Net Zero Whole Life Carbon Roadmap

Stakeholder Action Plans

UK GBC

WORLD GREEN BUILDING COUNCIL

#BUILDINGLIFE

Laudes Foundation

IKEA Foundation

November 2021

Stakeholder Action Plans

Introduction

The **Net Zero Whole Life Carbon Roadmap** project aims to outline a common vision and agree upon industry-wide actions for achieving net zero carbon in the construction, operation, and demolition of buildings and infrastructure in the UK.

The main areas of discussion include the carbon footprint for the UK built environment, the Net Zero Carbon trajectory to 2050, and policy recommendations with industry action plans to deliver the 2050 scenario. These outputs are published in an initial series of four reports:

A Pathway for the UK Built Environment - aimed at stakeholders from across the built environment value chain who need an overview of the Roadmap findings and its implications for the sector. The report provides context for why the Roadmap exercise is critical to delivering the UK net zero goal, while also detailing the necessary technological shifts, policies and industry actions that can help deliver decarbonisation.

Technical Report - provides detail on the project structure, the process for data collection, the key features of the calculation methodology and concludes with a description of the net zero scenario definition and results.

Summary for Policy-Makers - aimed at central government, local authorities, and anyone interested in built environment policies. The Summary provides an overview of the relevant Roadmap findings and policy recommendations for central government to deliver a net zero built environment by 2050.

Stakeholder Action Plans – sets out specific recommended actions for 14 key industry stakeholders, enabling them to play their part in achieving the Roadmap's goals.

Context

UKGBC is one of several European GBCs developing national Whole Life Carbon Roadmaps under the WorldGBC #BuildingLife project, funded by Laudes and the Ikea Foundation. In the runup to COP26, WorldGBC has convened ten European Green Building Councils to galvanise climate action in the built environment through national and regional decarbonisation roadmaps. The Green Building Councils spearheading the project are Croatia, Finland, France, Germany, Ireland, Italy, the Netherlands, Poland, Spain and the UK. BuildingLife is accelerating ambitions in the building sector by creating the first region-wide response to the vision of a net-zero whole-life carbon-built environment as set out in WorldGBC's 2019 report.

Citation

Net Zero Whole Life Carbon Roadmap: Stakeholder Action Plans

Green Building Council, 2021, London, UK.

NGOS / Trade Associations / Professional Institutions

Immediate Actions:	Progress by 2025:	Progress by 2030:
Professional Institutions to continue work-streams as set out in Construction Industry Council (CIC) Climate Action Plan, including: • Embed low carbon competency and advocacy across all current and prospective built environment professionals. • Review accreditation of relevant degrees and training courses and set core topics to be covered in each programme. • Adopt and update CPD requirements for climate issues, net-zero skills and competences for their members. • Work to agree a coherent approach to the development, adoption, approaches, and methods for monitoring in-use performance of buildings. • Support the development of performance-based rating schemes for in-use energy in buildings. • Introduce incentives and review professional requirements for their members to carry out in-use energy performance monitoring, evaluation, and reporting. • Support use of Whole Life Carbon (WLC) (and other environmental impacts) as design criteria and to drive design decisions. • Adopt and promote standard metrics for monitoring and reporting embodied carbon (for both buildings and infrastructure projects). • Establish a requirement for use of EPD databases in the design process (Built Environment Carbon Database (BECD)). • Develop a performance and disclosure culture across professional service firms, their clients, and supply chains. • Integrate retrofit competency requirements within professional qualification criteria. • Work with wider industry to develop BIM-based building passports dealing with build quality, build standards, embodied and operational carbon.	Professional Institutions to continue work-streams as set out in Construction Industry Council (CIC) Climate Action Plan, including: • Work with employers and training providers to ensure qualifications and training are kept up to date as technologies and techniques become available. • Include threshold carbon literacy and carbon competence tests, entrance requirements, and member assessments. • Agree and adopt a shared cross-industry Climate Framework Curriculum. • Develop benchmarks and case studies to support the development of guidance and targets and to track progress. • Support the uptake of building passports.	Professional Institutions to: • Develop and progress professional requirements in line with requirements of sector carbon budget.
Establish a central database (Built Environment Carbon Database (BECD): https://www.becd.co.uk) for embodied carbon (asset and product level) to gather data across the industry, standardise inputs, and help set benchmarks and targets per sector.		
Set strategy for asset level Net Zero Carbon (NZC) verification and / or certification scheme.	Verification and / or certification scheme for NZC buildings established, to include operational and embodied carbon performance standards.	NZC performance standards to be reviewed as required to ensure they align with sector carbon budgets.

