

GUIDEBOOK OF THE ENERGY PERFORMANCE CERTIFICATE OF DWELLINGS

A A+

B- B

C

D

E

F

G



Certificação Energética
e Ar Interior
EDIFÍCIOS

WHAT IS AN ENERGY PERFORMANCE CERTIFICATE?

An Energy Performance Certificate (EPC) of a building or autonomous fraction is the document issued under the National System for Energy and Indoor Air Quality Certification of Buildings (SCE), which translates the energy performance of the building, classifying it on a scale from A+ to G.

This document presents the possible improvement measures to be implemented at the level of energy performance and comfort, highlighting the ones with better economic viability.

Since July 2008, all new buildings must have a valid certificate. In the case of existing buildings, since 2009 they must necessarily have a valid certificate, at the stage of the conclusion of the contract of sale, lease or rental. The non-submission of this document is subject to penalties and fines established by law (Decree-law 78/2006, 4th April).



HOW TO CALCULATE THE ENERGY PERFORMANCE OF THE DWELLING?



The energy rate indicated in the EPC is based on the constructive characteristics of the dwelling (orientation, walls, floors, roofs, doors and windows), the existence or absence of renewable energy use, the ventilation systems (natural or mechanical), the type acclimatization systems and production of domestic hot water (DHW).

Based on the typology of the dwelling, the EPC presents an estimate of annual primary energy needs that translates the energy consumption required to maintain the dwelling comfort (acclimatization) and for the production of DHW. It does not include the energy spent on lighting and electrical appliances.

The indicative values of primary energy are calculated by m² of housing area and per year, allowing the comparison of different dwellings with each other. The real energy consumption (indicated on gas and electricity bills), might be different and will depend on the actual usage patterns of the occupants of the dwelling, i.e. consumption is estimated at nominal conditions, but the real consumption depends on the behavior of the users of the fraction.

WHO DOES THE ENERGY EVALUATION AND ISSUES THE CERTIFICATE?

The energy evaluation and the issuing of energy performance certificate of the dwelling is made by Qualified Experts (QE), who are trained architects or engineers, with at least 5 years of professional experience in the field of thermal or acclimatization of buildings and who have had special training for this purpose. The SCE website (www.adene.pt) contains the list of the existing QEs who are authorized to work in the system in Portugal.

In the Casa Certificada ('Certified House') website people can search the QEs by region and type of building (housing or services) and obtain their contacts, in order to request for quotation for the certification work. For more information see the website (www.casacertificada.pt).

See, also, "10 steps to an effective certification".

The assessment should involve an expert's visit to the dwelling, in order to check the situation on the site and carry out the necessary diagnostic and identifying the opportunities for improving the energy performance.

Qualified Expert Card



WHAT DOES THE CERTIFICATE TELLS ABOUT HOW TO IMPROVE THE DWELLING?

The EPC is an important tool for characterizing the energy performance improvement opportunities and thermal behavior of the dwelling. The identification and study of the improvement measures are one of the major concerns of the QE when doing the assessment.

The information produced by the expert should be on the certificate and on the complementary documentation that must be given by the QE to the owner or to the dwelling user.

The second page of the certificate displays a table with a brief description of the identified improvement measures and also:

- the estimated costs of the investment;
- the reduction on the energy bills;
- the payback period of the investment.

Recently, it was created an annex to the EPC with the study of the proposed improvement measures. The first page summarizes the information of all measures. The following ones contain the details of the proposed interventions so that it can be used in the quotation request to the construction professionals and to other suppliers.

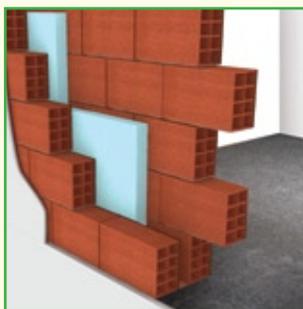
Identified improvement measures are not compulsory, but they highlight the key opportunities to save energy, to improve the comfort and the value of the dwelling.

WHAT ARE THE MAIN OPPORTUNITIES FOR IMPROVEMENT?

