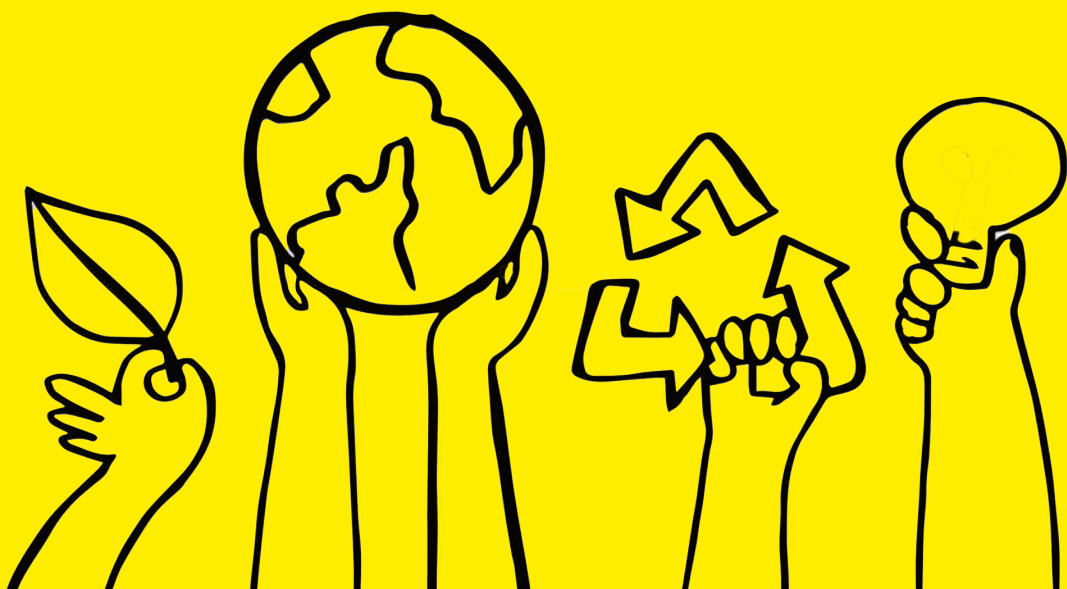


Achieving zero carbon

Guidelines for the Engineering
Construction Industry



Foreword – Achieving zero carbon

Governments around the world have increasingly been making a commitment to achieve a net zero emissions target, which is the sustainable balance between greenhouse gas emissions and carbon removal. The COP26 summit brought parties together to accelerate action towards the goals of the Paris Agreement and the UN Framework Convention on Climate Change; this has given a new focus and urgency to net zero commitments everywhere.

Getting to net zero requires that everyone, including the public and private sectors, agrees to key objectives for reducing greenhouse gas emissions in line with set targets. This means that all must get involved and each individual and organisation has a role to play in facilitating action by society as a whole.

This document has been produced by the ECIA at the request of its members and aims to provide a framework for organisations to plan their own zero carbon journey.

It defines common guidelines for companies to plan an implementation of a zero carbon strategy and can help them to:

- Decide and define their own company policy/policies for achieving zero carbon status
- Identify and define strategic objectives and decide on an approach to their implementation
- Decide on requirements for communication of objectives, as well as necessary training and upskilling
- Decide on requirements for engagement, measurement, recording and reporting.

Companies and organisations of all sizes are actively encouraged to put into practice zero carbon policies and initiatives in line with the guidelines contained within this document.

For further information please do not hesitate to contact ecia@ecia.co.uk.

First edition

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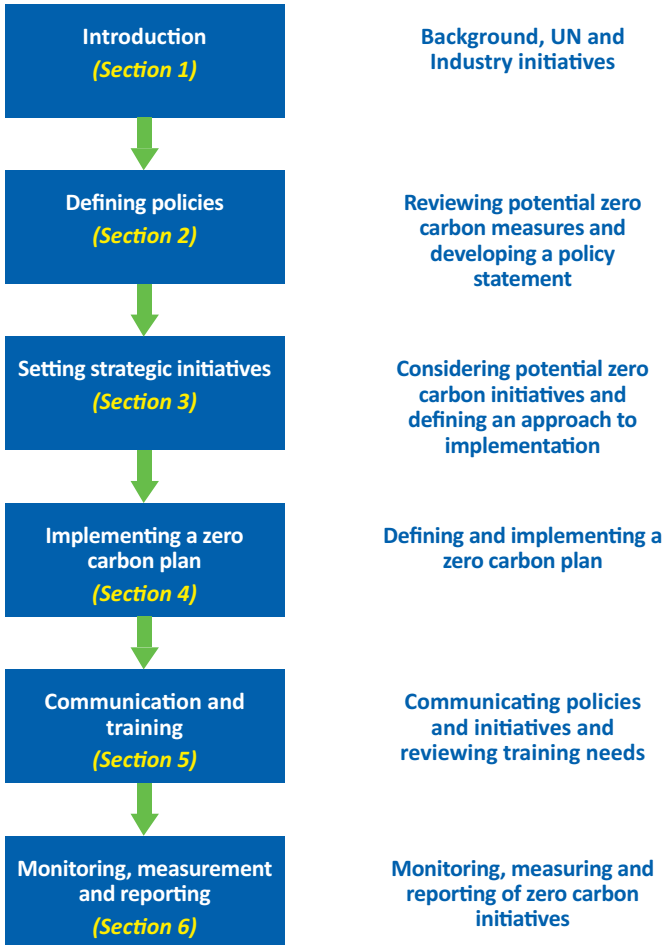
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Document overview by section



1. Introduction

The scientific evidence is clear that emissions of greenhouse gases ('GHGs'), resulting from human activity, are having a significant impact on warming of the planet ('global warming') with consequences for climate change.

Carbon dioxide (CO₂) is emitted when fossil fuels are burned to meet a demand for energy. Although it isn't the only greenhouse gas, carbon dioxide is the most significant and the umbrella term 'carbon emissions' is often used to describe all greenhouse gas emissions.

As one of the first major economies which began to address the problem, the UK government passed a net zero emissions law in June 2019, with a target that required the UK to bring all greenhouse gas emissions to net zero by 2050.

1.1 Background

What is Net Zero?

'Net zero' refers to a target of completely negating the amount of greenhouse gases produced by human activity, to be achieved by reducing emissions (especially carbon dioxide) and implementing methods of absorbing carbon dioxide from the atmosphere.

This balance or 'net zero' is achieved when the amount of greenhouse gas being produced is no more than the amount being removed from the atmosphere; this state is also referred to as 'carbon neutral' or 'zero carbon'.

Any carbon emissions which cannot be eliminated in the first place must be balanced or 'offset' by finding ways to absorb an equivalent amount of greenhouse gases from the atmosphere.

There are many ways to remove carbon from the atmosphere, for example by planting trees, which absorb CO₂ and release oxygen, and through no-till agriculture. However, as well as trying to take CO₂ out of the atmosphere, it's important to reduce the amount of CO₂ that is being put into the atmosphere in the first place. This means reducing reliance on energy sources like coal, which produce high carbon emissions, and increasing use of energy sources like wind, solar and nuclear power, which do not produce any carbon.

See also:

DEFRA 'Guidance on how to measure and report your greenhouse gas emissions' September 2009

Sources of Emissions

There are three generally accepted sources of emissions:

- **Scope 1** - Emissions directly generated by activities and operations that are under an organisation's direct control. These can include:
 - Combustion of natural gas, propane, butane or hydrogen (for example: boilers, furnaces or turbines)
 - Road vehicles owned or leased by the organisation
 - Process emissions: for example from cement, aluminium or waste
 - Fugitive emissions: for example air conditioning or refrigeration leaks; methane leaks from pipelines.
- **Scope 2** - Indirect emissions (from purchased energy such as grid electricity for heat and cooling), which will depend on the carbon intensity of the energy supplier and so mostly on the choice of supplier.
- **Scope 3** - Emissions from activities in the value chain (such as purchased materials and fuels, leased assets and services), which are likely to constitute the bulk of the emissions, and are not directly under an organisation's control; these are therefore more difficult to manage. They can, however, be influenced by supplier selection, supplier development, product design and marketing. The first step is to make an inventory of possible emissions and deal with them at a later stage, although there are actions that can be taken immediately depending on the level of an organisation's commitment.

