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The Future Homes Standard & Future Buildings Standard

Background

On **15th of December 2021**, DLUHC published new standards for

- **Ventilation (Approved Document F)**
- **Energy Efficiency (AD L)**
- **Overheating (AD O)**
- **Infrastructure for Charging Electric Vehicles (AD S)**

These standards and the legislation behind them come into force on the **15th of June 2022**.

The changes made in energy efficiency are an interim step ahead of the full Future Homes and Buildings Standards which come into force from 2025.

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Part L 2021 and the pathway to the Future Homes Standard

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Why are we doing this?

CB6

- 78% reduction in emissions by 2035

Heat and buildings

- 17% of our national emissions, the vast majority of which comes from heating

2050

- Heat and buildings will need to be almost completely decarbonised to meet our overall 2050 net zero target

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Future Homes Standard (FHS) Consultation – Background

In October 2019, we opened our consultation on energy efficiency and ventilation requirements for new homes

- We consulted on:
  - Plans for the FHS to be introduced in 2025
  - Options for interim increase to energy efficiency requirements in 2021
  - Simplified and strengthened ventilation guidance
  - Airtightness guidance
  - improving the as-built performance of constructed homes.

- We received 3310 responses from a variety of industries and members of the public.

- Some key issues raised through consultation included: Performance metrics; Role of local planning authorities in setting energy efficiency standards; Transitional arrangements; and some wider issues outside consultation scope regarding energy efficiency of buildings.

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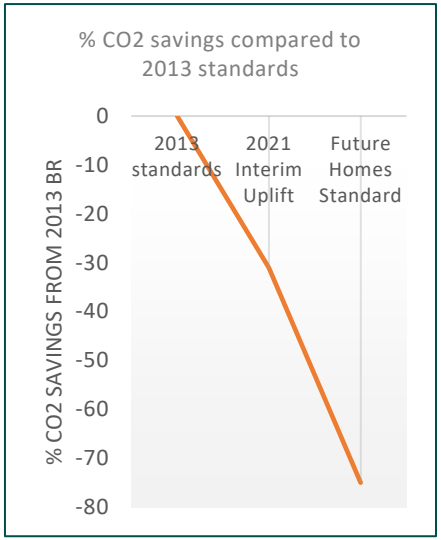
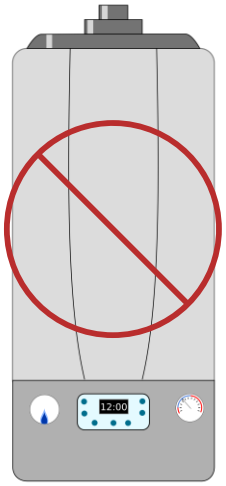
2025 Future Homes & Buildings Standard

- 75% lower CO_2 emissions for new homes built from 2025
- Grid decarbonisation - Zero Carbon Ready standard, no further retrofit work needed
- Part L 2021 Uplift as *interim tighter standard* – building up skills and supply chains
- **Very high fabric standards, technology neutral**
  - Compliance simplest and lowest cost with heat pumps
  - Will consult on the feasibility of ending the connection of new homes to the gas grid





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Implementation timeline

Phase 1: Introduce the interim uplift

- **Dec 2021** – Interim Part L, F and Overheating regulations made for domestic and non-domestic buildings
- **June 2022** – Interim Part L, Part F and Overheating regulations come into effect

Phase 2: Technical work and engagement

- **Autumn 2021 – Summer 2022** – research and analysis to develop proposed technical specification
- **Summer 2022 – 2024** – develop sector specific guidance and embed understanding of the FHS

Phase 3: Consultation and Policy Development

- **Spring 2023** – Technical consultation on the proposed specification of the Future Homes & Buildings Standards

Phase 4: Full FHS Implementation

- **2024** – Part L FHS & FBS Regulations made
- **2025** – Part L FHS & FBS regulations come into effect

