CONCERTED ACTION
ENERGY PERFORMANCE OF BUILDINGS

Implementation of the EPBD United Kingdom - Scotland

Status in 2020

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NATIONAL WEBSITES

www.gov.scot/Topics/Built-Environment/Building/Building-standards (http://www.gov.scot/Topics/Built-Environment/Building/Building-standards)

1. Introduction

This report provides information about the implementation of the EPBD in Scotland. It updates the previous reports published in 2010, 2012 and 2016. The implementation of the Directive in the other three UK jurisdictions (England, Wales and Northern Ireland) is addressed in separate reports.

The implementation of the EPBD in Scotland is the responsibility of the Local Government and Communities Directorate, Building Standards Division. Scotland controls both its Building Regulations and Energy Performance of Buildings Regulations.

This report introduces the most recent requirements. It also addresses certification and inspection of systems including quality control mechanisms, the training of Energy Assessors, information campaigns, incentives and subsidies. For more details, visit the relevant websites[1].

2. Current Status of Implementation of the EPBD

2.I. Energy performance requirements: NEW BUILDINGS

2.I.i. Progress and current status of new buildings (regulation overall performance)

Minimum energy performance requirements, for new buildings and new work to existing buildings, are set in the Building Regulations. These regulations were reviewed and improved most recently in October 2015 (Figures 1 and 2) based on percentage CO_2 emissions reductions (2002 regulations are the reference). Technical Handbooks[2] [3] provide guidance on achieving compliance with the regulations.

Building Regulations were amended in 2016[4] to transpose dates for nearly zero energy new buildings set out under Article 9(1). A review of the energy standards commenced in 2018 with a 'call for evidence'[5] to investigate where further improvement can be made in the energy performance of new buildings. Consultation and publication of improved standards is programmed for 2020/21.

The UK Government has assessed current minimum energy performance requirements in Building Regulations across the UK against the cost-optimal levels as required under Article 5 of the Directive. Following this assessment, it was concluded that EPBD requirements for 'nearly zero energy' new buildings are, at this time, met by the minimum energy performance requirements set by current Building Regulations.

In 2019, the Scottish Government passed legislation to amend its previous 2009 Climate Change Act and commit to a legally binding target of net zero emissions by 2045[6].

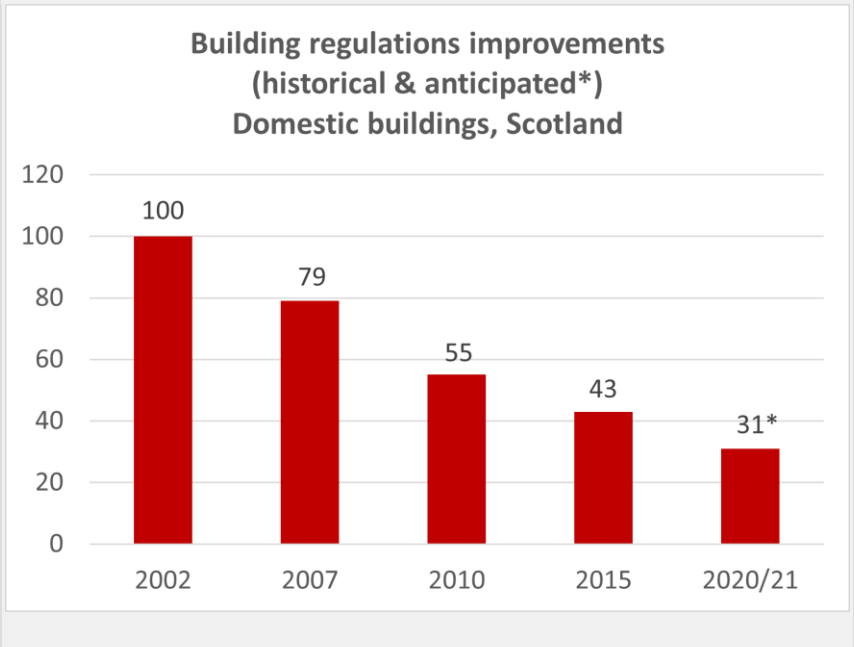


Figure 1. New domestic Building Regulations improvements, Scotland.

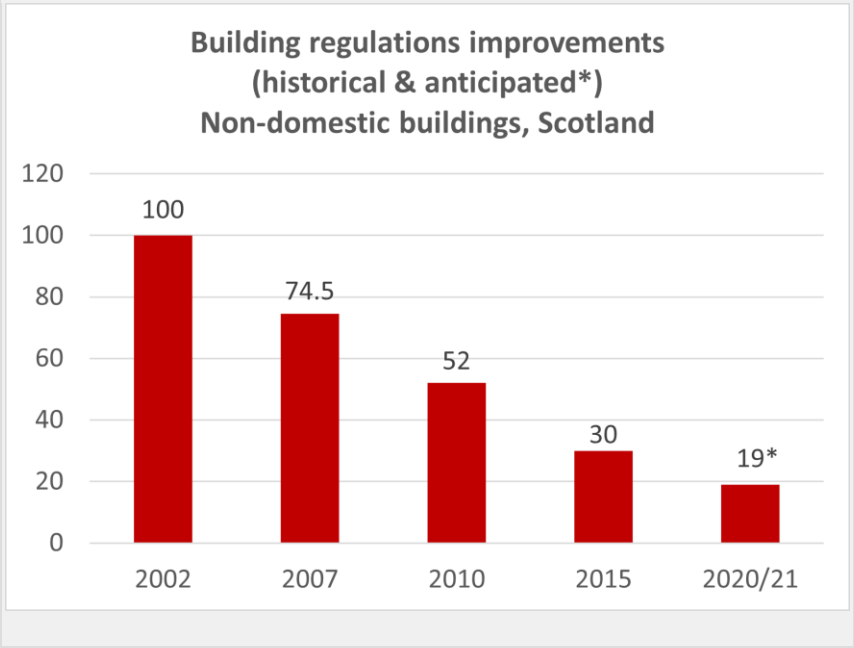


Figure 2. New non-domestic Building Regulations improvements, Scotland.

2.I.ii. Format of national transposition and implementation of existing regulations

The following Technical Handbooks provide guidance on how to meet energy requirements set under the Building Regulations: the "Technical Handbook Domestic"[2] (for new and existing domestic buildings) and the "Technical Handbook Non-domestic"[3] (for new and existing non-domestic buildings). They include references to best practice guides, e.g. Eurocodes (EN).

Mandatory functional standards set ten criteria for new domestic and non-domestic buildings (Table 1).

Criteria	Requirement addressed
1	Ensure the Building CO_2 Emission Rate is no greater than the Target Emission Rate. The target emission rate is set using a notional building specification which includes a low carbon fuel or equipment element, e.g., photovoltaic panels.
2	Reduce heat losses through the envelope (including minimum fabric performance, thermal bridging and air permeability). Scottish Accredited Construction Details for linear thermal bridging are available and airtightness testing is generally required.
3	Energy efficient space heating and hot water systems, including controls, minimum performance, etc.
4	Minimum insulation levels for pipes, ducts and vessels.
5	Energy efficient lighting and controls.
6	Reduce overheating (e.g., through the proportion and orientation of translucent glazing, solar shading/control, thermal mass, etc.) and ensure energy efficient mechanical ventilation and AC and controls.
7	Commissioning of building services to achieve optimum energy efficiency.
8	Information for building occupiers on the operation and maintenance of building services and energy supply.
9	The provision of EPCs on completion of new buildings and their display in public buildings.
10	Metering of fuel and power of buildings (or parts) and of end-uses (non-domestic buildings only).

Table 1. New buildings criteria, Scotland.

The Technical Handbooks provide guidance to calculate the Target Emission Rate and reference the *"Scottish Building Services Compliance Guides"*[7 8], which recommend minimum standards for Technical Building Systems.

For domestic buildings, the Standard Assessment Procedure (SAP[9]) 2012 is used to calculate energy performance, demonstrate compliance with Building Regulations, and produce EPCs. For non-domestic buildings, the Simplified Building Energy Model (SBEM) 2014 is used which implements the National Calculation Method (NCM) Modelling Guide[10]. The UK Government has developed the SBEM software, which is available free of charge. Government-approved, proprietary software tools may also be used for complex buildings. SAP, SBEM and proprietary software tools use calculated energy consumption based on standard conditions.

Scottish Accredited Construction Details (ACDs[11]) may be used to assist with compliance. ACDs focus on providing insulation continuity at junctions (thermal bridges) and airtightness (e.g. Figure 3).

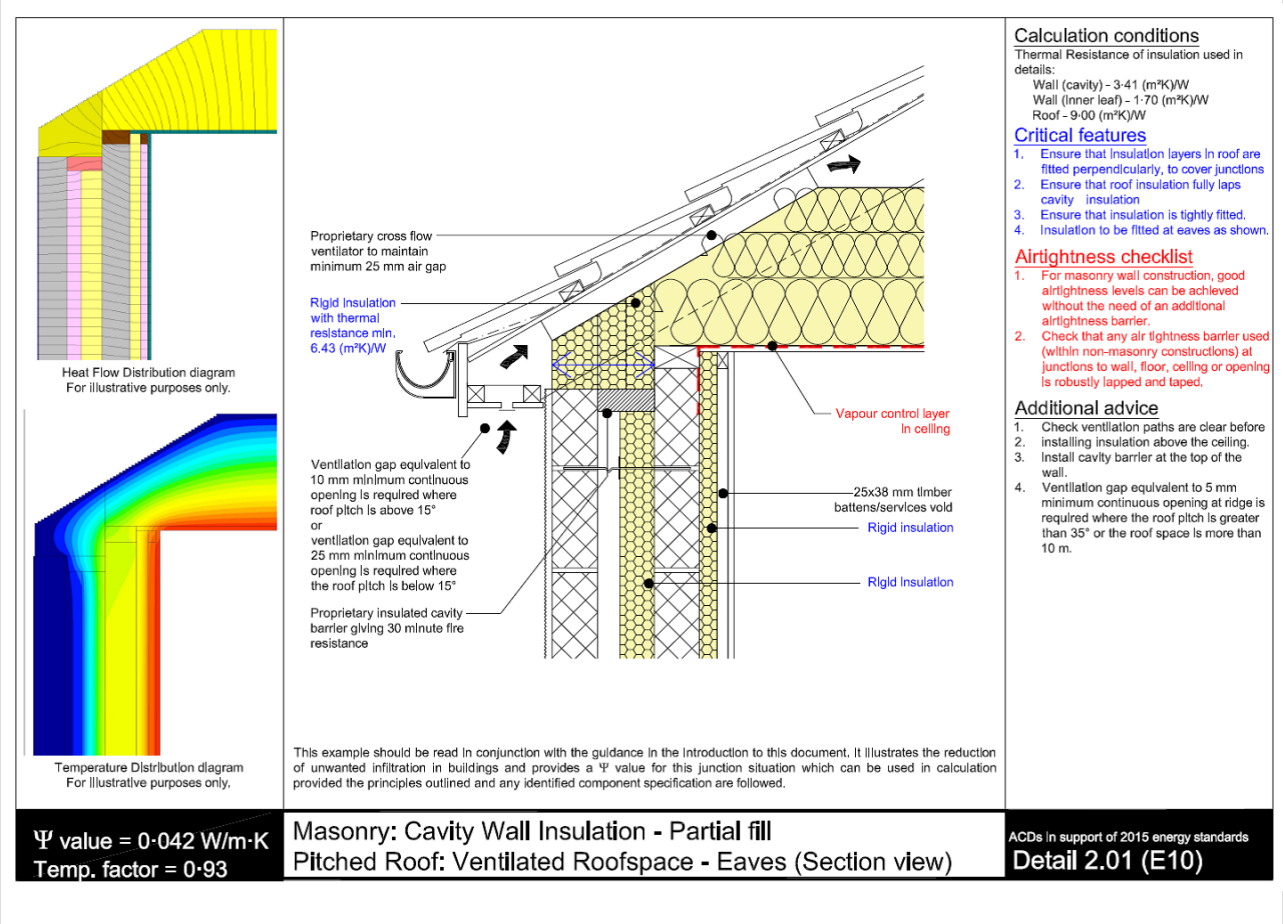


Figure 3. Illustration from ACD for Pitched Roof. Extracted from ACDs for Masonry External Wall Insulation.