Greenhouse Gases

A number of gases contribute to climate change and six main GHGs are covered by the Kyoto Protocol: **carbon dioxide** (CO₂), **methane** (CH₄), **hydrofluorocarbons** (HFCs), **nitrous oxide** (N₂O), **perfluorocarbons** (PFCs) and **sulphur hexafluoride** (SF₆).

CO₂ is the main source of greenhouse gases, of which the largest part is generated from the use of fossil fuels, the generation of energy through non-renewable channels and polluting human activities.

Different activities emit different gases, for example burning fossil fuels releases carbon dioxide, methane and nitrous oxide into the atmosphere, while producing aluminium releases carbon dioxide and perfluorocarbons.

**See
also:**

'Greenhouse Gas Reporting: Conversion Factors 2021' (Department for Business, Energy & Industrial Strategy) to see which emissions your organisation is most likely to emit.

Objectives

The COP26 summit brought parties together to accelerate action towards the goals of the Paris Agreement and the UN Framework Convention on Climate Change. It provides key objectives for governments, companies and organisations to reduce emissions and achieve net zero targets.

What was agreed at COP26?

- Methane – cut emissions
- Coal – phase down
- Reporting rules and transparency for emissions
- Green transport and clean technology.

PLUS...

- Loss and damage to vulnerable countries
- Carbon trading (allowing countries to trade the right to emit greenhouse gases by investing in developing countries).

What does this mean for UK construction?

- Annual reporting and tightening of commitments
- UK/UN 'race to zero' campaign, affecting the use of transport, fossil fuels, concrete, air conditioning, electronics and pharmaceuticals
- Measurement of the carbon footprint
- Consideration of the value chain during development, construction and maintenance activities.

PLUS...

- Finance – companies need to show that investments are aligned with net zero targets
- Carbon trading – need to align with current regulations.

1.2 United Nations Sustainable Development Goals (SDGs)

The United Nations Sustainable Development Goals (SDGs) are a collection of 17 interlinked global goals designed to be a "blueprint to achieve a better and more sustainable future for all". The SDGs were set up in 2015 by the United Nations General Assembly (UN-GA) with a goal for achievement by the year 2030.

See also:

UN Development Programme website: undp.org



The goals which particularly apply to zero carbon objectives for the Engineering Construction Industry (ECI) are summarised here (*original text abbreviated from the UN website undp.org):

7

**AFFORDABLE
AND CLEAN
ENERGY**

** Investing in and using solar, wind and thermal power, improving energy productivity, and ensuring energy for all is vital if we are to achieve **SDG 7** by 2030.*

9	INDUSTRY, INNOVATION AND INFRASTRUCTURE	<p><i>* Building infrastructure that facilitates innovation and technology progress is key.</i></p> <p><i>Investment in infrastructure and innovation are crucial drivers of economic growth and development. Mass transport and renewable energy are becoming ever more important, as are the growth of new industries and information and communication technologies.</i></p> <p><i>By investing in innovations and new technologies, you could help to reduce the cost of infrastructure and promote efficient use of resources.</i></p> <p><i>Technological progress is also key to finding lasting solutions to both economic and environmental challenges, such as providing new jobs and promoting energy efficiency. Promoting sustainable industries and investing in scientific research and innovation are both important ways to facilitate sustainable development.</i></p>
12	RESPONSIBLE CONSUMPTION AND PRODUCTION	<p><i>* The efficient management of our shared natural resources, and the way we dispose of toxic waste and pollutants, are important targets to achieve this goal.</i></p> <p><i>Encouraging industries, businesses and consumers to recycle and reduce waste is equally important.</i></p>
13	CLIMATE ACTION	<p><i>* Greenhouse gas emissions are more than 50 percent higher than in 1990 overall.</i></p> <p><i>The annual average economic losses from climate-related disasters are in the hundreds of billions of dollars. The aim is to mobilise US\$100 billion annually to address the needs of developing countries to both adapt to climate change and invest in low carbon development.</i></p>
17	PARTNERSHIPS FOR THE GOALS	<p><i>* The SDGs can only be realised with strong global partnerships and co-operation.</i></p> <p><i>The world is more interconnected than ever. Improving access to technology and knowledge is an important way to share ideas and foster innovation. Co-ordinating policies is vital for sustainable growth and development.</i></p>

1.3 Industry Initiatives

The following list of nine priorities (grouped under the headings: **Transport**, **Buildings** and **Construction Activity**) has been defined by the Construction Leadership Council (CLC), which is chaired jointly by the government and industry and is aligned with the government's plan to achieve net zero by 2050.

These priorities should inform your Policy Statement objectives and strategic initiatives.

Transport

1. Accelerate the shift of the construction workforce to zero emission vehicles and on-site plant.
2. Optimise use of modern methods of construction and improve on-site logistics to reduce waste and site transport.
3. Champion developments and infrastructure investments that both enable connectivity with low carbon modes of transport and design to incorporate readiness for zero emission vehicles.

Buildings

4. Work with government to deliver retrofitting to improve energy efficiency of the existing housing stock.
5. Scale up industry capability to deliver low carbon heat solutions in buildings, supporting heat pump deployment and trials of hydrogen heating systems and methods.
6. Enhance the energy performance of new and existing buildings through higher operational and energy efficiency.

Construction Activity

7. Implement carbon measurement to support decisions to remove carbon.
8. Become world leaders in designing out carbon.
9. Support development of innovative low carbon materials as well as advancing low carbon solutions for manufacturing production processes and distribution.

**See
also:**

Sections 2.1 and 3.1

CLC website: [constructionleadershipcouncil.co.uk](https://www.constructionleadershipcouncil.co.uk)

2. Defining Policies

A high-level zero carbon Policy Statement can provide a sustainable framework for defining and prioritising the various initiatives that a company decides to undertake. It should contain the key policy approaches best suited to your own organisation and form the basis for a commitment to zero carbon objectives.

- Some key points to consider before reviewing potential zero carbon measures are given in [Section 2.1](#)
- A typical approach to developing a Policy Statement is covered in [Section 2.2](#).

2.1 Review Potential Zero Carbon Measures

Consider the following points which may be relevant for a typical zero carbon Policy Statement in your organisation:

- Understand and recognise the need for zero carbon measures and setting measurable targets (see: [UN Sustainable Development Goals](#) in [Section 1.2](#) and [Industry Initiatives](#) in [Section 1.3](#))
- Review the sources of emissions in your organisation
- Consider the impact of emissions in different operational areas within your business
- Identify emission reduction opportunities
- Consider how the involvement of the supply chain may contribute to your overall carbon footprint
- Review UN SDGs to see which may be particularly applicable to your organisation ([Section 1.2](#))
- Review CLC nine priorities for net zero and identify those most relevant to your organisation ([Section 1.3](#))
- Identify priorities for the initiatives you have identified as appropriate for your organisation
- Consider how carbon emissions could be quantified, with accurate measurement of data ([Section 6.1](#))
- Consider any necessary resources, training and information required
- Consider how progress against targets can be measured, recorded and reported.

Operational Areas of Your Organisation to Consider

Consider the relevance of the following areas of your business to your zero carbon approach when deciding priorities for writing your Policy Statement and initiatives. More details about potential initiatives for carbon reduction are given in [Section 3.1](#).

