Wakefield
Climate Emergency

Action today for our tomorrow

Climate Change Action Plan

wakefieldcouncil working for you

Foreword

There is no more important an issue than climate change to our future existence on this planet. We know that global temperatures have steadily increased over the last two hundred years, as a result of rapid industrialisation, mechanised transport, and world population growth, and temperatures will continue to rise unless urgent and decisive action is taken to reverse this trend. Scientists predicted many years ago that global warming would have a devastating impact on our planet as temperatures increased and this resulted in more extreme weather, melting ice caps and glaciers, flooding, and forest fires. The knock-on effects cause loss of natural habitats and wildlife, whilst also having damaging, life-long impacts on people and communities.

Many of our local communities were built on coal mining, which powered the industrial revolution and laid the foundation for the relative prosperity which we benefit from today. However, the mining of coal followed by drilling of oil and gas here in the UK and across the world has, in a relatively short period of time, released trillions of tonnes of carbon that had previously been locked deep underground for millions of years. The carbon dioxide emitted from the burning of these fossil fuels is the most significant cause of the global warming which now threatens our planet. As a district we had a part to play in creating the problem, but we can also take action to change the current system and create an environmental revolution for the benefit of generations to come.

As a council we know that we cannot solve this global problem on our own, but we can take a lead where we have the greatest influence – here in the Wakefield district and for the benefit of the people we serve. In May 2019 the council made a unanimous, cross-party declaration to tackle the climate emergency, with a pledge to become a carbon neutral organisation by 2030 and working to accelerate carbon reductions for the whole district. This means a radical shift from the existing ways we heat and power the buildings and vehicles we use to provide essential services and embracing zero and low carbon alternatives, together with our wider role to influence and shape the district and achieve our net zero carbon ambition. This Climate Change Action Plan sets out how we will go about achieving this ambition over the next ten years, which we are committed to deliver and which will be further developed as new technologies emerge.

Yet the vision of a net zero Wakefield district will not be easy to achieve, it will require hard work, sacrifices and new ways of doing things. The climate emergency presents pressing issues for us all, and the actions of every resident, every community group and every business, however large or small, can collectively make a difference – doing one thing today can create a better tomorrow for us all.

Cllr Jack Hemingway
Deputy Leader of Wakefield Council
Portfolio Lead for Environment & Climate Change

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Executive summary

We have pledged to become a carbon neutral organisation by 2030, for those emissions that are under our direct control. This means having a net zero carbon footprint, and we aim to help the entire district achieve this goal too, within the same timeframe - if possible - but by 2038 at the latest.

Reducing carbon emissions at this scale – and broadening our net zero work to encapsulate the district as a whole – will enable the organisation to play its part in contributing to wider local, national, and international climate change efforts. Furthermore, by showing leadership and accountability in delivering this critical work, we hope to encourage other organisations across all sectors to address their own climate change impacts, whilst also inspiring and supporting members of the public to lead more sustainable lifestyles.

The climate change action plan is comprised of 6 workstreams, the first 5 of which address organisational emissions, with the 6th being dedicated solely to district-level work. The workstreams cover the following core areas: low carbon estate, low carbon fleet, renewable energy, carbon offsetting, behavioural change and influencing, and place.

The programme of work that supports these workstreams forms the basis for the future delivery of our net zero aspirations.

The council has a leadership structure and organisational hierarchy that recognises the importance of climate change, which is also underpinned by a skilled programme delivery team. With a suite of suitable policies, procedures, and strategies now in place, there is a corporate-wide commitment to embed climate change-centric thinking into everything the council does going forward, both organisationally and within the district.

We believe that this plan provides a solid foundation for sustained and rapid carbon emissions reductions, and that this will enable the council to demonstrate its full commitment to both the climate emergency and to delivering against its net zero promises.

Context

Through the Climate Change Act the UK is obliged by law to reach net zero, nationally, by 2050.

However, we recognise the value in achieving this target much faster as an organisation, in order to show leadership in helping society to respond to the threat of climate change as soon as possible. All of our work supports the Paris Agreement, which is a global commitment to keep temperature increases linked to climate change well below 2 degrees Celsius by the end of this century, compared to pre-industrial levels. Our local contribution will go further still, by attempting to follow the 1.5 degrees Celsius emissions pathway recommended by the United Nations (UN), through the work of its Intergovernmental Panel on Climate Change (IPCC).

Climate change has the potential to endanger the survival of both humanity and the natural world, meaning strong action is vital. The latest climate model projections suggest we only have 10 years to prevent the worst effects of climate change from becoming irreversible. The scale of decarbonisation required within our economy represents an enormous challenge; requiring rapid, far-reaching, and unprecedented changes throughout all aspects of society. As a result, only collaborative work undertaken across all sectors and industries can prevent the continued deterioration of climate change-linked issues and risks such as extreme weather events, sea level rise due to ice caps and glaciers melting, crop failures, and biodiversity loss. We all have an obligation to do everything in our power to help prevent the breakdown of the ecosystem services and natural cycles that make life on Earth possible.

Wakefield Council cares about the environment and has a duty to protect the district and its residents from anything that threatens future prosperity, health, and wellbeing. We want to play our part in solving the crisis that the planet faces. Our targets are ambitious but we recognise the importance of acting quickly to reduce the risks posed to the environment, economy, and society. We have achieved a lot already, with a 55% reduction in our carbon emissions accomplished between 1990 and 2018. This action plan builds upon past successes and outlines the next steps for guiding our transition towards net zero by 2030. It provides the framework for delivery that will turn our aspirations into reality.

We recognise that we also have a profound responsibility to address carbon emissions within the district as a whole and although this will be very challenging – and the work might take us beyond 2030 – we are committed to embedding transformational and sustainable change across every sector, and within all of our communities, whilst also embracing the many opportunities that can be capitalised upon through decarbonisation of the district economy.

Purpose of the climate change action plan (CCAP)

This plan focusses on how we aim to become a carbon neutral organisation – sitting within a carbon neutral district – by 2030.

It covers:

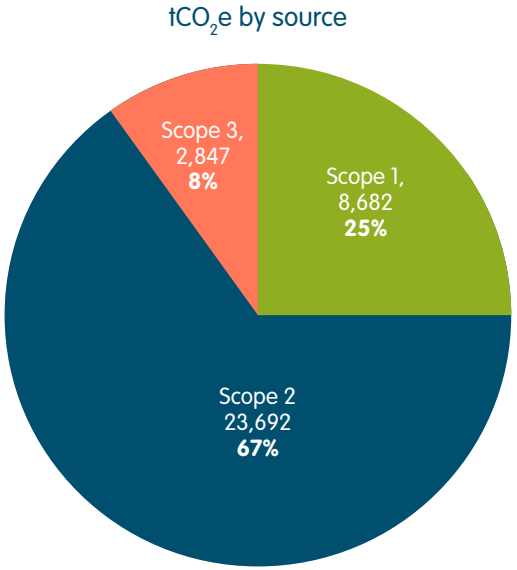
- The actions we will take to avoid, reduce, substitute and/or compensate our own carbon emissions;
- An overview of our approach to support the district to achieve net zero, by helping and/or influencing residents and businesses to take action to reduce their own emissions, by shaping the future of development in the district, and by helping to decarbonise sectors, industries, and physical infrastructure; and,
- The governance and reporting arrangements that will dictate how we run and manage the programme to deliver our net zero targets.

The programme of work outlined within this document is not static and will be reviewed regularly to ensure the proposed activities can respond to a changing landscape, as issues inevitably emerge, political drivers are modified, challenges are encountered, and opportunities to embrace better technological solutions arise.

Where are we now? (our baseline)

Our total baseline carbon emissions as of the 2018/19 financial year – which acts as our reference point – were 35,221 tonnes of CO_2 equivalent (tCO_2e). Our net zero target requires us to balance this measured amount of carbon release with an equivalent amount of carbon that is avoided, reduced, substituted, and/or offset by the end of 2030. This process will be iterative, as carbon reductions build up over the duration of the ten year period of the plan.

We have categorised our current carbon emissions into three scopes, as defined by the World Resources Institute's Greenhouse Gas (GHG) Protocol. This plan's overall purpose is to consider and formalise what we need to do to address emissions in each of these categories.



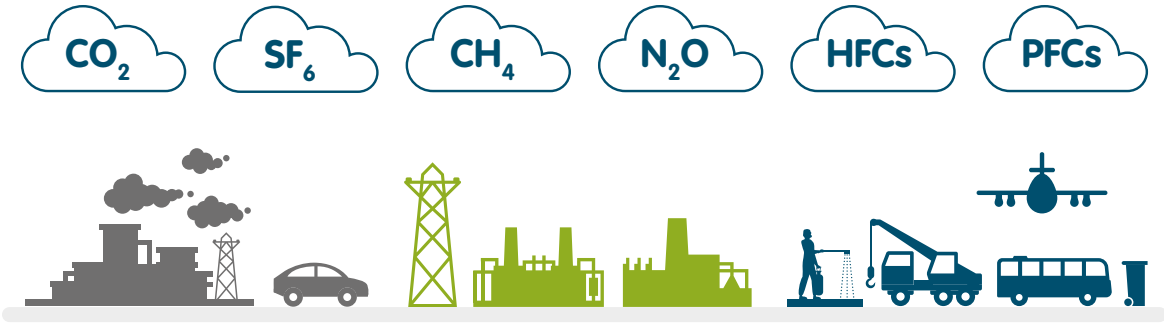
Scope 1 These are all direct emissions from our own activities or from activities that are under our sphere of control. The scope 1 emissions we have identified arise from council-owned fleet vehicles and from gas used to heat buildings, and they account for 8,682 tCO_2e in aggregate.

Scope 2 These are all of our indirect emissions from the electricity we purchase and use. The scope 2 emissions we have identified are attributable entirely to electricity and account for 23,692 tCO_2e.

Scope 3 These are all other indirect emissions from our activities, occurring from sources that we do not own or control. The scope 3 emissions we have included arise from business travel ('grey fleet') and grid-based losses from the transportation and distribution of the electricity we use, and these collectively account for 2,847 tCO_2e.

We recognise that our scope 3 emissions are much higher than our current estimation in real terms, but such emissions are very challenging to quantify. However, we will still seek to tackle our impacts in this crucial area by ensuring that our future procurement activity addresses both climate change and wider sustainability issues, as a matter of course, whilst also working with existing supply chain partners to reduce service delivery-based emissions as well. In addition, our district-wide work will look to reduce downstream scope 3 emissions from both business activity and residents, by looking at sustainable transportation and modal shift, encouraging sustainable lifestyles, promoting circular economies, and advising and supporting other organisations on how to reduce their own emissions.

Figure 1 – illustration of the different emissions scopes



Scope 1

Direct emissions

Fuel combustion

Owned vehicle fleet

Fugitive emissions

Scope 2

Energy indirect emissions

Purchased electricity for own use

Purchased heat, steam, cooling for own use

Scope 3

Other indirect emissions

Purchased goods and services

Waste disposal

Transportation and distribution

Employee business travel

What do we want to accomplish, why, and how will we achieve it?

What do we want to achieve?

We declared a climate emergency in Wakefield on the 23rd of May 2019. In response to the climate emergency declaration we have pledged to:

- Make Wakefield Council a carbon neutral organisation by 2030, and
- Support and work with all other relevant agencies and stakeholders to try to make the entire district net zero for carbon emissions within a similar timescale.

Why do we want to achieve this?

We recognise the value of becoming carbon neutral as quickly as possible, in light of the negative impacts that climate change will have on our health, wellbeing, economy, and environment in the future if left unchecked.

We also see the potential to turn threats into opportunities by making the district resilient to the effects of climate change and by embracing beneficial societal changes, such as the following:

Health & wellbeing – There are lots of ways in which the council's work will add value beyond carbon reduction alone, such as encouraging more sustainable lifestyles through things like modal shift, active travel, reducing waste and excessive consumption, and promoting a move towards plant-based diets. We will also seek to provide increased access and connection to nature and support more flexible working to allow people to have more time to spend with their families.

Green recovery – The jobs market is set for its biggest challenge in decades and experts are lobbying for a green recovery in a post-Covid-19 world as a way to reset the economy and redirect it towards a better, more sustainable path for making continuous progress within our societies. Fostering the right conditions to support the creation of new jobs that provide progressive and useful employment for people who have been made redundant or who have had issues finding stable work will allow us to achieve our wider 'build back better' aspirations.

Also, by nurturing opportunities for people to be trained up on and work in sustainability jobs – which will be required for many decades to come within the economy – we will help to reduce future unemployment risks.

Biodiversity – The world is on the cusp of a mass extinction event caused by human activities, and aside from the ethical issue of losing species forever this ecological crisis has the potential to damage our way of life, by disrupting the ecosystem services we all rely on for our survival, such as crop pollination, nutrient cycling, flood alleviation, and provision of raw materials. A lot of the work we will do under this programme can help to restore and expand habitats and in doing so, reverse biodiversity loss and maximise the benefits that healthy ecosystems provide.

Fuel poverty – It is clear that the effects of Covid-19 will lead to an economic recession, and this holds the potential to worsen existing poverty and deprivation within our communities. We have the power to tackle this by leveraging our influence to lobby for funding to improve energy efficiency in the domestic housing sector and by using our existing partnerships to carry out the work required, to a high standard and at a competitive rate. Such efforts can provide multiple benefits, by decarbonising hard-to-treat housing stock, increasing disposable income (by reducing fuel bills), avoiding health problems from poorly-heated homes, and improving people's mental wellbeing (by alleviating stress and financial hardship).

Air quality – Climate change and air quality work go hand-in-hand. If we can persuade people to embrace modal shift, the emissions from cars can be vastly reduced, and this has both carbon and air quality benefits, supporting a healthier district by reducing the risk of excess deaths caused by air pollution. The response to Covid-19 has shown us all what is possible when we work towards a collective goal in unison. We want to maintain that momentum and make positive changes like working from home our 'new normal'. Internally, the council owns a large and diverse fleet of vehicles and we will be endeavouring to replace them with the lowest emission alternatives possible as new purchases are made in the coming years. We hope that our proactive strategy will encourage other fleet operators coming in and out of the district to address the performance of their own vehicles as well, with the dual benefit of reducing both air pollution and carbon emissions.

Community cohesion – As more people have worked from home, they have found themselves increasingly reconnected with their immediate surroundings, and greater community spirit and more localised living have rapidly become normalised. There are lots of positives to take from this and embracing the concept of 'placemaking' has a role to play in supporting a move away from an economic model that previously relied upon excessive road use caused by centralisation of physical workplaces and the need for 'presenteeism' in office-based businesses. Covid-19 has shown that people can be productive working from home and this has had a hugely positive effect on congestion, carbon emissions, pollutants, and work-life balance. The pandemic has also improved social interaction between neighbours and this has paved the way for our societies to be more empathetic and willing to help and support each other in times of need. Our climate change work will seek to further encourage the decentralisation of workplaces and a switch towards increased active travel by reducing the need for daily mass transit of people, whilst being mindful not to trigger any unintended economic and place-related consequences. There are many lessons to learn from our response to the coronavirus public health crisis that can help us to lock-in and further expand the improved community cohesion we have seen.

How will we achieve this?

To achieve organisational carbon neutrality by 2030, we first had to measure and analyse our emissions. This was done with the help of our total facilities management partner, ENGIE.

As already mentioned, our carbon emissions were categorised into 3 scopes. This ensured that we have an accurate baseline against which to monitor and measure our improvements. Our total emissions have also been analysed to determine the achievable opportunities for carbon reduction. This means that our finite resources can be effectively channeled into the right projects throughout the programme.

We have also adopted the principles of the GHG management hierarchy to reflect best practice in how carbon reduction methodologies should be prioritised. The following summarises a preference for the incremental steps we will take:

Avoid: We will be embarking on efforts to train staff in carbon literacy, with a view to improving comprehension of climate change and carbon and getting people to better understand how they can reduce energy use and business miles in the workplace. We will also look at the potential to rationalise our estate and/or modernise the way that some of our services are offered so as to reduce emissions at source by not using as much energy in the first place.

Reduce: A range of opportunities to reduce our emissions have been considered, focusing on energy efficiency measures and deep retrofits to decarbonise the running of our organisational estate.

Substitute: Proposals for self-generating and/or buying our own renewable energy through power purchase agreements are currently being considered. This will allow us to displace the emissions associated with the grid mix for the electricity currently supplied to us, which includes power from non-renewable sources. Our 'substitution' work will be crucial as these emissions account for two thirds of our total baseline.

Compensate: The council will make its best endeavours to deal with the majority of its emissions by first avoiding and reducing them, and substituting when it comes to power specifically. However, there will be some gas and fleet-related emissions in particular that will be hard-to-treat. This means that we may have a degree of residual emissions, which we would have to compensate for to be able to reach a net zero position. In these cases, good quality offsetting projects will be used to cover the balance, with a focus on localising delivery of such schemes where possible, to provide value to communities in the district.

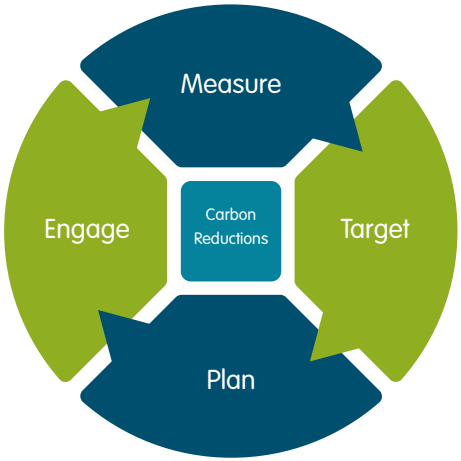


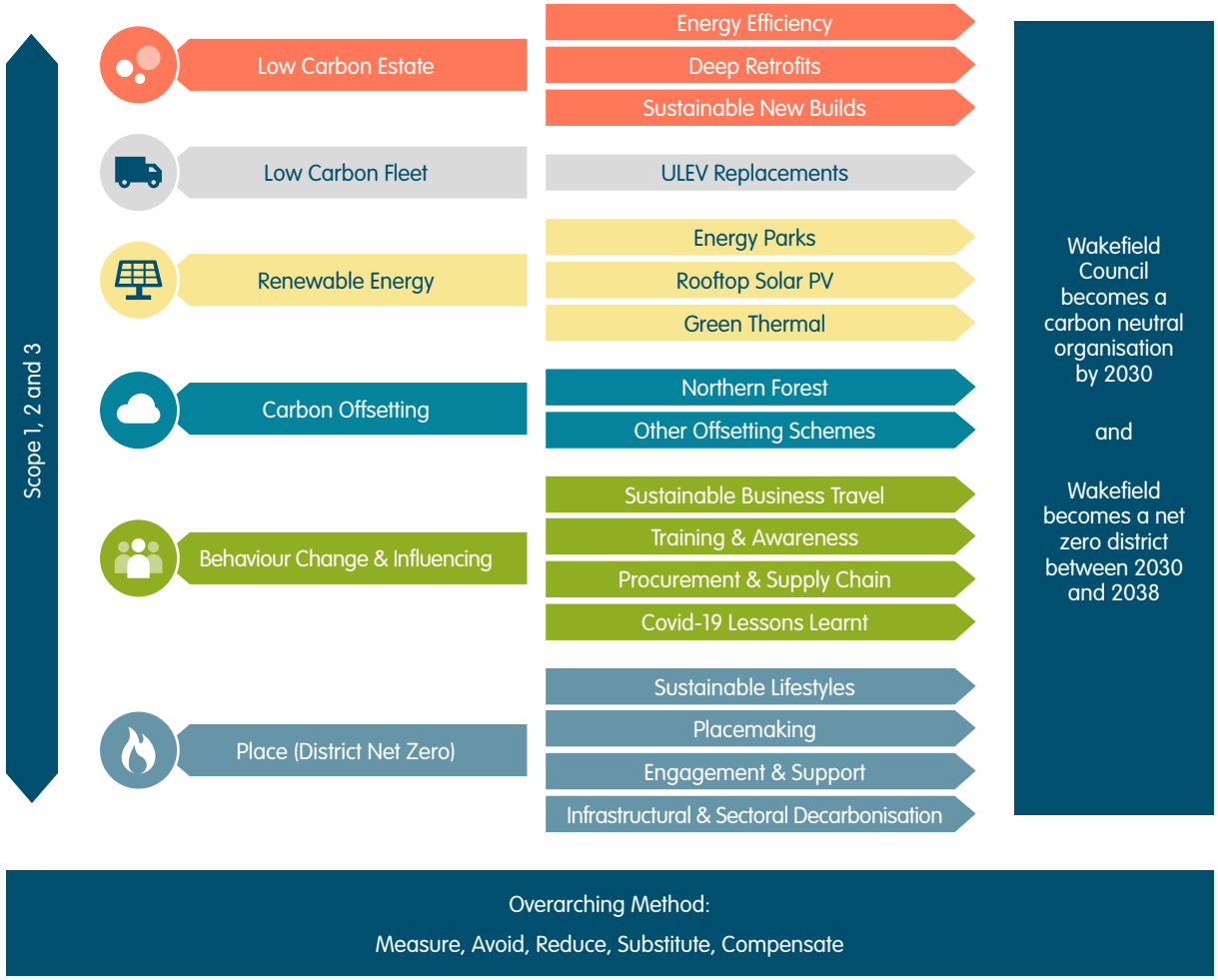
Figure 2 - our carbon reduction journey

To reflect these overarching principles we have established a programme of 5 delivery workstreams for our internal net zero commitments. Within each of these workstreams we have identified a number of projects with key deliverables to ensure activity progresses in a timely fashion and work is continuously directed towards achieving carbon neutrality by 2030. We have also created a 6th workstream for our district-wide work and once that programme is better defined and developed, the precepts of the GHG protocol process will be applied to that workstream as well.

In terms of categorising our approach, workstreams 1, 2, and 5 will address our scope 1 emissions, whilst workstream 3 will deal with scope 2 emissions. In addition, workstream 5 represents the beginnings of what will be our increasing focus on scope 3 emissions, whilst also looking to avoid emissions at source by altering internal staff behaviours when it comes to energy and vehicle use within the workplace. Workstream 4 will tackle any organisational emissions we haven't been able to eliminate through other means, with a focus on carbon offsetting via a programme of tree planting within the district, where possible. Workstream 6 concerns the emissions of external parties and hence will cover all 3 emissions scopes.

The workstreams and identified project themes are shown in Figure 3.

Figure 3 – programme summary diagram



To ensure we achieve our ambitions we will also need to:

- Call on government to provide the investment and powers to allow local authorities to maximise their chances of achieving carbon neutrality, both internally and within their catchment areas;
- Work with other public sector organisations and governments – both within the UK and internationally – to determine and implement best practice methods;
- Learn and build upon what has worked well within other local government settings;
- Continue to embrace partnership working across the Wakefield district and the Leeds City Region (LCR) to deliver our collective net zero ambitions in unison, by making best use of all relevant networks, groups, resources, strategies, plans, and funding pots; and,
- Ensure work reflects the upcoming devolution and new mayoral structure for West Yorkshire.

Delivery workstreams and key projects

Workstream 1
Low Carbon Estate (Avoid, Reduce, & Substitute)

Our ambition

To reduce the consumption of energy across our council buildings and ensure they are as energy-efficient as possible, with the added intention of reducing utility costs for water, electricity, and gas.

What will success look like?

Success will be measured against the following indicators:

- A reduction in the energy consumed across the council's buildings and estate, alongside a corresponding reduction in carbon emissions.
- A reduction in the council's spend on energy.
- All new buildings are constructed to the highest sustainability standards and investment/design decisions are based on whole-life costing justifications.

Assets, challenges, and opportunities

Assets

- The council owns 794 properties (including maintained schools) and the majority would benefit from energy conservation measures in some form or another.

Challenges

- A unique approach will be required for each building and asset to become energy-efficient and decarbonised.
- It would not be feasible to install energy conservation measures (ECMs) in all assets due to building age and condition. The council may also have plans to sell or re-purpose such buildings.
- Upgrades to buildings will require significant investment from the council and it may be several years before savings are 'realised' (paid back).

Opportunities

- This project aligns neatly with existing maintenance and refurbishment plans, as well as new-build schemes across the council.
- The climate emergency provides a mandate for any corporate capital projects to consider environmental impacts and to prioritise the inclusion of sustainable solutions and carbon reduction technologies in the final schemes delivered.

How will we get there?

Project 1
Energy efficiency in council properties

Suitable ECM interventions have been identified for installation across the council's properties and are currently being implemented to reduce the consumption of energy. Some of the common ECMs being explored include:

- **Variable speed drives** – Offer effective speed control of ventilation system motors by manipulating voltage and frequency, resulting in improved control, reduced wear on machines, increased efficiency, and energy/carbon savings.
- **Time & presence controls for water heaters** – Provide an energy saving by only having water systems on where and when needed.
- **Cooling additives** – Involve dosing chilled water systems with chemicals to modify heat transfer properties and protect pipework from freezing, which reduces the workload to compressors, resulting in an energy saving.
- **Heating additives** – Reduce the surface tension on heat transfer fluid whilst remaining non-corrosive, which increases the heat transfer rate and efficiency.
- **Boiler optimisation** – Prevents boiler dry cycling, which reduces needless gas consumption.
- **Valve insulation** – Removable insulation covers for valves and flanges reduce heat loss, resulting in an energy saving.
- **Cavity & solid wall insulation** – Reduces heat loss either through cavity walls by filling the airspace with material that inhibits heat transfer, or through applying an insulation skin to the outside of a building that lacks a cavity.
- **Roof insulation** – This reduces the amount of heat loss, resulting in a reduction of fuel required for heating.
- **Cooling optimisation** – Through installation of smart thermostats, temperature is stabilised and the air conditioning system is more responsive to changes in temperatures, resulting in energy savings.
- **BEMs & controls** – Building energy management systems (BEMs) monitor and control heating, ventilation, and air-conditioning, ensuring buildings operate at maximum efficiency levels, which results in energy savings.
- **Smart TRV solution** – Smart thermostatic radiator valves (TRVs) allow room by room/zoned heating control, which is more efficient.
- **LED lighting upgrades** – LED lights are more efficient at turning energy into light, resulting in energy savings, especially when tied to other smart controls, such as daylight dimming and occupancy sensors.

What have we achieved so far?

- We have completed a review of our buildings to identify which would be suitable for the installation of various ECMs and the energy savings this would result in.
- ECM improvements were instigated, through the total facilities management (TFM) agreement with ENGIE from 2018 onwards and added value proposals (AVPs) for energy efficiency schemes have already delivered sizeable carbon and utility savings.

To deliver this project we will:

- Identify and assess the ease of implementation and impact for proposed ECMs, i.e. the amount of carbon reduction that would be delivered in comparison to the cost of installation.
- Develop a programme of work to install suitable ECMs in appropriate buildings, linking to existing programmes of work – where appropriate – such as the long-term maintenance plan and ongoing building rationalisation.
- Ensure new buildings adhere to the highest sustainability and carbon reduction standards possible.

Project 2
LED street lighting replacement

Our street lights will be upgraded to energy efficient LED lights over a multi-year delivery programme, which will reduce annual carbon emissions and associated electricity costs.

What have we achieved so far?

- Significant work and effort has been invested in ensuring that the correct contractual provisions are in place to make the project deliverable.
- We have analysed the outcomes that this work will deliver once finalised, and this has identified that upon completion of the 3 year installation period a reduction in our baseline street lighting electricity consumption of 65% will be achieved, along with a CO_2 saving of approximately 114 tonnes per month.

To deliver this project we will:

- Finalise the legal and procurement paperwork that will allow work to fully commence on a contractually-compliant footing, i.e. complete a variation to the current private finance initiative (PFI) contract.
- Upgrade all street lighting with efficient LED lighting in line with delivery proposals.

Project 3
Reducing reliance on gas

This project will identify properties that are reliant on gas and aims to convert such fuel usage to a renewables-based or low-carbon heating systems by 2030, wherever possible.

What have we achieved so far?

- Completed a review of our buildings to identify which buildings are using fossil fuel heating and would be suitable for renewable or low-carbon solutions.
- We are working with our partners to identify alternative heating sources such as air/ground source heat pumps, natural ventilation sources, solar thermal, district heat networks, and alternative fuel boilers (hydrogen), which we can utilise in both our existing properties and future schemes.

To deliver this project we will:

- Develop an expanded programme of work, which links to the existing ECM project and wider maintenance plans, to install renewable or low-carbon heating solutions in appropriate buildings.
- Explore the development and feasibility of district or localised heat networks/energy centres based on low-carbon sources, such as heat from the waste water in old mine shafts.

Workstream 2
Low Carbon Fleet (Avoid, Reduce, & Substitute)

Our ambition

To embrace the best technologies and create suitable infrastructure to allow all of the council's fleet vehicles and plant to be converted and/or replaced with ultra-low emission vehicles (ULEVs) by 2030.

What will success look like?

Success will be measured against the following indicators:

- An increase in the number of electric vehicles (EVs) and a corresponding reduction in the levels of CO_2 emissions from the council's fleet.
- Intermediary bridging technologies are embraced in the case of difficult to treat vehicles, e.g. plug-in hybrid electric vehicles (PHEVs) and biomethane, whilst we wait for lower carbon options to be commercially available at scale.
- Telematics inform potential rationalisation of fleet, where opportunities exist to reduce vehicle numbers, without affecting service delivery.
- Telematics used to assess if vehicles are being driven appropriately, and behavioural change incited where instances of inefficient fuel use or unnecessary mileage are identified.

Assets, challenges, and opportunities

Assets

- Council owns a large number of sites, many of which are suitable for EV charging stations to be installed.
- Council owns around 600 fleet vehicles.

Challenges

- Council operates some specialist type vehicles for which electric versions either do not exist, or which may have prohibitive costs at present.
- Future technology, such as hydrogen, is still not mainstream.

Opportunities

- Using whole life costing when purchasing new vehicles can help justify a higher initial outlay on the basis of reduced running costs, which can support a faster transition to ULEVs.
- The council owns an anaerobic digestion (AD) facility, which could be used to create biogas for use in refuse collection vehicles (RCVs).
- Council is looking at consolidating operations at a new fleet depot, and this provides the potential to look at the possible integration of hydrogen refuelling infrastructure.
- Telematics can help the council to better understand if vehicles are being used appropriately and/or whether future retention/replacement is justified.

How will we get there?

Project 1
Fleet replacement

This project will aim to replace all council-owned vehicles that consume petrol or diesel with equivalent ULEVs by 2030. This will involve exploring alternatives for everything from small passenger cars to heavy duty/ specialist vehicles.

What have we achieved so far?

- Developed a transport asset management plan (TAMP) which includes plans to replace fleet vehicles with ULEVs.
- Undertaken high level investigations to support infrastructure development within the district to encourage electric vehicle charging and biomethane-centric compressed natural gas (CNG) and liquefied natural gas (LNG) solutions, which may be applied internally.

To deliver this project we will:

- Develop a dashboard, which will identify the state of play for all fleet vehicles and give the data required to investigate ULEV options, such as vehicle type, asset life, mileage, load, duty cycles, and so on.
- Develop a programme, informed by the dashboard, to replace the fleet with ULEVs at the appropriate point in time.
- Ensure the procurement of any future fleet vehicles involves consideration of ULEVs as a priority, or a low-carbon alternative if no options exist.
- Explore available solutions for heavy duty and/or specialist vehicles, which may not yet be suitable for EV replacement, due to cost or technological constraints.
- Install EV charging points across the district, and ensure this work covers the requirements of the corporate EV fleet.
- Consider opportunities to reduce the fleet across the council.
- Deliver driver education training if inappropriate use of vehicles is identified via telematics.

Project 2
Feasibility study for hydrogen refuelling

This project will aim to investigate the potential for the council's fleet to run off green hydrogen fuel in the mid- to long-term future. It will establish whether there is a business case for investment and detail the infrastructure developments/modifications that would be required to enable such an initiative to be delivered.

What have we achieved so far?

- Initial research has been conducted at a high level.

To deliver this project we will:

- Commission a 3rd party expert to carry out a feasibility study.

Workstream 3
Renewable Energy (Substitute)

Our ambition

To self-generate our own renewable clean energy and embrace technologies to store and utilise any excess power that is generated.

What will success look like?

Success will be measured against the following indicators:

- A source of cheap, renewable, reliable, and clean power is created by the council and an offtake is sleeved back to us to cover our corporate electricity supply requirements.
- Roof-top solar PV systems installed across 7 suitable sites, and others if opportunities arise.
- If viable, AD facility injects biomethane gas into the grid, and Renewable Gas Guarantees of Origin (RGGOs) are reallocated back to the council to 'green' its gas supply.

Assets, challenges, and opportunities

Assets

- Our current electricity contract runs until 2023.
- Wakefield already has 2 anaerobic digestion plants in operation.

Challenges

- Proposals to install solar PV or develop energy parks will take time and resources to deliver, and may require significant investment.
- The council needs to decide on the ownership and offtake models it wants to adopt for any delivered energy park schemes.
- Proposed energy parks may not be ready in time for the expiry of the current power supply contract, which means an interim contractual solution may be required to bridge the gap.
- The gas volumes created by the anaerobic digesters might not be sufficient to fuel RCVs and/or displace our gas under a RGGO style regime.

Opportunities

- Incorporation of employment and skills provision can help local people to find green recovery-related work and upskill the district's workforce for the future.
- We can utilise existing council land and buildings to generate renewable electricity.
- We can self-generate 100% of the electricity that the council consumes and save on electricity bills (depending on contractual arrangements).
- Fixing power costs in the long-term will also give greater budgetary security by insulating the council against volatile energy market prices.
- There is potential to use any excess energy generated to help residents in fuel poverty, or to create community grant funds for delivering local environmental improvements.
- The assets can be used to help educate and inspire young people.

How will we get there?

Project 1
Energy parks

This project will focus on identifying suitable parcels of land and renewable technology systems that can be used to self-generate clean power to cover the council's corporate electricity needs.

What have we achieved so far?

- Working with our partner, ENGIE, we have developed proposals for two large-scale energy parks with potential battery storage within the district.

To deliver this project we will:

- Consult relevant elected members and residents on proposals for the development of such energy parks.
- Consider different technical approaches and appraise commercial options and business case for final energy parks.
- Seek outline planning permission for the parks as a preliminary risk mitigation to maximise the viability of the project as a whole.
- Undertake a procurement exercise to appoint a 3rd party who can build the assets.
- Ensure that the commercial arrangement includes an offtake for the power generated.

Project 2
Rooftop solar PV

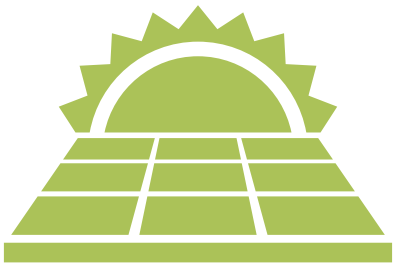
This project will explore suitable council sites/buildings for installing solar PV on rooftops. Ideally, rooftops will need to be flat, have sufficient space, have minimal shading during the day, and be assets that the council intends to retain for at least 20 years.

What have we achieved so far?

- We have identified 7 sites suitable for rooftop solar PV, which will save an estimated 384 tCO_2e per annum. The pilot project at the Chesney Centre is in the early stages of delivery.

To deliver this project we will:

- Install the pilot scheme at the Chesney Centre, then move on to the schemes at the additional 6 sites identified.



Project 3
Green gas

This project will explore the potential for utilisation of biomethane from our anaerobic digestion facilities to create a supply of 'green' gas, which can then displace at least some of the fossil fuel-based gas we use to heat the majority of our buildings. Green gas is a fairly new market, so whilst it's growing fast, there isn't yet enough of it around for us to procure 100% green gas at an affordable price. Natural gas, wherever it comes from, is pooled in the national gas network, and supplied indiscriminately to end users. However, we could buy RGGO certificates, associated with our own biomethane, if we choose to inject it into the grid and become part of the Green Gas Certification Scheme (GGCS).

What have we achieved so far?

- Two anaerobic digestion plants are in operation.

To deliver this project we will:

- Assess commercial feasibility of injecting purified biomethane into the grid in comparison to the economics of the current strategy, which is to burn the gas to produce electricity and then feed it into the power grid.
- Identify potential sites for further anaerobic digestion plants, if there is commercial merit in doing so.

Workstream 4
Carbon Offsetting (Compensate)

Our ambition

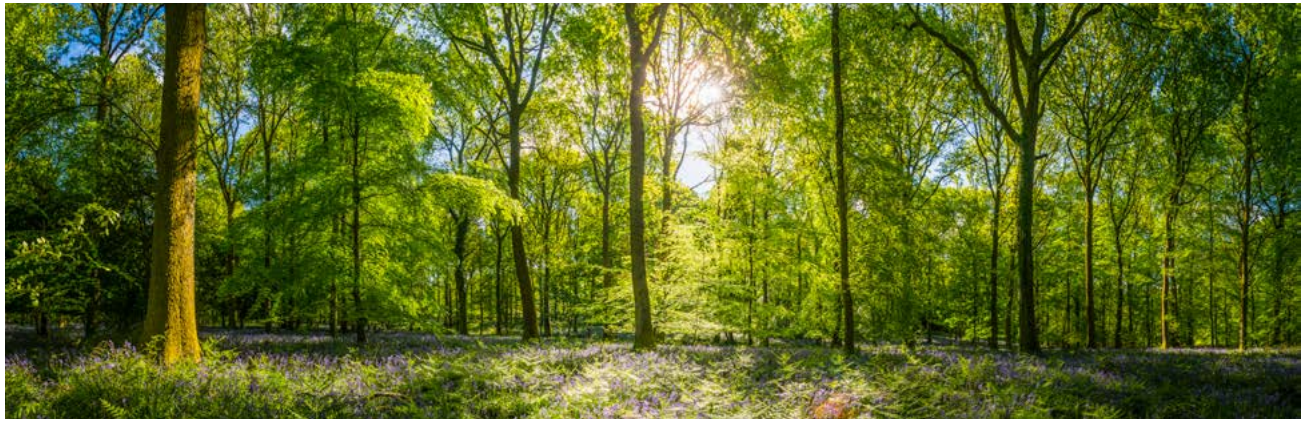
To invest in and deliver high quality projects to compensate for the residual carbon emissions left behind once the council has exhausted all other options to avoid, reduce, and substitute emissions. Furthermore, aside from the carbon benefits, this work intends to help to green the district's landscape by increasing tree canopy cover, whilst also providing flood alleviation, improving amenity and recreational opportunities, supporting a sustainable forestry industry, and promoting mental wellbeing and physical health through greater access to green space and re-connection with nature. Our goal is to also use any offsetting to address the ecological crisis by providing bigger, better, and more joined-up habitats for wildlife, which is vital in the fight to reverse biodiversity loss.

What will success look like?

Success will be measured against the following indicators:

- Residual organisational emissions as of 2030 are offset by robust carbon credits, backed by a certified scheme.
- Incremental tree planting targets are met between 2020 and 2025, year-on-year, in line with White Rose Forest (WRF) commitments and availability of council-owned land.
- Improved biodiversity outcomes are maximised and measured as part of all council-backed offsetting activities.
- Additional tree planting opportunities are explored through engagement with private landowners in the district.

Assets, challenges, and opportunities



Assets

- 240 hectares (ha) of available council-owned land, subject to surveys and successful consultation.
- Established network of local authority-owned land across the LCR, with a collective remit to commit to shared work under the WRF initiative.

Challenges

- Carbon is only effectively offset when a tree reaches maturity. In the early years and decades, carbon sequestration rates are very low. This increases exponentially as time progresses, up until the tree reaches maturity. The general rule-of-thumb is that an average tree will have locked up 1 tonne of carbon after 40 years of growth. Carbon offsetting accountancy must therefore be robust and scientifically accurate.
- Climate change, alongside historical neglect and inaction, has allowed non-native invasive species to rapidly proliferate throughout woodlands. A costly programme of work may be required to eradicate problems with species such as Himalayan balsam, rhododendrons, laurel, Japanese knotweed, and giant hogweed. If this doesn't happen, woodland health will continue to deteriorate and our offsetting work could be devalued.
- Funding will be required for tree planting activity but the WRF partnership is already in the process of securing funding for tree planting, establishment, and maintenance over a ten year period, through the Nature for Climate Fund.
- Ash dieback and other tree-borne diseases may have a large impact on the ability of Wakefield's trees to sequester and lock away carbon, and could cause our offsets to fail if it affects the trees we plant.
- Any carbon impacts from biodiversity offsets falling out of biodiversity net gain (BNG) compensation events attached to local developments cannot generally be 'banked' as they are considered to be neutral acts with very limited additionality. This creates a potential conflict in terms of what we might prioritise, land-use wise, in certain scenarios.

Opportunities

- Opportunity to explore available private land and corporate social responsibility-led contributions from businesses across the district.
- Opportunity to engage with community groups, schools, and businesses to act as tree planting volunteers.
- Opportunity to deliver substantial biodiversity improvements across the district, by creating new natural and semi-natural habitats.
- Opportunity to embrace natural regeneration for some of this work, to save money and enhance nature, by allowing land to 'self-will'.

How will we get there?

Project 1
Northern Forest & WRF

The establishment of the Northern Forest is a headline project in the government's 25 year plan to improve the environment and a key contributor to the Northern Powerhouse initiative. It is expected that 50 million new trees will be planted over the next 25 years between Liverpool and Hull. Wakefield Council and other LCR partners will contribute to the overall plan through two core work programmes:

1. Green Streets – The Urban Forest

This programme has 3 elements. Firstly, integrating green infrastructure design into West Yorkshire Transport Fund projects with a view to greening up the 'key routes network'. Secondly, establishing urban trees more generally and thirdly, strategic working with Highways England across the motorway network of the Northern Forest at a landscape scale.

2. Landscapes for Water – Natural Flood Management

The WRF has pioneered the role of trees and woodlands at a catchment scale in reducing flood risk through natural flood management. After the 2015 floods, it led the way in working with major landowners such as Yorkshire Water and the National Trust to take a Local Growth Fund programme scheme for 'growing resilience' to a full business case. This £1.3m natural flood management programme is now in its implementation phase.

What have we achieved so far?

- Established connections across the WRF.
- Baselined current tree canopy coverage across the district.
- Agreed a shared LCR target to increase tree canopy cover to a minimum of 17.5% by 2048, with an upper target of 21.6%, noting that Wakefield's current coverage is 14%. In terms of land area, this equates to tree cover of 4,778 ha out of a total of 33,861 ha.
- Developed a high-level tree planting plan for the next 5 years with a target of 480,000 trees planted on 240 ha of land, starting with a proposed 48,000 trees across 24 ha during the 2020/21 planting season (October until March). Achieving 17.5% will require 836 ha to be planted by 2048. Taking away the 240 ha scheduled for planting on council-owned land, this will mean that privately-owned land will need to contribute a total of 596 ha if this lower target is to be reached by 2048. Although the 2048 date is 18 years after the council's net zero deadline it is important to recognise that this work is a long-term project, as will be any associated carbon offsetting.
- Planted 600 trees at Shaw Cross during 2018.
- Planted 2,000 trees at Shaw Cross during 2019.
- Planted 350 trees at Notton Wood, 300 at Newmillerdam, and 4,750 at Orchard Head during 2020.
- Identified suitable council-owned land, completed initial site surveys, and reviewed potential schemes.

To deliver this project we will:

- Appoint a green space officer to support the programme manager in the operational delivery of this project.
- Design appropriate planting schemes for all identified sites, using the 'right trees in the right places' principle.
- Prepare and deliver land consultations (across technical, social, & political stakeholder groups) – under the Forestry Commission consents process.
- Complete and submit environmental impact assessment (EIA) – under the Forestry Commission consents process.
- Complete year 1 planting of 48,000 trees over 24 ha.
- Complete year 2 planting 96,000 trees over 48 ha.
- Complete year 3 planting 96,000 trees over 48 ha.
- Complete year 4 planting 120,000 trees over 60 ha.
- Complete year 5 planting 120,000 trees over 60 ha.
- Identify additional opportunities to plant trees on privately-held land and/or to purchase marginal land for tree planting purposes.
- Investigate potential for wetland creation schemes to sequester carbon, whilst also offering ecosystem services and increasing biodiversity.

Project 2
Measures to protect existing and future woodlands

Whilst not direct offsetting work, it is also crucial that the council enacts measures to protect both existing and future woodlands from potential harm. Such damage might come from tree diseases and pests, encroachment and competition from non-native invasive species, and destruction caused by poor quality and/or unsympathetic developments. Without preventative action to reduce the risks posed, offsetting efforts could be devalued or even derailed by losses that weren't anticipated within our carbon reduction accountancy.

What have we achieved so far?

- There is retained forestry expertise within the council.
- Work has been completed to assess the risks posed by ash dieback disease, and to develop an associated plan.
- Woodland Management Plans are in place, but they are in need of revision.
- The council adheres to United Kingdom Woodland Assurance Scheme (UKWAS) standards and holds Forestry Stewardship Council (FSC) certification.
- Grants have been obtained for the successful removal of rhododendron at Newmillerdam Country Park and Seckar Wood (SSSI).

To deliver this project we will:

- Stay aware of potential tree diseases in circulation and implement any measures that can mitigate the associated risks.
- Endeavour to cease importation of trees from abroad, unless absolutely necessary, and only with the appropriate biosecurity passporting in place.
- With specific reference to ash dieback, investigate innovative potential treatments – such as use of enriched biochar – to try to save mature specimens in the district and put in place procedures to stop the further spread of the disease wherever possible, whilst always seeking to retain trees for as long as is safe and reasonable as an initial strategy for management of the problem.
- Assess the extent of non-native invasive species distribution and spread within the district, and take action to control and eradicate species such as rhododendrons, laurel, Himalayan balsam, Japanese knotweed, and giant hogweed, using volunteers (where possible), and contractors or direct labour if work is of a technical nature.
- Ensure that adequate protections are in place for the retention of mature and veteran trees – and established woodlands – when determining the acceptability of planning applications in the district.
- Use powers to compel developers to deliver any BNG-related work in line with legal requirements and enforce any non-compliance, whilst also making sure that existing biodiversity is retained onsite wherever possible and any external biodiversity offsets delivered on council and/or developer (3rd party) owned land are implemented correctly, and have sufficient long-term (30 year) management plans in place.
- Recruit salaried ecologists to help assess and scrutinise developer BNG proposals going forward.
- Inspect construction sites to ensure that developers are not removing trees that should remain in situ and to ensure that construction vehicles and equipment aren't compacting soil and damaging root systems, which could kill trees.

Project 3
International carbon offsets

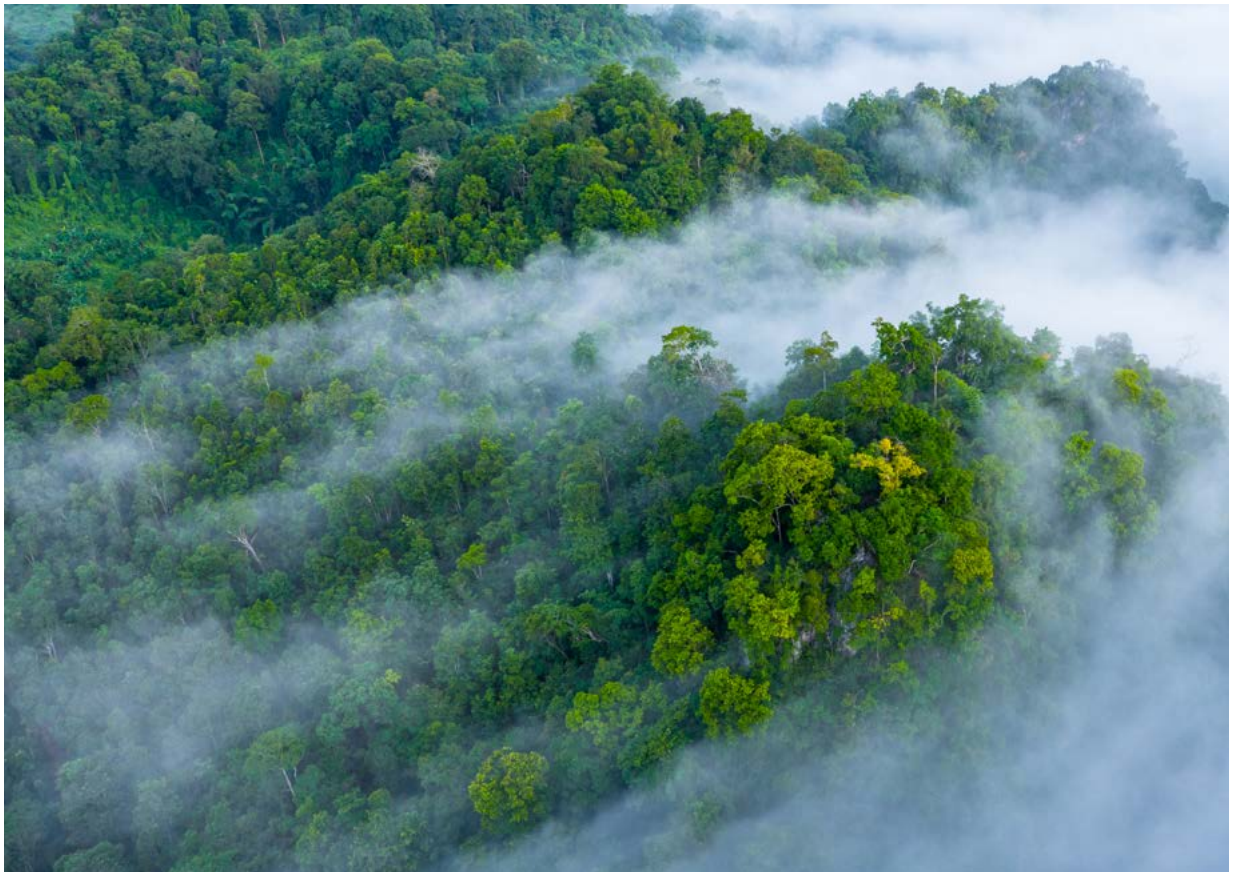
Project 1 under this workstream gives the council direct control over the delivery of its offsets, instead of handing over accountability and trust to external actors, who may be operating on the other side of the world. Nevertheless, due to limitations on the amount of land the council owns, there may still be a requirement to consider the purchase of credits from international offset projects, once avenues have been exhausted to purchase additional local/ regional land that can be planted as woodland.

What have we achieved so far?

- → This is a new piece of work.

To deliver this project we will:

- → Investigate the merits and legitimacy of established high quality international schemes, such as the credits offered by Verified Carbon Standard (VCS) and Gold Standard.
- → Consult with independent experts to choose the most genuine and reliable offset projects.



Workstream 5
Behaviour Change & Influencing (Avoid & Reduce)

Our ambition

For all employees and elected members of the council to understand the climate change emergency and be responsive to this within their day-to-day actions, decisions, and longer term visions and plans for both internal services and the district as a whole. And furthermore, for interventions to be made into appropriate procurement processes to embed carbon reduction in 3rd party service delivery, and for existing supply chain partners to be engaged with to help us achieve the same goal.

What will success look like?

Success will be measured against the following indicators:

- Employees and elected members understand the climate change emergency, know about the work being delivered in response to it, and are aware of how they can contribute.
- An increase in the number of staff working from home and not travelling to work or to and from meetings where a physical presence isn't required.
- Future key decisions consider climate change implications.
- Future procurement and commissioning activity considers climate change and carbon reduction implications.
- Existing supply chains have taken action to reduce the carbon impact of service delivery undertaken on our behalf.
- Sustainable, low-carbon business travel options exist, and are used as a matter of course.

Assets, challenges, and opportunities

Assets

- The Covid-19 pandemic emergency response saw rapid council-wide transformation, and a theme group was established to learn from our response and 'build back better'.
- We have recruited a dedicated climate change team.
- We have restructured our organisational directorates and there is now a new corporate director in place for 'environment, communities, & climate change'.

Challenges

- The response to and recovery from Covid-19 has put significant pressure upon council finances but it's important that investment in climate change remains a priority.

Opportunities

- Opportunity to learn from the Covid-19 pandemic response and embed the new ways of working into business as usual for the council.
- Opportunity to influence staff's behaviour across the council by changing attitudes and amending policy and processes.
- The council spends a lot on 3rd party contracts that deliver services within the district. This buying power can be leveraged to create carbon reductions within our supply chain, and therefore allow us to more inclusively tackle our scope 3 emissions.

How will we get there?

Project 1
Training & awareness

Raising all employees' and elected members' understanding and awareness of the importance of climate change will help behaviours across the organisation to align with our carbon neutrality ambitions. This project will also explore how we can influence our service delivery to ensure this continually complements and links into the ambitions outlined within this plan.

What have we achieved so far?

- Appointed an education and awareness officer as part of the climate change team.
- All key decisions have climate change considerations embedded as part of the cabinet board's decision-making process, and the new climate change team will provide an advisory function for services, to ensure that the section in the cabinet report template is populated with robust and appropriate provisions.
- Delivered a members' event in December 2019, to raise awareness of the climate change emergency.
- Developed this dedicated action plan.

To deliver this project we will:

- Develop a council-wide employee awareness campaign, based on the established Carbon Literacy Project framework.
- Deliver an educational programme across the organisation, with an e-learning section within the council's internal learning portal for general staff and more focussed training for high-impact and priority service areas.
- Promote and recognise good practice across the council via a visible area on the internal intranet site, to raise awareness and promote climate change-related activities and events.
- Identify climate change champions within each service to drive forward our climate change ambitions.
- Embed climate change as a priority within service planning, inductions, appraisals, and 1-2-1s.
- Develop metrics to help employees and members with carbon reporting and associated calculations, to encourage employees to record carbon benefits and liabilities accurately and consistently, both within reports and when analysing the impacts of service-based work.

Project 2
Sustainable business travel

This project will seek to change the way that business travel is conducted across the council. The order of preference – in terms of mode of mobility – will be active travel, followed by assisted exercise-based transport (e-bikes & e-scooters), then public transportation, and finally EV pool cars. We hope to get to a position where the use of personal vehicles will be a last resort. The project will focus on ensuring employees are utilising available options for sustainable transport during business hours (known as 'grey fleet'). It is hoped that exposing staff to sustainable business travel may also encourage them to choose an alternative travel solution for their own personal travel as well.

What have we achieved so far?

- Invested in 4 electric pool bikes and 10 EV pool cars, which are available for staff to use for business travel.
- Shared MetroCards are available for staff to travel to meetings using public transportation.

To deliver this project we will:

- Increase the number of shared MetroCards available.
- Expand the fleet of pool EV cars and assisted e-bikes and e-scooters set aside for business travel, as necessary.
- Undertake proficiency tests and training, and provide suitable PPE, to ensure staff are safe and comfortable when using the above.
- Improve showering and changing room facilities for staff using active travel to attend meetings.
- Make sure that the availability of such options is well advertised via all internal communication channels and the booking out system is efficiently administered.
- Investigate offering greater mileage claim incentives to casual and essential car users who make use of low emission personal vehicles.
- Seek to create provision for an organisational car leasing scheme for staff members, with specific focus on and preferential rates for ULEVs alone.

Project 3
Covid-19 lessons learnt

The Covid-19 pandemic forced a dynamic shift in behaviour over a very short period of time. This included a significant increase in the number of staff working from home, a reduction in non-essential travel, and an increase in the use of videoconferencing technology. It's crucially important that we learn from how we responded to this pandemic and how our shifts in behaviour have impacted on our carbon emissions reductions, with a view to avoiding a post-lockdown surge of emissions, i.e. so-called 'bounce-back'.

What have we achieved so far?

- Established a Covid-19 'build back better' theme group to ensure lessons learnt across the organisation are captured and embedded into future business as usual activities.

To deliver this project we will:

- Encourage staff to continue to work from home on a regular basis where appropriate.
- Utilise best available technology to enable remote meetings, conference calls, and events.
- Consider rationalising the council's estate, based on the revised requirements for space, and develop a plan as necessary.
- Enhance digital service delivery including e-post, digital transactions, and online customer relationship platforms.

Project 4
Procurement & supply chains

This project will seek to ensure that our future procurement activity addresses both climate change and wider sustainability issues, whilst also seeking to undertake a piece of work to engage with our existing supply chain to reduce current service delivery-based emissions as well.

What have we achieved so far?

- All key decisions have climate change implications embedded as part of the cabinet board's decision-making process, which should mean that new projects pay proper attention to the associated issues.

To deliver this project we will:

- Review procurement guidelines and category plans in line with the internationally-recognised guidance standard set out by ISO20400.
- Make relevant interventions into future procurement activity, based on a system of prioritisation, to ensure that the contract provision created aligns with our climate change ambitions.
- Engage with existing suppliers to ascertain ongoing carbon reduction activities that can be attributed to service delivery in the district and to encourage greater action where opportunities exist. This work will initially focus on those contracts that are known to have a significant carbon impact, but in time the scope will be broadened to cover all service provision.

Workstream 6

Place: District-wide Net Zero (Avoid, Reduce, Substitute, & Compensate)

Our ambition

To create a framework and overarching programme that allows us to influence and ultimately reduce the carbon emissions in the district that we have no or limited direct control over.

What will success look like?

Success will be measured against the following indicators:

- The district achieves net zero carbon emissions by 2030, or as soon as possible thereafter.
- Our places and communities are more self-sufficient, resilient, efficiently-run, encouraging of active travel, green, and attractive places to live, work, and learn in.
- Our residents have been educated and empowered to follow more sustainable lifestyles.
- All of the council's work across the district is guided by the principles of sustainable development, covering the environment, society itself, and the economy; and we can demonstrate that we have maximised our contributions to global attainment of the United Nations Sustainable Development Goals (UN SDGs).

Assets, challenges, and opportunities

Assets

- Through planning in general, the Local Development Framework, and our Housing Plan, the council has a huge amount of influence on the future direction and shape of the district.
- The Local Development Framework is integral to delivering sustainable and low-carbon developments.
- Council has a mandate to undertake this work, in line with existing climate emergency commitments.

Challenges

- We don't yet know what the public, local businesses, and lobby groups need from us and want to see us focus on when it comes to our work to deliver large-scale carbon reductions across the district.
- We need to further examine the available datasets to create a baseline for the district's carbon emissions.
- Changing the mindset and habits of residents – to encourage them to reduce their carbon footprints – will be extremely difficult and time-intensive.

Opportunities

- The council has a large reach, and a powerful voice, when it comes to utilising resources, groups, and networks that allow us to engage and communicate with residents.
- We hold many partnerships – across every sector and interest area – which allows for collaborative approaches to delivering strong climate change action across the district.
- As a local authority, we have land, assets, and potential access to funding, which could be called upon to help support district-centric projects and to incentivise large capital projects that can deliver significant decarbonisation.
- The council is updating its development strategy and development polices through the emerging Wakefield District Local Plan 2036, to require more sustainable and low-carbon developments.
- There is already a defined Housing Plan, where sustainable home provision and placemaking are core principles.
- We are currently engaged in extensive master-planning across key regeneration and housing growth sites, which provides opportunities to maximise the sustainability of communities.
- Given the breadth of the council's services and reach, we can contribute widely to the UN SDGs.

Project 1

Public consultation on district-wide approach

This project will initiate and deliver a consultation process to seek stakeholder feedback regarding how we should best shape our district-wide net zero proposals, with reference to the high-level themes suggested in this overall workstream. It is anticipated that the engagement activities will take between 3 and 6 months, and will include a range of communication and engagement approaches.

What have we achieved so far?

- Initial conversations have been undertaken with internal services, including corporate communications, and elected members have been made aware of the council's engagement plans.

To deliver this project we will:

- Use the following modes of engagement:
  1. Online surveys;
  2. The People's Panel, which consists of around 900 people from across the district;
  3. Youth Parliament;
  4. Established contact routes and networks to push out the survey to school children, whose voices are critical if we are to reflect the fact that their lives will be those most affected by future climate change;
  5. Workshop sessions with key stakeholder groups, such as housing providers, transport operators, and environmental groups;
  6. Social media channels, to attract respondents from as wide an audience as possible; and,
  7. Provision of procedures that allow for physical returns of the survey, to improve accessibility for those who don't have internet access or find the use of technology challenging.
- Collate and analyse responses.
- Prepare a feedback and recommendations report and present it to the climate emergency programme board, who will decide on any revisions that are required to this plan as a result.
- Publish the outcomes of the consultation on the content and direction of the plan so that all stakeholders and respondents can see that we have listened to their suggestions and ideas, and altered our approach accordingly.

Project 2
Baselining of district emissions & setting a carbon budget for net zero

This project will seek to baseline our district's emissions and create a carbon budget, which will then allow us to measure our progress towards net zero from a defined starting point.

It will also look to define and set the emissions sources that will be in scope, choosing only those that we can realistically quantify and report against. However, we will also endeavour to address any emissions that are considered 'out of scope' as well, e.g. through promotion of more sustainable lifestyles.

What have we achieved so far?

- Alongside the West Yorkshire Combined Authority (WYCA), we are currently working towards the development of a combined emissions pathway for the LCR, which will help with the delivery of this project.

To deliver this project we will:

- Make use of the best available science and if necessary, seek independent advice.
- Take insights from existing datasets to inform the direction of travel and establish a realistic and reflective baseline for the district.
- Ensure our targets, projections, and pathways are science-based.

Project 3
Sustainable lifestyles

This project will involve us helping residents to better understand how the choices they make can reduce their own personal carbon footprints, with a focus on reducing waste, consuming less, enabling active travel, promoting the benefits of plant-based diets and flexitarianism, and encouraging nature-based gardening techniques. Much of this work will be about improving the carbon literacy of the public, but we may also look at infrastructure too, e.g. new allotment plots.

What have we achieved so far?

- Some linked campaigns have been run but not yet at the scale required.

To deliver this project we will:

- Create a new website – or section of the council's existing internet pages – to showcase the actions that residents can take to reduce their carbon emissions and live more sustainable lifestyles, and to signpost help and guidance for all interconnected matters.
- Provide tools that allow residents to calculate and understand their carbon footprints.
- Formulate initiatives that support and/or incentivise more sustainable behaviours in the district's population, with a specific focus on reducing waste.
- Investigate potential measures to better support active travel, through greater pedestrianisation, access to bikes, improved infrastructure, educational campaigns, and any other relevant projects.
- Be inclusive in creating opportunities for residents to feed into our work, e.g. volunteering in tree planting schemes, getting involved in community litter picking events, and so on.
- Provide carbon footprint labelling on the food we sell in council leisure and catering outlets so that consumers can make more informed decisions on the carbon impacts of what they buy.

Project 4
Placemaking

Placemaking is a people-centred approach to the planning, design, and management of public spaces and communities. Put simply, it involves looking at, listening to, and asking questions of the people who live, work, and play in a particular space, to discover their needs and aspirations. This information is then used to create a common vision for that place. At its heart, it's about regeneration, re-localisation, efficiency, and cohesion. Furthermore, having self-sufficient communities that can meet most of their needs within a locality can pay dividends in terms of carbon emissions, through things like reducing the need for transportation, creating renewable energy schemes that feed into residents' homes, improving the efficiency of housing stock, and promoting circular economies. This project will look to embed the principles of placemaking in shaping the creation of more sustainable communities.

What have we achieved so far?

- Overarching existing work within planning and regeneration links to this project, with a comprehensive approach to master-planning across our key regeneration and housing growth sites, where placemaking is considered to be fundamental to these plans.
- Steps have been taken to ensure that sustainability and energy are considered within plans, and this is strategically linked to the goal of creating sustainable places.
- Master-planning approach is also a key tool for improving connectivity, ensuring the right infrastructure is developed, and making sure healthy/community-based lifestyles are encouraged. All of our master-plans are building frameworks for future action around these agendas.
- Local Development Framework provides context and policies to support placemaking, as does the Housing Plan.

To deliver this project we will:

- Ensure planning and development policy/strategy continues to support an ever greater focus on placemaking.
- Reassess our approach to economic development so that there are broader considerations than GDP alone when defining 'progress' and 'prosperity', e.g. by measuring and improving things like wellbeing, health, happiness, access to natural green space, and general quality of life.
- Analyse further opportunities for how existing communities can be turned into more sustainable places and hubs for community-based closed-loop living, through engagement with local people and groups, and via investment to improve infrastructure.
- Explore efforts to maximise the provision of attractive green linkages that connect communities to other communities, town centres, parks, and local greenspaces by non-vehicular means.

Project 5
Engagement & support

Some organisations across the district will need assistance to help them to understand and address their carbon impacts, and in these cases we will endeavour to offer an advisory service. This project will be about undertaking early engagement across every sector, to reflect how pivotal it is to understand the scale of support needed and the impacts and difficulties businesses face.

What have we achieved so far?

- This work will build on efforts already made through economic growth's work with the WYCA Resource Efficiency Fund and previous collaboration with CO_2 Sense to reach out to and help small and medium sized enterprises (SMEs).

To deliver this project we will:

- Signpost any stimulus packages or resources we are aware of that can help organisations to reduce their emissions.
- Collate resources and information for inclusion on a dedicated section of the council's website.
- Deliver focus group sessions with local businesses to better understand the gaps in their knowledge and any concerns they have, and to gain insights into what they need from the council to make their own net zero carbon transitions easier.
- Aspire to support businesses more proactively with energy efficiency advice and softer touch measures to reduce all organisational emissions.
- Provide funding through appropriate loans and grants, alongside access to carbon reduction-related pilots and demonstrator schemes, wherever possible.

Project 6
Infrastructural & sectoral decarbonisation

This project will focus on creating structural, systemic change across every sector and industry, with a view to achieving deep decarbonisation of everything, from mass transit to energy supply and housing. Some of this work will be about incentivising sustainable finance to flow into the district, as well as pursuing efforts to apply for government funding to help stimulate the development of innovative projects.

What have we achieved so far?

- A lot of good work has been done to address energy efficiency within the district's housing stock, and significant carbon reductions have been achieved in this area.
- Pockets of decarbonisation work are also happening across the district, both in the public and private realms.

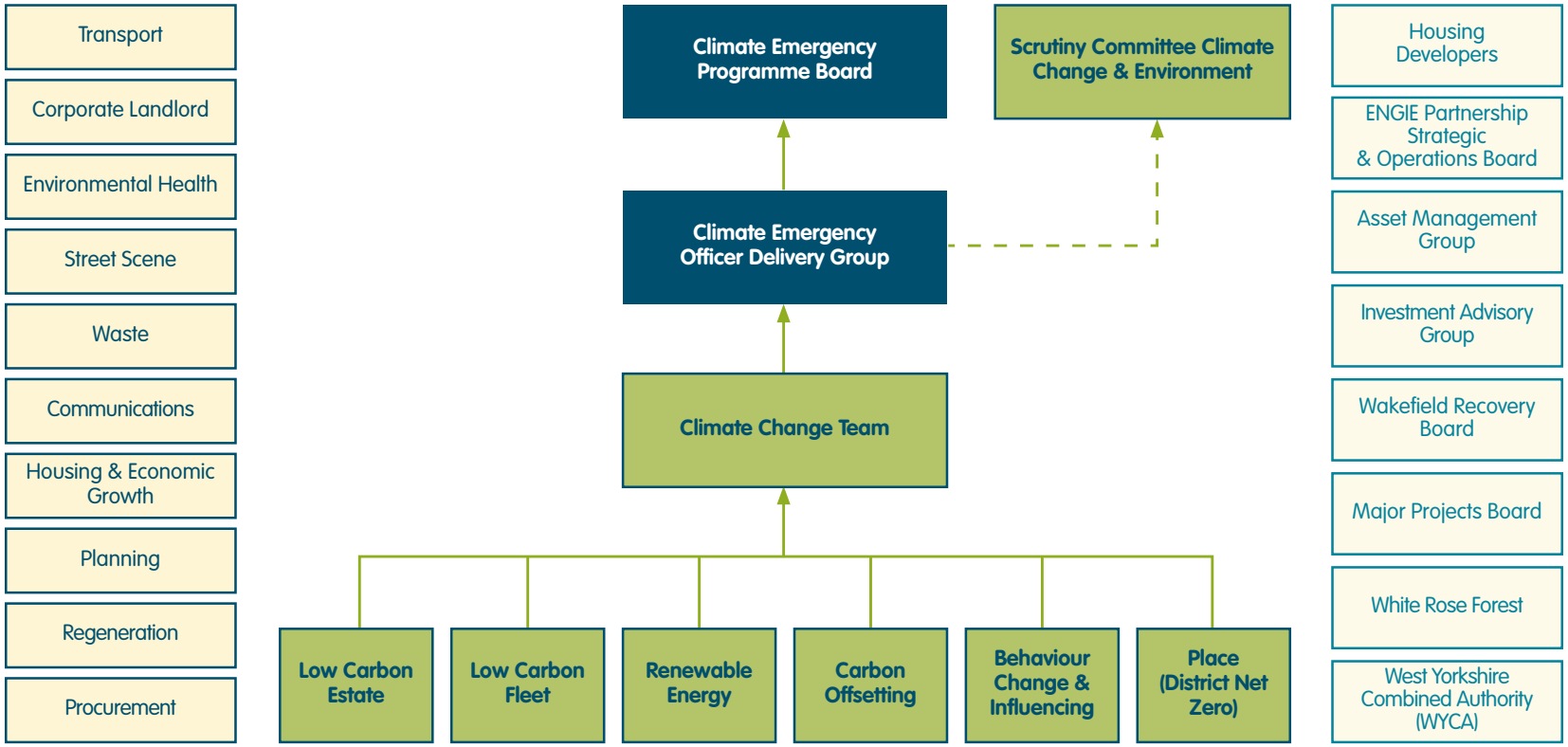
To deliver this project we will:

- Review land and asset holdings to see if opportunities can be provided to commercial 3rd parties to attract investment in major decarbonisation schemes, e.g. by using powers that allow for leasing or disposal arrangements.
- Work with district businesses and industries to see if we can create a more regenerative economy in the locality, i.e. a circular economy wherein our systems take advantage of increased reuse, sharing, repair, refurbishment, remanufacturing, and recycling to create closed-loop systems that minimise the use of resource inputs, and the creation of waste, pollution, and carbon emissions by association.
- Collaborate with and support registered social landlords and private housing developers in their efforts to improve the sustainability of both existing and new social/ private housing across the district; in particular, with partners such as Wakefield & District Housing (WDH), through their sustainability strategy. Linked to this, and under the Housing Plan, we will continue to seek to utilise corporately owned land assets for sustainable housing and regeneration.
- Bid for any government funding that allows major decarbonisation projects in the district to get off the ground, or to have a greater chance of success if already in our pipeline of work.
- Investigate the potential to create overarching frameworks – procured competitively – which provide a contractual route for calling off infrastructure schemes that can lead to sizeable carbon reduction opportunities across the district.
- Take advantage of any national and international innovations that we could bring to the district through collaboration or partnerships, where sectoral or industry specific decarbonisation – delivered at scale – is the primary outcome.
- Explore the potential to forge economic growth partnerships with local business trailblazers.
- Ensure that Enterprise Zones maximise the potential for renewable energy networks to be used to power and fuel them.
- Work with regional partners – such as WYCA and other public sector bodies – to ensure alignment of goals, promote cross-boundary decarbonisation, and avoid duplication of effort.

Programme governance

We have established a programme structure to ensure progress towards achieving carbon neutrality by 2030 is monitored, reported on, and scrutinised.

Figure 4



Roles & responsibilities

From a governance perspective, the established climate emergency programme board will oversee the delivery of the CCAP. The board is responsible for providing strategic direction, ensuring adequate financial support and resource is in place, and managing programme risks. The officer delivery group is responsible for monitoring progress within each workstream and providing updates to the programme board and scrutiny.

Workstream leads will be accountable for ensuring projects are developing in line with agreed objectives and timescales. They will also be responsible for reporting progress and communicating any risks or issues to the climate change team so they are in a position to collate a programme highlight report on a bi-monthly (8 weekly) basis. The detailed governance structures and procedures underpinning the management of this programme form a separate document to the CCAP, and can be downloaded from our website.

Existing boards & services

There are a number of existing boards – shown on the right of Figure 4 – who have established projects that are already contributing towards our climate ambitions. There are also several 'enabling' council services – shown on the left of Figure 4 – which are pivotal in helping the organisation to meet its overall climate ambitions.

Risks

Each workstream and discrete project will have its own risks, dependencies, and interfaces captured via appropriate risk workshops and dedicated risk registers; however, some of the key risks identified for the overall programme are outlined below:

Financial funding

For us to effectively optimise existing assets, embrace smart technology, meet our climate ambitions, and support the transition to a low carbon economy, we will need to invest beyond just bricks and mortar. There is a risk that the funding required to deliver the projects outlined in this CCAP is not available, which would result in the projects not being completed or being delayed.

To mitigate this risk we have earmarked £10m in the council's capital budget programme. We are also working with other local authorities to lobby government about future funding, and we will be seeking to incentivise flows of sustainable finance into the district from private investors, e.g. pension funds.

Resources

For us to achieve our targets, resource across the council will need to be increased. However, due to the existing pressures upon council budgets and available staff, there is a risk that the required resources will not be available.

To mitigate this risk we have established a dedicated climate change team and have developed a programme structure which will allow any issues regarding resourcing and delivery to be resolved in a timely manner. We will also work collaboratively with partners to share best practice and avoid duplication of effort.

Development of new technology

To address some of the energy challenges across our organisation we are reliant upon the latest technology being commercially available. As we are moving quickly and want to achieve carbon neutrality 20 years earlier than the legislated UK government target there is a risk that we will have taken actions to become carbon neutral before the best available technology is on the market.

To mitigate this risk we will review our plan and approach on a quarterly basis to ensure that we're on track and we are considering all eventualities and possibilities when it comes to technological advancement and the best overall carbon reduction techniques, both cost and carbon wise.

Climate change consequences come sooner than anticipated

If the world's collective response is too slow, and/or the modelled effects of climate change come sooner than scientists expected, how will we adapt?

The council needs to develop its approach to climate change adaptation as mitigation alone will not be enough. Some of the impacts from climate change will be unavoidable, which means that this programme will need to link into other areas of the council's work, such as emergency planning to help deal with unforeseen situations from increased flooding, heatwaves, and so on.

Monitoring & reporting on progress

The CCAP will be a dynamic, organic document that will evolve as the climate emergency landscape inevitably shifts over time. Therefore, the plan will be reviewed regularly to ensure that it stays current and remains fit-for-purpose.

Each workstream will report progress on a bi-monthly (8 weekly) basis to the programme board, and this will capture key milestones achieved in the last quarter and any risks or issues for the workstream in question. A suite of relevant key performance indicators will also be developed to assist with performance management and this will capture key milestones achieved during the last reporting period and any risks or issues for the workstream in question. We will continue to report our greenhouse gases through existing government reporting requirements and a carbon reduction tracker will also be used to quantifiably monitor progress made towards net zero, both organisationally and in relation to the district itself.

In February of each year, between 2021 and 2029, an annual report will be published to summarise the progress made during the previous calendar year, and to give a forward projection of the projects anticipated for delivery within the remainder of that calendar year. In 2030, a final report will be prepared to bring the 10 year programme to a close, noting that further reports may be published in subsequent years if the district-wide net zero target has not been achieved by 2030. The first report will cover the 2020 calendar year. It will evidence the carbon reductions achieved and link this back to the baseline net zero emissions targets for the organisation and the district to demonstrate the progress made within each period. This methodology exemplifies the council's desire to be open and honest about its climate change work, and will allow all stakeholders to ascertain whether or not the council's CCAP is on track.

The council will also commit to hosting an 'annual conference' to invite stakeholders and interested parties to consider and comment on the progress being made to achieve both organisational and district-wide carbon reductions. This will be timed to coincide with the publication of each annual report, meaning that the council's first conference will be held around March 2021.

Appendix 1 – Indicative programme timescales

Climate Change Action Plan (CCAP) - Indicative Programme Timescales

Completed | Scheduled /in progress | Not done/TBC

Ref	Proposed Actions	Responsibility	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Workstream 1 - Low Carbon Estate															
1.1	**Lighting measures:** phased installation across the corporate estate	Corporate Landlord/ENGIE													
1.2	**Heating & hot water measures:** phased installation across the corporate estate, e.g. timer controls, boiler optimisers, insulation, & additives	Corporate Landlord/ENGIE													
1.3	**BEMS & automation measures:** phased installation across the corporate estate	Corporate Landlord/ENGIE													
1.4	**Other grouped ECM measures:** phased installation across the corporate estate	Corporate Landlord/ENGIE													
1.5	**Building ECM review:** identify opportunities, assess ease of implementation vs. relative impact - in relation to cost, create plan	Corporate Landlord/ENGIE													
1.6	**Initial analysis of gas replacement possibilities:** e.g. air/ground source heat pumps, natural ventilation, hydrogen boilers, etc	Corporate Landlord/ENGIE													
1.7	**Deep retrofits of corporate buildings:** to replace gas heating systems with low carbon alternatives	Corporate Landlord/ENGIE													
1.8	**LED street-lighting conversion programme:** finalise contract variation, mobilise, and commence and conclude 3 year implementation phase	Corporate Landlord/ENGIE													

Climate Change Action Plan (CCAP) - Indicative Programme Timescales

Completed | Scheduled /in progress | Not done/TBC

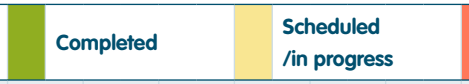
Ref	Proposed Actions	Responsibility	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Workstream 2 - Low Carbon Fleet															
2.1	**Fleet replacement programme:** phased transition towards ULEVs for entire fleet - in line with transport asset management plan (TAMP)	Transport Services													
2.2	**Develop fleet dashboard:** data repository to help explore ULEV options, using info like asset life, mileage, load, duty cycles, emissions	Transport Services													
2.3	**Research/investigate hard-to-treat solutions:** e.g. heavy duty and/or specialist vehicles, where cost or technology constraints limit ULEV options	Climate Change Team (CCT)													
2.4	**Installation of EV charge-points across district:** with a focus on ensuring this work covers the requirements of the internal EV fleet	Corporate Landlord													
2.5	**Rationalisation of fleet:** use telematics to consider whether continued retention of vehicles and/or replacements are necessary	Transport Services													
2.6	**Embed & maintain appropriate driver behaviours:** use telematics to ensure appropriate vehicle use & to avoid fuel or power wastage	Transport Services													
2.7	**Options appraisal or feasibility study for biomethane:** to consider existing anaerobic digesters as biogas source for fuelling RCV fleet	Climate Change Team (CCT)													
2.8	**Feasibility study for possible hydrogen refuelling:** to consider use of containerised electrolysis solution for fuelling suitable fleet vehicles	Climate Change Team (CCT)													

Climate Change Action Plan (CCAP) - Indicative Programme Timescales

Completed | Scheduled /in progress | Not done/TBC

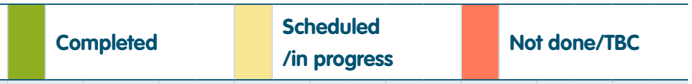
Ref	Proposed Actions	Responsibility	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Workstream 3 - Renewable Energy															
3.1	**Developed high proposals for two large-scale energy parks:** located within the district on council-owned land	ENGIE													
3.2	**Consultation with relevant members & residents:** on proposals for the development of such energy parks	Climate Change Team (CCT)													
3.3	**Consider different financial models and appraise commercial options:** for final energy parks	Climate Change Team (CCT)													
3.4	**Obtain outline planning permission for the energy parks:** preliminary risk mitigation to maximise the viability of the projects as a whole	Climate Change Team (CCT)													
3.5	**Procurement exercise:** appoint a 3rd party who can build & potentially operate the energy park assets, & include power supply offtake	Climate Change Team (CCT)													
3.6	**Pre-planning work for proposed energy parks:** surveys & studies to run concurrently with tender process to reduce timeframes	TBC													
3.7	**Obtain full planning permission for the energy parks:** post-contract award	Appointed Contractor													
3.8	**Energy park construction:** develop & deliver a programme of works	Appointed Contractor													
3.9	**Power purchase agreement:** electricity offtake commences from operational energy parks	Corporate Landlord													
3.10	**Install rooftop solar PV at earmarked sites:** starting with Chesney Centre	Corporate Landlord/Engie													
3.11	**Feasibility assessment:** commercials of injecting biomethane from AD into grid vs. economics of current strategy to run electricity turbines	Climate Change Team (CCT)													
3.12	**Suitability assessment:** analyse potential to identify further for anaerobic digestion plants - if there is commercial merit in doing so	Climate Change Team (CCT)													

Climate Change Action Plan (CCAP) - Indicative Programme Timescales



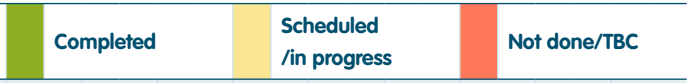
Ref	Proposed Actions	Responsibility	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Workstream 4 - Carbon Offsetting															
4.1	**Planted circa 8,000 trees:** across several locations in the district, including Shaw Cross, Notton Wood, Newmillerdam, & Orchard Head	Street Scene													
4.2	**Identified suitable council-owned land for further tree planting:** completed initial site surveys and reviewed these	Street Scene													
4.3	**Established current tree coverage across each district using 3rd party expert:** with connections made across the White Rose Forest (WRF)	Street Scene													
4.4	**Shared city region targets agreed:** to increase tree coverage to a min 17.5% by 2048 (Wakefield's current coverage is 14%)	Street Scene													
4.5	**Developed a high level tree planting plan for the next 5 years:** target of 480,000 trees to be planted over 240 hectares (ha) of land	Street Scene													
4.6	**Appoint a green space officer:** to provide support for the operational delivery of the council's WRF/internal offsetting work	Street Scene													
4.7	**Design planting scheme & obtain Forestry Commission consents:** to include technical, social, & political consultation & EIA submission	Street Scene													
4.8	**Complete year 1 tree planting:** circa 48,000 trees over 24 ha	Street Scene													
4.9	**Complete year 2 tree planting:** circa 96,000 trees over 48 ha	Street Scene													
4.10	**Complete year 3 tree planting:** circa 96,000 trees over 48 ha	Street Scene													
4.11	**Complete year 4 tree planting:** circa 120,000 trees over 60 ha	Street Scene													
4.12	**Complete year 5 tree planting:** circa 120,000 trees over 60 ha	Street Scene													
4.13	**Explore opportunities to plant beyond initial 5 year plan:** e.g. on private land, through partners, etc	Climate Change Team (CCT)													
4.14	**Implement measures to protect existing & future trees:** e.g. from tree diseases, invasive species, poor or unsympathetic developments	Street Scene/CCT													
4.15	**Ensure offsetting work complements & enhances work to address ecological crisis:** e.g. new habitat provision, links to BNG compensation	Street Scene/CCT													
4.16	**Assess international carbon offset schemes:** research credits offered by VCS & Gold Standard to verify legitimacy & alignment with goals	Climate Change Team (CCT)													
4.17	**Explore carbon sequestration abilities of wetland habitat creation:** ecosystem services assessment, with academic input sought	Climate Change Team (CCT)													

Climate Change Action Plan (CCAP) - Indicative Programme Timescales



Ref	Proposed Actions	Responsibility	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Workstream 5 - Behaviour Change & Influencing															
5.1	**All key decisions consider climate change implications:** within the report template that informs cabinet decision-making	Environment & Property													
5.2	**Delivered a members' event in December 2019:** to raise awareness of the climate change emergency & explain the role of this action plan	Environment & Property													
5.3	**Appointed dedicated climate change programme delivery team with 5 posts:** which includes 'education & awareness officer' role	Environment & Property													
5.4	**Develop a council-wide employee awareness campaign:** based on the established Carbon Literacy framework	CCT/Corporate Comms													
5.5	**Deliver educational programme (corporately):** module on learning portal for general staff & face-to-face training for priority service areas	CCT/Corporate Comms													
5.6	**Promote & recognise good practice across the council:** create area on intranet to raise awareness & advertise activities and events	Climate Change Team (CCT)													
5.7	**Identify climate change champions within each service:** to drive forward our climate change ambitions	Climate Change Team (CCT)													
5.8	**Embed climate change thinking within staff management & service planning:** including inductions, appraisals, & 1-2-1s	CCT/HR													
5.9	**Develop tools to help staff with carbon reporting & associated calculations:** to record CO_2 benefits & liabilities accurately/consistently	Climate Change Team (CCT)													
5.10	**Implement measures to make business travel more sustainable:** e.g. MetroCards, EV pool cars, e-bikes, enhanced ULEV mileage claims, etc	CCT/Transport Services													
5.11	**Embed cross-applicable Covid-19 lessons learnt:** e.g. working from home, best available technology, rationalising estate, & better digital services	All services													
5.12	**Review & amend procurement guidelines & category plans to embed sustainability:** using established standard set out by ISO20400	CCT/Procurement													
5.13	**Reach out to Yorkshire Purchasing Organisation:** ascertain their climate change work and collaborate to maximise the opportunities	CCT/Procurement													
5.14	**Make relevant interventions into future procurement activity:** based on a system of prioritisation, to ensure contractual provision supports aims	CCT/Procurement													
5.15	**Engage with existing suppliers:** to ascertain & encourage carbon reduction activities attributable to service delivery across the district	CCT/Procurement													

Climate Change Action Plan (CCAP) - Indicative Programme Timescales



Ref	Proposed Actions	Responsibility	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Workstream 6 - Place (District-Wide Net Zero)															
6.1	**Facilitate public consultation to get feedback on district net zero goals:** extensive stakeholder engagement to gather views & ensure alignment	CCT/Corporate Comms													
6.2	**Develop a roadmap for district net zero work:** science-backed baselining, carbon budget setting, & agreeing on an emissions pathway	CCT/WYCA													
6.3	**Promotion of 'sustainable lifestyles':** e.g. reducing waste, consuming less, active travel, reducing meat intake, nature gardening, education	CCT/Corporate Comms													
6.4	**Placemaking:** e.g. regeneration, community-based living, infra integration, modal shift, community cohesion, circular economy, sustainable homes	All services													
6.5	**Business engagement & support:** carbon literacy, 'hand-holding', signposting resources, providing information, linked grants & loans	CCT/Economic Growth													
6.6	**Infrastructural & sectoral decarbonisation:** structural & systemic change at scale, attracting investment, enabling major schemes, innovation	CCT/Economic Growth													

Appendix 2 – Glossary of terms

Active travel
Active travel refers to walking, cycling, or using some other form of physical activity for all or part of a journey instead of using motorised transport.

Air-source heat pump
An air-source heat pump is a system that extracts natural heat from the outside air using refrigeration pipes. It concentrates heat and transfers it into buildings to provide heating and hot water without using natural gas.

Air quality/pollution
Air pollution is the presence of substances in the atmosphere that are harmful to the health of humans and other living beings, or cause damage to the climate or to materials. There are different types of air pollutants, such as gases, particulates, and biological molecules. Air pollution may cause diseases, allergies and even death to humans; it may also cause harm to other living organisms such as animals and food crops, and may damage the natural or built environment. Human activities - such as vehicle use and open fires - are heavily implicated in the air pollution that causes up to 40K excess deaths per year in the UK.

Anaerobic digestion
Anaerobic digestion (AD) is the process of breaking down organic matter, commonly animal and food waste, into carbon dioxide, methane, water and bacteria. Anaerobic refers to the absence of oxygen, and the process can either occur naturally or in oxygen-free tanks called an anaerobic digester.

AD is predominantly used to produce biogas and biofertiliser. Biogas is a mixture of methane and carbon dioxide, and can be used to produce heat and electricity or mixed into vehicle fuel and gas grids. Biofertiliser is a nutrient-rich substance that can be applied to farmland or fed into ethanol production or even some building materials like fibreboard.

Biodiversity
The existence of a wide range of living organisms, such as animals and plants, in an environment or habitat. Biodiversity is important to the health of ecosystems as it provides food, materials and contributes to the economy.

Biodiversity is crucial to the health of ecosystems as it provides the complex ecological connections and communities that create sustainable provision of food, raw materials, medicines, natural processes, and landscape scale protections that provide healthy habitats for flora and fauna and also contribute value to our economies and societies.

Biodiversity Net Gain
When applying Biodiversity Net Gain (BNG) principles, developers are encouraged to bring forward schemes that provide an overall increase in natural habitat and ecological features, in the long-term. The aim of biodiversity net gain is to minimise losses of biodiversity and help to restore ecological networks.

Biodegradable
A material which breaks down organically over a period of time, as microorganisms such as bacteria or fungi break it down into naturally-occurring gases and biomass. The term does not mean the material should be freely released into the environment in an uncontrolled manner, as the speed, method and nature of biodegradation differs between materials.

Biomethane
Biomethane is a naturally occurring gas which is produced by the process of anaerobic digestion of organic matter. Biomethane is a flexible and easily storable fuel that can be used wherever natural gas is used without the need to change any settings on equipment designed to use natural gas.

Carbon footprint
The total amount of greenhouse gas emissions released into the atmosphere that are produced directly or indirectly by human activities. It can be calculated to measure the emissions emitted by products, services, individuals, companies or nations. The standard unit of measurement for carbon footprints is tonnes of carbon dioxide equivalent (tCO_2e).

Carbon literacy
Carbon literacy is the awareness of climate change and the climate impacts of humanity's everyday actions. The term has been used in a range of contexts in scientific literature and in casual usage, but is most associated with The Carbon Literacy Project (CLP).

Carbon neutral
Achieving carbon neutrality, or having a net zero carbon footprint, requires a nation or organisation to balance its carbon emissions with an equivalent amount sequestered or offset. Alternatively, it can purchase enough carbon credits to make up the difference between its emissions and a zero-carbon baseline.

Carbon sequestration
The long-term capture and storage of carbon dioxide from the atmosphere into carbon sinks such as oceans, forests or soils to mitigate global warming and avoid dangerous climate change. A classic example is during the photosynthesis within trees and plants, which absorb carbon dioxide and produce oxygen.

Circular economy
An industrial economy that promotes resource efficiency by replacing a linear 'take, make, dispose' model of production with one where materials function at their highest utility at all times. The circular economy model aims to extract maximum value from resources while in use, and then recover and reuse these materials at the end of each service life. It is a framework for an economy that is restorative and regenerative by design. It is based on three principles:
- Design out waste and pollution
- Keep products and materials in use
- Regenerate natural systems

Climate change
A long-term shift in global weather patterns or average temperatures. Scientific research shows that compared with climate change patterns throughout Earth's history, the rate of temperature rise since the Industrial Revolution is extremely high. Rising temperatures can lead to extreme weather such as droughts, extreme storm events, sea level rises and retreating glaciers.

Climate emergency
A situation, in some cases declared by a government, in which special measures must be taken to halt environmental damage caused by climate change.

Closed loop
A business model that completely reuses, recycles, or composts all materials. The term can also be used to refer to corporate take-back schemes, where companies that produce a good are also responsible for its disposal.

Corporate social responsibility (CSR)
A concept which encourages a company to take responsibility for its impact on environmental and social wellbeing. CSR is a broad movement which encompasses a variety of issues such as human rights, corporate governance, responsible sourcing and environmental footprints.

Decarbonise
To reduce the amount of carbon emissions associated with a process, product, or asset, preferably at every stage of its life cycle.

District heating
A system that distributes heat or hot water from a centralised location to a group of residential and/or commercial buildings. Heat networks can be supplied by a diverse range of sources including energy-from-waste (EfW) facilities, combined heat and power (CHP) plants and heat pumps. The advantages include cost savings, higher efficiencies and carbon emission reductions.

Ecological crisis
An ecological crisis occurs when the habitat/environment of a species or a population changes in a way that destabilises its continued survival. The world is on the brink of an unprecedented human growth-related ecological crisis that could well undermine future prospects for global civilization by disrupting the natural processes we rely on to regulate our environment and provide us with food. However, the biggest impact is the threat it poses to the natural world, where 1 million species are now at risk of extinction due to the excesses of humanity. We are entering the first mass extinction that has been caused by humanity as opposed to natural events and over the past 50 years the abundance of all wild animals has dropped by more than 60% across the planet.

Ecosystem services
Ecosystem services are the many and varied benefits to humans gifted by the natural environment and from healthy ecosystems, such as agroecosystems, forest ecosystems, grassland ecosystems and aquatic ecosystems. These ecosystems offer services defined as provisioning (e.g. providing raw materials, food and bioenergy), regulating (e.g. natural pollination of crops, reducing soil erosion, providing clean air, flood mitigation/ alleviation), and cultural (e.g. recreation, human mental and physical well-being).

Electric vehicle
An electric vehicle (EV) is a mode of transport which is powered by electricity. Unlike conventional vehicles that use a gasoline (petrol) or diesel-powered engine, electric cars and trucks use an electric motor powered by electricity from batteries or a fuel cell. A key advantage of EVs over other forms of transport is that they hold the potential to significantly reduce pollution by having zero exhaust (tailpipe) emissions and can potentially be fueled in a zero carbon way once our power grid is decarbonised.

Energy efficiency
The utilisation of less energy to provide the same service, e.g. space heating in a building. Increasing energy efficiency allows individuals and organisations to reduce their capital and operational costs, as well as lowering fuel consumption, thus reducing greenhouse gas emission and helping to tackle climate change. Measures to improve energy efficiency within buildings can include the installation of loft or cavity wall insulation (i.e. improving the energy efficiency of the building fabric/envelope) or installing new appliances that are more energy-efficient (e.g. new heating systems).

Flexitarianism
Flexitarianism or 'casual vegetarianism' is a plant-based diet that can reduce your carbon footprint and improve your health with an eating regime that is mostly vegetarian yet still allows for the occasional meat dish. The rise of the flexitarian diet is a result of people taking a more environmentally sustainable approach to what they eat by reducing their meat consumption in exchange for alternative protein sources.

Fossil fuels
A fuel (oil, coal or gas) that was formed from the remains of living organisms millions of years ago. Fossil fuels are non-renewable energy resources which are harmful for the environment because they release carbon dioxide, and other greenhouse gases and harmful air-polluting gases, when they burn.

Fuel poverty
A term used to identify households that are pushed into poverty because of the proportion of their income that they have to spend on fuel. Fuel poverty is contributed to by the energy efficiency of the property, the cost of energy and household income. Fuel poverty is measured in England using the low income-high cost definition, which states that a household is in fuel poverty if:

- Their income is below the poverty line (taking into account energy costs) and;
- Their energy costs are higher than is typical for their household type

Greenhouse gases (GHGs)
Gases released into the atmosphere, predominantly as a direct or indirect result of human activity, which add to the greenhouse effect; the sun's radiation passes through the atmosphere to the Earth's surface, which radiates thermal, infrared radiation back into the atmosphere, and greenhouse gases absorb this thermal radiation which is then re-radiated back down to the Earth's surface, thus trapping the sun's heat in the Earth's atmosphere causing it to heat up. To tackle climate change, we are mainly concerned with emissions of methane and carbon dioxide, as these have the highest global warming potential (ability to cause global warming) in relation to their emissions levels, comprising the largest proportion of anthropogenic (man-made) emissions.

Greenhouse Gas Protocol (GHG Protocol)
The most widely-used international accounting tool for government and business leaders to understand, quantify, and manage their greenhouse gas (GHG) emissions.

Ground-source heat pump
A ground-source heat pump (GSHP) system extracts natural heat from the ground using pipes which are buried under the surface. It concentrates heat and transfers it into buildings to provide heating and hot water without burning fossil fuels.

Habitat
The natural environment in which an organism lives; a species' habitat is a place where the species can find food, water, shelter, protection and mates for reproduction. It includes physical features (e.g. soil, range of temperature, light intensity) and biological features (e.g. availability of nutrients/food/prey, availability of mates, and presence/absence of predators).

Life cycle assessment
A technique used to examine the environmental impact of a product through all stages of the product's life, including design, raw material extraction, material production, part production, and assembly, through its use, and final disposal.

Mass extinction
Also known as an extinction-level event, this is a widespread and rapid decrease in the biodiversity on Earth. According to scientists, we are currently witnessing the sixth mass extinction event, termed the Anthropocene (or Holocene) Extinction, caused predominantly by human activities such as deforestation, intensive agriculture, and pollution of the natural environment.

Modal shift
The shift from one transport mode to another, generally replacing a saturated means of transport with another to make the first less congested or less utilised. In environmental terms, we want to encourage the modal shift from individual car usage to the usage of public transport, and to active travel modes, such as cycling or walking, (and within industrial/commercial settings, from road haulage to barge or rail) in order to reduce carbon emissions and improve local air quality.

Natural capital
The elements of the natural environment that provide valuable goods and functions such as clean air, clean water, food and recreation. Natural capital accounting puts a value on these resources.

Net zero carbon
A "net zero" target refers to reaching net zero carbon emissions by a selected date, but differs from zero carbon, which requires no carbon to be emitted as the key criteria.

Net zero refers to balancing the amount of emitted greenhouse gases with the equivalent emissions that are either offset or sequestered. This should primarily be achieved through a rapid reduction in carbon emissions, but where zero carbon cannot be achieved, offsetting through carbon credits or sequestration through rewilding or carbon capture and storage needs to be utilised.

Offsetting
The mechanism for claiming a reduction in greenhouse gas (GHG) emissions associated with a process or product through the removal of, or preventing the release of, GHG emissions in a process unrelated to the life cycle of the product being assessed.

Paris Agreement
A global climate change deal signed at the UN Conference of the Parties (COP) 21 in Paris in December 2015 and ratified by 97 countries in November 2016. The deal "emphasises with serious concern" the need to hold the increase in the global average temperature to "well below 2°C" above pre-industrial levels, and "pursuing efforts to limit the temperature increase to 1.5°C".

Place-making
A multi-faceted approach to the planning, design and management of public spaces, whereby we work together to shape spaces with community-based participation, bringing together residents, businesses, professionals and elected officials to improve a community's cultural, economic, social and ecological situation.

Plant-based diets
Any set of rules for food and drink consumption which emphasise minimally-processed foods and plants while limiting or excluding animal products and by-products.

Political driver
These are defined as broad aims, targets or statements that are considered to be desirable by the various bodies of government or non-government organisations in satisfying their overall goals such as 'maximising social welfare' or 'staying in power'.

Power purchase agreement
A contract between an energy generator and an energy buyer or 'end-user'. Power purchase agreements (PPA) can provide a fixed price for energy generated over the duration of the contract, removing exposure to energy price volatility and allowing for accurate and predictable cost planning.

Rationalisation (fleet or building portfolio)
Rationalisation is the action of making a company, process, or industry more efficient, especially by dispensing with no longer required personnel, equipment, or assets, e.g. a building or a vehicle.

Renewable energy
An energy source derived from natural resources which will not deplete when used. Examples of renewable energy include offshore and onshore wind, solar, geothermal power, wave power, and tidal power.

Retrofit
Retrofitting involves modifying equipment (buildings, vehicles, a factory, etc.) that is already in service using parts developed or made available after the time of original manufacture. It can also be thought of as installing, fitting, or adapting (a device or system) for use with something older.

Science-based targets
Science-based targets are a set of goals developed by a business to provide it with a clear route to reduce greenhouse gas emissions. An emissions reduction target is defined as 'science-based' if it is developed in line with the scale of reductions required as set out in the Paris Agreement.

Scope 1/2/3 emissions
These provide a consistent way of categorising different types of emissions within a business. Scope 1 covers direct emissions from owned or controlled sources. Scope 2 covers indirect emissions from the generation of purchased electricity, steam, heating and cooling consumed by the reporting organisation. Scope 3 includes all other indirect emissions that occur in an organisation's value chain.

Self-willed land (in relation to natural regeneration)
True wilderness is land that has supreme naturalness and is free of any human control or influences. It is called self-willed land because plants and animals can thrive there, in their own undisturbed communities. Self-willing land or 'rewilding' is about leaving nature to reclaim its true ecology and balance, without human interference, by adopting the philosophy that 'nature knows best'.

Solar power
Solar power is energy harnessed from the sun's rays. It is a renewable energy source, meaning it is a cleaner, more sustainable alternative to burning fossil fuels. Solar power produces no greenhouse gas emissions during operation, consumes no water, and uses relatively little land space.

Large-scale solar generation can either use the sun's heat or light to create usable energy. Some solar systems generate heat, while others transform light energy into electricity. Most generators use solar cells or photovoltaics (PVs), but solar water heating and solar furnaces can also be utilised. Solar cells are the most common form of solar energy and can be organised as offsite solar farms or placed into business operations or on households as small-scale arrays, usually on roofs.

Sustainable development
Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainable development goals (SDGs)
A UN document which features 17 sustainability goals and 169 smaller targets, to be achieved by 2030, including pledges to protect the world's oceans, improve water management and the energy system, and take urgent action on climate change. The overarching aim of the document is to 'end poverty'. Delegates from 194 member states adopted the agreement in September 2015.

Sustainable procurement
An exercise which takes into account environmental, social and ethical factors when selecting suppliers. Sustainable sourcing requires a higher degree of engagement between all parties in a supply chain.

Telematics
Telematics is a method of monitoring a vehicle. By combining a GPS system with on-board diagnostics it is possible to record – and map – exactly where a car is and how fast it is traveling, and cross-reference that with how a car is behaving internally. The data produced can be used by companies to make their journeys more efficient, to ensure vehicles are being driven correctly, and even to assess whether it is worth keeping certain vehicles, if they aren't being used often enough.

Whole-life carbon
This includes an assessment of 'embodied carbon', which covers the carbon emissions associated with making physical objects like cars or buildings, as well as the carbon emissions associated with the use of those objects, for example energy or fuel, and maintenance. The purpose of using whole life carbon style approaches is to move towards making and favouring products that generate the lowest carbon emissions over their lifetime (this is sometimes also referred to as cradle to grave).

Whole-life cost
Whole-life costing is an investment appraisal and management tool which assesses the total cost of an asset over its whole life. It takes account of the initial capital cost, as well as operational, maintenance, repair, upgrade and eventual disposal costs. The reason we do this is because sometimes 'green' products cost more to buy outright, but when you factor in their often cheaper costs of ownership – e.g. the reduced cost of powering an electric vehicle over refuelling a petrol car – the higher upfront cost can be justified.

Wakefield Climate Emergency

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