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# Wales Building Regulations 2014 Part L

Existing buildings

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### Introduction

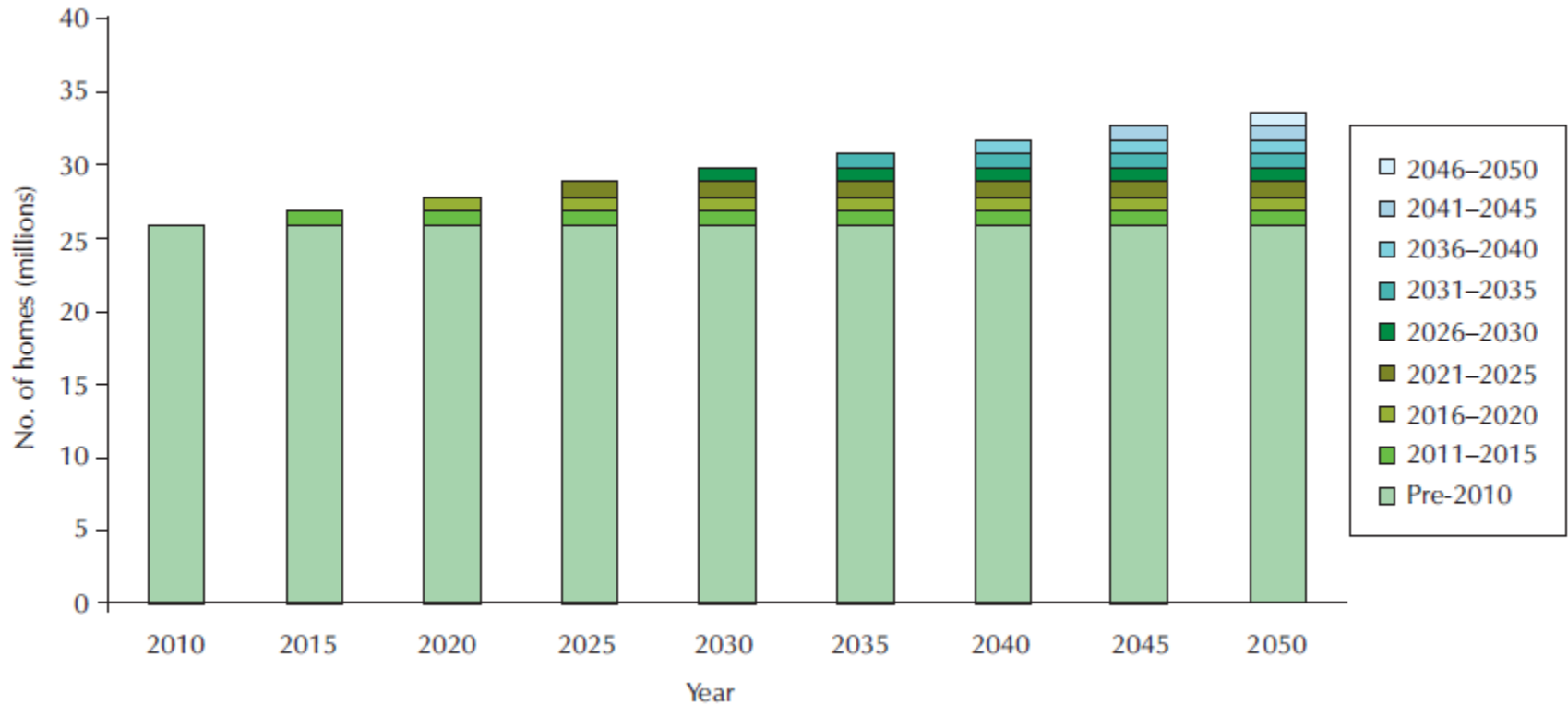
- Most attention is usually given to the energy performance standards of new buildings.
- The real opportunity for reducing national CO<sub>2</sub> emissions from the built environment is to improve the existing stock.
- To put it into context:

#### Domestic

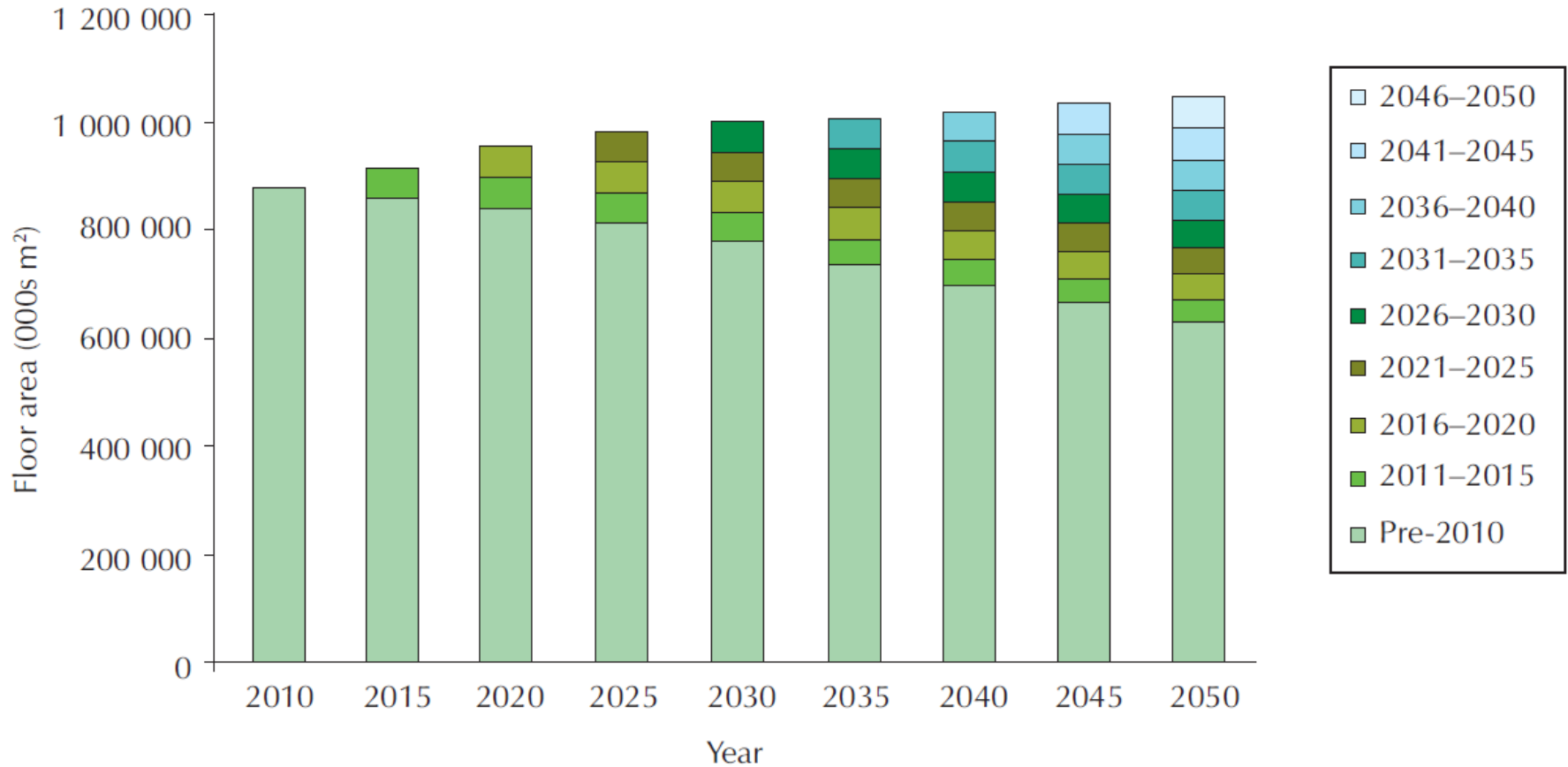
- there are around 1.3 million existing homes in Wales
- the new build rate has historically been 5,000 - 10,000 per annum.

#### Non-domestic

- there are around 50 million m<sup>2</sup> existing non-domestic building floor space in Wales
- the new build rate has historically been ~600,000m<sup>2</sup> per annum.



Source: "energy efficiency in new and existing buildings: comparative costs and CO<sub>2</sub> savings", BRE Trust



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### Introduction

- There are three main but related questions to achieving greater energy efficiency via Part L.
  - Can we improve the standards of energy efficiency required by Part L?
  - Can we improve levels of compliance?
  - Can we bring more building work into scope?
- In particular the first two issues can be interlinked
  - If the standards are set too high, building owners might seek to evade the regulations in order to avoid the “perceived” costs of compliance.

### Introduction

- The final set of amendments are close to those presented at consultation stage.
- The amendments were assessed in terms of their technical feasibility and their economic viability, and informed by stakeholder engagement including BRACW and consultation feedback.
- The published Impact Assessment shows that the amendments should have a net positive benefit over the lifetime of the policy.
  - Domestic: £56m
  - Non-Domestic: £16m

# DOMESTIC



## Energy efficiency standards for new thermal elements and replacement of controlled fittings

	Existing fabric standard	
	2010	2014
Wall (W/m <sup>2</sup> K)	0.28	0.21
Roof (W/m <sup>2</sup> K)	0.16/0.18	0.15
Floors (W/m <sup>2</sup> K)	0.22	0.18
Windows & Doors (W/m <sup>2</sup> K)	1.6	1.6

