EPC PLUS
RATING IMPROVEMENT REPORT

Shopping Arcade, Thames Valley

08 November 2017

Contents

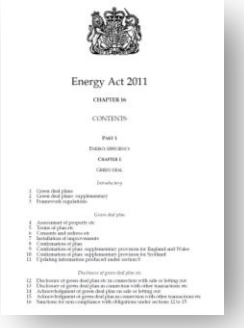
1. Introduction

1.1 We have been instructed to analysis the current Energy Performance Certificate (EPC) for this building and to put forward recommended measures where applicable to improve the energy performance rating of the building.

1.2 The objective is to provide a report that gives considered and costed measures for investment works to improve the current EPC rating. This will obviate the risk of being unable to let the property from 2018 under the Energy Act 2011 & the Energy Efficiency Regulations 2015.

1.3 This report examines the desktop results of stage one of a two stage review process which would lead to work being carried out on the property and the building services within it.

2. The Energy Efficiency Regulations 2015


Energy Act 2011

CHAPTER 16

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2.1 In 2011 the coalition government released the *Energy Act 2011*. The Act has three principal objectives: tackling barriers to investment in energy efficiency; enhancing energy security; and enabling investment in low carbon energy supplies. Section 49 of The Act placed an obligation on the Secretary of State for Energy and Climate Change to bring into force by 1st April 2018 regulations which will make it unlawful for a landlord to lease a property in England and Wales which does not meet a prescribed minimum energy efficiency standard. The Act requires the property's energy efficiency standard is to be demonstrated by an EPC.


STATUTORY INSTRUMENTS

2015 No. 962

ENERGY CONSERVATION, ENGLAND AND WALES

The Energy Efficiency (Private Rented Property) (England and Wales) Regulations 2015

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2.2 The *Energy Efficiency (Private Rented Property) (England and Wales) Regulations 2015* were passed into law on the 26th March 2015. Property's with an EPC rating of 'F' or 'G' are defined in the Regulations as a **sub-standard property**. The Regulations makes it unlawful from 1st April 2018 for landlords to grant a tenancy to new or existing tenants for a sub-standard non-domestic property, without implementing cost-effective energy efficiency improvements or fulfilling an exemption criterion. From 1st April 2023, landlords must not continue letting a sub-standard non-domestic property which is already let.


Department for Business, Energy & Industrial Strategy

THE NON-DOMESTIC PRIVATE RENTED PROPERTY MINIMUM STANDARD

Guidance for landlords and enforcement authorities on the minimum level of energy efficiency required to let non-domestic property under the *Energy Efficiency (Private Rented Property) (England and Wales) Regulations 2015*

February 2017

2.3 In February 2017, the Government released the 'Guidance for landlords and enforcement authorities on the minimum level of energy efficiency required to let non-domestic property under the *Energy Efficiency (Private Rented Property) (England and Wales) Regulations 2015'*. This document provides guidance and advice on the scope of the regulations, the relevant improvements works that can be carried out on a sub-standard non-domestic property, the cost effectiveness of improvements, the exemptions and exclusions, the enforcement framework and the appeals process.

2.4 Some of the key points of the Regulations are as follows:

Exemptions

There are a number of exemptions to the Regulations. Landlords will be eligible to register an exemption on the PRS Exemptions Register in the following circumstances:

- Where no EPC is required for the building.
- Where the capital cost of improvements are not cost effective, i.e. with a payback of seven years or less.
- The cost improvements do not meet the Green Deal's Golden Rule (should a Green Deal report have been commissioned).

- Improvements would diminish the capital value by more than 5%.
- Despite reasonable efforts, the landlord cannot obtain consent from third parties.
- All the relevant energy efficiency improvements that can be made to the building and it's energy performance remains below an EPC rating of 'E'.
- If a person has only just become a landlord.

Enforcement and penalties

- The Regulations will be enforced by Local Weights and Measures Authorities (LWMAs), who may serve compliance notices if they believe a landlord is in breach of the regulations.
- If it is proven that a landlord has been in breach for less than three months a financial penalty of up to £5,000, or of up to 10% of the rateable value of the property (whichever is greater) can be given, subject to a maximum financial penalty of £50,000.
- Other fines of £5,000 can be applied if a landlord is found to have published false or misleading information on the PRS Exemptions Register or if the landlord has failed to comply with a compliance notice.

