Charnwood 2030 Carbon Neutral Plan

Charnwood Borough Council's ambition and action plan to be a carbon neutral council by 2030

Charnwood

Urban Foresight

DCA

Summary

In June 2019, the UK Government amended the Climate Change Act (2008) to commit the UK to “reducing greenhouse gas emissions by at least 100% of 1990 levels by 2050”. This means the UK Government now has a legally binding target for the UK to be generating net zero carbon emissions per year by 2050. This followed on from the findings of the International Panel on Climate Change (IPCC) report published in October 2018.

Having considered the IPPC report, and to show we are keen to be part of the UK response to climate change, Charnwood Borough Council has committed to achieving carbon neutrality for the Council’s own operations by 2030. The Council made this commitment in June 2019. This builds on the success of our 2015-2020 Carbon Management Plan, which saw us reduce our carbon footprint by 37% between 2012 and 2018. Since then, our footprint has fallen by a further 3%.

Soon after making our June 2019 commitment to work with colleagues across the Council to fulfil our goal to reach carbon neutrality by 2030, an initial 2030 Carbon Neutral Plan was prepared in conjunction with Urban Foresight and DCA.

However, faced with the unexpected challenge of COVID-19, the Council has had to adapt operationally and financially, creating both new priorities and new ways of working.

Previous projects identified had either become less pertinent in terms of impact and priority, whilst new project opportunities have arisen.

The most significant challenge will be the financial situation the UK economy, the public sector and Charnwood Borough Council face following the current Covid-19 crisis. These market challenges will impact on the funding available for projects beyond 2021. The Council recognises the challenges we, and our communities will be facing and the need to use its available funding accordingly.

Therefore, Charnwood Borough Council have updated the 2030 Carbon Neutral Plan and projects in context of the new economic and logistic realities post-COVID. This includes reflecting the new policy and funding context.

A Living Carbon Neutral Plan

The menu of projects presented in this document is a 'point in time' menu of options for the Council, reflecting the situation we are currently in.

It is important that the Carbon Neutral Plan is treated as a living document which evolves over time. As the funding, policy and technology environment changes over time new projects will emerge which will need to be included in the Plan. Similarly, as feasibility studies are delivered projects may be changed or removed from the Plan.

One vital reason for us needing to be adaptable and flexible is uncertainty over the future of how and where the Council will work. In light of COVID-19, we are still reviewing our office estate and home working procedures. These considerations will influence which projects are added or removed from the Plan in future years.

Therefore, rather than being the end of a process or a fixed set of actions the Council is bound to, this 2030 Carbon Neutral Plan is the start of our 10-year journey. The activities outlined are not a fixed plan and will be reviewed regularly as we move through the next ten years and continually consider the best and most cost-effective ways of reducing our carbon footprint.

The projects and activities delivered by the Carbon Neutral Programme will be a mixture of newly conceived "stand-alone" activities and additional "top-up" activities. The "stand-alone" projects are those where carbon neutral funding available will be used to finance brand new low carbon project yet to be scheduled into council's planned activities. The "top-up" projects are those where carbon neutral funding available will be used to accelerate or enhance an existing low carbon project already being delivered.

Overall, the projects will combine both highly visible changes and some that will be behind the scenes. We will be making changes to the way that we use our buildings, how we operate our vehicles and how we generate our energy.

The 2030 Carbon Neutral Programme is overseen by a Project Board and has been created in collaboration with a number of Council services. This means the planned investment and efforts being made by different parts of the Council are taken into account to ensure the 2030 Carbon Neutral Plan compliments and adds to what is already planned. This 2030 Carbon Neutral Plan provides a realistic yet ambitious set of projects we can start delivering.

Charnwood's Regional Role

Eliminating the carbon footprint of the Council's assets, operations and services is not about, and cannot be about, one area of Council activity pursuing a stand-alone agenda. Making corporate decisions which enable and encourage all services to reduce carbon emissions will need to become the new normal during the course of this plan and, as such, is a whole Council activity. As a Council we are well placed to make the corporate and cultural changes needed to deliver the Carbon Neutral Plan. Our Lead Member for Transformation sits on the Council's Cabinet with a remit including the Environment and Climate Change agenda. The Council also has a climate change champion Member to promote the Council's objectives.

Looking beyond the Council's own operations and activity, our 2030 Carbon Neutral Plan is an opportunity to outline our vision to further inspire the community of Charnwood to implement other projects that can drive the Borough to become zero carbon. We hope the Council's endeavours will demonstrate how business operations can become net zero, and help our residents reduce both their emissions and their energy costs.

Charnwood is at the geographic centre of an expanding list of local Councils and other organisations that are working towards reaching net zero carbon emissions and we also have potential local allies such as the University of Loughborough and local businesses who are active in the low carbon economy. This 2030 Carbon Neutral Plan presents options for how we can inspire local and regional action whilst reducing our own carbon footprint.

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Why do we want to be carbon neutral?

Charnwood Borough Council has committed to achieving carbon neutrality for the Council's own operations by 2030. The Council made this commitment in June 2019, having considered the findings of the International Panel on Climate Change (IPCC) report published in October 2018.

