
# Route map to net zero carbon buildings in Wales

A collaboration of work by the Welsh Construction Forum Buildings Sectoral Working Group.

October 2021

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# Introduction

Achieving our net zero ambition will require a joined-up approach from across Wales, especially when considering we are all impacted by the consequences of climate change.

The built environment is, by far, one of the largest contributors to climate change - with buildings estimated to be responsible for 40% of our total carbon footprint. That is why the Welsh Construction Forum, chaired by Deputy Minister for Climate Change Lee Waters, and the Buildings Sectoral Group, set out to establish what the current frameworks, risks and opportunities are in aiming to achieve a net zero built environment.

Feedback from public sector and industry stakeholders revealed many consider the current approach to be disjointed, with some sectors of the built environment progressing well ahead of others, in terms of aspiration, regulation, and action.

Creating this route map is just one small part of what will need to be a much wider collaboration to achieve a net zero buildingt. Developed with the support of public and private sector partners, the route map sets out an understanding of how each of the core property sectors in Wales is currently legislated to become greener, and what the existing estate currently achieves.

The route map also considers specific risks and opportunities in each sector, including the opportunities to combine decarbonisation work with capital maintenance, building safety and skills and training development. It also helps identify where opportunities exist for greater targets and regulations to be legislated, as well as prospects for the supply chain to engage in the circular and foundational economy principles.

Furthermore, the route map identifies best practices in the steps to achieving a net zero building as demonstrated by the UK Green Building Council. It also highlights the important role measuring and reporting carbon has in monitoring progress towards decarbonisation.

What is apparent through the development of the route map is how quickly we need to act. The Welsh Government has already set an ambition that by 2030 all new public sector buildings will be net zero. Given the timeframe to plan, fund, approve and deliver a net zero building, we need to start acting now or will fail to meet this goal.

It is important to note this route map is a ‘moment in time’, which we hope will inspire the industry to collaborate and decision-makers to take action.

Finally, we would like to show our gratitude to those who helped develop this route map. It is all in our interest to create a greener Wales, and this is just the start of what we hope will be a leading collaboration in acting to achieve net zero.

**Samuel Rees**
**Chair, Net Zero Carbon Buildings Task & Finish Group**

**Ed Evans**
**Chair, Welsh Construction Federation Alliance**

# Background to net zero Wales

On 9 February 2021 Lesley Griffiths MS, Minister for Environment, Energy and Rural Affairs Welsh Government made a Written Statement: Wales' pathway to achieve net zero emissions laying regulations in the Senedd formally committing Wales, for the first time, to legally binding targets to deliver the goal of net-zero emissions. It stated:

"In advice Welsh Government received from our statutory advisor the Climate Change Committee (CCC) in 2017 and 2019, a net zero goal for the Welsh economy was not considered by their independent analysis to be credible, feasible or affordable. Now, on the basis of further evidence and analysis, this view has changed. Specifically, the CCC recommended:

- Carbon Budget 2 (2021-25): 37% average reduction with credit ("offset") limit of 0%
- Carbon Budget 3 (2026-30): 58% average reduction
- 2030 target: 63% reduction
- 2040 target: 89% reduction
- 2050 target: 100% reduction (net zero)

In its most recent advice in December 2020, CCC confirm that the 2020s are the "decisive decade" and our plan for the second carbon budget to be published in 2021 should focus on the need to "outperform" the recommended 37% average reduction in emissions with a clear line of sight to a 58% average reduction through the third carbon budget up to 2030, in order to set Wales on the path to net zero by the middle of this century, as required of all richer, developed nations by the terms of the Paris Agreement.

The new targets will be extraordinarily challenging to meet. Our efforts as a Government must focus on making the transition to net zero a just transition, where the costs and benefits are shared fairly across our society."

Welsh Government are currently developing delivery policy and plans to achieve the targets.

### The construction and buildings sector

The construction sector in Wales accounts for 7% of workforce jobs in Wales and is responsible for 8% of GVA. It employs over 100,000 people across Wales, with most of these in SMEs or micro-businesses. It is also a major provider of apprenticeships. However, construction is one of the largest emitters of CO2 in Wales.

The Construction Leadership Council (CLC) recently published their Construct Zero programme, detailing Performance Framework Proposals and aspirations to get the UK construction sector net zero by 2050, including retrofitting homes, creating new retrofit and coordinator skills, PAS 2080 accreditation and Zero-diesel trial construction sites by 2023.

The Welsh Construction Forum was established in the summer of 2020. Originally chaired by Lee Waters MS, Deputy Minister for Economy & Transport.

The forum brings together leading figures from across the Welsh construction industry along with social partners and public officials, to support the industry as it recovers from the coronavirus pandemic and to help Wales to "build back better". The sectoral working groups for Buildings, Housing and Infrastructure spin-off from the Welsh Construction Forum.