Design and construction	<ul style="list-style-type: none"> ■ Developing standard processes for assessing embedded carbon and material efficiency in product design ■ Embedding low carbon design and specifications ■ Switching to sustainable concrete and cement ■ Supporting sustainable steel production by reducing specification ■ Using green welding techniques.
Offices and site temporary facilities	<ul style="list-style-type: none"> ■ Delivering low carbon solutions in buildings for heating, air conditioning and electricity supply ■ Considering use of grey water and minimising water usage in general ■ Enhancing the energy performance of new and existing buildings through higher operational and energy efficiency such as efficient insulation.
Digital technologies	<ul style="list-style-type: none"> ■ Implementing new digital technologies to increase sustainability and improve energy efficiencies, for example in monitoring and controlling consumption.
Sustainability and environment	<ul style="list-style-type: none"> ■ Reducing emissions from electricity and fuel use ■ Utilising carbon capture, usage and storage (CCUS) ■ Reducing waste and progressing to zero waste ■ Adopting sustainable water usage ■ Respecting the natural environment.

Transport, plant and infrastructure

- Developing a low carbon infrastructure, including sustainable site temporary buildings and facilities
- Replacing dirty diesel generators, welding apparatus and other equipment and machinery with greener alternatives
- Training vehicle users to reduce fuel use
- Using sustainable travel options
- Reducing emissions by the use of electrical supplies for transportation of goods, materials and people
- Using electric company vehicles with access to on-site charging points
- Optimising on-site logistics to reduce vehicle usage.

Involvement of Supply Chain and Other Interested Parties**Value and supply chains**

- Engaging with suppliers and supply chain to assess and reduce carbon emissions
- Developing new supply chains (carbon capture, usage and storage; electricity supply chain; hydrogen supply chain).

Other interested parties

- Owners/Shareholders
- Clients/Customers
- Employees
- External Providers and Business Partners
- Local Community.

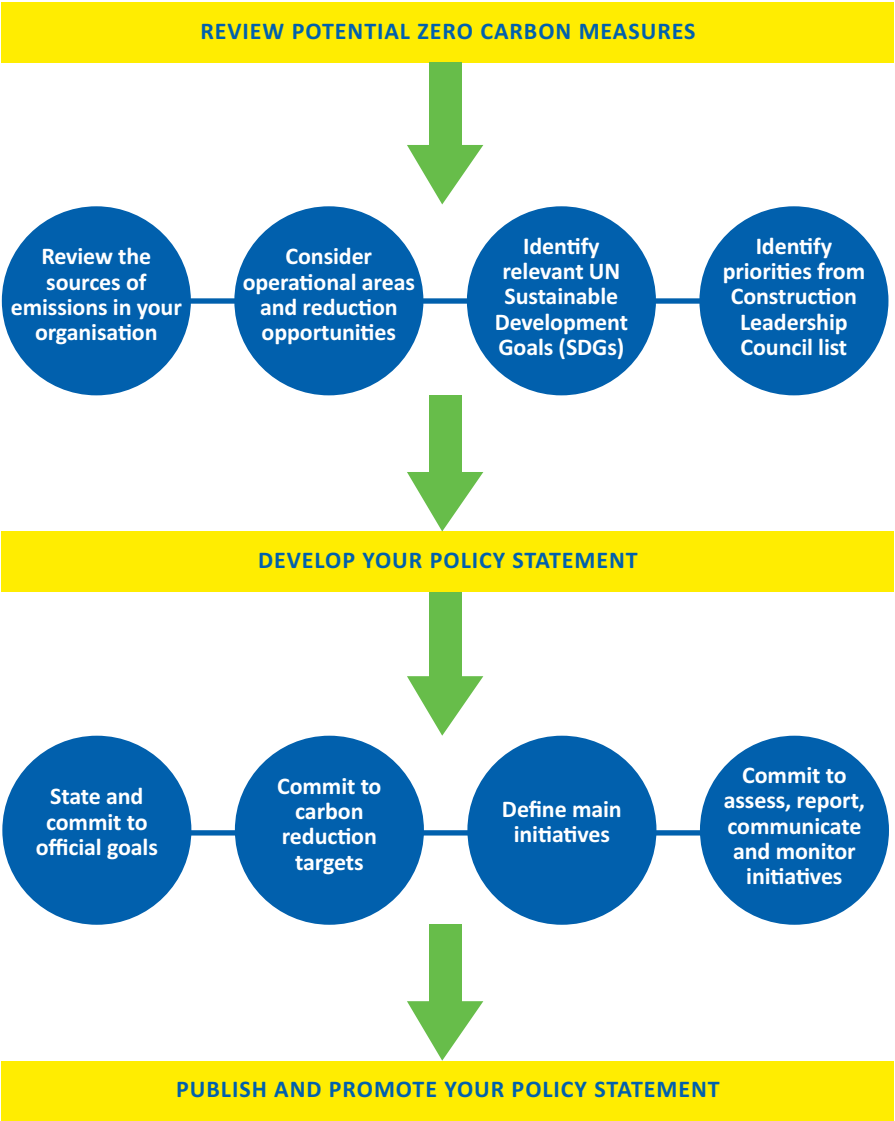
Training Needs**Training**

- Addressing the green skills gap (including provision for apprenticeships, technical education and training) for:
- Resource efficiency, such as carbon accounting
 - Low carbon economy, such as nuclear and renewable energy generation and carbon emission minimisation
 - Development of new or amended products, such as design and production of electric vehicles.

2.2 Develop Your Policy Statement

1. Identify sources of emissions in the main operational areas of your organisation and decide what you can reduce (see [Section 2.1](#)).
2. Make a statement about your commitment to:
 - Reduce carbon emissions and promote sustainable energy in accordance with science-based targets
 - Where appropriate, develop technological solutions for carbon capture, usage and storage (CCUS)
 - Achieve net zero carbon emissions from your internal activities through:
 - Decarbonisation
 - Reduction in energy consumption and greenhouse gas emissions.
 - Work with the supply chain and customers, where possible, to adopt sustainable energy technologies and solutions and commit to net zero carbon emissions.
3. Link your zero carbon commitment to your organisation's goals and values. Embed climate action in your business model and help your employees, partners and suppliers to understand how it impacts them day to day.
4. List any official goals you intend to focus on, for example from:
 - UN Sustainable Development Goals (SDGs), in particular: [SDG 7](#) (affordable and clean energy), [SDG 9](#) (industry, innovation and infrastructure) [SDG 12](#) (responsible consumption and production), [SDG 13](#) (climate action) and [SDG 17](#) (partnerships for the goals)
 - Construction Leadership Council's nine priorities (CO2nstructZero).
5. Describe the main initiatives you have selected for your zero carbon policy objectives (see [Section 3](#)).
6. Define what achievable targets you will set in a plan and prioritise them (for example, you may decide on a zero waste target by 2030).
7. State how you will quantify and assess emissions, where possible in participation with an independent body according to defined standards (e.g. ISO 14001 and DEFRA "Guide on how to measure and report your greenhouse gas emissions").
8. Confirm a procedure for regularly calculating, recording and reporting emissions and communicating the results to employees and other interested parties.
9. Commit to appropriate resources, training and information to ensure regular monitoring and processing of data.
10. Ensure a commitment to reviewing progress and striving for continual improvement.

2.3 Summary of Key Points



3. Setting Strategic Initiatives

Your strategic initiatives are based on the main objectives of your organisation’s Policy Statement and should be set according to their suitability for your organisation.

3.1 Consider Potential Initiatives for Carbon Reduction

In **Section 2.1**, we discussed some of the key aspects of your organisation to consider when developing your Policy Statement. Here we look at potential initiatives for carbon reduction in more detail.