This 2030 Carbon Neutral Plan presents options for how we can do this. Of course, we are very aware that types and costs of low carbon technology will change during the next ten years, as will government policy and legislation. These changes may create new opportunities or priorities which are not featured in this plan. Similarly, the Council's own finances and ways of working may change, especially as we support Charnwood's businesses and communities recover from Covid-19.

Therefore, this 2030 Carbon Neutral Plan is not a fixed plan and will be reviewed regularly as we move through the next ten years and continually consider the best and most cost-effective ways of reducing our carbon footprint.

UK response to climate change

Global scientific consensus, as reported in the 2018 IPCC report, indicates that human activities have caused global temperatures to rise by an estimated 1.0°C above pre-industrial levels. Looking to the future, the same evidence suggests that if the global economy maintains business as usual, then global temperature rise will reach 1.5 °C at some stage between 2030 and 2052.

In response to scientific consensus, the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement of 2016 commits the global community to act. At the time, Prime Minister David Cameron called the Paris Agreement "a huge step forward in helping to secure the future of our planet" and Secretary of State for Energy and Climate Change Amber Rudd declared it as "vital for our long-term economic and global security This agreement pledges to restrict the rise in global average temperature to well below

2°C above pre-industrial levels and, ideally, limit the global temperature increases to 1.5°C.

To restrict global warming to below 2°C or 1.5°C, cumulative carbon emissions from human activity need to be kept below a threshold, referred to as a carbon budget. The IPCC state that the global carbon budget needed to stay below a 2°C increase is 900GtCO_2 – or 900 million tonnes.

In June 2019, the UK Government amended the Climate Change Act (2008) to commit the UK to "reducing greenhouse gas emissions by at least 100% of 1990 levels by 2050". This means the UK Government now has a legally binding target for the UK to be generating net zero carbon emissions per year by 2050.

The UK Government's 2050 target builds on the Committee on Climate Change's (CCC) 2019 recommendations in the report *Net Zero – The UK's contribution to stopping global warming*. Furthermore, the CCC provided recommendations on carbon budgets for the UK divided into 5-year periods, which have also been translated into legally binding targets in the amended Climate Change Act. The current and future carbon budgets, presented in megatonnes (Mt), specified in the Climate Change Act (cumulative over each five-year period) are:

- 2018-2022: 2,544 MtCO_2e
- 2023-2027: 1,950 MtCO_2e
- 2028-2032: 1,725 MtCO_2e

Definition: carbon emissions

In this plan we use the phrases 'carbon emissions', 'carbon footprint', 'carbon' and carbon dioxide equivalent (CO_2e).

In the context of this plan, we use the terms interchangeably. Carbon dioxide, released into the atmosphere from burning fossil fuels, is one of several greenhouse gases (GHGs) which contribute to climate change. Rather than talk about each GHG individually, we use the phrase 'carbon dioxide equivalent (CO_2e)'.

The Council's carbon footprint is the volume of carbon dioxide equivalent (CO_2e) created by our operations and assets. In order to reduce our carbon footprint, we need to reduce the volume of our CO_2e emissions – or for short, carbon emissions.

These carbon budgets represent milestones towards a net zero 2050. Whilst latest monitoring indicates that the UK is on course to meet the 2018-2022 carbon budget, the CCC forecasts that the 2027-2032 budget will not be met without more ambitious action. This will require strong policy from national government and action from local authorities like Charnwood, both to reduce our own contribution to the carbon budget and climate change, and to inspire action from our communities and business.

Charnwood Borough Council's responsibility

The Committee on Climate Change's (CCC) 2019 recommendations outlined that:

"Local authorities are well placed to understand the needs and opportunities in their local area….they have important roles on transport planning, including providing high-quality infrastructure for walking and cycling, provision of charging infrastructure for electric vehicles, and ensuring that new housing developments are designed for access to public transport. They can improve health outcomes for people who live and work in the area by implementing clean-air zones that discourage use of polluting vehicles and other technologies."

The scientific evidence shows that climate change is likely to lead to more extreme weather, whether that be high winds and storms, higher peak temperatures in summer or more rain and flooding. In Charnwood, colder winters and warmer summers will put vulnerable people at risk, with the River Soar having already demonstrated the damaging consequences of flooding. Changing climate may also have significant impacts on agriculture and our rural economy.

Although the Climate Change Act did not include a statutory target for local authorities to reduce carbon emissions, other parts of the UK have done so. For example, the Welsh Government has a set a target of achieving a carbon neutral public sector by 2030. Whilst Charnwood Borough Council do not face such government targets, like all councils around the country we will have to act to reduce our carbon footprint.

This is for two reasons. Firstly, local authorities contribute significantly to the UK carbon footprint and the 2050 target will not be achieved unless all councils act. Secondly, as a visible local institution, it is equally important that Charnwood Borough Council shows leadership and develops policies to that support businesses and citizens in reducing their carbon emissions as well.

Action on climate change will not only reduce negative climate impacts, but it also has the potential to increase prosperity, happiness and social cohesion in the Borough. For example, studies have shown that investment in renewables typically provides 27% more jobs than investment in fossil fuels. In fact, the green economy has recently contained many of the fastest growing sectors in the UK. In addition, many of the projects that achieve carbon neutrality promote green spaces, reduce air pollution and create energy.

