)
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The Polish National Energy Conservation Agency (KAPE) is a consulting company specializing in effective energy management. Established in 1994, KAPE offers comprehensive, independent consulting services, including the optimization of energy production and consumption, and conducts audits for the industrial and construction sectors. It runs national and international educational projects and provides services to local government units concerning the implementation of a low-carbon economy. KAPE promotes European standards for proper energy management and assists businesses in implementing decarbonization strategies.

The ENSMOV+ project supports European Union Member States in monitoring, revising, improving, and implementing energy efficiency policies by developing materials on practical and strategic issues related to the implementation of Article 8 of the recast Energy Efficiency Directive (EED) (formerly Article 7).

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GLOSSARY OF ABBREVIATIONS

NFOSiGW – National Fund for Environmental Protection and Water Management
A central public institution in Poland financing environmental and energy-efficiency projects through grants, loans and dedicated programmes.

URE – Energy Regulatory Office (Poland)
A national regulatory authority overseeing the energy market, including electricity, gas and heat sectors, and supervising the white certificates system.

TGE – Polish Power Exchange
The electricity and gas exchange in Poland, where white certificates (energy efficiency certificates) are traded.

PURPOSE AND METHODOLOGY

The purpose of this document, prepared by a team from the Polish National Energy Conservation Agency (KAPE), is to compile data on the Substitution Fee, define its function, gather arguments supporting a change in its calculation method, and propose a new determination methodology.

The document was developed in two stages: a draft version was circulated to stakeholders, followed by a consultation meeting attended by KAPE experts and stakeholders representing diverse perspectives and interests. The meeting included representatives of obligated entities, end-users, financing institutions, expert organizations, and non-governmental organizations. Comments resulting from the discussion were incorporated into the final version of the document.

The discussion led to the identification of two methods for determining the Substitution Fee:

1. Benchmarking against NFOSiGW costs (See Chapter: „NFOSiGW Costs as a Benchmark," page 36).

2. Applying a method analogous to the Green Certificate Scheme (See Chapter: „Determining the Substitution Fee in a Manner Analogous to Green Certificates," page 39).

Based on the information gathered and the outcome of the discussion, it was determined that the most beneficial solution in terms of efficiency and clarity of spending would likely be a system based on the NFOSiGW cost benchmark (See Chapter: „NFOSiGW Costs as a Benchmark," page 36).

The arguments supporting this option include:

- Relative simplicity in determining the benchmark (NFOSiGW receives the funds not utilized by obligated entities and maintains relevant statistics).
- Transparency,
- Logical coherence: Revenue from the Substitution Fee would enable NFOSiGW, through its programmes, to achieve the same amount of toe equivalent to the toe settled via the fee.
- The White Certificate Scheme stabilizes at a level that facilitates the successful implementation of the most cost-effective measures (less cost-effective measures should be addressed using alternative mechanisms).

It should be noted that adopting the „as in Green Certificates" option offers advantages, primarily the simplicity and familiarity of this mechanism to market participants.

INTRODUCTION

The Polish support system for energy efficiency improvement measures comprises several key components (support instruments):

- Programs of the National Fund for Environmental Protection and Water Management (NFOSiGW).
- European Funds.
- Thermo-modernisation Fund.
- Regional Funds.
- Local Government Budgets.
- White Certificate Scheme.

The first five sources of energy efficiency financing are based on grants or loans. These sources are significantly larger than the entire White Certificate market. For instance, the Clean Air Programme, of which key component is thermo -modernisation, had received over 832,000 applications by April 12, 2024, for a total amount of PLN 26 billion in funding[1]. In comparison, the estimated value of the entire White Certificate market and the Substitution Fee combined in 2023 was approximately PLN 1.1 billion.

It is evident that the White Certificate Scheme alone cannot solve all energy efficiency challenges. Less profitable activities, such as the thermo-modernisation of public buildings or measures to combat energy poverty, remain largely outside the scope of this system. Crucially, no clear demarcation line has been established to determine which investments should be implemented through the White Certificate Scheme and which should be implemented using additional funding.

White Certificates are a unique instrument designed to support energy efficiency under market conditions. In accordance with the applicable law, the target amount of final energy savings for obligated entities under the Energy Efficiency Act (EEA) has been established at 1.5% of annual savings.

The achievement of this target is the sum of:

- Number of redeemed White Certificates (for a given year).
- Number of Substitution Fee units.
- Amount of energy saved based on Article 15 of the Energy Efficiency Act.
- Amount of energy saved based on Article 15a of the Energy Efficiency Act.
- Amount of energy saved based on Article 10 of the Energy Efficiency Act.

Currently, obligated entities primarily achieve the 1.5% savings target through the Substitution Fee (approximately 70%) and the re-

1 Rules of the „Clean Air" programme: https://czystepowietrze.gov.pl/media/informacje-praso-we/nowe- zasady-w-programie-czyste-powietrze

demption of White Certificates (30%), based on average values for 2021-2023. Other methods are considered marginal (no data available).

The total potential size of the White Certificate market following the 2021 amendment to the Act, defined by the total obligation size of obligated entities, is approximately 560,000 toe/year. This is composed of:

- approx 170,000 toe in White Certificates.
- approx. 380,000 toe in Substitution Fee.

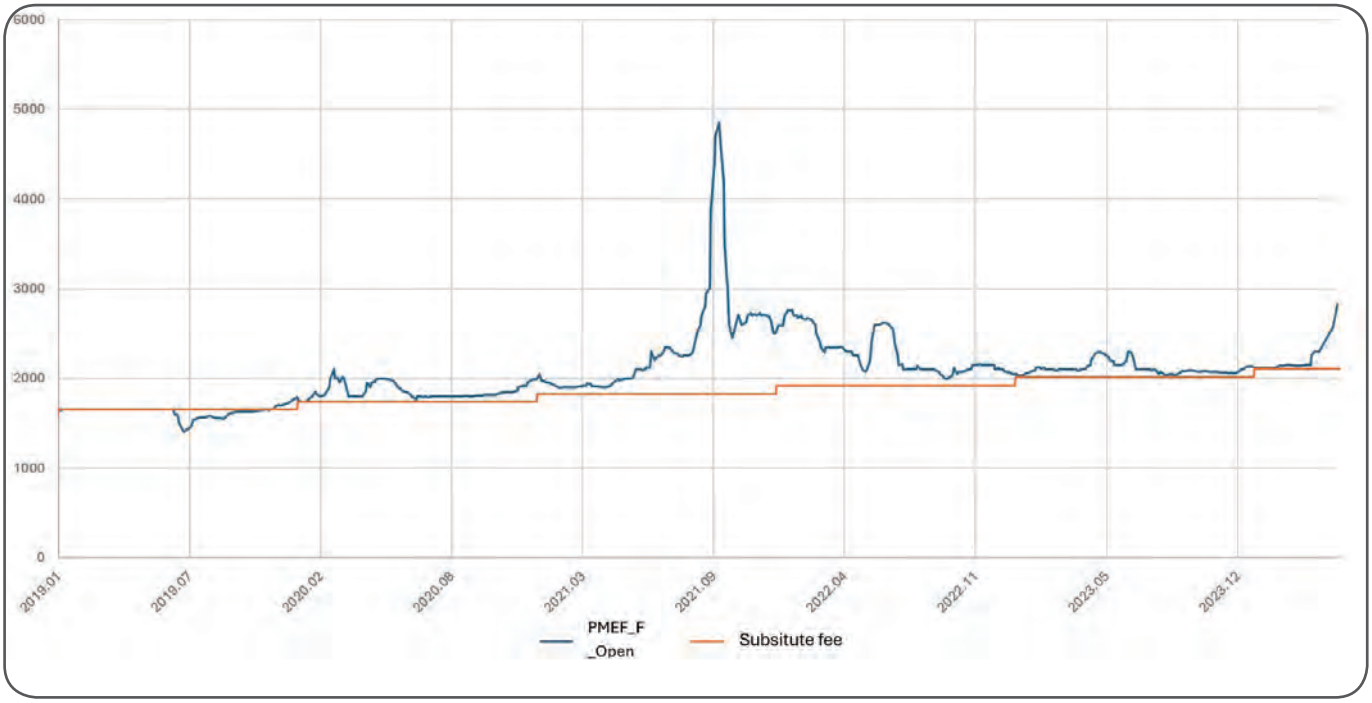
NOTE: The total amount of obligations was obtained through indirect calculations based on available information.

