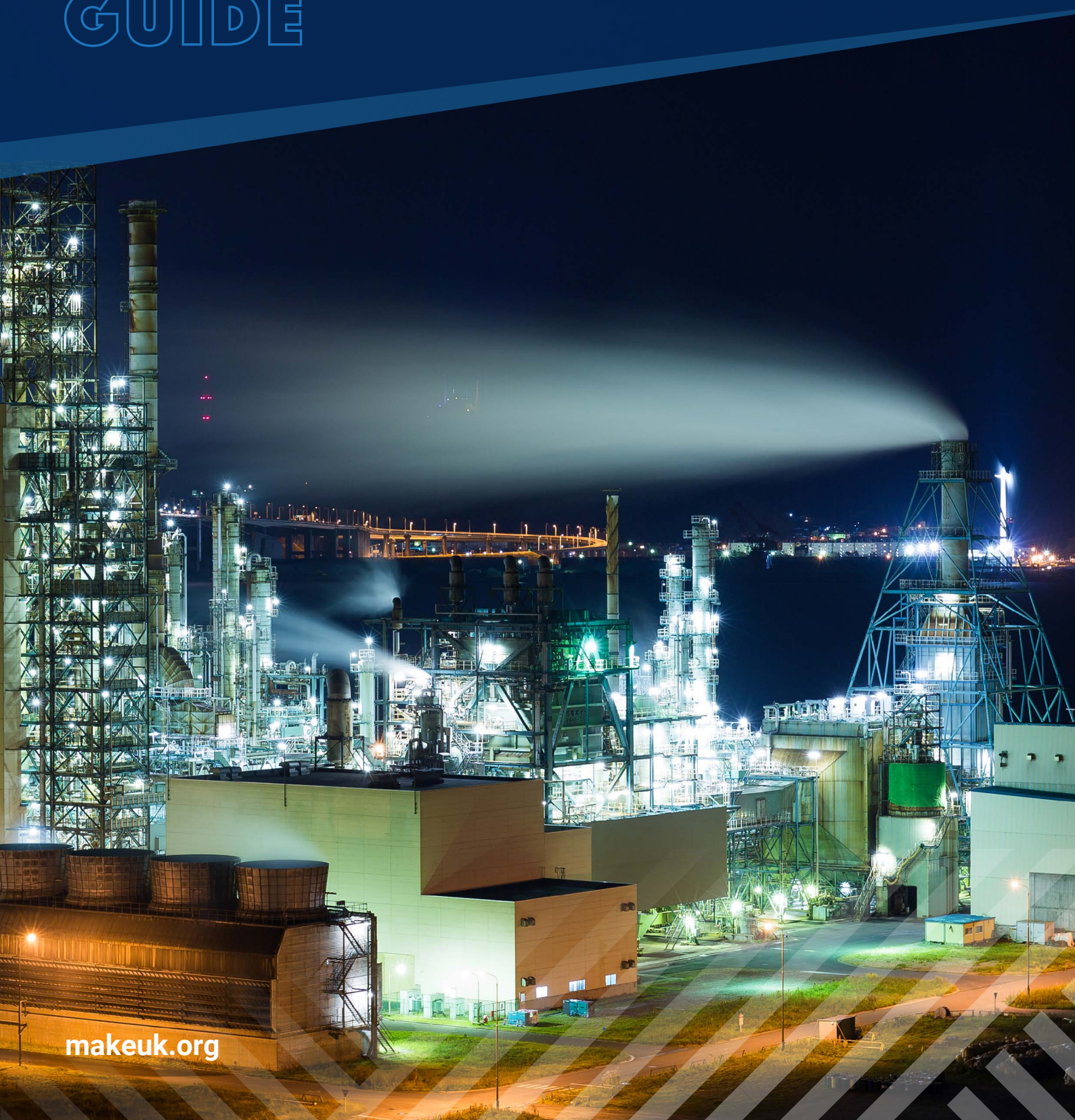
In association with:

INSPIRED PLC

MAKE uk
The Manufacturers' Organisation

MAKING IT TO NET ZERO:
A MANUFACTURERS' GUIDE



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CONTENTS

Introduction 3

Recap: What is net zero? 4

What does net zero mean for UK manufacturing? 4

What progress have manufacturers made towards net zero? 7

What are the benefits to manufacturers in becoming net zero? 8

Making it to Net Zero: Overview of 8 steps 9

- STEP 1: Knowing the basics 10
- STEP 2: Understanding your emissions and setting your target 12
- STEP 3: Understanding your value chain 14
- STEP 4: Developing and implementing a strategy 16
- STEP 5: Maximising the use of technology 18
- STEP 6: Knowing where to go for funding and advice 19
- STEP 7: Communicating and reporting your goals 21
- STEP 8: Evaluating your success 24

An Inspired Viewpoint 25

How Make UK and Inspired can help 26

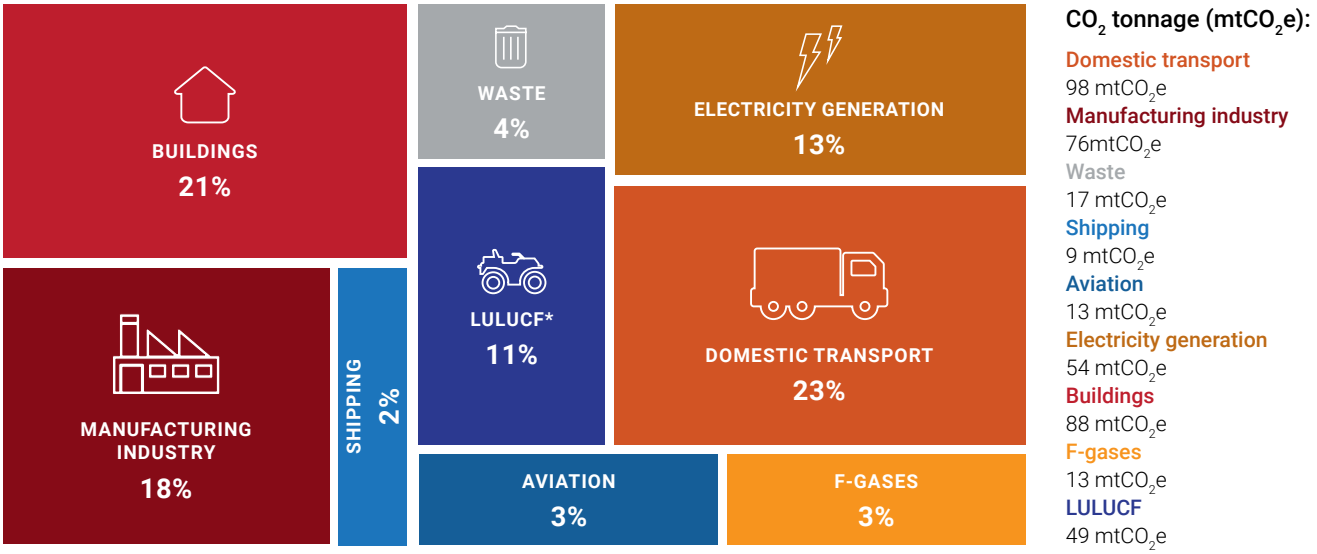
INTRODUCTION

UK businesses have been on a net zero countdown ever since the UK Government set a legally binding target to achieve net zero greenhouse gas emissions by 2050. To ensure industry remains on track, last year (2023) the Government set up a Net Zero Council to support industry to cut its emissions, develop greener practices and ensure that every sector is on track to be net zero by 2050.

All eyes are now on the manufacturing sector for two key reasons.

Firstly, manufacturing is the UK's third-highest emitting industrial sector after transport and buildings and is responsible for a sixth of the UK's total emissions (Figure 1).

Figure 1: Sector contributions to net territorial GHG emissions ($MtCO_2e$) in the UK (2021)[1]



*LULUCF: Land use, land use change and forestry

Secondly, the UK's transition to net zero presents a real opportunity for the sector. It is the manufacturing sector that will be developing the technologies as well as designing and making the products and services that will help decarbonise the economy. Therefore, the rest of the economy will be reliant on the low-emission technologies and products supplied by the manufacturing sector. Largely, these efforts have already begun.

The manufacturing sector has its own industry-specific roadmap that is aligned with both the Government targets as well as the Net Zero Council ambitions. To help companies meet these targets and ambitions, Make UK, in partnership with Inspired PLC, has developed this guide, Making it to Net Zero, with the aim to provide a clear roadmap to help manufacturers reach net zero.

[1]Figure 1- Source: Powering Up Britain: Net Zero Growth Plan and Carbon Budget Delivery Plan - analysis methodology (Technical annex, table 2), 22 June 2023 presented to Parliament pursuant to details of the Climate Change Act 2008 Section 14.

RECAP: WHAT IS NET ZERO?

While net zero has firmly been on the agendas of industry, the public and the Government in recent years, it is worth recapping what net zero means in order to understand the steps manufacturers should take to achieve it.