As part of the UK Climate Change Act there are national targets which relate to our activity and the lives of Charnwood's residents and businesses. The Government have legislated to end sales of new petrol and diesel cars and vans by 2035. This won't just impact on the Council's own fleet vehicle purchasing. It also means we must ensure our employees,

residents and businesses have the infrastructure needed to support the transition to electric vehicles. For example, the CCC estimated that the UK will require 3,500 rapid and ultra-rapid chargers near motorways to enable longer journeys, and 210,000 public chargers in towns and cities to meet the 2035 target.

HGVs and large vehicles are currently not subject to this target, but these will need to decarbonise too. For Charnwood Borough Council this means planning to reduce emissions from our waste collection vehicles in the long-term and supporting development of zero carbon refuelling of HGVs, buses and taxis. This is particularly for vehicles that have key routes through Charnwood, including Junction 23 of the M1 Motorway.

Similarly, March 2020 saw the announcement of the proposed new Future Homes Standard. Proposed revisions to Part F and L of the Building Regulations, require that from 2025 all new homes built must have 80% lower carbon emissions than today. At the time of writing, no changes have been made whilst the Government review the findings of a second round of consultation which took place from 18th January to 13th April 2021. As a Council we will have to monitor policy changes and then help enable these to happen, both through the homes we build and through those we give planning permission for.

The Committee on Climate Change (CCC) said in its report *UK Housing: Fit for the Future (2019)* "Buildings constructed now should not require retrofit in 15 years' time. Rather, they should be highly energy efficient and designed to accommodate low-carbon heating from the start."

More energy efficient homes and local energy generation will help Council's meet national fuel poverty targets. In England, the Government target is for all homes to have a minimum energy efficiency rating of Band C. Charnwood Borough Council take this one step further, with our Housing Strategy 2015-2020. This strategy details how our own Charnwood Standard is committed to ensuring our sheltered accommodation and social housing exceeds national standards. We also have a role to play, alongside organisations like National Energy Action, in helping residents to reduce their energy bills. Our Home Energy Conservation Act Progress Report 2017-2019 outlines the action we have taken during the last two years.

Linked to reducing the carbon emissions of transport and housing is the need to decarbonise electricity generation. March 2020 saw the UK Government reverse legislation banning onshore windfarms, providing Councils with large rural areas like Charnwood the ability to influence renewable energy generation through the planning system or by

investing in and developing windfarms themselves. This is something many Councils already do for solar energy generation.

It is this combination of changing our operations in response to the global challenge, and international and national policy, whilst also enabling and encouraging others to do so, which is at the heart of our Carbon Neutral Plan.

This is also reflected in a series of our other policies. As a Council we will encourage and enable residents, businesses and other public bodies across the Borough and region to deliver this ambitious goal through relevant technologies, strategies and plans.

Our Climate Change Strategy 2018-2030 seeks to minimise the environmental impacts of our own activities and contribute to the improvement of the wider environment through local action. We play a significant role in protecting and enhancing the environment of Charnwood and the strategy sets out how we will meet the challenges and opportunities of climate change. It outlines three strategic priority areas for action to protect the environment for future generations:

- raising awareness
- reducing our impact on climate change
- resilience.

Our Corporate Strategy (2020-24) sets out our commitment to be a carbon neutral organisation by 2030 and this carbon neutral plan is part of that action, laying out how we can achieve this ambition.

Our commitment to reducing carbon emissions, mitigating and adapting to climate change is reflected across our strategic policies including our Open Spaces Strategy 2018-2036, Local Plan Core Strategy and our new Draft Local Plan. The local plan sets out a vision and a framework for the future pattern, scale and quality of development in Charnwood. It outlines policies for mitigation measures which reduce our impact on climate change and looks to ensure our built and natural environments are resilient and can adapt to climate change over the short and longer term.

Our commitment in the Corporate Strategy to ensure 100,000 trees are planted in the Borough is also underway. The carbon savings from sequestration by these trees will be factored into the final year of this Carbon Neutral Plan, to consider the time taken to complete the planting programme and for the trees to reach maturity.

Building on our 2015-2020 success

In 2015, Charnwood Borough Council developed a Carbon Management Plan which aimed to achieve a 15% reduction in carbon emissions by 2020 against a 2012-13 baseline.

Definition: What is a carbon emissions baseline?