The Buildings working group brings together both public and private sectors; experienced providers of building construction services, to enable a more sustainable business environment. Task and Finish Groups have been formed to consider decarbonisation and net zero carbon. Their definition of net zero carbon was submitted to the Welsh Government's Climate Change Group and this document has been created to offer a sample route map to Net Zero Carbon in public buildings.

The Welsh Government has allocated specific funding to its construction programme areas to help deliver its low carbon aspirations, with examples being 21st Century Schools & Colleges and the Optimised Retrofit Programme.

### What is whole life net zero carbon?

The Buildings Sectoral Working Group had a task and finish sub-group to consider decarbonisation in buildings. The first task, to agree on a universally recognisable definition of Net Zero Carbon.

The group considered numerous examples and agreed, with a few minor amendments, the UK Green Buildings Council definition was the most appropriate. This definition was passed to the Welsh Government's Climate Change Group for consideration and agreed with the following:

*The UK Green Building Council (UKGBC) define whole life net zero carbon as "when the amount of carbon emissions associated with a building's embodied and operational impacts over the life of the building, including its disposal, are zero or negative". This means that throughout the whole lifecycle of a building, including its construction, the products and components used in construction, the operational energy use, during maintenance and at its end of life, there will be net zero carbon emissions.*

*Increasing efficiency of material use, improved construction practices and reducing operational demand should be prioritised, and the building must offset the remaining carbon impacts associated with its lifecycle.*

*Carbon offsetting through methods associated with exporting on-site renewable power/heat generation, the use of construction materials which capture carbon (e.g. through biogenic carbon sequestration in timber) and supporting on-site natural carbon capture (e.g. through tree or native hedge planting) should be considered ahead of off-site options.*

-Net Zero Carbon Buildings, A Framework Definition by UK GBC

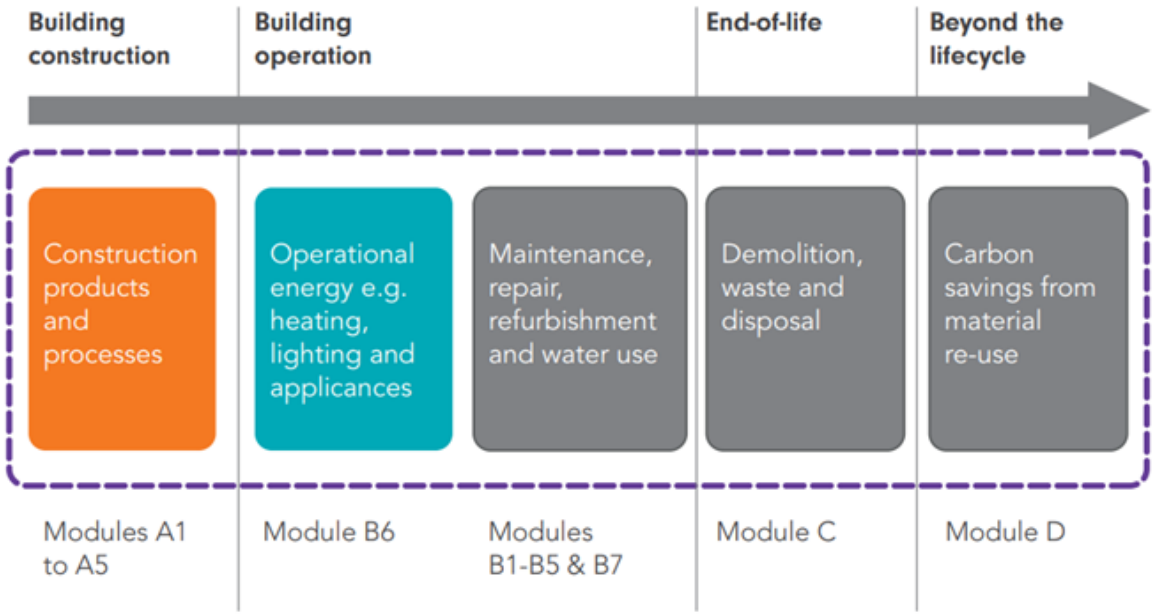
The net zero carbon buildings framework sets out definitions and principles around two approaches to net zero carbon, which are of equal importance:

**Net zero carbon – construction (1.1)**: "When the amount of carbon emissions associated with a building's product and construction stages up to practical completion is zero or negative, through the use of offsets or the net export of on-site renewable energy."

**Net zero carbon – operational energy (1.2)**: "When the amount of carbon emissions associated with the building's operational energy on an annual basis is zero or negative. A net zero carbon building is highly energy efficient and powered from on-site and/or off-site renewable energy sources, with any remaining carbon balance offset."

**Net zero carbon – whole life (1.3):** is also proposed at a high level, but further work will be needed to define the scope and requirements for this approach.

