



CONCERTED ACTION

ENERGY PERFORMANCE OF BUILDINGS

# Implementation of the EPBD Greece Status in 2020

## AUTHORS

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## NATIONAL WEBSITES

[www.ypeka.gr](http://www.ypeka.gr), [www.buildingcert.gr](http://www.buildingcert.gr), <http://www.ypeka.gr/el-gr/Επιθεώρηση/Ενεργειακή-Επιθεώρηση>

## 1. Introduction

The responsibility for the implementation of the EPBD in Greece lies with the Ministry of Environment and Energy (YPEN). In February 2013, the Greek Parliament approved the adoption of Directive 2010/31/EU with the passing of Law 4122/2013. Directive 844/2018/EU, which amends the former directive, is expected to be transposed into Greek legislation in the first trimester of 2020.

Law 4342/2015 transposed the EED into national legislation and requires 3% of the total floor area of heated and/or cooled public buildings to be renovated each year to meet the minimum energy performance requirements. This obligation will be included in the new law (as set in Directive 844/2018).

The national building code 'Regulation on the Energy Performance of Buildings' (KENAK) was amended in July 2017 with Ministerial Decision (M.D. DEPEA/oik. 178581, GoG B' 2367/12.07.2017), according to the results of the cost-optimal study; the relevant Technical Guidelines were approved in November 2017 (M.D. DEPEA/oik.182365, GoG B' 4003/17.11.2017).

The national plan for increasing the number of nearly zero-energy buildings was issued in August 2018 and defined, among others, that a new building may be characterised as a nearly zero-energy building if it falls at least under energy class A, while an existing building when it falls at least under energy class B+. A decision on the minimum share of RES and the way it contributes to primary energy consumption is still pending.

A ministerial decision was issued in February 2019 (M.D YPEN/DEPEA/6949/72, GoG B'408/14.02.2019) defining the calculation methodology for characterising a renovation as major.

Management and quality control is performed by the Departments of Energy Inspection (of Northern and Southern Greece), which are entities within the Directorate General of Audits and Inspections, established for this purpose.

This report presents an overview of the progress and current status of the EPBD implementation in Greece.

## 2. Current Status of Implementation of the EPBD

### 2.1. Energy performance requirements: NEW BUILDINGS

#### 2.1.i. Progress and current status of new buildings (regulation overall performance)

New buildings or building units must meet minimum energy performance requirements (class B) set out in the [KENAK](#). In July 2017, with Ministerial Decision (M.D. DEPEA/oik. 178581, GoG B' 2367/12.07.2017) the KENAK was amended according to the results of a cost-optimal study. This study determined the minimum energy performance requirements for new buildings or building units and for existing ones that undergo a major renovation, so that the maximum energy savings are achieved with a lower cost impact. The results of the cost-optimal study were also incorporated into the new technical guidelines of the Technical Chamber of Greece (TOTEI), which were approved in November 2017 with Ministerial Decree (M.D. DEPEA/oik. 182365, GoG B' 4003/17.11.2017).

Moreover, in combination with the obligation set in Law 4122/2013, every new building of the public sector from 1 January 2019 should be NZEB. This obligation also applies for all new buildings constructed after 1 January 2021.

The definition of NZEB has been used since 2013. The national plan for increasing the number of nearly zero-energy buildings was issued in August 2018 and defined, among others, that a new building may be characterised as a nearly zero-energy building if it falls at least under energy class A, while an existing building when it falls at least under energy class B+; this was incorporated into Greek legislation through Ministerial Decision YPEN/DEPEA/85251/242 (GoG B' 5447/5.12.2018). Nevertheless, a decision on the minimum share of RES and the way it contributes to primary energy consumption is still pending. The YPEN is expected to procure a study in the first semester of 2020 in order to deal with these issues.

At the stage of issuing a building permit for new buildings or building units, additional documentation must be prepared and submitted to the relevant Building Office Authority. This documentation accompanies the energy study and contains the technical, environmental and economic feasibility of the installation of at least one of the following alternative energy supply systems:

- decentralised energy supply systems based on RES;
- combined heat power (CHP);
- district heating or cooling systems in the region or block;
- heat pumps that meet the minimum eco-labelling requirements<sup>1</sup>.

For new buildings or building units, it is obligatory since 2011 to cover part of the hot water needs from solar, thermal or other RES/CHP systems. The minimum percentage of the solar share on an annual basis is set at 60%. Non-application of the above rate requires adequate technical documentation in accordance with current legislation and the prevailing conditions.

#### 2.1.ii. Format of national transposition and implementation of existing regulations

The study of the cost-optimal levels of minimum energy performance requirements for buildings and building elements (Directive 2010/31/EU, Article 5) was coordinated by a steering committee formed by the YPEN and consisting of experts from the academic and scientific community, that was assisted by individual thematic working groups.

## Implementation of the EPBD in Greece

The steering committee completed the report for 'single-family' buildings, 'multi-family' buildings and 'office' buildings in August 2018.

After the completion of the cost-optimal study, the committee compared their results with the current minimum energy performance requirements and the YPEN revised the KENAK, posing stricter energy performance requirements. The revision of the KENAK was issued in July 2017 (M.D. DEPEA/oik. 178581, GoG B' 2367/12.07.2017), while the revision of the relevant technical guidelines (5) of the TOTEE was issued in November 2017 (M.D. DEPEA/oik.182365, GoG B' 4003/17.11.2017). The guidelines took into account all the existing CEN standards related to the energy performance of buildings.

### **2.1.iii. Action plan for progression to NZEB for new buildings**

The national plan for increasing the number of NZEB (according to Directive 2010/31/EU, Article 9) was approved in December 2018 with Ministerial Decision YPEN/DEPEA/85251/242 (GoG B' 5447/5.12.2018).

The national plan:

- defines the technical characteristics of buildings with almost zero-energy consumption, taking into account national, regional or local conditions, and including a numerical indicator of primary energy use in kWh/m<sup>2</sup> year;
- sets intermediate targets for improving the energy efficiency of new buildings;
- provides information on the policies and financial or other measures taken to promote NZEB, including details of national requirements and measures concerning the use of energy from RES in new buildings and existing buildings which undergo major renovation.

It also provides:

- the characteristics of the national building stock;
- the evolution, through time, of the national requirements related to the energy performance of buildings;
- the energy characteristics of the buildings with nearly zero-energy consumption;
- policies and measures to encourage improvements in the energy efficiency of buildings so as to meet the requirement that from 1 January 2021 all new buildings are to be NZEB;
- policies and measures to transform existing buildings through deep renovation to NZEB.

An update of the national plan for increasing the number of NZEBs is expected to be adopted in 2020.

### **2.1.iv. Requirements for building components for new buildings**

The in July 2017 revised KENAK introduced stricter minimum energy performance requirements regarding new buildings' components and whole buildings' envelope. The requirements for existing buildings remained the same. Energy requirements for new buildings are presented in Table 1. Maximum acceptable thermal transmittance values for the building envelope of new buildings are presented in Table 2, according to the 4 climatic zones of Greece (Figure 1).

Building component	U-value [W/(m <sup>2</sup> .K)]			
	Climatic Zone			
	A	B	C	D
Roof	0.45	0.40	0.35	0.30
External walls	0.55	0.45	0.40	0.35
External walls in contact with the ground	1.30	0.90	0.70	0.65
Floor in contact with unheated space ('piloti')	0.45	0.40	0.35	0.30
Floor over ground	1.10	0.80	0.65	0.60
Openings	2.80	2.60	2.40	2.20
Glass façades	2.10	1.90	1.75	1.70

Table 1. Minimum energy performance requirements for building components of new buildings.

F/V (m <sup>-1</sup> )	Max U <sub>m</sub> [W/(m <sup>2</sup> .K)]			
	Climatic Zone			
	A	B	C	D
≤ 0.2	1.25	1.13	1.04	0.95
0.3	1.17	1.05	0.96	0.88
0.4	1.10	0.99	0.91	0.83
0.5	1.04	0.93	0.86	0.78
0.6	0.98	0.89	0.81	0.73
0.7	0.92	0.83	0.76	0.68
0.8	0.86	0.77	0.71	0.63
0.9	0.80	0.73	0.65	0.59
≥1.0	0.77	0.69	0.62	0.55

Table 2. Maximum acceptable mean U-value of the building envelope (U<sub>m</sub>) for new buildings.