- 2014 values align with revised backstops for new dwellings

## Renovation of a thermal element

- ADL1B recommends minimum energy efficiencies where there is a significant renovation of a thermal element
  - 50% surface of element (or 25% of building envelope)
  - e.g. cladding/rendering external surface or dry-lining internal surface
- Standards to stay the same
  - Anecdotally, this is an area of poorer compliance
  - Practical guidance may achieve greater carbon savings

## Retained thermal element

- ADL1B recommends minimum energy efficiencies where there is a retained thermal element:
  - Material change of use (e.g. warehouse to flats)
  - Existing element becomes part of the thermal envelope e.g. through loft or garage conversion
- Previously needed to meet same standards as for renovation but only if the current u-value is poorer than a defined threshold
- The threshold limit is now removed
  - Wish to improve the efficiency of existing buildings
  - Material change of use effectively produces a new building
  - Anecdotally, the threshold is often not applied for conversions etc
  - Only need to undertake work if technically, functionally and economically feasible.

### Consequential Improvements

- For buildings > 1000m<sup>2</sup>, increasing the carbon footprint of the building requires consequential energy efficiency improvements.
- The principal of consequential improvements is now extending to buildings of all sizes.
- The triggers for consequential improvements and the necessary improvements have been tailored for the domestic market to produce a simple and low cost approach.

## Consequential Improvements

- Only triggered by extensions or increases in habitable space (e.g. loft or garage conversion) and not through building services.
- For dwellings
  - if the dwelling has uninsulated or partially insulated cavity walls, fill with insulation where suitable (may not be suitable for sites exposed to driving rain); and
  - if there is no loft insulation or < 200 mm thick, provide 250 mm insulation or increase it to 250 mm; and
  - upgrade any hot water cylinder insulation as follows:
    - i. if the hot water cylinder is uninsulated, provide a 160 mm insulated jacket; or
    - ii. if the hot water cylinder has insulated jacket <100 mm thick, add a further insulated jacket to achieve a total thickness of 160 mm; or
    - iii. if the hot water cylinder has factory-fitted solid foam insulation < 25mm thick, add an 80 mm insulated jacket.

## Consequential Improvements

- The measures are appropriate and proportionate to the building works
  - Where works increase floor area < 10m<sup>2</sup>, upgrade loft insulation only
- Undertaking these works at the same time as other work, should reduce hassle and help future proof the building
- Only required where technically, functionally and economically feasible
- The Impact Assessment estimates that there will be a net positive benefit of £51m from the extension of Consequential Improvements to all dwellings.

## Conservatories and porches

- Conservatories and porches are currently exempt:
  - Where the floor area is less than 30m<sup>2</sup>
  - Thermal separation between the dwelling and conservatory or porch
  - Where the heating system of the dwelling is not extended into the conservatory or porch
- The exemption is not being removed at this time
- However, the final bullet has been expanded such that it “contains no fixed heating appliance or extension of the buildings heating system.”
- The consultation proposed extending the exemption to cover use of cooling, as it is highly energy intensive. However, we decided not to do this.
  - In most cases conservatory cooling will not be a controlled service - the cooling would be provided by a portable air conditioner
  - More effective would be to limit the proportion of roof glazing but not one for this revision.

### Optional approaches for greater design flexibility

- For extensions, it provides two optional approaches
  - U-value trade-off approach
  - Equivalent carbon target approach
- Inconsistent how it applied to other building works
- Extend optional approaches to other building works.
  - Conversions
  - Renovations
  - Material changes of use
  - Works to windows and doors
  - Non-exempt conservatories and porches



### Building Services

- Where work involves the provision, extension, alteration or replacement of any fixed building service, ADL1b refers to DCLG's Domestic Building Services Compliance Guide for minimum energy efficiency standards.
- Changes limited to bringing into line with BSEN Standards and EU Directives
  - Ecodesign Directive 2009/125/EC
  - Energy Labelling Directive 2010/30/EU

# NON-DOMESTIC

## Energy efficiency standards for new thermal elements and replacement of controlled fittings

	Buildings essentially domestic in character	Other non-domestic buildings
Wall	$U=0.21 \text{ W/m}^2\text{K}$	$U=0.26 \text{ W/m}^2\text{K}$ ( <del><math>0.28 \text{ W/m}^2\text{K}</math></del> )
Floors	$U=0.18 \text{ W/m}^2\text{K}$	$U=0.22 \text{ W/m}^2\text{K}$
Pitched roof: insulation at ceiling	$U=0.15 \text{ W/m}^2\text{K}$ ( <del><math>0.16 \text{ W/m}^2\text{K}</math></del> )	
Pitched roof: insulation at rafter	$U=0.15 \text{ W/m}^2\text{K}$	$U=0.18 \text{ W/m}^2\text{K}$
Flat roof	$U=0.15 \text{ W/m}^2\text{K}$	$U=0.18 \text{ W/m}^2\text{K}$
Windows	WERS Band C or $U=1.6 \text{ W/m}^2\text{K}$	$U=1.8 \text{ W/m}^2\text{K}$

- First column covers cases where occupancy levels and internal gains are similar to dwellings e.g. student accommodation, care homes. Aligns with backstops for existing dwellings.