The 32 Local Authorities in Scotland are appointed by Scottish Ministers as "*verifiers*" for their respective geographical area and they are responsible for the operation of the building standards system. As verifiers, they are responsible for granting permission for building work, undertaking reasonable enquiry to establish compliance and issuing a completion certificate before occupation.

Cost optimal procedure for setting energy performance requirements

A UK-wide cost-optimal report, which addresses Scotland, was published in January 2019. See England report for details.

2.I.iii. Action plan for progression to NZEB for new buildings

The UK national plan titled "Increasing the number of Nearly Zero-Energy Buildings"[12] covers all four UK jurisdictions: England, Wales, Northern Ireland and Scotland. See England report for details. Scotland specific details are included below.

Key elements and milestones, including national application of the definition of NZEB for new buildings

Building Regulations were amended in 2016 to transpose dates for nearly zero energy new buildings set out under Article 9(1). A review of the energy standards commenced in 2018. The publication of improved standards is programmed for 2020/21.

The Climate Change (Scotland) Act 2009[13] creates a legal framework to deliver greenhouse gas emissions reductions. This Act was amended by the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019[14] which introduced revised interim targets and a target for net zero emissions by 2045.

In February 2018, Scotland published its Climate Change Plan: Third Report on Proposals and Policies 2018-2032 (RPP3)[15]. The RPP3 sets out the path to a low carbon economy while helping to deliver sustainable economic growth and secure the wider benefits for a greener, fairer and healthier Scotland in 2032. Chapter 2 of the RPP3 reports on progress to date and sets out actions to reduce emissions associated with Scotland's building stock. Following the 2019 amendment of Scotland's Climate Change Act[14], an updated Climate Change Plan will be published later in 2020.

Examples of existing NZEBs

NZEB statistics are not maintained in Scotland. The following records of EPC A/A+ rated buildings provide an approximate alternative for high performance buildings.

Figure 4 shows historical EPC records for ratings A and A+. The graph shows a sharp increase for domestic and non-domestic buildings from 2012 to 2015, a drop in 2016 in both sectors, and the domestic sector sharply picking up again in 2017. Note that new building construction rates also affect these data, and non-domestic EPCs were only registered from 2013[16].

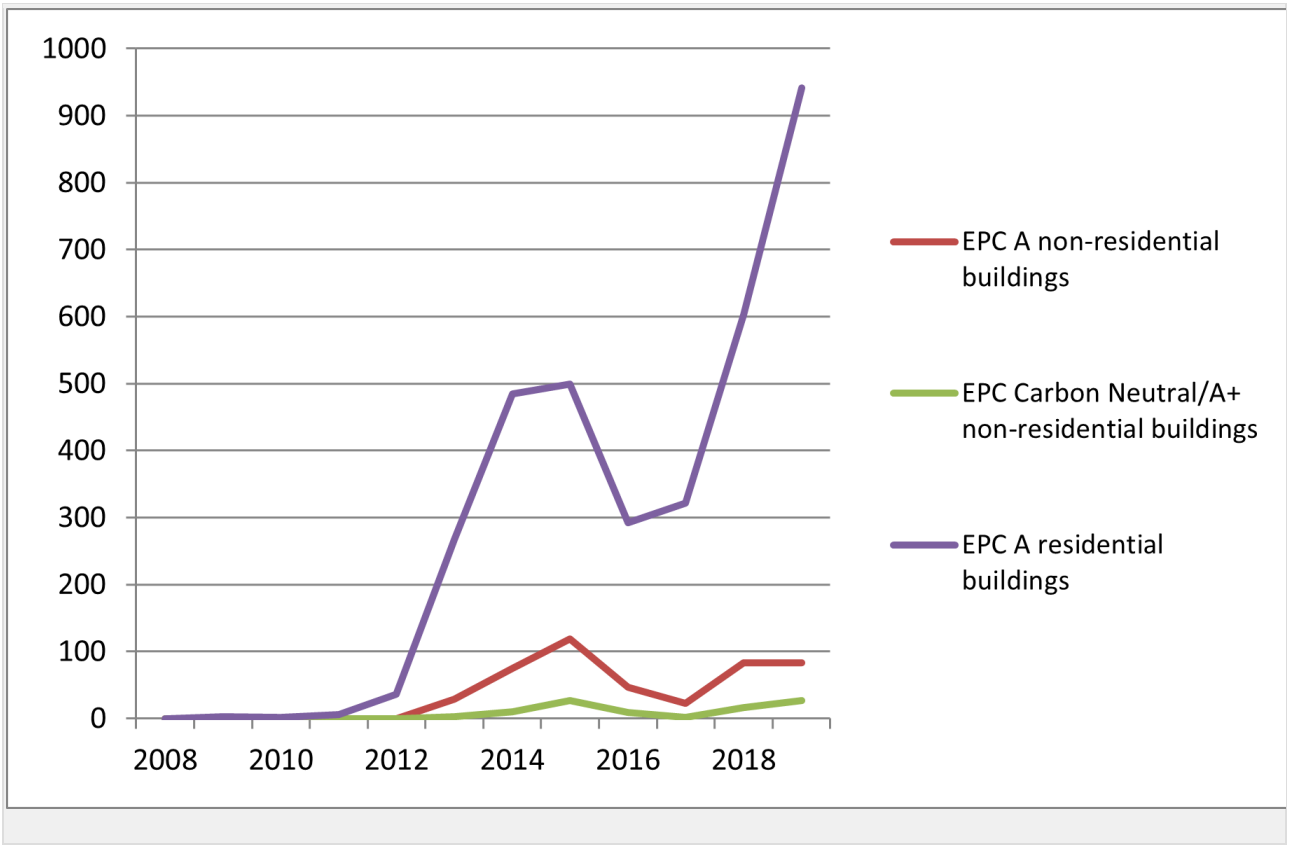


Figure 4. Historical EPCs Ratings A and Carbon Neutral/ A+, Scotland.

2.I.iv. Requirements for building components for new buildings

Please refer to Section 2.I.ii. Format of national transposition and implementation of existing regulations for details on requirements for new buildings.

Additional guidance[17] is also published to assist in the understanding of the principles of heat loss[18], to limit thermal bypass at junctions, and on provisions for airtightness testing[19] of new buildings.

2.I.v. Enforcement systems new buildings

A building warrant enforcement notice may be required:

- for ongoing work without a warrant, that a building warrant be obtained;
- for completed work without a warrant, that a completion certificate be submitted and the verifiers acceptance obtained;
- for work not carried out in accordance with the warrant, that the work be altered to comply with the warrant or that an amendment of warrant covering the changes be obtained; or
- for a limited-life building that has not been demolished, that a warrant for the demolition be obtained and the building be demolished.

The enforcement notice will specify a date by which these actions must be completed. Work may be suspended until the terms of the enforcement notice are satisfied.

If, by the specified completion date, the relevant person has not met the requirements of the enforcement notice, that person is guilty of an offence. The Local Authority may then carry out necessary remedial work to make the work compliant and the Local Authority can recover the costs of the remedial works from the relevant person.

2.II. Energy performance requirements: EXISTING BUILDINGS

In 2015, Scottish Ministers announced that the energy efficiency of the existing building stock would become a national infrastructure priority. This was launched in January 2017 as Scotland's Energy Efficiency Programme (SEEP)[20.] This work sets a 15-20 year programme to form part of Scotland's wider Energy Strategy[21] and is a key component of Scotland's current Climate Change Plan 2018-2032[15].

In February 2018, Scotland published its Climate Change Plan: third Report on Proposals and Policies 2018-2032 (RPP3)[13]. Chapter 2 of the RPP3[13] reports on progress to date and sets out actions to reduce emissions associated with Scotland's building stock. Following the 2019 amendment of Scotland's Climate Change Act[14], an updated Climate Change Plan will be published later in 2020.

Scotland has an estimated 2.6 million homes. Figure 5 shows the distribution of about 1.2 million domestic EPCs. There are approximately 196,000 non-domestic premises in Scotland. Figure 6 shows the distribution of about 49,000 non-domestic EPCs. Note that (i) non-domestic EPCs in Scotland are based on absolute emissions unlike the rest of the UK (see Section 2.III.i. for details); and (ii) EPCs are required under specific circumstances only, so Figures 6 & 7 are not representative of the whole Scottish building stock.