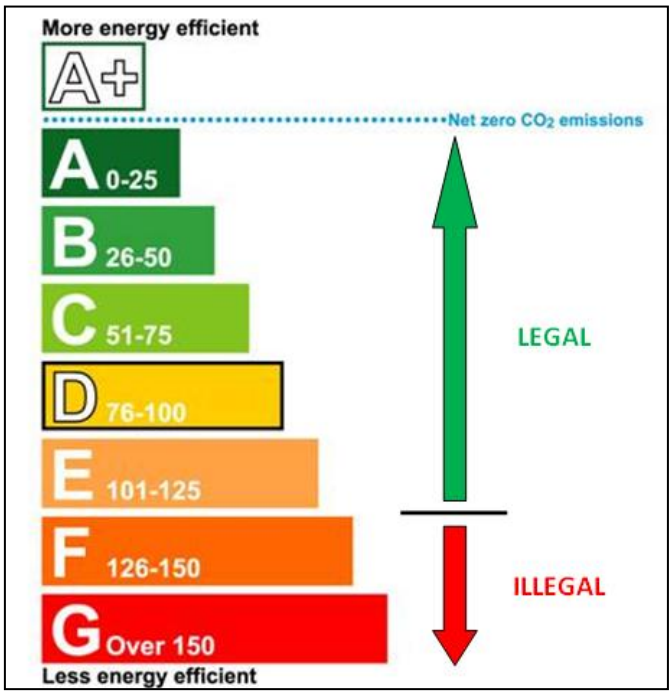


Figure 1 - Commercial EPC Rating

3. Starting Point: Your Building's Current Energy Performance ('Baseline')

3.1 In order to establish a baseline energy performance for your building, an EPC assessment has been carried out. This recent draft EPC is referred to in this report as the 'Baseline EPC', and all analysis in this report has been conducted from this starting point.

Shopping Arcade, Thames Valley		
	**Unique Property Reference Number**	252227660000
	Baseline EPC Rating	D 99
	Date of Survey	17 October 2017
	Energy Assessor for the Baseline EPC	Uruj Chanan
	Energy Assessor for the EPC Plus Report	Conor Sexton

Table 1 - Building Details

3.2 The Baseline EPC certificate was prepared using the accredited software iSBEM_v5.3.a using the Simplified Building Energy Model (SBEM) calculation engine SBEM_v5.3.a.0. The Simplified Building Energy Model is the national calculation methodology and, as the name suggests, it models using a simplified methodology to calculate a building's energy consumption and to produce an EPC asset rating.

4. EPC Improvement Options

4.1 The following section outlines the individual measures being recommended to improve the Baseline EPC rating, with indicative budget figures(excluding VAT).

4.2 The below table sets out each individual measure. This table is not cumulative and each measure is based individually from the Baseline EPC rating. The carbon factors used to calculate the CO_2 emission savings are taken from the latest version of Part L of the Building Regulations.

4.3 The table also gives the indicative Financial Analysis of the individual effect of adopting each measure. This is based on the energy requirements taken from SBEM for Space Heating, Hot Water, Cooling and Electricity and calculated against the current average commercial rate for Gas and Electricity. The Gas and Electricity rates used to calculate costs were 5.13p per kWh and 12.58p per kWh respectively and these were obtained from Quarterly Energy Prices published by the Department of Energy and Climate Change in September 2016 based on a 'Very Small' Non Domestic Gas and Electricity purchaser.

Option	Measure	Indicative Budget Cost (Individual)	Potential EPC Rating (Individual)	EPC Score Improvement (Individual)	Pounds per Point (Individual)	CO_2 Emission Savings (kg/CO_2/yr) (Individual)	Energy Operational Costs per annum (Individual)	Savings per annum (Individual)	Simple Payback Period (Individual)
	Baseline EPC		**D 99**				£7,144		
1	**Install external entrance door to Arcade corridor**	£2,500	**D 94**	5	£500	3,456	£6,306	£838	3 years
2	**Replace existing heating system with new boiler and radiators**	£10,000	**D 78**	21	£476	6,396	£5,571	£1,573	6.4 years
3	**Replace existing lighting with LEDs throughout**	£7,500	**D 81**	18	£417	5,387	£5,838	£1,306	5.7 years
4	**Install sub metering for lighting and HVAC**	£1,500	**D 95**	4	£375	1,272	£6,836	£308	4.9 years

Table 2 - Individual Measures

5. EPC Improvements Strategy

5.1 In many cases, the implementation of one measure alone is inadequate to achieve the ultimate objective of the exercise: an EPC rating of E to comply with the *Energy Efficiency Regulations* requirements. Therefore, it is customary for a number of improvement measures to be cumulatively combined in order to achieve compliance. Determining the optimum combination strategy requires modelling scenarios in such a way that reflects the most appropriate prioritisation of decision-making criteria such as cost and EPC point improvement.