**Breakdown of three net zero carbon scopes**



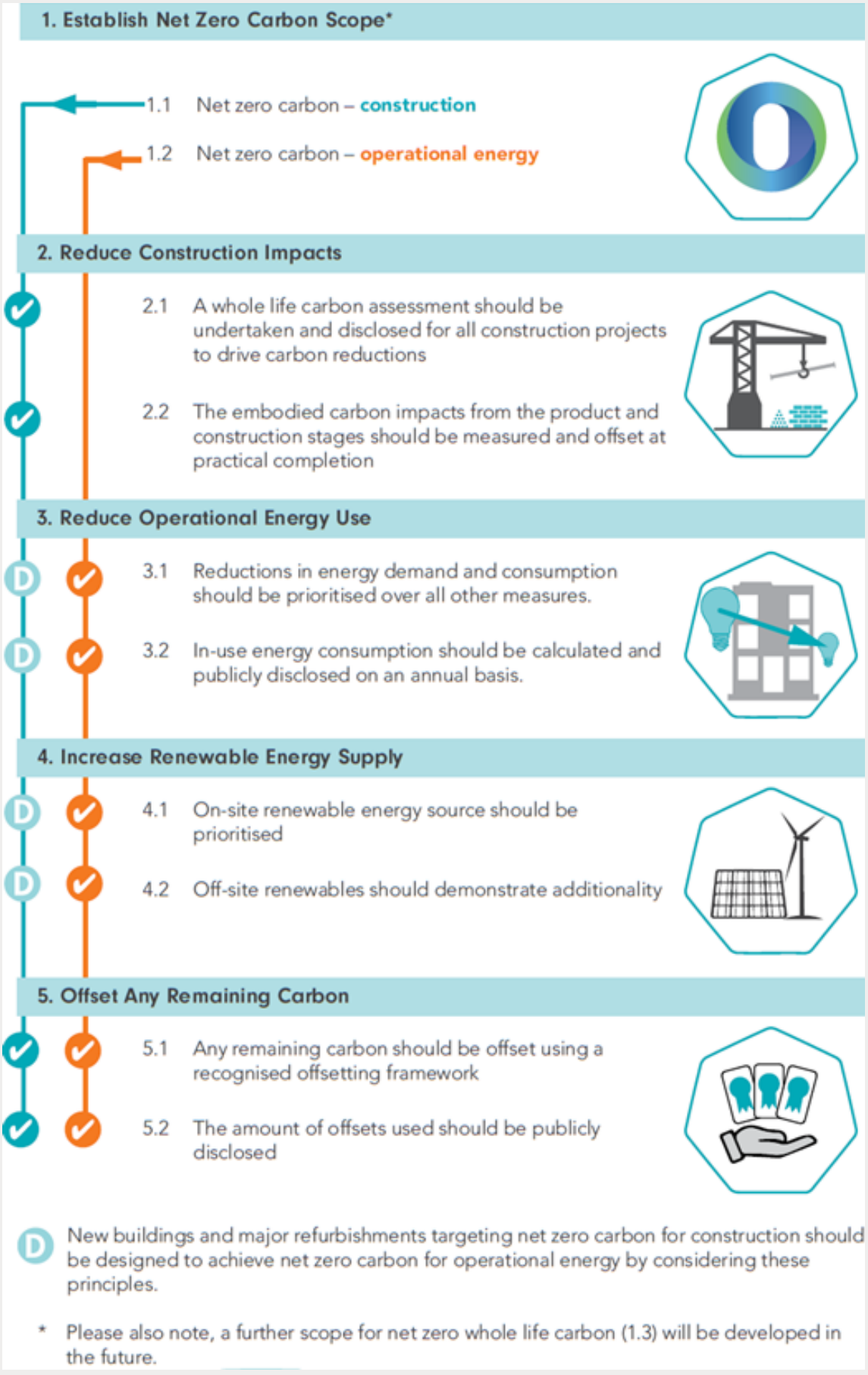

All Modules referred to are from EN15978 Sustainability of construction works – Assessment of environmental performance of buildings – Calculation method

Net Zero Carbon – Construction (1.1)

Net Zero Carbon – Operational Energy (1.2)

Net Zero Carbon – Whole Life (future development) (1.3)

Steps to achieving a net zero building as demonstrated in the UK GBC Net Zero Carbon Buildings Report.



# Measuring & reporting carbon

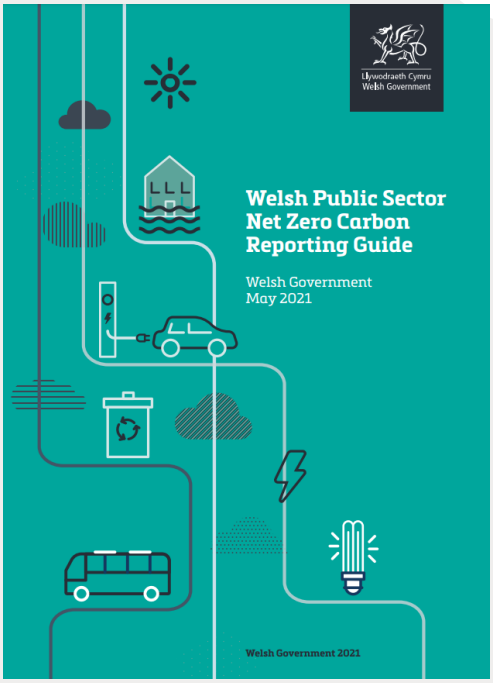
### Welsh Public Sector Net Zero Carbon Reporting Guide