The Substitution Fee is a key component of the Polish energy efficiency certificate system, influencing demand, supply, and price, as well as (indirectly) the type of investments undertaken. The legislated price of the Substitution Fee is set at a low level. Consequently, the current mechanism for fulfilling obligations strongly encourages the use of the Substitution Fee as the primary method for compliance.

As a rule, the obligation should be fulfilled by demonstrating actual savings, as the payment of the Substitution Fee is not directly linked to the implementation of any investment resulting in final energy savings.

The Substitution Fee is payable by June 30 of the third year following the year to which the obligation relates, giving the obligated entity three years to settle the obligation denomi-

Figure 1. WC value and substitution fees



Source: TGE (Polish Power Exchange)/KAPE

nated in tonnes of oil equivalent (toe) of final energy savings.

Therefore, a situation may arise in which a company assumes that it will meet its annual obligations by paying the substitution fee. However, after verification, it may turn out that this assumption was incorrect and the amount paid was insufficient. In such a case, the entity is required to purchase certificates on the Polish Power Exchange or to achieve final energy savings through other available mechanisms (e.g., Articles 15 and 15a). Failure to meet these obligations may result in a financial penalty.

Currently, the White Certificate Scheme primarily promotes the implementation of energy efficiency projects in the industrial sector, mainly due to their high profitability and short payback periods. The system is convenient, straightforward, and cost-effective for obligated entities, which bear low transaction costs (around 1%) and have quick access to certified, securitised savings generated by other parties. At the same time, White Certificates remain one of the few instruments supporting energy efficiency improvements in this sector — and often the only one available to large enterprises.

However, it should be noted that the length of the certification and securitisation process conducted by the Energy Regulatory Office discourages many companies from using this mechanism. In contrast, the monetisation of energy savings through the sale of property rights on the Polish Power Exchange is relatively fast, although it requires meeting additional conditions related to exchange trading.

The substitution fee (in its current form) has several characteristics that warrant discussion, including the following:

- it limits the implementation of energy efficiency investments in the industrial sector — if the fee did not exist, or if it were set at a higher level, the volume of such investments would likely be significantly greater;
- it promotes "additionality" only to a limited extent, as it primarily encourages profitable projects that would probably be implemented even without support;
- it restricts the participation of ESCOs and other intermediaries;
- it discourages obligated entities from directly undertaking energy efficiency measures, as the value of certificates remains too low to make such investments financially attractive;
- it constrains the principle of achieving energy savings at the lowest possible cost, since projects implemented outside

the White Certificate Scheme are often considerably more expensive[2].

In the current practice of the White Certificate Scheme, the obligated entity most often acts merely as an intermediary, passing on the cost of the substitution fee to end users in the form of an additional charge on their energy bills.

The primary objective of the White Certificate Scheme is to achieve measurable energy savings in Poland. It is important to note that, under the provisions of the 2023 Energy Efficiency Directive (EED), all EU Member States are required to significantly increase their average annual energy savings rate — from the current 0.8% to between 1.3% and 1.9% in the period 2024–2030. This higher target will necessitate a substantial acceleration of real modernisation and efficiency measures across all sectors.

This document provides an overview of the White Certificate Scheme and the substitution fee, outlines potential changes to the system, and analyses the proposed solutions.

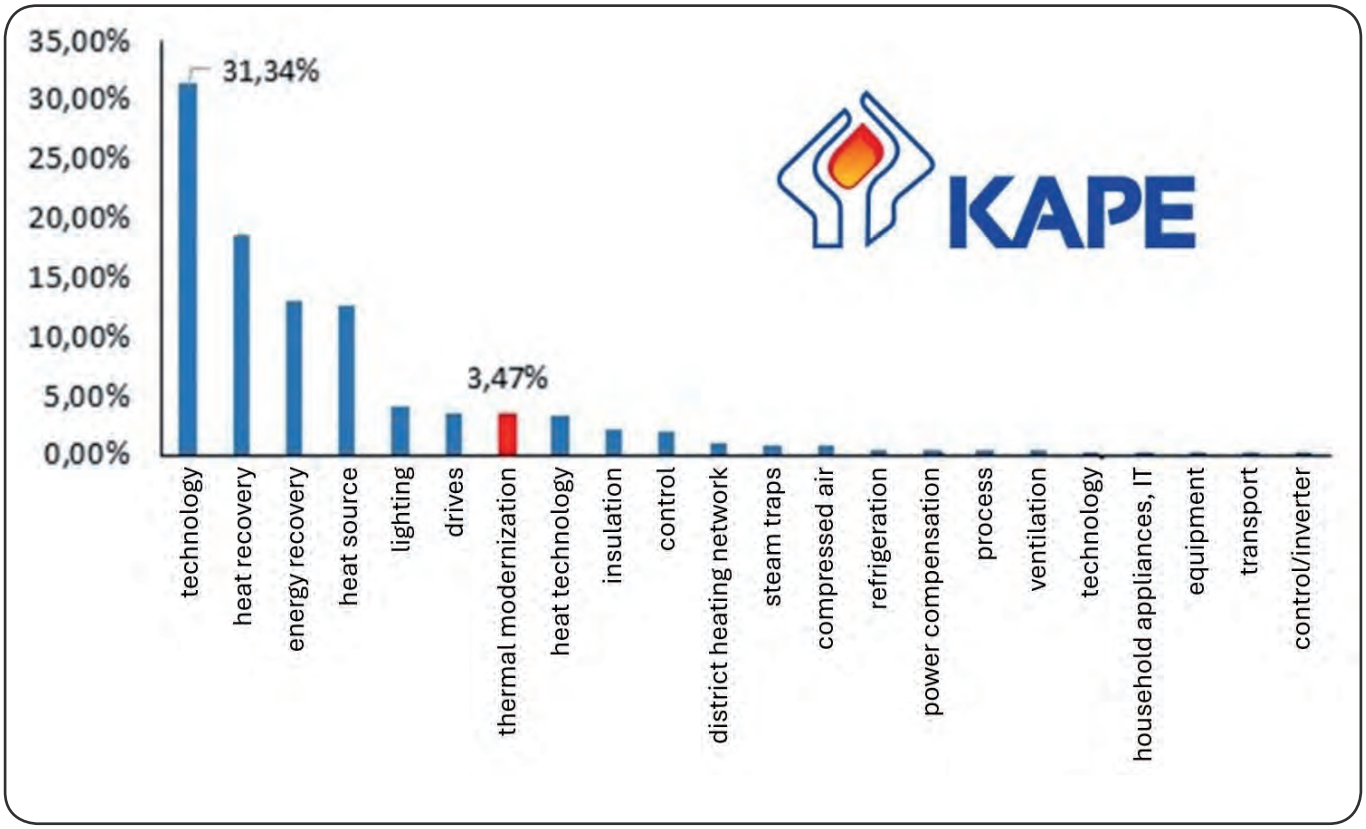


Figure 2 . Share in energy savings (%). Data from projects prepared by KAPE S.A. The vast majority of projects are of an „industrial" nature. The share of thermal modernisation of buildings is approx. 3.5%.