5.2 The order of the measures listed in the following table follow the above described methodology to determine the pathway of measures that enables an EPC level to be reached that meets minimum requirements.

Option	Measure	Indicative Budget Cost (Cumulative)	Potential EPC Rating (Cumulative)	EPC Score Improvement (Cumulative)	Pounds per Point (Cumulative)	CO_2 Emission Savings ($kg/CO_2/yr$) (Cumulative)	Energy Operational Costs per annum (Cumulative)	Savings per annum (Cumulative)	Simple Payback Period (Cumulative)
	Baseline EPC		**D 99**				£7,144		
2	**Replace existing heating system with new boiler and radiators**	£10,000	**D 78**	21	£476	6,396	£5,571	£1,573	6.4 years
2+3	***Above plus:*** **Replace existing lighting with LEDs throughout**	£17,500	**C 57**	42	£417	12,459	£4,099	£3,046	5.7 years
2+3+1	***Above plus:*** **Install external entrance door to Arcade corridor**	£20,000	**C 57**	42	£476	13,616	£3,827	£3,318	6 years
2+3+1+4	***Above plus:*** **Install sub metering for lighting and HVAC**	£21,500	**C 55**	44	£489	14,194	£3,688	£3,457	6.2 years

Table 3 - Cumulative Measures

6. Comparison Between Baseline EPC vs Potential EPC

6.1 The below figure is an illustration of the Baseline EPC and the Potential EPC rating should all the measures be undertaken in Section 5. As this information is for reference purposes only, it does not affect any lodged EPC data on the Landmark website.

Baseline EPC **Potential EPC**

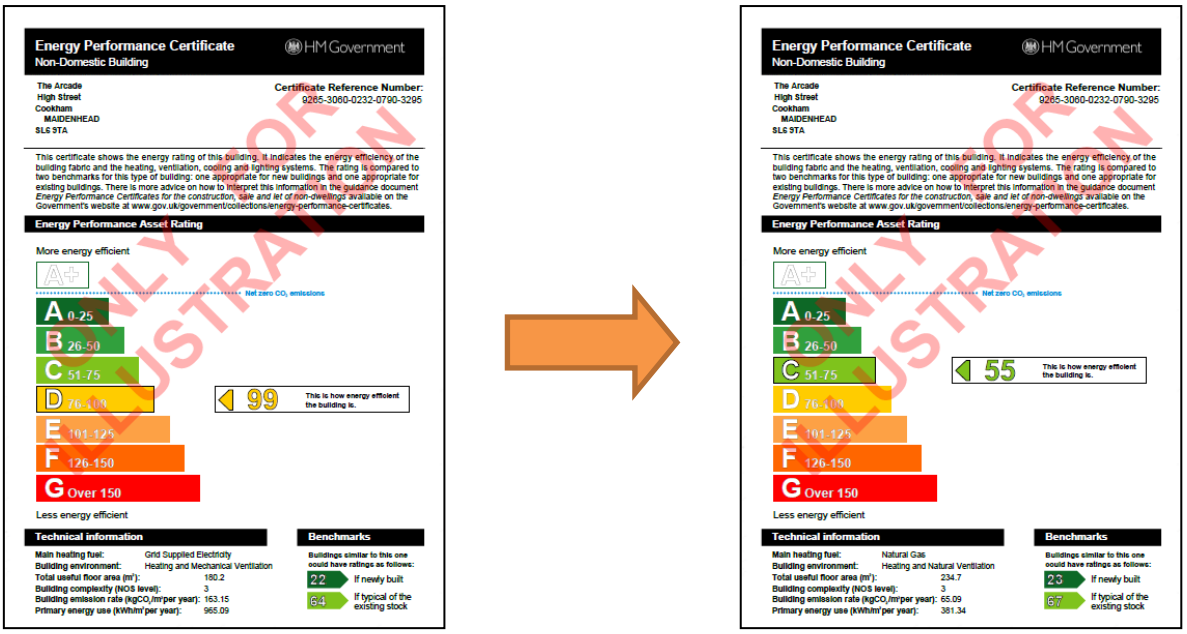


Figure 2 – Baseline EPC and Potential EPC 'With All Measures'