Net zero means reducing greenhouse gas (GHG) emissions to as close to zero as possible. Any remaining emissions which cannot be eliminated in the first place must be balanced by finding ways to absorb an equivalent amount of GHG (e.g., carbon removals) from the atmosphere.

Underlining its importance to the UK economy, in 2019, the UK became the first major economy to implement a legally binding net zero target to reduce GHG emissions to reach 'net zero within our boundaries, as well as for the UK's share of international aviation and shipping, by 2050'.

WHAT DOES NET ZERO MEAN FOR UK MANUFACTURING?

In 2021 the UK committed, through its carbon budgets, to reducing its GHG emissions by 78% by 2035 (compared to 1990 or by 67% compared to 2018 levels) and to achieve net zero by 2050.

To meet our net zero targets the manufacturing sector will need to halve its emissions by 2030.

Although this is not an official target, it is deemed a logical one, and is encouraged by the UK Government[2] and the United Nations. But with the time ticking to meet this halfway point it is imperative that the manufacturing sector acts now.

[2]Companies (SMEs up to 500 employees) are encouraged to pledge via The SME climate Hub a coalition of recognised international initiatives and the United Nations Race to Zero campaign.

SECTOR COMMITMENTS

As a result of these targets and ambitions, the manufacturing sector has set out its own clear commitments[3]:

2035

↓67%

Scope 1 and 2 emissions reduction vs 2018[4]

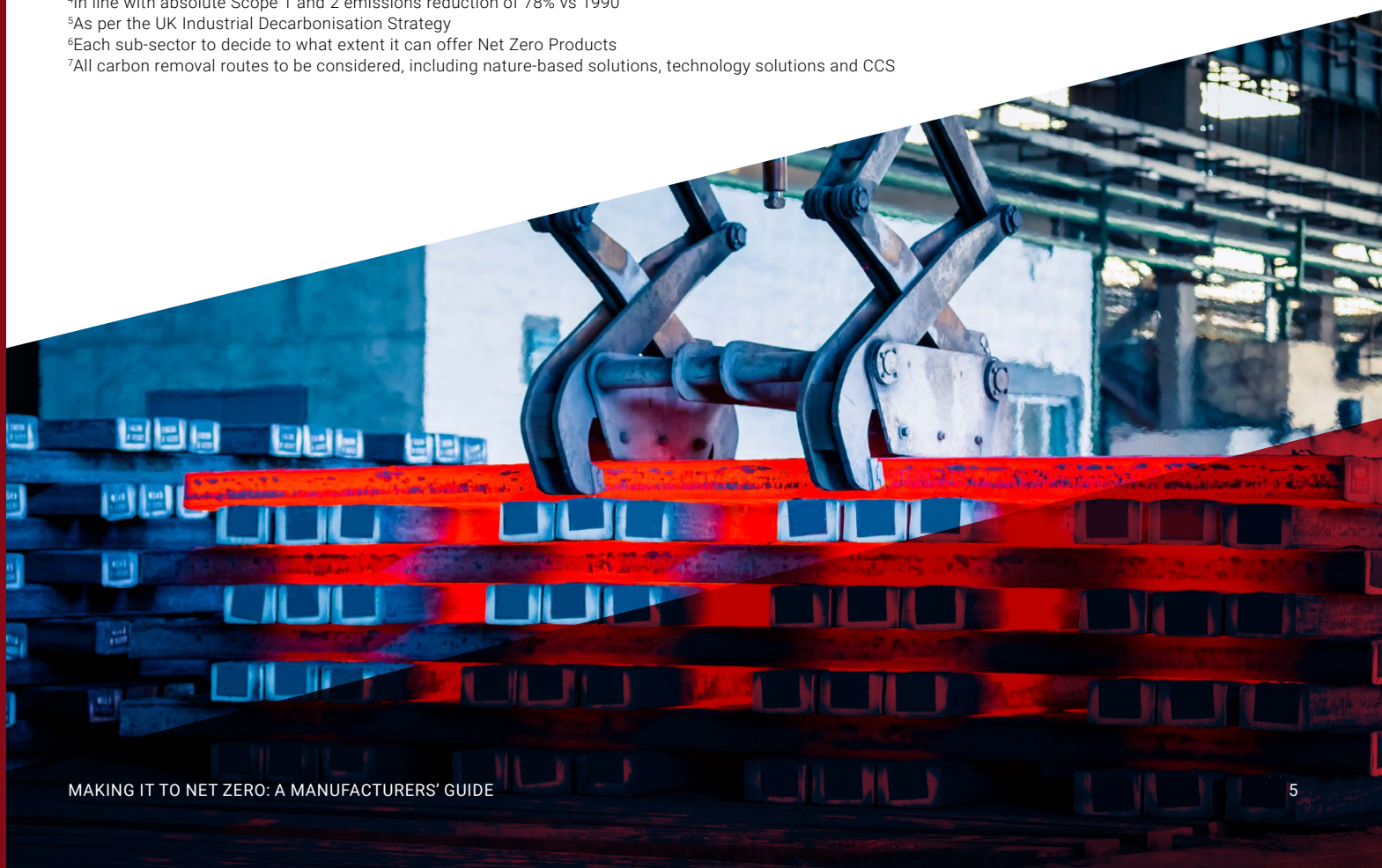
2050

NET ZERO

Scope 1 and 2 emissions reduction of at least 90%

- Help establish 4 low carbon industrial clusters by 2030, 1 zero carbon cluster by 2040[5] and decarbonise the mini-clusters at dispersed sites
- Support our suppliers and customers to get to net zero, to reduce our Scope 3 emissions
- Offer net zero products[6]
- Utilise carbon removal[7] where needed, to achieve net zero by 2050
- Engage with Government and other stakeholders to create the optimal business and regulatory environment

[3] Manufacturing Sector Net Zero Roadmap, Make UK in partnership with Inspired PLC, May 2022
[4] In line with absolute Scope 1 and 2 emissions reduction of 78% vs 1990
[5] As per the UK Industrial Decarbonisation Strategy
[6] Each sub-sector to decide to what extent it can offer Net Zero Products
[7] All carbon removal routes to be considered, including nature-based solutions, technology solutions and CCS



MILESTONES

The major milestones that the manufacturing sector therefore need to focus on to meet the 2050 net zero goal are[8]:

UP TO 2030:

- Aim to be on a path to halve Scope 1 and 2 emissions (amongst others) through:
- Maximising energy, resource, and material efficiency
- Maximising heat recovery in high temperature sites
- Electrification of processes, heating and transport
- Help establish 4 low-carbon industrial clusters

UP TO 2035:

- Equipping workers with the new skills required for net zero
- Progressing digital transformation and smart systems

UP TO 2040:

- Support suppliers and customers on their own net zero journey, to reduce the sector's upstream and downstream Scope 3 emissions, respectively
- Support the establishment of 1 zero carbon industrial cluster
- Support the decarbonisation of the mini clusters at dispersed sites

Reducing emissions requires an understanding of their nature and their quantification. While understanding of Scope 1 and 2 emissions is generally widespread now, there is still a gap in understanding of Scope 3 emissions, yet these are equally as important as Scope 1 and 2. To be a net zero business you need to reduce your value chain emissions, as well as your operational emissions. This means you have to measure, monitor and reduce your Scope 3 emissions in addition to Scope 1 and 2.

This guide seeks to ensure that UK manufacturers have a full understanding of how and why they need to cut Scope 1, 2 and 3 emissions. This is set out later in our 'Making it to net zero: 8 simple steps.'

[8]Manufacturing Sector net Zero Roadmap (2022), Make UK in Partnership with Inspired PLC, January 2022.

WHAT PROGRESS HAVE MANUFACTURERS MADE TOWARDS NET ZERO?

Progress is being made in leaps and bounds despite the challenges encountered.

Two years ago:
Awareness of net zero had climbed to above 90% due to a combination of factors such as the UK's leadership role for COP26 and awareness raising activities, including educational programmes from Make UK. At this time only 12% of manufacturers saw net zero as a priority for their business with many companies considering it a burden on costs and resources.

18 months ago:
Six months after the momentum that COP26 had created, 72% of manufacturers stated that net zero was a high or a medium priority (35% and 37% respectively), and 28% said it was a low priority.[9]

With a sense of importance building, almost half (49%) of manufacturers had a dedicated net zero strategy in place, with over a third (35%) saying they had begun implementing that strategy and 14% planning to implement it.

Two-fifths (40%) of companies didn't have a strategy yet but planned to within the next 12 months. Just 11% of manufacturers had no net zero strategy in place and no plans to implement one.

Today:
Make UK's latest survey[10] shows an overwhelming majority of manufacturers (92%) see the UK's transition to net zero as a priority to their business, stating it as essential.

Manufacturers are fully aware of the commercial gains to be had and are intent on playing their part in reducing carbon emissions. Almost seven in ten manufacturing firms (68%) have already made business investments to transition their operations to net zero, and a further 22% are planning to within the next 12 months.[11]

[9]COP26, 6 months on, Make UK report, May 2022
[10]Post PM net zero announcement (20/9/2023): Make UK membership survey, 22 September 2023
[11]Ibidem

WHAT ARE THE BENEFITS TO MANUFACTURERS IN BECOMING NET ZERO?