Design and Construction

INITIATIVE	POTENTIAL ACTION(S)
Reduced steel use	Consider reducing overspecification of steel to reduce embedded carbon. Steel can be lightweight and may make quality structures with smaller foundations.
Low carbon materials	Switch to materials with lower embodied carbon footprints to reduce the overall emissions associated with construction projects. Identify suitable materials.
Concrete	Utilise concrete appropriately. Although the production of concrete generates CO ₂ , concrete is 100% recyclable and naturally absorbs atmospheric CO ₂ throughout its lifetime from carbonation. After a concrete structure has served its original purpose, the concrete can be crushed and recycled into aggregate for use in new concrete pavements or as backfill or road base.
Welding	Plan alternatives to current welding techniques, where these are not carbon neutral, such as moving from use of gas and oxygen to electricity.

Offices and Site Temporary Facilities

INITIATIVE	POTENTIAL ACTION(S)
Built environment (including site temporary facilities)	<ul style="list-style-type: none"> ■ Use sustainable construction materials and prioritise effective insulation ■ Develop higher efficiency heating and cooling systems making use, for example, of solar panels ■ Introduce efficient products for electrical supply to buildings ■ Utilise glass from low carbon sources ■ Replace equipment with the lowest carbon alternative for its application: <ul style="list-style-type: none"> ■ LED lighting ■ Heating controls with start optimisation technology ■ Air conditioning controls with built in time scheduling. ■ Consider the following aspects of site temporary facilities: <ul style="list-style-type: none"> ■ Location ■ Insulation ■ Sustainable services, including power supplies ■ Water usage (including drinking water, toilets and showers). ■ Increase use of grey water and rainwater to decrease water demand and emissions.

Digital Technologies

INITIATIVE	POTENTIAL ACTION(S)
New digital technologies	Implement new digital technologies and techniques, where possible, to increase sustainability and improve energy efficiencies. Types of technologies that can improve efficiency include: automation (robotics, cobotics (human collaboration with robots)), internet of things (IOT), virtual reality (VR) and augmented reality (AR), Additive Manufacturing (e.g. 3D printing) and Artificial Intelligence (AI)/machine learning. Such initiatives may help to make a difference in your business's sustainability and energy/resource efficiencies.

Sustainability and Environment

INITIATIVE	POTENTIAL ACTION(S)
Reduction in emissions	<p>Reduce emissions from electricity and fuel use by:</p> <ul style="list-style-type: none"> ■ Generating/using electricity from low carbon sources, such as renewables ■ Electrifying heating, air conditioning and vehicle transportation.
Water	<p>Increase use of grey water and rainwater to decrease water demand and emissions, for example in:</p> <ul style="list-style-type: none"> ■ Showers, toilets and taps ■ Cleaning.
Zero waste	<p>Promote zero waste initiatives:</p> <ul style="list-style-type: none"> ■ Reduce, Reuse, Compost and Recycle materials ■ Adopt a policy of not sending waste to landfill sites ■ Adopt or develop a conservation programme to consider the entire life-cycle of products, processes, and systems relating to waste.
Environment	<p>Have respect for the natural environment through:</p> <ul style="list-style-type: none"> ■ Prevention of pollution ■ Protection of the environment, biodiversity and the natural habitat.

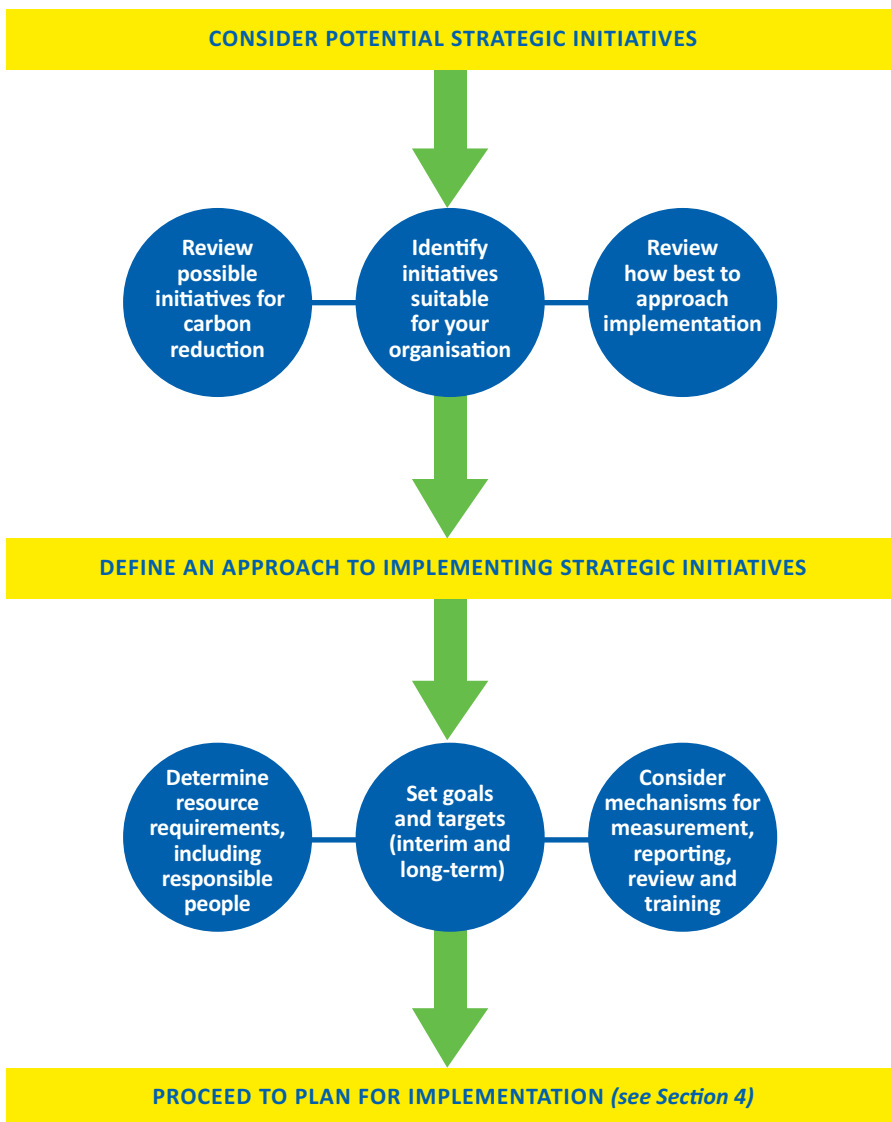
Transport, Plant and Infrastructure

INITIATIVE	POTENTIAL ACTION(S)
Energy infrastructure and technologies	<p>Utilise sustainable and resource efficient products and technologies, including:</p> <ul style="list-style-type: none"> ■ Electric vehicle charging infrastructure, with on-site charging points ■ More efficient products for electrical supply to buildings ■ LED lighting ■ Electricity from renewable sources ■ Heating from renewable energy.
Electric vehicles and plant	<p>Explore options for hybrid and electric transport, including:</p> <ul style="list-style-type: none"> ■ Electric company vehicles for low carbon energy generation ■ Replacement of dirty diesel generators and welding apparatus with greener alternatives.
Employee travel options	<p>Consider the benefits of:</p> <ul style="list-style-type: none"> ■ Vehicle training to reduce fuel use ■ Sustainable travel options including, for example, car sharing and minibus use ■ Working from home and use of technology to reduce travel.
Logistics	<p>Consider the benefits of:</p> <ul style="list-style-type: none"> ■ Replanned travel logistics, where appropriate, to reduce vehicle requirement and usage.

