

# Energy Performance Certificates for Homes...Explained



## What is an Energy Performance Certificate?

The Energy Performance Certificate (EPC) is a European Union (EU) initiative as part of the drive to improve energy efficiency across the EU member countries. An EPC provides two key pieces of information:

- The energy efficiency of a property
- The environmental impact of a property

The EPC provides a rating of a property's energy efficiency and displays this as a graph, similar to those found on kitchen appliances.

Ratings come on a scale of A-G, with A being the best rating. This means that home owners and occupiers can compare the energy efficiency of different properties in a similar way to comparing the energy performance of fridges or freezers.

The EPC also includes a Recommendation Report which lists the potential improvements that can be made to a property in order to:

- Cut fuel bills
- Improve energy efficiency
- Help cut carbon emissions

The EPC is split into the following four sections:

1. The performance and environmental impact of the property
2. Estimated energy use based on standard occupancy assumptions
3. A summary of energy performance features
4. The recommendations for improving the energy efficiency



## How is an EPC produced?

An EPC can only be produced by a Domestic Energy Assessor (DEA) or a Home Inspector (HI) who is a member of an approved Government Accreditation scheme. The energy assessor will visit the property to determine the energy related features. These are then entered into a computer program which has a calculation model developed by the government and is known as Reduced Data Standard Assessment Procedure (RDSAP)

RDSAP is a cost-based rating system which uses pre-determined assumptions. It does not look at the appliances, but rather the performance of the building itself in areas such as heating and lighting. In other words, it provides an energy efficiency rating for the property itself rather than an occupancy rating.

When collecting the RDSAP data the energy assessor will need to determine the following:

- Property type
- Age of property
- Type of construction
- Property dimensions
- Room and water heating systems
- Insulation levels
- Windows and glazing types
- Types of lighting

This information will be entered into the calculation software and an EPC will be produced.

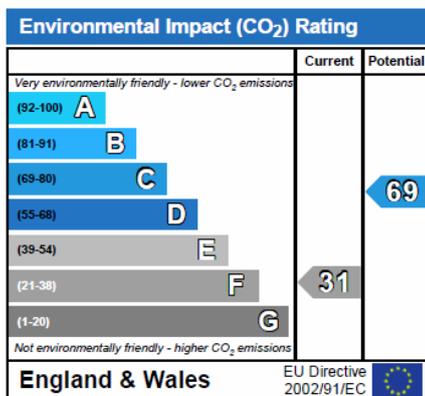
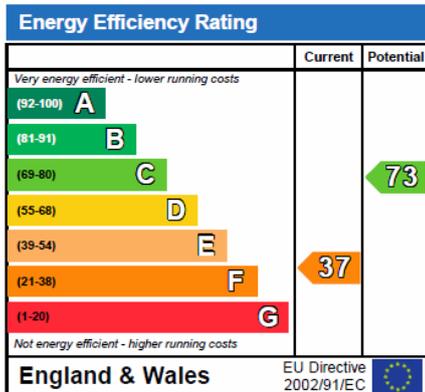
## When is an EPC required?

Since 2009, as part of the Energy Performance of Buildings Directive (EPBD) issued by the EU, all buildings in the UK that are constructed, sold or offered for rent need an EPC.

- An EPC is required whenever a property is marketed
- The EPC is valid for 10 years
- This applies to all sellers hoping to sell their property and to landlords offering a property for rent

# Performance Rating

The EPC displays the Energy Efficiency Rating and Environmental Impact Rating as shown below.



The performance of a property is rated in terms of the energy used per square metre of floor area; the energy efficiency based on fuel costs; and the environmental impact based on CO<sub>2</sub> emissions. The numbered arrows show the current rating based on the existing energy performance of the property and the potential rating if the suggested improvements are implemented.

## Estimated energy use

The estimated energy ( see table below) shows the estimated energy use, CO<sub>2</sub> emissions and fuel costs of the dwelling. The figures in the table are based on standardised assumptions about occupancy, heating patterns and geographical location. This means that the figures displayed will be different to the **actual** fuel cost.

### Estimated energy use, carbon dioxide (CO<sub>2</sub>) emissions and fuel costs of this home

	Current	Potential
Energy Use	453 kWh/m <sup>2</sup> per year	178 kWh/m <sup>2</sup> per year
Carbon dioxide emissions	13 tonnes per year	4.9 tonnes per year
Lighting	£81 per year	£65 per year
Heating	£1173 per year	£457 per year
Hot water	£219 per year	£104 per year

The reasons for this are:

- RDSAP uses a standard heating pattern of 9 hours each weekday and 16 hours a day at the weekend. It further assumes that the main living area is heated at 21°C and the remainder of the dwelling at 18°C. This may be different to the actual heating pattern of the person living there, but it enables properties to be compared on a like for like basis
- The model assumes that the number of occupants is proportional to the floor area of the dwelling and hot water usage is calculated using the same proportions. Therefore, if a single person is living in a five-bedroom house, the energy used for hot water in the model and displayed on the EPC will be higher than the actual usage. This procedure allows all properties to be compared on an equal basis
- The model assumes that all properties are based in the middle of England and uses the average outside temperature of that region for the heating calculations. A property in the southwest of England is likely to require less energy for heating than a comparable property in the northwest and this would be reflected in the actual energy bills