Figure 1. The 4 climatic zones of Greece.

Some features newly introduced in the revised regulation are the following:

- The concept of a low-demand building, regarding the DHW needs, introduced the DHW recirculation using a pump (the use of a speed-adjustable speed pump is required, with a constant Δp).
- The concept of terminal control through space thermostats and thermostatic valves per operating space. Also, the obligation to use calorimetry is stated, where there is a need for cost allocation.



building. Following the inspections of its Building Auditors (Law 4495/2017) and in order to issue the Construction Inspection Certificate (PEC), a necessary prerequisite is the issue of the EPC of the building by an energy auditor. The EPC of the building or building unit is submitted and registered electronically at the Ministry Building Inspection database, and a copy is submitted to the relevant Service Construction agency, accompanied by a report of the energy auditor for the fulfilment, or lack thereof, of the minimum requirements for the structural elements of the envelope and the technical building systems of the building or building unit, as well as of the energy category identified in the Energy Performance Study.

The Energy Performance Study should include information regarding:

1. The technical, environmental and economic feasibility of installing alternative high efficiency power supply systems, if available;
2. The necessary measures to ensure a healthy indoor climate;
3. The examination of passive and active fire protection conditions;
4. The assessment of risks that may affect the building's static adequacy.

## **2.II. Energy performance requirements: EXISTING BUILDINGS**

### ***2.II.i. Progress and current status of existing buildings (regulation overall performance)***

Regarding existing buildings, the definition of major renovation is set in Law 4122/2013 which was then amended by Law 4409/2016, Article 49 (A' 136). A renovation is considered as major when the total cost relating to the renovation of the building envelope or the technical building system is higher than 25% of the value of the building, excluding the value of the land upon which the building is situated.

A ministerial decision was issued in February 2019 (M.D YPEN/DEPEA/6949/72, GoG B'408/14.02.2019) defining the calculation methodology for characterising a renovation as major renovation.

Law 4342/2015 (A' 143), which transposed the EED into national legislation, sets the obligation that, from 1 January 2014, 3% of the total floor area of heated and/or cooled buildings owned and occupied by the central government must be renovated each year so as to meet the minimum energy performance requirements. In 2017, the list of the central government buildings included 82 buildings with a total area of 309,712 m<sup>2</sup>, but in recent years there have been re-evaluations of what is considered a central government building, leading to a decrease of the number of registered buildings. The refurbishment of these buildings is included in the national structural funds programmes. The YPEN had initiated an official communication with all central government organisations, in order to update the list with buildings with a floor area greater than 250 m<sup>2</sup>, and to acquire all necessary information. By the end of 2019, this list included 21 buildings with a total area of approximately 200,000 m<sup>2</sup>.

In July 2017, with Ministerial Decision (M.D. DEPEA/oik. 178581, GoG B' 2367/12.07.2017) the KENAK was amended according to the results of the cost-optimal study. This cost-optimal study determined the minimum energy performance requirements for existing buildings or building units that undergo a major renovation, so that the maximum energy savings are achieved with the lower cost impact. The results of the cost-optimal study were also incorporated in the new technical guidelines of the TOTEE, approved in November 2017 with the issue of Ministerial Decree (M.D. DEPEA/oik.182365, GoG B' 4003/17.11.2017).

Implementation of the EPBD in Greece

The energy performance of an existing building that undergoes major renovation should be energy class B or better, unless it can be proved, through a technical report, that this is technically, functionally and economically not feasible.

### ***2.II.ii. Regulation on individual parts, distinct from whole building performance***

The KENAK has set minimum requirements (maximum U-values) for the building elements, as well as for energy losses and gains for the whole building envelope (max.  $U_{\text{building}}$ ), and minimum requirements for the efficiency of heating, cooling and hot water production systems. These are set for all building uses, supplemented with lighting requirements for the tertiary sector buildings.

### ***2.II.iii. Initiatives/plans to improve the existing building stock***

The definition of NZEB in existing buildings has been set in Law 4122/2013 and its application is determined in the national NZEB study issued in December 2018 (Ministerial Decision YPEN/DEPEA/85251/242, GoG B' 5447/5.12.2018). The study also establishes plans to renovate the existing building stock to become NZEB.

In December 2019, the YPEN submitted the National Energy and Climate Plan (NECP). In the area of energy efficiency improvements, renovation of the national building stock (tertiary and residential) is set as one of the twelve different policy priorities. According to the NECP, renovation goals are set for the existing building stock and it is considered necessary to establish a central quantitative objective for the renovation and replacement of residential buildings with new nearly zero-energy buildings, which could in aggregate amount to 12-15% of all residential buildings by 2030. The annual objective is to have an average of 60,000 buildings or building units upgraded in terms of energy and/or replaced with new more energy-efficient ones.

Also, according to the NECP, it is important to optimally integrate RES technologies for heating and cooling purposes in the building sector, in particular to the extent that all new buildings are to be nearly zero-energy buildings from 2021 onwards.

Finally, with the transposition of Directive 844/2018 into national legislation, which is expected in the first trimester of 2020, there will be an obligation to establish a long-term renovation strategy, to support the renovation of the national stock of residential and non-residential buildings, both public and private, into a highly energy efficient and decarbonised building stock by 2050, facilitating the cost-effective transformation of existing buildings into nearly zero-energy buildings.

### ***2.II.iv. Long Term Renovation Strategies, status***

By June 2018, the YPEN had approved the study<sup>2</sup> of the 2<sup>nd</sup> long-term strategy for mobilising investment in the renovation of the national stock of residential and commercial buildings (according to the provisions of EED, Article 4). The new long-term renovation strategy (according to Directive 844/2018, Article 2A) is expected to be established in 2020, after transposing Directive 844/2018 into national legislation, which is expected in the beginning of 2020.

According to the 2<sup>nd</sup> renovation strategy from 2018, the basic goal set out is that almost 7% of the existing building stock will be renovated by 2030. This means that almost 25,000 buildings should be renovated annually. Two different scenarios have been examined, consisting of two different renovation types:

- medium renovation with 40% savings;
- deep renovation with 60% savings.

The investment amount necessary to achieve the aforementioned scenarios ranges from 1.6-2.5 billion €. In order to transform the existing building stock by 2030, it is necessary to foster a mixture of fiscal and economic incentives and also to mobilise private capital. Greece must therefore proceed with regulatory framework developments and focus on capacity building and good practices. Finally, it is also important not to overlook the multiple benefits deriving from renovations, as renovations have a significant impact on society as a whole and secures resources from the reduction of expenses in other sectors (e.g., health).

### **2.II.v. Financial instruments and incentives for existing buildings**

National programmes have been established to facilitate the uptake of energy efficiency measures in buildings.

- The 'Energy Savings in Households II (*Eksikonomisi kat' Oikon II*)' programme, launched by YPEN in 2018, provides financial incentives for implementing energy renovation measures in households. The eligible interventions focus on building envelopes, heating and cooling systems as well as DHW systems.
- The 'ELEKTRA' programme outlined in Law 4608/2019 is a new programme for energy efficiency renovations in public buildings. This programme will provide loans to General Government bodies in order to implement energy efficiency investments in their buildings. Loans will be financed or co-financed by the national part of the National Investment Programme as well as by beneficiaries' own resources. Recently, an addition to the project's design made it possible to finance part or all of the investment by using Energy Service Companies (ESCOs). The programme is expected to be launched in autumn 2020.
- The 'Energy Savings in Households (*Eksikonomisi kat' Oikon*)' programme, was launched by the former Ministry of the Environment, Energy and Climate Change (YPEKA), to promote energy retrofitting of existing buildings. This programme offered a set of financial incentives for household owners to implement energy efficient technologies that focus on the building envelope, the heating and cooling systems, and DHW systems.
- The national programme 'SAVE I (*Eksikonomo I*)', addressed to municipalities of over 10,000 inhabitants, provides subsidies for implementing energy efficient technologies in buildings owned or used by municipal services. The subsidy provided was up to 70% of the cost of the energy efficiency measures. A total budget of 82 million € was allocated during the first phase of the programme (2009 - 2012). The proposed measures included building envelope measures and equipment for efficient heating, lighting, ventilation, cooling and control systems. This first phase proved to be successful and was welcomed by local authorities. The programme was therefore extended and is on-going.