NGOS / Trade Associations / Professional Institutions (continued)

Immediate Actions:	Progress by 2025:	Progress by 2030:
Trade associations work with apprenticeship programmes to develop strategies to build capacity in order to meet significant increase in future domestic retrofit demand.	Trade associations to have developed skills base for domestic retrofit programme, via retraining programs for gas fitters, PAS 2035 retraining programmes for project managers and cost consultants, ongoing incorporation into CPD programmes, wholesaler information provided for effective use of products, etc.	Retrofit supply chain capacity continues to scale up.
Green Certification Schemes such as CEEQUAL and BREEAM update minimum standards for highest rating levels to align with industry NZC metrics for operational energy performance and embodied carbon (i.e. shift to absolute performance metrics instead of comparison studies).	Green Building Certification Schemes aligned with net zero carbon targets.	
All industry awards to mandate disclosure of carbon / energy, with consideration as part of judging.	All industry awards include carbon performance as key judging criteria.	

Investors (banks, funders, etc.)

Immediate Actions:	Progress by 2025:	Progress by 2030:
Include operational energy performance and embodied carbon targets in project funding criteria.	Mandate operational energy and embodied carbon targets in project funding criteria.	Project funding criteria based on validated past performance of projects, as well as targets for the project seeking funding.
Investors and lenders to align decision making with energy performance-based ratings for commercial and industrial buildings and away from EPCs, as BEIS Performance-Based Rating Framework comes into effect.	Energy performance-based ratings established as primary energy KPI within asset valuations and investment decisions.	
Institutional investors based in UK begin disclosing the operational energy and carbon performance of all held properties (at asset level) across their portfolios (Funds) in annual reporting.	Investors to ask for BIM-based Building Passports and engage with existing benchmarking frameworks as a requirement for assessing investment potential.	All properties have building passports.
Require Climate-Related Financial Disclosure (TCFD) reporting.	Recommendations from the BEIS consultation on mandatory climate-related financial disclosures are fully implemented.	
Develop finance solutions and packages for accelerating domestic retrofit, informed by engagement with local authorities to discuss options for all tenure retrofit funding packages (drawing on recommendations from the UKGBC GFI round table and the Green Finance Institute).	Offer a range of finance solutions for domestic retrofit, suitable for different domestic tenures, including 'blended finance packages' which combine funding from private and public sector.	Mature financing landscape supporting high levels of investment in domestic retrofit.
Require all domestic loan scopes to cover whole house retrofits.	Predicate home repair loans on energy efficiency improvements and performance.	Work with domestic clients to assess actual energy performance of domestic buildings.
Provide increased home mortgage lending for retrofit measures and reduced rates of interest for highly efficient properties.	Offer preferential mortgage rates based on home energy efficiency for new and existing buildings.	Established relationship between mortgage rate and home energy efficiency.
Develop stricter guidance on what constitutes a net zero non-domestic building for the purpose of lending, based on the UKGBC Net Zero Carbon Buildings Framework Definition.	Begin offering preferential borrowing rates for low to zero carbon retrofits that actively demonstrate how they reduce Whole Life Carbon.	Established relationship between lending rate and low carbon retrofits.