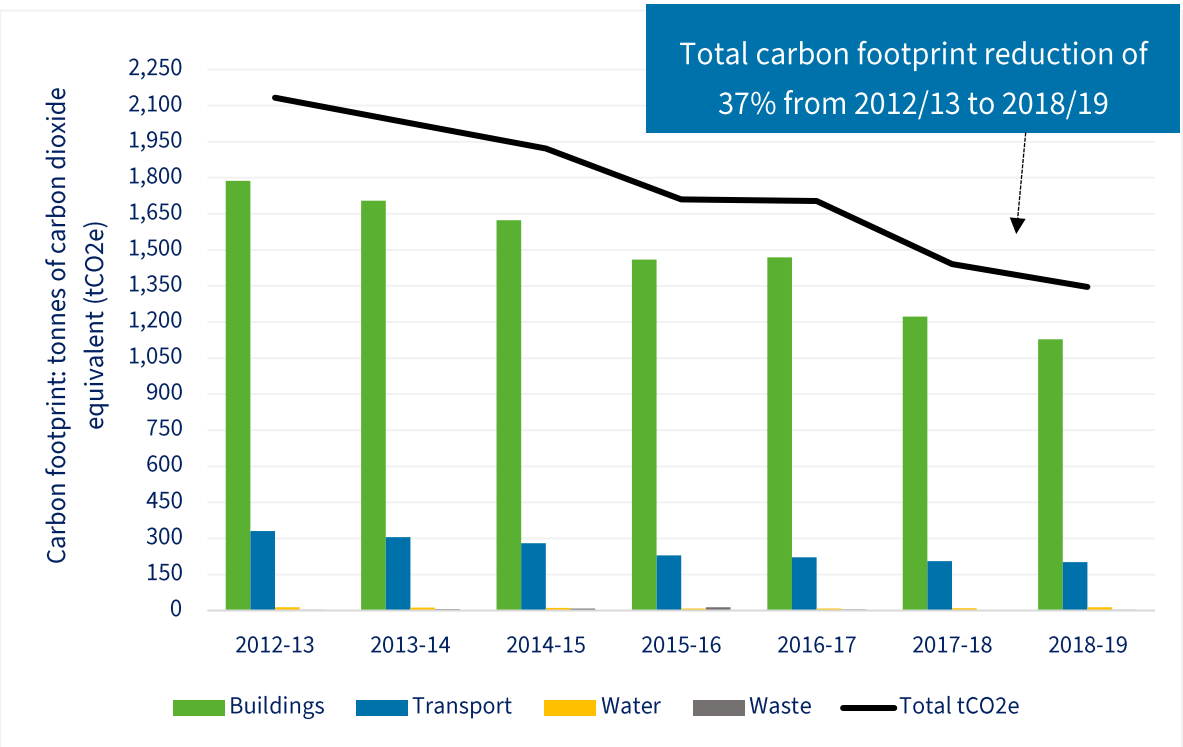
The baseline for the Carbon Management Plan refers to the total carbon emissions the Council created in the final year before we started developing the plan.

The baseline was used to show what the Council's total emissions would be each year if our operations and activity continued without implementing any projects to reduce emissions. To measure reductions in our carbon emissions resulting from projects, we compare how our emissions have changed compared to the baseline.

Within a year from 2015-16, as a result of energy savings across the Council operations, we achieved and surpassed that target and recorded a 21% decrease in emissions. Progress continued as more energy saving projects across our buildings were implemented.

As a result, the most recent monitoring report for the Carbon Management Plan shows that carbon emissions from Council operations fell by 37% in comparison to the 2012-13 baseline – well in excess of the 15% target. In absolute terms this was a reduction of 787 tonnes of carbon dioxide equivalent (tCO_2e) (Figure 1). This is the equivalent of heating and lighting nearly 200 households based on Committee on Climate Change latest figures (2014).

Figure 1: Change in Charnwood Borough Council's carbon footprint over time



Not only did the projects implemented as part of the Carbon Management Plan achieve significant carbon reductions, but they also delivered financial savings to the Council. Despite a rise in the price of energy, the projects within the Carbon Management Plan helped reduce energy and fuel costs by a cumulative total of over £280,000.

Energy and fuel costs in 2018/19 were £33,000 less compared to 2012/13. This is equivalent to 3% of our 2019/2020 budget for maintaining parks, sports grounds, and public spaces in Loughborough, and would pay for the maintenance of Carillion Tower more than twice over.

The biggest changes in energy use, carbon emissions and costs came earlier on in the programme, with fewer projects being delivered in 2018/19. The new Carbon Neutral Plan 2030 will therefore help renew the momentum and impetus the 2015-2020 Carbon Management Plan created.

Our carbon footprint

The target of reaching net zero emissions by 2030 is challenging, but we have already shown that we can act decisively and effectively to reduce carbon emissions. As a council we have been reducing our carbon emissions for many years through our Carbon Management Plan and are building on a solid record of success.

Despite the achievements of the Carbon Management Plan, there is much more that the Council must do to achieve carbon neutrality. To this end, a new baseline for this plan has been calculated for the Council's operations. This provides an understanding of the Council's current carbon footprint and will allow the Council to measure reductions in our carbon emissions as a result of this plan.

Defining our carbon footprint

What are the GHG Protocol and PAS 2060 standards?

GHG Protocol establishes comprehensive global standardized frameworks to measure and manage greenhouse gas (GHG) emissions from private and public sector operations, value chains and mitigation actions. Building on a 20-year partnership between World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), the GHG Protocol is used by governments, industry associations, NGOs, businesses and other organizations.

PAS2060 is an international standard of carbon neutrality. Published by the British Standards Institution, it aims to create transparency and accountability around declarations of carbon neutrality to build trust and confidence. The standard is widely used by organisations across the world to demonstrate validated evidence of carbon neutrality.

In keeping with the globally recognised GHG Protocol, we have broken down carbon emissions into Scope 1, Scope 2 and Scope 3 emissions.

Understanding different scopes:

Scope 1 emissions are those created within buildings owned and occupied by the Council, such as the Southfields offices, and fleet vehicles owned and used by the Council.

Scope 2 includes any emissions created on the Council's behalf. For example, through the purchase of electricity generated from gas-fired power stations.