In order to receive financing within the aforementioned programmes, an EPC must be issued by an approved expert before the funding application is filed; a second one is issued after the measures are completely implemented in order to verify the energy benefit.

### **2.II.vi. Information campaigns / complementary policies**

Information material about the KENAK, the EPC and the energy efficiency of buildings has been produced by the YPEN and is found at the ministry's website

<http://www.ypeka.gr/Default.aspx?tabid=282&language=el-GR>. Additionally, the implemented financing scheme 'Energy Savings in Households II' (see previous section) provides information related to EPCs.



## 2.III. Energy performance certificate requirements

### 2.III.i. Progress and current status on EPCs at sale or rental of buildings

The legal requirement in Greece that each new rental or sale transaction must be accompanied by an EPC still remains<sup>3</sup>. The only change, according to Law 4342/2015, Article 58, paragraph 3, is that from 9 November 2015 all new rentals must adhere to the unique protocol number of the EPC being inserted into the electronic platform of the General Secretariat of Information Systems of the Ministry of Finance ([www.gsis.gr](http://www.gsis.gr)).

According to the National Energy and Climate Plan (NECP), some regulatory provisions are expected to be promoted in 2020. More specifically:

- After 31 December 2023, all buildings housing public authorities must be classified under energy category B or higher on the basis of the EPC;
- As of 1 January 2021, all new buildings or building units rented or purchased by central government bodies must be nearly zero-energy buildings (energy category A or higher);
- As of 1 January 2021, for each building or building unit that is available for sale or rent, the energy efficiency index shown in the EPC should be declared in all commercial advertisements.

### Issued EPCs

Until the end of 2019, a total number of 1,815,232 EPCs have been issued according to the Energy Inspections Department. In 2019 alone, 315,804 EPCs were issued. The number of EPCs according to the reason of issuance is presented in Table 3<sup>4</sup>. The Departments of Energy Inspection have developed a web platform which provides many statistical data of the issued EPCs (<http://www.ypeka.gr/Default.aspx?tabid=907&language=el-GR>).

Figure 3 presents the total number of issued EPCs per year. Figure 4 depicts the energy categories of the residential buildings equipped with EPCs, while Figure 5 shows the energy categories of the tertiary sector buildings equipped with EPCs.

Reason of issuance	Number of EPCs	Total area (m <sup>2</sup> )
Sale	252,544	28,538,163.18
Rent	1,229,140	115,230,704.9
New and renovated building	11,854	3,633,740.285
Existing residential buildings: first energy audit for "Energy Savings in Households" programme	198,138	20,898,195.08
Existing residential buildings: second energy audit for "Energy Savings in Households" programme	88,500	9,379,240.752
Public school buildings: first energy audit	161	239,347.325
Public school buildings: second energy audit	28	43,814.52
Local public buildings programme: first energy audit	266	326,316.265
Local public buildings programme: second energy audit	20	25,482.95
According to Law 4178/2013: first energy audit	1,281	555,472.833
According to Law 4178/2013: second energy audit	1,308	524,342.242
According to Law 4495/2017: first energy audit	2,825	552,001.827
According to Law 4495/2017: second energy audit	1,423	309,325.925
Public buildings according to Article 13 of Law 4122/2013	1,112	2,475,671.775
Other reason	26,632	923,9314.406
<b>Total</b>	<b>1,815,232</b>	<b>191,971,134.265</b>

Table 3. EPCs according to the reason of issuance.

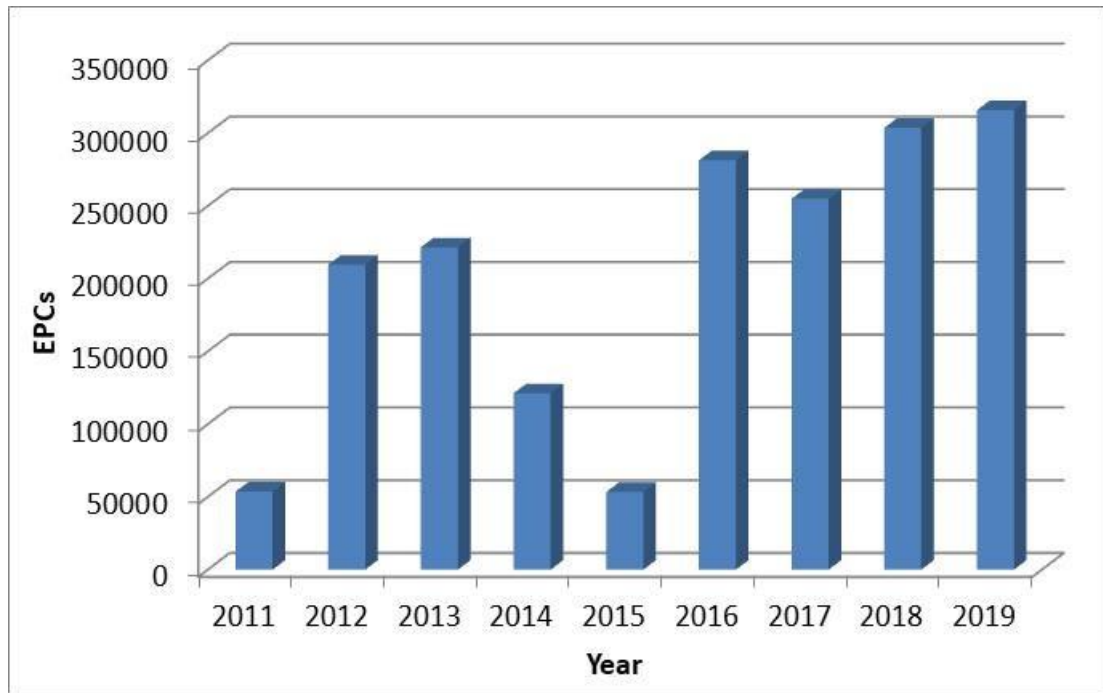


Figure 3. Issued EPCs per year.