6.2 The below table summaries the above illustration in Figure 2 of the Baseline EPC and the Potential EPC ratings should all the measures be undertaken as per Section 5. It also clarifies which software versions were used for the both the Baseline EPC and Potential EPC 'With All Measures' ratings.

Building Status	Date	Software Version	Band	Score
Baseline EPC	October 2017	iSBEM_v5.3.a	D	99
Potential EPC 'With All Measures'	November 2017	iSBEM_v5.3.a	C	55

Table 4 – Baseline EPC and Potential EPC 'With All Measures'

7. Technical Description of Improvement Measures

7.1 The first measure is to decommission and remove the existing electric heaters throughout and replace with a new efficient condensing gas boiler feeding radiators. SBEM works on the basis of calculating a rating based on energy used within the building; therefore energy hungry systems such as electric heaters will always produce a poor EPC rating. By replacing the electric heaters with a new efficient condensing gas boiler, this will improve the EPC rating. New radiators would need to be installed throughout to emit the heating. This recommendation is based on the boiler having with a minimum Seasonal Energy Efficiency Rating (SEER) of 90%.

7.2 The second measure is to replace the existing lighting throughout with LEDs. It is recommended that before this measure is implemented that a lighting design is undertaken to ensure that the correct level of illumination is used throughout. When entering this measure into SBEM, the option we selected for inputting the lighting details was 'Lighting chosen but calculation not carried out' - which uses the equation Luminaire Efficacy (lm/W) = Lamp Efficacy (lm/W) × Light Output Ratio. This measure is based on the lamps having no less than 75 'lamp lumens per circuit-watt' and the luminaires having no less than an 80% 'light output ratio'. By entering this measure in this manner it will considerably improve the EPC rating rather than selecting the other option of *'Lighting parameters not available'* and just defining the lighting type as LEDs. In this 'basic' option the default luminaire efficacy's used by SBEM are extremely pessimistic. It must be noted that whilst most new LEDs will achieve 75 'lamp lumens per circuit-watt', the target of an 80% 'light output ratio' is dependent on the efficiency of the luminaire (i.e. the amount of useful light that makes it out of the luminaire), therefore this may mean that the whole of the luminaire may need to be changed and not just the lamp to achieve this target. These parameters for the 'lamp lumens per circuit-watt' and 'light output ratio' must be supported by documentary evidence such as manufactures' data sheets or from a lighting design in order for an assessor to enter them into SBEM in the above manner.

7.3 The third measure is to install an external entrance door to the corridor through the Arcade that leads onto the public pavement. This will help reduce the heat loss from the shops out onto the corridor therefore reducing the energy consumption of the building.

7.4 The fourth measure is to install sub metering for the lighting and heating, ventilation & air conditioning (HVAC). Understanding when and where energy is being used is one of the most important steps in reducing energy consumption. Better metering can provide more timely and detailed information on how energy is being used in a building. This enhanced understanding of when and where energy is being used through automated meter readings allows waste to be identified and suitable corrective measures to be taken. This saving of energy leads to reductions in energy bills and carbon emissions. This measure includes providing 'out of range' alarms to warn building management that corrective action may be required.

8. Limitations

8.1 As the name suggests SBEM is a simplified building energy model and the inputs into the software is open to interpretation to the assessor and their skills and knowledge in regards to the SBEM software, buildings M&E and construction. The information and inputs used to produce the EPC is based on a visual non intrusive survey of the building.

8.2 Only through a site inspection by a qualified building surveyor would it be possible to confirm that the measures can be practically carried out to give such an improvement. The next stage would be a feasibility and option appraisal. Only once the changes have been made would a new EPC certificate rating be calculated and a further certificate could then be issued in place of the existing one. With improvements being made to the SBEM software through periodic updates to Building Regulations the actual EPC rating at the time of the completion of any site work could only be determined using the most up to date SBEM version at the time of re-assessment.