Developers

Immediate Actions:	Progress by 2025:	Progress by 2030:
Implement Net Zero Carbon (NZC) skills and training plans to establish a baseline degree of carbon literacy across all staff.	Maintain skills and training, and update where necessary to reflect evolving NZC requirements, to ensure all staff have suitable levels of carbon literacy.	Suitable levels of carbon literacy / competence embedded within organisational structure.
Review and establish internal carbon pricing mechanisms (as suitable) to embed climate risks within investment evaluations.	Embed carbon reduction metrics within corporate KPIs and executive remuneration mechanisms.	
Establish Whole Life Carbon (WLC) as a first order consideration within initial site development appraisals and decision-making and prioritise refurbishment / extension over demolition and new build.	Assess, as standard, development appraisals with WLC impacts as key determinant i.e. prioritise brownfield development, sustainable transport solutions, and local economies.	
Establish a NZC client brief on all development projects which: • Embeds an outcome-focused "design for performance" approach through design and procurement. • Sets targets for energy intensity metrics for all projects in line with industry / sector targets. • Sets embodied carbon targets (A1-A5 and A-C) and material re-use targets. • Establishes WLC as a primary decision-making metric to be evaluated at each RIBA Stage.	Track progress of completed projects against energy intensity and embodied carbon targets, with as built and in-use verification in place to limit any performance gap.	Progressive tightening of targets in line with net zero trajectories and industry carbon budgets.
Carry out Post Occupancy Evaluation on all projects delivered in last 5-years to evaluate performance, rapidly improve industry datasets and generate feedback loops. Share asset level data for completed projects via industry-wide central carbon database (Built Environment Carbon Database (BECD)) to expand datasets, evidence base, and support development of targets.	Improved industry datasets for in-use performance.	
Work with contractors to set operational and embodied carbon reduction targets, procure materials with EPDs (EPD A-D to EN15804 & externally verified), require mandatory disclosure of supply chain data, and track construction site emissions.	Aim for at least 40% of products and materials used in building projects to have EPDs.	Aim for 100% of products and materials used in building projects to have EPDs (with suitable minimum thresholds).
Engage contractors during the design phase so that the design team and supply chain can collaborate to develop cost-effective low-carbon solutions to embed into the project before procurement and construction commence.	Pre-contract carbon reviews common practice.	

Developers (continued)

Immediate Actions:	Progress by 2025:	Progress by 2030:
Ensure carbon is evaluated alongside cost in all value engineering exercises.		
Develop NZC pathways on projects to demonstrate how future NZC performance standards can be achieved through future upgrades with lowest WLC impact (i.e. via tenant fit-out, building operation, etc).		
Engage with local authorities to support city-level second-hand materials markets to drive circularity and material re-use.		
Support industry, NGOS and central government in the development of energy performance-based rating systems.		

Landlords / Owners

Immediate Actions:	Progress by 2025:	Progress by 2030:
Commercial landlords to establish Net Zero Carbon (NZC) strategy for procurement and operation of commercial real estate, including: • Targets for energy intensity metrics for all projects in line with industry / sector target trajectories. • Base-build performance requirements. • Portfolio-wide strategies for transition away from fossil-fuels. • Steps to reduce landlord energy usage.	NZC strategies established by all commercial landlords and embedded into business plans and corporate KPIs.	
Commercial landlords to carry out POE on all projects delivered in last 5-years to evaluate performance, rapidly improve industry datasets, generate feedback loops and support the formation of new performance-based rating systems.	Commercial landlords supporting development of improved industry datasets and evidence base for performance outcomes via transparent data sharing with central databases.	
Commercial landlords to ensure plans are in place for in-use energy monitoring and reporting in entire building portfolio. Commit to sharing energy data regularly and transparently with all tenants, and engaging and working with occupiers to minimise operational energy and disclose on an annual basis the operational performance of assets.	Disclose embodied carbon impacts of in-use life-cycle stages (i.e. servicing / maintenance arrangements) to better understand EN15978 lifecycle stages B1-B5 (in-use) including refrigerant leakage, and feed data into relevant public databases (i.e. Built Environment Carbon Database (BECD)). Clear asset plans in place to reduce operational energy usage.	Provide annual public carbon reporting for retrofit, replacement and maintenance work alongside operational energy / carbon reporting from 2025 onwards. Feed data into relevant public database (i.e. BECD).
Commercial landlords to work with industry bodies to develop/review existing green lease templates for all commercial sectors.	Promote the uptake of green leases by working with potential occupiers to establish how the lease could benefit all parties; clearly demonstrate how the progress and outcomes of the lease will be followed up on during the occupier's tenancy.	From 2025 onwards, green lease clauses included in all business leases as part of Government update to Landlord & Tenant Act of 1954.
Commercial landlords to start tracking buildings through green building passports to ensure they are operating as intended.	Work with professional bodies to promote the uptake of green building passports.	By 2030, all buildings within commercial portfolios include building passports.
Commercial landlords to include incentives for improved energy management within non-domestic FM contracts and require condition-based maintenance approach rather than standard PPM.		