Source: KAPE S.A. 2024

2 Probably because no study/summary of the effectiveness of measures implemented by various programmes and support tools has been prepared to date – e.g. NFOSiGW vs energy efficiency programmes financed from European funds and implemented by local governments vs the Thermal Modernisation Fund vs the Clean Air Programme vs the Energy Efficiency Certificate System vs the Energy Efficiency Programme.

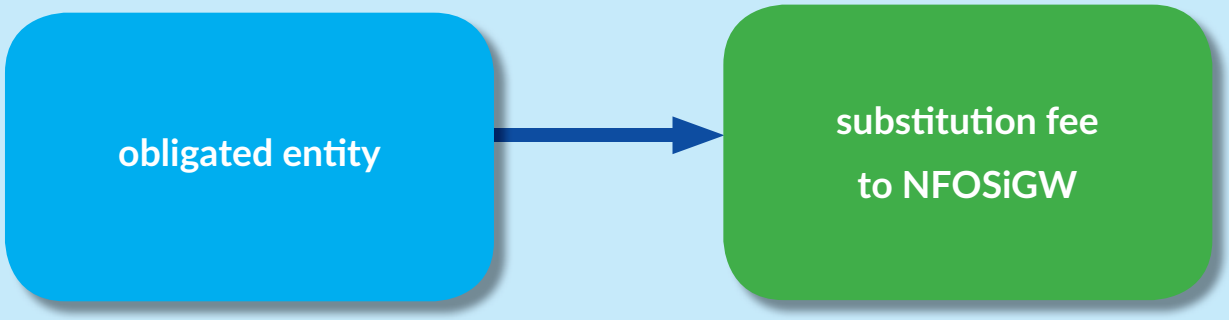
THE SUBSTITUTION FEE IN THE ENERGY EFFICIENCY OBLIGATION SCHEME

The substitution fee should be an important element of the energy efficiency certificate system, commonly known as the white certificate system. The white certificate system in its current form was established by the Energy Efficiency Act of 2016 (as amended).

The participants in the system are:

- Obligated entities, which have the following options for fulfilling their obligations:
  - Implementation of energy efficiency improvement measures among end users.
  - Obligated entities or their authorised representatives may implement non-repayable grant programmes to co-finance projects aimed at improving energy efficiency (Article 15a of the Energy Efficiency Act).
  - Purchase of energy efficiency certificates or payment of a substitution fee.
- End users who implement energy efficiency projects (e.g. thermal modernisation of their homes or modernisation of technological processes) and who may be holders of energy certificates.
- Brokerage house, intermediating in transactions between end users and obligated entities and the Polish Power Exchange.
- Polish Power Exchange – a platform for the purchase and sale of energy certificates.
- National Fund for Environmental Protection and Water Management (NFOSiGW) – recipient of the substitution fee.
- Independent energy auditors – conducting analyses and preparing the documentation necessary to obtain an energy certificate.

Figure 4. Fulfilment of obligations through payment of a substitution fee: from the perspective of the obligated entity simpler and cheaper.



Source: KAPE 2024.

The substitution fee is paid to the NFOiGW by companies obliged to redeem energy efficiency certificates, which are unwilling or unable to do so by implementing energy efficiency projects or purchasing energy efficiency certificates.

Currently, when fulfilling the obligation through a substitution fee, the obligated entity incurs lower financial and organisational costs compared to purchasing energy efficiency certificates (no need for audits, participation of the Energy Regulatory Office, brokers or the stock exchange).

The obligation to purchase certificates applies to entities that:

a. underestimate the coverage of their obligation by paying the fee,

b. cannot demonstrate their willingness to purchase certificates on the exchange, for example because they do not have sufficient funds to freeze in their brokerage account,

c. they are large, vertically integrated companies that are de facto both distributors and end users – such entities definitely prefer to obtain white certificates and invest the funds thus obtained in improving their own infrastructure.

An increase in the price of the certificate may result in increased investment activity by these entities, which in turn may contribute to a reduction in energy production costs. The difficulty of fulfilling the obligation through a substitution fee most affects relatively small enterprises (SMEs and micro-enterprises), which, in order to prove that they intended to purchase certificates at subsequent sessions on the Polish Power Exchange, must freeze the relevant funds in their brokerage accounts. Currently, the substitution fee is the main tool for fulfilling obligations, while at the same time allowing companies to avoid making efforts to implement actual investments. The substitution fee does not fulfil its intended role as a 'safety net' enabling the fulfilment of obligations in exceptional situations

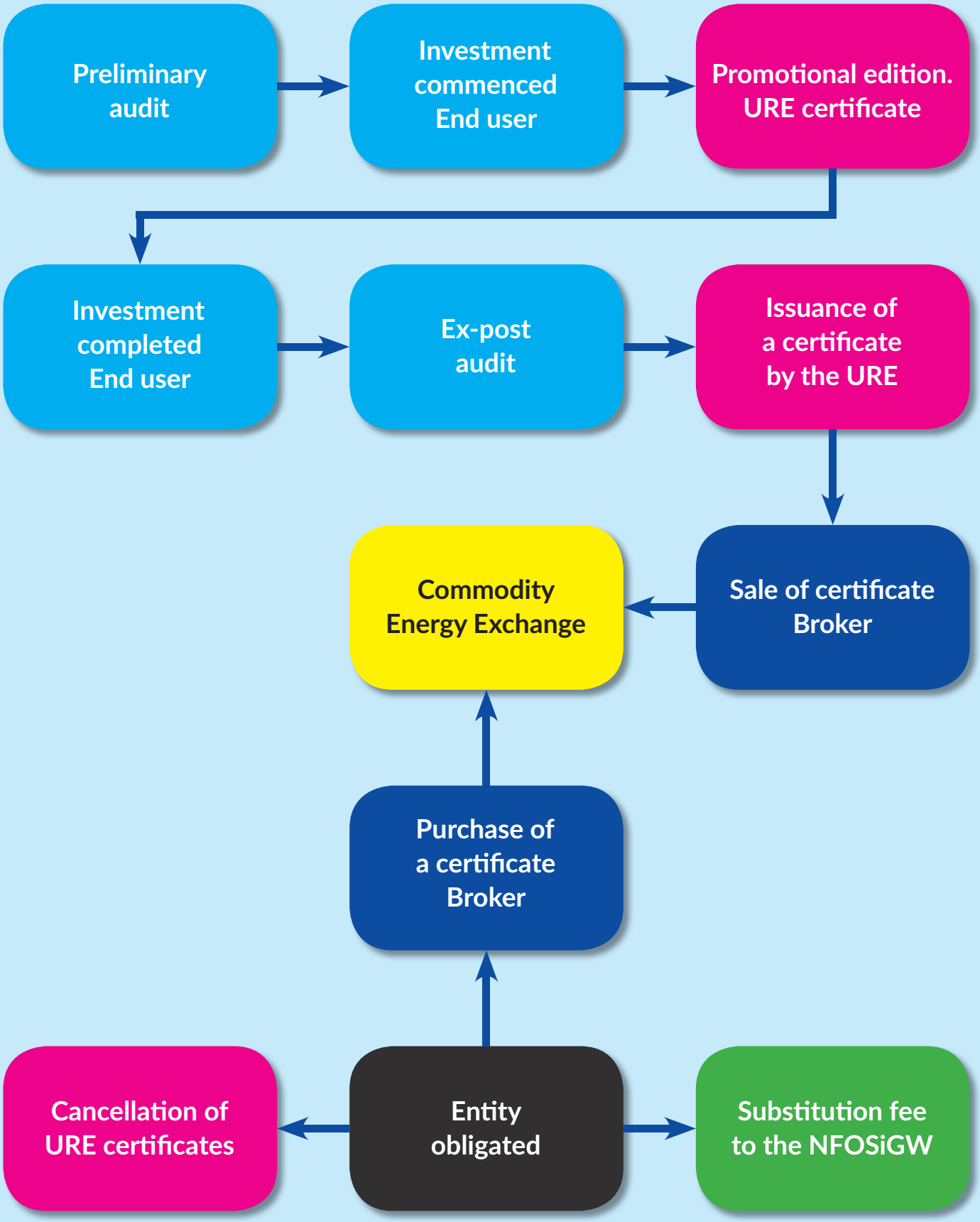


Figure 5. Diagram summarising the Polish energy efficiency certificate system (white certificates).

