'Spotlight on...' The Considerate Constructors Scheme's 'Spotlight on...' campaigns focus on different topics associated with improving the image of construction and raising awareness among Scheme-registered organisations about the issues and how to help.

CONSIDERATE CONSTRUCTORS SCHEME

BEST PRACTICE HUB

Spotlight on...
carbon reduction

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'**Spotlight on...** carbon reduction asks what net zero means for the industry and outlines easy and practical guidance to support your decarbonisation journey.

Reducing our carbon emissions has become one of the biggest issues for our generation. In this 'Spotlight on...' we ask what net zero means for the industry and outline easy and practical guidance to support your decarbonisation journey.

INTRODUCTION

Climate change and global warming has become one of the single largest threats to our planet and having dominated our headlines for decades, it is the defining issue of a generation. Many governments have declared a climate emergency, with more than 70 countries including the UK and Ireland, pledging their commitment to become net zero by 2050 as part of the landmark **Paris Agreement**. With energy consumption and carbon (CO2) emissions in the construction industry reaching an all-time high, how is the sector adapting to meet these legally-binding targets? In this 'Spotlight on...' we ask what net zero means for the industry and outline easy and practical guidance to support your decarbonisation journey.

The UK and Ireland construction industry is responsible for **25%** of our total carbon footprint, generating **40 – 50 million tonnes of CO2 emissions annually.** To put this into perspective, this is more than the total emissions from aviation and shipping combined. According to a recent survey conducted by the Considerate Constructors Scheme to more than 450 construction industry professionals, over 90% of respondents believe there is an issue with the amount of CO2 emissions produced by construction, with energy and fuel consumption seen as the main contributor. 83% of respondents believe the industry has the potential to significantly reduce its CO2 emissions, with over 60% feeling the sector is not doing enough to tackle the issue.

The outlook is even worse from a global perspective with the building and construction sector accounting for over **34% of energy** consumption and 37% of CO2 emissions. With demand for raw materials predicted to **double by 2060** (including some of the biggest contributors to CO2 emissions), and growing population and commercial demands putting increasing pressure on the industry, is it possible to make a difference to reduce CO2? What guidance is there to decarbonise and fulfil the Government's commitment to become net zero by 2050, and how do we pave the way for greener, cleaner and more sustainable practices in construction.

WHAT ARE THE TYPICAL SOURCES OF CO2 EMISSIONS IN CONSTRUCTION?

From the mining and manufacturing of materials such as concrete and cement, to the management and eventual deconstruction of a structure, CO2 emissions can be found at every stage of a construction and engineering lifecycle.

The **Greenhouse Gas Protocol** framework provides a globally recognised classification to group sources of CO2 emissions at an organisational level.

Typical sources of CO2 emissions in construction are split into three scopes and include:

Scope 1 (direct):	Emissions caused by an organisation directly; for example from running machinery and heating buildings.	• Operational functions to light, heat, and power a site • Energy to operate machinery, equipment and generators • Construction waste and landfill • Maintenance of a structure during its lifetime • Demolition process
Scope 2 (indirect):	Emissions generated indirectly when energy is produced on behalf of the organisation from a utility provider.	• Energy purchased to operate and maintain a site and plant, such as gas, electricity, oil.
Scope 3 (indirect):	Emissions produced from the supply chain and at a customer level.	• Extraction and production of materials such as steel, aluminium and concrete • Transportation • Activity from across the supply chain • Waste management

WHAT ARE CARBON EMISSIONS AND WHY DOES IT MATTER?

Carbon emissions, often referred to as greenhouse gases, are generated by the release of CO2. Methane and others into the atmosphere. They are created by human activity, such as the burning of fossil fuels (coal, oil and gas), the impact of deforestation and the growth in landfill and waste disposal. CO2 radiates and traps heat from the sun and this has caused our planet to warm by +1.1°C in 200 years, disturbing the natural balance of our planet and resulting in an unprecedented change to the climate.