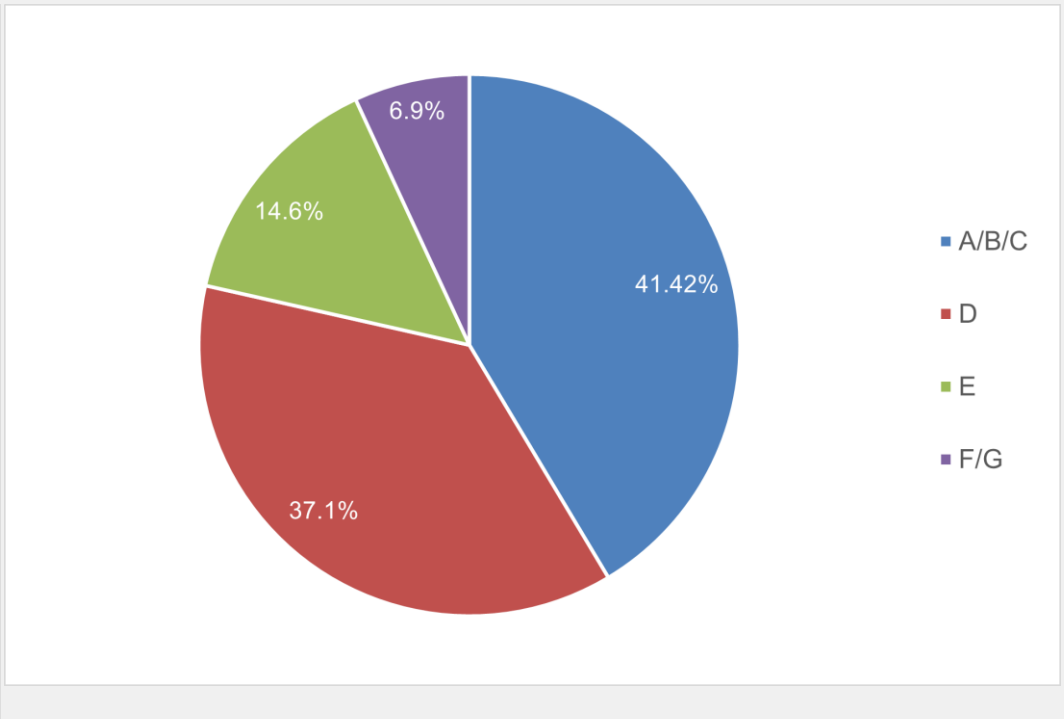


Figure 5. Distribution of domestic EPCs to 2019, Scotland.

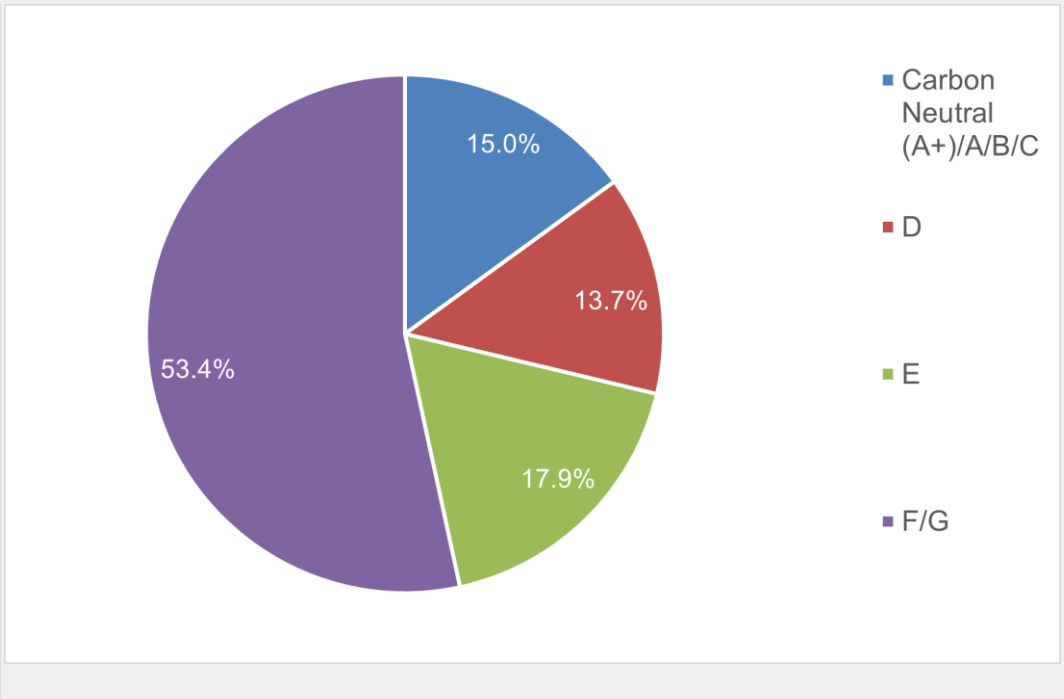


Figure 6. Distribution of non-domestic EPCs to 2019, Scotland.

2.II.i.Progress and current status of existing buildings (regulation overall performance)

Similarly to England, an elemental approach has been adopted for existing buildings. See England report for details. In non-domestic buildings, under certain circumstances (e.g. where work to an existing building includes the provision of new fixed building services or extends the capacity of existing services), the existing services must be improved to meet the current performance recommendations in the Scottish Technical Handbooks[2] [3]. This approach is referred to as "*consequential improvements*".

2.II.ii. Regulation on individual parts, distinct from whole building performance

An approach similar to England was adopted. See England report and Scottish Technical Handbooks[2] [3] for details. The Technical Handbooks reference industry guidance, e.g. the Chartered Institution of Building Services Engineers (CIBSE) Commissioning Codes[22], and the Building Services Research and Information Association (BSRIA) Commissioning Guides[23].

2.II.iii. Initiatives/plans to improve the existing building stock

The Energy Efficient Scotland Programme[20] will be at the heart of activities led by the Scottish Government and its partners to improve the energy efficiency of all Scottish buildings over the next 15 – 20 years. The Programme has been organised into two delivery phases:

- Phase 1 (2016 – 2018) piloting new approaches and programme scoping; and
- Phase 2 (commencing in 2018), the initial phase of the integrated programme of support for the domestic and non-domestic sectors as set out in a published Route Map.

The National Energy Efficiency Action Plan (NEEAP)[24] includes a Building Renovation Strategy in compliance with the Energy Efficiency Directive (EED)[25] Article 4. The policies and programmes to deliver this strategy include:

- A programme of interest free and low interest loans is available to SMEs, households and other organisations to incentivise the uptake and installation of energy and resource efficiency measures, micro-renewables and district heating;
- The "Sustainable Housing Strategy"[26], which sets targets for 2020 on insulation, boiler efficiency, and uptake of renewable heat for space and water heating;
- The Energy Efficient Scotland Programme[20] is supported by our national energy efficiency scheme, Warmer Homes Scotland[27], and Area Based Schemes designed and delivered by local councils. Since 2013, these programmes have provided energy efficiency measures to over 135,000 fuel poor households;
- The "Energy Company Obligation"[28] (ECO) mandating large energy suppliers to deliver a reduction in household energy costs by providing energy efficiency measures to domestic premises;
- Section 63 of the "Climate Change (Scotland) Act 2009"[13] which requires non-domestic building owners to improve energy performance and reduce emissions. Work to review these Regulations to expand their scope and level of challenge is underway for 2021 as part of the Energy Efficient Scotland Programme[20].
- The "Energy Efficiency Standard for Social Housing"[29] which requires landlords of socially rented homes to ensure their properties meet a minimum energy efficiency rating by 2020.

By the end of 2021, over £1 billion will have been allocated (since 2009) to tackling fuel poverty and improving energy efficiency to make homes warmer and cheaper to heat.

The UK Government decided to implement the alternative approach allowed by EED Article 5(6). See England report for details. The Scottish Government publishes an annual assessment[30] of energy efficiency improvements of Civil Estate buildings. The Government updated its Environmental Policy setting out targets for the performance of the Civil Estate, and actions under their Carbon Management Plan, which is

expected to save 27.5 GWh by 2020. To date, £1.5 million (~2 million €) has been spent on energy efficiency projects in Civil Estate buildings, including voltage optimisation, lighting upgrades, building management systems, and building fabric improvements.

2.II.iv. Long Term Renovation Strategies, status

Refer to the England Report for details.

2.II.v. Financial instruments and incentives for existing buildings

See Section 2.II.iii.

2.II.vi. Information campaigns / complementary policies

The Scottish Government has invested more than £45 million (~52 million €) since 2007 to support households, businesses and organisations finance energy efficiency, renewable energy and district heating. This has generated loans more than £65 million (~75 million €) to over 4,000 applicants.

Domestic Energy Efficiency

Home Energy Scotland (HES)[31] is Scotland's national advice service on fuel poverty and energy efficiency and provides advice and support to those struggling with their energy bills. It comprises a network of local advice centres covering all of Scotland. Their expert advisors offer free, impartial advice on energy saving, keeping warm at home, renewable energy, greener travel, cutting water waste and more. HES is funded by the Scottish Government and managed by the Energy Saving Trust, and their core mission is to help people in Scotland create warmer homes, reduce their bills and help tackle climate change.

HES advisors provide a single point of access to sustainable energy and fuel poverty support in Scotland. They provide a valuable resource helping vulnerable customers make efficiencies in their fuel bills, an advocacy service with energy companies, and a broader service directing those in need to places where they can find practical help. Information on the advice service can be found online[32], with further detail within section 5 of the 2019 Energy Saving Trust Scottish Home Energy Programmes Report[33].

Non-domestic Energy Efficiency

Advice and support for businesses is available through the Energy Efficiency Business Support Service[34] (EEBS, formerly Resource Efficient Scotland). The service is provided by Zero Waste Scotland (ZWS) and funded by the Scottish Government and the European Regional Development Fund (ERDF). The service is focused on SMEs and helps organisations to reduce costs and improve energy efficiency, by offering free advice and technical support and by sharing best practice.

Support for businesses[35] includes specialist advice, funding opportunities, training and specific tools, delivered online, on-site or over the phone. Funding opportunities promoted by EEBS include the SME Loan Fund[36]. Reports on activities for the last full year indicated that 1,075 SMEs were provided with in-depth support, resulting in £5M of identified annual cost savings, and estimated annual energy savings of 40 GWh equivalent to greenhouse gas emissions reductions of 25,000 tonnes.

2.III. Energy Performance Certificate requirements

2.III.i. Progress and current status on EPCs at sale or rental of buildings

Overview and administration

The Scottish approach generally mirrors English provisions. The Scottish Government entered into protocols with Approved Organisations to deliver EPCs. Approved Organisations "*ensure that members are fit and proper persons [qualified to prepare and issue] EPCs*". Approved Organisations' members produce EPCs (and other regulatory outputs) using Government-approved methodologies and tools.

All EPCs are produced from data recorded on the Scottish EPC Register[16]. EPCs are publicly accessible from the register using the EPC unique Report Reference Number (RRN). Regulations require that the EPC is "affixed"[37] to the building.

Format and content of the EPC

> ***Domestic buildings:*** The EPC (Figure 7) shows a calculated rating (asset rating) of the current and potential energy efficiency of the building on a scale from A (most efficient) to G (least efficient). The Energy Efficiency rating is based on the building's characteristics, its services, standardised occupancy and energy cost. The average rating for a domestic building in Scotland is rating D (63).