3.2 Define an Approach to Implementing Strategic Initiatives

1. Identify the initiatives to be undertaken (for example: replanned travel logistics to reduce carbon emissions) and prioritise.
2. Identify the person(s) responsible for overseeing the implementation of each initiative.
3. Give details of and confirm key resource requirements and costs (look at available sources of funding from government low carbon initiatives).
4. Identify the people it will affect (employees, suppliers and clients) and any mitigating factors that need to be considered.
5. Take account of any official legislation and its potential impact.
6. Plan on how to gather consistent and accurate data for a particular initiative (for example: carbon emissions from waste).
7. Set targets for achieving goals (interim and final).
8. Consider mechanisms for measuring, monitoring and reporting against targets.
9. Consider any potential training requirements.
10. Decide on suitable review mechanisms to ensure targets are being met.
11. Proceed to a plan for implementation (*see Section 4*)

3.3 Summary of Key Points



4. Implementing a Zero Carbon Plan

Once a Policy Statement has been created and key strategic initiatives for achieving zero carbon have been defined, it is essential that a detailed plan is produced with a timeline of key dates and targets.

A plan should take account of initiatives previously identified (as described in [Section 3.1](#)), which are most likely to be in the following areas:

- Design and construction, including the use of low carbon materials and low carbon alternatives for equipment use (such as in welding)
- Energy efficiency in buildings and infrastructure, including site temporary facilities, which covers sustainable energy supply (for example: heating, lighting and air conditioning)
- Use of digital technologies
- Sustainability and the environment, including reduction of carbon emissions from energy infrastructure (such as plant and equipment)
- Zero waste objectives
- Sustainable transport and travel, including logistics, vehicle use and employee awareness of necessary carbon reduction measures.

All initiatives should fit together into an overall zero carbon plan but you could consider if different initiatives can be grouped together under a single objective or target.

A timeline should be created and should include both short and long-term goals and objectives, with target dates that can be monitored.

**See
also:**

[Section 3.1](#) – ‘Consider Potential Initiatives for Carbon Reduction’

4.1 Define and Implement Your Plan

The following are suggested key steps to follow when creating a zero carbon plan:

1. **Define:** Describe the subject areas identified for carbon reduction (for example: transport or waste).
2. **Assign responsible person(s):** Assign people responsible for implementing the plan and list any additional resources required (such as equipment or systems).
3. **Measure:** Provide a complete and accurate account of the current emissions for areas identified, based on accurate and consistent data collection, and define a suitable process to measure emissions on an ongoing basis (*see Section 6*).
4. **Assess:** Assess potential impacts and benefits of the initiatives to be undertaken.
5. **Identify requirements:** Identify any statutory requirements, stakeholder requirements, best practice and standards.
6. **Set target:** Set an overall target with clear objectives to achieve carbon negative through a combination of internal reductions such as carbon offset.
7. **Set timeline:** Set a timeline containing short and long-term dates for targets to be achieved.
8. **Reduce:** Proceed to achieve the target dates through a combination of internal reductions such as carbon offset.
9. **Plan data collection:** Implement accurate and consistent data collection and measurement on an ongoing basis (*See also: Section 6*).
10. **Engage with value and supply chains:** Encourage and work with suppliers to reduce carbon emissions.
11. **Engage with stakeholders:** Communicate and engage with all stakeholders on zero carbon objectives.
12. **Communicate:** Provide full, accurate and transparent reporting to stakeholders and any relevant official bodies.
13. **Monitor:** Regularly assess data and monitor progress against targets on an ongoing basis.

4.2 Engage with the Value and Supply Chains

For many companies, emissions in the value and supply chains (**Scope 3** emissions – **Section 1.1**) can be much higher than the direct emissions in their own operations (**Scope 1** and **Scope 2** emissions – **Section 1.1**). An organisation can therefore significantly improve their negative climate impact by working to decarbonise their supply chains.

Early engagement with suppliers and the supply chain to assess sources of emissions is recommended. Your organisation can then provide guidance on how to meet emission targets and goals so as to conform to your requirements for achieving lower carbon emissions.

1. Set goals and targets for suppliers, particularly taking account of:
 - Circularity/recycling
 - Material and process efficiency
 - Renewable power
 - Renewable heat
 - New production processes
 - Nature-based solutions
 - Fuel switch (to green fuels)
 - Carbon capture.
2. Build a comprehensive emissions baseline and gradually fill with actual supplier data.
3. Set ambitious reduction targets, reducing emissions by revisiting product design choices and reconsidering (geographic) sourcing strategy.
4. Set ambitious procurement standards.
5. Work jointly with suppliers and stakeholders on a shared approach to zero carbon objectives.
6. Develop internal governance mechanisms that introduce emissions as a steering mechanism and incentivise suppliers to meet emission targets.

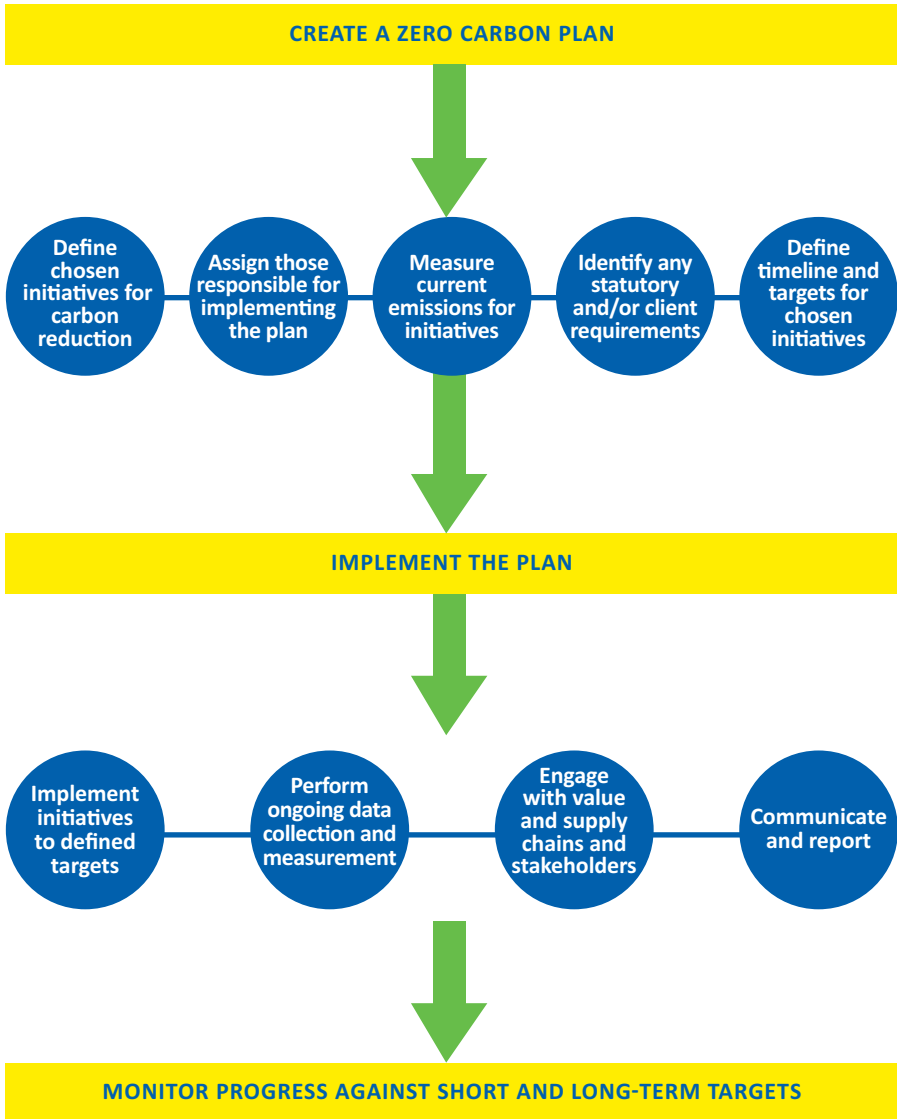
4.3 Work with Stakeholders

It is important to raise awareness among all stakeholders about your zero carbon strategies and initiatives. By working together with partners, overall carbon emissions can be reduced significantly. It is also important to collaborate with other industry sectors, governmental and non-governmental organisations and community representatives to share learning and promote best practices to help achieve global carbon reduction goals.