Chris Skidmore's (MP, former Energy Minister) 'Independent Review of Net Zero' (January 2022) has shown that the transition to net zero will provide the 'economic opportunity of the 21st century', driving economic growth and opportunity across the UK. The sooner we act to make net zero a reality, the less costly it will be.

The Climate Change Committee[12] has revised its estimate of the cost of net zero which will amount to less than 1% of annual GDP (from over 1%) until 2050. The savings it would allow would far outweigh the costs of doing nothing and bearing the full brunt of the climate impacts. This is being corroborated by more and more studies as the effects of climate change are being felt sooner and harder than expected.

And manufacturers agree. Make UK's most recent survey revealed that seven in ten (69%) manufacturers see net zero as a commercial opportunity for their business.

KEY OPPORTUNITIES

1. EASIER ACCESS TO FINANCE

Some 14% of manufacturers say that by focusing efforts on net zero they have better access to finance and lenders are now offering better financial terms and conditions to those with net zero and wider ESG (environmental, social and governance) credentials.

2. MANUFACTURING PROCESS EFFICIENCY AND PRODUCTIVITY IMPROVEMENTS

Manufacturers have identified significant money saving opportunities by improving process efficiency and productivity, with almost 60% of manufacturers citing this as a major opportunity. Greater efficiency in manufacturing produces reduced emissions as well as costs. In addition, by utilising digital technology to decarbonise, manufacturers can become more productive.

3. OPPORTUNITIES TO DEVELOP NEW PRODUCTS AND TAP INTO NEW MARKETS

Gaining a competitive advantage through innovative products or services (38%) was deemed the second biggest opportunity area which can help UK manufacturers compete on the global stage. Not only can manufacturers take advantage of changing consumer preference towards greener products, but they are also developing the technologies to help decarbonise the global economy.

4. DEVELOPING NEW GREEN SUPPLY CHAINS AND NETWORKS

Displaying green (ESG) credentials is becoming increasingly important with 16% of companies experiencing increased sales after decarbonising. Procurement contracts increasingly include ESG or specific net zero elements.

5. ATTRACTING NEW WORKERS INTO A GREEN AND INNOVATIVE INDUSTRY

The industry's inability to attract young people has been a long-standing problem. Being able to demonstrate a company's commitment to net zero can help attract new talent, with 15% of firms having already benefited from this.

[12]Climate Change Committee- 6th Carbon Budget, December 2020

MAKING IT TO NET ZERO: OVERVIEW OF 8 STEPS

STEP 1 - KNOWING THE BASICS

Understanding net zero for your business | Understanding key drivers | Asking the 'big' questions early on

STEP 2 - UNDERSTANDING YOUR EMISSIONS & SETTING YOUR TARGET

Understanding Scope 1, 2 and 3 emissions | Setting your target

STEP 3 - UNDERSTANDING YOUR VALUE CHAIN

The importance of Scope 3 emissions | Tackling Scope 3

STEP 4 - DEVELOPING AND IMPLEMENTING A STRATEGY

Constraints and sucesses in your business | Who needs to be involved | Seizing the opportunities

STEP 5 - MAXIMISING THE USE OF TECHNOLOGY

Cutting emissions by using digital technologies

STEP 6 - KNOWING WHERE TO GO FOR FUNDING AND ADVICE

National funds | Local funds

STEP 7 - COMMUNICATING AND REPORTING YOUR GOALS

Internal communication | External communication | Drivers for reporting | Clear and honest reporting

STEP 8 - EVALUATING YOUR SUCCESS

Measuring success | Continuous improvement | Logging and reporting failure

STEP 1: KNOWING THE BASICS

This section asks your business key questions to get you started on your journey:

- Getting to grips with your business' emissions.
- Understanding the drivers behind transitioning to net zero in your business – learn how your journey to net zero interacts with your company's reputation, energy efficiency and whether you want to bid for Government contracts.
- Asking the 'big' questions in your business early on – have you thought how some core parts of your overall business strategy, skills, priorities and culture will need to be reviewed in the context of net zero.

UNDERSTANDING EMISSIONS IN YOUR BUSINESS

Where do your emissions come from?	– Upstream activities (suppliers) – Core company operations – Downstream activities (customers)
Do you know the split between Scope 1, 2 and 3?	Emissions are categorised as Scope 1, 2, and 3 and it will be necessary to know the split between these. See step 2 for more information on emissions.
Have you undertaken Greenhouse Gas screening to understand what your baseline of emissions is?	The baseline emissions is key as it will be the reference against which your business will set its targets and measure any progress in future. If you are struggling to understand this, Make UK's Advantages Partner Inspired PLC can help.

UNDERSTANDING THE DRIVERS BEHIND TRANSITIONING TO NET ZERO IN YOUR BUSINESS

Does your business meet the thresholds for mandatory reporting?	There is a mandatory requirement for large, registered UK limited companies or partnerships for a number of schemes such as SECR, ESOS or the TFCD-aligned[13] climate-related financial disclosures (CRFD)[14]. It may be mandatory for your business to report on your net zero credentials
Are you planning to bid/ participate in a Government procurement contract?	If your business wishes to participate in the procurement of major central government contracts, it will need to follow the Procurement Policy Notice PN06/21[15] and produce a carbon reduction plan with a net zero target of 2050 at the latest.
What are your customer and supplier expectations?	Other pressures may come from customers or suppliers who need or wish to disclose their value chain emissions and request to see the company's efforts around net zero and sustainability. Companies may be requested to submit this data through the Carbon Disclosure Project (CDP), the globally recognised gold standard of environmental and climate reporting. Ecovadis also delivers sustainability ratings which help companies monitor and improve their ESG performance. Finally, many customers are requesting their suppliers set Science-Based Targets through the Science-Based Targets initiative (SBTi). This means setting ambitious near-term and net zero targets which align with the latest climate science to limit global warming to 1.5 °C or well-below 2°C , compared to pre-industrial temperatures.

[13]TFCD: Task Force on Climate-related Disclosures
[14]CRFD: Climate-Related Financial Disclosure
[15]Procurement Policy Note 06/21 (PPN 06/21) for contracts above £5m per annum excluding VAT.

Have you considered how you can become more energy efficient?	Most manufacturers have already taken measures to become more energy efficient due to extreme energy costs. There are a number of no-cost/low-cost steps as well as more major investments that your business can use to become more energy efficient. Make UK's report in partnership with Inspired, Driving Industrial Energy Efficiencies, can give you best practice examples of how this can be achieved.
Have you analysed what the reputational damage could be if you do not act?	Many companies face intense scrutiny on ESG aspects of their business. Many manufacturers have either already invested in net zero or are in the process of planning to do so. By committing to net zero, a business can establish its credibility and demonstrate its commitment to addressing climate change. You can create a competitive advantage by being more ambitious or making more progress than your competitors.

ASKING THE 'BIG' QUESTIONS IN YOUR BUSINESS EARLY ON

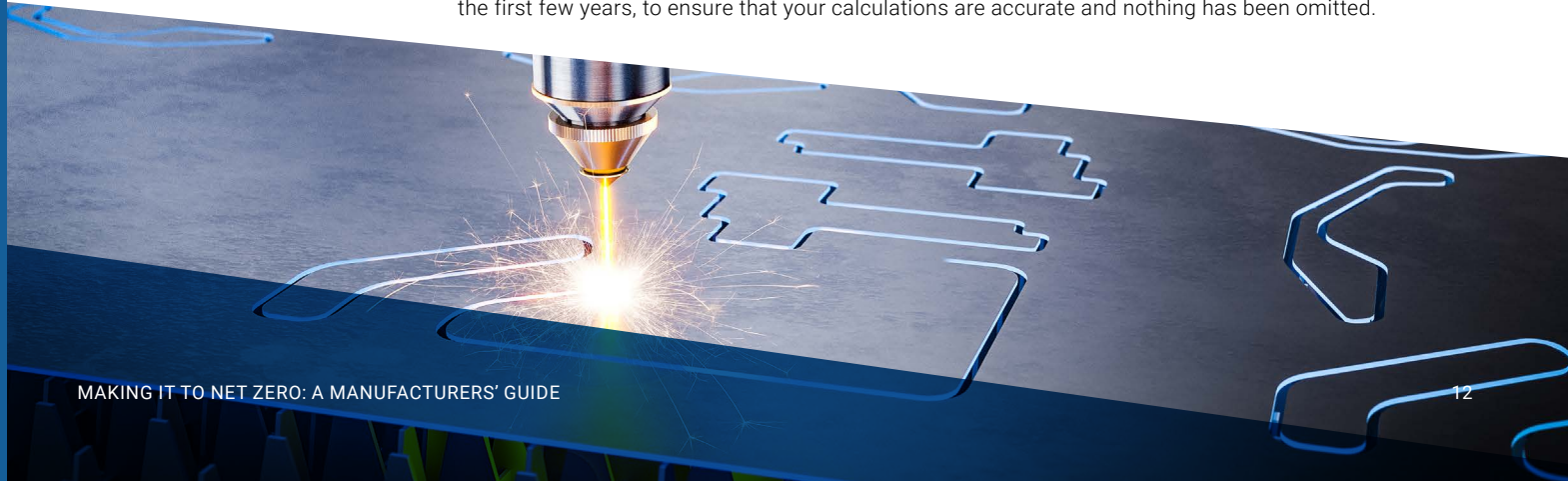
Have you reviewed your business priorities in the context of net zero?	Transitioning to net zero will take time and money in order see emissions fall. This might feel like it clashes with immediate business priorities but will still be worthwhile, since the payback period can be shorter than you think.
What is your current organisation's culture when it comes to lowering emissions and change more generally?	A change in individual mindsets and organisational culture may be required for the management and staff to embrace net zero in the organisation. Making sure you communicate goals and expectations to staff across the business early on will be critical (see in step 7).
Is the current leadership ready to lead the company to net zero?	It will take the vision of those at the very top to ensure your business can successfully become net zero by 2050. Strong leadership and management skills will be required to make this change happen and to ensure that these ambitions are cascaded down across the business. Consider whether senior leadership needs to go through ESG training to provide them with the right knowledge to embed sustainability into the business.
Have you mapped your current skills needs against future skills needs?	It is worth undertaking a skills mapping exercise and diagnostic to understand what skills will be most in demand. You should then undertake a skills gap analysis and create a skills strategy to acquire any skills that your business is missing. Make UK's report on Green Skills can help your business identify what skills you might require.