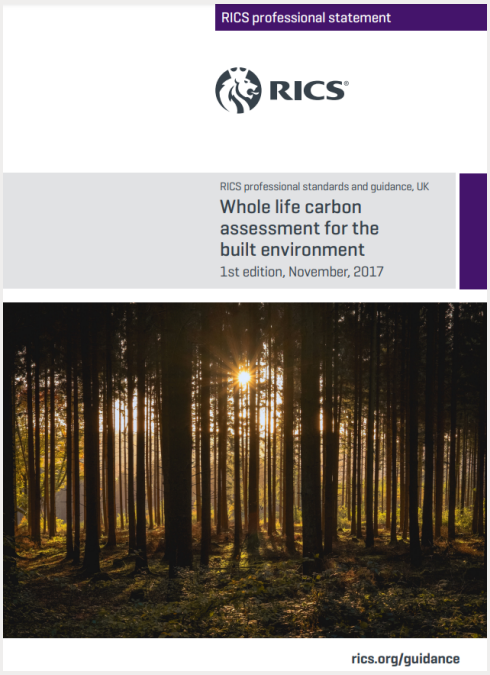
This guide details the principles and priorities for the Welsh Public Sector Net Zero Carbon reporting approach (hereafter called the Welsh Net Zero reporting approach), its operational and organisational scope and the data which public bodies in Wales will need to assemble in order to fulfil the reporting requirements.

Furthermore, TM65 has been developed to support the calculation methodology of embodied carbon in buildings - an important factor for future estate planning.

To support Welsh public sector organisations in compiling their net-zero emission reporting, the Welsh Government have launched the Welsh Public Sector Net Zero Reporting Q&A forum as a portal for technical support in measuring carbon.

The forum can be accessed at - https://www.publicsectornetzero.org/




### Whole Life Carbon Assessments & the Building Carbon Database

The fundamental objective of whole life carbon measurement is the mitigation of carbon impact in the built environment. Better understanding and consistent measurement of the whole life carbon emissions of built projects will, in turn, enable comparability of results, benchmarking and target setting to achieve carbon reductions.

Developed with the assistance of industry experts, including the UK Green Building Council, the Whole Life Carbon Assessment is intended to standardise whole life carbon measuring and enhance consistency in outputs by providing specific practical guidance for the interpretation and implementation of the methodology in EN 15978 in carbon calculations.

Data collected, can further shape and develop the Building Carbon Database, created with the support of UK Government, WRAP and the UK Green Building Council. The database is instrumental in helping organisations meet their net-zero ambitions, by providing a source of data that people from across the whole supply chain, including engineers, architects and quantity surveyors, can use to benchmark building designs and as a result, assist in identifying where carbon reductions can be made.

With hundreds of projects already listed, the information on the database is free and publicly available and will be collated and presented in a clear, comprehensive and standards-compliant way to allow project teams to gain an understanding of the typical embodied carbon footprint of different building types.

# Cross-sector targets

### Waste and recycling in construction

The Welsh Government's 'Towards Zero Waste' strategy set a 2020 target of 90% for all construction and demolition waste to be recycled across all sectors. The most recent 'Construction and demolition waste survey', published by Natural Resources Wales in 2012, showed the sector already achieving a recycling rate of 87%.

The Government also mandated a 10% recycled content target in public sector construction based on advice from WRAP. Additional targets were set for selected elements in the public sector to increase the rate of recycled material use in construction.

This work is further supported by the potential to utilise Design for Manufacture and Assembly strategies (including DfMA Wales)- helping to reduce waste, improve productivity and encourage innovation.

### Net zero carbon status by 2030

The Welsh Government have set an ambition that by 2030, zero carbon will be routine in building management and construction, culturally embedded and self-regulated across the Welsh public sector.

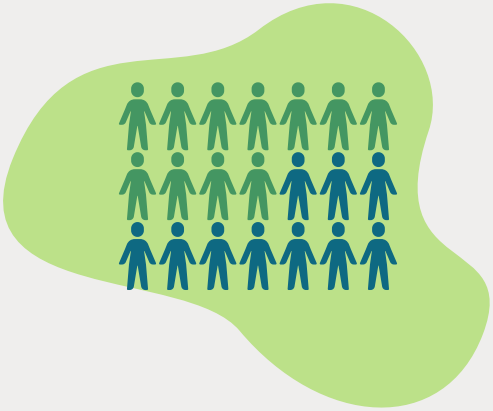
The 'Net zero carbon status by 2030' report sets a goal in Wales that by 2030, all new public sector buildings are built to net zero standard, including those in the supply chain.

Furthermore, it also sets out that by 2030, all public buildings are supplied with low carbon heat and where feasible, generates its own electricity.