Source: KAPE 2024.

WHEN CAN YOU PAY A SUBSTITUTION FEE?

Starting in 2019, regarding the possibility of meeting the obligation through a substitution fee, Article 11(3) of the Energy Efficiency Act (EEA) applies. According to this provision, an obligated entity may fulfil its obligation for 2019 and each subsequent year by paying a substitution fee if, during the relevant calendar year, it did not acquire property rights from energy efficiency certificates because the market price of these rights exceeded the unit substitution fee for that year, or because there were too few offers available[3].

In other words, if the substitution fee is lower than the market value of the certificates, the obligated company may choose to pay the substitution fee instead.

The substitution fee must be paid by 30 June of the year following the year for which the obligation is fulfilled through this payment (for example, for 2018 – by 30 June 2019)[4].

The current system is designed in such a way that obligated companies (if they are not end-users themselves and can assess market imbalances) first consider paying the substitution fee (which has a fixed, regulated value) and only afterwards plan to purchase white certificates (which, over time, tend to be only slightly more expensive than the substitution fee).

This is because actual investments aimed at reducing energy consumption require significantly higher expenditure than the amount of the substitution fee. In practice, obligated companies rarely implement energy saving projects for end users, as such projects are not profitable (it is more profitable to pay the substitution fee or purchase certificates).

This explains why there is practically no market for energy services in this sector. When margins and credit costs are added, such projects become even less profitable.

In practice, fulfilling the obligation through a substitution fee has proved to be the cheapest and least risky option for the companies concerned.

3 The obligated entity must demonstrate that it has attempted to purchase certificates at each session preceding the deadline by which the obligation must be fulfilled, which limits the possibility of smaller entities such as small power plants using the fee.

4 https://www.ure.gov.pl/pl/urzad/informacje-ogolne/aktualnosci/8763%2CURE-przypomina-o-terminach-i-zasadach-umarzania-swiadectw-efektywnosci-energetyc.html

PURPOSE OF THE SUBSTITUTION FEE

The legislation does not define the function/ purpose of introducing a substitution fee. It can be assumed that the current mechanism was designed in such a way that the costs of fulfilling obligations by end users (steelworks, cement works, refineries) would not be too high and would allow Polish industry to remain competitive (hence the substitution fee was probably set at a low level). Such an 'intention':

a) does not determine the overall purpose of introducing the substitution fee,

b) is not reflected in practice or in current legislation (although it is present in discussions on the conditions for introducing the Energy Efficiency Act).

Below are two interpretations of the function of the substitution fee, resulting from the provisions of the Act and practice (these functions are not necessarily mutually exclusive), and a possible third interpretation, which is not currently implemented in practice.

5.1. OPTION 1: THE SUBSTITUTION FEE AS THE CHEAPEST OPTION FOR FULFILLING OBLIGATIONS INSTEAD OF CONDUCTING INVESTMENTS

The substitution fee is „charged in the bills/in the price of the energy carrier" and then paid by the obligated entities instead of making investments or purchasing energy efficiency certificate.

5.2 OPTION 2: FEE PAID FOR THE PURPOSE OF FINANCING THE IMPLEMENTATION OF INVESTMENTS BY NFOSIGW (THE STATE)

A substitution fee paid for the performance of tasks by the National Fund for Environmental Protection and Water Management (NFOSiGW) (in place of investments that should be carried out by obligated entities in the first period).

This interpretation stems directly from the provisions of the Energy Efficiency Act[5]:

(...)

4. The substitution fee shall be paid to the bank account of the National Fund for Environmental Protection and Water Ma-

5 https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU20160000831/T/D20160831L.pdf

nagement by 30 June of the year following the year to which the obligation referred to in Article 10(1) relates. The proceeds from the substitution fee shall constitute the revenue of that Fund.

5. The National Fund for Environmental Protection and Water Management allocates funds in an amount equivalent to the revenue from the substitution fee for the implementation of projects aimed at improving energy efficiency among end users.

6. The Management Board of the National Fund for Environmental Protection and Water Management shall submit to the minister responsible for energy a report on the amount of funds allocated to the implementation of projects aimed at improving energy efficiency among end users and the final energy savings achieved as a result of such projects, broken down by the types of projects listed in Article 19(1), by 31 July each year for the previous calendar year. Article 13. 1.

The method of determining the substitution fee was probably based on concerns about an excessively high WC value, which in turn would place a heavy burden on the obligated entities.

5.3. OPTION 3: SUBSTITUTION FEE AS A MARKET STIMULATION MECHANISM

Both previous definitions, resulting from current practice, are inappropriate.

The function/purpose of the substitution fee should be to stimulate real investment while ensuring market flexibility.

In principle, the substitution fee should be significantly higher than the value of white certificates, so that the market signal is clear and transparent.

Flexibility of the fee is necessary when the market must respond in the medium term by ensuring an adequate supply of certificates. An adequate supply is the point of (dynamic) market equilibrium when the vast majority of the obligation is fulfilled using energy efficiency certificates (e.g. 80-90%).

DECISION-MAKING PATHWAYS FOR OBLIGATED ENTITIES REGARDING THE SUBSTITUTION FEE

Obligated companies, guided by profitability criteria, have no difficulty deciding to take advantage of the possibility of fulfilling their obligations by means of a substitution fee. Obligated entities commission the purchase of certificates at the price of the substitution fee.

If this operation is unsuccessful (and as a rule it is unsuccessful because the substitution fee is set at a very low level), they pay the lowest possible price for fulfilling their obligations in the form of a substitution fee.

6.1. PATH 1: NON-PARTICIPATION IN THE CERTIFICATE MARKET OR END-USER PROJECTS

If the obligated company does not wish to purchase energy efficiency certificates or does not intend to carry out any activities among end users, it submits a monthly offer to purchase certificates at the substitution fee price.

This path is convenient for obligated companies that do not have problems with current cash flows (i.e. those that are able to freeze the funds allocated to pay the substitution fee) and are not part of a larger group that also includes end users.

6.2. PATH 2: THE ENTERPRISE FULFILLS ITS OBLIGATION BY PURCHASING WHITE CERTIFICATES

If the obligated company cannot prove that it has attempted to buy certificates at the price determined by the substitution fee, it must instead purchase white certificates on the market.

Although this option tends to be more costly, it is often a more practical solution for smaller companies facing cash flow challenges.

6.3. PATH 3: A COMPANY IS OBLIGATED, VERTICALLY INTEGRATED, AND FULFILLS ITS OBLIGATION BY PURCHASING WHITE CERTIFICATES FROM ENTITIES THAT ARE PART OF THE GROUP

Large companies, which include both distribution companies and end customers, are more likely to make investments through white certificates.

This is due to the fact that the substitution fee does not provide any benefits, whereas the implementation of the investment and obtaining the certificate, in fact on one's own property, leads to benefits.