8.3 The cumulative measures generate an overall figure when this is done in the order shown in the table 3. If the measures were to be carried out in a different order then the cumulative figure would be different. Making small changes to a building will not dramatically improve the rating, so any particular order the measures are carried out will produce only small changes in the cumulative rating.

8.4 The measures given are a guide to what could be done for the costs given. Prices quoted in this report are purely indicative and not to be utilised as part of any wider project, no responsibility for pricing can be taken by the individual assessor. For full and accurate costing a specialist surveyor from an organisation looking to implement any of the measures must conduct an independent site survey and quote production.

8.5 Revisions to the SBEM software are constant and some NCM (National Calculation Method) changes can result in an inferior rating even with no changes to the building. If any significant amount of time elapses then we would recommend refreshing this desktop exercise if any works are to be undertaken to improve the EPC rating.

8.6 This report is intended as a guide for improving the buildings EPC rating. If based on this report the Landlord wishes to pursue an exemption in accordance with the Energy Efficiency Regulations 2015 this report alone would not be sufficient. A more detailed 'Exemptions' report would need to be carried out for the building in line with the methodology set out in Table two of the guideline document of the Regulations depending on which exemption is being pursued. For example if registering an exemption under the regulation 28(3) exception (*where a measure in a valid recommendations report is not a "relevant energy efficiency improvement" because it does not meet the seven year payback rule)* then the evidence to support this would require more in depths calculations on the seven years payback rule. The calculations would need to incorporate actual energy prices for the building based on previous 12 month billing, capital cost of installation of measures based on three quotations and calculating the interest rate factor for the repayment cost.

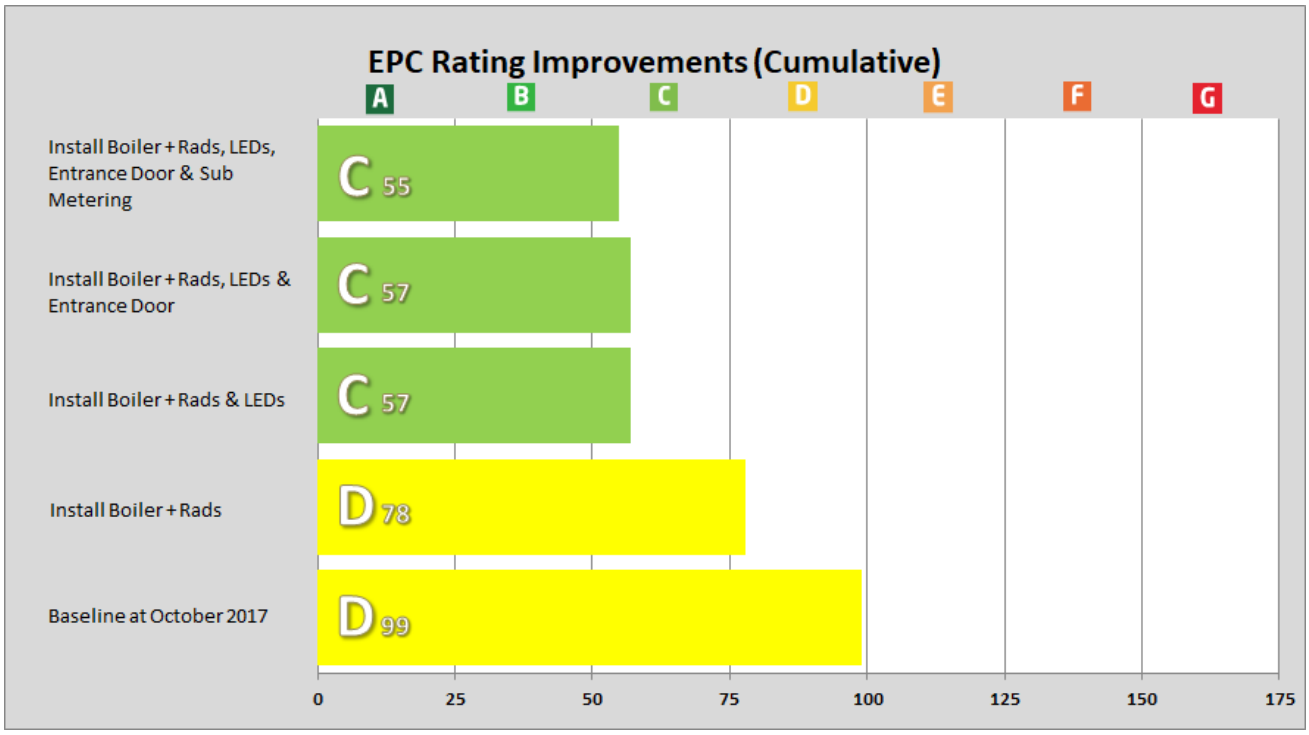
8.7 Prior to making improvements to your property, we strongly urge you to consider Enhanced Capital Allowances. Many of our clients obtain good tax relief when undertaking improvements via the Enhanced