Scope 3 covers the other emissions that are the consequence of actions of the Council which are not included in Scope 1 or Scope 2 – this includes outsourced services, employee commuting, and the use of employees' personal cars for Council activity.

Our footprint also includes some of our procurement, such as how we purchase electricity. Purchasing more renewable electricity reduces the carbon footprint of the energy we use, making a direct impact on our footprint.

A long-term goal of many organisations is to reach a level on a par with globally recognised carbon neutral standards, such as PAS 2060. For the Council to achieve this will require a full audit of our procurement processes and to measure the emissions resulting from every product and service we purchase. At this stage in the Council's journey however, it has been decided to focus on emissions we can directly control. This means for example, that the electricity used in our own buildings is counted, but electricity used by our tenants in buildings that we own, but do not occupy, is not.

2018-2019 Baseline

2018-2019: our carbon footprint was 1,130 tCO_2e

To demonstrate the impact of our decision to purchase renewable electricity we have presented the emissions of our electricity consumption calculated using both a location-based and market-based methodology (see below box).

A new methodology for a new plan:

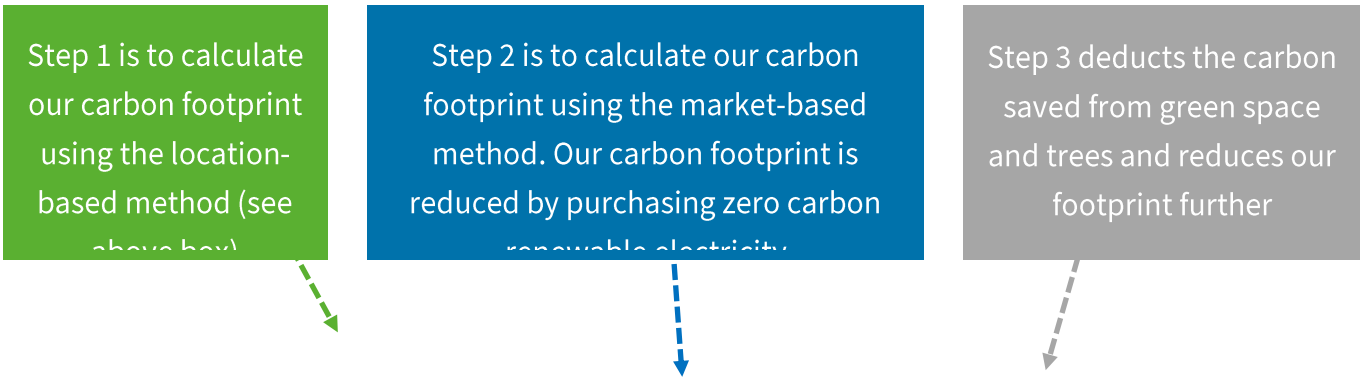
Location based method: the location-based method for calculating carbon emissions from electricity use is based on the carbon impact of the local electricity grid. In the UK our electricity is generated from both fossil fuel, zero-carbon, and renewable energy. The location-based method takes Charnwood Borough Council's electricity use and calculates the carbon emissions based on the national mix of how electricity is generated. **The location-based method was used in the 2015-2020 Carbon Management Plan.**

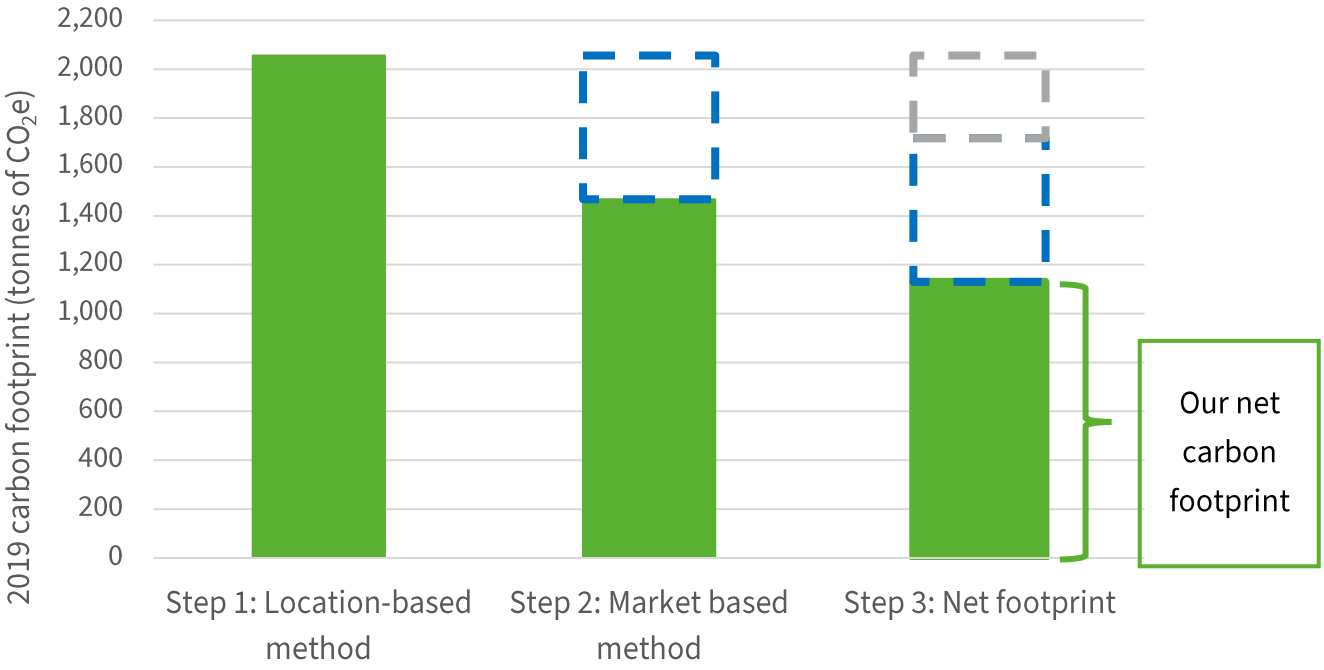
Market based method: Our 2020 baseline for the **Carbon Neutral Plan 2030 uses the market-based method** to calculate emissions from electricity use. This method takes into consideration how the energy the Council actually purchases is generated. If we procure more 100% renewable energy, our footprint goes down.