STEP 2: UNDERSTANDING YOUR EMISSIONS AND SETTING YOUR TARGET

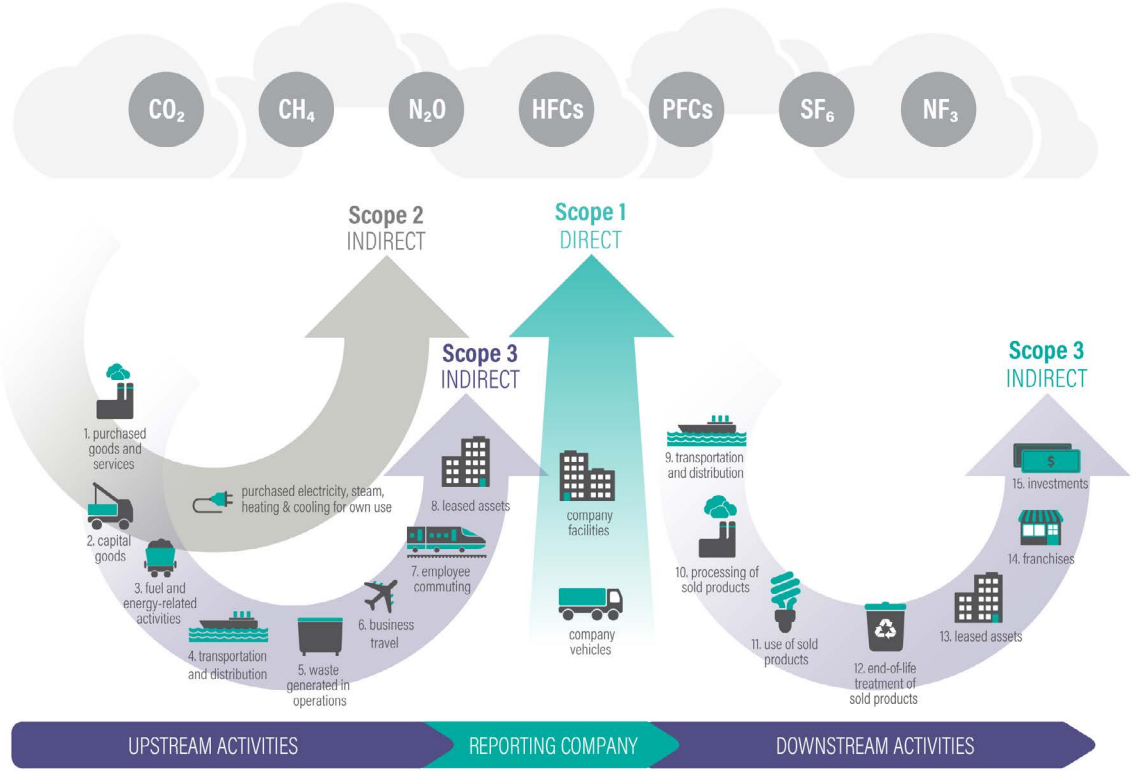
Understanding the split between your business' Scope 1, 2 and 3 emissions, and how emissions are generated is critical in forming your business' plan to net zero.

UNDERSTANDING SCOPE 1, 2 AND 3 EMISSIONS

Do you know the split of emissions between Scope 1,2 and 3?	To quantify emissions, businesses will need to define exactly what the boundary of the organisation is (e.g. is it the physical site or the whole organisation), which aspects of Scopes 1, 2 and 3 are relevant to the organisation and which consolidation approach to take when calculating emissions. Refer to the GHG Protocol Corporate Accounting and Reporting Standard for more details on boundary setting.
Scope 1 emissions	*Scope 1 emissions are those directly generated by assets that are owned or controlled by a business. This includes the combustion of fuels in a manufacturer's operations, buildings, or transport as well as leakage of fluorinated gas (f-gas) from cooling units. They are under the business' direct control, so energy and operational changes can be made to reduce them.*
Scope 2 emissions	*Scope 2 emissions are indirect, not directly generated by operations, but rather associated with purchased energy and will depend on the carbon intensity of the energy supplier. Minimising them can be managed mainly through the choice of supplier (of green electricity or biofuels) and behaviours on how energy is used (e.g., switching lights and machines off when not needed).*
Scope 3 emissions	*Scope 3 emissions are emissions associated with all activities in the value chain and are broken up into fifteen categories. They are likely to constitute the bulk of a business' emissions and capture all the other indirect emissions caused by the organisations' activities, which are physically occurring elsewhere in its value chain. Scope 3 emissions are separated into upstream (e.g., purchased materials and services, equipment, employee transport) and downstream (e.g., the distribution of products to customers, and their in-use and end-of-life emissions).*
How do you plan to calculate emissions?	Emissions should be calculated following the Greenhouse Gas Protocol Corporate Accounting and Reporting Standard. While calculating Scope 1 and 2 emissions can be simple enough for small organisations, calculating Scope 3 emissions and the emissions of large manufacturers can be an extremely complicated task. It is recommended that experts such as Inspired PLC are hired, at least for the first few years, to ensure that your calculations are accurate and nothing has been omitted.



Categorisation of Scope 1, 2 and 3 emissions



Source: GHG Protocol's Technical Guidance for Calculating Scope 3 Emissions, page 6.

SETTING YOUR COMPANY'S TARGET

What target will you set for your business?

Targets should be clearly defined and transparent. They should be ambitious but realistic, with meaningful emission reductions.

At a minimum, they must cover Scope 1 and 2 emissions. It is also recommended to include Scope 3 to take responsibility for your value chain emissions. It is recognised that Scope 3 is a challenge but when value chain emissions are substantive, it is important for organisations to put targets in place to reduce them to ensure they are addressing the wider environmental impacts of their business.

What the target covers should be clear, e.g., what scopes and categories are included. You should always refer to the base year that the targets are set against, to be explicit about your baseline. This helps provide context for stakeholders and will enable you to track progress internally.

Some companies will be asked by their customers to participate in certain net zero initiatives. For example, businesses that have set SBTi approved supplier engagement targets will require their supply chain to set public targets that are aligned with the latest climate science. The SBTi is an internationally recognised initiative which defines and promotes best practice in science-based target setting. Many businesses have had their targets validated by the SBTi to ensure their targets are robust and ambitious. Once targets are validated, the SBTi requires you to report progress against targets publicly on an annual basis, to encourage businesses to take action.

The SBTi guidance documentation and tools are publicly available, so even though you may not want to pay for validation you can still utilise their materials to help set targets.

When setting targets, there may be other external industries, companies or bodies that you wish to align with e.g., local government, parts of your supply chain (OEMs, Tier 1) who will have their own goals and initiatives, the UN Global Accord on Climate Change, or simply your Climate Change Agreement commitment.

STEP 3: UNDERSTANDING YOUR VALUE CHAIN

Scope 3 emissions come from your value chain and are therefore not often at the forefront of a business' net zero plans. However, your net zero plan is not complete until you assess what your Scope 3 emissions are, how you plan to measure them and how you can support your value chain to reduce their emissions.

THE IMPORTANCE OF SCOPE 3 EMISSIONS

Does your business understand what Scope 3 emissions are?

Scope 3 emissions are those associated with all activities in the value chain, e.g., indirect emissions caused by an organisation which physically occur elsewhere in its value chain. Scope 3 typically represents at least 70% of a business' emissions and tackling them can be a daunting prospect, with often thousands of suppliers and customers/users across the world.