Each building has its peculiarities, and the measures for improvement are always specific to each dwelling.

Taking into account the certificates already issued for the residential buildings, one can see that a significant proportion of the suggested improvement measures focuses on aspects such as:

- Implementation of building envelope insulation: walls, roofs and floors;
- Replacement or installation of high thermal performance windows with external solar protection;
- Implementation of renewable energy systems, with emphasis on solar collectors for domestic water heating;
- Replacement or installation of more efficient boilers and water heaters for domestic water heating and room heating.



The Energy Performance Simulator for households 'casA+' of ADENE is a useful tool to understand the effect of the implementation of some improvement measures, on the energy performance of a dwelling. However, the simplified nature of this tool should not exempt a detailed analysis and the more specific technical advice that only a QE can give.

www.casamais.adene.pt



HOW TO READ THE CERTIFICATE

1ST PAGE

1. Unique identification number of the Energy Performance Certificate. You can use it on www.adene.pt to confirm its authenticity.

2. Illustrative photo of the dwelling.

3. Address or location of the certified fraction or building, with the designation of the fraction and photograph, identifying clearly the dwelling.

4. Identification of the Qualified Expert who issued the certificate.

5. Energy performance certificate issue and expiry date (valid for 10 years after issuance).

6. Dwelling energy rate: A+ for the most efficient, G for the less efficient.

7. Translates the energy needed in kilograms of oil equivalent per square meter (kgoe/m^2) to maintain the dwelling comfortable and produce hot water for its occupants throughout the year. It's calculated for standardized conditions of use.

8. Represents the maximum value for a new building, constructed according to the existing technical regulations. The minimum rating required for new buildings is 'B-':

9. Estimation of greenhouse gas emissions that would result from the consumption of primary sources of energy calculated for the dwelling. The lower the value, the more sustainable it will be.

10. Energy efficiency scale, results from the ratio between the primary energy needs of a building and its limit value. The new buildings have to be more than rate B-, which represents the reference consumption (100%). The existing buildings may have any rate, the various rates represent the percentage range of the reference consumption, e.g. a dwelling of rate C consumes 100% to 150% (1 to 1.5 times) the reference consumption.

11. Partial needs of useful energy for heating in winter, cooling in summer and production of domestic hot water throughout the year. The values are calculated for standard conditions: dwelling with temperature between 20° C and 25° C and an average consumption of 40 liters of hot water at 60°C, per occupant. Needs greater than the limit mean more potential consumption when comparing with the maximum applicable in the case of new buildings.

12. Explanatory notes on the certificate, common to all dwellings, should be read carefully.

Energy Rating	$R = N_{tc}/N_t$	% of the reference consumption
A+	$R \leq 0,25$	25% or less
A	$0,25 < R \leq 0,50$	Between 25% and 50%
B	$0,50 < R \leq 0,75$	50% to 75%
B-	$0,75 < R \leq 1,00$	75% to 100%
C	$1,00 < R \leq 1,50$	100% to 150%
D	$1,50 < R \leq 2,00$	150% to 200%
E	$2,00 < R \leq 2,50$	200% to 250%
F	$2,50 < R \leq 3,00$	Between 250% and 300%
G	$R > 3,00$	More than 300%

reference consumption



13

14

15

16

17

18

19

20

13. Description with the purpose of allowing a rapid recognition of the dwelling identifying and characterizing the main elements that influence its energy performance.

14. Floor area, for energy performance calculation. It excludes the spaces not subject to thermal requirements (garages, storage rooms and similar places). The floor area might not be the same indicated in the architecture project.

15. Summary table with the improvement measures identified during the dwelling assessment. Outlined in bold there are the measures considered by the QE in the calculation of the new energy rate indicated in (18). The improvement measures represent good opportunities to save energy, to improve comfort and the value of the dwelling.

16 e 17. Indicative values to lower the energy bill, estimated investment cost and payback period for each described measure. Due to the diversity of available solutions and market costs, in conjunction with the variation of energy prices throughout the certificate validity, the information is presented in ranges of values, according to the graphic legend presented in (17).