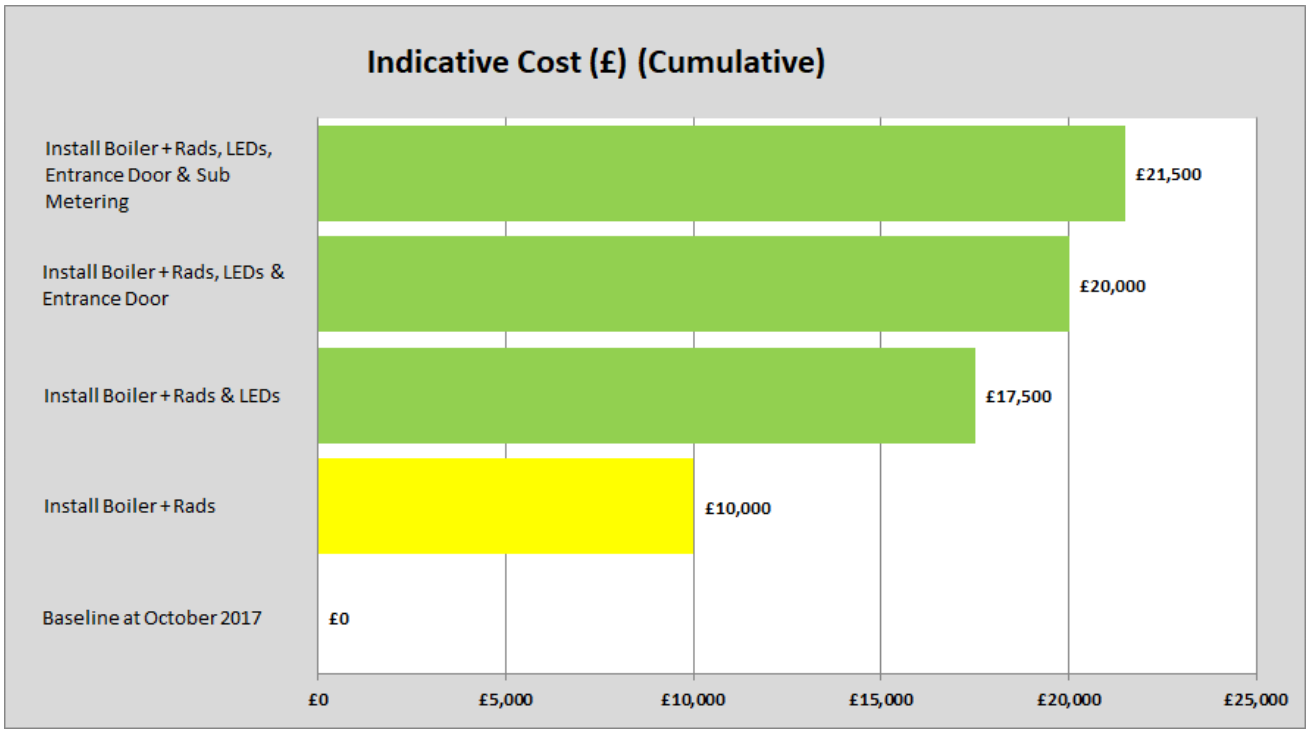
Capital Allowances scheme. We are not tax experts and we do not know your personal / corporate tax arrangements but we strongly recommend that you seek professional advice from a Capital Allowances Accountant BEFORE you start the process of upgrading your building. If you wish to look at more information on this, CIBSE (The Chartered Institution of Building Services Engineers), have a free guide online called Briefing 4. www.cibse.org