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PART L 2021

ENERGY EFFICIENCY IN NEW DWELLINGS

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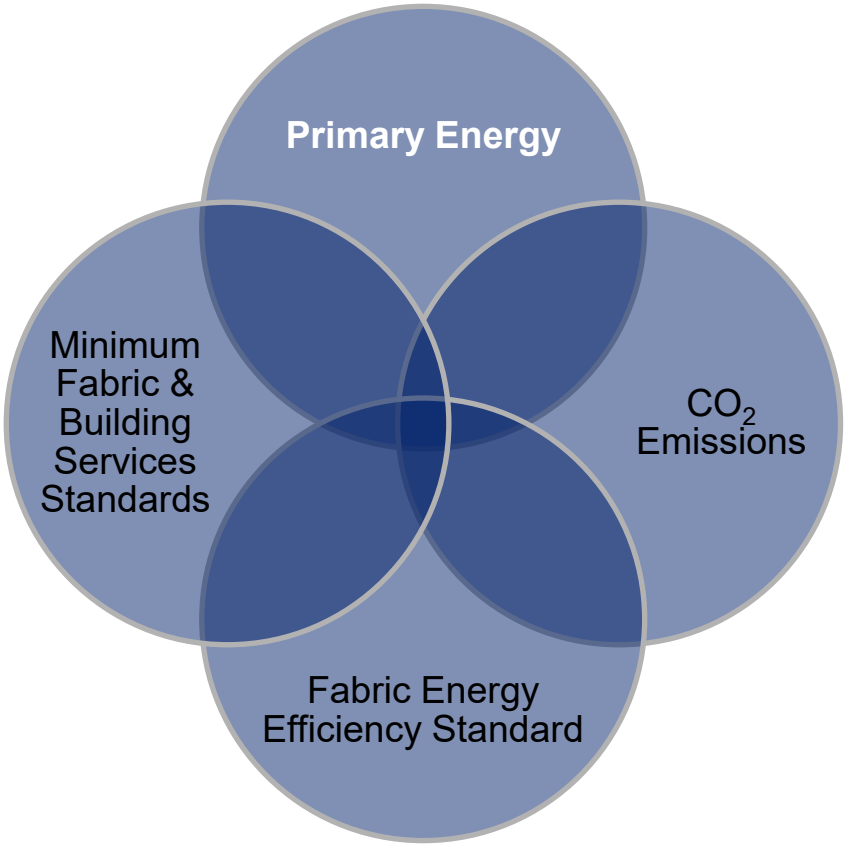
Notional building specifications

	Current 2013 Part L standard	2021 Part L Standard	Indicative FHS specification
Floor U-value (W/m2.K)	0.13	0.13	0.11
External wall U-value (W/m2.K)	0.18	0.18	0.15
Roof U-value (W/m2.K)	0.13	**0.11**	0.11
Window U-value (W/m2.K)	1.4	**1.2**	0.8
Door U-value (W/m2.K)	1.0 - opaque 1.2 – semi-glazed	**1.0**	1.0
Air permeability at 50 Pa	5.0 m3/(h.m2)	5.0 m3/(h.m2)	5.0 m3/(h.m2)
Heating appliance	Gas boiler	Gas boiler	Low-carbon heating (e.g. Heat pump)
Heat Emitter type	Regular radiators	**Low temperature heating**	Low temperature heating
Ventilation System type	Natural (with extract fans)	Natural (with extract fans)	Natural (with extract fans)
PV	No	**40% floor area**	None
Wastewater heat recovery	No	**Yes**	No

Performance metrics



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Minimum Fabric

Element	Current 2013 Part L standard -U-value (W/m2.K)	2021 Part L Standard - U-value (W/m2.K)
External walls	0.30	0.26
Party walls	0.20	0.20
Floor	0.25	0.18
Roof	0.20	0.16
Windows	2.00	1.6
Rooflights	2.00	2.2 (horizontal position)
Door	2.00	1.6
Air permeability	10.0$m^3/(h \cdot m^2)$ at 50Pa	8m^3/m^2 at 50Pa

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Minimum standards for Building Services

Revisions to minimum building services efficiencies and controls for new dwellings (indicative Future Homes Standard (2025) standards)		
Application	Current 2013 standard	Final 2021 standard
Gas Boiler Efficiency	88% SEDBUK 2009	92% ErP
Heat Pump Efficiency	SCOP 'D' if ≤12kW/COP2.5	**COP 3.00 for space heating COP 2.00 for domestic hot water**
Comfort Cooling Efficiency	EER 2.4 if air cooled and EER 2.5 if water cooled	**SEER 4.00**
Lighting	45 light source lumens per circuit-watt	**75 light source lumens per circuit-watt**

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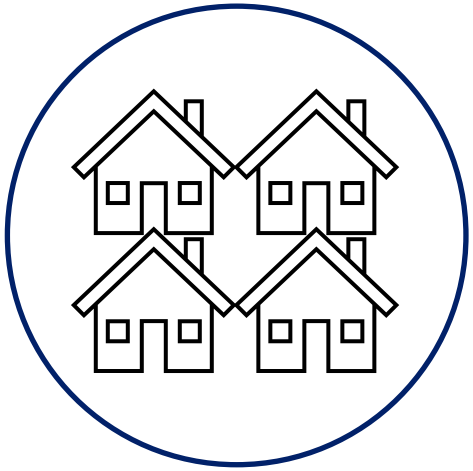
Airtightness