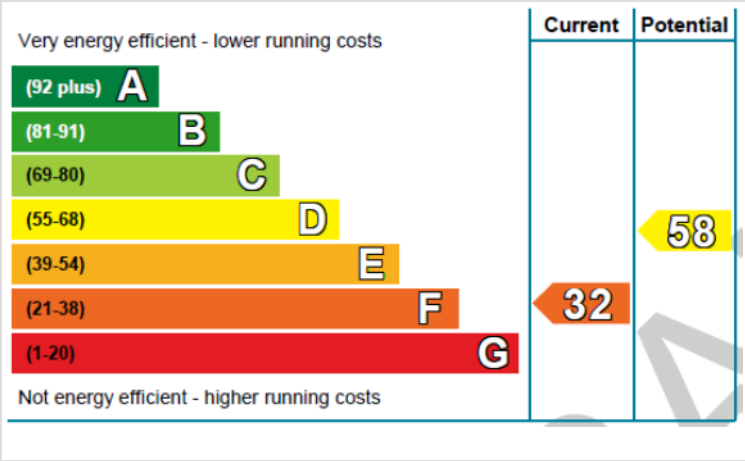


Figure 7. Example of current and potential Energy Efficiency ratings, Scotland.

The EPC also includes an Environmental Impact rating, showing the calculated current and potential CO_2 emissions from the building (Figure 8). The average Environmental Impact rating for a domestic unit in Scotland is rating D (59).

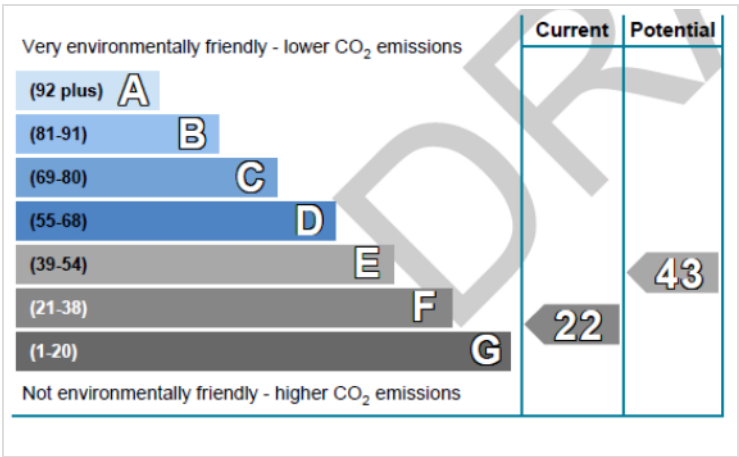


Figure 8. Example of current and potential Environmental Impact ratings, Scotland.

The first page of the EPC for domestic units is shown in Figure 9. The EPC includes a list of cost-effective recommendations to improve the building's energy efficiency and indicates the potential Energy Efficiency and Environmental Impact ratings if all cost-effective measures were implemented.

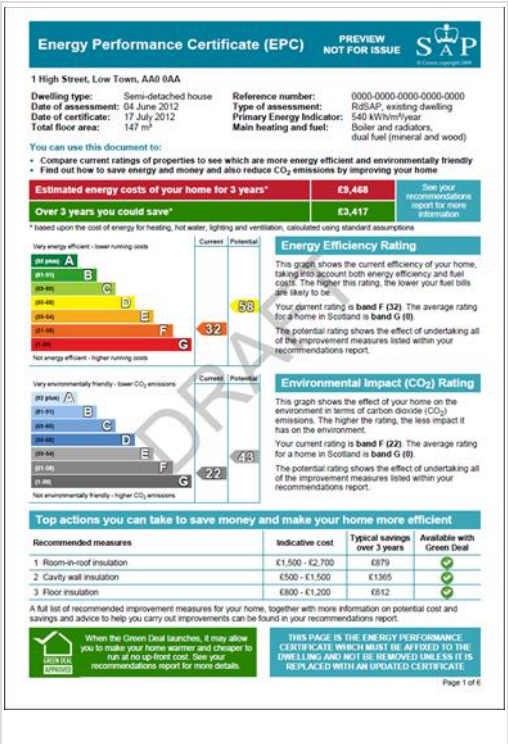
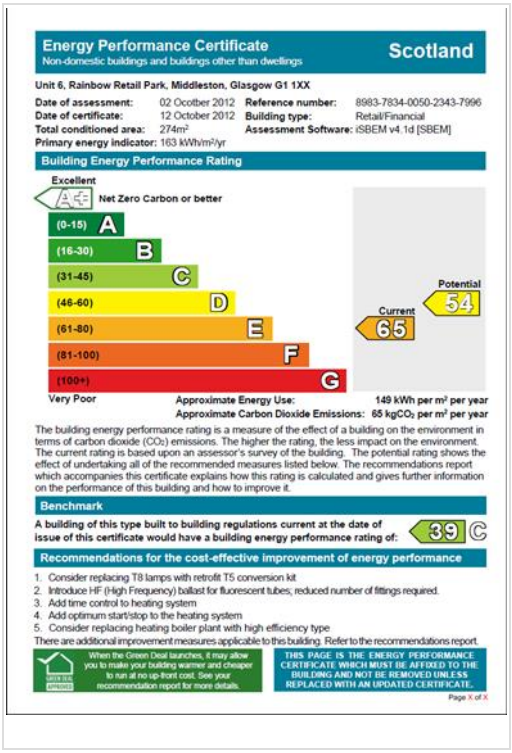


Figure 9. First page of domestic EPC[24], Scotland.

> ***Non-domestic buildings:*** Figure 10 shows the first page of the EPC for non-domestic buildings. Energy performance is shown as a calculated CO_2-based asset rating against an A to G scale. The rating is based on absolute CO_2 emissions, rather than the relative approach (actual vs reference/notional building) adopted in the rest of the UK. Primary and delivered energy consumptions are also shown. The EPC includes one benchmark, the energy rating if the building were constructed according to Building Regulations applicable at the time of the assessment (Figure 11). Recommendations, based on the assessor's inspection, are included in the accompanying Recommendations Report.



Energy Performance Certificate
Non-domestic buildings and buildings other than dwellings
Scotland

Unit 6, Rainbow Retail Park, Middleston, Glasgow G1 1XX

Date of assessment: 02 Ocotber 2012
Date of certificate: 12 October 2012
Total conditioned area: 274m²
Primary energy indicator: 163 kWh/m²/yr
Reference number: 8983-7834-0050-2343-7996
Building type: Retail/Financial
Assessment Software: iSBEM v4.1d [SBEM]

Building Energy Performance Rating

Excellent
Net Zero Carbon or better
(0-15) A
(16-30) B
(31-45) C
(46-60) D
(61-80) E
(81-100) F
(100+) G
Very Poor

Potential 54
Current 65

Approximate Energy Use: 149 kWh per m² per year
Approximate Carbon Dioxide Emissions: 65 kgCO₂ per m² per year

The building energy performance rating is a measure of the effect of a building on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating, the less impact on the environment. The current rating is based upon an assessor's survey of the building. The potential rating shows the effect of undertaking all of the recommended measures listed below. The recommendations report which accompanies this certificate explains how this rating is calculated and gives further information on the performance of this building and how to improve it.

Benchmark

A building of this type built to building regulations current at the date of issue of this certificate would have a building energy performance rating of: 39 C

Recommendations for the cost-effective improvement of energy performance

1. Consider replacing T8 lamps with retrofit T5 conversion kit
2. Introduce HF (High Frequency) ballast for fluorescent tubes; reduced number of fittings required.
3. Add time control to heating system
4. Add optimum start/stop to the heating system
5. Consider replacing heating boiler plant with high efficiency type

There are additional improvement measures applicable to this building. Refer to the recommendations report.

When the Green Deal launches, it may allow you to make your building warmer and cheaper to run at no up-front cost. See your recommendation report for more details.

THIS PAGE IS THE ENERGY PERFORMANCE CERTIFICATE WHICH MUST BE AFFIXED TO THE BUILDING AND NOT BE REMOVED UNLESS REPLACED WITH AN UPDATED CERTIFICATE.

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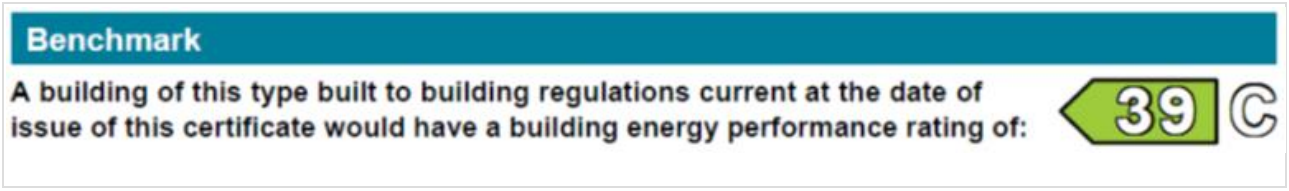
Figure 10. First page of non-domestic EPC[25], Scotland.



Benchmark

A building of this type built to building regulations current at the date of issue of this certificate would have a building energy performance rating of: 39 C

Figure 11. Non-domestic EPC benchmark, Scotland.

EPC activity levels

Until 2012, only EPCs for existing domestic units were recorded on the Scottish EPCs register. EPCs for new buildings were submitted to Local Authorities as part of the Building Warrant process, and EPCs for existing non-domestic buildings were not recorded. A new Scottish register[16] was implemented in 2013, and EPCs for all buildings have since been recorded. Tables 2 and 3 as well as Figures 12 and 13 show data to December 2019 and reflect these historical arrangements.

Asset rating EPCs are produced on construction, sale, rent and for display. EPCs become valid after the data used to produce them is recorded on the register. All EPCs are valid for 10 years.

Domestic EPC lodgements by band								
	Total EPCs	A	B	C	D	E	F	G
Total	2,510,202	3,946	176,438	859,208	931,549	365,454	131,355	42,252
Percentage	100%	0.16%	7.03%	34.23%	37.11%	14.56%	5.23%	1.68%

Table 2. Domestic EPCs to December 2019, Scotland.