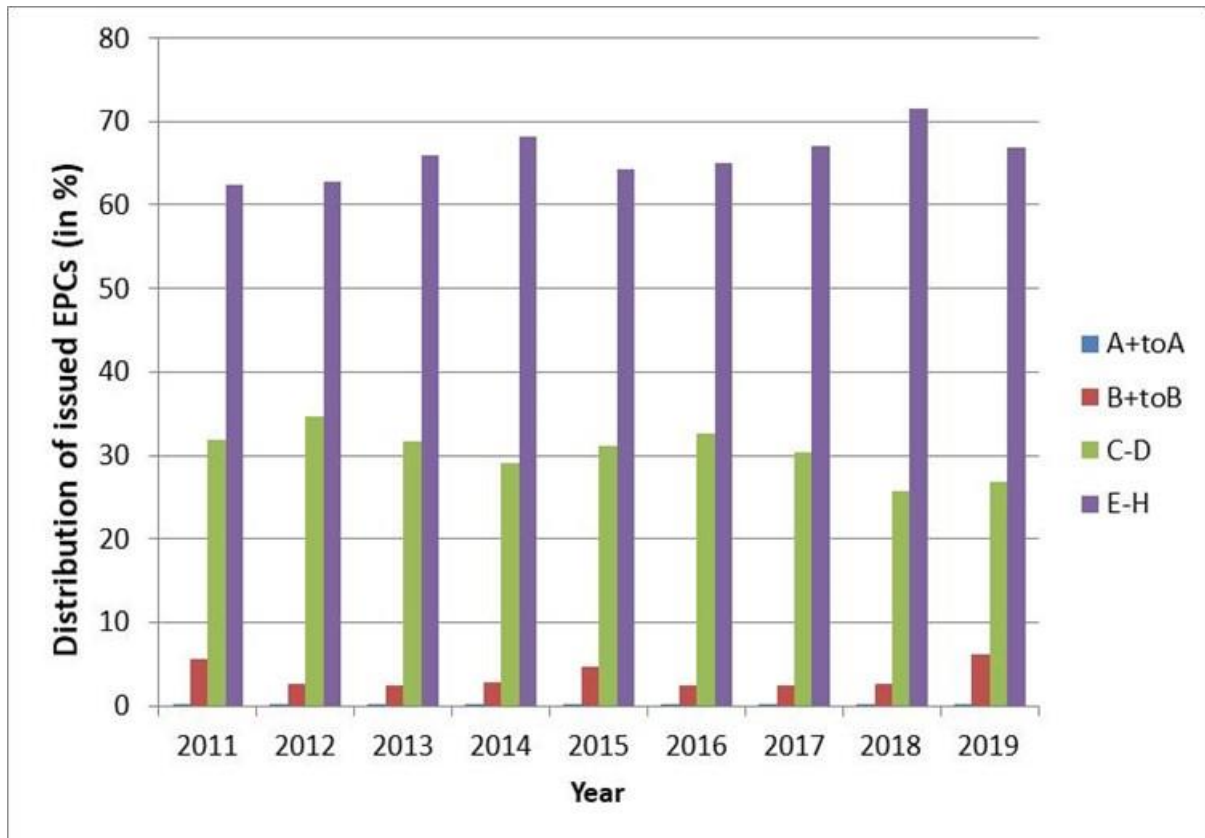


Figure 4. Energy categories of residential buildings.

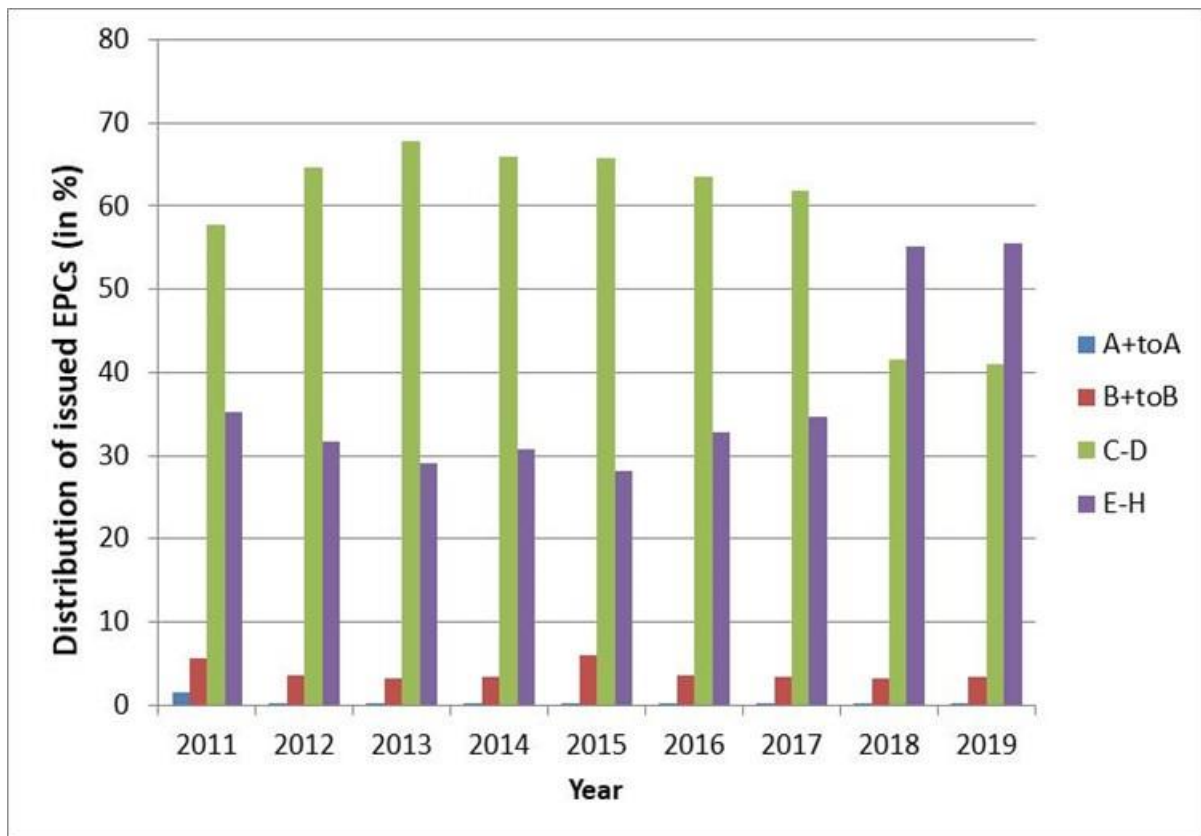


Figure 5. Energy categories of tertiary sector buildings.

### Energy auditors, inspectors' qualifications

The required qualification of energy auditors and their classification in three categories was set with Law 4409/2016 (part 3, Article 52), approved by Parliament in July 2016. According to this law, the energy auditors are classified in three categories: Class A, Class B and Class C.

Class A: energy auditors/inspectors that belong to Class A can perform audits and inspections for the following categories:

- building audits for buildings or building units with a total area lower than 250 m<sup>2</sup>;
- heating systems inspections for heating systems with a heating capacity lower than 50 kW;
- AC system inspections for AC systems with a cooling capacity lower than 50 kW.

Eligible: all auditors/inspectors already registered in the national registry.

Class B: auditors/inspectors in Class B can perform audits and inspections for:

- buildings or building units from 250 m<sup>2</sup> to 1,000 m<sup>2</sup>;
- heating systems with a heating capacity from 50 kW to 400 kW;
- AC systems with a cooling capacity from 50 kW to 400 kW.

Eligible: auditors falling under class A who have conducted at least 30 audits of Class A, 20% of which for non-residential buildings with heating systems or AC systems larger than 15 kW.

Class C: auditors in Class C can perform audits and inspections for:

- buildings or building units above 1,000 m<sup>2</sup>;
- heating systems with a heating capacity above 400 kW;
- AC systems with a cooling capacity above 400 kW.

Eligible: auditors that have successfully passed the examination foreseen by Presidential Decree 100/2010 Article 9 or auditors that fall under Class B who have already conducted at least 10 Class B audits.

At the end of 2019, the total number of energy auditors/inspectors registered in the National Registry for Energy Auditors was 21,489. Table 4 classifies them by type of inspections.

Category	Quantity
Building energy auditors	16,096
Inspectors for heating systems	2,982
Inspectors for AC systems	2,411

Table 4. Energy auditors/inspectors by type of inspections.

### **2.III.ii. Quality Assurance of EPCs**

The Departments of Energy Inspection are responsible for carrying out random EPC control checks and checks on specific EPCs after complaints.

The checks include:

1. control of the data inputted into the electronic database used for the EPC calculations;
2. on-site inspection of the building in order to verify the data used for the EPC.

The quality check procedure utilises a tolerance of 5% from the total primary energy consumption of the existing building or a variation of more than one energy class. Penalties to energy auditors are calculated according to a specially developed algorithm from the Departments of Energy Inspection of the YPEN, and covers all types of issued penalties (according to Law 4409/2016, Article 56).

The penalties foreseen in case of non-compliance remain the same since 2013, and include fines and temporary or permanent suspension or permanent exclusion of the auditor, depending on the severity of the violation, the consequences, the building floor area and the possibility of reoccurrence. Law 4409/2016 (Article 49, paragraph 4) introduced a new range for the fines, amounting from 200 € to 10,000 €, instead of the previously defined (by Law 4122/2013) range of 1,000 € to 10,000 €.

