

Level 3 Certificate in Energy Efficiency for Domestic Heating

(6084)

Scheme Handbook

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Energy Efficiency for Domestic Heating (6084)

Foreword

It is a Government priority to reduce energy wastage and CO₂ emissions. Domestic heating and hot water systems are responsible for about 85% of energy usage in domestic dwellings. Home energy usage is responsible for over a quarter of CO₂ emissions. To support this Government priority, it is essential that existing and new heating installers are competent in installing and maintaining energy-efficient domestic heating and hot water systems.

The Building Regulations Part L1 in England and Wales, the Building (Scotland) Regulations 2004 Section 6 and the Building Regulations (Northern Ireland) 2000 Part F set out the minimum requirements for energy use in buildings.

The Energy Efficiency for Domestic Heating qualification has been developed to enable heating installers to gain an understanding of the requirements of the abovementioned regulations in order to demonstrate competence and compliance. In addition, the qualification encourages and supports the use of best practice in domestic heating and hot water systems installation. This qualification is recognised by Building Regulation Competent Persons Schemes in England and Wales.

Scope of the Qualification

The qualification relates only to domestic heating and hot water systems and equipment, and the knowledge and understanding required to install and upgrade such systems and equipment in accordance with regulatory requirements, and to provide advice to consumers and other relevant persons.

Introduction

The objectives of the qualification are to:

- create awareness and understanding of the need to adopt energy efficiency measures
- provide a practical framework to promote energy efficiency options to consumers
- ensure holders of the qualification have knowledge and understanding of practical solutions to improve energy efficiency performance
- ensure holders of the qualification have knowledge of legislative and other drivers which support energy efficiency.

Solid fuel

Whilst the certificate contains energy efficiency information common to all fuels, the training and assessment is primarily aimed at oil and gas and is not specifically applicable to solid fuel. Those installers and specifiers involved in solid fuel installation are advised to contact HETAS at www.hetas.co.uk for full details of appropriate training for the installation of solid fuel appliances.

Prior qualifications and experience

The qualification is relevant to those people who undertake individual customer-facing roles and who are responsible for advice, design and installation of energy efficiency heating and hot water systems. It may also be of interest to those people who specify the installation and maintenance of the heating and hot water systems and to those who provide training and development for installers and specifiers.

Installers and specifiers entering for the qualification should meet one of the following:

Appropriate NVQ Level 3/BTEC or equivalent qualification
OR

Accreditation and recognition of skills through an appropriate industry registration scheme e.g. OFTEC, Gas Safe Register, Competent Persons Scheme

OR

At least two years industry experience in the installation of domestic heating and hot water systems, currently un-certificated skills equivalent to NVQ Level 3

OR

At least two years industry experience in the provision of design and advice services for domestic heating and hot water systems at NVQ Level 3 or equivalent

Acceptance of candidates onto a course of study is at the discretion of the centre and it will be the centre's responsibility to check and confirm the acceptability of their prior qualifications before entering them for the examination.

The Energy Efficiency for Domestic Heating qualification structure

The qualification consists of **one** unit with six knowledge outcomes. These are:

- Outcome 1 The benefits of efficient heating and hot water
- Outcome 2 Energy efficiency and building regulations
- Outcome 3 The importance of boiler efficiency
- Outcome 4 The importance of an efficient hot water cylinder
- Outcome 5 The importance of domestic heating and hot water controls
- Outcome 6 How to commission heating and hot water systems and handover to the customer

The importance of training in current practices

It is important that candidates receive training to cover all of the knowledge outcomes in the qualification although it will be possible for candidates that satisfy the entry requirements to access assessment without having attended a training course. A notional 24 hours guided learning has been ascribed to the qualification; this covers input on a taught course (minimum of six hours) and individual pre-course study.

Reference materials needed by candidates are available online and details of their content and where they can be sourced are in Appendix A. The training should be delivered using a standard PowerPoint presentation, which is available to approved centres only, on the City & Guilds web page for the Level 3 Certificate in Energy Efficiency for Domestic Heating (6084).