- All new dwellings must be airtightness tested – no more sample testing.
- New method for airtightness testing – TM23
- Pulse testing for airtightness available

PULSE

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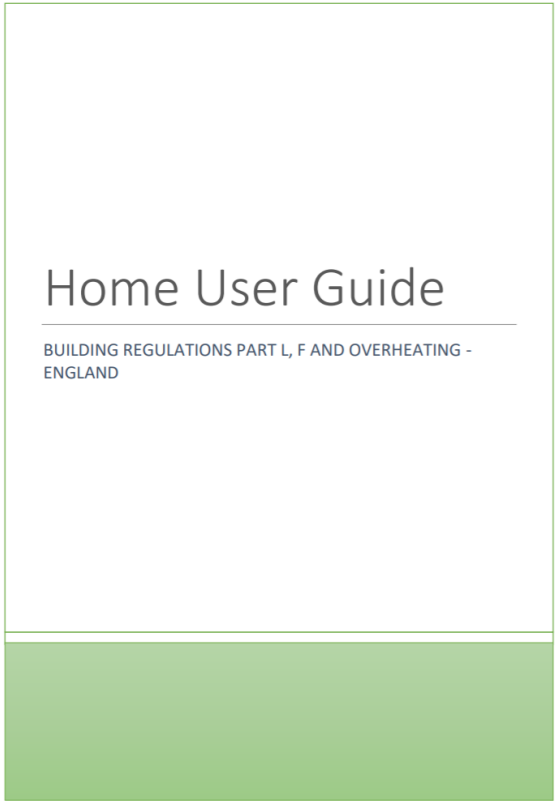
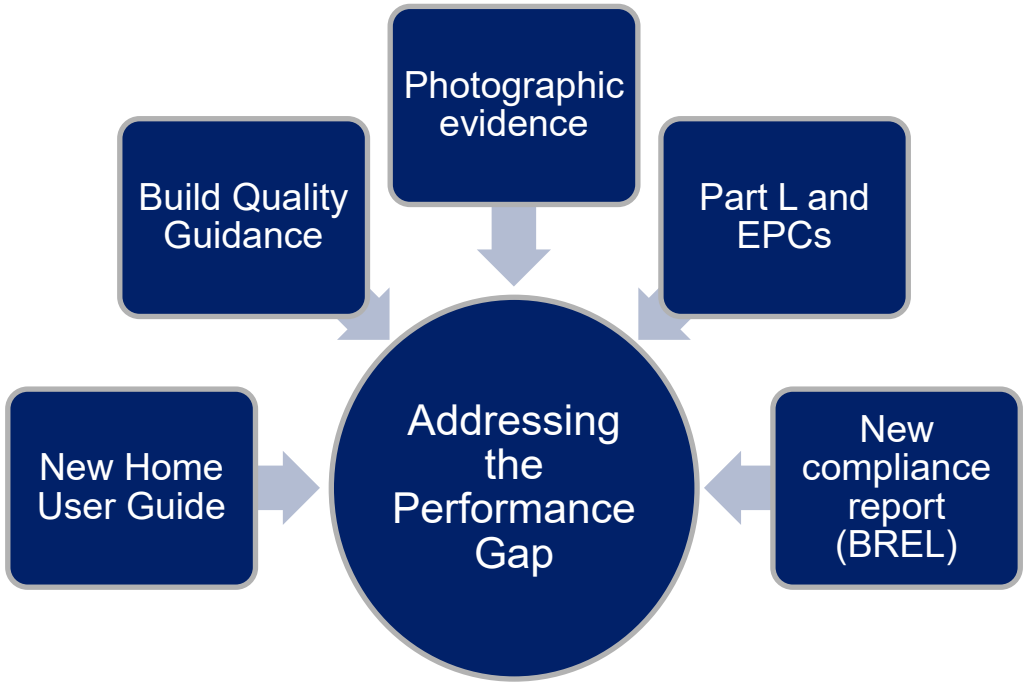
Performance Gap





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PART L 2021

ENERGY EFFICIENCY IN EXISTING DWELLINGS

Building Regulations

- The Building Regulations apply when building work is done to existing buildings.