- **Owners/Shareholders:** Profitability, growth, corporate governance and legal compliance.
- **Clients/Customers:** Price, reliability, value and ISO accredited.
- **External Providers and Business Partners:** Common approach, effective communication and shared values.
- **Regulatory and Statutory:** Compliance, reporting and corporate governance.
- **Employees:** Shared values and security.
- **Trades Unions:** Employee wellbeing and protection.
- **Local Community:** Being good neighbours, socially and environmentally.

4.4 Summary of Key Points





5. Communication and Training

Communication and training both play key roles in supporting a company's net zero journey and its commitment to defined zero carbon objectives.

For both activities, the challenges faced by many organisations are:

- How and when to meaningfully engage with stakeholders
- How to determine and address the net zero training needs for their organisation.

A plan is critical to the achievement of net zero targets. Both a communications strategy and training should be incorporated into your main zero carbon plan and be aligned with your stated goals and objectives.

5.1 Communication

Effective communication promotes the initiatives that will help you transition to net zero and is an opportunity to communicate with and secure the support of employees and other stakeholders on your zero carbon journey.

1. Designate a person(s) responsible for your zero carbon communications strategy.
2. Establish the main objectives for communications.
3. Review and confirm the target audience, including all interested parties who need to be informed. Different audiences have different expectations of engagement and you will need to focus your message appropriately.
4. Consider the format and content of any message you are communicating. Keep messaging simple and focus on a small number of tangible actions. Frequent and consistent communication about initiatives undertaken allows companies to achieve a position from which they can influence and guide others on climate action.
5. Create a Communications Plan.
6. Consider the most suitable channels of communication and methodology (email, social media, face to face) for your organisation.
7. Invite feedback.
8. Review and take account of feedback and, in doing so, demonstrate that this is a shared journey, in which everyone can learn from each other.

5.2 Training for Green Skills

The transition to a green economy requires a workforce with the right skills. This includes not only skills in the low carbon and environmental aspects of the Engineering Construction Industry, but also those needed to help the supply chain use natural resources efficiently and sustainably.



1. Identify the relevant skills needed for any new strategic initiative(s) and areas for skills development (upskilling). Review sources of training (In-house, ECITB, government and private initiatives).
2. Review skills availability.
3. Review general training and awareness requirements for zero carbon delivery.
4. Review potential impacts on each area of your operation (see picture above).
5. Define mechanisms for delivery of training (for example: toolbox talks/courses/one to one sessions).
6. Set up feedback channels.

5.3 Green Champions

‘Green Champions’ can be described as people who are passionate about climate action and environmental sustainability and who see an opportunity to boost action in their workplace. They can help to promote an organisation’s environmental initiatives by engaging with other members of staff and acting as a point of contact for those wanting to take green action. This can involve the development of individual skills, as well as acting as a catalyst for action in the environmental responsibilities of an organisation.

Some organisations have already established a Green Champion role, but for others this is still to be initiated. The role can involve more than one person and the most important thing is to have in place individuals committed to improving their employer’s environmental impact.

Developing the Role

It is important for Green Champions to develop their knowledge and skills so as to understand the causes and impacts of climate change, and how best to effect change.

Some key points to consider

- Develop a good understanding of what is meant by ‘green’. Consider researching definitions, wider national and international contexts and where there might be differences of opinion. Think about relating your work to the Sustainable Development Goals (see [Section 1.2](#)) or national strategy to find widely-accepted perspectives.
- Explore the relative impact of different actions. Some green actions reduce emissions more than others. Consider the green changes you want to make, and prioritise them based on how much of an impact they will have.
- Find out how your organisation works. Understand how decisions are made, how you can influence them, and where green ambition can be embedded. Think about your governance or finance processes and talk to senior management.

Tools that can assist

- Carbon Management Planning Tools (for those organisations reporting on their emissions and carbon management plan), for example:
creativecommons.scot.nhs.uk/carbon-management/tools-and-resources
- Guidance on policy writing, waste and energy management
- Case studies from other organisations
- Online training and resources, for example:
One UN Climate Change Learning Partnership website: uncclearn.org
- In-person training by environmental organisations.

Building the Role

In building a Green Champion role, consider the following:

- **Focus on specific projects:** As a first step, create (or update) your environmental policy and initiatives.
- **Create dedicated time:** Set time aside for actions and initiatives.
- **Get support from your senior management:** Work with managers (or your board) to get support and a mandate for spending time on green initiatives.
- **Recognise the benefits:** Identify potential positive impacts for your organisation, for example by greening the supply chain, improving energy efficiency and reducing travel emissions.
- **Form a Green Team:** Increase the opportunity for as many people as possible to participate. Co-opt volunteers and organise team meetings, including representatives from senior management or board members.

Construction Leadership Council (CLC)

The CLC's mission is to provide sector leadership to the construction industry. Its zero carbon change programme 'CO2nstructZero' aims to involve companies as 'Business Champions'.

A Business Champion (effectively a 'Green Champion') is a company whose work in the net zero field aligns with one or more of the CO2nstructZero priorities. If a company does so, it can then apply to become a Business Champion as part of this programme (for construction enquiries see construction.enquiries@beis.gov.uk).

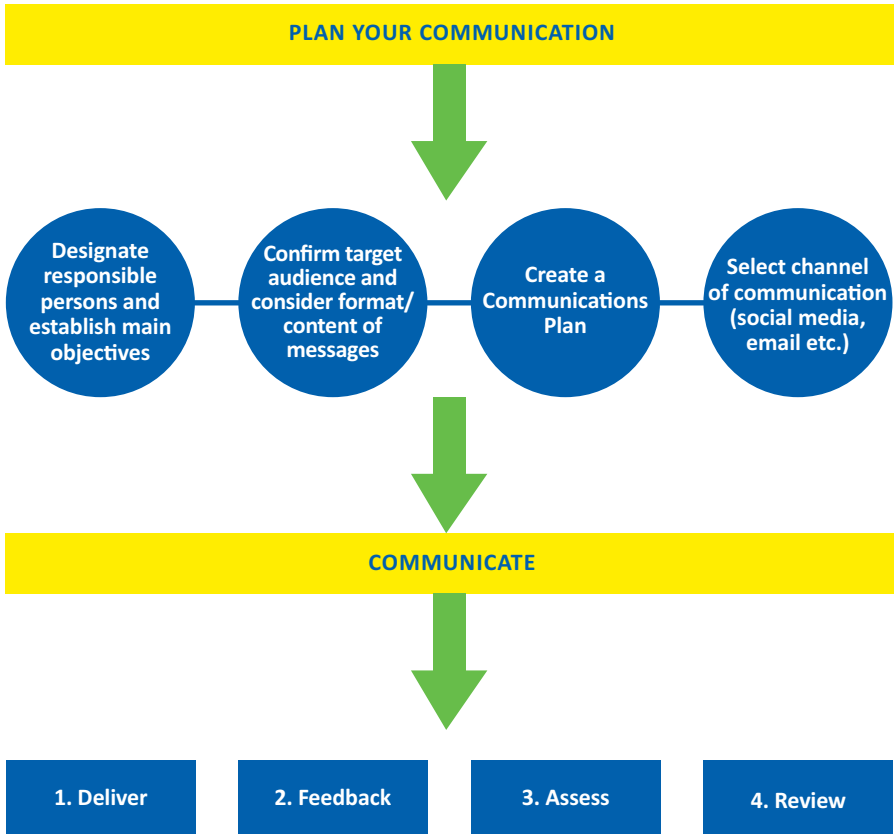
The CLC is looking to secure a diverse mix of representative companies drawn from across the construction sector (SMEs as well as large scale corporates with a global footprint), including their supply chains.