Landlords / Owners (continued)

Immediate Actions:	Progress by 2025:	Progress by 2030:
Social landlords to develop high level roadmap for decarbonisation of building stock that sets out financial provision and funding mechanisms for retrofits, engaging fully with local regeneration and housing decarbonisation opportunities provided by Local Authorities and Central Government.	Established decarbonisation plan in place and first retrofit demonstrators completed, ready to implement lessons in further scaling up (note that this is strongly contingent on policy, regulatory, technology and funding mechanism provided by the Government & Local Authorities).	National domestic retrofit programme rolling out at pace and scale.
Social landlords to engage customers (tenants) in the retrofit imperative (including carbon literacy training for employees and setting up Tenants Working Groups).	Social landlords to work with local authorities to develop detailed retrofit plans by archetype, as part of area-based approaches to retrofit and 'One-Stop Shops.'	
Social landlords to establish current carbon footprint, accounting for operational in-use and embodied carbon impacts (i.e. maintenance and repair).	Support decarbonisation business planning through technical assistance and clarity on finance models and recharge mechanisms.	
Social landlords allocate a % of funds for establishing a new retrofit programme (funds could go nominating a responsible person in post for the decarbonisation of housing stock, contracting PAS2035 assessments as basis for surveying building stock retrofit needs, etc.).	Retrofit programme established.	
Private rented sector (PRS) landlords allocate funds to assessing energy efficiency of property portfolio (using PAS 2035) and developing a medium-term improvement plan to meet EPC C (at a minimum) across stock. PRS landlords to engage with managing agents and leaseholders to develop and fully cost a block wide plan to improve every property to band C. PRS landlords to engage with managing agents and leaseholders to increase the use of green energy block wide and drive energy consumption reduction through resident action.	Retrofit works on properties in full progress (doubling each year).	
PRS sector to work together to access 'trusted trader offer' for energy efficiency and low carbon technologies installs and repairs.		
Landowners (MOD, NR, HE, Water utilities etc) set out plans to incorporate climate resilience / enhancements and carbon offsetting within the upkeep and operation of their estates to support their own Net Zero objectives.		
Homeowners and consumers to consider home improvement plans to identify most practical timelines, triggers and approach to energy upgrades (i.e. whole house or room-by-room), with reference to building renovations plans as they become available, and with full support from Local Authorities & one-stop shops on funding mechanisms available and practical issues.		

Occupiers

Immediate Actions:	Progress by 2025:	Progress by 2030:
Establish Net Zero Carbon (NZC) strategy for procurement and occupation of commercial real estate, including: • Base-build performance requirements. • Transition away from fossil-fuels. • Steps to reduce unregulated energy uses and embodied carbon of internal fit-outs. • Steps to achieve net zero operational energy targets, including actions for all occupants.	NZC strategies established by all occupiers and embedded into business plans and corporate KPIs.	
Establish a NZC occupier brief for all fit-out projects (and any new builds) including targets for embodied carbon and tenant energy intensity in line with industry targets.	Commit to NZC fit out targets on all Full Repairing and Insuring leases.	All fit outs achieve NZC targets for energy intensity and embodied carbon.
Ensure embodied carbon assessments are undertaken on major fit-out projects and internal works, and begin sharing embodied carbon data with landlord / developer and industry carbon databases (Built Environment Carbon Database (BECD)) to support development of industry targets.	Provide embodied carbon assessment data for all projects to carbon database (BECD).	
Work with landlords to develop mutually beneficial green leases. Make public commitments to only taking 'green leases' or occupying low carbon spaces (for instance, NABERS rated buildings, fossil fuel-free, provision of 100% additional renewable energy, etc).	Only occupy buildings with green leases.	
All business occupiers commit to sharing energy data regularly and transparently with landlords. Full Repairing and Insuring (FRI) building occupiers commit to aligning with the NZC pathway and operation of the building, as set out by the asset-owner - in addition to data sharing.	Publish consumption rates and adopt targets for energy intensity in occupied spaces.	Only occupy buildings that achieve NZC operational energy targets in operation.
Collaborate with landlords to shift to low-carbon heating technologies, install on-site renewable energy solutions (where possible) or procure 100% off-site renewable energy that creates additionality.		

Facilities Managers / Maintenance

Immediate Actions:	Progress by 2025:	Progress by 2030:
Implement skills and training plans for all students and staff to understand energy targets and plant maintenance requirements for net zero archetypes.	Undertake accredited training for all staff to deliver optimal building service management.	Staff fully equipped to manage and deliver Net Zero Carbon (NZC) energy targets.
Commit to assessing, monitoring, and implementing building performance plans, set against energy use reduction targets over time, including clear plans for ongoing engagement with end users/occupiers.	By 2025, report on performance against plans and demonstrate significant progress.	
Incorporate data associated with operational carbon, embodied carbon, and building / infrastructure lifecycles within the ongoing management of existing / future assets to drive low carbon decisions.	Managers adopt BIM-based building passports.	
Share learnings from maintaining / operating net zero assets to inform future projects and retrofits, including the submission of operational and embodied carbon data into a centralised data base to inform new projects.		
Advocate for earlier involvement in the design and renovations process to ensure the project brief is informed by aftercare and vice versa.	Managers are advocates for NZC buildings.	