- **The Future Buildings Standard consultation in 2021 also proposed increased energy efficiency standards in the following circumstances for existing homes:**
  - A new or replacement thermal element being built e.g. an extension
  - A controlled fitting being replaced e.g. a window replacement
  - A thermal element being renovated e.g. loft insulation
  - Building services being replaced or installed for the first time e.g. fixed lighting

- These changes were also implemented in the Building Regulations amendment in December 2021. More detail can be found in the Approved Documents online.

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PART F 2021

VENTILATION IN NEW DWELLINGS

Ventilation in new dwellings

- Ventilation standards simplified to make easier to follow.
- Performance-based standards for ventilation updated and individual VOCs as an alternative to total VOCs.
- Improved guidance on minimising the ingress of external pollutants.
- Natural ventilation guidance for more airtight homes removed
- Information in Home User Guide to homeowners on using ventilation systems and detailed commissioning checklist for systems

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PART F 2021

VENTILATION IN EXISTING DWELLINGS

Part F in existing homes

- New methods to determine if ventilation provision is sufficient when common energy efficiency work is undertaken
- New **Ventilation Guide**
  - Explains to home users the purpose of good ventilation
- **Revised ventilator sizes** when adding or refurbishing certain rooms.
- Refurbishing a **kitchen** or **bathroom**
  - Extra checks of ventilation devices
  - More ventilation might be needed if building less compliant

Replacing windows

If not mechanical supply and extract ventilated, replacing windows likely to reduce useful ventilation

Install background ventilation

Or demonstrate that dwelling ventilation provision is not worse overall

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PART O 2021

OVERHEATING IN NEW RESIDENTIAL BUILDINGS

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Overheating in residential buildings

- **Overheating is a risk for new homes that can affect the health and welfare of occupants**, particularly during hot weather.
- Major risk in the National Adaptation Programme for climate change
- Our new Part O requires overheating mitigation to be designed into all new residential buildings:
- Dwellings
- Residential institutions such as care homes and boarding schools
- Residential buildings such as university halls and children's homes

Overheating strategy for the building must be usable

Mechanical cooling can only be used once all other reasonable methods have been exhausted

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2021 energy efficiency and ventilation standards and the pathway to the Future Buildings Standard

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NEW NON-DOMESTIC BUILDINGS: ENERGY EFFICIENCY

Minimum standards for fabric and fixed building services

New non-domestic Part L uplift (2021)

In 2021, we consulted on two options for aggregate decrease in CO_2 across the building mix.

We selected the option which provides the most CO_2 saving, and acts as a better stepping stone to the Future Buildings Standard

Average of 27% decrease in CO_2	High fabric standards, improved building services, low carbon technologies

New non-domestic Part L uplift (2021)

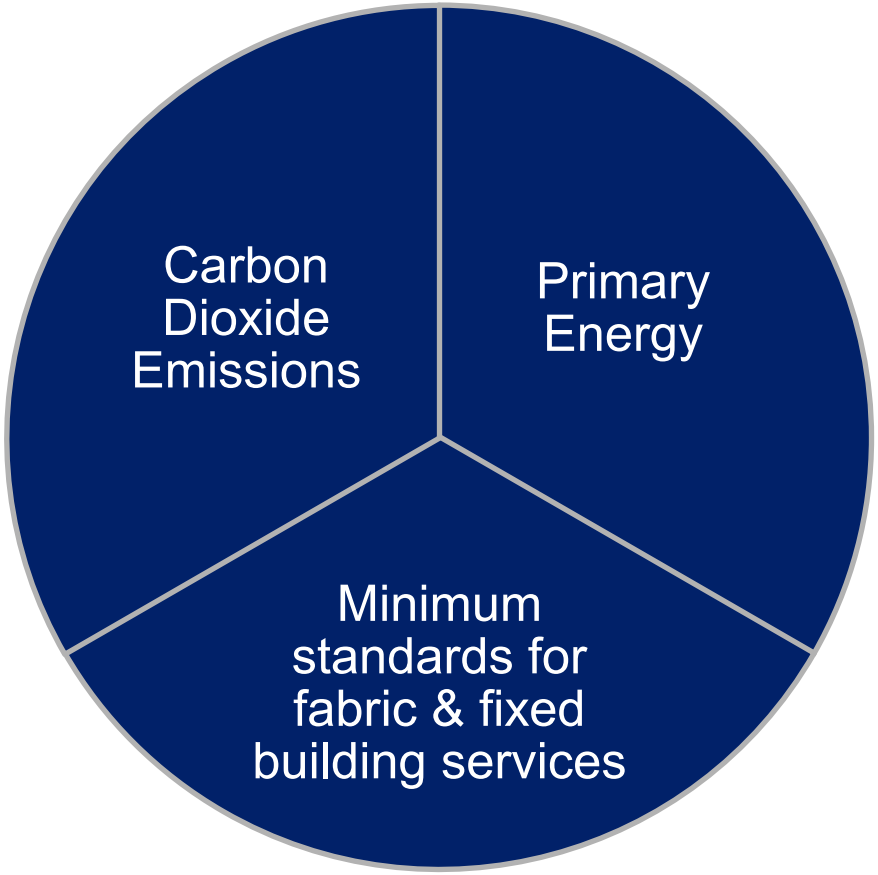
We made changes to the notional building used to set targets for energy efficiency for non-domestic buildings including:

- Raised fabric standards
- Increased the efficiencies of the systems in the notional building
- Included PV panels (unless heat pumps meet 100% of building's demand)
- Changes to lighting to align with modern standards
- Different spec for low and high hot water use

All add up to the 27% reduction in carbon emissions.

Metrics

Carbon Dioxide Emissions helps to drive low carbon choices



Primary Energy provides a measure of the energy use in dwellings while taking account of upstream energy uses

Fabric standards for new non-domestic buildings

	2013 U-values (W/m².K)	2021 U-values (W/m².K)
Pitched roof	0.25	**0.16**
Flat roof or roof with integral insulation	0.25	**0.18**
Wall	0.35	**0.26**
Floors	0.25	**0.18**
Windows in buildings similar to dwellings	2.2	**1.6 or Window Energy Rating Band B**
Rooflight	2.2	**2.2 (horizontal plane)**
All other windows, roof windows and curtain walling	2.2	**1.6**
Pedestrian doors (including glazed doors)	2.2	**1.6**
High usage entrance doors	3.5	**3.0**
Vehicle access and similar large doors	1.5	**1.3**
Roof ventilators (including smoke vents)	3.5	**3.0**
Air Permeability	10 m³/ (h.m²) @50Pa	**8 m³/ (h.m²) @50Pa**

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Minimum building services standards in new non-domestic buildings

Natural Gas LPG Oil Boilers (single boiler <2MW)	93% seasonal efficiency
Domestic hot water	91% seasonal efficiency, controls
Lighting	95 luminaire lumens per circuit watt for general lighting; 80 light source lumens per circuit watt for display lighting.
Comfort cooling	Increased SEER for all systems; large improvement for VRF and split and multi-split air conditioners
Building Automation and Control Systems	Required where effective rated output > 180kW
Thermostatic room controls	Required in every room/zone
On site electricity generation	Appropriately sized for demand; controls

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Monitoring the as-built performance of non-domestic buildings

- **CIBSE's TM39** as the standard to which new buildings should be sub-metered.
- Sub-metering installation should allow a useful comparison to be made between **design-stage forecasts** and **measured results**.

- Large buildings (a floor area over 1,000m^2) should have energy forecasting provided to the building owner for benchmarking purposes, which may be based on design calculations, benchmarking or detailed modelling such as **CIBSE TM54.**

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NEW NON-DOMESTIC BUILDINGS: VENTILATION

Minimum standards for ventilation

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Enhanced standards for offices and other rooms

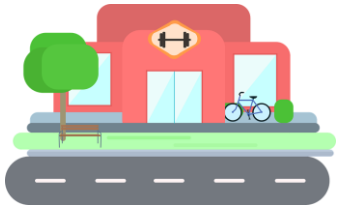
Standards in offices:

- Indoor air quality monitoring (CO_2)
- Systems that recirculate air should be capable of providing outdoor air only if needed unless HEPA filters can be installed or UVC-cleaning system in place
- Outdoor air rate now set as per l/s/m^2 as well as l/s/per.
  Outdoor air rate of 0.5 l/s/m2 for common spaces including corridors and lift lobbies.
- Bathroom extract fans capable of being “always on”

Rooms where:

- **singing, loud speech** or **aerobic exercise** may take place
- **Low temp** and **low humidity environments**
- Where **members of the public are likely to gather**

- Indoor air quality monitoring (CO_2)



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EXISTING NON-DOMESTIC BUILDINGS: ENERGY EFFICIENCY

Minimum standards for fabric and fixed building services.