The Award

For the award of a certificate, candidates must successfully complete one of the assessments for Unit 1

Unit		Assessment components required (one of the below)	
Unit 1	Energy Efficiency for Domestic Heating	Component 101	Online multiple choice open book
		Component 210	Multiple choice open book (paper-based)

The Energy Efficiency for Domestic Heating qualification and the Plumbing NVQ

The outcomes of the Energy Efficiency for Domestic Heating qualification have been mapped against the National Occupational Standards in the Level 3 NVQ in Mechanical Engineering Services – Plumbing (Domestic) (6089) so that the links are readily identifiable. The relationship between the Energy Efficiency for Domestic Heating qualification and the Plumbing NVQ is shown below.

Unit number	Performance criteria	Range	Knowledge
1 Design domestic plumbing systems	1.1.1, 1.1.3, 1.1.4, 1.1.6 1.2.1, 1.2.2, 1.2.4, 1.2.5	1,3,4,6 1,2,4	1,3,4,5 1,2,3,4
2 Specify programmes for working on domestic plumbing systems	2.1.3	4	4
3 Plan complex domestic plumbing work activities	3.1.1, 3.1.2, 3.1.3, 3.1.5	1,2,3,4,6	1,2,4,5,8
6 Plan domestic plumbing oil heating systems work activities	6.1.1, 6.1.2, 6.1.3, 6.1.5	1,2,3,4,6	1,2,4,5,8
8 Install complex domestic plumbing systems and components	8.1.6 8.2.2, 8.2.3, 8.2.4, 8.2.5, 8.2.6, 8.2.8	6 2,3,4,5,8	7 2,3,4,8
11 Install domestic plumbing oil heating systems and components	11.1.6 11.2.2, 11.2.3, 11.2.4, 11.2.5, 11.2.6, 11.2.8	6 2,3,4,5,6,8	7 2,3,4,8
13 Commission and decommission complex domestic plumbing systems	13.1.1,13.1.2, 13.1.3, 13.1.4 13.2.1,13.2.3, 13.2.4, 13.2.5 13.3.3	1,2,3,4,5 1,2,3,5 2,3,4	1,2 1,2,3,5,7 1
15 Commission and decommission domestic plumbing oil heating systems	15.1.1, 15.1.2, 15.1.3, 15.1.4 15.2.1, 15.2.3, 15.2.4, 15.2.5 15.3.3	1,2,3,4,5 1,2,3 2,3,4	1,2,3,4,5 1,2,3,5,6,7,8 1
17 Service and maintain complex domestic plumbing systems and components	17.1.1,17.1.2, 17.1.3, 17.1.6, 17.2.1,17.2.2, 17.2.3 17.3.1, 17.3.3	1,2,3,6 1,2,3 1,2,3,4	1,2,3 1,2,3 1,2,4,6
20 Service and maintain domestic oil heating systems and components	20.1.1, 20.1.2, 20.1.3, 20.1.6 20.2.1, 20.2.2, 20.2.3 20.3.1, 20.3.3	1,2,3,4 1,2,3,6 1,2,3	1,2,4,6 1,2,3 1,2,3,4
23 Contribute to the improvement of plumbing business products and services	23.1.3 23.2.1, 23.2.4 23.3.3	1 3 1,2	4,5 3,4,5 5,6
24 Maintain effective plumbing working relationships	24.1.2, 24.1.3	1,2	4

The Energy Efficiency for Domestic Heating qualification and the Domestic Natural Gas, Installation and Maintenance NVQ

The outcomes of the Energy Efficiency for Domestic Heating qualification have been mapped against the National Occupational Standards in the Domestic Natural Gas, Installation and Maintenance NVQ Level 3 (6012) so that the links are readily identifiable. The relationship between the Energy Efficiency for Domestic Heating qualification and the Domestic Natural Gas, Installation and Maintenance NVQ is shown below.