The impact of Scope 3 versus Scope 1 and 2 can be varied for manufactures. For example, for a forge or brick manufacturer, the majority of the business' emissions fall under Scope 1 and 2, as their furnaces burn fuel at very high temperatures. In contrast, an aircraft manufacturer's emissions would lie predominantly in the 'in-life' use of the products (Scope 3), as the whole life emissions of products need to be taken into consideration and an aircraft will be burning fuel for many years.

Does your business understand why it must manage Scope 3 emissions?

First-tier companies or OEMs, who have mandatory reporting obligations, need to report their Scope 3 emissions. These groups of businesses routinely ask for their suppliers' Scope 1 and 2 emissions (which will constitute as their upstream Scope 3). If you sell products, your customers will increasingly be asking for your upstream Scope 3 emissions.

As part of managing Scope 3, businesses often analyse the major areas they need to address to show progress on their emission reduction targets over time. As this practice begins to filter through, we should see more companies begin to manage their Scope 3 emissions.

It is important to note that Scope 3 emissions of a company are essentially the Scope 1 and 2 emissions of another company. This means that all companies play a crucial role in achieving one another's net zero objectives. Considering the vastness of any given value chain, and the fact that it is beyond the direct control of the company, we would recommend beginning to monitor and manage these emissions as soon as possible.

Managing and reporting Scope 3 emissions has a further benefit beyond information collection: driving suppliers, customers, and employees towards a low-carbon economy. This will enable manufacturing businesses to maximise mutual benefits and reduce costs through a like-minded and effective value chain.

What are the practical ways your business will measure Scope 3 emissions?

To calculate Scope 3 emissions, a business' first port of call is to use the 'spend-based' method (based on standard conversion factors published by the UK government[18]). This provides an estimation of the corresponding emissions of purchased goods and services, capital expenditure, third-party logistics, waste, business travel etc. Refer to the GHG Protocol Technical Guidance for Calculating Scope 3 emissions for more details on Scope 3 calculation methodologies.

Over time, the methodology can be improved to increase the accuracy of the data collected, and the impact on the carbon footprint can be tracked and reported. This entails directly engaging with the suppliers to ask them for the exact data for each product/service they provide.

For those who wish to follow an ISO standard, ISO 14064 standard provides an integrated set of tools which can help to measure, quantify, record, and reduce greenhouse gas emissions in a structured way.

TACKLING SCOPE 3 EMISSIONS

Has your business considered sourcing lower-carbon products and materials (elimination/ reduction of emissions)

Purchasing lower-carbon products and materials and selecting service providers with lower embedded emissions (Scope 3 emissions) will go a long way in supporting emissions reductions. However, this can be challenging as the process is not fully under the organisation's control and requires a lot of engagement with suppliers.

To make the task less overwhelming, it is recommended that you pick out your top 5-10 suppliers for your initial supplier engagement. Top suppliers can be selected based on a number of criteria, for example, total number of sales, carbon footprint of the product and the type of relationship the organisation has with them (for example, short/long term importance to the business).

This will help you to focus on those who are creating 'emission hotspots' in your carbon footprint. One of the first questions to ask is whether they already measure their emissions and have a net zero target in place. This information can be obtained by sending out a simple survey.

There are a range of engagement approaches for suppliers. It may be helpful to consider the following:

- Taking a supportive approach, where the company will inform, educate, and help the supplier to reduce their emissions.
- Taking an 'enforcing' approach, where the company stipulates rules for suppliers. This may be appropriate in the case of short-term relationships, if there are alternative suppliers, or for high impact/ high revenue suppliers.
- Taking a competitive approach where the organisation engages its suppliers in groups, with the aim to create a healthy competition between them.

Progress of each supplier should be monitored annually, and any data improvements should be included in your Scope 3 calculations.

Has your company considered in-setting?

Some companies have opted to reduce Scope 3 emissions within their own supply chain by investing in projects that directly contribute towards decarbonisation of their supply chain. This is called in-setting.

By acting within their own value chain, and helping their suppliers to decarbonise, the company can reduce their Scope 3 emissions. An example of this might be installing solar PV on supplier sites, which can be coordinated through your own Power Purchase Agreement (PPA). Or supporting key suppliers to purchase green electricity.

What about offsetting?

It is possible to offset your GHG emissions by purchasing carbon credits. This will help to reduce or avoid carbon emissions from other businesses/projects. However, it should be noted that the voluntary carbon offset market is currently largely unregulated, and caution should be exercised when purchasing carbon offsets. Any purchases should be of high quality and scientific integrity and verified independently by an accredited agency. If possible, they should also bring co-benefits, such as helping the local communities maintain themselves and thrive in a sustainable manner.

It is also worth noting that offsetting your emissions will not help you achieve net zero. To achieve net zero you must reduce your emissions to as close to zero as possible and only offset the remainder through sequestration mechanisms e.g. carbon capture and storage or nature-based sequestration methods.

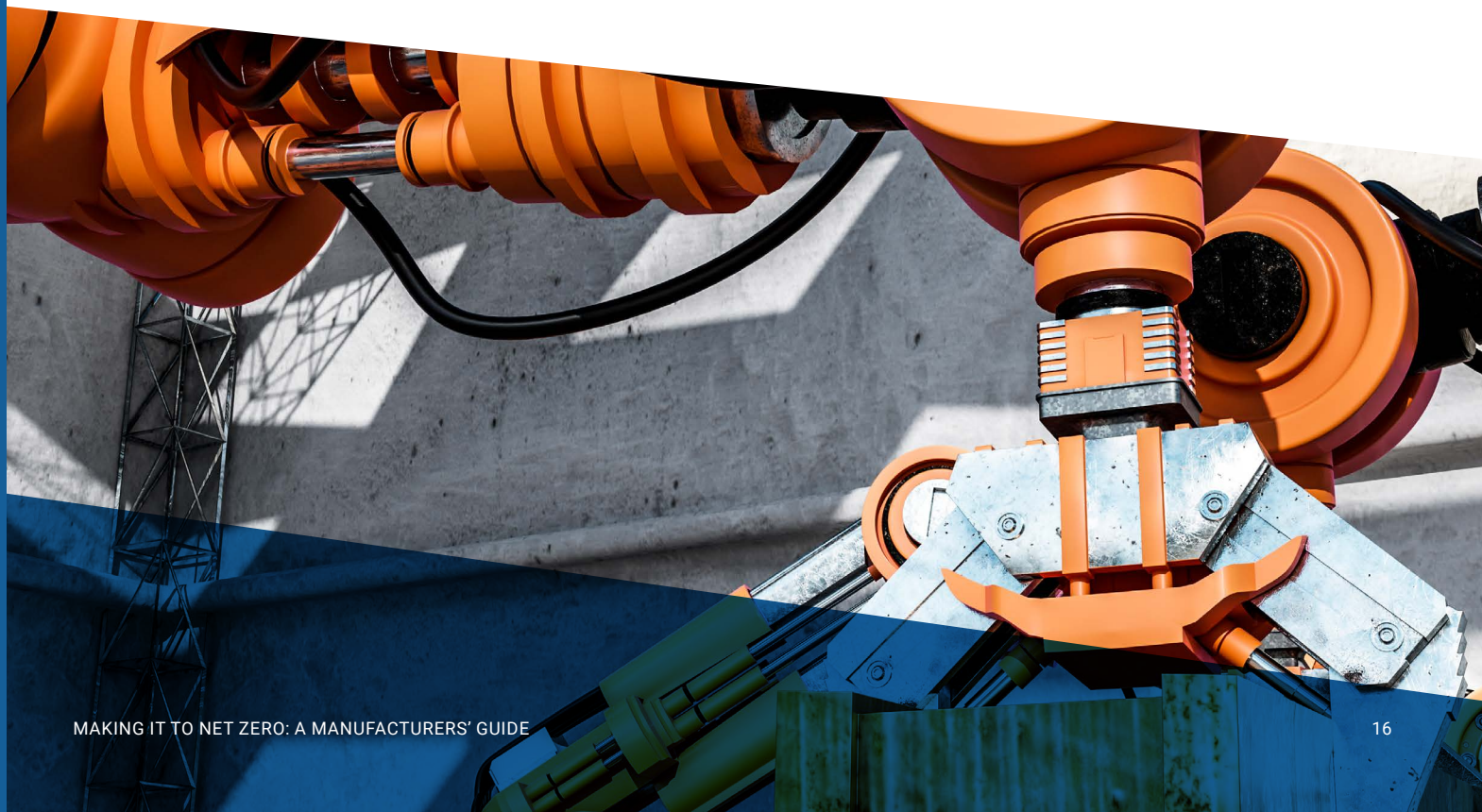
[18]UK Government GHG Conversion Factors for Company Reporting. Note that many Governments now produce their national conversion factors and that these can be used in the right context (e.g., when purchasing goods from abroad).