From 2011 until the end of 2019, there were 43,846 EPCs randomly checked, of which 277 were checked on-site. These figures do not yet include 2019 figures from the Department of Northern Greece, as the relevant annual report of the Inspection Bodies has not yet been issued.

Until the end of 2019, 138 penalties were issued to energy auditors (a combination of fines and yearly suspensions).

### **2.III.iii. Progress and current status of EPCs on public and large buildings visited by the public**

According to the provisions of Law 4122/2013, from 9 July 2015, the requirement that all buildings used by the public sector and visited by the public must ensure an EPC is issued and publicly displayed<sup>5</sup> also applies

## Implementation of the EPBD in Greece

to buildings with a total area of 250 m<sup>2</sup> or more. Since no official registry for public buildings exists in Greece, the necessary information on public buildings is difficult to access. A list of 21 public buildings owned by central government organisations with a total useful floor area over 250 m<sup>2</sup> has been compiled using the framework of Article 5 of EED. No controls are foreseen regarding the issuance and public display of EPCs.

### ***2.III.iv. Implementation of mandatory advertising requirement - status***

Law 4122/2013 establishes the mandatory inclusion of EPC energy classes in advertisements for sales or rentals of buildings or building units that already have an EPC. However, since the EPC is only required at the moment of sale or rental and not before, in most cases for existing buildings there is still no EPC class reference when the building or flat is advertised. Therefore, many advertisements still do not include information on the energy rating. In the case of newly constructed buildings in which the issuing of the EPC has already been done, the advertisement includes the EPC energy class. To date, no fines have been issued for non-compliance with this requirement.

## **2.IV. Smart buildings and building systems**

### ***2.IV.i. Status and plans on smart buildings***

The adaptation of Directive 844/2018/EU in the Greek legislation (expected in early 2020) foresees the establishment of a smart readiness indicator (SRI) of the buildings, which will express the ability to adapt the operation of the building or the building unit to the needs of the tenants and the network, and the possibility to improve its energy efficiency and overall performance. The SRI is based on energy saving characteristics, benchmarking and flexibility, enhanced features, availability of interconnected capabilities and smart devices.

### ***2.IV.ii. Regulation of system performance***

The type and level of requirements are a function of the type of building (dwellings, tertiary sector buildings) and cover, among others:

- maximum U-value for walls, windows, roofs etc., for each one of the four climatic zones.;
- at least 50% heat recovery in the central AC units;
- minimum levels of insulation of the heating and cooling distribution networks;
- at least 60% hot water production from solar panels; this percentage can only be covered by other energy supply systems based on RES, CHP and district heating systems on building blocks, as well as by heat pumps that provide significantly higher thermal energy output than what they consume for their operation;
- minimum requirement for lighting installations in the tertiary sector buildings (60 lm/W).

Buildings of the tertiary sector with a useful area of more than 3,500 m<sup>2</sup> must be equipped with a building energy management system (BEMS) for the central control of the operation of their technical building systems. Also, buildings used as hotels or hostels must be equipped with a room control system via electronic cards.

### **2.IV.iii. Building Automation and Controls (BACs)**

The inclusion of Building Automation and Controls in buildings has been discussed and the adaptation of Directive 844/2018/EU in the Greek legislation (expected in early 2020) will require automation and control systems to be installed in non-residential buildings with heating systems or combined heating and ventilation systems with a high output power, if technically and economically feasible, which will allow:

- a) continuous monitoring, recording, analysis and adjustment of energy consumption;
- b) the comparative evaluation of the energy efficiency of the building, identifying losses in the efficiency of technical building systems and informing the person in charge of the facilities or the technical management of the building on ways to improve energy efficiency;
- c) communication with interconnected technical building systems and other devices within the building.

The same approach applies for the AC systems.

It has been confirmed that the state supports the application of Building Automation and Controls measures by the inclusion of such systems in the next national energy efficiency programmes expected to be launched at the end of 2020.

### **2.IV.iv. Status and encouragement of intelligent metering**

Law 4342/2015 foresees that final customers for electricity, natural gas, district heating, district cooling and domestic hot water are provided with competitively priced individual metering devices that accurately reflect the final customer's actual energy consumption, providing information on actual time of use. Such meters shall be provided whenever an existing meter is replaced or a new connection is made, unless this is technically impossible or not cost-effective in relation to the estimated potential savings in the long term.

In Greece, according to the provisions of Law 4001/2011, the responsible body for the electricity meters is the Hellenic Electricity Distribution Network Operator (HEDNO S.A). HEDNO S.A. has already installed electronic meters for all medium voltage consumers and around 60,000 meters for low voltage consumers with high consumptions (large consumers).

### **2.IV.v. Progress and current status on heating systems (Inspection / Equivalence)**

It was decided to nationally adopt the inspection scheme (model A) for heating systems. The inspectors for heating systems perform the on-site inspection and prepare a report to assess the system characteristics, operation, size and efficiency. They also provide instructions and recommendations regarding the maintenance/replacement of the heating system or parts of it, and other alternatives. The inspection reports are submitted online to the same platform used for the registration of the EPCs:

[www.buildingcert.gr](http://www.buildingcert.gr). Quality control procedures for heating systems inspection reports are the same as those for EPCs.

The official launch of the registry of the heating systems inspection reports was in January 2016. All provisions are covered by the KENAK, together with the relevant technical guide issued by the Technical Chamber of Greece which describes in great detail the procedure to inspect boilers and heating systems.

After each inspection, a report is issued which is provided to the owner, manager and/or tenant of the building dependent on ownership and use. The inspection report contains the results of the inspection

Implementation of the EPBD in Greece

performed and includes recommendations for the cost-effective improvement of the energy performance of the system inspected or replaced.

The heating systems should be inspected:

1. a) at least every five (5) years for boiler systems with a total effective rated output power 20 - 100 kW;
2. b) at least every two (2) years, for boilers with a total effective rated output > 100 kW and, if they are heated with gas fuel, at least every four (4) years.

By the end of 2019, 44 inspection reports for heating systems had been issued.

### 2.IV.vi. Progress and current status on AC systems (Inspection / Equivalence)

Similarly to the heating systems, the official launch of the registry of the AC systems inspection reports was in January 2016. The information supplied for the heating systems inspection is also supplied for the AC inspection procedure. Screenshots of the first page (out of 14) of the inspection report for AC systems are given in Figure 6.

The AC systems should be inspected at least every five (5) years if their total capacity exceeds 12 kW.

Again, in the period from 2016 to 2019, 43 inspection reports for AC systems had been issued.