Unit number	Performance criteria	Range	Knowledge
1 Design natural gas systems	1.1.1, 1.1.3, 1.1.4, 1.1.6 1.2.1, 1.2.2, 1.2.4, 1.2.5	1,3,4,6 1,2,4	a,c,d,e a,b,c,d
2 Specify programmes for working on natural gas systems	2.1.3	4	d
3 Plan the work activities for natural gas systems and components	3.1.1, 3.1.2, 3.1.3, 3.1.5	2,4,5,6	a,b,d,e,h
5 Commission and decommission natural gas systems	5.1.1, 5.1.2, 5.1.3, 5.1.4 5.2.1, 5.2.3, 5.2.4, 5.2.5 5.3.3	1,2,3,4 1,2,3,5 2,3	a,b,e a,b,c,e,f,g,h a
8 Establish, maintain and develop effective working relationships with others for all natural gas related work	8.1.2, 8.1.3	1,2	d
9 Contribute to the improvement of business products and services for natural gas related work	9.1.3 9.2.1, 9.2.4 9.3.3	1 2 1	d,e c,d,e e,f
10 Apply gas safety measures to domestic, natural gas related work activities	10.1.4 10.2.1, 10.2.2, 10.2.3, 10.2.4, 10.2.5 10.3.1 10.4.1, 10.4.2, 10.4.5, 10.4.6	4 1,2,3 1,2 1,2,6	d a,b,c a,b a,b,c,d,e,f
14 Install complex natural gas systems and components	14.1.6 14.2.2, 14.2.3, 14.2.4, 14.2.5 14.2.6, 14.2.8	6 2,3,4,5	g b,c,d,e,f,h,k
15 Service and maintain complex natural gas systems and components	15.1.1,15.1.2, 15.1.3, 15.1.6, 15.2.1,15.2.2, 15.2.3 15.3.1, 15.3.3	1,2,5 1,2,3 1,2,3	a,b,c a,b,c,e,f a,b,d,f,h

The Energy Efficiency for Domestic Heating qualification and the Oil Fired Technical Services NVQ

The outcomes of the Energy Efficiency for Domestic Heating qualification have been mapped against the National Occupational Standards in the Level 3 NVQ in Oil Fired Technical Services **(0786)** so that the links are readily identifiable. The relationship between the Energy Efficiency for Domestic Heating qualification and the Oil Fired Technical Services NVQ is shown below.

Unit number	Performance criteria	Range	Knowledge
2 Specify programmes for working on oil-fired systems and equipment	3	4	d
3 Maintain environmental good practice when working with oil	6,7	3	c,d,h,i,k
8 Develop and maintain effective working relationships with others for oil-fired related work	4,5	1,2	c
9 Contribute to the improvement of oil-related products and services	9.1.3 9.2.1, 9.2.4	1 2	d,e c,d,e
12 Design oil-fired systems	12.1.1, 12.1.2, 12.1.5, 12.1.6, 12.1.9 12.2.5	1,2 1	c,d,f,g,h,i,j a,b,c,e
13 Service and commission oil-fired systems and equipment	13.1.3, 13.1.4 13.3.2, 13.3.3, 13.3.8 13.4.5, 13.4.6, 13.4.7	2 1,3 1,2	c,d,e,i k,l,m,n,o,p a,b,c,g,h,i,r
14 Diagnose and rectify faults in oil-fired systems and equipment	14.1.7 14.2.10, 14.2.11, 14.2.15	1,2,3 1	i,m,n,o,p J,k,l,m,n
17 Install complex oil-fired systems and equipment	4,6,7,8,9,11	4,5,6,7	c,d,f,j
18 Pre-commission and decommission complex oil-fired systems and equipment	18.1.1, 18.1.2, 18.1.3, 18.1.4 18.2.4	1,2,3,4 2,3	a,b,c,d,e b
19 Diagnose and rectify faults in complex oil-fired systems and equipment	19.1.7 19.2.1, 19.2.2, 19.2.6	1,2,3 1	a,e,f,g,h,i,j d,f,g

The Energy Efficiency for Domestic Heating qualification and Key Skills

The outcomes of the Energy Efficiency for Domestic Heating qualification have been mapped against the Key Skills Units so that the links are readily identifiable. Candidates who go on to make use of the knowledge and understanding gained through the qualification, in the workplace, will have opportunities to gather evidence of their competence in the Key Skills Units shown below.