By becoming involved, you will be able to:

- Share relevant net zero events your organisation is delivering with the CO2nstructZero team and showcase your journey to net zero
- Gain access to the latest CO2nstructZero news, opportunities, and information from CLC and BEIS around CO2nstructZero and the government's response to net zero
- Illustrate how your business can promote CO2nstructZero and potentially feature on CO2nstructZero campaigns.

5.4 Summary of Key Points

Communication



Training for Green Skills



6. Monitoring, Measurement and Reporting

The transition to a low carbon economy depends on achieving a reduction of carbon emissions by businesses and individuals. To achieve this end it is important that organisations understand how their operations impact greenhouse gas emissions and what they can do to minimise them. A first step to reduction is to measure what emissions are currently being produced.

Guidance has been provided by government for the measurement and reporting of greenhouse gas emissions. It explains how to measure greenhouse gas (GHG) emissions and set targets to reduce them. It is intended for all sizes of business and for public and voluntary sector organisations. Organisations which use this guidance to measure and report are not required to submit reports nor otherwise make the data available to government, although large (quoted) companies are required to report their emissions internally (for example in their Directors' Report).

As part of a process of engagement with the value and supply chains, some larger organisations are already seeking information from their suppliers on greenhouse gas emissions and many smaller businesses will increasingly be expected to measure and report on their emissions.

See also:

DEFRA 'Guidance on how to measure and report your greenhouse gas emissions' September 2009

6.1 Perform Data Collection and Measurement

1. Identify which activities in each area of your operations are responsible for releasing greenhouse gases.
2. Decide from which part(s) of your operations you are going to measure data.
3. Decide on a period over which data will be collected (for example: 12 months).
4. Categorise activities into **Scopes 1** (emissions directly generated by your own activities and operations), **2** (indirect emissions, for example from purchased energy) and, optionally, **3** (activities in the value chain).

See also: *Section 1.1 'Sources of Emissions'.*

5. Collect current data for the activities you have identified (for example: litres of fuel used, vehicle mileage or tonnes of waste disposed of). Ensure the completeness and quality of the data.

6. Identify the appropriate emission factor from the government's website* 'Greenhouse Gas Reporting: Conversion Factors' for UK emissions to apply the calculation for greenhouse gas emissions per activity.

* gov.uk/government/collections/government-conversion-factors-for-company-reporting

7. Calculate emissions for the **Scope 1** and **2** activities you have identified on the basis of the formula: *Activity data x Emission factor = GHG emissions*.

Note: Measure or calculate emissions from up to the six GHGs covered by the Kyoto Protocol, as appropriate (see **Section 1.1**).

8. Report emissions, where required to do so:

- Total **Scope 1** GHG emissions (for example: tonnes of CO₂)
- Total **Scope 2** GHG emissions.

Note: There is a requirement for large (quoted) companies to report emissions and intensity ratio in their Director's Report or equivalent.

9. Choose a base year on which to report. Your base year should be: the earliest year that verifiable emissions data is available for either a single year or a multi-year average (e.g. 2020-2022).
10. Set an ongoing reduction target and choose the approach that best suits your company.

Emission-Producing Activities and Sources of Data

The following is a list of some key activities from which data can be collected:

ACTIVITY	SOURCE OF INFORMATION
Electricity use	Total kilowatt hours (kWh) used from electricity bills.
Natural gas use	Total kilowatt hours (kWh) used from gas bills.
Water supply	Total water supplied in cubic metres (m ³) from water bill.
Water treatment	Total water treated in cubic metres (m ³) from water bill.
Fuel used in company owned vehicles	Litres of fuel purchased from invoices and receipts (more accurate); or vehicle mileage from vehicle log books/odometers (less accurate).
Employee travel	Method and frequency of travel: use distance calculation websites to obtain flight, rail and road distances.
Waste disposal/recycling	Tonnes of waste treated by waste type (e.g. paper, glass, waste to landfill) from waste collection provider.

Streamlined Energy and Carbon Reporting

Streamlined Energy and Carbon Reporting (SECR) was introduced in 2019 as legislation to replace the Carbon Reduction Commitment (CRC) Scheme. SECR requires obligated companies to report on their energy consumption and associated greenhouse gas emissions within their financial reporting for Companies House.

The qualifying conditions are met by a UK registered quoted company or large unquoted company/Limited Liability Partnership (LLP) which, in a year, satisfies two or more of the following criteria:

- Turnover £36 million or more
- Balance sheet TOTAL of £18 million or more
- Number of employees 250 or more.

If a company qualifies, it will need to report UK energy use and associated greenhouse gas emissions relating to gas, electricity and transport, as well as an intensity ratio and information relating to energy efficiency action within its annual reports. It is only mandatory to include subsidiaries if they qualify for SECR themselves.

Exceptions: If a company meets the qualification conditions but consumes less than 40MWh annually, then there is no requirement for detailed disclosure.

SECR will be enforced by The Conduct Committee of the Financial Reporting Council.

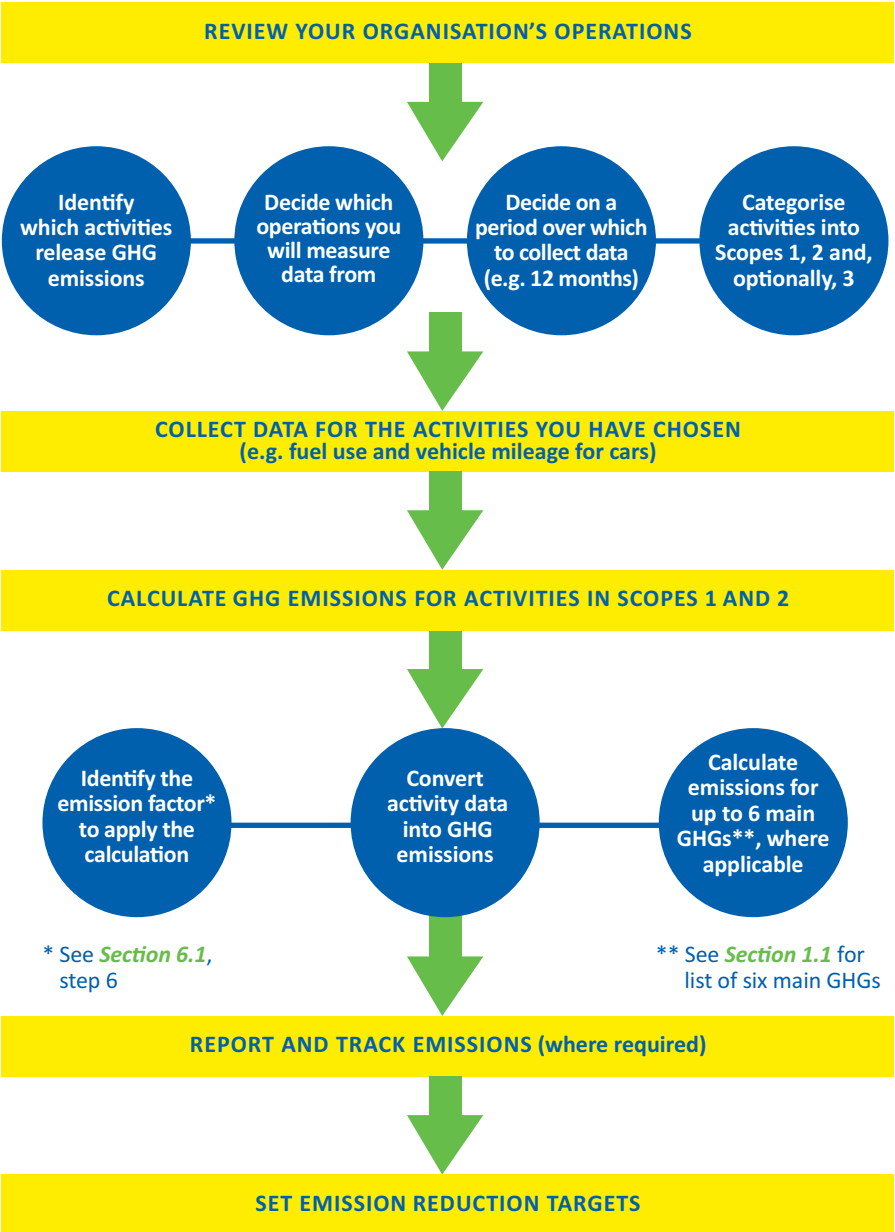
The following table sets out the key obligations for organisations in scope and the information they will need to report and disclose annually:

QUOTED COMPANIES	LARGE UNQUOTED COMPANIES & LLPs
<ul style="list-style-type: none"> ■ Annual GHG emissions from activities for which the company is responsible, including combustion of fuel and operation of any facility ■ Annual emissions from the purchase of electricity, heat, steam or cooling by the company for its own use 	<ul style="list-style-type: none"> ■ UK energy use (as a minimum gas, electricity and transport, including UK offshore area)
<ul style="list-style-type: none"> ■ Underlying global energy use 	<ul style="list-style-type: none"> ■ Associated greenhouse gas emissions
<ul style="list-style-type: none"> ■ Previous year's figures for energy use and GHG emissions 	<ul style="list-style-type: none"> ■ Previous year's figures for energy use and GHG emissions
<ul style="list-style-type: none"> ■ At least one intensity ratio 	<ul style="list-style-type: none"> ■ At least one intensity ratio
<ul style="list-style-type: none"> ■ Energy efficiency action taken 	<ul style="list-style-type: none"> ■ Energy efficiency action taken
<ul style="list-style-type: none"> ■ Methodology used 	<ul style="list-style-type: none"> ■ Methodology used

The new mandatory reporting requirements are designed to:

- Increase awareness of energy use within large and quoted organisations
- Create a level playing field among large organisations in terms of energy and emissions reporting
- Ensure administrative burdens associated with energy and emissions reporting are proportionate and broadly aligned to any existing energy reporting requirements and framework
- Provide organisations in scope with the right data to inform adoption of energy efficiency measures and opportunities to reduce their impact on climate change
- Provide greater transparency for investors, and other stakeholders, on business energy efficiency and low carbon readiness.

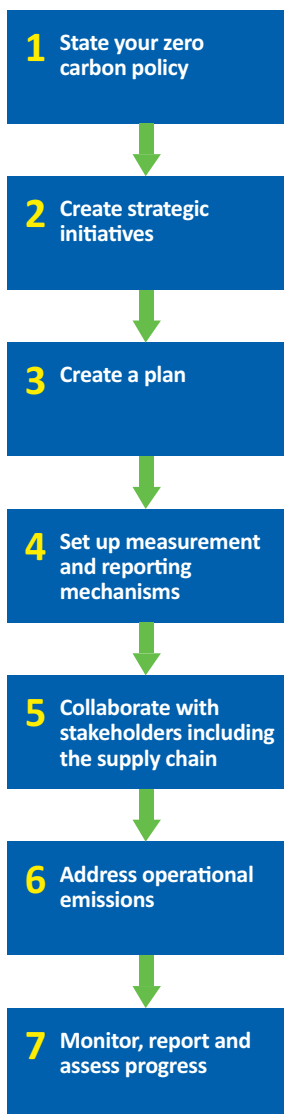
6.2 Summary of Key Points





7. Conclusions

THE ZERO CARBON JOURNEY



For many organisations, the journey towards zero carbon is only just beginning. As part of a global commitment to a cleaner and more sustainable future, both the public and private sectors are being encouraged to adopt net zero initiatives in accordance with government guidelines and legislation.

All companies need to become involved in the reduction of emissions from their operations. Making a commitment and the building of knowledge, even from small beginnings, can be part of a wider shared contribution to achieving a carbon neutral environment.

The aim of this document has been to stimulate thought about climate objectives and encourage organisations to think about their own approach to achieving zero carbon.

It contains guidance on:

- Defining policies
- Setting strategic initiatives
- Implementing a plan
- Communication objectives and the training needed to develop green skills
- Monitoring, measuring and reporting emissions for the initiatives undertaken.

By taking account of the suggestions made here, a working framework for a zero carbon strategy can be put in place, which can be employed by all sizes of company.

The overall objective should be to ensure that a process is defined, established and implemented, involving all stakeholders who have a role to play in achieving any stated goals.

Companies and organisations of all sizes are actively encouraged to take a proactive approach and put into practice zero carbon policies and initiatives in line with the guidelines contained within this document.

Adoption of these principles by the Engineering Construction Industry can assist in building a successful green future.

7.1 Summary of Main Recommendations

<p>(Section 2) Defining Policies</p>	<ul style="list-style-type: none"> ■ Review sources of emissions in your operations ■ Consider potential reduction opportunities for carbon emissions ■ Identify priorities from: <ul style="list-style-type: none"> ■ UN Sustainable Development Goals (Section 1.2) and Construction Leadership Council nine priorities (Section 1.3) ■ Develop a Policy Statement.
<p>(Section 3) Setting Strategic Initiatives</p>	<ul style="list-style-type: none"> ■ Publish and promote your Policy Statement ■ Consider potential strategic initiatives ■ Review how best to implement each initiative ■ Determine resource requirements ■ Set goals and targets.
<p>(Section 4) Implementing a Zero Carbon Plan</p>	<ul style="list-style-type: none"> ■ Create a zero carbon plan, including timeline and targets for initiatives ■ Implement the plan.
<p>(Section 5) Communication and Training</p>	<ul style="list-style-type: none"> ■ Plan how to communicate about strategic initiatives, including target audience and format and content of messaging ■ Identify skills needed and areas for upskilling ■ Review skills availability ■ Define mechanisms for training delivery ■ Consider adopting ‘Green Champions’.
<p>(Section 6) Monitoring, Measurement and Reporting</p>	<ul style="list-style-type: none"> ■ Consider how to measure and report emissions ■ Decide which operations in Scopes 1 and 2 you will measure data from and over what period ■ Collect data for the activities you have chosen ■ Calculate GHG emissions for activities in Scopes 1 and 2 ■ Report and track emissions ■ Monitor progress against short and long-term targets ■ Set emission reduction targets.

A. Abbreviations and Acronyms

ABBREVIATION	DESCRIPTION
AI	Artificial Intelligence
AR	Augmented Reality
BEIS	Department for Business, Energy & Industrial Strategy
CCUS	Carbon Capture, Utilisation and Storage. CCUS is a technology that can capture and make effective use of the high concentrations of CO ₂ emitted by industrial activities
CLC	Construction Leadership Council
CRC	Carbon Reduction Commitment
DECC	Department of Energy and Climate Change
DEFRA	Department for Environment, Food and Rural Affairs
ECI	Engineering Construction Industry
ECIA	Engineering Construction Industry Association
ECITB	Engineering Construction Industry Training Board
GHG	Greenhouse Gas
IOT	Internet of Things. Describes physical objects that are embedded with sensors, processing ability, software, and other technologies that connect and exchange data with other devices and systems over the Internet or other communications networks.
ISO	International Organisation for Standardisation
LED	Light-Emitting Diode
LLP	Limited Liability Partnership
NAECI	National Agreement for the Engineering Construction Industry
NJC	National Joint Council for the Engineering Construction Industry
SDG	Sustainable Development Goal
SECR	Streamlined Energy and Carbon Reporting
SME	Small and Medium Enterprises
UN	United Nations
UN-GA	United Nations General Assembly
VR	Virtual Reality



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Engineering Construction Industry Association (ECIA)
5th Floor, Broadway House, Tothill Street, London SW1H 9NS

Email: ecia@ecia.co.uk

Tel: 020 7799 2000

Website: www.ecia.co.uk



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