STEP 4: DEVELOPING AND IMPLEMENTING A STRATEGY

Setting your ambition and your company targets may seem to be straightforward, but there are potential pitfalls that you don't want to fall into. When it comes to implementing your strategy, don't allow it to be a siloed activity – bring your workforce along and think about change culture. Remember that you are not the only one doing this alone – speak to similar manufacturers about their net zero plans.

SETTING THE AMBITION AND SCOPE OF YOUR NET ZERO STRATEGY

What are your company's limitations?	Some companies will be limited by what is possible and how it is done. You should be ambitious but also realistic when setting your net zero ambitions.
Will there be conflicting business objectives across the business because of implementing a net zero strategy? And if so, how will these be overcome?	There may be conflicting objectives within the company e.g., the desire to procure a product as cheaply as possible but the product should be as sustainable as possible. There will need to be alignment within the company to decide what the acceptable price point is to pay for a more sustainable product.
How will ensure you don't bake new emissions into your business?	There should be careful consideration about not baking in new emissions into your business. For example, one department is considering a major investment in a gas-powered furnace, which would add emissions into their process for the next 20 years. This would make achieving net zero almost impossible without making further fundamental changes in many parts of their operations.



IMPLEMENTATION

What is your staff engagement plan?	It is critical that every member of staff is aware of your company's net zero objectives, and this must be communicated effectively (see step 7: Communicating and reporting your goals). It is worthwhile developing a continuous staff engagement plan.
What are your change management plans?	Successful implementation requires managing the people side of the journey. Change management involves providing support, training, and communication to employees to ensure they understand the benefits of net zero and are willing and capable of adopting a new way of working and technologies.
Could a net zero leadership team or task force benefit your business?	A net zero leadership team often includes the managers responsible for the different functions/departments in the company. The net zero leadership team is usually responsible for establishing the decarbonisation strategy and the main goals for each part of the company. They can also manage strategy roll out to ensure progress is being made against targets.
Have you thought about the benefits of an energy audit to help implement your strategy?	Conducting an energy audit can spot wastage and improve your energy efficiency. You can start with the very basics such as: – Identifying low-handing fruits e.g., LED lighting. – Moving to electric cars and fleets. – Generating your own renewable electricity. – Buying green energy. Third parties, like Inspired, can conduct site surveys that both support ESOS compliance and provide emissions reduction solutions.
Have you spoken with other manufacturers to get feedback on how they have implemented their plans?	Reaching net zero is a new concept for all businesses – meaning you really are not alone. Reach out to your competitors and your neighbours – you may find it surprising how willing others are to share their ideas.

STEP 5: MAXIMISING THE USE OF TECHNOLOGY

Digitalisation will be an important tool to help manufacturers with their journey to net zero. This step sets out some of the tools and technologies that can help.

CUTTING EMISSIONS BY USING DIGITAL TECHNOLOGIES

How can digital technologies help my business reduce its emissions?

The fourth industrial revolution has brought unprecedented digital advancement and transformation. There is now an array of digital technology vendors in the marketplace, meaning manufacturers can choose from hundreds of solution-focused tools and technologies to improve their processes. These include:

- Analytics and intelligence: big data, Artificial Intelligence (AI) and Machine Learning (ML), Generative AI, Digital Twins, and advanced analytics
- Production method advancements: Additive manufacturing
- Human-to-machine and machine-to-human interaction: industrial robots, collaborative robots (cobots), and robotic process automation

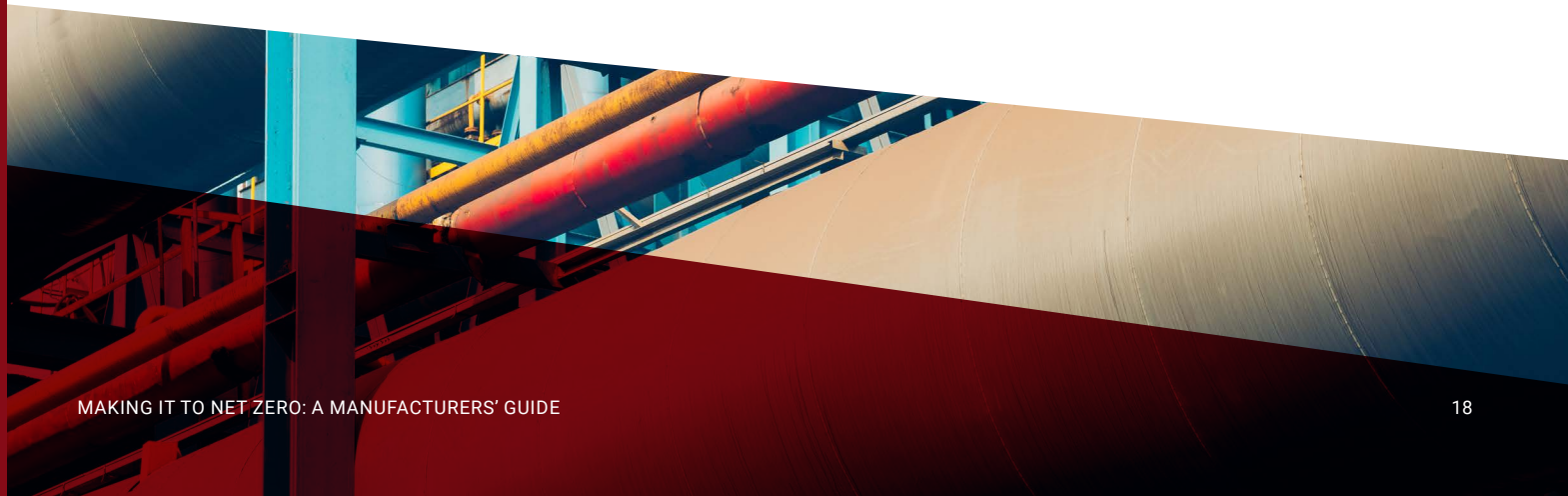
What digital technologies are available and how can they help reduce my company's emissions?

Examples:

Sensors: By installing sensors such as sub-meters, businesses can monitor and manage energy in greater detail, which helps to reduce waste and improve production energy efficiencies. These benefits are now being realised across the manufacturing sector. Just over 1 in 3 (34%) of manufacturers felt that digital adoption improved energy efficiencies, and a third also agreed that process improvements contributed to reducing emissions. All of these are vital in achieving the sector's net zero ambitions.

Equipment maintenance: There is an increasing focus on the use of digital technologies in production areas such as equipment maintenance. Readily available products such as AI and ML, and tools such as IoT, can be incorporated as part of predictive maintenance. Predictive maintenance has been shown to lead to significant energy consumption reduction, subsequently leading to carbon emission reductions.

Supply chain management tools: Three in ten manufacturers are using digital technologies for supply chain management, and a further 40% are considering it. Better visibility and control of the supply chain is important, and digital technologies can play a critical role. Being able to map and quantify, in real time, the emissions contributed by the different suppliers provides greater insight into areas of improvement.



STEP 6: KNOWING WHERE TO GO FOR FUNDING AND ADVICE

Funding your net zero plan is integral to success. This step sets out the different funds, grants and reliefs that can help your business.

NATIONAL FUNDS, GRANTS, AND RELIEFS

What is available to companies nationally?

The Industrial Energy Transformation Fund (IETF): A grant that offers match funding for a minimum project size of £75,000.

The Green Heat Network Fund (GHNF): A capital grant for all businesses to fund heat network projects in England.

The Green Gas Support Scheme (GGSS): Companies with large biomass production can apply to the Green Gas Support Scheme (GGSS). This provides financial incentives for new anaerobic digestion biomethane plants to increase the proportion of green gas in the gas grid.

Other national funds: These include the Wales Funding Programme, the Low Carbon Manufacturing Challenge Fund (Scotland), the Salix Energy Efficiency Loan (Scotland), Scottish Central Government Energy Efficiency Grant, and the Workplace Charging Scheme (WCS).

SME focused funds
Innovate UK: Innovate UK provides loans to help overcome obstacles to the success of innovative products, processes, services, or businesses. This includes projects related to net zero, next-generation digital technologies, and technology families.

Funds for Innovation:
The Net Zero Innovation Programme (NZIP): This covers various programmes supporting Carbon Capture, Use and Storage (CCUS), bioenergy, direct air capture (DAC) and greenhouse gas removal (GGR), advanced modular nuclear reactors (AMRs), energy storage and flexibility, future offshore wind, homes and buildings, hydrogen, and disruptive technologies.

Innovate Smart Grants[16] support the manufacturing technologies that contribute to the green economy e.g., the Heat Pump Ready programme.[17]

For Energy Intensive Industries (EIIs):
The British Industry 'Super-Charger' package: Announced earlier this year, this new initiative will enhance the existing measures and will help with improving price parity. It includes:

- The Energy Intensive Industries (EIIs) Compensation Scheme, which provides relief for the indirect costs of the UK Emissions Trading Scheme and Carbon Price Support mechanism in the electricity bill (extended until 2025).
- The Renewal Energy exemption scheme, which provides relief for the indirect costs of the Contracts for Difference (CfD), Renewable Obligation (RO) and Feed in Tariff (FIT) schemes. The exemption is currently at 85% but will be uplifted to 100% from April 2024.
- Network charges compensation scheme (NCC) which will provide a 60% relief from April 2024.
- Capacity Market exemption has also been announced, with details to come.