Key Skill	Element
Communications	C3.1a Contribute to a discussion about a complex subject C3.1b Make a presentation about a complex subject
Application of number	N2.1 Interpret information from two different sources N2.2 Carry out calculations to do with amounts and sizes N2.3 Interpret the results of the calculations and present the findings
Working with others	WO3.1 Plan complex work with others, agreeing objectives, responsibilities and working arrangements WO3.2 Seek to establish and maintain co-operative working relationships over an extended period of time, agreeing changes to achieve agreed objectives WO3.3 Review work with others and agree ways of improving collaborative work in the future
Problem solving	PS3.1 Explore a complex problem, come up with options for solving it and justify the option selected for taking forward PS3.2 Plan and implement at least one option for solving the problem, review progress and revise the approach, as necessary PS3.3 Apply agreed methods to check if the problem has been solved, describe the results and review the approach to problem solving

Centre and scheme approval

Centres wishing to offer City & Guilds qualifications must gain approval.

New centres must apply for centre and scheme approval.

Existing City & Guilds centres will need to get specific scheme approval to run this Certificate.

Full details of the process for both centre and scheme approval are given in *Providing City & Guilds qualifications - a guide to centre and scheme approval* which is available from City & Guilds' regional offices (see page 20) or from the City & Guilds website at:

www.cityandguilds.com

City & Guilds reserves the right to suspend an approved centre, or withdraw its approval from an approved centre to conduct a particular City & Guilds scheme or particular City & Guilds schemes, for reasons of debt, malpractice or for any reason that may be detrimental to the maintenance of authentic, reliable and valid qualifications or that may prejudice the name of City & Guilds.

Operating procedures – general requirements

All centres offering the Energy Efficiency for Domestic Heating qualification will have to meet the full requirements for the assessment procedures as detailed in this handbook.

This includes the provision of:

- appropriately qualified staff to invigilate the examination
- facilities for knowledge assessments to be undertaken at appropriate times under conditions required by City & Guilds.

Invigilation

Centres will be expected to provide invigilators for the examination procedures. The invigilator will be responsible for the conduct and integrity of the examination. The person(s) undertaking this role will need to:

- be familiar with the content of the *JCQ Instructions for Conducting Examinations* document
- accurately observe the time allotted for the examination
- read out the 'rules to candidates' prior to commencement of the examination
- ensure that all used and unused examination papers are collected immediately after the examination and handed to the person responsible for despatching them
- ensure compliance with all other regulations relating to the examination.

Invigilators ideally will not be involved in training the candidates. However, where this is unavoidable, the trainer will not be allowed to be the only invigilator involved for that examination.

Assessment Procedures

National standards and rigorous quality assurance are maintained by the use of City & Guilds set and marked multiple-choice tests.

Quality assurance includes initial centre approval, scheme approval and the centre's own procedures for monitoring quality. Details of City & Guilds criteria and procedures, including roles of centre staff can be found in *Providing City & Guilds Qualifications - a guide to centre and scheme approval*.

Details of the availability of assessments and of the general regulations for their conduct are given on the Catalogue section of the City & Guilds Walled Garden.

For candidates with particular requirements, centres should refer to City & Guilds policy document *Access to Assessment*. This also applies to candidates who wish to seek examinations in language other than English.

The assessment for the qualification consists of a 30 item (open book) multiple-choice test. The exam, covering the six knowledge outcomes has a time limit of 1 hour 15 minutes.

The examination will be delivered through City & Guilds' online system, GOLLA or through a paper-based assessment.

Candidates must have access to the reference documents needed to complete the examination. At the end of the examination, the documents will be retained by the centre for use in subsequent examinations. Centres will be responsible for ensuring that the documents (see Appendix A) are not annotated in any way that would give an unfair advantage to any candidate.

Paper-based tests

Orders for the paper based assessment can be made via the Walled Garden, using the EDI facility, or by completing form BB. For more information, contact Customer Relations:

centresupport@cityandguilds.com

Tel: 020 7294 2787

Fax: 020 7294 2413

Timing of knowledge assessment

The question paper should be taken by candidates at a time which suits their individual circumstances. They may take the examination on completion of a short training course, or when they believe they have the knowledge and understanding required to pass the examination. Candidates should be encouraged to develop the knowledge required to pass the examination in whichever way is most appropriate for them.

Conduct and supervision of the examinations

Centres must ensure the following:

1. Candidates will be issued, by the Centre, with the relevant reference documents for use in the examination; they will not be allowed access to their own reference materials during the course of an examination. Any information charts in rooms or workshops where knowledge assessments take place should be removed or covered if they would give help to candidates taking the assessments.
2. Centres must provide levels of invigilation that are commensurate with ensuring that the candidate works unaided for the duration of the examination.
3. Where, in the opinion of the Invigilator, the candidate engages in any conduct during an examination that is deemed to have given him/her an unfair advantage, the candidate will be required to retake an alternative assessment.