- If the property has two space heating systems (a main heating system such as a gas boiler with radiators) and a secondary or 'top-up' heating system (e.g., an open coal fire), the model assumes that up to 15% of the space heating is provided by the secondary system. The efficiency of the secondary system is likely to be much lower than that of the main system and will therefore push the energy costs up. It may be that the secondary system is rarely used and would not contribute to 15% of the space heating, but so as to compare properties fairly, these are the standard assumptions made in the model

- The energy use displayed in the EPC includes the energy consumed in producing and delivering the fuel to the dwelling, and thus will be greater than the energy actually used in the dwelling

# Summary of energy performance related features

The summary of energy performance related features section of the EPC shows the most crucial energy related elements of the property in the form of a table. The table is broken down into the different elements of the property such as:

- Wall construction type
- Roof construction type
- Floor construction type
- Windows and glazing
- Main Heating system present
- Main heating controls
- Secondary heating system
- Water heating
- Low energy lighting

The table then shows how each of the different elements of the property are performing in terms of their current energy efficiency and environmental performance. The descriptions provided are based on the data that has been collected specific to the property's thermal and heating elements. These descriptions are shown as stars where 1 star means least efficient and 5 stars means most efficient.



In some cases, due to the RDSAP calculation methodology, some of the elements have to be assumed. Floors are a typical example of this as it is usually not possible for the energy assessor to identify whether any additional floor insulation is present. This is because the survey is non invasive and the assessor cannot use a drill to lift floorboards or pull back carpeting.

Some of the descriptions could lead to concern for the homeowner and it is important to understand the reasoning behind these. For example, the energy efficiency of the hot water system may be given a single star rating because of the cost associated with electricity compared to the cost of gas. The environmental impact may also rate as a single star due to the carbon emissions associated with electricity generation. This **does not** mean that the system is of poor quality, poorly manufactured or poorly installed.

## Recommendations

The recommendations section lists measures that can improve the energy efficiency and therefore the SAP rating of the property. The recommendations are separated into:

- Lower cost measures—below £500 installation cost
- Higher cost measures—above £500 installation cost

The measures are assessed cumulatively in a predetermined order and are only included if they make a measurable change to the energy efficiency of the building.

The recommendations section also displays typical savings per year and shows the energy efficiency and environmental impact ratings as a result of these improvements.

Finally, there is a description of each recommendation and explains how it can be used to improve the energy efficiency of the home. It also gives advice on how the recommendation can be applied/installed.

For example, if a recommendation was given to replace an existing boiler with a more energy efficient Band A condensing boiler, the accompanying text would read as follows:

### **"Band A condensing boiler**

*A condensing boiler is capable of much higher efficiencies than other types of boiler, meaning it will burn less fuel to heat this property. This improvement is most appropriate when the existing central heating boiler needs repair or replacement, but there may be exceptional circumstances making this impractical. Condensing boilers need a drain for the condensate which limits their location; remember this when considering remodelling the room containing the existing boiler even if the latter is to be retained for the time being (for example a kitchen makeover). Building Regulations apply to this work, so your local authority building control department should be informed, unless the installer is registered with a competent persons scheme, and can therefore self-certify the work for Building Regulation compliance. Ask a qualified heating engineer to explain the options."*

## Further information

Further information on EPCs and the full EPBD legislation can be found at:

[www.communities.gov.uk/  
planningandbuilding/  
theenvironment/  
energyperformance/homes/  
energyperformancecertificates/](http://www.communities.gov.uk/planningandbuilding/theenvironment/energyperformance/homes/energyperformancecertificates/)

<http://epc.direct.gov.uk/index.html>

[www.energysavingtrust.org.uk](http://www.energysavingtrust.org.uk)

[http://actonco2.direct.gov.uk/  
actonco2/home.html](http://actonco2.direct.gov.uk/actonco2/home.html)



### Recommendations

The measures below are cost effective. The performance ratings after improvement listed below are cumulative, that is they assume the improvements have been installed in the order that they appear in the table.

Lower cost measures (up to £500)	Typical savings per year	Performance ratings after improvements	
		Energy efficiency	Environmental impact
1 Low energy lighting for all fixed outlets	£ 23	F 32	F 31
2 Hot water cylinder thermostat	£ 108	F 36	F 35
Sub-total	£ 131		
Higher cost measures			
3 Replace boiler with Band A condensing boiler	£ 286	E 48	E 46
Total	£ 417		
<b>Potential energy efficiency rating</b>		<b>E 48</b>	
<b>Potential environmental impact (CO<sub>2</sub>) rating</b>		<b>E 46</b>	

### Further measures to achieve even higher standards

The further measures listed below should be considered in addition to those already specified if aiming for the highest possible standards for this home. However you should check the conditions in any covenants, planning conditions, warranties or sale contracts.

4 Solar water heating	£ 25	E 49	E 48
5 Replace single glazed windows with low-E double glazing	£ 72	E 52	E 51
6 50 mm internal or external wall insulation	£ 268	D 67	D 66
7 Solar photovoltaic panels, 2.5 kWp	£ 172	C 77	C 75
<b>Enhanced energy efficiency rating</b>		<b>C 77</b>	
<b>Enhanced environmental impact (CO<sub>2</sub>) rating</b>		<b>C 75</b>	

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