Appendix 1.0
Potential Ratings and Cost Implications

Appendix 1.0 - Potential Ratings and Cost Implications

GRAPHICAL SUMMARY - CUMULATIVE





Appendix 2.0
Photos of Measures

Appendix 2.0 - Photos of Measures

Install external entrance door to Arcade corridor

Replace existing heating system with new boiler and radiators

Replace existing lighting with LEDs throughout

Install sub metering for lighting and HVAC

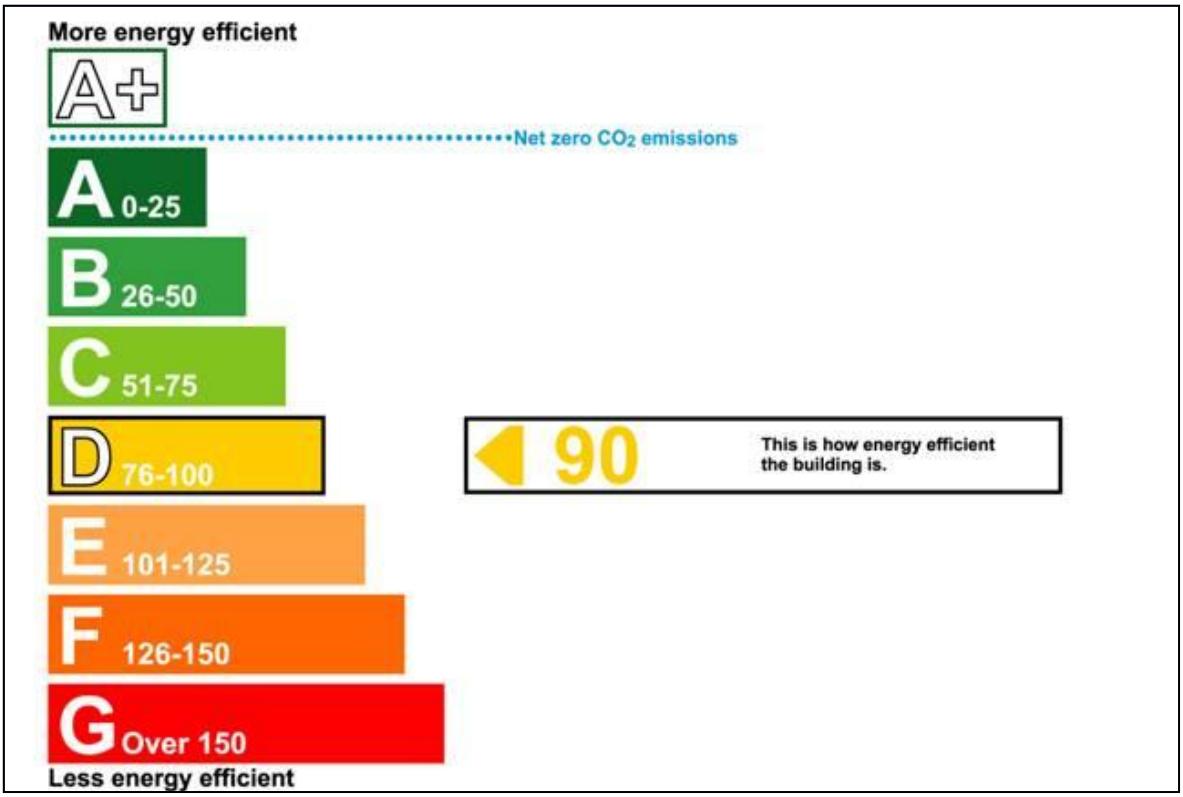
Appendix 3.0
Non-Domestic Energy Performance Certificates

Appendix 3.0 - Non-Domestic Energy Performance Certificates

Since October 2008 a Non-Domestic EPC is required for a commercial building when it is constructed, sold or let. A certificate must be made available to the prospective purchaser tenant or building control officer at the point of marketing the sale or lease or the completion of building works. An EPC can only be issued by an accredited assessor and it must be registered on the national database administered by Landmark plc. Once lodged, the certificate is valid for 10 years. Some buildings are exempt from the EPC requirements, examples of which are 'listed buildings' and buildings which are not intended to be occupied.