The location-based methodology is the first step in a three-step process to calculating our carbon footprint based on our total gas and electricity consumption. The market-based method is the second step, which accounts for the fact we use 100% renewable electricity at Council buildings meaning this electricity use creates zero carbon emissions.

The third step is to calculate the net footprint – which is the emissions we generated and calculated at Step 2 minus any emissions we offset. We offset emissions by reducing the carbon emissions by activities that either take carbon dioxide directly out of the atmosphere or reduce the carbon impact of others more than would happen without our involvement. This accounts for the positive impact of green spaces and trees throughout Charnwood on absorbing carbon dioxide from the atmosphere (a process known as sequestration) and carbon positive activity like producing renewable energy.

Overview of the three steps





Step 1: Gross carbon footprint using location-based method

Using the location-based methodology to calculate the emissions from electricity consumption the gross carbon footprint in 2019 is 2,056 tCO_2e (Table 1). This is the same method used in the Carbon Management Plan 2015-2020.

Table 1: Step 1 – Gross 2018-2019 carbon footprint of the Council operations by scope using location-based method

Source	Emissions (tCO_2e)			
	Scope 1: emissions directly from Council owned and operated activity	Scope 2: emissions created through energy supply	Scope 3: emissions from outsourced services and grey fleet	Total emissions
Building	298	542	46	886
Transport	123	0	1,026	1,149
Waste	0	0	6	6
Water	0	0	16	16
Total	421	542	1,093	2,056

Step 2: Gross carbon footprint using market-based method

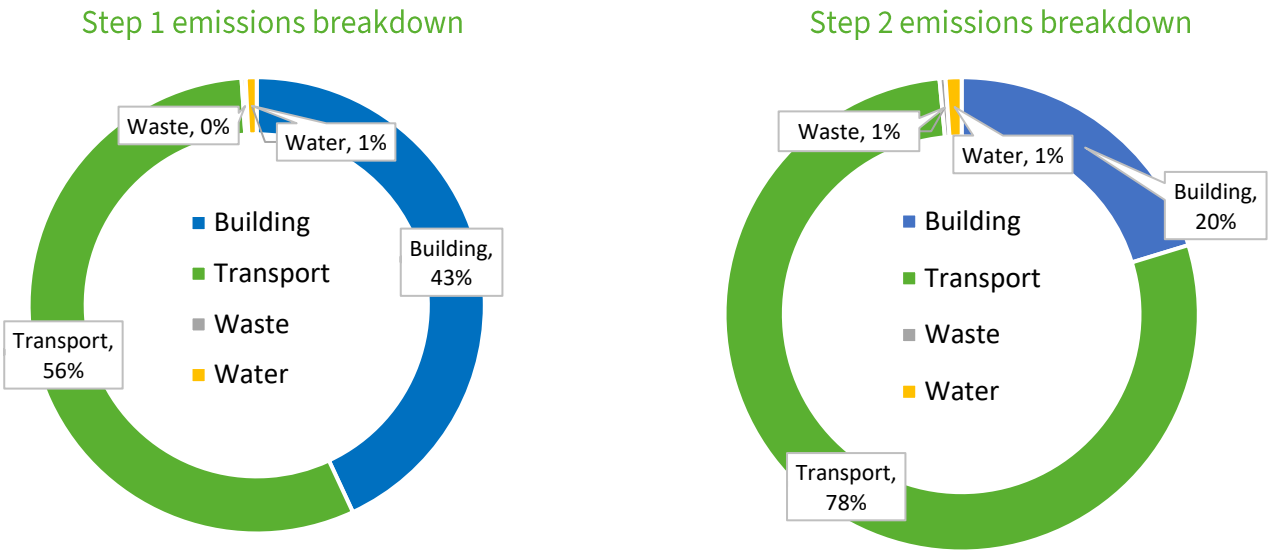
Adopting the more accurate market-based method for calculating emissions from electricity shows that any electricity used at Council buildings does not create any carbon. The Council's positive procurement choice to purchase renewably sourced electricity for all its own operations saves 588 tonnes of carbon dioxide equivalent (tCO_2e), reducing the carbon footprint by 35% to 1,468 tCO_2e (Table 2).