Impacts of global warming include (source: The United Nations):

- Higher temperatures have increased heat-related illness and the spread of disease, damaged natural habitats through increased threat of wildfires, and reduced the earth's ability to cool down by melting the polar ice caps.
- Increased severity of storms which have become more frequent, devastating the lives of millions of people, destroying homes and communities, and causing huge economic loss.
- Drought and scarcity of water which has threatened and destroyed crops, decreasing food supply and increasing the plight of communities who struggle for water.
- Rising sea levels, hotter and more acidic oceans threatening coastal and island communities, endangering marine life and coral reefs.
- Declining biodiversity where forest fires and extreme weather conditions have increased the prevalence of disease and threatened approximately one million species with extinction in the next few decades.
- Shortage of food as climate change has compromised the yield of fisheries, crops, and livestock causing a rise in hunger and poor nutrition.
- Increased health risks as air pollution, disease, extreme weather and forced population displacement has affected the mental and physical wellbeing of around 13 million people every year.
- Poverty and displacement as extreme floods and water scarcity have forced millions of people to become refugees and into poverty.

What is the construction industry doing to tackle the problem?

RESOURCES AND INITIATIVES

In the last decade there has been a surge in the number of resources and initiatives available to support greener practices in construction; **the UK Green Building Council** has published **Net Zero Carbon Buildings: A Framework Definition**, with principles to achieve net zero carbon. They have also created a **Whole Life Carbon Roadmap** which shows how industry can get to net zero by 2050.

The **Construction Leadership Council** have launched several initiatives to champion sustainability including: CO2nstructZero, a zero carbon programme identifying nine priorities for carbon reduction that align with the government's 10-point plan, and a **Zero Avoidable Waste Routemap** to help manage construction waste and reduce landfill.

Part Z is an industry-proposed amendment to UK Building Regulations 2010 which would ensure that embodied carbon is assessed on all projects, as part of a comprehensive whole life carbon assessment.

ENVIRONMENTAL ASSESSMENT METHODS

BREEAM continues to influence greener more sustainable practices and is recognised by investors and contractors alike. In recent research conducted by the Scheme two thirds of respondents have worked on BREEAM or LEED certified projects. Similarly, many contractors have adopted the globally recognised **ISO 14001** Certification in Environmental Management Systems to strengthen and audit environmental policies.

STANDARDISED METRICS

The project has begun to create the UK's first **Net Zero Carbon Buildings Standard** which will be launching later this year to provide standardised metrics to demonstrate and verify net zero carbon buildings in the UK. Bringing together leading industry organisations including **BBP**, **BRE**, **The Carbon Trust**, **CIBSE**, **IStructE**, **LETI**, **RIBA**, **RICS**, and **UKGBC**, this is the first major collective step in supporting stakeholders throughout the decarbonisation of procurement, design, construction and operation of buildings.

There is a suite of **European Standards** that cover sustainability works for construction and infrastructure. These include methodologies for assessment of environmental performance (including carbon) at a building and product level.

SUSTAINABLE MATERIALS

Net zero targets have been a catalyst for innovation as investment in the research and development of sustainable greener construction materials grows. Contractors are exploring new uses for existing materials such as bamboo and evaluating new resources like sustainable low carbon concrete and production methods like 3D printing in reducing emissions from production, packaging and transport. Closed loop remanufacturing schemes are emerging, creating a circular economy by re-using products and transforming them into eco-friendly new materials. Furthermore, there's been a growth in the uptake of recycled plastics and metals, reducing waste and landfill.

Manufacturers are now producing **Environmental Product Declaration's (EPD)** to provide the environmental performance of a product. These are then used in whole life carbon assessment tools to assess which materials may have less of a carbon impact.

What are we doing to help support carbon reduction?

At the Considerate Constructors Scheme we prioritise the issues that affect our planet, championing sustainability, decarbonisation and the natural environment as one of the three pillars of our Code of Considerate Practice. We recognise the construction industry will need to play a significant role in helping achieve Net Zero by 2050 and are spearheading industry standards to help constructors minimise the impact of their operations, take considered steps to safeguard the natural environment and optimise the use of resources.