REVENUE FROM THE SUBSTITUTION FEE

The document focuses on covering data from 2021 to 2023, assuming that during this period the system's operation was not disrupted by changes in the rules (2019 change in the calculation method, 2021 expansion of the catalogue of obligated enterprises).

Revenues from substitution fees and penalties resulting from the Act of 20 May 2016 on energy efficiency are transferred to the National Fund for Environmental Protection and Water Management (NFOSiGW) for the implementation of energy efficiency tasks. These revenues amounted to respectively:

- in 2021 in the amount of PLN 707,465.2 thousand, i.e. 199.1% of the plan (planned PLN 355,331.6 thousand)[6],
- in 2022 in the amount of PLN 707,370.7 thousand, i.e. 197.3% of the plan (planned PLN 358 560.0 thousand)[7],
- in 2023 in the amount of PLN 773,584.5 thousand, i.e. 109.4% of the plan (planned PLN 796 000.0 thousand)[8].

In 2021–2022, the almost doubled revenue performance was caused by unplanned increased inflows from substitution fees. This may mean that unexpectedly for decision-makers, entities obliged to fulfil the efficiency obligation fulfilled this obligation by paying the substitution fee twice as willingly as expected, rather than by redeeming energy efficiency certificates or implementing projects to improve energy efficiency. This may indicate unintended effects of the introduced law. In 2023, the NFOSiGW's plans have already been adjusted accordingly.

In 2021, the catalogue of obligated entities was expanded[9]. Based on the data cited above, the average approximate amount [toe] for the period 2021-2023 was calculated, settled using a substitution fee:

6 Implementation of the 2022 financial plan of the National Fund for Environmental Protection and Water Management, page 6, section 3.1.1., page 29, NiK 2023,https://www.nik.gov.pl/plik/id,27894.pdf

7 Implementation of the 2022 financial plan of the National Fund for Environmental Protection and Water Management, page 6, section 3.1.1., page 29, NiK 2023,https://www.nik.gov.pl/plik/id,27894.pdf

8 Implementation of the 2022 financial plan of the National Fund for Environmental Protection and Water Management, page 7, section 3.1.1, NiK 2024, https://www.nik.gov.pl/plik/id,29512.pdf

9 „The Act of 20 April 2021 amending the Energy Efficiency Act and certain other acts expanded the list of entities obliged to include fuel entities marketing liquid fuels. The obligation for fuel entities is progressive, starting at 0.2% in 2021 and 2022, 0.4% in 2023 and 2024, 0.5% in 2025, 0.6% in 2026, 0.7% in 2027, 0.8% in 2028, 0.9% in 2029, 1% in 2030 and in each subsequent year. also in the case of fuel entities, it is possible to fulfil the obligation by paying a substitution fee at the level of 20% of the obligation for 2021

and 2022, 10% of the obligation for 2023, 2024 and 2025." MKiS, 2024 https://www.gov.pl/web/klimat/system-zobowiazujacy -do-efektywnosci-energetycznej -inaczej-zwany-bialymi-certyfikatami

Year	NFOSIGW income [PLN]	substitution fee amount [PLN/toe]	volume [toe]
2021	707 000 000	1823	385 075
2022	707 000 000	1914	369 383
2023	774 000 000	2010	385 075
		AVERAGE	**379 844**

TABLE 1 KAPE's own study based on NIK reports on the implementation of NFOSiGW plans for 2022 and 2023

On average, approximately 380,000 toe per year was settled by obligated entities with the help of a substitution fee.

The above information indicates that

- On average, between 2021 and 2023, the fee was paid for approximately 380,000 toe of 'paper' energy savings.
- at least PLN 700-800 million was not allocated to the most cost-effective energy efficiency measures,
- there has been a reduction in the funds available to industry for energy saving (the white certificate system mainly finances investments in industry). In Poland, few instruments are aimed at energy efficiency in industry, so paying money from the substitution fee to the NFOSiGW reduces the funds available to enterprises.
- The NFOSiGW purchases the effect of reducing energy consumption at a higher price than would be possible with the white certificate system (because it finances less profitable projects). Information on the details of how the NFOSiGW spends its funds is unknown, as the NFOSiGW does not disclose such information. Currently, based on the available information, it is not possible to determine how many toe the NFOSiGW is able to purchase for the nearly 800 million (in 2023) obtained from the substitution fee.

THE VALUE OF THE WHITE CERTIFICATES MARKET

The amount of energy saved in [toe] between 2021 and 2023 is shown in the table below.

For the data from 2021-2023, the average amount of [toe] settled by the Energy Regulatory Office using issued energy certificates was calculated:

Year	Number of WC issued	Volume of WC issued
2021	1 181	138 539
2022	1 402	211 898
2023	1 071	148 027
	AVERAGE:	166 155

Table 2 Data on the white certificate market in the years 2021–2023.

Source: KAPE based on correspondence with the Energy Regulatory Office 2024

In the years 2021-2023, the obligated companies fulfilled their obligation, on average, by 'producing' approximately 170,000 [toe/year] in the form of energy efficiency certificates.

The value of the certificates can be roughly estimated as follows:

average number of certificates 170,000 [toe] * average value of a certificate at approx. PLN 2,100 (assumed value for 2023 'slightly above the substitution fee') = approx. PLN 360 million.

In other words, PLN 360 million is investment support settled in the form of white certificates granted primarily to industrial entities (value for 2023).

COMPARISON OF FULFILLMENT OF OBLIGATIONS BY PAYING A SUBSTITUTION FEE AND PURCHASING WHITE CERTIFICATES

The amount of toe obtained by implementing actual measures certified by energy efficiency certificates and 'virtual' toe obtained in the form of a substitution fee indicates a clear preference for fulfilling obligations by paying the substitution fee. In 2021-2023, the average amount [toe] obtained through the payment of a substitution fee (approx. 380,000 toe) was significantly higher than the average amount of toe obtained through the purchase of energy efficiency certificates (approx. 170,000 toe).

The total market volume can currently be estimated at approx. 560,000 [toe/year], and the approximate value calculated for 2023 was approx. PLN 1.1 billion. It is important to bear in mind the potential increase in the volume of the certificate market in connection with the increase in the national obligation as a result of the amendment to the EED 2023 Directive, as well as its value (if only due to the increase in the substitution fee).

