United Kingdom

Building Code Implementation - Country Summary


Section I: Code Development

History

Starting year


As a member of the European Union, the United Kingdom was required to comply with the Energy Performance of Buildings Directive (EPBD) passed in 2002 and recast in 2012. The UK implemented the directive in 2005 by adding to the National Building Regulation (Part “L”) requirements for energy efficiency and CO₂ emissions standards for new and existing buildings.

In 2011, the “built performance” emissions from new homes could not exceed: 10 kg CO₂ (eq) /m²/year for detached houses; 11 kg CO₂ (eq) /m²/year for other houses; 14 kg CO₂ (eq) /m²/year for low rise apartment blocks. New regulations in 2014 improved these thresholds by 6%. The current version of the regulations came into force in April 2014.

These regulations only apply to England and Wales, whereas Scotland and Northern Ireland are responsible for incorporating European directives at their national levels. Scotland relies on its own national regulation, which did not include energy provisions until 2003 with the Building (Scotland) Act. Northern Ireland has adopted two relevant pieces of legislation: the Building (Amendment) Regulations (Northern Ireland) 2006 and the Energy Performance of Buildings (Certificates and Inspections) Regulations (Northern Ireland) 2008.¹

Timeline/road map

England and Wales plan to issue their next building regulation revisions in 2016. Scotland has created a panel in to advise on the development of a low carbon building standards strategy to increase energy efficiency and reduce carbon emissions.

¹ http://www.epbd-ca.org/Medias/Pdf/country_reports_14-04-2011/England_and_Wales_Scotland_and_Northern_Ireland.pdf
## Existing codes

### Structural coverage

<table>
<thead>
<tr>
<th>Scale (National, regional, local, etc.)</th>
<th>Building size threshold</th>
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</thead>
<tbody>
<tr>
<td><strong>Residential buildings</strong></td>
<td></td>
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<tr>
<td>England and Wales</td>
<td>All new residential buildings must comply.</td>
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<tr>
<td>Northern Ireland</td>
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</tr>
<tr>
<td>Scotland</td>
<td>The code exempts buildings with heat consumption rated below 25 W/m² floor area and those that are installed solely for the purpose of frost protection.</td>
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<tr>
<td><strong>Existing buildings for retrofits</strong></td>
<td></td>
</tr>
<tr>
<td>England and Wales</td>
<td>The code covers existing buildings with a total useful floor area of over 1,000 m² where the proposed work includes extension, new fixed building services or increased capacity of fixed building services.</td>
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<tr>
<td>Northern Ireland</td>
<td>No known code for existing buildings.</td>
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<td>Scotland</td>
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</tr>
<tr>
<td><strong>Commercial buildings</strong></td>
<td></td>
</tr>
<tr>
<td>England and Wales</td>
<td>The code exempts stand-alone buildings with a total useful floor area of less than 50 m².</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>No known code for commercial new buildings.</td>
</tr>
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</tbody>
</table>
England and Wales added energy consumption limits to the National Building Regulation to implemented EPBD. Scotland adopted the Building (Scotland) Act, which introduced energy efficiency requirement, while Northern Ireland issued the Building (Amendment) Regulations (Northern Ireland) 2006. All of these codes are mandatory, and the main approach of compliance is performance-based. Regional governments oversee compliance with the support from third parties.

**Measures covered**

- Envelope
- HVAC
- Service water heating
- Lighting
- Electric power
- Renewable energy
- Maintenance
- Option for performance-based approach [This appears to me the main approach.]

**Correction/new codes**

*Motivation/policies for improving existing building energy codes*
Achieve "zero carbon buildings" by 2016 (homes) and 2019 (all buildings).

*Revision schedule*
England and Wales are to revise the building code in 2016.

*Involvement of stakeholders in the development of codes*
The government uses the Zero Carbon Hub. There is also widespread formal consultation on any proposals for changes to building regulations with industry and other key stakeholders. There is also a standing Building Regulations Advisory Committee – see https://www.gov.uk/government/organisations/building-regulations-advisory-committee
Section II: Code Implementation

Administration

Administrative/enforcement structures

Government agency
Local authorities oversee compliance with building regulations and target emission rates.

Private sector/third party
Third parties submit reports with calculations showing compliance.

Design-Construction – Pre-occupancy check

<table>
<thead>
<tr>
<th>The role of federal/central government</th>
<th>Design</th>
<th>Construction</th>
<th>Pre-occupancy check</th>
</tr>
</thead>
<tbody>
<tr>
<td>The local authority oversees that building work complies with the building regulations, unless it is under the control of an Approved Inspector. Builders and developers are statutorily required to inform Building Control Bodies of a new build dwelling’s as-built Target Emission Rate (TER) and Design Emission Rate (DER). Building Control Bodies reviews Building Emission Rate (BER) to ensure its consistency with the construction as built.</td>
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<table>
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<tr>
<th>The role of state/provincial and local government</th>
<th>Design</th>
<th>Construction</th>
<th>Pre-occupancy check</th>
</tr>
</thead>
<tbody>
<tr>
<td>Third parties are required to submit a report that provides calculations that show compliance with the building regulations as well as a Target Emission Rate (TER) and Design Emission Rate (DER) for the proposed dwelling. This report is also</td>
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<tr>
<th>Involvement of third parties and their role</th>
<th>Design</th>
<th>Construction</th>
<th>Pre-occupancy check</th>
</tr>
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<tr>
<td>Performance of buildings as-built should be consistent with the calculated Building Emission Rate (BER). Third parties must submit calculations of the Building Emission Rate (BER) to the Building Control Bodies after</td>
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</table>
necessary to obtain an energy performance certificate. For commercial buildings, third parties might perform a pressure test to show that the air permeability is within reasonable limits and to reflect any changes during construction and confirm the as-constructed building is consistent with the Building Emission Rate (BER).

completion and take account of: a) any changes in performance between design and construction; and b) the achieved air permeability, ductwork leakage and commissioned fan performance. Also, a third party must submit a Commercial Energy Performance Certificate to the Building Control Bodies to obtain a completion certificate.