The EPC looks broadly similar to the energy labels now provided with vehicles and many household appliances. Its purpose is to indicate how energy efficient a building is. The certificate will provide an energy performance asset rating of the building. The rating is made up of two parts, firstly an alphabetical A to G banding, where an A band is very efficient and a G band is the least efficient. The better the banding, the more energy-efficient the building is and the lower the energy costs are likely to be.

Secondly, within the alphabetical banding there is a scoring system consisting of 25 points per band, i.e. Band A's scoring goes from 0 to 25, Band B's scoring goes from 26 to 50, and so on until G. The numerical scoring of the G band has no limit. There is also an additional banding of A+ with a numerical scoring starting at -1. As the numerical value of 0 (zero) is equal to a carbon foot print of 0 we can conclude that some buildings are now able to produce more energy that they use. This is possible through the installation of 'green technologies' such as photo voltaic, wind turbine etc.



Appendix 4.0
Implications for Owners, Investors and Funders

Appendix 4.0 - Implications for Owners, Investors and Funders

Impacting already

With less than a year remaining until the 2018 deadline the effects of The Energy Efficiency Regulations are already being felt. Most lenders will now not approve loans on sub-standard properties, and some will only lend if an energy efficiency upgrade plan is agreed to. Many RICS Valuers will not sign-off a valuation unless they have seen and had regard to a building's EPC rating. A two-tier market is starting to emerge with well informed tenants seeking buildings well clear of the EPC Grade F and G "danger zone". Tenants do not want buildings that they cannot sublet.

Changing EPC benchmarks

Mandatory EPCs started in 2008 and around 40% of the entire stock of commercial buildings in England & Wales now have an EPC lodged on the Government's central database. Since 2008 the benchmark for how the A-G Grade is assessed has tightened up. This means that a building with an EPC Grade of E assessed in 2009 may be reassessed as a Grade F if the EPC were recalculated today, even though no changes have been made to the building.

"Old" and "New" EPCs – critical date April 2011

EPCs are valid for 10 years so great caution is required for borderline EPC grades assessed between 2008-11. Due to the changes to the A–G grading, lenders such as Coutts Bank, now demand to see 'new' EPCs carried out after April 2011 before lending.

Get information

The first step is to obtain EPCs on all your assets to find the problem buildings. Over the past 12 months we have undertaken a number of complete portfolio EPC surveys. This gives a full data-set from which landlords and asset managers can make informed decisions. Noting the date of any existing EPCs is critical. All EPCs carried out before April 2011 may be downgraded to a poorer grade if reassessed today, using the latest Government software.

How to upgrade

An EPC is calculated having regard to the building's envelope and its heating, cooling and lighting services. Fully air-conditioned office buildings built in the 1980s and 1990s are particularly susceptible to very poor EPC grades, as too are uninsulated industrial buildings. Cost effective building upgrades include changing halogen lighting to LED, renewing boilers and air-conditioning plant and introducing insulation into roofs and wall structures.

Our solution

We provide a comprehensive service to property owners and their professional advisors. We calculate the EPC for the building "as is" and model different refurbishment scenarios in our software to calculate the effects on the EPC grade. Many of our clients are now developing strategies to upgrade their existing assets to just achieve an EPC Grade C by one point. We strongly recommend that no building refurbishment is undertaken until the impact on the EPC is calculated before the works are carried out.

Benefits

An important consideration that well informed Landlords and Asset Managers try to achieve when upgrading buildings is to improve the thermal environment and lighting levels (lux) of a building so that it makes a more comfortable working environment for the occupiers/ workers. Satisfaction with the thermal environment is important because it influences productivity and health. Workers who are satisfied with their thermal environment are more productive. Thermal discomfort

has also been known to lead to sick building syndrome symptoms. The combination of high temperature and high relative humidity serves to reduce thermal comfort and indoor air quality. Appropriate placing of lighting and selecting the right level of illumination can enhance workers productivity and job satisfaction. For example, if lighting is excessive or causes glare on a computer monitor screen, workers may develop eyestrain, fatigue, headaches and be forced to continually adjust position.

Your own house

The 2018 deadline also relates to residential property. We recommend that you obtain an EPC on your own house now to see if you fall into the F & G “danger zone”. You may want to upgrade your home sooner rather than later before it causes you a big problem when you come to sell or let in the future.