External verification and independent invigilation

For this award, City & Guilds also reserves the right to externally verify the training input and the conduct and supervision of the examination to help us ensure that the training and assessment is being carried out according to City & Guilds' requirements. External verifiers/independent invigilators will be used for this activity, which will be co-ordinated by the Regional/National offices. Centres should be aware that visits by an independent invigilator will be made without prior notice and (for those centres offering paper-based tests) may involve candidates being asked to sit a different test paper, as provided by the invigilator on the day of the visit.

Pass marks

The pass mark for the certificate is 80%. There is no grading for this qualification.

Responsibility for security

The Centre Manager shall be responsible for ensuring the security of all examination materials, including the reference documents. S/he may nominate a named person to take charge of the examination materials, to be responsible for day-to-day security, to record the issue and return of examination material to storage after use. In addition to the nominated person, the Centre Manager shall be the only person within the centre with access to the secure storage for examination material.

The centre's storage provisions for examination materials, methods of recording issue and return will be examined by External Verifiers on centre approval and any subsequent verification visits, and failure to comply with the security requirements will have serious consequences for the centres' ongoing approval as an assessment centre.

On Line assessment requirements

The assessments are available on line through the City & Guilds GOLA system.

Each test will comprise of multiple choice items in accordance with the test specifications provided. The entire test will be conducted via the candidate's VDU. All data relating to the assessment will be held by City & Guilds with results and performance feedback being delivered to the approved centre.

City & Guilds will continue to apply its rigorous quality control procedures to the production, editing, marking, moderating and revision of all questions whilst at the same time applying a robust security system to prevent assessments being accessed or drawn down by unauthorised persons or for purposes beyond those authorised.

GOLA registration

Centres are required to register as a GOLA centre before any tests can be scheduled. The form for this is available from the website www.cityandguilds.com/gola

A centre only needs to register once for GOLA

Further information

There is a GOLA helpline number - centre enquiries and technical enquiries about GOLA can be directed to this number **0845 241 0070**.

Centres can also e-mail: gola@cityandguilds.com.

The following leaflets are available:

A centre's guide to global on-line assessment

A centre's guide to technical requirements for global on-line assessment

A centre's guide to administering global on-line assessment

A learner's guide to global on-line assessment.

Centres looking for general information about GOLLA or copies of the GOLLA leaflets are advised to use the website www.cityandguilds.com/gola.

Test specification

The knowledge requirements will be assessed by a multiple choice test.

Subject Level 3 Energy Efficiency for Domestic Heating

Title Energy Efficiency for Domestic Heating (open book)

Duration 1 hour 15 minutes **No of items** 30

The assessment consists of a 30 item (open book) multiple-choice test.

Outcome	Group	Topic/objective	No of items under test specification	
			No of items per group	Total no of items
1 The benefits of efficient heating and hot water	1.1	The key elements of energy efficient heating and hot water systems and the benefits to be gained. The impact of climate change and Government response and commitment. (knowledge 1.1 and 1.2)	1	2
	1.2	The effect of the relationship between energy use and pollution, the costs of different sources of energy and the associated running costs of different sources of energy. (knowledge 1.3)	1	

2 Energy efficiency and the Building Regulations	2.1	<p>Means of demonstrating reasonable provision for limiting heat loss through the building fabric i.e. Elemental method, Target U-value method, Carbon Index method. (The qualification concentrates on use of the Elemental method for sizing boilers and has not been designed to assess competence in the calculation of Target U-values or Carbon Index)</p> <p>(knowledge 2.1 a)</p>	1	6
	2.2	<p>From April 1 2005 Part L1 will require, for England and Wales, that gas boilers fitted in all replacement and new heating systems in both new and existing dwellings, and oil boilers in new dwellings, must be SEDBUK A or B-rated except in exceptional circumstances. For exceptional circumstances a procedure exists. (knowledge 2.1 b and c)</p>	2	
	2.3	<p>Thermostatic radiator valves must be fitted on all bedroom radiators as a minimum. Time controls must be fitted and boiler interlock implemented in all cases. A fully pumped system must be fitted if possible – if the system is semi-gravity, controls must be fitted to implement boiler interlock.</p> <p>(knowledge 2.1 d, e and f)</p>	1	
	2.4	<p>Installers are responsible for commissioning, demonstrating and handing over the heating system to the end user. All installations have to be certified as being installed and commissioned by a competent person or receive approval from Building Control.</p> <p>(knowledge 2.1 g and h)</p>	1	
	2.5	<p>Use of the Standard Assessment Procedure (SAP) for the energy rating of dwellings.</p> <p>(knowledge 2.1 i)</p>	1	