Requirements for commissioning before occupancy

In England, Paragraph L1(b)(iii) of Schedule 1 to the Building Regulations requires fixed building services to be commissioned by testing and adjusting them, if as-constructed buildings vary from the plan.

Tools used for compliance checking

Software used for compliance checking

For England and Wales, the Government and the Building Research Establishment have developed the Standard Assessment Procedure (SAP) methodology (for dwellings with a total floor area up to 450 m²) and Simplified Building Energy Model (SBEM) methodology (for offices and retail units through to schools, hospitals, hotels, warehouses and airport terminals, amongst many others). (Description of SAP is available here http://www.bre.co.uk/filelibrary/SAP/2012/SAP2012_9-92_software.pdf). These methodologies include software for rating of buildings in England and Wales (not available for Scotland and Northern Ireland).

Regulations in all jurisdictions of the UK set a limit on the permissible annual CO₂ emissions from new buildings, expressed in kilograms per m² of floor area (kg/m²). SAP offers calculations SAP demonstrating compliance with regulations for the conservation of fuel and power and/or limitation of energy use. Other tools used to check compliance
Capacity building and education

*Education and capacity building programs that support code implementation*

The regional governments have worked with professional bodies, trade associations and accreditation schemes to ensure a smooth implementation process. Local authority building control (LABC) is a not-for-profit membership organisation that represents all local authority building control teams in England and Wales.

Section III: Compliance & Enforcement

Penalties, incentives and other mechanisms for improving compliance

*Penalties for non-compliance with energy provisions in codes*
- Fines
- Rejection of construction permit

*Incentives/rewards to go beyond minimum required performance level*

Dwellings constructed to achieve net carbon emissions of zero over the year are exempt from the stamp duty tax.

*Other mechanisms to encourage compliance*

The Department for Communities and Local Government proposed a regulatory incentive under the 2013 revision to develop and use quality assurance processes to help ensure as-designed performance of new homes is delivered on completion.

The UK also has several voluntary labelling schemes that have built capacity in the design and construction of energy efficient buildings. These schemes include:
- BREEAM Domestic Refurbishment
- BREEAM New Construction
- BREEAM Non-Domestic Refurbishment
- BREEAM’s Code for Sustainable Homes
- New buildings Passive House

Compliance assessment

*The share of buildings using building energy simulation to comply with codes*

All
Airtightness testing required prior to compliance
Yes

Section IV: Building Materials & Energy Performance Certificates

Building materials (e.g., windows, insulation, HVAC, lighting)

Rating building materials

The Building Regulations (England and Wales) 2010 and the Building Regulations (Northern Ireland) 2010) require rating of building materials through the following acceptable schemes:

- CE marking under the Construction Products Regulation (305/2011/EU-CPR), which covers energy economy and heat retention
- CE marking under other EU directives and regulations, such as the Gas Appliances Directive
- British Standards, which are harmonized with the European standards used for CE marking;
- other national and international technical specifications, such as those prepared by ISO of other countries, that demonstrate that a product not covered by a harmonized European standard meets the performance requirements of the Building Regulations
- independent certification schemes, which must comply and not conflict with CE marking.

Testing by certified test labs
The UK Accreditation Service holds a schedule of testing laboratories.

Energy Performance Certificates

Energy Performance Certificates are not a voluntary labeling scheme, they are mandatory for all new buildings and when an existing building is sold or let.

Building codes and energy performance certificate
Building codes in the UK reference energy performance certificates (EPCs). The UK has adopted the Energy Performance of Buildings Directive (EPBD) and mandated EPBD EPC requirements in line with the European standards.

In England, Wales and Northern Ireland, an EPC for residential buildings provides a rating of the building’s overall energy efficiency on a scale from A (very efficient) to G (least efficient). A residential EPC primarily focuses on the potential costs and savings of different energy efficiency measures and contains an environmental impact rating in terms of CO₂ emissions. In non-residential buildings, EPCs show energy performance as a single CO₂-based asset rating against an A to G scale.
In Scotland, EPCs for residential buildings are very similar to England and Wales’, with the addition of a scale to provide an environmental impact (CO₂) rating. Non-residential EPCs show a banding based on absolute CO₂ emissions rather than the relative approach adopted in England and Wales (i.e., ‘actual building’ versus ‘reference building’).

Other voluntary EPC requirements include:
- BREEAM
- Passive House
- Zero Net Buildings (ZEB)

**Enforcement of codes and energy performance certificates**
In the UK a system incorporating most of the requirements of the EBPD, including energy performance certificates, has been in place for some years for dwellings. Both the code and energy performance certificates use the same Standard Assessment Procedure for Energy Rating of Dwellings, or SAP. A similar methodology has been developed for non-residential buildings.

**Existence of national registry database for energy performance certificates**
The UK follows a “regional” approach to the EPC registry spanning over three jurisdictions: one for England and Wales, one for Northern Ireland and one for Scotland. The EPC registry for England, Wales and Northern Ireland is operated by Landmark Information Group, which receives no government funding. It operates the register on behalf of the Secretary of State for the Department for Communities and Local Government. In Scotland, the Energy Savings Trust manages the EPC registry.