Contractors

Immediate Actions:	Progress by 2025:	Progress by 2030:
Develop and implement training and capacity building to deliver Net Zero Carbon (NZC) targets internally and with key suppliers and sub-contractors, supported by Professional Institutions, covering all pertinent sources of emissions during the construction process: • Establishing baseline carbon literacy across staff. • Transport and site (modules A4-A5) & upfront carbon issues. • Closing the energy performance-gap. • Ensuring sub-metering is fully operational. • Processes for avoiding demolition and facilitating deconstruction to optimise reuse of materials.	All contractors are carbon competent in delivering low carbon solutions, with knowledge embedded throughout workforce via appropriate CPD and training programmes.	Carbon reduction established as fundamental requirement within construction works, alongside Health and Safety.
All contractors track construction site emissions, measuring and monitoring all emissions from transport (A4), construction processes (A5), as well as materials quantities brought on to site and material wastage rates. Site carbon data should inform the project's carbon assessment and be fed into an industry database (Built Environment Carbon Database (BECD)).	All contractors require at least 50% of on-site construction (construction vehicles and processes) to be fossil fuel free (transition to 100% by 2030), including eliminating the use of red diesel onsite (through using electric plant and equipment, hydrogen power or biofuel from waste).	Zero emissions from on-site activity / all construction sites are highly resource and energy efficient and, along with site-related transport processes, are powered by renewable energy.
Work with supply chain to set operational and embodied carbon reduction targets, require mandatory disclosure of supply chain data, track construction site emissions, and request EPDs (EPD A-D to EN15804 & externally verified) from all supply chains (driving towards 40% of all products, in terms of carbon impact, by 2025).	EPDs declared for 40% of construction materials and products used in supply chain.	All contractors have declared 100% of supply chain products and materials via EPDs. i.e. 100% EPD by 2030 (with suitable minimum thresholds).
Include carbon reduction targets and reporting commitments explicitly in all documents, as a deliverable of the construction process, using PAS 2080 (or equivalent standard).	Share 'good/best practice' case studies from using PAS2080. 80% of projects achieve PAS 2080 verification (or equivalent standard).	100% of projects achieve PAS 2080 verification (or equivalent standard).
Increase investment (time and / or cost) in low carbon innovation, including role of Modern Methods of Construction (MMC) and Design for Manufacture and Assembly (DfMA) approaches.	Analysis of role of MMC and DfMA approaches drawn from delivered projects has informed corporate strategies and policies. Full suite of documents driving low carbon outcomes available for new projects based on continuous improvement and learning from previous projects.	MMC and DfMA approaches play a critical role in delivering low carbon outcomes.
Ensure robust systems are in place to ensure quality standards and mitigation of performance gaps.		

Contractors (continued)

Immediate Actions:	Progress by 2025:	Progress by 2030:
Carry out detailed pre-refurbishment and pre-demolition audits, to ensure that existing materials can be kept at their highest value. Provide material resource and disassembly plans for completed buildings.	Register of assets as material banks available and design for deconstruction common place.	
Engage in the design stages to work with designers to de-risk low carbon designs, ensure buildability and optimise procurement.		Low carbon design outcomes are achieved.
Domestic contractors to assess existing retrofit capabilities and develop a skills training and recruitment plan for PAS 2030/2035 to guarantee retrofit supply chain capacity, including providing support for upskilling experienced tradespeople.	Training and upskilling of employees in domestic retrofit is ongoing.	All domestic contractors are retrofit-ready.
Tier 1 contractors to achieve verification of their carbon management processes to PAS 2080, or have a verified carbon management and reduction plan accredited to ISO14064 or equivalent.		