Our Scheme Monitors uphold standards and measure progress with Registered Activity, benchmarking initiatives and offering advice and guidance.

The Considerate Constructors Scheme checklist includes:

- **Q2.2.1: How is the Registered Activity planning to reduce its carbon footprint, including measurement, recording and publication of performance?**
- **Q2.2.2: How is the Registered Activity optimising the use of resources, energy and waste?**
- **Q2.2.3: How is the Registered Activity ensuring supply chain involvement in the reduction of carbon?**

The Checklist also asks Registered Activity to optimise the use of resources, including minimising carbon throughout the value chain.

Law and legislation

The following law and legislation is relevant to helping address the issue of reducing carbon emissions.

THE CLIMATE CHANGE ACT 2008

- This Act established a legally binding target to reduce the UK's Green House Gas (GHG) emissions by at least 100% of 1990 levels (net zero) by 2050.
- It provides the UK with a legal framework including a 2050 target for emissions reductions, five-yearly 'carbon budgets' (limits on emissions over a set time period which act as stepping stones towards the 2050 target), and the development of a climate change adaptation plan. Currently the UK is projected to fall short of the fourth and fifth carbon budgets.

For government guidance on the act, visit **https://www.legislation.gov.uk/ukpga/2008/27/contents**

THE COMPANIES ACT 2006 REGULATIONS 2013

- This requires 'quoted companies' (companies listed on LSE, NSE, EEA) to report information on Greenhouse Gas emissions in their Director's Reports.

For government guidance on the act, visit **https://www.legislation.gov.uk/uksi/2013/1970/contents/made**

MINIMUM ENERGY EFFICIENCY STANDARD (MEES)

- This came into force on 01/04/2018 – requires private rented residential and non-domestic property to be at a Minimum Energy Efficiency Standard Rating of E.

For government guidance on the act, visit **https://www.legislation.gov.uk/ukdsi/2015/9780111128350/contents**

THE COMPANIES (DIRECTORS' REPORT) AND LIMITED LIABILITY PARTNERSHIPS (ENERGY AND CARBON REPORT) REGULATIONS 2018

- These regulations impose new obligations for what must be included in the Director's Reports for quoted companies. Large unquoted companies and Limited Liability Partnerships must now report emissions in their director's reports as well
- Large companies are classed as satisfying two of the following requirements: having a turnover of £36m or more, a balance sheet of £18m or more; and 250 or more employees.

For government guidance on the act, visit **https://www.legislation.gov.uk/ukdsi/2018/9780111171356**

CLIMATE CHANGE LEVY

- A tax on electricity, gas and fuel oil use by business. Reduced levy rates are paid by those who deliver reductions in energy use in line with their sector's climate change agreements.

For government guidance on the act, visit **https://www.gov.uk/guidance/climate-change-levy-rates**

BUILDING REGULATIONS PART L

- Part L is a building regulation that concerns construction projects that are new, or result in the change of use of a dwelling or all other buildings in England. It sets the standards for the energy performance and carbon emissions of buildings.

For government guidance on the act, visit **https://www.gov.uk/government/publications/conservation-of-fuel-and-power-approved-document-l**

Government initiatives

THE CONSTRUCTION SECTOR DEAL

- This is a partnership between the government and the industry which sets out a strategy to improve the sector.
- Part of this deal is an aim to halve the energy use of new buildings by 2030. It also aims to make more sustainable and lower carbon buildings cheaper to build. The deal sets out a 50% reduction in GHG emissions within construction by 2025.

For government guidance on the act, visit **https://www.gov.uk/government/publications/construction-sector-deal**

GREEN FINANCE STRATEGY

- This sets out framework for the UK to become the world's first Net Zero Aligned Financial Centre, outlining how we will ensure market participants have the information and tools they need to align to our climate and nature goals.
- The strategy sets out a framework for supporting technologies as they grow to commercialisation. We also set out our next steps to grow high integrity voluntary markets including a framework for developing nature markets in the UK.