3 The importance of boiler efficiency	3.1	The definition of boiler efficiency and what the efficiency of a boiler depends on. (knowledge 3.1 a to j)	1	7
	3.2	The definition of a regular boiler, a combi (combination) boiler, a non-condensing boiler, a condensing boiler. (knowledge 3.2)	1	
	3.3	What SEDBUK means and what the main features are of SEDBUK. (knowledge 3.3)	1	
	3.4	Why condensing boilers are more efficient and the installation and maintenance requirements of condensing boilers. (knowledge 3.4)	1	
	3.5	What CH _e SS means and how to use it in relation to boilers (knowledge 3.5)	1	
	3.6	The importance of selecting the right boiler and of sizing it accurately. (knowledge 3.6)	1	
	3.7	How to size a boiler using known U-values and The Whole House Boiler Sizing Method document. (This will be available during the assessment.) (knowledge 3.7)	1	

4 The importance of an efficient hot water cylinder	4.1	The alternative approaches available in the provision of hot water. (knowledge 4.1)	1	7
	4.2	The factors that affect the efficiency of hot water storage systems. (knowledge 4.2)	1	
	4.3	The characteristics of 'high performance' hot water cylinders and the savings potential from use of a 'high performance' cylinder. (knowledge 4.3)	1	
	4.4	The characteristics of combi boilers. (knowledge 4.4)	1	
	4.5	The importance and use of insulation. (knowledge 4.5)	1	
	4.6	What publications are available and how to access information about the selection of hot water systems. (knowledge 4.6)	1	
	4.7	What CHeSS means and how to use it in relation to the storage of hot water. (knowledge 4.7)	1	

5 The importance of domestic heating and hot water controls	5.1	Why controls are needed and the importance of installing them correctly (knowledge 5.1)	1	6
	5.2	The savings potential of different controls and how to work out an economic case for the installation of heating and hot water systems. (knowledge 5.2)	1	
	5.3	What controls are available for heating systems and their main features. (knowledge 5.3 a to g)	2	
	5.4	What controls are available for hot water systems and their main features. (knowledge 5.4 a to d)	1	
	5.5	What publications are available and how to access information about selecting the right controls (knowledge 5.5)	1	
6 How to commission heating and hot water systems and handover to the customer	6.1	How to commission the system. (knowledge 6.1 a to c)	1	2
	6.2	What operating advice and information to give to the customer. (knowledge 6.2)	1	

Appeals and Equal Opportunities

Centres must have their own auditable, appeals procedure. If a candidate is not satisfied with the examination conditions or a candidate feels that the opportunity for examination is being denied, the Centre Manager should, in the first instance, address the problem. If, however, the problem cannot be resolved, City & Guilds will arbitrate and an external verifier may be approached to offer independent advice. All appeals must be clearly documented by the Centre Manager and made available to the external verifier or City & Guilds if advice is required.

Should occasions arise when centres are not satisfied with any aspect of the external verification process, they should contact City & Guilds regional or national office.

Access to the qualification is open to all, irrespective of gender, race, creed, age or special needs. All candidates however, will need to be experienced heating installers or specifiers or involved in the training of installers or specifiers. The Centre Manager should ensure that no candidate is subjected to unfair discrimination on any grounds in relation to access to assessment and to the fairness of the assessment. OFQUAL requires City & Guilds to monitor centres to check whether equal opportunities policies are being adhered to. The City & Guilds equal opportunities policy appears in the Directory of Awards.