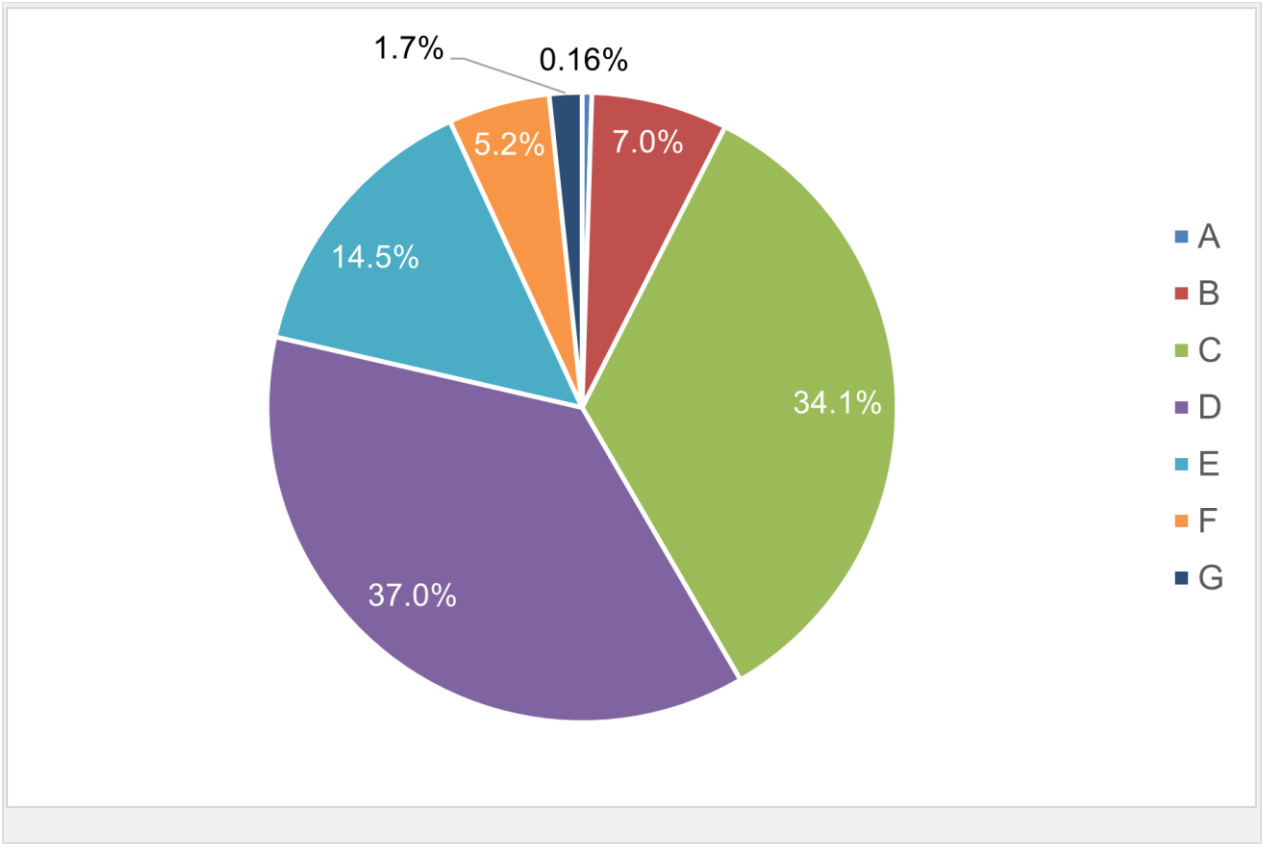


Figure 12. Domestic EPCs to December 2019. Percentages by EPC band, Scotland.

Non-Domestic EPC lodgements by band									
	Total EPCs	Carbon Neutral / A+	A	B	C	D	E	F	G
Total	49,208	75	619	2,062	4,630	6,752	8,793	6,788	19,489
Percentage	100%	0.15%	1.25%	4.19%	9.41%	13.72%	17.86%	13.79%	39.61%

Table 3. Non-domestic EPCs to December 2019, Scotland.

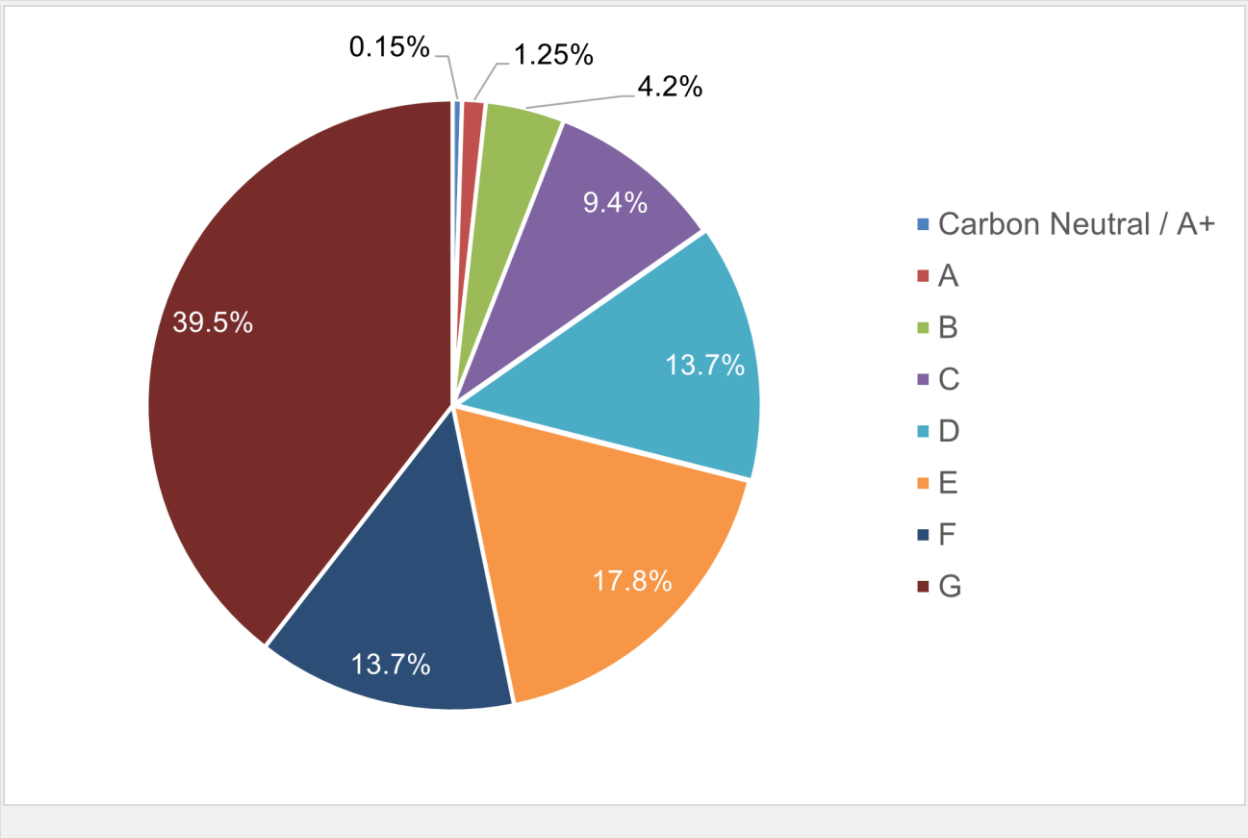


Figure 13. Non-domestic EPCs to December 2019. Percentages by EPC band, Scotland.

Typical EPC costs

EPC costs vary greatly. Indicative starting costs (lowest market costs based on internet search), including the registration fee[28] payable each time an EPC is recorded on the register, are:

- for domestic EPCs: from £35 to £60 (~41 € to 70 €);
- for non-domestic EPCs: from £129 to £150 (~150 € to 175 €).

Assessor corps

The Operating Framework requires Approved Organisations to reference the UK National Occupational Standards (NOS)[38] when establishing requirements for Energy Assessors. See England report for details. Four levels of registration are available for EPC assessors, instead of eight for the rest of the UK (Table 4). The Operating Framework requires Continued Professional Development (CPD). A minimum level of CPD hours is specified by each Approved Organisation.

Assessor types	Assessor numbers
Domestic EPCs (existing buildings)	1,529
Domestic EPCs (new buildings)	473
Non-Domestic EPCs (existing buildings)*	503
Non-Domestic EPCs (new buildings)	120
AC inspections (level 3 systems)	28
AC inspections (level 4 systems)	89
Total number	2,742
Notes	
*includes public buildings EPC: Energy Performance Certificate AC: Air-conditioning AC level 3: for simple packaged AC AC level 4: for complex central AC	

Table 4. Energy assessors' qualifications and numbers, Scotland[39]

Enforcement with building owners and real estate actors

Local Authorities enforce the Regulations in their jurisdiction. They have the powers to require copies of EPCs. Failing to include the EPC rating in commercial media (when marketing a property) can result in enforcement actions. Penalties vary from £500 (~582 €) for domestic units, to £1,000 (~1,160 €) in any other case. Local Authorities can also consider criminal action[40].

The Scottish Government has no statistical information on enforcement proceedings or penalties since the coming into force of the requirements in 2008. Government is aware that complaints have been investigated and, where appropriate, EPCs obtained.

2.III.ii. Quality assurance of EPCs

Under the Operating Framework, Approved Organisations have Quality Assurance responsibilities. Since 2013, Approved Organisations must check a representative sample of EPCs, e.g., a minimum 2% of all EPCs produced must be checked. Checks repeat the EPC calculations using data on the register. In 2019, 246,727 EPCs were produced and 5,645 (2.29%) were checked. Most checks are desk-based. Assessors' outputs are checked every six months at the minimum. Poor performance can lead to targeted auditing, re-training, suspension, or being struck off.

The Government audits Approved Organisations to ensure compliance with the Operating Framework. Approved Organisations who fail to meet the terms of the Framework are subject to a schedule of corrective action and may have their agreement terminated.

2.III.iii. Progress and current status of EPCs on public and large buildings visited by the public

Unlike other UK jurisdictions, in Scotland the calculated EPC required on construction, sale or rental is also displayed in public buildings. The requirement applies to two building categories:

- Buildings occupied by public authorities with a floor area > 250 m² and frequently visited by members of the public. Qualifying occupiers must obtain and display an EPC.
- Other non-domestic buildings with a floor area > 250 m² and frequently visited by members of the public. Qualifying occupiers must display the EPC only if they have one.

Activity levels for the display of EPCs within Local Authority public buildings are monitored by the Scottish Government. Non-domestic EPCs activity levels are provided above.

2.III.iv. Implementation of mandatory advertising requirement – status

An EPC must be provided when the building owner intends to sell or rent a building. Valid existing EPCs can be used for sale or rent, otherwise a new EPC must be obtained. The EPC and Recommendations Report must be provided to prospective buyers or tenants. Since 2013, building owners must ensure that commercial advertising of a property for sale or rent includes the "*energy performance indicator*", e.g., EPC = C.

2.IV Smart buildings and building systems

2.IV.i. Status and plans on smart buildings

See England report for details. There are no Scotland specific plans for any further smart building initiatives at this time.

2.IV.ii. Regulation of system performance

Scotland adopted a similar approach as England, and published the "Scottish Domestic and Non-domestic Building Services Compliance Guides"[7] [8] for use with the Technical Handbooks [2] [3]. The Guides recommend minimum energy efficiency standards for technical building systems. Selected extracts are included in Table 5.

A review of the energy standards commenced in 2018 and is investigating where further improvement can be made in the energy performance of new buildings. These new requirements are programmed to take effect in 2021.

Building Services Type	Recommended minimum energy efficiency standard
Natural gas, single boiler system ≤ 2MW output (for new buildings)	Gross seasonal efficiency: 91%
Biomass, independent boiler, automatic [feed], pellet/ woodchip (for new buildings)	Gross seasonal efficiency: 75%
Oil, single boiler system (for new buildings)	Gross seasonal efficiency: 84%
Heat pump – electrically driven (not air to air): space heating	Heat generator coefficient of performance 2.5 at rating conditions in EN 14511
Heat pump – electrically driven (not air to air): domestic hot water	Heat generator coefficient of performance 2.0 at rating conditions in EN 14511
Air distribution systems, central balanced mechanical ventilation with heating only	Specific fan power (max): 1.5 W/(l.s)
Air distribution systems, plate heat exchanger	Dry heat recovery efficiency: 50%
Internal lighting, general lighting in office, storage and industrial areas	Effective lighting efficacy: 60 luminaire lumens per circuit-watt
Comfort cooling, vapour compression cycle chillers, water cooled > 750 kW	Energy efficiency ratio: 4.7

Table 5. Examples of recommended minimum energy efficiency standards, Scotland Non-domestic Compliance Guide[8].