# Housing

Tenure pathway

## Social housing



- 2021 - WHQS publication with the requirement for new homes to achieve EPC A and from 1st October 2021 for the use of fossil fuel heating systems in new build social homes to end.
- 2025 – Aim for all private developers to phase out the use of fossil fuel heating systems in new build properties.
- 2030 – Fuel poverty social homes to reach EPC C.
- 2035 – All social housing to achieve EPC C or as close to as feasibly possible. In addition no more than 5% of households are to be estimated as living in fuel poverty at any one time.

## Private rented sector

- 2020 MEES regulations on all lets for EPC F&G homes
- 2025 – Proposed date for new lets to be a minimum of EPC C
- 2028 – Proposed date for all tenancies to be an EPC C

## Owner occupier

- 2023 – Proposed date for mortgage lenders to start declarations of their mortgage book portfolio EPC average. At the time of publication, it is still unclear whether this will be a voluntary or compulsory declaration.
- 2025 - Ambition for private developers to end the use of fossil fuel heating systems in new homes based on the WHQS.
- 2030 – Proposals for mortgage lenders to achieve a portfolio average of EPC C.

## Reduction in embodied carbon

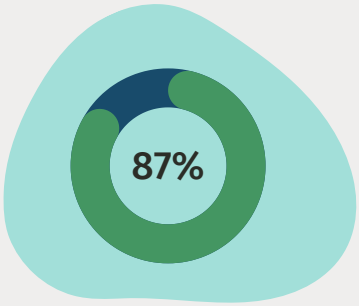
2030 Climate Challenge Targets for residential buildings:

- 2020 - <600 kg CO2 e/m²
- 2025 - <450 kg CO2 e/m²
- 2030 - <300 kg CO2 e/m²

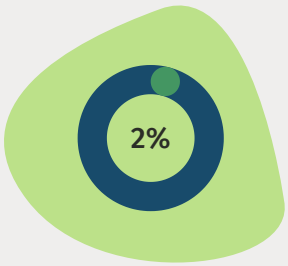
## Overview of current housing market

### New build homes

- Q4 2020 - 87% of all new build homes achieved an EPC A or B rating.
- 2022 - All new build homes in Wales will have to reduce carbon emissions by 37%.
- 2025 - Building Regulations setting out to produce a minimum of 75% less CO2 emissions than current requirements.




### Existing homes




- 42% of existing Welsh dwellings of all tenures currently achieve EPC C or higher, out of a total of 1.4 million domestic properties.
- While the vast majority of new homes are achieving EPC A and B, existing homes are barely registering similar ratings. Not since 2015 has the number of EPC ratings undertaken and achieving EPC B or higher been above 2%, with an estimated 2 in 3 owner-occupied homes being EPC D or below.

## Net zero housing risks & opportunities

### Risks

- The lack of decisive action or targets, especially with existing properties, to get past EPC C.
- Impact green measures can have on fuel poverty targets e.g. the switch to electric boilers rather than gas could lead to higher energy costs.
- Insufficient workforce to assess, advise and deliver on home decarbonisation work.
- The high cost of materials and the significant upfront financial burden are expected to fall onto consumers unless greater government assistance/intervention becomes available.
- Current decarbonisation of the grid and its long-term capacity to support a greater shift from traditional fossil fuels to electricity.
- MEES likely to have a strong influence of PRS, but again does not currently go beyond EPC C requirements.
- Minimal current legislation exists to influence net-zero in the existing owner-occupied sector outside of BEIS proposals for greater regulation of lenders.

### Opportunities

- In 2022 it is expected the government will consult on the next phase of WHQS and their wider heat and energy performance strategy.
- Social housing and PRS sectors already proving how effective standards can improve energy performance, such as those set in WHQS and MEES.
- Opportunities for the owner-occupied sector to improve homes during the home buying/selling process along with greater support from lenders with green mortgages and conditions.
- Significant job creation, innovation, and upskilling opportunities.
- Expansion of the use of MMC and locally sourced materials to reduce embodied carbon – as demonstrated through the WHQS.
- Ability to combine decarbonisation work with building safety and quality standards.
- Advancing technologies present new opportunities for greener energy solutions - including heat pumps, hydrogen and battery packs.

# Education

Targets for education and schools

## Key dates

- 2030 - All new buildings net zero in operation
- 2050 - All buildings net zero

## Net zero operational in schools

2021 - 2025 public sector pilot schemes being delivered to net zero and gathering best practices including:

**Design**
- Prediction Modelling (TM54)
- Standards (Building Regs)

**Performance in use**
- Standard reporting
- Education of Building users
- Capture and analysis of data
- Sharing and using the data to improve

**Technology**
- Investigate, use and analyse new technologies to achieve NZC
- Understand and train to get best performance

**Offsetting**
- What initiatives work and are acceptable at the various levels, i.e. local, national. Verification of certification.

2025 – all designs should be net zero in operation, in order to be delivered and operational for 2030. All new Outline Business Cases to have included for net zero in operation.