Unit 1 Energy Efficiency for Domestic Heating

Rationale

The Energy Efficiency for Domestic Heating qualification has been developed to enable heating installers to gain an understanding of the requirements of the Building Regulations Part L1 in England and Wales, the Building (Scotland) Regulations 2004 Section 6 and the Building Regulations (Northern Ireland) 2000 Part F in order to demonstrate competence and compliance. In addition, the qualification encourages and supports the use of best practice in domestic heating and hot water systems installation.

There are six learning outcomes to this unit. The candidate will be able to describe

Outcome 1 The benefits of efficient heating and hot water

Outcome 2 Energy efficiency and building regulations

Outcome 3 The importance of boiler efficiency

Outcome 4 The importance of an efficient hot water cylinder

Outcome 5 The importance of domestic heating and hot water controls

Outcome 6 How to commission heating and hot water systems and handover to the customer

Connection with other awards

The content of this qualification directly relates to activities within the following NVQ awards, as stated on pages 6-9 of this handbook:

Oil Fired Technical Services

Plumbing

Domestic Natural Gas, Installation and Maintenance

Assessment

The underpinning knowledge requirements are listed for each outcome. These will be assessed by one online multiple-choice test, or one paper-based multiple-choice test, produced in accordance with the test specification.

Outcome 1 The benefits of efficient heating and hot water

Underpinning Knowledge

The candidate will be able to describe:

1. The key elements of energy efficient heating and hot water systems and the benefits to be gained
2. The impacts of climate change and Government response and commitment
3. The effect of the relationship between energy use and pollution, the costs of different sources of energy and the associated running costs of different sources of energy.

Outcome 2 Energy efficiency and the Building Regulations

Underpinning Knowledge

The candidate will be able to state:

1. that the Building Regulations Part L1 in England and Wales, the Building (Scotland) Regulations and in the Building Regulations (Northern Ireland) incorporate energy efficiency in the following ways:
 - a means of demonstrating reasonable provision for limiting heat loss through the building fabric.
 - b regulations require that gas and oil boilers fitted in all replacement and new heating systems in both new and existing dwellings must be A- or B-rated, except in exceptional circumstances for which a specific procedure exists
 - c thermostatic radiator valves must be fitted on all bedroom radiators as a minimum
 - d time controls must be fitted and boiler interlock implemented in all cases
 - e a fully pumped system must be fitted if possible – if the system is semi-gravity, controls must be fitted to implement boiler interlock
 - f installers are responsible for commissioning, demonstrating and handing over the heating system to the end user
 - g all installations have to be certified as being installed and commissioned by a competent person or receive approval from the relevant regulatory body
 - h use of the Standard Assessment Procedure (SAP) for the energy rating of dwellings.

Outcome 3 The importance of boiler efficiency

Underpinning Knowledge

The candidate will be able to state:

1. that the definition of boiler efficiency and that the efficiency of a boiler depends on:
 - a fuel
 - b boiler type and design
 - c whether the unit includes automatic or permanent pilot ignition or pump over-run
 - d the type of burner control
 - e the load on the boiler due to the weather
 - f the sizing of the boiler and radiators relative to the design heat load
 - g the system controls
 - h flow and return temperatures
 - i installation and commissioning
 - j regular servicing and maintenance
2. the definition of a regular boiler, a combination boiler, a non-condensing boiler, a condensing boiler
3. the meaning of SEDBUK and its main features
4. how condensing boilers are more efficient and the installation and maintenance requirements of condensing boilers
5. the meaning of CHESS and how it is used in relation to boilers
6. the importance of selecting the right boiler and of sizing it accurately
7. how to size a boiler using known U-values and The Whole House Boiler Sizing Method (this document will be available during the assessment).

Outcome 4 The importance of an efficient hot water cylinder

Underpinning Knowledge

The candidate will be able to describe:

1. the alternative approaches available in the provision of hot water
2. the factors that affect the efficiency of hot water storage systems
3. the characteristics of 'high performance' hot water cylinders and the savings potential from use of a 'high performance' cylinder
4. the characteristics of combi boilers
5. the importance and use of insulation
6. the publications available and how to access information about the selection of hot water systems
7. the meaning of CHESS and how it is used in relation to the storage of hot water.