2.IV.iii. Building Automation and Controls (BACs)

Control of technical building systems are addressed in the Scotland Domestic and Non-Domestic Building Services Compliance Guides[7] 8 and the Technical Handbooks[2] [3]. The National Calculation Method also provides additional benefits for more effective controls.

A review of the energy standards commenced in 2018; this review proposes to implement BACs in new non-domestic buildings, where technically and economically feasible, for air-conditioning or for combined air-conditioning and ventilation systems over 290 kW (effective rated output), in advance of broader requirements expected for 2025.

2.IV.iv. Status and encouragement of intelligent metering

Energy metering requirements are included in the "Technical Handbook Non-domestic"[3] buildings. Each building (or part) should be fitted with fuel and power meters. Sub-metering should allow monitoring of end uses. The handbook references industry best practice, e.g., CIBSE TM 39[41]. Automatic meter reading is referenced as good practice but is not mandated.

There are no metering requirements for domestic buildings in the "Technical Handbook Domestic"[2] buildings. See England report for details about the smart meter roll out which applies to Scotland.

2.IV.v. Progress and current status on heating systems (Inspection / Equivalence)

The UK adopted alternative measures for heating systems and inspections for AC systems. Refer to the England Report for an overview of the adopted UK-wide alternative measures for heating systems.

Heating systems measures specific to Scotland include the "Energy Assistance Package"[42,] which targets fuel poverty and aims to reduce fuel bills and improve the energy efficiency of homes, the "Home Energy Efficiency Programmes"[24] and the "Warmer Homes Scotland"[27].

2.IV.vi. Progress and current status on AC systems (Inspection / Equivalence)

AC inspections were phased in between 2011 and 2013. In the same building, multiple systems < 12 kW but totalling 12 kW or more, qualify for an inspection if they are centrally controlled. Portable systems and AC of process only loads do not qualify.

Inspections are required throughout the life of the building, as long as a qualifying AC system is present. Building owners must ensure AC systems are inspected by an accredited expert who issues a report setting out recommendations and timescales for the next inspection. AC inspection reports are not recorded on a central register.

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2.IV.vii. Enforcement and impact assessment of inspections

Enforcement and penalties

Local Authorities ensure that building owners possess a valid inspection report or have commissioned an inspection. Local Authorities may serve enforcement notices and, if building owners do not comply, Local Authorities can undertake remediation work for compliance and recover expenses from building owners. There are no published records of enforcement notices imposed by Local Authorities for non-compliance.

Quality control of inspection reports

The procedures for AC inspections are set out in the Technical Handbook which refers to industry guidance[43]. An Operating Framework has been established for *"Approved Organisations"* to accredit AC inspectors[44]. The Framework requires Approved Organisations to reference the UK National Occupational Standards for AC inspections, which set minimum competencies and skills. See England report for details.

The Operating Framework sets minimum requirements for the quality assurance of inspectors, and for the audit of Approved Organisations by the Government, including:

- at least 2% of all inspection reports are checked for accuracy;
- outputs from inspectors are checked at least every six months;
- Approved Organisations maintain records to allow Government compliance audits.

In 2019, 389 AC inspection reports were produced and 24 reports were checked, i.e., 6.1%. Note that due to the Scottish climate, there are few qualifying AC systems.

Impact assessment

Similar to England. See England report for details.

3. A success story in EPBD implementation

EPCs continue to be a key mechanism to support both policy-making and the delivery (and monitoring) of energy efficiency improvements in Scotland.

An example of this can be seen in the Energy Efficient Scotland Route Map (2018)[45] which sets out long term objectives to improve the energy efficiency of the Scottish building stock across tenures and building types. This national programme, which will run until 2040, proposes to use the EPC assessment as the basis for both setting targets and demonstrating the level of improvement achieved. This Route Map is scheduled to be updated during 2020.

4. Conclusions, future plans

The UK is divided into four jurisdictions. The mix of approaches transposing the EPBD differs between these jurisdictions, with significant differences between the English and Scottish approaches.

The recommendations of "The Sullivan Report, A Low Carbon Building Standards Strategy for Scotland"[46] have steered work to reduce energy use and CO_2 emissions from buildings in Scotland since 2007. The 2013 update of the report recommended the review of energy standards beyond 2015 to be aligned with the EPBD timetable for NZEB. This work is ongoing.

In addition to transposing the EPBD requirements, Scotland introduced in 2016 Display Energy Certificates (DECs) to report operational energy as part of the legislation for the assessment and improvement of existing non-domestic buildings under Section 63 of the Climate Change (Scotland) Act 2009[13].

The Scottish Government recognises the value of the data recorded on the EPC register, which is already used to support a broad range of policies and other initiatives. The Scottish Government has published EPC register data to support research and broader carbon and energy efficiency improvements of the building stock. This will be further expanded in support of the Energy Efficient Scotland Programme[20] which has broadly adopted EPCs and their calculation methodologies as a core mechanism to set and demonstrate improvement in the building stock.

The energy standards of the Scottish Building Regulations are expected to be amended in 2021 to further improve the energy performance of new buildings. New regulations are also being developed that aim to avoid the use of fossil fuels in new homes from 2024, with a similar ambition for non-domestic buildings.

The transposition of the EPBD and associated benefits continue to be reviewed by each UK jurisdiction as part of their respective programmes to achieve national energy efficiency and CO_2 objectives.

Endnotes

1. Relevant websites on quality control mechanisms, the training of Energy Assessors, information campaigns, incentives and subsidies:
    - Building standards. Cabinet Secretary for Communities and Local Government & Minister for Local Government, Housing and Planning, April 2020. Available at: www.gov.scot/Topics/Built-Environment/Building/Building-standards,
    - Energy Performance Certificates: introduction. Scottish Government, April 2016. Available at: www.gov.scot/epc
    - Energy Saving Trust Scotland. Available at: www.energysavingtrust.org.uk/scotland
2. Building standards technical handbook 2019: domestic. Scottish Government, September 2019. Available at: https://www.gov.scot/publications/building-standards-technical-handbook-2019-domestic/
3. Building standards technical handbook 2019: non-domestic. Scottish Government, September 2019. Available at: https://www.gov.scot/publications/building-standards-technical-handbook-2019-non-domestic/
4. Statutory Instruments No. 71: The Building (Energy Performance of Buildings) (Scotland) Amendment Regulations 2016. Available at: https://www.legislation.gov.uk/ssi/2016/71/contents/made
5. Scottish Building Regulations review of energy standards: call for evidence. Scottish Government, June 2018. Available at: https://www.gov.scot/publications/scottish-building-regulations-review-energy-standards-call-evidence/
6. Scottish Statutory Instruments 2019 asp 15: Climate Change (Emissions Reduction Targets) (Scotland) Act 2019. Available at: https://www.legislation.gov.uk/asp/2019/15/enacted
7. Domestic Building Services Compliance Guide for Scotland, The Scottish Government, 2015 Edition. Available at: https://www.gov.scot/publications/domestic-building-services-compliance-guide-for-scotland/
8. Non-domestic Building Services Compliance Guide for Scotland, The Scottish Government, 2018. Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/factsheet/2018/12/building-standards-list-of-guidance/documents/non-domestic-building-services-compliance-guide-for-scotland-2018/non-domestic-building-services-compliance-guide-for-scotland-2018/govscot%3Adocument
9. UK's National Calculation Method for Non-Domestic Buildings. Available at: www.uk-ncm.org.uk
10. National Calculation Methodology (NCM) Modelling Guide (for buildings other than dwellings in England): 2013 Edition. Available at: https://www.uk-ncm.org.uk/filelibrary/NCM_Modelling_Guide_2013_Edition_20November2017.pdf
11. Accredited Construction Details, The Scottish Government, 2007. Available at: https://www.gov.scot/publications/accredited-construction-details-scotland-2007/

12. Increasing the Number of Nearly Zero Energy Buildings. UK National Plan, September 2012. Available at: https://ec.europa.eu/energy/sites/ener/files/documents/united_kingdom_en_version.pdf

13. Climate Change (Scotland) Act 2009. Acts of the Scottish Parliament. Available at: https://www.legislation.gov.uk/asp/2009/12/contents

14. Climate Change (Emissions Reduction Targets) (Scotland) Act 2019. Acts of the Scottish Parliament. Available at: http://www.legislation.gov.uk/asp/2019/15/enacted

15. Climate Change Plan: third report on proposals and policies 2018-2032 (RPP3). Scottish Government, February 2019. Available at: https://www.gov.scot/publications/scottish-governments-climate-change-plan-third-report-proposals-policies-2018/

16. Visit https://www.scottishepcregister.org.uk/ for details of EPCs recorded on the register

17. Building Standards: list of guidance. Scottish Government, December 2018. Available at: https://www.gov.scot/publications/building-standards-list-of-guidance/pages/key-supporting-technical-guidance/

18. Conventions for U-value Calculations. BRE, 2019. Available at: https://www.bregroup.com/wp-content/uploads/2019/10/BR443-October-2019_consult.pdf

19. Air tightness Testing in support of Standard 6.1 from 1 January 2015. Scottish Government. Available at: https://www.webarchive.org.uk/wayback/archive/20181001223332/https://www.gov.scot/Topics/Built-Environment/Building/Building-standards/techbooks/ast2015

20. Scottish energy strategy: Scotland's The Energy Efficient Scotland Programme (SEEP). Scottish Government, January 2017 onward. Available at: https://www.gov.scot/policies/energy-efficiency/energy-efficient-scotland/; https://www.gov.scot/publications/national-infrastructure-priority-energy-efficiency-scotlands-energy-efficiency-programme/

21. The future of energy in Scotland: Scottish energy strategy. Scottish Government, December 2017. Available at: https://www.gov.scot/publications/scottish-energy-strategy-future-energy-scotland-9781788515276/

22. CIBSE Commissioning Codes: www.cibse.org/knowledge/cibse-publications/cibse-commissioning-codes

23. BSRIA Commissioning Guides: www.bsria.co.uk/information-membership/bookshop/category/commissioning-guides/

24. UK National Energy Efficiency Action Plan. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/307993/uk_national_energy_efficiency_action_plan.pdf

25. The Energy Efficiency Directive, European Commission. Available at: https://ec.europa.eu/energy/topics/energy-efficiency/targets-directive-and-rules/energy-efficiency-directive_en