**Έντυπο ενεργειακής επιθεώρησης συστήματος κλιματισμού**

1. Γενικά στοιχεία κτηρίου					
Χρήση κτηρίου:					
Όνομα ιδιοκτήτη:					
Α.Φ.Μ.					
Κ.Α.Ε.Κ.					
Α.Π. δήλωσης & κωδικός ιδιοκτησίας					
Ιδιοκτησιακό καθεστώς: Δημόσιο <input type="checkbox"/> Ιδιωτικού ενδιαφέροντος <input type="checkbox"/>					
Ιδιωτικό <input type="checkbox"/> Ιδιωτικό δημοσίου ενδιαφέροντος <input type="checkbox"/>					
Ταχυδρομική διεύθυνση:					
Στοιχεία επικοινωνίας υπευθύνου: Ιδιοκτήτης <input type="checkbox"/> Διαχειριστής <input type="checkbox"/> Ενοικιαστής <input type="checkbox"/>					
Τεχνικός υπεύθυνος <input type="checkbox"/>					
Όνοματεπώνυμο:					
Τηλέφωνο / φαξ:					
Ηλεκτρονικό ταχυδρομείο:					
Ιστορικό κατασκευής:	Κατάσταση κατασκευής	Συνοπτική περιγραφή	Πηγή πληροφορίας	Έτος έκδοσης οικοδομικής άδειας	Έτος / χρονική περίοδος ολοκλήρωσης κατασκευής
	Αρχική κατασκευή <input type="checkbox"/>				
	Ριζική ανακαίνιση <input type="checkbox"/>				
	Προσθήκη ορόφου/ων <input type="checkbox"/>				
	Προσθήκη δωμάτιου <input type="checkbox"/>				
	Προσθήκη πτέρυγας <input type="checkbox"/>				
	Ρύθμιση αυθαρεσίων <input type="checkbox"/>				
Άλλο <input type="checkbox"/>					
Τύπος: Παλιό <input type="checkbox"/> Ριζικά ανακατασκευασμένο (Κ.Εν.Α.Κ.) <input type="checkbox"/> Νέο (Κ.Εν.Α.Κ.) <input type="checkbox"/>					
Ριζικά ανακατασκευασμένο (με την εφαρμογή του αναθεωρημένου Κ.Εν.Α.Κ.) <input type="checkbox"/>					
Νέο (με την εφαρμογή του αναθεωρημένου Κ.Εν.Α.Κ.) <input type="checkbox"/>					
2. Γενικά χαρακτηριστικά κτηρίου & συστημάτων					
Έτος λειτουργίας κτηρίου:					
Ωρες λειτουργίας κτηρίου ανά ημέρα (h):			Ημέρες λειτουργίας ανά εβδομάδα (h):		
Συνολικό εμβαδό επιφάνειας κτηρίου (m <sup>2</sup> ):			Ύψος κτηρίου (m):		
			Συνολικός όγκος κτηρίου V (m <sup>3</sup> ):		
Εμβαδόν ωφέλιμης επιφάνειας (m <sup>2</sup> ):			Όγκος θερμαινόμενων χώρων (m <sup>3</sup> ):		
Εξωτερικές συνθήκες σχεδιασμού					
Θερμοκρασία (°C): _____					
Σχετική υγρασία (%): _____					
Διάγνωση υφιστάμενης κατάστασης		Ανεπαρκής		Μερικώς μονωμένα	
				Επαρκής	

Figure 6. AC systems inspection report format.

## **2.IV.vii. Enforcement and impact assessment of inspections**

### **Enforcement and penalties**

The control and monitoring of the process and the quality of inspection reports on heating and AC systems, fall under the jurisdiction of the Directorate of Environment, Construction, Energy and Mines Inspections of the YPEN. The Directorate is also the authority responsible for controlling the performance of the functions of the energy inspectors and the compliance and application of the related provisions.

Checks are performed automatically and are randomly sampled at a rate of at least 5% or after complaints of an inspection report. They consist of:

- checking the validity and accuracy of input data submitted by an electronic data form file on the archive of inspection reports, including recommendations;
- on-site inspection of the building to verify the correctness of the inspection reports.

Energy inspectors as well as owners, managers or tenants of the buildings must provide all necessary information, access to the building and its facilities, and any other possible assistance for carrying out the inspections; otherwise, they shall receive a fine (Law 4122/2013, Article 20).

By the end of 2019, no penalties were issued regarding the inspection reports, and no statistics are available.

### **Quality control of inspection reports**

The Departments of Energy Inspection of Northern and Southern Greece are responsible for the operation of the inspection scheme and the quality control of inspection reports. However, since the official launch of the inspection scheme (at the beginning of 2016), a very small number of inspection reports have been registered and, as a result, no quality control checks have been carried out yet.

### **Impact assessment, costs and benefits**

Regarding the impact assessment of the heating and AC system inspections, since very little data exists after the scheme was put into operation, no study on the impact has been performed so far. Additionally, no studies are available related to the cost and benefit of the operation of the scheme.

## **3. A success story in EPBD implementation**

A very successful programme for energy renovation measures in the residential sector is the 'Energy Savings in Households II' (Figure 7). It is a national programme that offers financial support by way of structural and national funds for interventions in the building envelope, the heating/cooling systems and the installation of RES for DHW production. The programme was launched as 'Energy Saving in Households II' and resembles the previous 'Energy Saving in Households' programme, with a few changes concerning the subsidies provided as well as beneficiaries categories. More analytically, the current programme provides subsidies ranging from 25% to 70%, while the remaining investment was provided in the form of zero-interest loans. The maximum eligible measures (inclusive VAT) should not exceed 25,000 €. Due to its large acceptance rate, the programme was performed in two rounds, where the second round began in 2019. The initial budget of the first round of the programme was approximately 502.99 million €, while due to great interest more money was allocated to the programme, reaching 778.01 million € in the beginning of the second programme.



## Implementation of the EPBD in Greece

The programme includes buildings which have a building permit and:

- are of residential use (main residence);
- their owners meet specific income-related criteria;
- are classified as low-energy efficiency buildings (energy class D or lower).

The programme offers incentives for citizens to carry out the most important renovations, aimed at improving their houses' energy efficiency, while at the same time contributing to the achievement of Greece's energy and environmental targets.

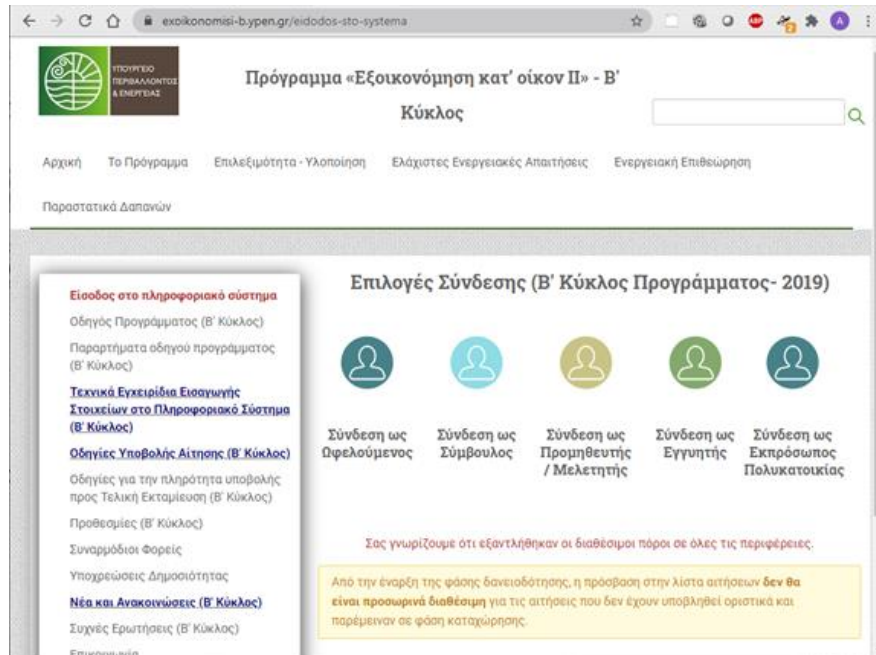


Figure 7. The 'Energy Savings in Households II' programme website.

The main supported actions/measures include:

- building envelope (including thermal insulation, windows & glazing, exterior wall, doors, ceiling, etc.);
- equipment (including efficient heating, efficient lighting systems, ventilation, cooling, control systems, etc.);
- energy audits, consultancy costs, labour costs, education and training activities, etc.

Eligible for participation in the programme are only natural persons who have the right of (full or bare) ownership, or usufruct to an eligible residence and meet the income-related criteria set.

The programme's goal is to result in:

- energy savings;
- public awareness concerning the rational use of energy and environmental protection;
- improving the living conditions in buildings, cities and the urban environment;
- mobilising market forces towards developing sustainable communities.

## 4. Conclusions, future plans

The use of EPCs has been fully implemented in the building market and its existence in building transactions is obligatory. The uptake of EPC recommendations is still a challenge, which is currently being addressed on a state level through financial incentives, information campaigns and with national and European programmes.

A national registry system for issuing EPCs and heating and AC systems inspection reports is fully operational, and the system is centrally operated by the YPEN. The full implementation of the energy inspections of heating and AC systems started in January 2016. However, until the end of 2019, a very limited number of inspection reports has been issued; thus, the implementation and control of energy efficiency measures for these systems still cannot be fully implemented.