Outcome 5 The importance of domestic heating and hot water controls

Underpinning Knowledge

The candidate will be able to describe:

1. why controls are needed and the importance of installing them correctly
2. the savings potential of different controls and how to work out an economic case for the installation of heating and hot water controls
3. the controls available for heating systems and their main features
 - a room thermostats
 - b programmable room thermostats
 - c frost thermostats
 - d pipe thermostats
 - e thermostatic radiator valves
 - f automatic bypass valve
 - g boiler interlock
4. the controls available for hot water systems and their main features
 - a time controls
 - b cylinder thermostats
 - c boiler interlock
5. the publications available about selecting the right controls, and how to access information.

Outcome 6 How to commission heating and hot water systems and handover to the customer

Underpinning Knowledge

The candidate will be able to describe:

1. how to commission the system
 - a basic safety checks
 - b commissioning checks
 - c completion of the self-assessment commissioning certificate
2. the operating advice and information to give to the customer.

Further information

Further information regarding centre/scheme approval or any aspect of assessment of this award should be referred to the relevant City & Guilds regional/national office.

Region	Telephone	Facsimile
City & Guilds Scotland	0131 226 1556	0131 226 1558
City & Guilds North East and Cumbria	0191 402 5100	0191 402 5101
City & Guilds North West	01925 897900	01925 897950
City & Guilds Yorkshire	0113 380 8500	0113 380 8525
City & Guilds Wales	02920 838700	02920 838725
City & Guilds West Midlands	0121 359 6667	0121 359 7734
City & Guilds East Midlands	01773 842900	01773 842940
City & Guilds South West	01823 722200	01823 444231
City & Guilds London and South East England	020 7294 2820	020 7294 2419
City & Guilds Southern England	020 7294 2603	020 7294 2412
City & Guilds Eastern	01480 308300	01480 308325
City & Guilds Northern Ireland	028 9032 5689	028 9031 2917
City & Guilds Head Office – Customer Relations	020 7294 2800	020 7294 2400
City & Guilds Publication Sales	020 7294 2850	020 7294 3387

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Appendix A

Resource Materials

All resources are available online.

The training should be delivered using a standard PowerPoint presentation, which is available to approved centres only, on the City & Guilds web page for the Level 3 Certificate in Energy Efficiency for Domestic Heating (6084). The training course was developed by the Energy Saving Trust, the Heating and Hot Water Information Council, the Energy Efficiency Partnerships for Homes, the Institute of Domestic Heating and Environmental Engineers, Summit Skills and OFTEC.

Candidates will require access to the following publications for pre-course study, during taught delivery and during assessment.

- CE 51: Central Heating System Specifications (CHeSS) – Year 2008
- CE54 Whole House Boiler Sizing Method for Houses and Flats (2003)
- CE 29 Domestic Heating by Oil: Boiler Systems – guidance for installers and specifiers (2008)
- CE 30 Domestic Heating by Gas: Boiler Systems – guidance for installers and specifiers (2008)

These publications are available from the Energy Saving Trust website
<http://www.energysavingtrust.org.uk/business/Business/Building-Professionals/Publications>.

Appendix B








GOLA help screen

Select your answer from the options displayed by using your mouse. Your answer is stored automatically when you move to another question.

- indicates a selected option. To clear your selection click the selected option again or select a different option.

Command buttons

Along the top of your screen is a line of command buttons. The command buttons allow you to move through the test, going forwards and back at will, marking questions for return later or just providing you with useful information. Not all command buttons are used for every test, so to make your life easier available buttons appear onscreen as very bright, while unavailable buttons are dimmed. To select a command, click on it with your left mouse button. You may need to use the horizontal and vertical scroll bars to view all the information for a question.

Clicking this	Does this
 Time	The time remaining is shown in the bottom right hand corner. Clicking on the icon displays or hides the time.
 Help	Opens a help facility (similar to this sheet). The help facility is available throughout the examination.
 Review	Displays a window that enables you to review questions already viewed, showing those answered and flagged. To review all items ensure the 'view flagged questions only' checkbox is unchecked. Double-click on the question number to go to the question you want to review.
 Flag	Flags the current question for review (so you can easily return to it later) the button appears light if the question is flagged. The question can then be returned to later by selecting it from the review window.
 Previous	Moves you back to the previous question.
 Next	Moves you forward to the next question.
 Exhibit	Displays a window containing additional information needed to answer the question. Close the Exhibit to return to the question.

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