For government guidance on the act, visit **https://www.gov.uk/government/publications/green-finance-strategy**

NET ZERO STRATEGY: BUILD BACK GREENER

- This strategy sets out policies and proposals for decarbonising all sectors of the UK economy to meet our net zero target by 2050.

For government guidance on the act, visit **https://www.gov.uk/government/publications/net-zero-strategy**

Examples of best practice

We are proud to support some of the most pioneering constructors in the industry who are taking a stand and making a real difference to minimise their environmental impact. Our Best Practice Hub contains a wealth of insights and exceptional examples of environmental innovation from across the country.

- This contractor has made an online net zero dairy which is available to all via their website. The diary aims to share best practice but also highlight areas where the industry needs to better collaborate to achieve net zero construction.
- This contractor has created an embodied carbon model for the project at RIBA Stage 4, using OneClick LCA. As the project progresses, this model is being updated to reflect final quantities of materials procured, all environmental product declarations use on the project and final site emissions data.
- This contractor hired three Ampd Enertainer batteries, to power three tower cranes. These batteries were initially trialled in Hong Kong and Singapore. Following their success, they came to the Olympia Redevelopment as the first deployment in Europe.
- The welfare setup has been fitted with measurable energy sockets and fuse spurs for all power outlets. Measurable Energy equips facilities managers, building owners and occupants with real-time energy and GHG emissions monitoring, automated controls and data driven actions to avoid unnecessary carbon emissions and reduce costs.
- This contractor has rolled out an environmental initiative on site, to allow all personnel to calculate their individual carbon footprint. Those who scan the code can then complete a short questionnaire, answering relevant questions on their diet, travel and home life.
- The contractor is using the lowest embodied carbon structural steel product available and is the first project in UK to use this. The steel comes with a cost uplift over other rolled steel sections.
- This contractor created an 'Educating Our Supply Chain' video on carbon reduction to support their business commitment towards Net Zero, which was publicised and shared with their key supply chain partners.
- As part of the site and office setup, the project team analysed the cost and carbon emissions of traditional items or services and their green alternatives. 12 'green' proposals were evaluated which ranged from procuring renewable sourced energy to retrofitting site cabins with energy and water efficiency fittings.
- On this project they received the new Eco Hybrid Lithium welfare cabin with increased lithium battery capacity. These mobile eco welfare units use smart Lithium Hybrid technology for silent green running, as well as a smart water system.
- This project is set to be the UK's first fossil fuel-free major mixed-use property estate, all eight buildings across the development will be powered by electricity derived from renewable resources, producing zero emissions in operation.

To view over 120 Best Practice Hub entries relating to the 'Spotlight on... carbon reduction' learning toolkit visit: **ccsbestpractice.org.uk/tag/carbon-reduction/**

Case Studies

Be inspired by those across our industry who share their story and offer advice on carbon reduction in construction.

bam	**BAM** have an ambition to have a net positive impact on the environment. They believe that effective energy management is the best way to save money and should be planned as early as possible.
	https://ccsbestpractice.org.uk/wp-content/uploads/2023/05/BAM-Effective-Onsite-Energy-Management.pdf

bam	**BAM** on their Exmouth Community College chose to install two temporary eco cabins while their enabling works were being completed and the site was being prepared for the main welfare cabins.
	https://ccsbestpractice.org.uk/wp-content/uploads/2023/05/BAM-Low-Carbon-Welfare-Unit.pdf

bam nuttall	**BAM Nuttall** have assessed the carbon savings that have occurred between the design stage and construction of the Flow Control Structure through concrete mix design.
	https://ccsbestpractice.org.uk/wp-content/uploads/2023/05/BAM-Nuttall-Carbon-Savings-through-Concrete-Mix-Design.pdf

bam nuttall	**BAM Nuttall** have reduced their carbon emissions by carrying out the UK's largest single pour of Cemfree for Network Rail at Chatham Station.
	https://ccsbestpractice.org.uk/wp-content/uploads/2023/05/BAM-Nuttall-Chatham-Station.pdf

bam nuttall	**BAM Nuttall** used low carbon concrete in the Boston barrier. Due to the complex structure, only in-situ reinforced concrete was considered.
	https://ccsbestpractice.org.uk/wp-content/uploads/2023/05/BAM-Nuttall-Low-Carbon-Concrete-used-in-Boston-Barrier.pdf