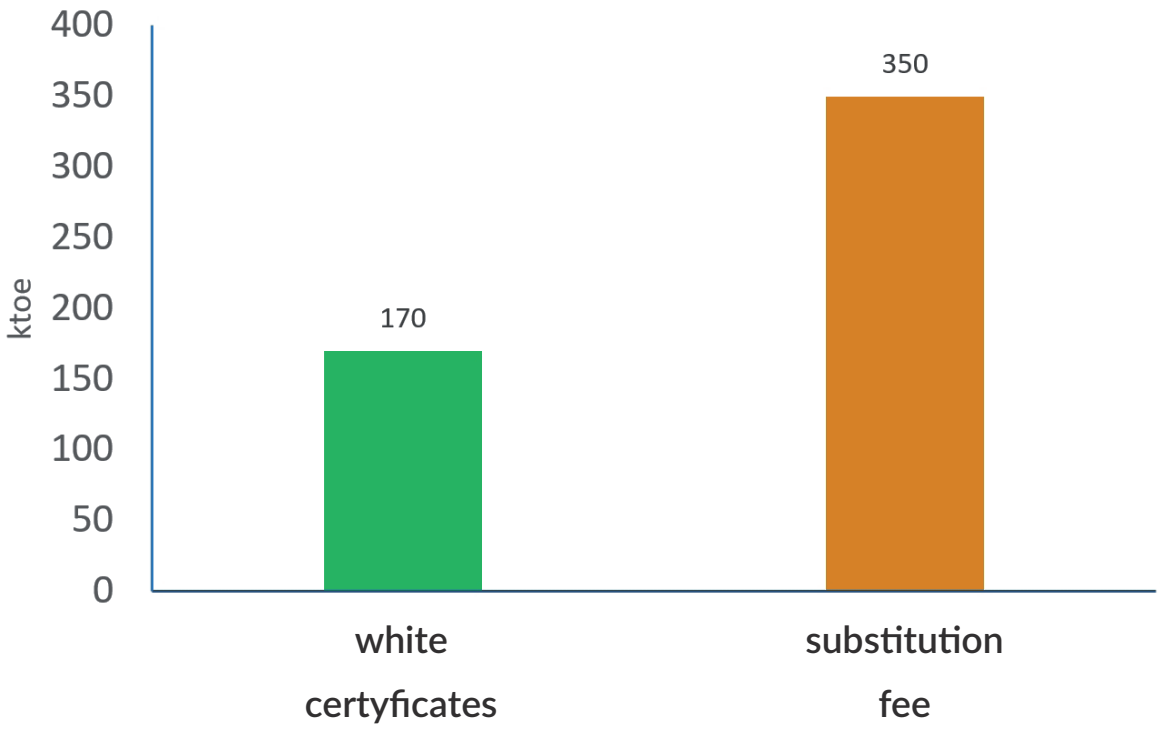


Figure 6. Comparison of average annual toe quantities settled by obligated entities in the form of energy efficiency certificates (for 2021–2023).

Own study based on data from the Energy Regulatory Office and the Supreme Audit Office (NIK) (sources provided in the previous two chapters).

THE CURRENT METHOD OF DETERMINING THE SUBSTITUTION FEE

In 2017, the substitution fee was arbitrarily set at PLN 1,500/toe. This value is revalued annually by a factor of 1.05 (5%). Therefore, the value of the fee in 2023 is PLN 2,010.14/toe.

In the last year, this means a real price decrease, as the adopted growth rate is lower than inflation (11.4% according to GUS).

In the existing solution, the substitution fee actually serves as the value limit of a white certificate.

10.1. ADVANTAGES

- reduction in the cost of fulfilling the obligations of obligated entities (at the expense of NFOSiGW and other entities which, in one way or another, must fulfil the national energy efficiency target of 5,580,000 toe by 2030, which is likely to be significantly increased in accordance with EED2023 reduction in the cost of fulfilling the obligations)
- reduction of transaction costs associated with obtaining white certificates (multi-stage assessment, involvement of the Energy Regulatory Office, brokers, Polish Power Exchange).

10.2. WEAKNESSES

- lack of logic and transparency in determining the level of the substitution fee,
- increased cost of fulfilling national obligations,
- additional burden on the budget due to the cost of fulfilling obligations (equal to the difference between the purchase of energy consumption reductions and revenue from white certificates to NFOSiGW).

(A) – amount of energy saved through the purchase of white certificates,

(X) – amount of energy resulting from the target of 1.5% energy savings in relation to sales,

Red dot – value of the substitution fee.

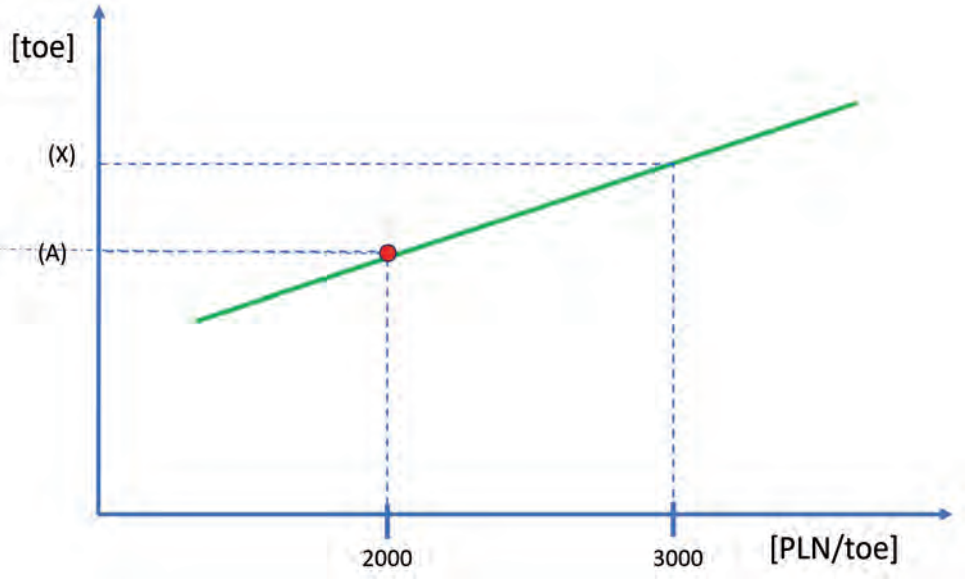


Figure 7 Determining the amount ofthe substitution fee

Note: The chart and figures are for illustrative purposes only. Source: KAPE

PROPOSALS FOR A NEW APPROACH TO DETERMINING THE AMOUNT OF THE SUBSTITUTION FEE

Both the function and the method of determining the substitution fee require revision, clarificationand verification. The most obvious function of the substitution fee should be to enable those entities that are unable to fulfil their obligations with the help of certificates to do so, while stimulating the implementation of actual investments.

The amount of the substitution fee should actively encourage the selection of actual investments confirmed by certificates, rather than demonstrating the fulfilment of obligations without taking any action.

When defining the 'new substitution charge', the following criteria should be taken into account:

1. The total cost of Poland's fulfilment of its energy efficiency obligations,
2. The impact on the amount of investment in energy efficiency (with an emphasis on industry),
3. Impact on energy bills,
4. Stimulating the energy efficiency market,
5. Transparency,
6. Stimulating investments by end users implemented by obligated entities,
7. Introducing competition between energy efficiency support paths.

This chapter summarises the options for determining the substitution fee. For all options, the key challenge, given a set/planned substitution fee value of, for example, PLN 3,500/toe, is to determine the supply of white certificates.

It should be emphasised that the supply of certificates varies at different levels of the substitution fee (in the current system, a higher substitution fee = higher supply).

Establishing a balance will be dynamic in nature, as over time the average profitability of investments in energy efficiency will decrease, because the most profitable projects will be implemented first, followed by those that are slightly less profitable, and so on (the 'low hanging fruits' will be picked).

The fee should be high enough to motivate real action, and the value of the substitution fee should be higher than the average value of the certificate (in a given year).

The value of the substitution fee should keep pace with changes in the market, but in the medium term (e.g. one year/several years). An important factor to be taken into account when designing the substitution fee mechanism is the delay in market response – reaching equilibrium at a higher price level will take several years.

Therefore, when introducing any changes, the time-consuming process of market adjustment must be taken into account. The substitution fee should therefore be higher than at present, but raised gradually, e.g. over a period of several years.

It is important to 'design' feedback into the substitution fee mechanism so that price and supply signals influence the value of the substitution fee.

	Currently	NFOSIGW	„like green"
Market linkage/feedback	0 No feedback	+++ Through the „NFOSIGW cost benchmark"	+++ Direct connection
Enabling the purchase of an environmental effect equal to the amount of toe obtained from the substitution fee	+ Unknown value	+++	++
1. Determining the „target value" at the change stage	+++ Specified in the Act	+++ Based on the cost of NFOSiGW	0 Unable to determine
2. Predictability	+++	++	+
3. Stimulating investment implementation	0	+++	+++
4. Achieving tangible results in the form of investments	+ (below 50%)	+++	+++
5. Building the energy services market	0	+++	+++
6. Relative cost of fulfilling Poland's obligations	+++	+	+
7. Relative impact on energy bills	+	++	++
8. Transparency of the method used to determine the fee	0	++	+++

Table 3. Approximate comparison of different methods of determining the substitution fee. One cross means 'little', three crosses mean 'significantly'.