18. New energy rate calculated by the QE in the case of the improvement measures outlined in bold (in table 15) being implemented.

19. Description of the main points made by QE in the selection and characterization of the presented improvement measures. It may contain information on the assumptions made, as the energy price, the unit costs of materials, calculation methods, any limitations, etc. It should be noted that the calculations of savings and investment return are based on standard use conditions; the effective values will depend on real consumptions and may vary from those stated here.

3RD PAGE AND THE FOLLOWING ONES

20. The certificate has usually 4 or 5 pages. The 3rd page and the followings it includes the detail of more elements relevant to the assessment of the energy performance of the dwelling. It includes: the walls; roofs; floors in contact with the exterior or no heated spaces; windows; acclimatization system; domestic hot water preparation system; renewable energy systems (if any); ventilation system.

In elements with improvement opportunity measures can be detailed, this information will be useful to construction professionals or suppliers, when the owner decides to go ahead with the implementation.

At the end of the EPC comments and notes are presented with considerations, approximations and/or limitations of the undertaken analysis.

ANNEX TO THE ENERGY PERFORMANCE CERTIFICATE

Study of the improvement measures.

The study complements the energy performance certificate information on the improvement opportunities. The first page shows a summary of all the identified measures in the dwelling. Each of the following pages details the suggested solutions to be used in the quotation request to the construction professionals and suppliers of efficient equipment.

AVERAGE ANNUAL COST OF THE ENERGY CONSUMPTION OF A DWELLING

Dwellings built in:	3 bedroom apartment			3 bedroom house				
	Energy Rate predominant	Oporto	Lisbon	Faro	Energy Rate predominant	Oporto	Lisbon	Faro
After 2000	B	from 370 to 1320 €	from 350 to 1050 €	from 340 to 1000 €	C	from 530 to 2930 €	from 470 to 2250 €	from 450 to 2070 €
1991 to 2000	C	from 600 to 1550 €	from 570 to 1280 €	from 570 to 1230 €	D	from 770 to 3230 €	from 700 to 2530 €	from 680 to 2350 €
1961 to 1990	D	from 730 to 2740 €	from 680 to 2270 €	from 670 to 2130 €	E	from 840 to 3880 €	from 810 to 3650 €	from 790 to 3350 €

Table legend:

The indicate values represent potential consumption for heating and cooling and domestic hot water production, assuming that the dwelling is acclimatized during 10% (lower value) or 100% (higher value) of the time. The estimate reduction on the energy bill and the payback period was calculated considering that the total dwelling area was acclimatized.

PROPOSAL OF IMPROVEMENT MEASURES

1

3 BEDROOM APARTMENT LOCATED IN LISBON BUILT BETWEEN 1961 AND 1990 WITH ENERGY RATE:

D

Suggested improvement measures	Energy bill annual reduction	Estimated investment cost	Payback period
Inclined roof – with application of 8 cm of thermal insulation	☺☺	☹☹☹☹	☹☹☹☹
External wall - with application of 4 cm of interior thermal insulation with plasterboard covering	☺☺	☹☹☹☹	☹☹☹☹
Windows – replace the existing by a new one more efficient	☺	☹☹☹☹☹	☹☹☹
Replacement of the water heater by a condensing boiler and installation of hot water radiators system	☺☺	☹☹☹☹☹	☹☹

IF ALL ABOVE MENTIONED IMPROVEMENT MEASURES ARE IMPLEMENTED THE ENERGY RATE WILL IMPROVE TO...

A

2

3 BEDROOM HOUSE LOCATED IN OPORTO BUILT BETWEEN 1961 AND 1990 WITH ENERGY RATE:

E

Suggested improvement measures	Energy bill annual reduction	Estimated investment cost	Payback period
Inclined roof – with application of 8 cm of thermal insulation	☺☺☺	☹☹☹☹	☹☹☹
External wall - with application of 6 cm of external thermal insulation of the type ETICS	☺☺☺	☹☹☹☹	☹☹☹
Windows – replace the existing by a new one more efficient	☺	☹☹☹☹☹	☹
Replacement of the water heater by a condensing boiler and installation of hot water radiators system	☺☺	☹☹☹☹☹	☹☹☹

IF ALL ABOVE MENTIONED IMPROVEMENT MEASURES ARE IMPLEMENTED THE ENERGY RATE WILL IMPROVE TO...