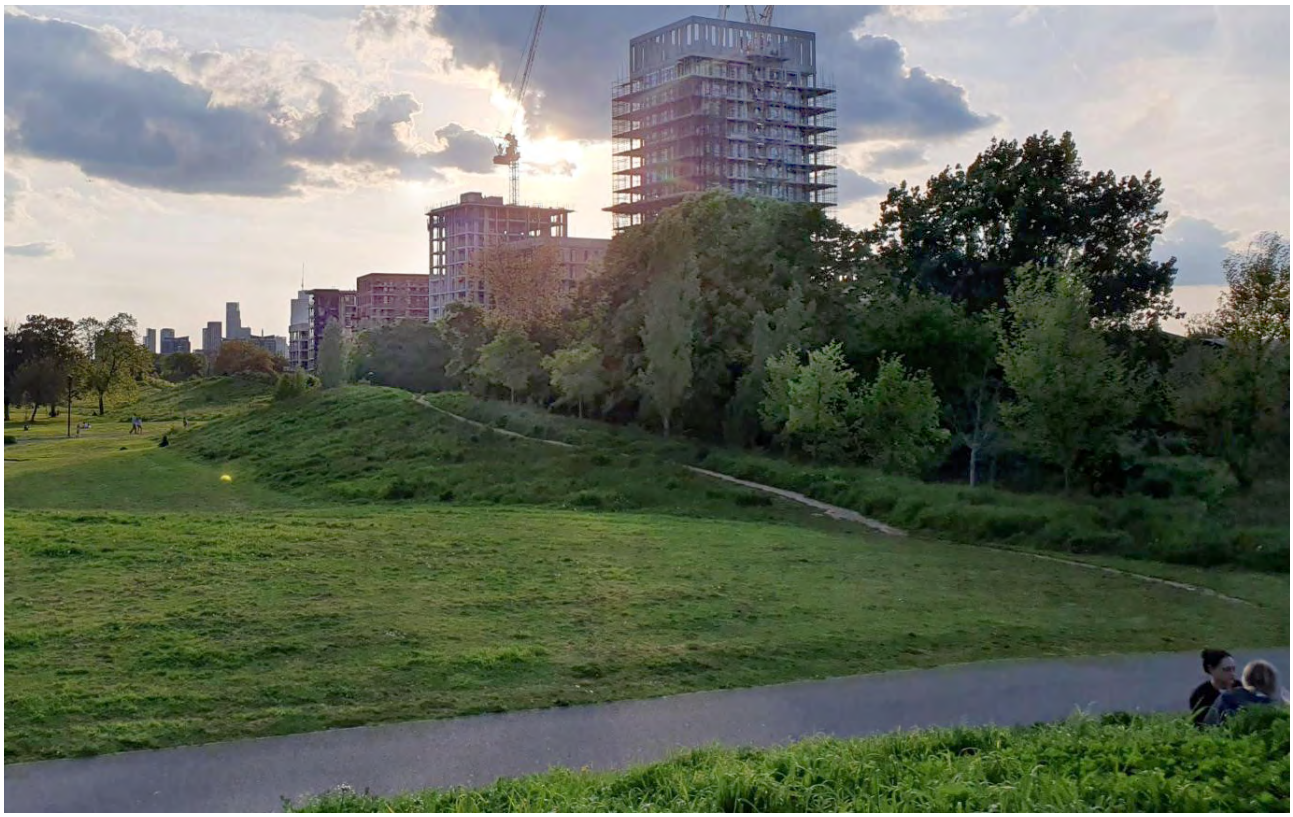
+ BOWMER KIRKLAND	**Bowmer + Kirkland** has been measuring and managing its carbon footprint for 15 years in partnership with the internationally recognised Planet Mark certification scheme.
	https://ccsbestpractice.org.uk/wp-content/uploads/2023/05/Bowmer-and-Kirkland-BEST-PRACTICE-AND-INNOVATIVE-EXAMPLES.pdf