Table 2: Step 2 -Gross 2018-2019 carbon emissions of the Council operations by Scope, using market-based method (gross emissions taking account of renewable energy purchase)

Source	**Emissions (tCO_2e)**			
	Scope 1: emissions directly from Council owned and operated activity	**Scope 2: emissions created through energy supply**	**Scope 3: emissions from outsourced services and grey fleet**	**Total emissions**
Building	298	0	0	298
Transport	123	0	1,026	1,149
Waste	0	0	6	6
Water	0	0	16	16
Total	421	0	1,468	1,468

The impact of adopting the market-based method is to reduce Scope 2 & 3 emissions from our buildings. The fact that these buildings use 100% carbon zero renewable energy means that the only emissions from buildings are through fossil-fuelled heating and cooling. The change in the make-up of emissions at Step 1 compared to Step 2 is shown in Figure 2.

Figure 2: breakdown of emissions by source



Step 3: Net carbon footprint

The final step to complete our carbon footprint calculation is to subtract our carbon-positive activity from built and land assets we own. This includes sequestration by trees and green space or renewable energy that we generate in our own renewable energy installations and then export to the National Grid.

Across the Borough's owned green space and natural assets, 338 tCO_2e was sequestered or removed from the atmosphere in 2018/19. Subtracting this from the emissions we generate means that in 2019 our carbon footprint was 1,130 tonnes of tCO_2e (Table 3).

Table 3: Step 3 – 2018-2019 Net- carbon emissions of the Council operations

Source	Total tCO_2e (location-based method)	Total tCO_2e (market-based method)	Total tCO_2e sequestered
Building	886	298	
Transport	1,149	1,149	
Waste	6	6	

Water	16	16	
Total emissions	*2,056*	*1,468*	
Sequestration			338
Renewable generation			0
Total offset			*338*
Total net baseline			**1,130**

2019-2020 Carbon Footprint & Sequestration Value Change

2019-2020: our carbon footprint was 1,377 tCO_2e

2019-2020 footprint

Our 2019-2020 energy use shows the important positive impact our decision to purchasing 100% renewable electricity. In fact, purchasing renewable electricity has reduced the carbon emissions from our buildings by 70%, saving 737 tonnes of CO_2e (Table 4).

Table 4: 2019-2020 carbon footprint

Source	Total tCO_2e (location-based method)	Total tCO_2e (market-based method)	Total tCO_2e sequestered
Building	1,059	322	
Transport	1,279	1,279	
Waste	6	6	
Water	23	23	
Total emissions	*2,233*	*1,496*	
Sequestration			-252
Renewable generation			0
Total offset			*-252*
Total net baseline			**1,377**

Change against 2018-2019

Our carbon footprint has increased compared to 2019. This includes a rise of 24 tonnes CO_2e in buildings and of 138 tonnes in transport (Table 5).

However, the biggest impact on our footprint comes from a change in the way the sequestration of carbon emissions is calculated following the publication of new data on carbon storage by Natural England in 2021. Natural England undertook a major review of the scientific evidence for sequestration from different land uses and collated the latest

information on how, for example, planting trees has a positive impact on carbon emissions. However, the report also brought in more evidence of the impact of other aspects of the land use change, including the impact on soil. The positive benefit we get from sequestration is better understood but overall the effect is less by 86 tonnes CO_2e.

Table 5: 2019-2020 carbon footprint compared to 2018-2019 baseline.

Source	tCO2e generated (market-based method)		
	2018-2019	2019-2020	% Change
Buildings	298	322	7%
Transport	1,149	1,279	10%
Waste	6	6	0%
Water	16	23	30%
Total emissions	1,468	1,496	2%
Sequestration[1]	-338	-252	-34%
Renewable generation	0	0	0%
Total offset	*-338*	*-252*	*25%*
Total net baseline (Emissions minus offset)	**1,130**	**1,378**	**18%**

The 2020 carbon footprint uses the same three-step method developed in 2019. The impact of the Council's decision to purchase renewable electricity, and the carbon sequestration of trees and green space is shown in Figure 3 and Figure 4.

[1] Sequestration values are impacted by a newly updated Natural England conversion factor used for 2020 and 2021

