

Training to produce Energy Performance Certificates PREPARATION MATERIAL

This document sets out reading and preparation that is required of candidates in advance of joining the two day training course for the production of Energy Performance Certificates.

You are strongly advised that this preparation should be taken seriously. The required reading will be referred to and expanded upon during the training and you should have a thorough knowledge of the documents in advance in order to gain further knowledge in their application. The examination will feature some questions on the content of these documents.

There is a set of questions at the end of this document entitled 'Routemap' These should guide you to some of the relevant sections of the essential reading list below and provide you with some quick self- assessment questions to test whether you have read and absorbed what is required.

The essential reading can either be downloaded from on the links provided or from the free downloads areas of the CIBSE website, you will need to log in or register to get access to this: <https://www.cibse.org/membersservices/downloads/>

Essential reading

(all these documents can be accessed by clicking on the links below or in the downloads area on the website - www.cibse.org/epcdownloads)

- The Energy Performance of Buildings Directive – CIBSE Briefing 6
www.cibse.org/membersservices (You will need to log in or register to access the briefing)
- Approved Document L2A: Conservation of fuel and power (New buildings other than dwellings) (2006 edition)
<http://www.planningportal.gov.uk/england/professionals/en/1115314231806.html>
- Approved Document L2B: Conservation of fuel and power (Existing buildings other than dwellings) (2006 edition)
<http://www.planningportal.gov.uk/england/professionals/en/1115314231813.html>
- Energy Performance of Buildings Regulations Statutory Instrument
http://www.opsi.gov.uk/si/si2007/uksi_20070991_en_1
- CLG Guide to energy performance certificates at construction, sale and let of non-dwellings
<http://www.communities.gov.uk/planningandbuilding/theenvironment/energyperformance/publications/epcccommercial>

- Low or Zero Carbon Energy Sources: Strategic Guide (April 2006)
http://www.planningportal.gov.uk/uploads/br/BR_PDF_PTL_ZEROCARBONfinal.pdf
- Non Domestic Heating, Ventilation and Air Conditioning Compliance Guide (2006)
http://www.planningportal.gov.uk/uploads/br/BR_PDF_PTL_NONDOMHEAT.pdf
- Guide F - Energy efficiency in buildings (2004)
Download from CIBSE website
<https://www.cibse.org/membersservices/downloads/listings.asp>
- Energy Use In Offices ECG 019
<http://www.carbontrust.co.uk/Publications/publicationdetail.htm?productid=ECG019&metaNoCache=1>
- CIBSE Code of Conduct
<http://www.cibse.org/index.cfm?go=home.show&TopSecID=1&PageID=131&L1=131>

iSBEM - Essential

- Download iSBEM and training manual from www.ncm.bre.co.uk
- Load the software
- Load the example building file
- Run the example and check answers against questions 12-20 in routemap

We have provided you with some extra reading and recommended websites which will help to give you an all round holistic approach to part L. Any extra reading you do will help you to gain a good pass mark and extra reading is encouraged but not essential. It is expected that candidates will be familiar with many of these documents already. Reference may be made to these in the training but you will not be disadvantaged if you are not overly familiar with them. If you would like to purchase any of these additional reading materials please either call the publications department on 020 8675 5211 or order them on line at www.cibse.org.

Important reading

- Approved Document F - Ventilation (2006 edition) (www.dclg.gov.uk)
- AM10: Natural ventilation in non-domestic buildings (CIBSE purchase)
- TM22: Energy, assessment and reporting methodology (CIBSE purchase)
- TM39: Building energy metering (CIBSE purchase)
- Commissioning Code M: Commissioning management (CIBSE purchase)
- TM31: Building log book toolkit (CIBSE purchase)
- TM37: Design for improved solar shading control (CIBSE purchase)
- The UK Climate Change Programme (DEFRA
<http://www.defra.gov.uk/environment/climatechange/uk/ukccp/index.htm>) (2006)
- PROBE studies (CIBSE CD-ROM)

- The design team's guide to environmentally smart buildings GPG287 (CIBSE CD-ROM or www.thecarbontrust.co.uk) (2000)
- TM38: Renewable energy sources for buildings (CIBSE purchase) (2006)
- GPG388 CHP for Buildings (Carbon Trust) (2003) (www.thecarbontrust.co.uk)