CANARY WHARF CONTRACTORS	**Canary Wharf Group** aim to raise awareness of the environmental impact from embodied carbon in construction and provide information on the initiatives taken to reduce carbon emissions through innovative methods and stakeholder collaboration.
	https://ccsbestpractice.org.uk/wp-content/uploads/2023/05/Canary-Wharf-Group.pdf
C.F. CONSTRUCTION	**C.F Construction** made a conscious and dedicated decision to improve their environmental footprint. Through this, they have implemented multiple improvements in different areas of their business, aiming to improve their environmental sustainability.
	https://ccsbestpractice.org.uk/wp-content/uploads/2023/05/CF-Construction-Improving-Environmental-Sustainability.pdf
GallifordTry	**Galliford Try** as part of their energy reduction initiatives took the decision to use battery packs to accompany the generators that would power the site. The battery packs allow the site to utilise hybrid power and the site to be powered by battery at periods of low demand in order to reduce generator running time.
	https://ccsbestpractice.org.uk/wp-content/uploads/2023/05/Galliford-Try-Off-Grid-Battery-Packs.pdf
BUILDERS SISK CONTRACTORS Established 1859	**John Sisk & Son** are reducing their carbon footprint through promoting carbon efficiency, sustainably sourcing material, preserving heritage assets, protecting the environment and enhancing biodiversity and improving waste management through innovation and re-use/recycling.
	https://ccsbestpractice.org.uk/wp-content/uploads/2023/05/John-Sisk-Reducing-our-Carbon-Footprint.pdf
MORGAN SINDALL	**Morgan Sindall** have created a 10 Tonne Carbon Challenge which is an initiative set up as part of their effort to mitigate climate change by reducing the carbon impact of what they build and how they build it.
	https://ccsbestpractice.org.uk/wp-content/uploads/2023/05/Morgan-Sindall-10-Tonne-Carbon-Challenge.pdf
MORGAN SINDALL	**Morgan Sindall** have made a significant contribution to becoming a diesel free site by switching to electric and battery powered equipment and using HVO fuel.
	https://ccsbestpractice.org.uk/wp-content/uploads/2023/05/Morgan-Sindall-Diesel-Free-Site.pdf

Peabody	**Peabody New Homes** have included the provision of efficient fossil fuel free heating and hot water in the development of new homes as this is key to decarbonisation.
	https://ccsbestpractice.org.uk/wp-content/uploads/2023/05/Peabody-NEW-HOMES.pdf

ROCHESTER BRIDGE TRUST	**Rochester Bridge Trust's** journey to Net Zero began with the calculation of its carbon footprint for all bridge maintenance activities. Since April 2022, all maintenance activities on Rochester Bridge are carried out at Net Zero Carbon.
	https://ccsbestpractice.org.uk/wp-content/uploads/2023/05/Rochester-Bridge-Trust-Net-Zero-Carbon-Management.pdf

St James Designed for life	**St James** commitment to sustainable building was seen in their White City project with a high standard of environmental management. This follows a set of group-wide environmental policies which aim to put the group at the forefront of industry sustainability.
	https://ccsbestpractice.org.uk/wp-content/uploads/2023/05/St-James-Maintaining-Carbon-Positivity.pdf



What can you do?

Whether you are a contractor, supplier, manager or construction professional, we all have a duty to protect our planet and there are lots of ways you can make a difference to build a greener, sustainable industry.