### Renovation of a thermal element

- As for domestic, standards to stay the same

### Retained thermal element

- Previously needed to meet same standards as for renovation but only if the current u-value is poorer than a defined threshold.
- As for domestic, threshold to be removed
- Only need to undertake work if technically, functionally and economically feasible.

## Consequential Improvements

- As in 2010 ADL2b, for buildings  $> 1000\text{m}^2$ , increasing the carbon footprint of the building requires consequential energy efficiency improvements
- Triggers are
  - An extension (or increase in habitable space)
  - Initial provision of a fixed building service
  - An increase in the installed capacity of any fixed building service
- Consequential measures are
  - Extensions: Select from measures in a table, to be capped at 10% of principal works. Measures selected to achieve payback in 15 years.
  - Services: Improve fabric in serviced areas and included additional measures as per extensions.

### Consequential Improvements

- In 2014 ADL2b, new requirement for non-dom buildings less than or equal to 1000m<sup>2</sup> to trigger consequential improvement measures.
- Triggers limited to:
  - extensions or increases in habitable space (e.g. conversions)
  - but not through increase in use of building services in the existing building
- Consequential measures are the same as for extensions to larger buildings
- For all non-dom buildings, can select consequential measures from
  - List of measures
  - EPC recommendation report
  - A Green Deal assessment
- Undertaking these works at the same time as other work, should reduce hassle and help future proof the building
- Only required where technically, functionally and economically feasible

### Conservatories and porches

- As for dwellings, the exemption is not being removed at this time
- Furthermore, similarly, the exemption has been expanded such that it the conservatory or porch must contain “no fixed heating appliance or extension of the building’s heating system.”

### Optional approaches for greater design flexibility

- For extensions, it provides two optional approaches
  - U-value trade-off approach
  - Equivalent carbon target approach
- Inconsistent how it applied to other building works
- Extend optional approaches to other building works.
  - Conversions
  - Renovations
  - Material changes of use
  - Works to windows and doors
  - Non-exempt conservatories and porches



## Building services

- Where work involves the provision, extension, alteration or replacement of fixed building services, ADL2b refers to DCLG Non-Domestic Building Services Compliance Guide for minimum energy efficiency standards
- As for dwellings, there have been changes to align with BSEN Standards and EU Directives
- There have been improvements in the energy efficiency standards e.g.
  - Improvements in comfort cooling (dependant on system type)
  - Average initial lighting efficacy increased from 55 to 60 luminaire lumens per circuit-watt
  - Improvements in SFP for air distribution systems (dependant on system type)
- An alternative approach has been introduced for setting minimum standards for lighting - LENI (Lighting Energy Numerical Indicator). It is a measure of the performance of lighting in terms of energy per square metre per year (kWh/m<sup>2</sup>/yr).

# New Formatted Approved Document

## Approved Documents

- Approved Documents have been redesigned to make the more accessible
  - Simpler layout
  - Simpler language
  - Introductory flowchart to help navigation
- In particular, we see that ADL1b and ADL2b will particularly benefit
  - Each section separately addresses a distinct type of building work
  - In general, each section is self-contained

## Sections within ADL1b

<b>1: Introduction</b>	<b>8: Work on windows and doors</b>
<b>2: Extensions</b>	<b>9: Conservatories and porches</b>
<b>3: Conversions</b>	<b>10: Indoor swimming pools</b>
<b>4: Consequential improvements</b>	<b>11: Optional approaches with more design flexibility</b>
<b>5: Renovations</b>	<b>12: Dwellings of architectural or historical interest</b>
<b>6: Material change of use</b>	<b>13: Notifying Building Control</b>
<b>7: Building Services</b>	<b>14: Providing information to the Occupier</b>

- ADL2b has a similar structure – main difference is Section 12 includes a greater range of buildings that are exempt or where special considerations apply.

## Sections within ADL1b

- Typically, multiple section will need to be reviewed.
- For example, if you are adding a new extension, renovate a roof and install replacement windows, the following sections should be followed.

<b>1: Introduction</b>	<b>8: Work on windows and doors</b>
<b>2: Extensions</b>	<b>9: Conservatories and porches</b>
<b>3: Conversions</b>	<b>10: Indoor swimming pools</b>
<b>4: Consequential improvements</b>	<b>11: Optional approaches with more design flexibility</b>
<b>5: Renovations</b>	<b>12: Dwellings of architectural or historical interest</b>
<b>6: Material change of use</b>	<b>13: Notifying Building Control</b>
<b>7: Building Services</b>	<b>14: Providing information to the Occupier</b>

**ANY QUESTIONS?**

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