Web sites to visit

- www.dclg.gov.uk (building regulations)
- www.planningportal.gov.uk
- www.cibse.org (publications, low carbon consultants, LCC FAQ's, briefings, Part L conference webcast, Annual conference 2006 webcast)
- www.100days.co.uk
- www.thecarbontrust.co.uk (publications)
- www.est.org
- www.defra.gov.uk/environment
- www.ukcip.org.uk (climate change)
- www.ukace.org
- www.retscreen.net (renewable tools)

Background reading

- Guide A: Environmental design (2006) (CIBSE purchase)
- TM36: Climate change and the indoor environment: impacts and adaptation (CIBSE purchase)
- TM38: Renewable energy sources for buildings (CIBSE purchase - Due end of July 2006)
- TM33: Tests for software accreditation and verification (CIBSE - available as a free pdf download)
- Avoiding or Minimising Air Conditioning GIR031 (CIBSE CD-ROM or www.thecarbontrust.co.uk)
- Bordass W T, Flying Blind – Everything you always wanted to know about energy in commercial buildings but were afraid to ask (Association for the conservation of energy www.ukace.org) (2001)
- The benefits of including energy efficiency early in the design stage - Anglia Polytechnic University GPCS 334 (1997) (CIBSE CD-ROM or www.thecarbontrust.co.uk)
- Guide to ownership, operation and maintenance of building services (2000) (CIBSE Purchase)
- Mixed mode buildings, CIBSE Applications Manual AM13 (CIBSE Purchase) (2000)

Route Map

The following provides a route through some of the key information by a series of actions and questions. You can self assess yourself against the answers provided overleaf. We have reduced the size of these answers so that you don't look at them by mistake! To convert to a readable form simply highlight the answer and convert back to normal sized font – i.e. Arial 11.

1. What do TER and BER stand for in ADL2A. Establish how they relate in compliance.
2. What is the TER relative to the notional building for an air conditioned building?
3. In ADL-2A What air permeability is allowed in SBEM for buildings less than 500m² if you do not wish to carry out a pressure test ? Read the section on air permeability testing.
4. In ADL-2B, what are the minimum values of consequential works required when extending a building over 1,000m²? Read the section on consequential improvements.
5. In ADL-2B, what is the minimum lighting efficacy required when upgrading a lighting system in an office? Read the section on controlled services and fittings.
6. In the Non Domestic Heating, Ventilation and Air Conditioning Compliance Guide, what is the minimum effective heat generating seasonal efficiency for a natural gas fired boiler? Read the section on how to use this guide
7. In the Low or Zero Carbon Energy Sources Strategic Guide, what is the typical cost of photovoltaic systems? Read about three technologies in this guide.
8. In CIBSE Guide F, section 8, what is the typical energy use for refrigeration in an air conditioned prestige office? Read section 2 and 3 of the guide.
9. In CIBSE Guide F, section 11, what is the typical efficiency of a three phase 15 kW motor? Read section 4 of the guide.
10. In CIBSE Guide F, section 20, what is the typical electricity consumption of a supermarket? Read the energy design checklist at the beginning of section 2 and the “why buildings fail on energy” table at the beginning of section 15.
11. In CIBSE Guide F, appendix A2, what is the calorific value of domestic wood and dry short rotation coppice? Read sections 5 & 6 of the guide.
12. In iSBEM example building, what is the external wall U value used?
13. In iSBEM example building, what is the seasonal boiler efficiency?
14. In iSBEM example building, what is the specific fan power used?
15. In iSBEM example building, what is the BER?
16. In iSBEM example building, change the boiler to biomass, what is the new BER?
17. Has it passed Part L?
18. Now add 10m² of south facing solar hot water heating at 30^o inclination, what is the new BER?
19. Now change the specific fan power to 2.0 W/l/s, what is the new BER?
20. Has it passed Part L on CO₂?

ANSWERS

To read these answers, highlight the text and convert the font size back to Arial 11.

1. Target emissions Rating & Building Emissions Rating.
2. 0.72 x Cnotional
3. 15 m³/m²/hr
4. Not less than 10% of the value of the principal works
5. The requirements would be met if the installed lighting has an average lamp plus ballast efficacy of not less than 45 lumens per circuit-Watt (reference to "initial (100 hour)" applies to other types of space – clause 58)
6. 84%
7. £4.5k to 10k per kW installed
8. 41 kWh/m²/yr
9. 90%
10. 1026 kWh/m²/yr
11. 10 and 18.6 GJ/tonne
12. 0.24 W/m²·K
13. 89%
14. 2.2 W/litre/s
15. 90 kg CO₂/m²
16. 82.5 kg CO₂/m²
17. No
18. 82.8 kg CO₂/m²
19. 81.2 kg CO₂/m²
20. No