26. Scotland's Sustainable Housing Strategy. Scottish Government, 2013. Available at: https://www.gov.scot/publications/scotlands-sustainable-housing-strategy/#:~:text=The%20Sustainable%20Housing%20Strategy%20sets,low%20carbon%20economy%2

0across%20Scotland.&text=We%20want%20everyone%20in%20Scotland,and%20that%20meet%20their%20needs

27. HEEPS: Warmer Homes Scotland Scheme. Further information available at: https://energysavingtrust.org.uk/scotland/grants-loans/heeps/heeps-warmer-homes-scotland-scheme

28. Energy Company Obligation (ECO). Further information available at: https://www.ofgem.gov.uk/environmental-programmes/eco

29. Home energy and fuel poverty. Further information available at: https://www.gov.scot/policies/home-energy-and-fuel-poverty/energy-efficiency-in-social-housing/

30. Scottish civil estate: efficiency and sustainability reports. Scottish Government, September 2018. Available at: https://www.gov.scot/publications/the-scottish-civil-estate-efficiency-and-sustainability-reports/

31. https://energysavingtrust.org.uk/scotland/home-energy-scotland

32. https://energysavingtrust.org.uk/about-us/news/energy-saving-trust-report-provides-insight-scotland's-ambitious-energy-efficiency

33. https://energysavingtrust.org.uk/sites/default/files/EST%20Programmes%20In%20Scotland%20FINAL.pdf

34. https://energy.zerowastescotland.org.uk/

35. https://energy.zerowastescotland.org.uk/content/support-scottish-businesses

36. https://energy.zerowastescotland.org.uk/SMELoan

37. The Scottish Government Guidance Leaflet states: "*It is a requirement under law that the EPC must be 'affixed' to the building. Building standards guidance suggests that the EPC be located in the boiler or meter cupboard. A copy should be retained with other legal papers relating to your property.*" Guidance Leaflet EPC 01 04/16, An introduction to energy performance certificates, Local Government and Communities Directorate, Building Standards Division, The Scottish Government. Available at www.gov.scot/Resource/0049/00499867.pdf

38. National Occupational Standards (NOS). UK Commission for Employment and Skills, April 2014. Available at: https://www.gov.uk/government/publications/national-occupational-standards

39. Data has been collated from annual returns received from the Approved Organisations / Protocol Organisations, 2019. This data has not been published previously.

40. "The legal system in Scotland has two distinct sections for:

    - cases which involve disputes between individuals or organisations, for example eviction or divorce. These are civil cases.

    - cases which involve charges being brought against individuals or organisations, for example rape or assault. These are criminal cases. […]

41. Building energy metering. A guide to energy sub-metering in non-domestic buildings. Technical Memorandum (TM) 39: 2006, CIBSE

42. Energy Assistance Package Scotland. Further information available at: https://www.homeheatingguide.co.uk/grants-schemes/energy-assistance-package-scotland

43. Technical Memorandum 44 (TM 44) Inspection of Air-conditioning Systems published by the Chartered Institution of Building Services Engineers (CIBSE). Available at: https://www.thenbs.com/PublicationIndex/Documents/Details?DocId=300581

44. Operating Framework for the Inspection of Air-Conditioning Systems – Existing Buildings. Further information available at: https://www.gov.scot/binaries/content/documents/govscot/publications/factsheet/2013/06/inspection-air-conditioning-systems-operational-framework/documents/inspection-air-conditioning-system-over-12kw-operational-framework-pdf/inspection-air-conditioning-system-over-12kw-operational-framework-pdf/govscot%3Adocument/inspection%2Bof%2Bair%2Bconditioning%2Bsystem%2Bover%2B12kw%2B-%2Boperational%2Bframework.pdf (

45. Energy Efficient Scotland: route map, Scottish Government, 2018. Further information available at: https://www.gov.scot/publications/energy-efficient-scotland-route-map/

46. A low carbon strategy for Scotland: The Sullivan Report. Panel appointed by Scottish Ministers and Chaired by Lynne Sullivan, 2007. Available at: https://www.gov.scot/publications/a-low-carbon-strategy-scotland-sullivan-report/ and 2013 report update available at: https://www2.gov.scot/sullivanreport

Annexes - Key Indicators & Decisions

Key Indicators & Decisions - General Background

no	Key Indicators & Decisions – General Background	Description / value / response	Comments
01.01	Definition of public buildings (according to article 9 b)	Not available	Transposition of Article 9 in respect of new buildings is achieved by setting minimum energy performance requirements in building regulations. Requirements for new non-domestic buildings do not differentiate between new buildings occupied and owned by public authorities and other new buildings.
01.02	Definition of public buildings used by the public (according to article 13)	The calculated energy EPC required on construction, sale or rental is also displayed in "public buildings". The requirement applies to: • Buildings occupied by public authorities with a floor area >250 m² and frequently visited by members of the public. Qualifying occupiers must obtain and display an EPC. • Other non-domestic buildings with a floor area >250 m² and frequently visited by members of the public. Qualifying occupiers must display the EPC only if they have one.	No definition in legislation. However, the criteria of qualifying buildings are identified in guidance clause 6.9.3 of standard 6.9 'Energy Performance Certificates' within the Scottish Non-domestic Technical Handbook. Further information available at: https://www.gov.scot/publications/building-standards-technical-handbook-2019-non-domestic/6-energy/6-9-energy-performance-certificates/
01.03	Number of residential buildings	2.6 million* homes in Scotland (estimated)	(*) Housing Statistics 2019: Key Trends Summary, Scottish Government, September 2019. Available at: https://www.gov.scot/publications/housing-statistics-scotland-2019-key-trends-summary/
01.04	Number of non-residential buildings	196,000* non-domestic buildings in Scotland (estimated)	(*) Scotland's non-domestic energy efficiency baseline: report, Scottish Government, December 2018. Available at: https://www.gov.scot/publications/scotlands-non-domestic-energy-efficiency-baseline/

no	Key Indicators & Decisions – General Background	Description / value / response	Comments
01.05	If possible, share of public buildings included in the number given in 01.04	Not available	Recorded data do not differentiate between buildings occupied by public authorities and other buildings.
01.06	If possible, share of commercial buildings included in the number given in 01.04	Retail and financial premises account for 32% of the 196,000 non-domestic buildings outlined in 01.04*. This is approximately 62,000 premises. A further breakdown of these figures is not available.	(*) Scotland's non-domestic energy efficiency baseline: report, Scottish Government, December 2018. Available at: https://www.gov.scot/publications/scotlands-non-domestic-energy-efficiency-baseline/
01.07	Number of buildings constructed per year (estimate)	Domestic: See 01.08 Non-domestic: See 01.09	
01.08	If possible, share of residential buildings constructed per year (estimate, included in the number given in 01.07)	New domestic building completions (Scotland)*: 2016-2017: 17,201 2017-2018: 17,623 2018-2019: 21,292	(*) Housing Statistics for Scotland 2019: Key Trends Summary, Scottish Government, September 2019. Available at: https://www.gov.scot/publications/housing-statistics-scotland-2019-key-trends-summary/
01.09	If possible, share of non-residential buildings constructed per year (estimate, included in the number given in 01.07)	New non-domestic building completions (Scotland): 2019: 211 2018: 438 2017: 324	Statistical data is not published, but has been derived from EPC dataset published at: https://statistics.gov.scot/data/non-domestic-energy-performance-certificates
01.10	Useful floor area of buildings constructed per year in million square meters (estimate)	New domestic building completions (Scotland): 2019: 2.3 2018: 1.9 2017: 1.5 New non-domestic building completions (Scotland): 2019: 0.69 2018: 0.76 2017: 0.73	Statistical data is not published but has been derived from EPC datasets published at: Domestic: https://statistics.gov.scot/data/domestic-energy-performance-certificates Non-domestic: https://statistics.gov.scot/data/non-domestic-energy-performance-certificates

Key Indicators & Decisions - New Buildings

no	Key Indicators & Decisions – New Buildings	Description / value / response	Comments
02.01	Are building codes set as overall value, primary energy, environment (CO_2), reference building or other	New buildings must meet a performance target set as greenhouse gas emissions (CO_2). Targets are defined by applying a published guidance to calculate CO_2 emissions for a 'notional building' which the actual building must not exceed. The current 2020/21 review will introduce a primary energy target as the principal compliance metric. Individual elements within a new building must also meet minimum performance standards. This provision covers all building fabric elements and technical building systems installed.	Domestic buildings: Building Standards Technical Handbook 2019: domestic. Scottish Government, September 2019. Available at: https://www.gov.scot/publications/building-standards-technical-handbook-2019-domestic/ Non-domestic buildings: Building Standards Technical Handbook 2019: non-domestic. Scottish Government, September 2019. Available at: https://www.gov.scot/publications/building-standards-technical-handbook-2019-non-domestic/
02.02	Requirements for energy performance of residential buildings in current building code	Technical Handbooks support the implementation of Building Regulations energy requirements and set out ten criteria for new domestic and non-domestic buildings. 1. Ensure the Building CO_2 Emission Rate (BER) is no greater than the Target Emission Rate (TER). TER is set using a notional building specification which includes a low carbon equipment element e.g. photovoltaic panels. 2. Reduce heat losses through the envelope (including minimum fabric performance, thermal bridging and air permeability). Scottish Accredited Construction	Domestic buildings: Building Standards Technical Handbook 2019: domestic. Scottish Government, September 2019. Available at: https://www.gov.scot/publications/building-standards-technical-handbook-2019-domestic/

no	Key Indicators & Decisions – New Buildings	Description / value / response	Comments
		Details for linear thermal bridging are available and airtightness testing is generally required. 3. Energy efficient space heating and hot water systems, including controls, minimum performance, etc. 4. Minimum insulation levels for pipes, ducts and vessels. 5. Energy efficient lighting (e.g. minimum 60 lamp lumens/circuit-watt in offices) and controls. 6. Reduce overheating (e.g. through the proportion and orientation of translucent glazing, solar shading/control, thermal mass, etc.) and ensure energy efficient mechanical ventilation and air-conditioning (AC) and controls. 7. Commissioning of building services to achieve optimum energy efficiency. 8. Information for building occupiers on the operation and maintenance of building services and energy supply. 9. The provision of Energy Performance Certificates (EPCs). 10. Metering of fuel and power of buildings (or parts) and of end-uses (non-domestic building only).	