## Reduction in embodied carbon

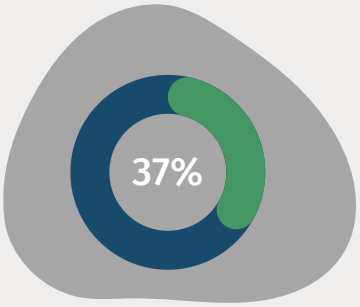
Using the baseline of 1000kgCO2/m2 for schools:

- 2021 - 2025 pilot net zero in operation also to have reduced embodied carbon to be below 800kgCO2/m2
- 2025 - 40% reduction to 600kgCO2/m2
- 2030 - 65% reduction to 350kgCO2/m2

### Existing estate

The transition for the existing estate to net zero carbon operational is by 2050. In order to achieve this, we will need to deliver a percentage reduction in line with the targets below.

- 2025 target 37% reduction
- 2030 target: 63% reduction
- 2040 target: 89% reduction
- 2050 target: 100% reduction



## Existing estate overview

As with many things, do we know what the benchmark is? There is a serious lack of data available at the moment to inform us on what we need to improve. There is probably information on energy bills on an annual or quarterly basis but this is probably the limit. All 21st Century Schools & Colleges will have been fitted with meters in accordance with BREEAM requirements.

If these can be reviewed and the data collected by each local authority we can at least have a benchmark to improve. This will also give us a limited knowledge of the high energy use items.

As built TM54 calculations may also be useful to reflect what is actually in each building, how it is used and this will give us a better idea of what energy use we should be using, being able to compare predicted to actual is really helpful to inform areas of improvement.

The targets above probably need to be aligned to achieving certain key activities and then a timescale for carrying these outfits into the timeline. Some examples are below but the industry will lead us into what can be done, what is affordable and when it will become cost-effective.

- **2025** target 37% reduction (Determine actual energy use, identify quick wins i.e. LED lighting, review commissioning, look at how the building is used, install PV panels, remove comfort cooling, local offsetting initiatives)
- **2030** target: 63% reduction (All of the above plus, further long term and costly measures like changing or removing high energy use systems (Kitchen), detail review of envelope performance and heat loss and identify measures that can be implemented (Improve airtightness, reduce solar gain, cloud based servers)
- **2040** target: 89% reduction (significant investment in new technologies, improvement to building envelope)
- **2050** target: 100% reduction (net zero)

We would recommend that there is an additional funding stream is considered for updating where possible the existing school estate to net zero.

This would require up to date condition surveys, accurate energy consumption figures – ideally from half hour meter readings, run TM 54 assessment and where identified as required thermographic surveys.

This would then enable us to understand the current education estate position and work on the plan to reduce it. If this could be completed by 2024 it would help enable the identification for the next wave of investment into the estate.

## Net zero education risks & opportunities

### Risks

- Lack of availability of sufficient additional funding.
- Insufficiently skilled workforce and access to materials and technology.
- Consistent method to monitor and verify – new and existing buildings.
- Additional heating operational costs for schools due to the switch from gas to alternative sources.

### Opportunities

- Opportunities to embed ‘Beyond Recycling Strategy’ targets for recycled material use.
- New job, training and best practice learning opportunities.
- Work with young people who will be future designers and builders – form part of new curriculum.
- Well-Being and Future Generations Act 2015 – legislative requirement.

# NHS & healthcare provision

Key dates

## Baseline targets

| NHS Wales Decarbonisation Target | Emissions (tCO2e) | % reduction from 2018/19 | Cumulative savings from initiatives will total (tCO2e) |
|---|---|---|---|
| 2025 | 845,600 | -16% | 459,000 |
| 2030 | 661,500 | -34% | 1,982,500 |

## Route map of actions

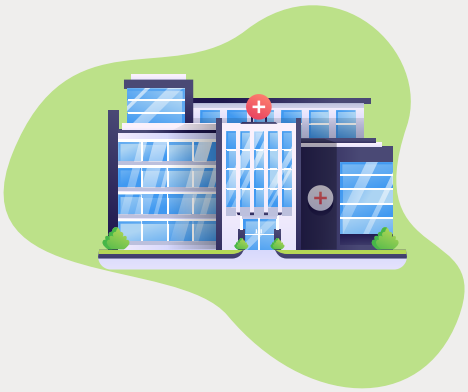
- 2021 - Action Plan requirements and expectations to be developed.
- 2022 - Effective building management systems and dedicated resource to optimise the use of energy by better control will be put in place
- 2023 - Low carbon heat evolution plans will be completed for all acute hospitals, and renewable energy implementation plans will be developed.
- 2024 - New buildings will be constructed and accredited to a net zero standard.
- 2025 - Decommissioning of natural gas CHP plants will be prioritised over refurbishment. All lighting will be fully replaced by LED.
- 2026/27 - 50% of overall renewable energy generation potential will have been installed.
- 2028-2030 - Every building will have undergone an energy-efficient upgrade – low carbon heating will be utilised, renewable energy will be generated on-site, and all gas CHPs will be decommissioned.