A+

3

3 BEDROOM HOUSE LOCATED IN FARO BUILT BETWEEN 1991 AND 2000 WITH ENERGY RATE:

D

Sugestões de medidas de melhoria	Energy bill annual reduction	Estimated investment cost	Payback period
Inclined roof – with application of 6 cm of thermal insulation	☺☺☺	☹☹☹☹	☹☹☹
External wall - with application of 4 cm of external thermal insulation of the type ETICS	☺☺☺	☹☹☹☹	☹☹☹
Solar energy system – installation of 4 m ² of flat solar collectors for DHW	☺☺	☹☹☹☹	☹☹☹
Replacement of the water heater by a condensing boiler	☺☺	☹☹☹☹	☹☹☹

IF ALL ABOVE MENTIONED IMPROVEMENT MEASURES ARE IMPLEMENTED THE ENERGY RATE WILL IMPROVE TO...

A+

Legend

☺☺☺☺ more than €1000 per year	☹☹☹☹ more than €5000 per year	☹☹☹☹ lower than 5 years
☺☺☺ between €500 and €599 per year	☹☹☹☹ between €1000 and €4999 per year	☹☹☹ between 5 and 10 years
☺☺☺ between €100 and €499 per year	☹☹☹ between €200 and €999 per year	☹☹☹ between 10 and 15 years
☺ less than €100 per year	☹ less than €200 per year	☹ more than 15 years



HOW MUCH DOES THE ENERGY PERFORMANCE CERTIFICATION OF A DWELLING COST?

The price is established on the basis of the respective market, is not listed, being made up of two components:

- Fixed - corresponding to the fixed rate of issuing and registering in the SCE, whose value is currently 45 EUR (plus VAT) for housing fraction.
- Variable - associated with the fees of the qualified expert and it should be agreed between this one and the owner who contracts the service.

For example, the cost for certifying a three bedroom apartment can vary between 1 and 2 EUR per m², plus VAT. The effective cost for each situation will vary according to factors such as the complexity of the building, the information provided to the expert and travel costs, among others.

It should be noted that there are no listed prices, so one should always ask more than a quotation and compare the terms and conditions of each QE work.

HOW LONG IS THE ENERGY PERFORMANCE CERTIFICATE VALID FOR?

The EPC of a dwelling has a validity of 10 years. During this period, it can be used as many times as necessary for legal purposes.

In the specific case of new buildings, still in project, the energy performance is also assessed and a pre-certificate is issued, designated as EPC for the design stage.

This translates the confirmation, by QE, that building to be built according to the project, will be in conformity with the thermal behavior regulation and will have a certain energy rate not lower than B-. Upon completion of the construction work the first EPC is issued, with the mentioned validity, translating the effective performance of the dwelling, in accordance with the constructed reality.

WHO ARE THE ENTITIES INVOLVED IN THE CERTIFICATION?

The SCE is the result of the transposition of European Directive 2002/91/CE of the European Parliament and of the EU Council, of 12/16/2002, on the energy performance of buildings. This was later updated by the Directive 2010/31/EU of 19th May.

The Portuguese Energy Agency (ADENE) is the managing body of the SCE with the competence to ensure the regular functioning of the system, with regard to the supervision of the QEs and certification processes. It carries out the monitoring of the quality of the certificates by sampling, in order to ensure the quality of the work carried out by the QEs. Within the framework of their competences, they may ask ADENE to clarify some questions or request further information.

The Directorate-General for Energy and Geology (www.dgge.pt) and the Portuguese Environment Agency (www.apambiente.pt) are the entities responsible for the supervision of SCE, for energy efficiency and indoor air aspects, respectively.



ONE DAY ALL BUILDINGS WILL BE GREEN.



www.adene.pt

Managing Entity:



Supervisor Entities:

