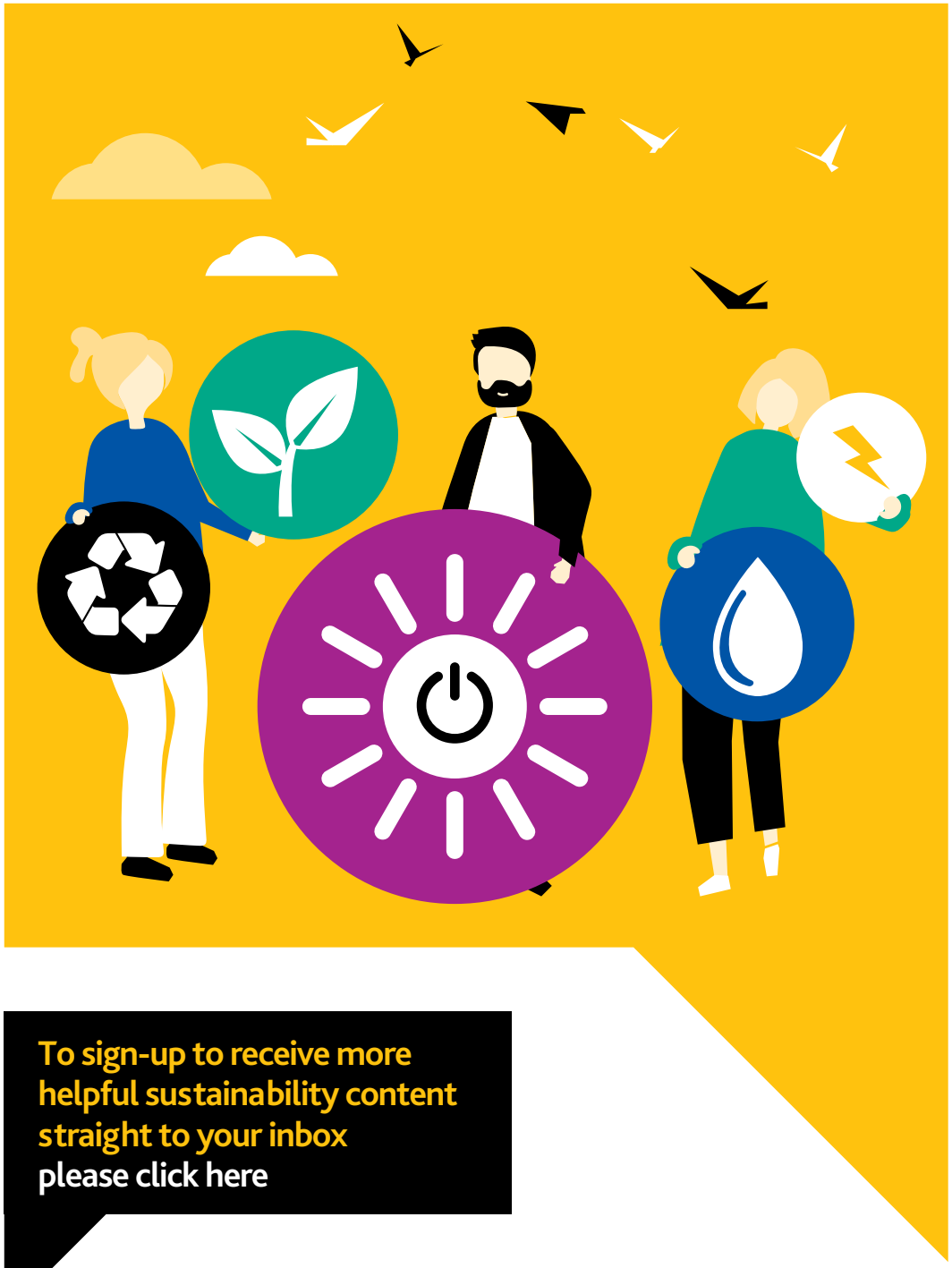

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An A to Z to Simplify Sustainability

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A

AIR, WATER AND GROUND SOURCE HEAT PUMPS: All of these pumps use naturally occurring heat to provide a more efficient and renewable means of heating a building and getting hot water. All of them use electricity to generate heat in a super-efficient way, typically creating 2-3 units of useful heat for each unit of electricity, and completely avoiding the use of fossil fuels like gas. The real difference between them is where they get the heat from – as the names suggest, the air source heat pump gets it from the air, the ground source heat pump gets it from water loops in the ground, and the water source heat pump gets it from a nearby lake or river. Ground and water source heat pumps are quite site-specific in how they can be applied to buildings, and they tend to be the most efficient- air source heat pumps can be used on all building types, are quite cost-effective, and are typically a bit less efficient.

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B

BIODIVERSITY NET GAIN: Biodiversity is all the different kinds of life you'll find in one area – including all of the animals, plants and other organisms that make up our natural world. These organisms work together in ecosystems, like an intricate web, to balance and support our natural areas. They provide vital functions such as flood prevention and improving air quality, and having access to nature can also help to improve people's physical and mental wellbeing.

Biodiversity net gain (sometimes referred to as BNG) is the term used to describe the process of increasing the overall biodiversity value of a development site. Biodiversity net gain sits within the Environment Act. From November 2023, the Act requires all development schemes in England to deliver 10% biodiversity net gain, which must also be maintained for a period of at least 30 years.

When it comes to construction projects, it's important that biodiversity is taken into account right at the beginning of the project to maximise the benefits gained within the site. Adding it on later down the line can be much more costly.

BREEAM: BREEAM stands for 'Building Research Establishment Environmental Assessment Method'. In short, it's a standard that outlines the best practice in sustainable building design, construction and operation. You may hear buildings being called BREEAM Excellent, Good, etc. This is how the building measures against best-practice benchmarks. BREEAM can be used for new buildings, fit-out projects and when buildings are in-use. If you want to aim for a BREEAM certification, it's important to raise this early in the process as the assessment spans across the lifecycle of the project – from concept to design to construction to hand-over.

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C

CARBON FOOTPRINT: A building has its own carbon footprint. This is the amount of greenhouse gases that are produced throughout the entire lifecycle of the building. This includes the gases produced in the manufacture and supply of the materials, the actual construction of the building, the running of the building, any retrofitting or upgrades and the demolition of the building. For every organisation, their carbon dioxide emissions are categorised into one of three scopes. For the following examples, we have focused on how an organisation would classify the emissions relating to the creation and running of their building.

Scope 3 emissions primarily relate to an organisation's supply chain. When a contractor is hired to build a new building, any emissions produced would fall into the organisation's scope 3 emissions as they are the customer.

Scope 2 emissions come into effect once the building is operational, it relates to the electricity that is used.

Scope 1 emissions also apply to an operational building. This includes things like any gas that is used.

CARBON NEUTRAL: A great way to think of carbon neutral is that it's a key milestone that you should hit on the way to achieving the end-goal, which is net-zero carbon.

The principal behind being carbon neutral is that any carbon emissions produced are being balanced out by funding an equivalent amount of carbon savings elsewhere in the world.

A carbon neutral company, product or building may not necessarily be low carbon, but a sustainable organisation will try to reduce its emissions before offsetting and will only use high-quality, verified credits.

CARBON OFFSETTING: Carbon offsetting is the practice of compensating for the carbon emissions you produce by purchasing measurable, verified credits.

One carbon credit is equal to one tonne of carbon dioxide being reduced, avoided or removed from the atmosphere from certified projects. Examples of projects could include tree planting or building a wind farm. A credible offsetting scheme will provide certified credits that can only be used once, and they will result in carbon reduction that is additional to what would have happened anyway without the project.

The fact that carbon credits can only be used once is important to note. When it comes to a building's operational carbon (which is the carbon produced when you're running a building) the carbon produced must be offset every year.

CIRCULAR ECONOMY: A traditional, linear economy has a wasteful process of "take, make, use, dispose of". A circular economy maximises usage to its fullest by designing out waste, designing in adaptability and keeping products and materials in use for as long as possible. In construction this could be how concrete is reused. When an old building is demolished, often the concrete can be crushed and reused in a new building. Equally, it might be worth thinking about how you can apply this to entire buildings. There are alternatives to knocking down a building and building a new one, such as medium and major refurbishments.

D

DECARBONISATION: This has become a commonly used word when talking about how to stop climate change. It essentially refers to the measures an organisation and/or industry needs to take to reduce their carbon footprint – mainly its emission of greenhouse gases. In terms of construction, this relates to both the creation of new buildings as well as the retrofitting of existing buildings, some of which can be old and inefficient. Of the two, decarbonising existing buildings can be more of a challenge, but it's incredibly important to allow us to meet the UK's 2050 net-zero target as most of the buildings that will be around in 2050 already exist.

DISPLAY ENERGY CERTIFICATE AND ENERGY PERFORMANCE CERTIFICATE: A Display Energy Certificate, also known as a DEC, is a building certificate for non-domestic buildings. A DEC rating is based on the actual energy usage and carbon emissions of the building when it's in operation. It gives a full picture of the in-use energy efficiency of the whole building as it covers both regulated and unregulated sources of energy.

An Energy Performance certificate, also known as an EPC, can apply to both domestic and non-domestic buildings. Unlike a DEC, an EPC rating is a theoretical calculation made at design or build stage. It doesn't take into account unregulated energy sources (which includes things like IT equipment, lab equipment, lifts and catering facilities), meaning the rating doesn't give a true view of how energy efficient a building is.

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E

EMBODIED CARBON: Embodied carbon is the total greenhouse gas emissions (often simplified to 'carbon') generated to produce a building. It excludes operational emissions but includes those related to the extraction of all raw materials, manufacture and processing of all products or systems required in a building, transportation of those to site, assembly on site, and any maintenance or replacement activities required during the lifetime of those products or systems. It also includes end of life processes, such as deconstruction and eventual disposal or reuse/recycling.

ENERGY SYNERGY™: Energy Synergy™ is Willmott Dixon's in-house system for measuring and improving a building's energy performance. It has two main uses.

The first use is around helping to design the most efficient buildings. The system provides energy modelling that covers all building energy uses – this means that if you want to make changes to a building's design, we can work out what the positive or negative outcomes will be in relation to energy. For example, if adding more windows means the building is less airtight and insulated, how much more energy will you need to use to keep the building at the right internal conditions?

Using this modelling gives our team information that will help you to make the most sustainable decisions, and sets the target levels against which to measure performance later – we essentially help you to get the most sustainable building possible for your budget.

The second use is when a building is operational. There can be many reasons why it doesn't perform as expected in terms of its energy usage – changes in design and specification through the project, commissioning setups that are not optimal, lack of understanding on how best to operate and control equipment, and changes in the way the building is used or equipped when operational.

A system like Energy Synergy™ allows us to measure the actual energy performance of a building so we can compare the results to the target data – this detailed comparison helps us to pinpoint why the building isn't performing as it should be so this can be corrected, potentially saving energy costs and carbon emissions, and reducing the impact on the environment.

ENVIRONMENTAL NET GAIN: Environmental net gain is an approach to development that leaves both biodiversity and the environment in a measurably better state than it was prior to development. The concept was launched in 2018 as part of the Government's 25 Year Plan to Improve the Environment but there are no timescales for making it mandatory. This approach builds upon the concept of Biodiversity Net gain but also considers how sites can contribute wider environmental benefits like storing flood water to reduce the risk of flooding.

ENVIRONMENTAL PRODUCT DECLARATIONS: Also known as an EPD, this is a document that quantifiably demonstrates the environmental impacts associated with a product's lifetime. They are based on the data obtained through carrying out a life cycle assessment and are verified by a third party. EPD supports decision making and carbon reduction initiatives by enabling users to compare the environmental impacts of different materials and products. They are generally valid for five years, after which they need to be updated. Historically the costs associated with developing EPD have been a barrier to more widespread adoption by manufacturers and although the number of available EPD is steadily increasing, they are still relatively small in number.

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F

FOSSIL FUELS: Fossil fuels are found in the Earth's crust and are made over millions of years from decomposing plants and animals. Examples of fossil fuels include coal, oil and natural gas. When these are burned, carbon dioxide, a greenhouse gas, is released into the air forming a barrier that traps heat around the Earth. Fossil fuels are also a finite resource as it can take more than 650 million years for the decomposing plants and animals to transition into usable fossil fuels – which is why they fall into the category of 'non-renewable energy'. The Intergovernmental Panel on Cimate Change has warned that If we keep burning these fuels at the same rate as today we will hit a catastrophic climate tipping point around 2030.

FUTURE CLIMATE READY: This principle focuses on making sure the buildings we create are able to cope with changes that may come with a hotter, wetter and more unpredictable future climate. A climate-ready building is built with a changing environment in mind to minimise risks such as overheating or flooding, incorporating features that will make it resilient and able to stand the test of time. A good example of this is providing solar shading or enhanced ventilation to new homes to make the risk of future overheating lower.

G

GLOBAL WARMING: This refers to the long-term increase in the Earth's temperature over a prolonged period.

Some temperature variation is natural, however, there has been a huge increase in the pace of warming over the last 100 years.

This can be attributed to the creation of Greenhouse Gases from the burning of fossil fuels and the production of chemicals such as refrigerants.

Once released, these harmful gases form a barrier in the atmosphere which traps heat in and warms the Earth.

GREENHOUSE GASES: Greenhouse gases include methane, nitrous oxide and carbon dioxide. They are compounds that, when released into the atmosphere, form a barrier around Earth. This barrier traps heat in our atmosphere, warming up the Earth's surface. Buildings and construction are large contributors of carbon emissions – the UKGBC estimates that the UK Built Environment is currently responsible for 25% of total UK greenhouse gas emissions. This is why it's critical we find ways to reduce how much is produced during a building's entire lifecycle.

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H

HYDROTREATED VEGETABLE OIL (HVO): Hydrotreated Vegetable Oil, often called HVO, is a low carbon alternative fuel to diesel and is produced from 100% renewable raw materials such as waste fats, vegetable oils and biofuel crops.

It can be used as a direct replacement or alternative to diesel in most generators and plant machinery. It's not a fossil fuel and offers up to 90% carbon emissions reduction when compared to diesel.

All HVO purchased must come with a Proof of Sustainability, or POS, certificate which confirms the origins of the raw material and ensures the fuel is responsibly sourced.

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I

INTEGRATED DESIGN: Integrated design is where the different specialisms involved in a construction project (such as architects, main contractors, project managers and quantity surveyors) are brought together to collaborate from very early on in the process – ideally as early as RIBA stage 1. Bringing these specialisms together should enable better decisions about the project to be made as all of the experts can provide relevant information for you to consider. This is particularly important for sustainable construction as it allows the specialisms to collaborate and find holistic solutions, which can include things like how you can get the most energy efficient building or reduce waste.

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J

JARGON: Ironically, this video series is full of sustainability jargon! Sustainability covers lots of different topics, so 'sustainability jargon' and technical terms often crop up. Those of us who work in the sustainability sphere are often guilty of using technical terms and forgetting that they aren't commonly used by everyone. If someone uses a word or phrase that you're not familiar with, let us know. Once you get past the jargon, sustainability is simpler than you might think.

K

KEY MILESTONES: On your journey to net-zero, you won't be able to go from start to finish in one go. One of the most important parts of reaching net-zero goals is creating a roadmap that includes achievable milestones. Against these milestones, you will need measurable targets that will help you to check you're on track to reach the finish line. Your measurements may not be exactly the same as other people's; you need to tailor them to your portfolio, estate or assets. In its simplest form, you will need to identify the important datasets, monitor these to establish a baseline, identify what the goal needs to be for each dataset, produce a plan that outlines how you get there and then put in place ongoing management and monitoring to ensure you're on-track.

L

LETI: This stands for London Energy Transformation Initiative. It's a voluntary group of built environment professionals including academics, architects, contractors, engineers, sustainability professionals and more. It was founded in 2017 to help drive London's transition to net-zero carbon. Although their focus is on London, most of their research is best-practice regardless of location. They mainly focus on how the reduction in energy demand plays a critical part in achieving net-zero carbon buildings, and have provided some excellent guides to embodied carbon impacts and reduction.

LIFE CYCLE ASSESSMENT: Choosing the right materials for your building isn't always easy as all materials have pros and cons. When looking at the best materials to use from a sustainability perspective, a life cycle assessment can be really helpful. The assessment looks at the processes involved for a material across its entire life cycle – from raw material extraction all the way to end of life. This assessment helps to bring perspective to the overall environmental impact of the material rather than focusing on one or two elements – for example, some materials that may seem less sustainable in the earlier stages (such as extraction or manufacturing) may actually balance this out in the of end of life phase by being able to be recycled.

LIFE CYCLE COSTING: Life cycle costing assesses the total cost of an asset over its lifecycle, including initial capital costs, maintenance costs, operating costs, and residual value at the end of its life.

This helps to give a fuller picture of the value a material, product or component will deliver over time. Life cycle costing is particularly useful in helping to support value-based decisions.

If you're looking into sustainable solutions, life cycle costing can help you understand the longer-term value rather than just the upfront capital costs.

M

MAJOR AND MINOR REFURBISHMENT: When decarbonising a building, there are many different terms that cover the range of possible energy and carbon reduction measures available.

At one end of the range is major refurbishment. This involves substantial changes to the building fabric (such as adding external wall insulation and replacing glazing), improved internal layout and space usage, and new high-efficiency building services. The main benefits of a major refurbishment are that it can maximise the value of the current building, achieve significant decarbonisation levels, and improve efficiency and performance.

At the other end of the range is minor refurbishment, sometimes called retrofitting. It involves more limited changes that usually relate to specific aspects of the building services or fabric. A typical example might be replacing gas boilers with heat pump systems to reduce carbon emissions and to avoid using fossil fuels. In minor refurbishments, the decarbonisation levels are more limited but project disruption to users is much less and investment costs are lower.

N

NET-ZERO CARBON IN OPERATION: Operational carbon comes from the day-to-day running of a building. A building is classed as net-zero carbon in operation when these emissions are zero or negative. This means that any carbon emissions from the energy used to run the building have been balanced out by carbon reductions from renewable energy generation and certified offsetting schemes.

There are standard thresholds a building must meet to be classed as net-zero in operation. Firstly, the building must be highly energy efficient, reducing the day-to-day energy it uses and therefore the energy costs and carbon produced. The building is then powered by on site and/or off-site renewable electricity sources and avoids the use of fossil fuels like gas. If there is any remaining carbon being produced at this point, then it must be offset through certified schemes.

NET-ZERO EMBODIED CARBON: When a building is being built, upgraded, retrofitted or demolished then embodied carbon emissions are generated. This doesn't include carbon coming from the energy used for the day-to-day running of the building, which is called operational carbon.

A net-zero embodied carbon building is highly resource efficient – it minimises the embodied carbon from the extraction, production, transport and installation of materials and equipment. After this, certified carbon offsetting is used for any residual emissions, achieving net-zero across the life cycle.

NET-ZERO READY: When it comes to sustainability, doing something is better than nothing. If you can't make your new buildings fully net-zero carbon in operation right now, then do what you can and prepare them for a point in time when you can retrofit them to be net-zero in the future.

Taking a fabric-first approach is the most important first step – this includes thinking about things like orientation, glazing ratios, air tightness and insulation to reduce energy usage. If you don't, it's likely to be very costly and disruptive to retrofit these kinds of measures in the future.

The next step is putting the infrastructure in place now to make retrofitting easier later – this is called 'making a building net-zero ready'. This includes things like ensuring the structure can take the weight of solar PVs in the future, including larger pipes and radiators that are compatible with air-source heat pumps, and making sure the power supply can support electric vehicle charging points.

Not making your building net-zero ready now and having to retrofit and upgrade things in the future can cost a lot more money in the long run.

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O

OPERATIONAL CARBON: Operational carbon relates to the carbon emitted in the day-to-day running of a building, including heating, cooling, lighting, lifts, electrical equipment and more.

If a building doesn't use renewable energy sources, it can result in high levels of operational carbon being emitted.

When looking to decarbonise an existing building or create a new net-zero building, reducing operational energy and carbon emissions is critical.

P

PASSIVHAUS: Passivhaus is a performance standard that delivers highly energy-efficient buildings with excellent indoor air quality and comfort.

Passivhaus places a major focus on reducing heat loss in buildings, which significantly reduces the amount of energy required for heating and cooling.

There are very exacting quality assurance processes associated with Passivhaus that must be met for a building to be officially certified as meeting the standard.

Underpinning the standard are measurable targets and a high-quality construction approach. Passivhaus buildings are becoming increasingly common in the UK, across all sectors from housing to schools to leisure centres.

PERFORMANCE GAP: The term 'performance gap' describes the difference between the predicted amount of energy that is expected to run a building, and the actual amount of energy the building uses to run once in use.

This 'gap' can be caused by a wide range of factors, including the way the building's users actually use the building, complexities in control settings resulting in energy being used when it's not needed or even equipment and systems not running as efficiently as they were designed to.

The key to avoiding performance gaps and getting the best from a building is to make sure there's a clear and simple way to monitor the actual performance of the building, compare it with the expected performance, and be able to take action to reduce the gap. Doing this will reduce energy usage, carbon emissions and running costs.

PVs: PVs stands for photovoltaics, also known as solar panels. They convert energy from the sun directly into electricity and are an example of a renewable energy source.

Typically they are fitted on the roof of a building as a solar panel array, often providing a significant proportion of the energy the building needs to operate. This means a building is using less energy from the grid which in turn reduces operational carbon emissions.

Willmott Dixon has a scheme called Community Solar Energy that enables our customers to benefit from the environmental and economic benefits of solar panels, without having to invest capital costs themselves. The scheme involves a community energy group owning and operating the panels, with renewable energy being supplied to the building owner at a market-competitive cost.

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Q

QUANTIFYING SUSTAINABILITY: One of the key things you'll need to do on your journey to net-zero is establish how you'll quantify your progress. Reducing carbon in the construction and operation of buildings is just one of the ways organisations need to embed sustainability. Quantifying the monetary value of this is easier said than done. The UK Green Building Council has suggested that the value of embedding sustainable initiatives in your organisation goes far beyond what you may think. Back in 2018, they identified 11 value drivers: cost savings, talent attraction and retention, customer attraction and satisfaction, brand and reputation, licence to operate, resilience, access to capital, innovation, productivity, quality, and value of assets. Fast-forward to today, and we see students are considering a University's sustainability credentials when choosing where to study, applicants are selecting employers based their purpose and values, and suppliers are being chosen for the social return on investment they can bring to a contract. Investors and shareholders have already realised that sustainable investments are lower risk but with good rates of return. It's clear that these value drivers are becoming increasingly impotant when constructing, retrofitting and maintaining buildings in the future.

R

REGULATIONS AND DISCLOSURE: Environmental regulations are the laws that are protect our environment from harm. Examples that can affect a construction project include preventing pollution, dealing properly with waste and protecting our wildlife. There are also other laws like the Climate Change Act which commits the UK Government to reducing greenhouse gas emissions.

Disclosure is when companies share information about their impact on the environment. The purpose is that investors and consumers can use this information to make choices about where to invest or spend their money. Some types of disclosure are now mandatory in the UK – such as the Streamlined Energy and Carbon Reporting (or SECR) which requires companies to report on their carbon emissions and the Taskforce for Climate-related Financial Disclosure (or TCFD) which requires companies to report on their climate related risks.

There are also voluntary ways that companies can disclose their impacts, such as the Carbon Disclosure Project or via their sustainability reports.

RENEWABLE ENERGY: Renewable energy is a source of energy that's derived from natural, renewable resources like wind, solar and hydro power. Solar photovoltaic (PV) generation is the most common type used on buildings and generates renewable electricity to feed directly into the building's power supply, reducing the need for energy from the grid and often saving both cost and carbon emissions.

S

SCIENCE BASED TARGETS: The Intergovernmental Panel on Climate Change (or IPCC for short) has calculated that global warming must not exceed 1.5 degrees centigrade above pre-industrial levels if we are going to avoid the most catastrophic impacts of climate change.

Experts have used computer modelling to calculate the overall reduction in greenhouse gas emissions that will be needed to ensure global warming doesn't exceed this threshold.

Science-based targets are how this modelling distills down to individual organisations. These targets tell an individual organisation by how much and how quickly they need to reduce their own emissions so we can collectively meet our goal. Organisations whose carbon reduction plans are in line with science based targets can also have their targets validated.

SINGLE USE PLASTICS: Single-use plastics have become a common sight in our day-to-day lives. They include items like plastic bags, plastic bottles and food packaging. The UK is believed to be the fifth-largest producer of single-use plastic waste in the world, with an estimated three million metric tons generated in 2019, which works out to an average of 44 kilograms per person.

Over 99% of plastic is made from chemicals that are sourced from fossil fuels. This sort of plastic is not biodegradable, meaning it doesn't break down into natural substances. Instead, it causes pollution with a lot of plastic ending up in the sea, which is damaging for our planet.

In the UK, some steps have been taken to try and address our reliance on single use plastics. For example the charge on plastic bags has drastically reduced their use and Scotland has brought in a ban for some single use plastics such as straws. More and more organisations are looking for ways to do their bit. At Willmott Dixon, our ambition is to become single-use plastic free in our offices, sites and events by 2030.

SOCIAL ENTERPRISE: Buying from social enterprises helps to contribute toward meeting the needs of the present without compromising the ability of future generations to meet their own needs.

Social enterprises are businesses that are driven by a social or environmental objective rather than shareholder gain. They do sell goods or services for profit, but they reinvest the majority of these profits into achieving their social or environmental objectives. Profits can be reinvested back into the business or into the local community.

Using social enterprises in your supply chain is another way your organisation can support social or environmental causes. Some examples of social enterprises we use on construction projects include an environmentally friendly signage company that employs disabled people, a cleaning company that supports people who face barriers to employment, and a recycling and waste management company that funds offender rehabilitation.

SOCIAL VALUE: The United Nations Brundtland Commission defined sustainability as the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs. This is where social value comes in. The idea is to give back to the communities we work in by providing support that addresses needs in that area. In the context of construction, this includes things like using local goods and labour, helping unemployed people to gain qualifications or employment opportunities, giving training to those who aren't confident in using digital technology, providing school children with hands-on learning experiences and even making donations of much-needed items into the community.

There is an official framework for reporting and measuring the amount of social value delivered called Themes, Outcomes and Measures – or TOMs for short. This framework was developed by the National Social Value Taskforce to help standardise reporting, provide transparency and also establish a benchmark for 'good' social value across industries.

SOCIAL VALUE RETURN ON INVESTMENT: Social value return on investment, sometimes shortened to SROI, is a way of measuring, managing and accounting for social value or social impact.

It's often shown as a monetary value, and different activities have a different amount attributed to them. This helps to show which activities have the most impact on individuals and communities.

The figure doesn't take into account any costs incurred in the delivery of the social value – it focuses solely on the outcomes and the value provided.

SOFT LANDINGS: Soft landings is the process that a new or refurbished building follows to make sure the customer gets the best possible performance from their building once it's handed over.

The process takes into consideration how the building is designed to incorporate efficient operation and maintenance. It also helps to make the transition from construction to occupation as smooth as possible and ensures the building's operational performance is optimised.

This could include things like making sure the owner of the building understands how the heating and cooling controls work so they can manage energy performance, ensure appropriate comfort levels for building users, and understand how to maintain the new building effectively.

The BSRIA Soft Landings Framework process is a useful reference point if you'd like to know more.

SUSTAINABLE PROCUREMENT: Traditional procurement activity tends to consider the cost and quality of goods or services. Sustainable procurement focuses on how goods or services can provide wider social, economic and environmental value across their lifecycle.

In terms of sustainable procurement in construction, a large focus will fall on the procurement of materials. This includes things like where the materials come from, whether they are renewable and their carbon footprint across their whole lifecycle.

T

THERMAL COMFORT: Thermal comfort relates to how hot or cold a person feels when living or working in a building.

It's an important factor to consider during a building's design and construction to make sure that the combination of the building fabric (which includes things like form, insulation levels and orientation) and the building services (including things like heating, cooling and ventilation) provide the right levels of thermal comfort for building users.

This is becoming a really important consideration as climate change is causing higher and more variable outside temperatures. We need to embed solutions that will keep people comfortable in homes, offices and schools without having to rely on costly and environmentally unfriendly options such as air conditioning.

U

U VALUE: Building materials vary in their insulation properties. Materials that form the outer envelope of the building like the roof, walls, and windows are given a U-value.

This value is used to measure how effective materials are at preventing heat loss through the building's envelope i.e., from the inside to the outside.

A low U-value is good and means there will be less heat loss from the building, meaning energy usage and bills will be lower as well.

UKGBC: UK Green Building Council is a charity whose mission is to radically improve the sustainability of the built environment, by transforming the way it is planned, designed, constructed, maintained and operated.

Made up of over 600 member organisations, the UKGBC spans across the entire industry. Amongst many things, it provides guidance, showcases solutions, advocates for progressive policy and encourages transformational leadership. The UKGBC is currently working closely with its member organisations, including Willmott Dixon, to develop standards and guidance to define and accelerate delivery of net-zero carbon buildings.

UNREGULATED AND REGULATED ENERGY SOURCES: The energy used by a building when it's in operation is split into that coming from unregulated sources or regulated sources.

Regulated usage come from the things that keep a building running such as heating and cooling systems, hot water and lighting. These energy uses are 'regulated' by Building Regulations and are typically used to measure a building's energy efficiency through things such as Energy Performance Certificates or EPC ratings.

Unregulated energy uses include additional things in a building like appliances, IT equipment, lab equipment, lifts and catering facilities. These uses aren't controlled in the same way by Building Regulations, which means they can vary a lot from one building to another.

When you're designing a building, both categories should be treated in the same way from a usage and cost perspective. Initially, the goal is to minimise the amount of energy being used. Once this has been achieved, enough renewable energy sources should be included to meet the energy needs of your building.

V

VEHICLES – ELECTRIC: New diesel and petrol vehicles will be banned from 2030 onwards, which means there will be even more electric and plug in hybrid vehicles on our roads soon. New and exsiting buildings will need to include the infrastructure to support this transition. Whether you're building residential homes or commercial spaces, including electric vehicle charging points in your plans is important.

VIRGIN MATERIALS: Virgin materials are materials that have not yet been used in the economy, for example iron ore that is mined from the ground or wood obtained from trees.

In a linear process, we take virgin materials from the Earth, make products from them, and eventually throw them away as waste. There are a number of problems with this.

The first is that we are using up our finite resources. Secondly, the impact of obtaining these resources on the environment can be significant, for example mining and logging can have a large impact. And finally, there is the problem of what we do with the waste – in the UK in 2018 we sent over 50 million tonnes of waste into landfills and we sent around two thirds of our plastic waste overseas.

W

WASTE HIERARCHY: A waste hierarchy helps to make sure that waste is being managed in the most efficient and environmentally friendly way possible. The hierachy sets out the actions that should be taken in order of priority.

The actions in order of priority are:

Firstly, reducing and preventing waste – for example by avoiding or reducing unecessary packaging.

Secondly, reusing materials – examples include things like donating unwanted furniture to charities to be used again or recycling materials in way so they are made into something new like plastic bottles being made into fleeces.

Finally, the waste can be turned into energy through a process called energy recovery – an example of this is energy being generated by waste being burned.

The final resort is to send the waste to a landfill site.

Following this hierachy will help to generate as little waste as possible.

WATER EFFICIENCY: Climate change is causing us to experience periods of hotter weather and our population is growing, bringing greater demand for water in homes and agriculture. This is putting more and more pressure on our water reserve levels.

Reducing consumption can help to conserve our water supplies. Water saving measures in buildings such as low flow plumbing fixtures, dual flush toilets and rainwater harvesting is helping to alleviate some of these pressures.

Reducing our consumption can also save us money and it helps keep water in our reservoirs, rivers and streams supporting important habitats and biodiversity.

WELL STANDARD: The WELL Standard is used to measure, certify and monitor how well a building promotes and caters to the occupants' health & wellbeing. It covers seven key areas: air, water, nourishment, light, fitness, comfort and mind. Typically, it will be applied to workplaces or commercial buildings, but it can be applied to residential or educational buildings, too. If you want to aim for WELL certification for a new building, make sure to engage key stakeholders in the project early on to ensure the required criteria will be met by your building.

X

X (baby boomers), Y (millennials) and Z GENERATIONS: Reaching the Government's 2050 net-zero targets is truly an inter-generational challenge. As Barack Obama observed: "We are the first generation to feel the effect of climate change and the last generation who can do something about it."

Whilst those who are procuring buildings now are paving the way for the future, it will be the future generations who will be ultimately responsible for meeting the targets in 2050 and beyond. All generations need to work together to reduce carbon emissions, stop climate change and help our planet to start to heal. We must all play our part in this race to net-zero.

Simplify Sustainability

Y

YOU: We all have a responsibility to play a part in healing our planet. For those of us that are involved in construction projects, the choices we make have a wider reach than we think. The buildings that we are planning today will be standing when we pass the Government's 2050 net-zero deadline and may still be with us at the end of the century when we need to have limited global temperature rise to 1.5C. We need to be building sustainable net-zero new buildings right now, and also retrofitting existing buildings if we are to avoid catastrophic climate change. Failing to build for future climates today will mean costly retrofitting projects in the coming years. Even if you can't get to net-zero today – don't wait to take action, get started and do as much as you can to decarbonise your buildings and minimise the cost and disruption of retrofitting tomorrow.

Z

ZERO AVOIDABLE WASTE: In our current economy, we take materials from the Earth, make products from them, and eventually throw them away. Much of this waste ends up in landfills or incinerators and is lost. This system can not work in the long term because the resources on our planet are finite.

Zero avoidable waste means preventing waste being generated at every stage of a project's lifecycle – from the manufacturing of materials and products, across design, specification, procurement, building assembly, and all the way to deconstruction. If waste cannot be avoided, then it must be recovered at the highest possible level of the waste hierachy. At Willmott Dixon, our ambition is to eliminate avoidable waste from the demolition, excavation and construction phases of our projects by 2030.

ZERO CARBON: Zero carbon means that absolutely no carbon emissions are being produced from a product or service, for example renewable energy sources like wind and solar do not create carbon emissions when in operation and so they are zero carbon. Willmott Dixon has set an ambition to become zero carbon in our own operations by 2030. This means that we will eliminate fossil fuels from our day to day activities (in our offices and construction sites) and use only renewable electricity. We will also transition to a fully electric fleet.