New & existing estate opportunities

## New builds & major refurbishment

- Develop and build low carbon buildings to net zero standard – engage and collaborate with NHS partners across the UK on the emerging net zero building standard for hospitals, and adopt a net zero building accreditation approach which will be defined by 2022.
- All project teams to have an independent client-side sustainability representative to provide due diligence support for the optimal low carbon design across all development stages – and be responsible for ensuring the Net Zero Framework process is followed.
- Integrate Modern Methods of Construction (MMC) into the design and construction of new buildings – this will consider modular design, offsite fabrication, and just-in-time delivery to minimise construction-related carbon emissions.
- Install electric vehicle charging points in new developments beyond minimum requirements, and future-proof new car parks by installing infrastructure to enable straightforward installation of future charging points.
- Prioritise low carbon heating solutions as a key design principle. No fossil fuel combustion systems are to be installed as the primary heat source for new developments.
- Incorporate the principles of sustainable transportation into the design of new sites (in addition to electric vehicle infrastructure) in line with the Welsh Government's Active Travel Action Plan for Wales.

## Existing estate



- Progress a transformational energy and water efficiency retrofit programme across the estate – every building with a long-term future will have undergone a multi-technology energy-efficient upgrade by 2030.
- Fully replace all existing lighting with LED lighting by 2025.
- Complete expert heat studies by the end of 2023 for all acute hospitals to set the plan to transition away from fossil fuel heat sources.
- Progress low carbon heat generation for all non-acute sites larger than 1,000m2 by 2030.
- We will not plan to install any further natural gas CHP plant - renewable CHP will be championed instead. For the existing CHP plant, we will prioritise decommissioning over investment in major refurbishment of failed CHP from 2025, with the ambition for all CHP to be decommissioned by 2030.
- Take an active approach to efficient control of energy in our buildings. All buildings will have up-to-date, standardised, and effective building management systems (BMS). Dedicated resources to optimise the use of energy by BMS control will be put in place by 2023.
- Determine the overall viable potential for onsite renewable energy generation at each NHS Wales organisation by 2023. Install half of this potential by 2026, and the remainder by 2030.

## Net zero NHS and healthcare provision risks & opportunities

### Risks

- Lack of availability of sufficient additional funding.
- Potential increased revenue costs for some low carbon technologies.
- Ability to access external funding support (eg. The Public Sector Decarbonisation Fund which is not accessible to organisations in Wales)
- NHS is going to be stretched in reacting to the Covid-19 pandemic backlogs.
- Resources within NWSSP are insufficient to properly support the work required.
- Challenging the culture to make radical changes required. Making this part of the whole organisation and not just an Estates issue (eg. Clinical input).
- Building Regs compliance tools need to be updated as they do not reflect the current carbon factors for different energy sources (see point above also).

### Opportunities

- New job creation & training opportunities.
- Develop / support local supply chains – supporting Foundational Economies and circular economy aims.
- Potential opportunities to reduce revenue costs (dependent on technologies and future utility costs).
- Positive reputational impact on NHS organisations and winder public health benefits (e.g. through improved air quality).
- New and improved facilities create a better working environment and a better clinical “healing” environment
- More collaboration and all-Wales working opportunities.

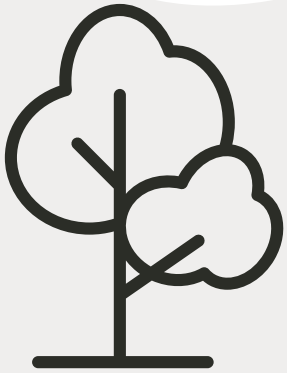
# Wider public sector

Key dates

## Reduction in embodied carbon

Using the baseline of 1000kgCO2/m2

- 2021 – 2025 pilot net zero in operation also to have reduced embodied carbon to be below 800kgco2/m2
- 2025 – 40% reduction 600kgco2/m2
- 2030 - 65% reduction 350kgco2/m2



2030

## Net zero carbon status by 2030

Using the Welsh Government 'Route map for decarbonisation across the Welsh public sector' ambition:

- 2030 - All new public sector buildings are built to net zero standards, including those involved in the supply chain.
- 2030 - All public buildings are supplied with low carbon heating systems and where feasible, generates its own electricity.

## Regulation for new builds

The 'Nearly zero energy buildings requirements for new buildings' update released by the Welsh Government in February 2021 includes:

Regulation 25B states: 'Where a building is erected, it must be a nearly zero-energy building'.
For new buildings occupied and owned by public authorities, the coming-into-force date for Regulation 25B is 1 January 2019.

For all other new buildings, the coming-into-force date for Regulation 25B is 31 December 2020.

## Net zero operational in the wider public sector

2021 - 2025 public sector pilot schemes being delivered to net zero and gathering best practices including:

**Design**
- Prediction Modelling (TM54)
- Standards (Building Regs)

**Performance in use**
- Standard reporting
- Education of Building users
- Capture and analysis of data
- Sharing and using the data to improve

**Technology**
- Investigate, use and analyse new technologies to achieve NZC
- Understand and train to get best performance

**Offsetting**
- What initiatives work and are acceptable at the various levels, i.e. local, national. Verification of certification.