Material & Product Manufacturers

Immediate Actions:	Progress by 2025:	Progress by 2030:
All manufacturers and suppliers commit to their specific industry roadmaps, or publish their own, which include carbon reduction targets, investment required, and timelines to Net Zero Carbon (NZC).	Investment committed to major industry supply chain decarbonisation roadmaps.	Industrial decarbonisation ongoing via energy efficiency, material substitutions, fuel switching, and investment in CCS and hydrogen infrastructure.
All manufacturers begin developing EPDs for product portfolio, aiming for a minimum of A1-A5 + C + D (EN15804 and externally verified) and working towards 40% of their standard product portfolio (in terms of embodied carbon impact) by 2025, with minimum thresholds and support and subsidies for SMEs.	All manufacturers have declared the embodied carbon of the top 40% of their standard product portfolio via EPDs.	All manufacturers have declared their entire standard product portfolios via EPDs. i.e. 100% EPD by 2030 (with suitable minimum thresholds).
All manufacturers and suppliers to develop embodied carbon reduction plans for their products and operations, focusing on reducing materials, energy usage, manufacturing waste, packaging and transport needs. Circular approaches (designing for deconstruction, reuse, Modern Methods of Construction (MMC) and Design for Manufacture and Assembly (DfMA)) are prioritised.	Increased provision and utilisation of material take-back and refurbished product schemes.	Re-used material usage widespread.
Contribute to central industry database (BECD) capturing embodied carbon at product level through EPDs (EPD A-D to EN15804 & externally verified).	Develop material passport standards, tools and databases, with support of industry bodies.	Material passports established and adopted by industry.
Product suppliers to provide enhanced support, technical guidance and training for product installation to help ensure construction quality and overcome performance gap.	Development and innovation within key product supply chains supports NZC energy and embodied carbon targets.	Product development and innovations helps deliver NZC targets.
Key supply chains for domestic retrofit (heat-pumps, insulation) conduct market analysis (with support of newly formed Retrofit Agency and local delivery programmes) to better understand demand, forecast material needs, and guarantee capacity to scale up whilst minimising embodied carbon of expected products.	Embodied carbon reduction plans established for key supply chains for domestic retrofit, minimising emissions from expected products.	Robust low carbon supply chains for domestic retrofit.

Architects

Immediate Actions:	Progress by 2025:	Progress by 2030:
Implement Net Zero Carbon (NZC) skills and training plans supported by Professional Institutions, with reference to the Climate Framework, to establish carbon literacy across all students and staff.	High levels of carbon competence amongst qualified architects, with knowledge embedded in CPD and RIBA Membership criteria.	All Architects are key change agents, challenging project teams and clients to achieve lowest carbon design strategy at each RIBA stage.
Carry out high level Whole Life Carbon (WLC) estimates as part of initial site appraisals (refurb / extend / new build), identify and advocate for lowest carbon development options. Wherever possible, advocate and design for re-use and retention of existing building structure / substructure.	WLC assessments and carbon impacts used as the key driver to inform design strategies throughout the project lifecycle (RIBA stages 0-7). Provide clients with low carbon or NZC design options as standard at early design stages.	'Retrofit first' mindset and prioritisation of material reuse becomes standard practice.
Establish energy intensity and embodied carbon targets in project briefs for all projects in line with industry / sector targets.	Contribute towards achieving energy intensity and embodied carbon targets for majority of projects, with as built and in-use verification in place to limit any performance gap.	Widespread knowledge and adoption of key carbon reduction opportunities within each building sector / typology.
Within domestic market, architects develop a skills training plan for PAS 2030/2035, to build capacity and skills in in retrofit.	Use emerging data on embodied carbon of domestic retrofit to optimise decisions on material selection and specifications.	All retrofit projects are optimised for reducing embodied carbon.
Carry out Post Occupancy Evaluation on all projects delivered in last 5-years to evaluate performance, rapidly improve industry datasets and generate feedback loops.	Support development of improved industry datasets for in-use performance.	

Building Services Engineers

Immediate Actions:	Progress by 2025:	Progress by 2030:
Implement Net Zero Carbon (NZC) skills and training plans supported by Professional Institutions, with reference to the Climate Framework, to establish carbon literacy across all students and staff.	High levels of carbon competence amongst Building Services Engineers, with knowledge embedded in CPD and PI Membership criteria.	All Building Services Engineers are key change agents, challenging project teams and clients to achieve lowest carbon design strategy at each RIBA stage.
Build capacity in undertaking detailed operational energy assessments to elevate competencies and improve quality of energy assessments.	Elevated industry competence and skills in operational energy forecasting, across all building types.	Leading expertise in operational energy forecasting, across all building types.
Proactively work with developers and building owners to carry out Post-Occupancy Evaluation on all projects delivered in last 5-years to evaluate performance, rapidly improve industry datasets, generate feedback loops and support the formation of new performance-based rating systems.	Support development of improved industry datasets and evidence base for performance outcomes.	
Adopt and embed a "design for performance" culture across all project types and scales: • Work with developers to establish energy intensity targets in project briefs for all projects in line with industry / sector targets. • Carry out operational energy assessments to an appropriate level of detail on all projects through all RIBA Stages, to inform design, procurement, handover and operation. • Implement effective handover procedures on all projects in line with Soft Landings. • Advocate for the measurement of in-use energy monitoring and performance and support initial optimisation of buildings in first 2 years post-handover.	Publish results of operational energy and Whole Life Carbon (WLC) assessments on an anonymised basis; comparing design calculations with verified operational performance to support industry development. Contribute towards achieving energy intensity and embodied carbon targets for majority of projects, with as built and in-use verification in place to limit any performance gap.	Performance gap eliminated.
Improve understanding of WLC impact of typical MEP installations, build capacity in undertaking WLC assessments, and push supply chains to provide EPDs (EPD A-D to EN15804 & externally verified) and improved embodied carbon data.	Carry out embodied carbon assessments of building services systems on all projects through all RIBA stages, to inform design and procurement, and contribute to achieving industry targets for embodied carbon intensity.	Low embodied carbon MEP design and specification becomes standard practice.
Adopt and support the development of industry project targets and commit to presenting design options for how these can be achieved on all projects.	Ensure all designs are as a minimum 'net zero ready' - with planned upgrade pathways identified to avoid significant future retrofit and minimise WLC.	
Commit to identifying the lowest WLC approach for every project.	Champion the lowest WLC approaches on all projects.	
Work collaboratively to challenge industry norms, reduce over-specification and enable leaner design.	Improved industry specifications and standard practices, including better understanding of how industry guidance can be applied to achieve best outcomes.	

Structural Engineers

Immediate Actions:	Progress by 2025:	Progress by 2030:
Implement NZC skills and training plans supported by Professional Institutions, with reference to the Climate Framework, to establish carbon literacy across all students and staff.	High levels of carbon competence amongst Structural Engineers, with knowledge embedded in CPD and PI Membership criteria (i.e. structural engineers able to offer low carbon solutions as part of a standard scope of works).	All Structural Engineers are key change agents, challenging project teams and clients to achieve lowest carbon design strategy at each RIBA stage.
Build capacity in undertaking embodied carbon assessments using industry tools to elevate competencies and enhance quality of structural embodied carbon assessments.	Elevated industry competence and skills in embodied carbon assessment of structural designs across all building types.	Low embodied carbon structural design and specification becomes standard practice.
Undertake and present embodied carbon estimates for different structural solutions at concept design stage on all projects.	Embodied carbon assessments carried out for structural design on all projects through all RIBA design stages as one of the primary decision tools in design and procurement. Contribute to achieving industry targets for embodied carbon intensity.	
Promote and learn from existing pathfinder projects adopting low carbon construction materials at scale.	Innovate structural design to embrace low carbon construction materials. Support industry to work through delivery challenges in order to mainstream adoption.	
Enable market circularity through training structural engineers in conducting pre-demolition audits, identifying re-use and retention opportunities, and designing for disassembly (i.e. the future re-use of building products and materials).	On all projects, proactively identify opportunities to utilise re-used structural elements and design for disassembly, and advocate for maximum re-use of existing building structure / substructure. (if structures must be demolished, advocate for controlled deconstruction over demolition to maximise reuse potential of structural components).	Re-used material usage widespread.
Work collaboratively to challenge industry norms, reduce over-specification and enable leaner design. Proactively propose solutions to the design team and client, that maximise efficiency of structural configuration (well-proportioned beams, short spans, direct axial load paths, etc) on all projects.	Improved industry specifications and standard practices, including better understanding of how industry guidance can be applied to achieve best outcomes.	