IDENTIFY AND MONITOR CO2 EMISSIONS AND SET TARGETS

The first step to reducing CO2 emissions is to identify possible causes from a company and project level. The **Greenhouse Gas Protocol** framework as mentioned above is a useful tool to categorise, track and report on emissions and find opportunities to support a long-term carbon reduction strategy.

WORKPLACE TRAINING AND ADVOCACY

To help achieve net zero targets, education, awareness and advocacy is critical. Once a strategy, tactical plan and targets have been set, ensure it is communicated across the company or project and regularly reported on. Create a benchmark of success and celebrate achievements to inspire other teams in the business and across the supply chain.

Drive change by increasing the skills and knowledge of staff through regular training and during site inductions, challenge traditional behaviours, and raise awareness with poster campaigns, toolkits and site events. Appoint advocates and champions of sustainability from the boardroom and throughout the business to promote best practice.

ASSESS ENERGY USE

One of the biggest ways to reduce CO2 emissions is to identify, monitor and evaluate the energy used onsite; from vehicles, machinery and equipment, to lighting, heating and site accommodation. Make positive eco-conscious choices:

- Use biofuels, green/renewable energy to power equipment, machinery and vehicles, if not available look into hybrid-powered alternatives
- Review alternative options to using diesel generators
- Opt for low energy consumption tools
- Switch off equipment and vehicles when not in use
- Don't overcharge tools
- Reduce reliance on water supplies by harvesting natural rainwater onsite
- Use low energy light fittings and switch off when not in use
- Turn off heating when not needed

WASTE REDUCTION AND MATERIAL USAGE

Construction, demolition and excavation accounted for almost **two thirds** of the UK's total waste. Reducing waste using the 3 R's of waste management – reduce, reuse, recycle can make significant strides in reducing landfill and CO2 emissions.

- Use sustainable materials that are less energy-intensive to produce
- Explore the use of reused and recycled materials
- Turn waste stone and concrete into aggregate
- Send materials for recycling
- Source materials sustainably and ethically
- Buy local and reduce mileage and carbon footprint
- Donate excess resources to charities for reuse
- Agree buy-backs and take back with suppliers.

ENCOURAGE AND SUPPORT SUPPLY CHAIN

Decarbonisation is a collective responsibility and every part of the construction industry has a part to play.

With an average of 50-70 suppliers on a typical project, the supply chain is a big component of a carbon zero strategy.

Adopt a green supply chain management approach, integrating environmental processes and ensure you have transparency of practices.

Support suppliers with guidance, best practice and share training resources.

Conclusion

The Government's commitment to achieve net zero by 2050 is an ambitious target and reaffirms the urgency needed to react. But in an industry that is still producing more CO2 than ever before, greater strides are needed to make an impact and tackle the issue head on.

According to the Scheme's Carbon Reduction survey 2023, over half of respondents have never worked on a project that has successfully met a CO2 reduction target, and only 1 in 3 construction projects have used renewable energy on site. Over 85% of respondents agree there is not enough incentive for construction companies to reduce their CO2 emissions, with cost seen as the biggest barrier, and smaller firms struggling to remain competitive with more expensive greener alternatives. The Construction Industry Training Board (CITB) predict the construction industry will require **350,000 new roles** to be created by 2028, to ensure the government's commitment to achieving net zero by 2050 is on track.

These stark statistics suggest more work is needed to support a carbon free industry, a collective drive from contractors, designers, asset owners, manufacturers, industry bodies and across the supply chain, as well as at a policy and government level to promote investment in greener cost efficient initiatives.

The opportunity to transform the industry is huge; to develop low carbon materials, zero emission plant, sustainable practices and a new generation of eco-conscious champions to lay the foundations of a sustainable greener construction industry, we can all be proud of.

Further reading on this topic can be found in the References and Useful Resources section.

The Scheme will continue to update this page as new case studies and examples of how the industry is tackling climate change are identified. If you would like to share how your organisation helps to reduce CO2 emissions, please contact the Scheme by emailing **enquiries@ccsbestpractice.org.uk.**

This learning toolkit is supported by: ASBP The Alliance for Sustainable Building Products