The transposition law related to Directive 2010/31/EU (Law 4122/2013) has been modified with issues regarding the energy auditors' qualifications, fines and the operation of the control authorities, while the EED was officially adopted in November 2015 by Law 4342/2015. The transposition of Directive 2018/844/EU in the Greek legislation is expected in the first trimester of 2020.

The national building code KENAK was amended in July 2017 according to the results of the cost-optimal study performed earlier, and has more strict energy requirements regarding new buildings. Additionally, the relevant Technical Guidelines were updated accordingly in November 2017.

The national plan for increasing the number of nearly zero-energy buildings was issued in August 2018 and defined, among others, that a new building may be characterised as a nearly zero-energy building if it falls at least under energy class A, while an existing building when it falls at least under energy class B+; a decision on the minimum share of RES and the way it contributes to primary energy consumption is still pending.

For buildings of the public and wider public sector, Law 4609/2019 foresees the role of a building energy manager and states that the appointment process as well as the formal qualifications of the building energy manager are determined by the Minister of Environment and Energy.

Finally, the national plan for Energy and Climate (NECP)<sup>6</sup> was issued in December 2019 and sets, among others, a key priority to improve the energy efficiency of the building stock through the energy upgrade of 12-15% of the existing buildings and/or building units, between 2021-2030. The aim is to achieve the energy upgrade of some 600,000 buildings by 2030, resulting in an 8 billion € increase in domestic value added. The national energy targets are quite ambitious and include an overall target for energy conservation of 38%, and a 42% reduction of CO<sub>2</sub> emissions until 2030.

In order to support the targets of the national plan for Energy and Climate, a series of legislative works are ongoing to update the regulation of energy efficiency in buildings with the NZEB criteria and launch a set of national energy renovation programmes to subsidise energy measures in buildings.

## Endnotes

1. Established by Decision 2007/742/EC of the European Commission of 9 November 2007, as amended.
2. [https://ypen.gov.gr/wp-content/uploads/2020/12/%CE%94%CE%95%CE%A0%CE%95%CE%91%CE%93%CE%BF%CE%B9%CE%BA.175603\\_04.06.2018-%CE%A6%CE%95%CE%9A-%CE%92-2258.pdf](https://ypen.gov.gr/wp-content/uploads/2020/12/%CE%94%CE%95%CE%A0%CE%95%CE%91%CE%93%CE%BF%CE%B9%CE%BA.175603_04.06.2018-%CE%A6%CE%95%CE%9A-%CE%92-2258.pdf)
3. Since 2013, Law 4122, Article 12.
4. Petroliaški, report on energy inspections of buildings, thermal and AC systems for years 2011 to 2019. Energy Inspection departments, Ministry of Environment and Energy.
5. The EPC needs to be issued by an approved energy auditor.
6. [https://ec.europa.eu/energy/sites/ener/files/documents/el\\_final\\_necp\\_main\\_el.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/el_final_necp_main_el.pdf)

**Annexes -Key Indicators & Decisions**

## Key Indicators & Decisions - General Background

no	Key Implementation Decisions – General Background	Description / value / response	Comments
01.01	Definition of public buildings (according to article 9 b)	<p>Law 4122/2013 sets the obligation for new buildings occupied and owned by public authorities to be nearly zero-energy buildings from 1/1/2019.</p> <p>There is no further definition of what is considered a public building. For a new building to be characterised as nearly zero-energy building it should at least fall under energy class A, while for an existing building to be characterised as nearly zero-energy it should at least fall under energy class B+.</p>	
01.02	Definition of public buildings used by the public (according to article 13)	<p>There is no specific definition for public buildings under the scope of article 13.</p> <p>According to the provisions of Law 4122/2013, the requirement for all buildings used by the public sector and visited by the public to issue and publicly display an EPC, from 9/7/2015 also accounts for buildings with a total area of 250 m<sup>2</sup> or more.</p> <p>Since no official registry for public buildings exists in Greece, the necessary information of public buildings is difficult to be accessed.</p> <p>The only available registry is the one referring to public buildings (with more than 250 m<sup>2</sup> floor area) owned by the Central Government. The YPEN has initiated the communication with all central government organisations in order to acquire all necessary information.</p> <p>No controls are foreseen regarding the issuing and public display of EPCs.</p>	<p>This list of 21 public buildings referred here is under the scope of Article 5 of EED, which concerns buildings owned and occupied by the central government.</p>
01.03	Number of residential buildings	<p>3,246,008 residential buildings (2,990,324 buildings that have only residential use, and 255,684 buildings of mixed use where the prevailing use is residential)</p>	<p>Another number that can be useful is the number of dwellings. A multi-family building can have e.g. 15 dwellings.</p> <p>According to the Hellenic Statistical Authority, the total number of dwellings was 4,122,088, census 2011.</p>
01.04	Number of non-residential buildings	<p>The total number of non-residential buildings is 273,596 (209,469 + 64,127).</p> <p>The type of uses are: hotels, schools, office/commercial, and hospitals.</p> <p>The first number accounts for single-use buildings, while the second number accounts for buildings with mixed use where the prevailing use is one of the aforementioned.</p>	<p>According to the National (Hellenic) Statistical Authority, buildings can be of the following types based on their use: residential, church/monastery, hotel, factory, school, office/commercial, parking, hospital, and other.</p> <p>For the purposes of this document only the</p>

no	Key Implementation Decisions – General Background	Description / value / response	Comments												
			categories that are relevant to the EPC are totalled. Source: Hellenic Statistical Authority, census 2011.												
01.05	If possible, share of public buildings included in the number given in 01.04	34,958, which account for 12.8% of the number indicated in 01.04	The number indicated here concerns buildings where the owner is a public authority and their use is one of the following: hotel, school, office/commercial, hospital. (Source: Hellenic Statistical Authority, census 2011).												
01.06	If possible, share of commercial buildings included in the number given in 01.04	206,254 buildings characterised as office/commercial buildings (153,510 + 52,744). The first number accounts for single-use buildings, while the second number accounts for buildings with mixed use where the prevailing use is office/commercial. It accounts for 75% of the number indicated in 01.04.	Source: Hellenic Statistical Authority.												
01.07	Number of buildings constructed per year (estimate)	<table border="1" data-bbox="528 1104 1126 1301"> <thead> <tr> <th></th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>Number of new buildings</td> <td>4,930</td> <td>5,685</td> <td>6,044</td> </tr> <tr> <td>Number of additions to existing buildings &amp; refurbishments</td> <td>4,137</td> <td>4,250</td> <td>4,520</td> </tr> </tbody> </table>		2017	2018	2019	Number of new buildings	4,930	5,685	6,044	Number of additions to existing buildings & refurbishments	4,137	4,250	4,520	
	2017	2018	2019												
Number of new buildings	4,930	5,685	6,044												
Number of additions to existing buildings & refurbishments	4,137	4,250	4,520												
01.08	If possible, share of residential buildings constructed per year (estimate, included in the number given in 01.07)	<p>The numbers given here refer to dwellings, not buildings and can thus not be given as a share of the figures indicated in 01.07.</p> <table border="1" data-bbox="528 1391 1126 1491"> <thead> <tr> <th></th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>Number of new dwellings</td> <td>10,335</td> <td>13,337</td> <td>17,432</td> </tr> </tbody> </table>		2017	2018	2019	Number of new dwellings	10,335	13,337	17,432	Source: Hellenic Statistical Authority – Building Activity				
	2017	2018	2019												
Number of new dwellings	10,335	13,337	17,432												
01.09	If possible, share of non-residential buildings constructed per year (estimate, included in the number given in 01.07)	<p>The numbers given here do not exclusively include new constructed commercial buildings but can also include permits for establishing a new commercial use for an existing building or additions to existing buildings, etc. Thus, they cannot be given as a share of the numbers indicated in 01.07.</p> <table border="1" data-bbox="528 1727 1094 1800"> <thead> <tr> <th></th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>New commercial use</td> <td>2,361</td> <td>2,501</td> <td>2,606</td> </tr> </tbody> </table>		2017	2018	2019	New commercial use	2,361	2,501	2,606	Source: Hellenic Statistical Authority – Building Activity				
	2017	2018	2019												
New commercial use	2,361	2,501	2,606												
01.10	Useful floor area of buildings constructed per year in million square meters (estimate)	<p>The numbers given in 01.07 for newly constructed buildings in terms of useful floor area are given in the table below:</p> <table border="1" data-bbox="528 1890 1126 1991"> <thead> <tr> <th></th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>Number of new buildings</td> <td>(4,930) 1.7 m<sup>2</sup></td> <td>(5,685) 2.2 m<sup>2</sup></td> <td>(6,044) 2.5m<sup>2</sup></td> </tr> </tbody> </table>		2017	2018	2019	Number of new buildings	(4,930) 1.7 m <sup>2</sup>	(5,685) 2.2 m <sup>2</sup>	(6,044) 2.5m <sup>2</sup>	Source: Hellenic Statistical Authority – Building Activity				
	2017	2018	2019												
Number of new buildings	(4,930) 1.7 m <sup>2</sup>	(5,685) 2.2 m <sup>2</sup>	(6,044) 2.5m <sup>2</sup>												