no	Key Indicators & Decisions – New Buildings	Description / value / response	Comments
02.03	Requirements for energy performance of non-residential commercial buildings in current building code	Ditto 02.02	Non-domestic buildings: Building Standards Technical Handbook 2019: non-domestic. Scottish Government, September 2019. Available at: https://www.gov.scot/publications/building-standards-technical-handbook-2019-non-domestic/
02.04	Requirements for energy performance of non-residential public buildings in current building code	Ditto 02.02	Ditto 02.02
02.05	Is the performance level of nearly zero energy (NZEB) for new buildings defined in national legislation?	Statutory Instruments (SI) No. 71* states: “Every building must be designed and constructed in such a way that […] (c) it is a nearly zero-energy building” The NZEB performance level is not defined in national legislation. SI No. 71* defines NZEB as “a building that has a very high energy performance, as determined in accordance with a methodology approved under Regulation 7, of the Energy Performance of Buildings Scotland) Regulations 2008(a), where the nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on site or nearby.” The approved methodology does not set a performance level for NZEB.	(*) Statutory Instruments No. 71: The Building (Energy Performance of Buildings) (Scotland) Amendment Regulations 2016. Available at: https://www.legislation.gov.uk/ssi/2016/71/contents/made
02.06	Nearly zero energy (NZEB) level for	Ditto 02.05	

no	Key Indicators & Decisions – New Buildings	Description / value / response	Comments
	residential buildings (level for building code)		
02.07	Year / date for nearly zero energy (NZEB) as level for residential buildings (as indicated in 02.04)	For all buildings (excluding buildings occupied by public authorities); 31 December 2020.	Statutory Instruments No. 71: The Building (Energy Performance of Buildings) (Scotland) Amendment Regulations 2016. Available at: https://www.legislation.gov.uk/ssi/2016/71/contents/made
02.08	Nearly zero energy (NZEB) level for all non-residential buildings (level for building code)	Ditto 02.05	Ditto 02.05
02.09	Year / date for nearly zero energy (NZEB) as level for non-residential buildings (as indicated in 02.06)	For buildings occupied by public authorities; 1 January 2019. For other new buildings, see 02.07.	Ditto 02.07.
02.10	Are nearly zero energy buildings (NZEB) defined using a carbon or environment indicator?	Carbon based. Also see 02.01.	Statutory Instruments No. 71: The Building (Energy Performance of Buildings) (Scotland) Amendment Regulations 2016. Available at: https://www.legislation.gov.uk/ssi/2016/71/contents/made
02.11	Is renewable energy a part of the overall or an additional requirement?	Part of the overall requirement.	Statutory Instruments No. 71: The Building (Energy Performance of Buildings) (Scotland) Amendment Regulations 2016. Available at: https://www.legislation.gov.uk/ssi/2016/71/contents/made
02.12	If renewable energy is an additional requirement to	Not applicable	

no	Key Indicators & Decisions – New Buildings	Description / value / response	Comments
	NZEB, please indicate level		
02.13	Specific comfort criteria for new buildings, provide specific parameters for instance for airtightness, minimum ventilation rates	See 02.02	

Key Indicators & Decisions – Existing Buildings

no	Key Indicators & Decisions – Existing Buildings	Description / value / response	Comment
03.01	Is the level of nearly zero energy (NZEB) for existing buildings set in national legislation?	No	
03.02	Is the level of nearly zero energy (NZEB) for existing buildings similar to the level for new buildings?	Not defined	
03.03	Definition of nearly zero energy (NZEB) for existing residential buildings (if different from new buildings)	Not defined	
03.04	Definition of nearly zero energy (NZEB) for existing non-residential buildings (if different from new buildings)	Not defined	
03.05	Overall minimum requirements in case of major-renovation	Building Regulations apply to new works on existing buildings. Exceptions are detailed in the Technical Handbooks*. Similarly to England, an elemental approach has been adopted for existing buildings. In non-domestic buildings, under certain circumstances, the existing services must be improved to meet the current performance recommendations in the Technical Handbook. This approach is referred to as “consequential improvements”.	(*) Domestic buildings: Building Standards Technical Handbook 2019: domestic. Scottish Government, September 2019. Available at: https://www.gov.scot/publications/building-standards-technical-handbook-2019-domestic/ Non-domestic buildings: Building Standards Technical Handbook 2019: non-domestic. Scottish Government, September 2019. Available at: https://www.gov.scot/publications/building-standards-technical-handbook-2019-non-domestic/
03.06	Minimum requirements for individual building	Ditto 03.05	

no	Key Indicators & Decisions – Existing Buildings	Description / value / response	Comment
	parts in case of renovation		
03.07	National targets for renovation in connection to Long Term Renovation Strategy (number or percentage of buildings)	Not defined	
03.08	National targets for renovation in connection to Long Term Renovation Strategy (expected reductions and relevant years)	Not defined	

Key Indicators & Decisions - Energy Performance Certificates

no	Key Indicators & Decisions – Energy Performance Certificates	Description / value / response	Comment
04.01	Number of energy performance certificates per year (for instance average or values for of 3-5 years)	Scotland* Domestic EPCs: 241,580 Non-domestic EPCs: 6,847	(*) Average value per 12 months for five-year period April 2015 to March 2020 Data has been extracted from the Scottish Energy Performance Certificate Register (SEPCR). This data differs from the published data, which excludes historical lodgements.
04.02	Number of EPCs since start of scheme	Scotland* Domestic EPCs (total to December 2019): 2,510,202 Non-domestic EPCs (total to December 2019): 49,208	Please see 04.01.
04.03	Number of EPCs for different building types	**Domestic buildings (estimated)** Bungalow: 297,709 (11.86%) Flat: 1,028,430 (40.97%) House: 1,128,084 (44.94%) Maisonette: 55,978 (2.23%) **Total: 2,510,202** **Non-domestic buildings (estimated)** Administration, Business, Commerce: 39,858 (81.0%) Culture, Leisure, Sport, Travel: 3,641 (7.4%) Education: 2,559 (5.2%) Health & Social Care: 2,756 (5.6%) Law & Order, Emergency Services: 295 (0.6%) Transport: 49 (0.1%)	Source: published EPC data from 2013 to December 2019: Domestic: https://statistics.gov.scot/data/domestic-energy-performance-certificates Non-domestic: https://statistics.gov.scot/data/non-domestic-energy-performance-certificates Note that (i) Percentages for each building type provided as data only recorded centrally from 2013, this data is not published by the Register. (ii) The published dataset does not include any assessments that have subsequently been replaced by a newer record. (iii) The numbers of EPCs for different building types have been estimated through a combination of the published data (building type totals) and unpublished data (percentages of different building types). Therefore, these EPC numbers are approximate.

no	Key Indicators & Decisions – Energy Performance Certificates	Description / value / response	Comment
		Other: 98 (0.2%) **Total: 49,208**	
04.04	Number of assessors	Scotland: 2,742	Data has been collated from annual returns received from the Approved Organisations / Protocol Organisations in 2019. This data has not been published previously.
04.05	Basic education requirements for assessors	The Scottish Operating Framework requires Approved Organisations to reference the UK National Occupational Standards (NOS) when establishing requirements for Energy Assessors. NOS specify the qualifications and skills, which Energy Assessors should meet to be accredited to produce regulatory outputs. Different accreditations are available depending on the building type, the software to be used, and the type of regulatory outputs to be produced.	
04.06	Additional training demands for assessors	The Scottish Operating Framework requires Continued Professional Development (CPD). A minimum level of CPD hours is specified by each Approved Organisation.	Approved Organisations: Operational Framework. Scottish Government, December 2012. Available at: https://www.gov.scot/publications/energy-performance-certificate-approved-organisations-operational-framework/
04.07	Quality assurance system	Under the Operating Framework, Approved Organisations have Quality Assurance responsibilities. Since 2013, Approved Organisations must check a representative sample of EPCs. Checks repeat the EPC calculations using data on the register. In 2019, 246,727 EPCs were produced and 5,645 (2.29%) were checked. Most checks are desk-based. Assessors' outputs are checked every six months minimum. Poor performance can lead to targeted auditing, retraining, suspension, or being struck off.	Available at: https://www.gov.scot/publications/energy-performance-certificate-approved-organisations-operational-framework/

no	Key Indicators & Decisions – Energy Performance Certificates	Description / value / response	Comment
		Government audits Approved Organisations to ensure compliance with the Operating Framework. Approved Organisations who fail to meet the terms of the Framework are subject to a schedule of corrective action and may have their agreement terminated.	
04.08	National database for EPCs	Yes	Scottish Energy Performance Certificate Register. Available at: https://www.scottishepcregister.org.uk/
04.09	Link to national information on EPCs / Database	https://www.scottishepcregister.org.uk/ (https://www.scottishepcregister.org.uk/)	Scottish Energy Performance Certificate Register.

Key Indicators & Decisions - Smart Buildings and Building Systems

no	Key Indicators & Decisions – Smart Buildings and Building Systems	Description / value / response	Comment
05.01	Is there a national definition of smart buildings?	No	
05.02	Are there current support systems for smart buildings?	No	
05.03	Are there currently specific requirements for technical building systems (for instance in building codes)?	Yes, see Scotland Building Services Compliance Guides and Technical Handbooks.	Domestic: Building Standards Technical Handbook 2019: domestic. Scottish Government, September 2019. Available at: https://www.gov.scot/publications/building-standards-technical-handbook-2019-domestic/ Domestic Building Services Compliance Guide for Scotland, The Scottish Government, 2015 Edition. Available at: https://www.gov.scot/publications/domestic-building-services-compliance-guide-for-scotland/ Non-domestic: Building Standards Technical Handbook 2019: non-domestic. Scottish Government, September 2019. Available at: https://www.gov.scot/publications/building-standards-technical-handbook-2019-non-domestic/ Non-domestic Building Services Compliance Guide for Scotland, The Scottish Government, 2018. Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/factsheet/2018/12/building-standards-list-of-

no	Key Indicators & Decisions – Smart Buildings and Building Systems	Description / value / response	Comment
			guidance/documents/non-domestic-building-services-compliance-guide-for-scotland-2018/non-domestic-building-services-compliance-guide-for-scotland-2018/govscot%3Adocument
05.04	Are there current requirements for automatics (for instance in building codes)?	Yes, see Scotland Building Services Compliance Guides and Technical Handbooks. Further provisions for BACs are expected to be introduced for AC systems above 290kW.	
05.05	Chosen option A or B for heating systems (inspection or other measures)	Option B	
05.06	Number of heating inspections; reports per year (if option A)	Not applicable	
05.07	Chosen option A or B for cooling systems (inspection or other measures)	Option A	
05.08	Number of air-conditioning / cooling system inspections; reports per year (if option A)	In 2019, 389 AC inspection reports were produced	Data returns to Local Government and Communities Directorate from Approved Organisations, 2019 Note that due to the Scottish climate, there are few qualifying AC systems.
05.09	Is there a national database for heating inspections?	Not applicable	As per 05.05, the UK decided to provide advice on boilers/ heating systems, rather than implement an inspection regime.

no	Key Indicators & Decisions – Smart Buildings and Building Systems	Description / value / response	Comment
05.10	Is there a national database for cooling / air-conditioning inspections?	No	Approved Organisations maintain records to allow Government compliance audits.
05.11	Are inspection databases combined with EPC databases for registration of EPCs and inspection reports?	Not applicable	
05.12	Link to national information on Inspection / Database	Not applicable	

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