Source: KAPE's own study.

For individual proposals, feedback is provided as follows:

a. Current system – no feedback loop,

b. System without a substitution fee – feedback loop via the market – the balance is established automatically,

c. System in which the cost of achieving the effect by NFOSiGW is a benchmark – by linking the price of the substitution fee to the cost of achieving the effect through alternative measures implemented by the Fund,

d. System in which the mechanism for determining the substitution fee is similar to the method of determining the fee in the green certificate system – by determining the average value from previous years.

Based on the information gathered and the consultations conducted, the most advantageous solution from the point of view of efficiency and clarity of spending would be a system based on the NFOSiGW benchmark. The following arguments speak in favour of this option:

- Relative ease of determining the target value by setting a benchmark (NFOSiGW keeps relevant statistics),
- Transparency,
- Logic – for revenues from the substitution fee NFOSiGW would be able to 'purchase' the same amount of final energy (toe) through its programmes,
- The white certificate system will stabilise at a level that allows for the successful implementation of the most cost-effective tasks (less cost-effective tasks should be implemented using other programmes and instruments).

11.1. OPTION 0 – STATUS QUO

In the current system, the determination of the substitution fee is specified by law (Article 10 of the Energy Efficiency Act, Journal of Laws 2021.2166[10]).

The disadvantages of the current method of determining the substitution fee are:

- arbitrariness,
- lack of connection to the market,
- excessively low fee (real value is reduced),
- narrowing of the investment portfolio,
- indirectly increasing the cost of fulfilling domestic obligations

10 https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU20210002166/U/D20212166Lj.pdf

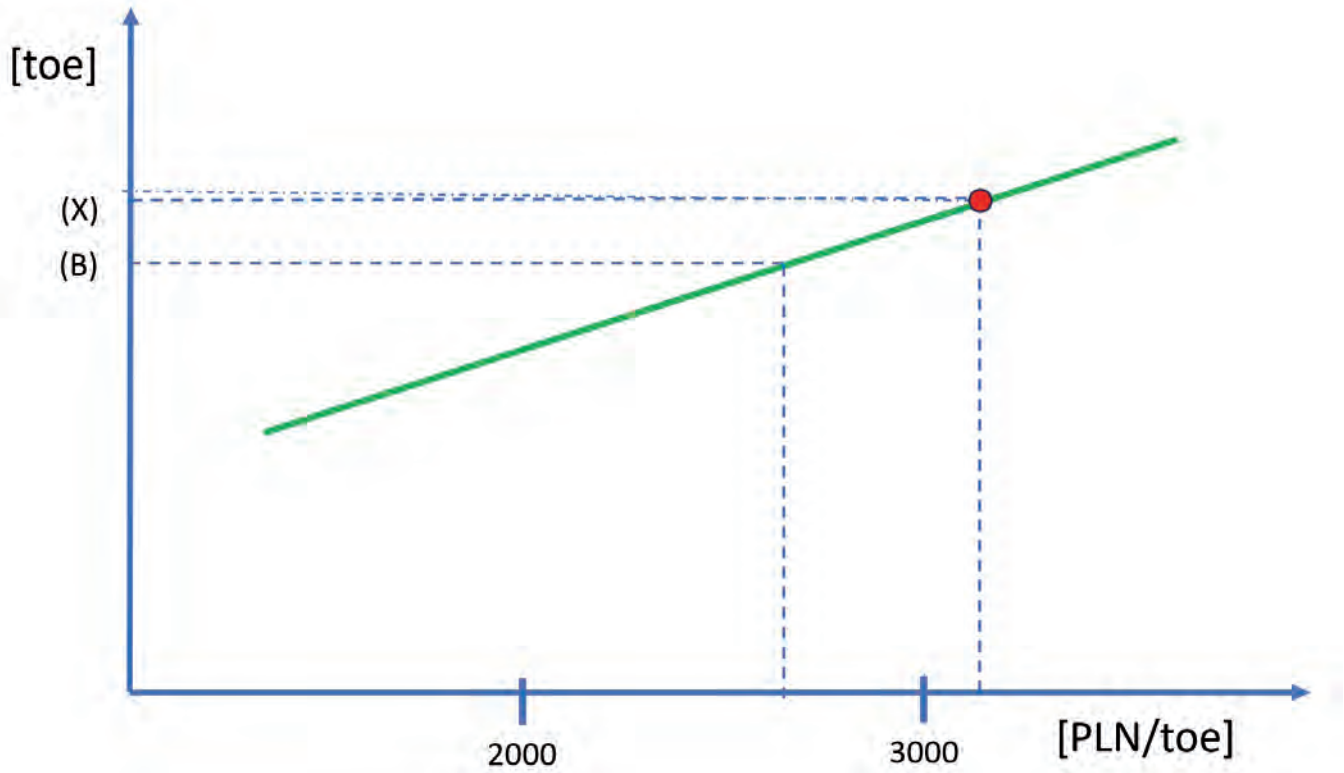
- no incentive to perform tasks among end users,
- no positive impact on the development of the energy services market.

The current mechanism and level of fee setting is characterised by a very low risk associated with uncertainty regarding the value of liabilities (with a fixed fee set by law, the risk is practically non-existent).

This situation is beneficial for potential investors, because in the current situation, investors use a known, pre-determined fee (and thus white certificate) price, set at a low level, in their profitability calculations. The prices of white certificates fluctuate; for example, an increase was recorded in spring 2024 (Figure 1. Value of WC and substitution fee, page 11).

11.2. NFOSIGW COSTS AS A BENCHMARK

In this variant, the substitution fee is set at the average cost of obtaining 1 toe in energy efficiency investment projects financed by NFOSiGW.



(B) – hypothetical average value of certificates assuming market 'saturation' (when the average value of a certificate is lower than the cost of achieving the effect by NFOSiGW).

(X) – amount of energy resulting from the 1.5% energy saving target in relation to sales, red dot – value of the substitution fee determined on the basis of the average purchase price of the effect by NFOSiGW.

Red dot – the value of the substitution fee determined on the basis of the average purchase price of the effect by NFOSiGW.

Figure 8. Amount of the substitution fee. Source: KAPE study

If this option is used, the state budget's interests are protected both when the cost of achieving the effect is higher than the price of the certificate and when it is lower (the state can purchase more of the effect for the same price).

It should be assumed that the cost of obtaining 1 toe in projects implemented by the National Fund for Environmental Protection and Water Management (NFOSiGW) is higher than the currently established substitution fee (e.g. because the NFOSiGW also supports non-commercial activities with a long payback period).

The introduction of a new fee calculation system may entail the risk of non-fulfilment of obligations due to the lack of certificates on the TGE. The change in the fee for the TGE, leading to its value being set at the average cost of project implementation by NFOSiGW, should therefore take place gradually over a period of several years, e.g. 3-4. A gradual increase in the fee and knowledge of its value will be crucial for both end users and obligated entities (especially in the first years).

Determining the price of the substitution fee using NFOSiGW costs may prove relatively simple, as NFOSiGW already has the relevant indicators at its disposal; the problem will be deciding on the 'basket' of projects/programmes included in the benchmark).

11.2.1. Advantages

- The state does not subsidise the activities of obligated entities and is certain that it will be able to "purchase" the effect using other instruments (e.g. subsidies) with the money obtained from the substitution fee.
- A clear picture of the costs of implementing energy efficiency measures using various support instruments is obtained.
- The pool of money, primarily for low-cost investments in industry, in the form of 'white certificates' is increasing. Linking certificates to other support instruments – creating a single system using similar efficiency criteria.