**Key Indicators & Decisions - New Buildings**

no	Key Implementation Decision – New Buildings	Description / value / response	Comments
02.01	Are building codes set as overall value, primary energy, environment (CO <sub>2</sub> ), reference building or other	The national Regulation on the Energy Performance of Buildings provides an overall primary energy consumption indicator, together with a CO <sub>2</sub> emissions indicator by the use of a reference building method.	
02.02	Requirements for energy performance of residential buildings in current building code	The national Regulation on the Energy Performance of Buildings has set minimum requirements (maximum U-values) for the building elements, as well as for the whole building envelope (max. U <sub>building</sub> ) and minimum requirements for the efficiency of heating, cooling and hot water production systems. All new buildings must be at least Class B until the dates that NZEB come into force (1/1/2019 for public buildings, 1/1/2021 for all new buildings), and then all new buildings should be at least Class A.	
02.03	Requirements for energy performance of non-residential commercial buildings in current building code	Non-residential buildings have on top of the aforementioned requirements additional ones for the lighting systems.	.
02.04	Requirements for energy performance of non-residential public buildings in current building code	Non-residential public buildings have on top of the under 02.02 aforementioned requirements additional ones for the lighting systems.	
02.05	Is the performance level of nearly zero energy (NZEB) for new buildings defined in national legislation?	All new buildings must fall under energy performance category A.	The performance level for NZEB and the exact share of RES is expected to be defined in a forthcoming study (expected mid 2020).
02.06	Nearly zero energy (NZEB) level for residential buildings (level for building code)	At least energy class A	
02.07	Year / date for nearly zero energy (NZEB) as level for residential buildings (as indicated in 02.04)	January 2021 for all new buildings (either residential or commercial) as set in Law 4122/2013	
02.08	Nearly zero energy (NZEB) level for all non-residential buildings (level for building code)	At least energy class A	
02.09	Year / date for nearly zero energy (NZEB) as level for non-residential buildings (as indicated in 02.06)	January 2019 for public buildings, January 2021 for private buildings	
02.10	Are nearly zero energy buildings (NZEB) defined using a carbon or environment indicator?	No	

no	Key Implementation Decision – New Buildings	Description / value / response	Comments
02.11	Is renewable energy a part of the overall or an additional requirement?	Part of the overall requirement	
02.12	If renewable energy is an additional requirement to NZEB, please indicate level		To be defined in the forthcoming study
02.13	Specific comfort criteria for new buildings, provide specific parameters for instance for airtightness, minimum ventilation rates	Yes	



**Key Implementation Decision - Existing Buildings**

no	Key Implementation Decision – Existing Buildings	Description / value / response	Comment
03.01	Is the level of nearly zero energy (NZEB) for existing buildings set in national legislation?	At least energy class B+	
03.02	Is the level of nearly zero energy (NZEB) for existing buildings similar to the level for new buildings?	No, there is a differentiation (energy class A for new buildings, and energy class B+ for existing ones).	
03.03	Definition of nearly zero energy (NZEB) for existing residential buildings (if different from new buildings)	At least energy class B+	
03.04	Definition of nearly zero energy (NZEB) for existing non-residential buildings (if different from new buildings)	At least energy class B+	
03.05	Overall minimum requirements in case of major-renovation	When a building undergoes major renovation, it must meet the minimum requirements of the KENAK (i.e., Class B). This is until the dates that the NZEB comes into force (1/1/2019 for public buildings, 1/1/2021 for all buildings) and then all existing buildings that undergo major renovation should be at least of Class B+.	
03.06	Minimum requirements for individual building parts in case of renovation	Yes, if the existing buildings undergo major renovation.	
03.07	National targets for renovation in connection to Long Term Renovation Strategy (number or percentage of buildings)		
03.08	National targets for renovation in connection to Long Term Renovation Strategy (expected reductions and relevant years)		

## Key Implementation Decision - Energy Performance Certificates

no	Key Implementation Decision – Energy Performance Certificates	Description / value / response	Comment
04.01	Number of energy performance certificates per year (for instance average or values for of 3-5 years)	In 2019 alone, a total of 315,804 EPCs were issued; in 2018 a total of 303,672 EPCs were issued; in 2017 a total of 254,914 EPCs were issued.	
04.02	Number of EPCs since start of scheme	Until the end of 2019, a total of 1,815,232 EPCs have been issued according to the Energy Inspections Department.	
04.03	Number of EPCs for different building types		
04.04	Number of assessors	Building energy auditors: 16,096 Inspectors for heating systems: 2,982 Inspectors for AC systems: 2,411	
04.05	Basic education requirements for assessors	Engineer or architectural degree	
04.06	Additional training demands for assessors	Training seminars were available for assessors. Those assessors that have successfully passed the examination foreseen in article 9 of Presidential Decree (P.D.) 100/2010 are categorised as Class C (highest) assessors.	
04.07	Quality assurance system	The Departments of Energy Inspection (of Northern and Southern Greece) of the General Directorate of Environment, Construction, Energy and Mineral Inspectorate are responsible for carrying out random EPC control checks and checks on specific EPCs due to complaints. The checks include: <ol style="list-style-type: none"> <li>1. control of the data inserted in the electronic database used for the EPC calculations;</li> <li>2. on-site inspection of the building in order to verify the data used for the EPC.</li> </ol> The quality check procedure utilises a tolerance of 5% from the total primary energy consumption of the existing building or variation of more than one energy class. Penalties to energy auditors are calculated according to a specially developed algorithm from the Departments of Energy of YPEN and covers all cases of issued penalties (according to art. 56, Law 4409/2016.	
04.08	National database for EPCs	Yes	
04.09	Link to national information on EPCs / Database	<a href="http://bpes.ypeka.gr/?page_id=21">http://bpes.ypeka.gr/?page_id=21</a>	

## Key Indicators & Decisions - Smart Buildings and Building Systems

no	Key Implementation Decision – Smart Buildings and Building Systems	Description / value / response	Comment
05.01	Is there a national definition of smart buildings?	Not yet defined	
05.02	Are there current support systems for smart buildings?		
05.03	Are there currently specific requirements for technical building systems (for instance in building codes)?		
05.04	Are there current requirements for automatics (for instance in building codes)?		
05.05	Chosen option A or B for heating systems (inspection or other measures)	Option A	
05.06	Number of heating inspections; reports per year (if option A)	The official launch of the registry of the heating systems inspection reports took place in January 2016. Until the end of 2019, 44 inspection reports for heating systems had been issued.	
05.07	Chosen option A or B for cooling systems (inspection or other measures)	A	
05.08	Number of air-conditioning / cooling system inspections; reports per year (if option A)	43 in total	
05.09	Is there a national database for heating inspections?	Yes	
05.10	Is there a national database for cooling / air-conditioning inspections?	Yes	
05.11	Are inspection databases combined with EPC databases for registration of EPCs and inspection reports?	Yes	
05.12	Link to national information on Inspection / Database	<a href="http://www.buildingcert.gr">www.buildingcert.gr</a>	



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