2025 – all designs should be net zero in operation, in order to be delivered and operational for 2030. All new Outline Business Cases to have included for net zero in operation.

## Reduction in embodied carbon

Using the baseline of 1000kgCO2/m2 for the wider public sector:

- 2021 - 2025 pilot net zero in operation also to have reduced embodied carbon to be below 800kgCO2/m2
- 2025 - 40% reduction to 600kgCO2/m2
- 2030 - 65% reduction to 350kgCO2/m2

## Net zero wider public sector buildings risks & opportunities

### Risks

- Lack of availability of sufficient additional funding. Transparency of current funding is also an issue.
- Timescales – need to implement programmes now - set timeline and realistic targets.
- Ability to access external funding support (eg. The Public Sector Decarbonisation Fund which is not accessible to organisations in Wales).
- Lack of clarity between the Welsh Government's 'Net zero carbon status by 2030' and CCC targets adopted.
- Increased operational costs associated with new heating systems.

### Opportunities

- New job creation & training opportunities.
- Develop/support local supply chains – supporting Foundational Economies and circular economy aims.
- Potential opportunities to reduce revenue costs (dependent on technologies and future utility costs).
- More collaboration and all-Wales working opportunities.
- Opportunities to integrate the Welsh Government 30% permanent remote working proposals with future estate strategy reviews.

# Commercial property

Key dates

## Reduction in embodied carbon

Using the baseline of 1000kgCO2/m2

- 2021 – 2025 pilot net zero in operation also to have reduced embodied carbon to be below 800kgco2/m2
- 2025 – 40% reduction 600kgco2/m2
- 2030 - 65% reduction 350kgco2/m2

## Heat & buildings strategy

UK Government's 'Heat and buildings strategy', released in October 2021 states:

"Significantly reducing energy consumption of commercial, and industrial buildings by 2030...setting privately-rented commercial buildings a minimum efficiency standard of EPC band B by 2030 in England and Wales, introducing a new and innovative performance-based energy rating for large commercial and industrial buildings, over 1,000m2".

## Regulation for new builds

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For new buildings occupied and owned by public authorities, the coming-into-force date for Regulation 25B is 1 January 2019.

**For all other new buildings, the coming-into-force date for Regulation 25B is 31 December 2020.**

## Reduction in embodied carbon

Using the baseline of 1000kgCO2/m2 for commercial buildings:

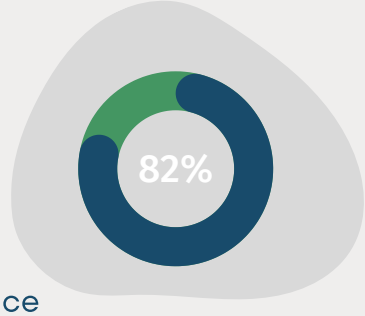
- 2021 - 2025 pilot net zero in operation also to have reduced embodied carbon to be below 800kgCO2/m2
- 2025 - 40% reduction to 600kgCO2/m2
- 2030 - 65% reduction to 350kgCO2/m2

Existing estate

## Existing commercial building performance

Existing EPC register data highlights that over the last decade there has been a minimal improvement in the number of non-domestic EPC A-B ratings - with 18% of commercial properties achieving the banding in 2020.

Of 3,100 non-domestic property EPC surveys undertaken in Wales in 2020, 82% were still EPC C or below.




Commercial property best practice

## LETI Climate Emergency Design Guide for non-domestic property

Meet upfront embodied carbon emission targets for building elements:

**Best practice 2020**

**<600kgCO2/m2**

- Equivalent to 40% reduction over baseline
- 30% materials from re-used sources
- 50% of materials can be re-used at end of life

**Best practice 2030**

**<350kgCO2/m2**

- Equivalent to 65% reduction over baseline
- 50% materials from re-used sources
- 80% of materials can be re-used at end of life

Net zero commercial property risks & opportunities

### Risks

- Outside of Building Regulations L and F, and the UK Government Heat and Buildings Strategy, there are few legislated targets or ambitions for commercial property to decarbonise.
- The viability gap for commercial properties is already significant. In many cases, it already costs more to develop or refurbish a building than what its value is post-completion, and the push to create a low carbon and net-zero buildings will only exasperate this.
- Challenge of funding decarbonisation work – is it the landlord or tenant? The landlord is responsible for the building itself, but commercial tenants have a significant influence over the environmental performance of the property - so green premiums in rent may become more prevalent.
- Existing lease covenants may prevent certain work being untaken until building is vacant.

### Opportunities

- Explore new energy performance and recording data e.g. NABERS UK.
- New job, training and supply chain opportunities - linking closely with the circular and foundational economy strategy and social value aspirations.
- Opportunities to embrace retrofitting and repurposing of commercial units, especially to support the shortage in industrial units and changes in office footfall post-Covid.