[16]Innovate Smart for game-changing and commercially viable R&D innovation that can significantly impact the UK economy
[17]The £60m Heat Pump Ready programme is developing innovative solutions and developing financial models that support an increase in heat pump deployment in homes and businesses across the UK.

The Mineralogical and Metallurgical Exemption:
This benefits businesses carrying out metallurgical and mineralogical processes by exempting them from the main rate of the climate change levy (CCL).

Climate Change Agreements (CCAs):
Businesses of all sizes and conducting a wide range of qualifying energy-intensive activities may benefit by getting a discount on the Climate Change levy, a tax paid by all businesses through electricity and fuel bills. This is a very under-utilised relief and is not limited to EIIs (from metals, surface treatments, plastics, tyres) but covers food & drink, semiconductors, furniture, and textiles (non-exhaustive list). It has just been extended for 6 years, so it is worth checking the list of activities and contacting the relevant sector association running the CCAs to see whether you can participate.

Are there tax reliefs for businesses to help transition to net zero?

Business rates reliefs: These are available for investments in green machinery and plant equipment until 2035, and in building improvements (e.g., insulation until 2028, however, the reliefs only apply for the first 12 months).

Full expensing: Full expensing has been made permanent and covers new equipment (so that would normally cover new clean technologies). However, it does not cover leased or second-hand equipment, which is still an issue, particularly for SMEs.

Is Internal Carbon Pricing (ICP) possible under our business operations?

More and more organisations are starting to build an internal carbon price into their business operations and investment decisions to prepare for a low-carbon future and divert investments away from carbon-intensive activities.

Factoring the cost of their GHG emissions into each operational division/unit's budget and using it as a performance indicator means that these divisions are incentivised to cut emissions. It effectively brings the cost of the environmental damage caused by greenhouse gas emissions back to the specific emitter site. Better understanding the operational cost of decarbonisation projects helps to inform investment decisions around emissions and energy efficiency and to keep on track with the net zero targets.

There is no fixed way to set this mechanism; it can take different shapes and forms. The most common approach includes a hypothetical carbon price or the actual carbon tax, offsetting and internal carbon taxes or levies. The money raised can be placed in a fund to finance carbon reduction or other sustainability projects.

ICP is a fast-growing trend and in 2020, some 5,900 companies reported carbon pricing data, while research by the Carbon Disclosure Project (CDP) showed the number of companies using or planning to use ICP has increased by 80% in the past five years.

LOCAL FUNDS

Have you looked around to see what might be available locally?

Business Energy Advisory Service (BEAS) West Midlands pilot scheme (for SMEs): The recently launched BEAS is co-funded by the government and is being piloted in the West Midlands. It is a dedicated energy advisor offering trusted advice on improving energy efficiency. Working with local primary delivery providers, it will deliver a mix of standard and energy-intensive assessments and grants.

For this scheme, an Energy Intensive Business is defined as:
- SMEs (10-250 employees) within target SIC codes (Manufacturing 10000- 33200) and 383209 (recycling, waste processing) AND
- have annual energy costs (gas and electricity) greater than 10% of turnover,

OR

Any businesses in the manufacturing and engineering related sector with a total energy consumption (gas and electricity) > 075 GWh per annum.

STEP 7: COMMUNICATING AND REPORTING YOUR GOALS

As with all parts of business, communication is key. Internal communication to your organisation is just as important as communicating your message externally. Be careful of 'greenwashing': it's always better to be honest and upfront about your reporting.

INTERNAL COMMUNICATION

How will you communicate and report your goals internally?

Communication inside the business is essential, as everyone in the organisation must understand they have an important role to play in achieving net zero.

By introducing a pledge to achieve net zero, a company can demonstrate its commitment to mitigating business impact on the environment. This promotes accountability, and creates an ongoing conversation, both internally and externally, around decarbonisation.

Any pledge should be endorsed by the head of the organisation, as well as senior leadership, and should be accompanied with a commitment to ensure carbon literacy at all levels of the business.

Have you considered introducing carbon literacy or behavioural change training?

Staff should understand what net zero is, why the company is taking action on net zero, how the company intends to achieve the net zero goal, how each member of staff can contribute and why their contribution is essential to achieving success in driving emission reduction. Once people understand the overarching ideas and goals, the plan for net zero becomes more accessible, and culture change will happen at a faster rate and become more widespread across the company.

Internal training could be set up to improve your business' carbon literacy. This should include, as a minimum, training on climate change terminology and context, and should be mandatory for all department/branch/operations managers to ensure ownership and accountability. It is important that staff can input their ideas into the process to foster a sense of ownership.

Furthermore, building in environmental KPIs into individuals' development plans or performance reviews will also help hold staff accountable.

There are other complementary training sessions that businesses can run to help facilitate behavioural change. These might cover more specific and/or technical areas that link to emissions reduction, e.g., Lean Six Sigma training to drive continuous improvement.

The potential of digital technologies as an enhancer of net zero could also be emphasised through awareness building, as too many plant operators still see them only as tools to increase productivity.

Could net zero champions or taskforces help your internal communications?

Nominating net zero champions in each area can give staff a sense of responsibility and involvement and help to create momentum within the organisation.

For larger companies, creating dedicated taskforces or working groups, rather than just nominating individuals to perform specific tasks or programmes, will provide a clear line of responsibility. This can help ensure that action is taken and that net zero remains a business priority throughout organisational changes over time.

Moreover, feeding your net zero plans into your corporate social responsibility (CSR) and environmental, social and governance reports, will demonstrate your commitment to achieving net zero. This can contribute to retaining staff and attracting new talent.

EXTERNAL COMMUNICATION

Has your business considered the benefits of publicising goals externally?

Publicising goals externally can:

- Raise the accountability of your business to meet the goal.
- Help to keep the focus on the end goal.
- Send an early signal to suppliers about what is in the pipeline, so they, in turn, know they will need to take action.
- Highlight your ambitions to customers who want to see more sustainable products and services.
- Have a positive reputational impact, as the company is demonstrating efforts to towards mitigating climate change and improving sustainability.

DRIVERS FOR REPORTING

Has your business considered the benefits of reporting?

Reporting successes and progress can have positive reputational impacts such as:

- Retaining existing customers, who want to purchase products from responsible suppliers
- Attracting new customers
- Attracting new recruits, particularly the younger generations who want to work for companies that care about climate change and sustainability.
- Improving the company image and creating a reputation as a responsible business adhering to the Environmental, Social and Governance (ESG) criteria
- Responding to a mandatory reporting requirements (e.g., ESOS, SECR, CRFD)
- Reporting to a voluntary scheme (e.g., SME Climate Hub)

Does your business fall in scope of mandatory reporting?

SECR and ESOS schemes: If you are a large business, or part of one in the UK (e.g., a Limited Company or a Limited Liability Partnership, LLP), reporting your GHG emissions and/or energy usage in your end-of-year accounts is mandatory for the SECR and ESOS schemes.

Climate-Related Financial Disclosure: In 2022, the UK government introduced mandatory Climate-Related Financial Disclosure requirements for large UK businesses and LLPs. The Climate-Related Financial Disclosure is based on the TCFD reporting structure, which provides a framework for companies to report the potential impact of physical and transitional risks of climate change on their business. This is particularly important for attracting investors, who need certainty and clarity to make future investment decisions.

UK Government procurement policy: Procurement Policy Note PPN 06/21 now requires any businesses tendering for government contracts of over £5m per year to have a publicly available carbon reduction plan.

ISO standards: Some ISO standards may be required by customers in highly regulated sectors such as aerospace, pharmaceuticals, medical devices, and healthcare products e.g. ISO 14001: Environmental Management or ISO 50001: Energy Management.

Would voluntary reporting benefit your business?

Public statements: There are many net zero initiatives to which your business can align to demonstrate your net zero commitment e.g. the SBTi[19], the Climate Pledge, B-Corp, Race to Zero, the SME Climate Hub etc. The Race to Zero (for large businesses) and the SME Climate Hub are part of the UN Programme which is supported by the UK Government.

Roadmaps: These are credible disclosures of a company's plans for net zero as they provide detail on important milestones and how net zero goals will be attained.

Climate change agreements (CCAs): These are voluntary agreements made between UK industry and the Environment Agency to reduce energy use and carbon dioxide (CO_2) emissions. In return, operators receive a discount on the CCL, a tax added to electricity and fuel bills.

Environment, social and governance: ESG credentials are now frequently required by the company (group) owner, potential investors, lenders, or customers. Publishing a voluntary ESG report can help to differentiate you as a market leader in the sustainability space.

CLEAR AND HONEST REPORTING

How do you ensure your company is not at risk of 'Greenwashing'

Whether reporting is mandatory or not, transparency, authenticity, and regularity (at least annually) in communicating progress is paramount. The stakes are high, particularly in terms of reputational risk or benefit for the company.