11.2.2. The example of Ireland

In Ireland, the value of the substitution fee is equal to the cost incurred by the government for the energy efficiency measures it implements. The costs of the measures implemented by the government and its agencies are significantly higher than the estimated cost of purchasing energy certificates by obligated entities.

The Irish government, with the help of an independent consulting firm, is preparing an analysis of the costs associated with the implemen-

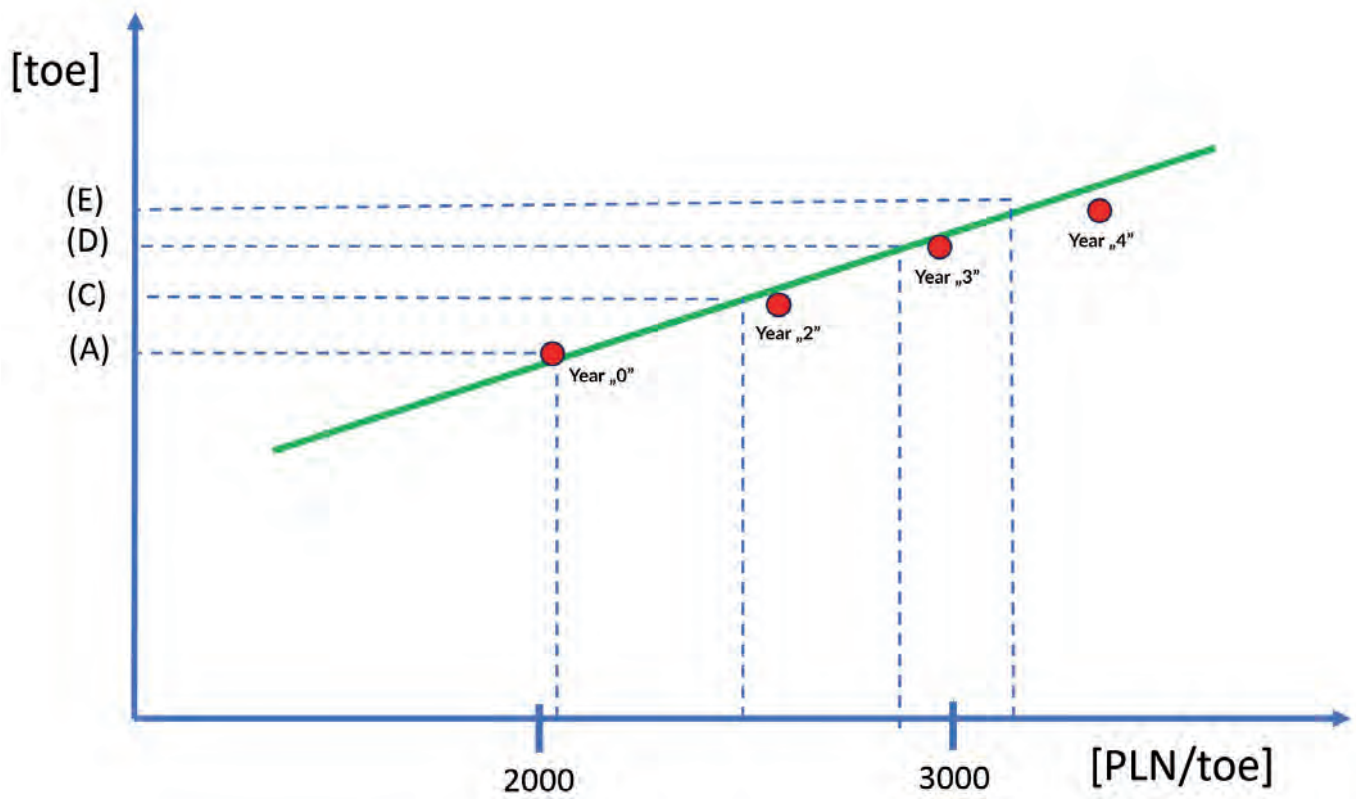
tation of the certificate system in its entirety, as well as broken down by sector and sub-objectives, such as the housing sector or energy efficiency for people affected by energy poverty.

It is worth noting that obligated entities may achieve no more than 30% of their annual energy efficiency targets through the use of a substitution fee.

Failure to achieve the targets results in a penalty, which is determined in relation to the substitution fee rate and is significantly higher than it.

This decision is justified by the fact that failure to achieve the target is significantly more costly than achieving it by up to 30% in the form of a substitution fee.

The Energy Efficiency Directive states that Member States may decide that obligated parties may fulfil their obligations under Article 8(1) and (4) by contributing annually to a national energy efficiency fund an amount equal to the investments required to fulfil those obligations. Although this is a 'may' clause and not a requirement, it indicates that setting the



(A) – reference value of certificates in year '0',

(C) – value and quantity of certificates after the first year,

(E) – saturation point – when the value of the certificate is 80% of the substitution fee.

Figure 9. Determining the amount of the substitution fee in a manner analogous to white certificates. Source: KAPE study

substitution fee at the level of the costs incurred by the state would be in line with the EED Directive.

11.3. DETERMINATION OF THE SUBSTITUTION FEE IN A MANNER ANALOGOUS TO GREEN CERTIFICATES

The substitution fee would be calculated as the quotient of the coefficient (e.g. 1.25) and the average price of certificates from the previous year.

11.3.1. Advantages

- setting a substitution fee above marginal cost,
- simplicity and transparency,
- ability to respond, e.g. to a fall in the price of certificates,
- dynamic adaptation to the market.

11.3.2. Disadvantages

- uncertainty regarding the purchase of the effect in the form of reduced energy consumption using funds obtained from the substitution fee,
- lack of a logical link between the substitution fee and other instruments for energy efficiency.

In the case of green certificates, the market price has stabilised due to a significant oversupply caused by a sharp increase in investment in the renewable energy market (RES). In a situation of significant oversupply, the substitution fee has no impact on market equilibrium or the price of certificates. Currently, the white certificate market is 'unsaturated' and is likely to remain so for some time.

XII. ANNEX

Volume of energy performance certificates issued in 2023

Type of project - open-ended	No. of certificates (units)	Volume (toe)
Insulation of industrial installations	104	11 141,103
Reconstruction or renovation of buildings, including installations and technical equipment	314	15 576,851
Modernisation or replacement of lighting	340	17 411,226
Modernisation or replacement of equipment and installations used in industrial processes, energy, telecommunications or IT	170	67 436.644
Modernisation or replacement of local heating networks and local heat sources	16	1 695,986
Modernisation or replacement of equipment intended for domestic use	0	0,000
Modernisation or replacement of vehicles used for road or rail transport	0	0,000
Energy recovery, including energy recovery in industrial processes	60	31 666,257
Reduction of transmission losses	3	64,161
Reduction of losses in heating networks	59	2 458,326
Reduction of losses related to reactive energy consumption	2	518,862
Reduction of network losses related to the transmission or distribution of electricity, natural gas or liquid fuels	3	57,355
Reduction of losses related to power supply systems for telecommunications or IT equipment	0	0,000
Reduction of losses related to the storage and transfer of liquid fuels produced in renewable energy installations.	0	0,000
Use of energy generated in renewable energy installations for heating or cooling buildings, use of useful heat in high-efficiency cogeneration or waste heat from industrial installations	0	0,000
		148 026,771

Table 4. Final energy savings by type of project [toe]

Source: Report on the activities of the President of the Energy Regulatory Office, URE April 2024, https://www.ure.gov.pl/download/9/14628/Sprawozdanie2023.pdf

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