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Fabric Standards in existing non-domestic buildings

	2013 U-values (W/m².K)	2021 U-values (W/m².K)
Pitched roof	0.18	**0.16**
Wall	0.28	**0.26**
Floors	0.22	**0.18**
Windows in buildings similar to dwellings	1.6 or Window Energy Rating band C	**1.6 or Window Energy Rating Band B**
Rooflight	1.8 (vertical plane)	**2.2 (horizontal plane)**
All other windows, roof windows and curtain walling	1.8	**1.6**
Pedestrian doors (including glazed doors)	1.8	**1.6**
High usage entrance doors	3.5	**3.0**
Vehicle access and similar large doors	1.5	**1.3**
Roof ventilators (including smoke vents)	3.5	**3.0**

These standards are aligned with new non-domestic buildings

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Building Services in existing non-domestic buildings

Natural Gas LPG Oil Boilers (single boiler <2MW)	93% seasonal efficiency
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Lighting	95 luminaire lumens per circuit watt for general lighting; 80 light source lumens per circuit watt for display lighting.
Comfort cooling	Increased SEER for all systems; large improvement for VRF and split and multi-split air conditioners
Building Automation and Control Systems	Any systems installed where effective rated output > 180kW must benchmark building energy efficiency and have other monitoring and communicating functions
Thermostatic room controls	Required in every room/zone where technically and economically feasible
On site electricity generation	Appropriately sized for demand; controls, replacement systems must have at least equal generation capacity

These standards are aligned with new non-domestic buildings

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TRANSITIONAL ARRANGEMENTS FOR THE WHOLE OF THE DEC 2021 UPLIFT

Part L, Part F and Part O

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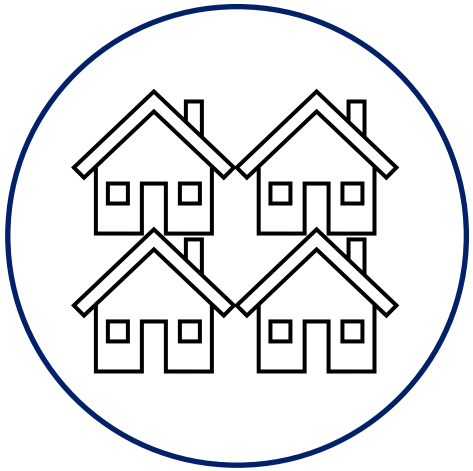
Transitional Arrangements

Before…



Transitional arrangements applied site-wide

Now…

Transitional arrangements apply to individual homes

With a reasonable period of **12 months** to commence work

PART S 2021

INFRASTRUCTURE FOR THE CHARGING OF ELECTRIC VEHICLES

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Approves Document S: Infrastructure for the Charging of Electric Vehicles

- Every **new home** with associated on-site parking is to have an electric vehicle charge point
- Existing **domestic buildings**, undergoing major renovation, with more than 10 parking spaces, are to have one charge point per dwelling with associated parking and cable routes in all spaces without charge points.
- All new **non-domestic buildings** with more than 10 parking spaces are to have one charge point and cable routes for one in five of the total number of spaces.
- Existing **non-domestic buildings,** undergoing a major renovation, with more than 10 parking spaces are to have a minimum of one charge point and cable routes for one in five spaces.
- The new regulations and AD S set out more details and exemptions.

UPCOMING CHANGES TO THE BUILDING REGULATIONS

Department for Levelling Up, Housing & Communities

Upcoming Changes to the Building Regulations

- Department for Culture Media and Sport will be introducing legislation later this year to ensure that **new build homes** are future-proofed and ready for **gigabit-capable connections**. More information is available on gov.uk.

- **Part M Review** - A full review of Part M of the Building Regulations, relating to access to, and use of, buildings is underway. Including **raising Accessible Housing standards** and will publish a government response and next steps in due course.

- The Government will be extending requirements for **smoke and carbon monoxide alarms.** Smoke alarms will be required in social rented homes. Carbon monoxide alarms will be mandatory in rooms with a fixed combustion appliance used for heating in private and social rented homes.

- **Approved Document J** Carbon monoxide alarms will also be required upon installation of a fixed combustion appliance for heating. We are engaging with alarm manufacturers and installers on readiness.

Important information

- The uplift comes into force on **15th June 2022**. Transitional arrangements will apply, allowing the previous standards to apply for a period of **12 months**.

- Approved Documents are available now on gov.uk and in hard copy from RIBA Books (www.ribabooks.com/approved-documents).

- The Future Homes Hub is producing a ‘How to Build’ guide.

- Enquiries on the Building Regulations can be sent to enquiries.BR@levellingup.gov.uk.