When things do not progress as planned, it is important to explain clearly why. If the efforts are genuine and clear, stakeholders will be understanding. If reported publicly, it is even more important to ensure that the commitments and plans are followed through.

There have been claims of 'greenwashing' by watchdogs in recent years, who have found that many corporations 'talk the talk' but don't 'walk the walk' and subsequently lose their reputation. To avoid this, always make sure that you are transparent and clear with the wording of your reports and maintain a robust audit trail to back up any claims you make.

Does your business understand the difference between carbon neutral and net zero?

Both net zero and carbon neutrality aim to neutralise emissions that have been generated by human activities. However, there are key differences your business should be aware of:

Net zero: Net zero is more prescriptive and refers to more than just carbon dioxide. It includes other manmade greenhouse gases e, g, F-gases, nitrous oxide and methane.

It requires absolute reduction of GHG emissions (i.e. total emissions and not an emissions intensity e.g., CO_2e/£m) and follows a science-based trajectory to limit global warming to at most 2ºCelcius and ideally 1.5oC above pre-industrial levels. To achieve net zero, businesses must reduce their absolute emissions to as close to zero as possible. Any emissions that remain by their net zero year, because they are too difficult to eliminate or abate, must then be removed from the atmosphere through technological (e.g., carbon capture and storage) or nature-based sequestration methods (e.g., trees, marine kelp).

Carbon neutrality: Carbon neutrality covers only carbon dioxide emissions. It is much less prescriptive than net zero, as companies can become carbon neutral by purchasing offsets that cover all or part of their emissions. To become carbon neutral, businesses simply need to purchase carbon credits that are equal to the emissions they wish to offset. Carbon credits come in many forms and can either be sequestration offsets or avoidance offsets. Avoidance offsets are investments in schemes that help other businesses/ projects to avoid further CO_2 emissions, e.g., by protecting existing forests (as opposed to planting more), fixing methane leaks from oil wells, or promoting greener products over high emitting ones (e.g., green electricity and gas certificates, or using gas cookstoves over coal stoves). A key difference between carbon neutral and net zero is the timeframe they can be achieved. Carbon neutrality can be achieved within days, once offsets have been purchased, whereas net zero will often take years to complete.

[19]The Science Based Targets initiative (SBTi) which outlines best practice for net zero target setting, suggests that businesses should set targets for Scope 3 emissions, when they represent 40% or more of your total footprint.

STEP 8: EVALUATING YOUR SUCCESS

The evaluation step is often missed as firms see it as a nice to have. Don't make this mistake – it's important to evaluate your progress to drive continuous business improvement by identifying what went well and what can be improved. You can also help others by sharing your successes and detailing how you got there.

MEASURING SUCCESS

How will your business measure success?	Net zero is an iterative process. We recommend you: 1. Pick a base year to measure progress against, that reflects a business as usual year. Note that if there are any significant changes to your business, you will need to re-calculate your baseline emissions to account for those changes to ensure you are comparing like for like data. 2. Calculate your emissions at least annually so you can monitor progress. Make sure you update your strategy annually as well to account for new technologies/ solutions etc. A continuous feedback loop is important to ensure your strategy still matches your marketplace and your changing business. 3. Conduct annual review meetings with the relevant stakeholders/ committees to discuss what has gone well and what needs to be improved in the coming year.
Have you built in feedback loops for continuous improvement?	You will get feedback on your net zero plans from all areas of the business – the key is to build in how you will get that feedback and how you will adapt your plan accordingly. Continuous improvement should be part of everyone's job, but often only a few people in the business are continually trying to improve. This should be part of your change culture strategy, as set out in step 7.
How are you logging your barriers and what isn't working?	The best learning often comes from your mistakes, and not your successes. Be clear to your workforce that it's okay to fail, as long as you are always learning about how to improve.

VIEWPOINT

INSPIRED PLC

The transition to a net zero economy provides significant opportunities to the manufacturing sector. Manufacturers, as suppliers, will be pivotal in supporting businesses and consumers across the UK to decarbonise.

They will produce the technologies needed to reduce emissions from energy, transport and products. Therefore, a net zero manufacturing sector will be crucial for reaching a net zero economy. With the UK government committing to net zero by 2050, Make UK has built upon its existing Net Zero Roadmap with this My Net Zero Guide to help manufacturers on their emission reduction journey.

Understanding and measuring your emissions is a crucial first step since this will be your baseline year for any emission reduction targets. Many larger manufacturers will have been reporting their Scope 1 and 2 emissions already through the government's Streamlined Energy and Carbon Reporting (SECR) requirements, however, this may be new for smaller enterprises. Calculating Scope 3 emissions may seem overwhelming; however, tackling the 15 categories individually can help to make the process less daunting, as can seeking external support. Scope 3 emissions calculation is an iterative process, and the focus should be on improving data accuracy over time. It is highly recommended that manufacturers put processes in place early on to facilitate data collection, using technology to collect the data needed automatically, thereby reducing valuable employee time spent on data collection each year. As more businesses in the economy begin to measure their own Scope 1, 2 and 3 emissions, working with all parts of your value chain will be needed to reduce emissions.

In order to drive decarbonisation, it is recommended that businesses set net zero targets across Scope 1, 2 & 3 emissions. As a minimum, you will be required to achieve net zero by 2050, in line with the UK government commitment and Make UK Roadmap. To help you set realistic but ambitious targets, there are publicly available tools and guidance from the Science Based Targets initiative (SBTi), which promotes best practice in climate science-aligned target setting. Making a public commitment to net zero can help demonstrate to your supply chain, employees and customers that you are serious about mitigating your impact on the environment.

Once your targets have been set, it will be important to create a decarbonisation strategy to help you achieve them. Effective strategies should identify key technologies, solutions, equipment and actions that can be implemented in the short, medium and long term to produce a roadmap to net zero. Making the most of technology and energy efficiency will be particularly important for the manufacturing industry, where Scope 1 & 2 emissions often make up a significant portion of a company's footprint. To successfully embed your net zero strategy within your business, clear and continuous communication with employees will be required to help them understand why net zero is important and what they can do to help. Make UK's 'My Net Zero Guide' covers all these key steps and more, to help manufacturers successfully start on their net zero journey.

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HOW MAKE UK AND INSPIRED CAN HELP

INSPIRED PLC

'My Net Zero Toolkit' is a service provided by Inspired PLC that will guide UK manufacturers' towards net zero by 2050 (or earlier if possible) and help them to take action against climate change.

The toolkit is intended to enable all members, wherever they are on their net zero journey, to plan their future business in a climate-responsible manner, and develop robust, data-led strategies to help achieve net zero.

The toolkit includes:
- Carbon Footprint
- Site Surveys
- Project Implementation

The toolkit full service brochure can be accessed here via our partners Inspired PLC.

MAKE UK

Make UK has set up a Net Zero framework for its members with a set of four Net Zero Guiding Principles, a series of five educational 'Demystifying Net Zero' videos on why and what is net zero, and a 'My Net Zero Toolkit' (delivered in partnership with and delivered by Inspired PLC).

The sector has committed to net zero by 2050 through its sectoral Manufacturing sector roadmap to net zero, which was created by Make UK in partnership with Inspired PLC.

Make UK's Health and Safety Services also provide training designed to equip all levels of the workforce with the knowledge and skills to help our members achieve their environmental and sustainability goals. Our IEMA accredited courses will help to implement your Net Zero strategy and factor in the Environment Act 2021. See the Course Brochure. See what other businesses are already doing here.

Our Net Zero Hub can also be used to find more information and support.

Make UK is backing manufacturing – helping our sector to engineer a digital, global and green future. From the First Industrial Revolution to the emergence of the Fourth, the manufacturing sector has been the UK's economic engine and the world's workshop. The 20,000 manufacturers we represent have created the new technologies of today and are designing the innovations of tomorrow. By investing in their people, they continue to compete on a global stage, providing the solutions to the world's biggest challenges. Together, manufacturing is changing, adapting and transforming to meet the future needs of the UK economy. A forward-thinking, bold and versatile sector, manufacturers are engineering their own future.

www.makeuk.org
@MakeUKCampaigns
#BackingManufacturing

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Inspired PLC (AIM:INSE) is a leading B2B technology-based service provider supporting corporate businesses to control energy costs and enable their journey to net zero.

To enable our clients to respond to the climate emergency, we focus on solving their toughest sustainability challenges. By managing data comprehensively, offering expert insight and providing advisory services to reduce carbon efficiently, we enable our clients to control costs effectively, make authentic environmental, social and governance (ESG) disclosures and achieve their net zero targets.

We currently serve over 3,500 UK and Irish organisations across the public, private and third sectors and what sets us aside from other energy and sustainability advisory partners is our expertise in data management. Our solutions are evidence-based and enable us to provide our clients with practical steps to make a real difference.

In November 2020, we were delighted to receive the London Stock Exchange Green Economy Mark, recognising the Group's environmental and strategic advice, service and support to clients and the impact the business has on the green economy.

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