Infrastructure Clients

Immediate Actions:	Progress by 2025:	Progress by 2030:
Commit to relevant industry roadmaps, or publish their own, which includes Science Based Targets in line with 1.5 degree pathway, investment required and timelines to Net Zero Carbon (NZC) for both new and existing assets.	NZC strategies and roadmaps established.	
Include carbon reduction targets and reporting commitments explicitly in all procurement documents, as a deliverable of the procurement process, using PAS 2080 (or equivalent standard) as the reference standard.	All clients to achieve PAS 2080 verification (or equivalent)	
Provide a carbon baseline for all projects by adopting PAS 2080 and set targets for carbon reduction against these, driving innovation. Include, where appropriate, financial incentives to ensure targets are met.	Implement approaches to improve capabilities to measure and reduce embodied and operational carbon over the whole lifecycle of the asset and ensure carbon reduction targets remain progressive over time with industry advancements.	
Provide supply chain with performance/ outcome-based specifications and commercial arrangements, where possible, ensuring outputs are not constrained to current thinking but encourage low carbon innovations.	Require strategic suppliers to have science-based carbon reduction targets in line with a NZC pathway.	
	Make a public commitment via SteelZero to procuring, specifying or stocking 100% net zero steel by 2050 and an interim commitment to procuring, specifying or stocking 50% of its steel requirement by 2030.	As per SteelZero commitment, 50% of steel requirements procured, specified, or stocked at net zero.
Share carbon data openly via industry-wide central embodied carbon database (Built Environment Carbon Database (BECD)).	Commit to using an agreed industry-wide set of carbon emission factors for construction products and buildings materials that are used consistently across all infrastructure projects.	

Infrastructure Owners

Immediate Actions:	Progress by 2025:	Progress by 2030:
Owners of existing assets to commission studies on how they might best reduce operational carbon, recognising that in many cases (e.g. roads) it is the users of those assets who produce most emissions.	Commit to and disclose science-based targets in line with net zero pathway.	Progressive tightening of targets in line with net zero trajectories and industry carbon budgets.
Ensure operational investment plans align with the national net zero obligation, including retrofitting decarbonisation to existing asset operations and their use.		
Include carbon reduction targets and reporting commitments in project briefs as deliverables of the design. Use PAS 2080 (or equivalent standard) as the reference document for this.	80% of projects achieve PAS 2080 verification (or equivalent standard).	100% of projects achieve PAS 2080 verification (or equivalent standard).
Develop net zero strategies for asset system maintenance, refurbishment and low-cost upgrade (i.e. not major project), including identifying big-ticket actions for targeting reductions.	Implement approaches to improve capabilities to measure and reduce embodied and operational carbon over the whole lifecycle of the asset and ensure carbon reduction targets remain progressive over time with industry advancements.	
Share carbon reduction data openly via industry-wide central embodied carbon database (Built Environment Carbon Database (BECD)) for the purposes of benchmarking and performance improvement, and commit to sharing own best practice across the supply chain / sectors and learning from and adopting others best practice where possible.	Commit to using an agreed industry-wide set of carbon emission factors for construction products and buildings materials that are used consistently across all infrastructure projects.	All projects use an agreed industry-wide set of carbon emission factors.

Infrastructure Designers

Immediate Actions:	Progress by 2025:	Progress by 2030:
Develop and implement internal training and capacity building to deliver Net Zero Carbon (NZC) as a core design and/or consultancy service.	High levels of carbon competence and skills amongst Infrastructure Designers, with knowledge embedded in CPD and PI Membership criteria.	All Infrastructure Designers are key change agents, challenging project teams and clients to achieve lowest carbon design strategies.
Proactively recommend and adopt carbon measurement and carbon reduction methodologies in all projects for both design and construction, regardless of whether clients are requesting them. Use PAS 2080 (or equivalent standard as the reference document).		
Conduct Whole Life Carbon (WLC) assessments for all projects above £10m.	Conduct WLC assessments for all projects above £5m.	Conduct WLC assessments for all projects.
Include carbon reduction targets and reporting commitments explicitly from the client, as a deliverable of the design. Use PAS 2080 (or equivalent standard) as the reference document for this.	80% of projects achieve PAS 2080 verification (or equivalent standard).	100% of projects achieve PAS 2080 verification (or equivalent standard).
Contribute carbon reduction data to an industry-wide central carbon database (Built Environment Carbon Database (BECD)) for the purposes of benchmarking and performance improvement, and to sharing own best practice across the supply chain / sectors and learning from and adopting others best practice where possible.		
Actively instigate early collaboration with the client and across the value chain, including with product manufacturers and the O&M team to deliver on the carbon requirements, and inform the development of approaches and standards.		
Automate production and delivery of CO_2e information through design and construction by using integrated approaches to data creation and management. This will inform optimal solutions through the build phase and streamline delivery of information to clients.		