Figure 3: The three steps to calculate the 2020 carbon footprint

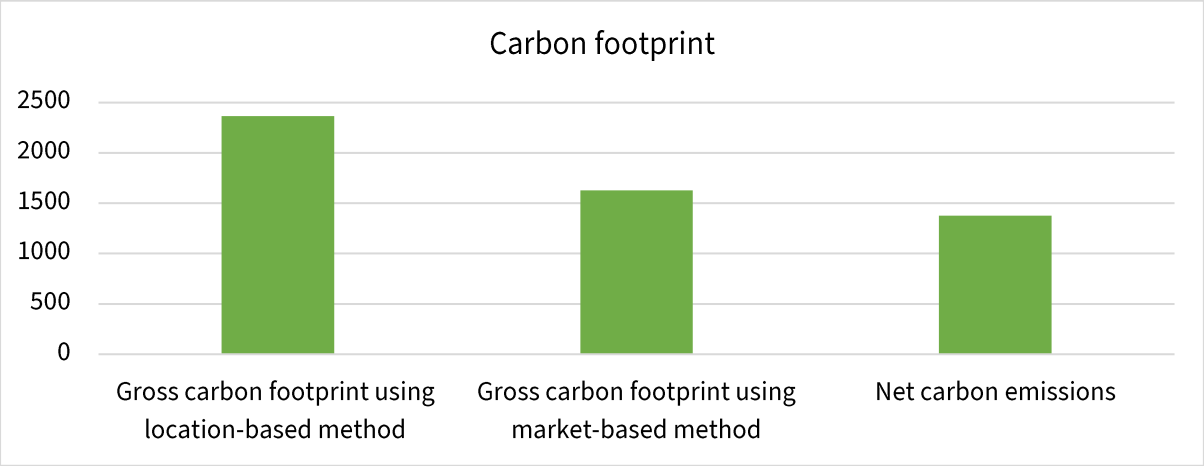
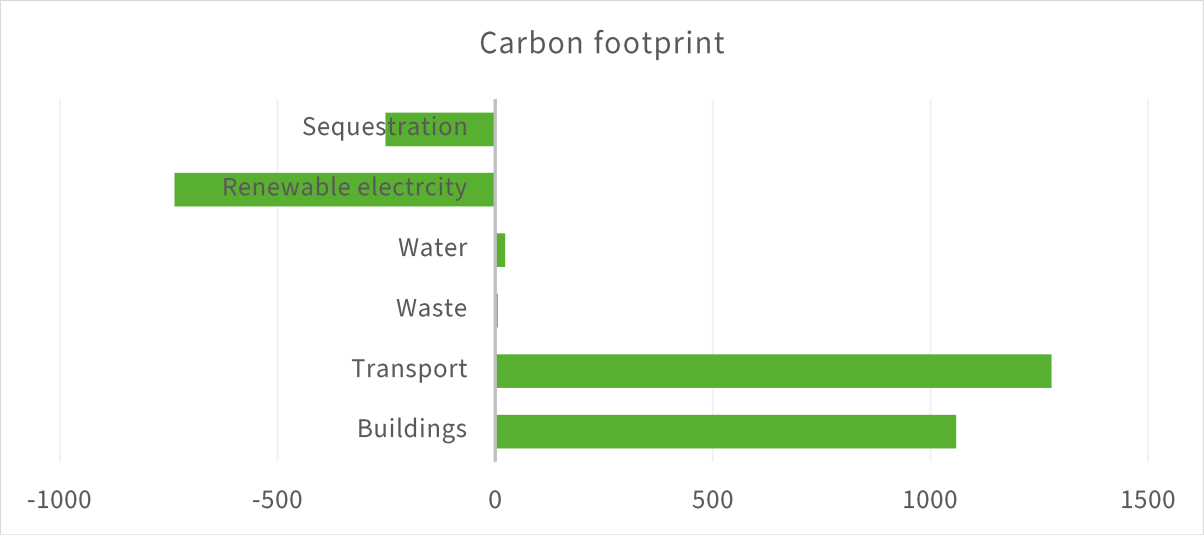


Figure 4: The impact of renewable electricity and carbon sequestration



2020-2021 Carbon Footprint and COVID-19 Impact

2020-2021: our carbon footprint is 1,092 tCO_2e

2020-2021 footprint

Our 2020-2021 energy use shows the important positive impact made by our decision to purchase 100% renewable electricity. In fact, purchasing renewable electricity has reduced the carbon emissions from our buildings by 76%, saving 631 tonnes of CO_2e (Table 6).

Since September 2020, as part of the COVID-19 pandemic response, the NHS have leased the ground floor of the Southfields Road building. The Council do not have access to this space, and as such, the emissions generated need to be excluded from the buildings carbon footprint for 2020-2021. However, the building is not sub-metered meaning there is no definitive record of energy consumed by the NHS. Therefore, an estimate has been made using floor space leased and operational hours. The emissions of the NHS have been estimated based on the NHS using 32% of the buildings operational time (calculated as square metres an hour per week).

Table 6: 2020-2021 carbon footprint

Source	Total tCO_2e (location-based method)	Total tCO_2e (market-based method)	Total tCO_2e sequestered
Building	833	202	
Transport	1,133	1,133	
Waste	6	6	
Water	9	9	
Total emissions	*1,981*	*1,350*	
Sequestration			-258
Renewable generation			0
Total offset			*-258*

Total net baseline			**1,092**

Change over time

Our 2020-2021 carbon footprint has reduced by 3% compared to 2018-2019 (Table 7). There has been a larger decrease 286 tonnes CO_2e or 21% from 2019-2020(Transport emissions were impacted by COVID-19, as staff travel was heavily reduced. Reported mileage driven was 50% less than baseline. Similarly, there was a reduction in the use of some contracted vehicles, including a reduction in fuel use by refuse collecting vehicles.

The nature of the Council's buildings means the impact of COVID-19 energy use and carbon emissions has been different across the buildings. These differences can be seen in Table 9. The changes in working practice and building occupancy meant that water use was also 61% down on the baseline.

Table 8). Net emissions from all sources have fallen.

Table 7: 2020-2021 carbon footprint compared to 2018-2019 baseline.

	tCO2e generated (market-based method)		
Source	**2018-2019**	**2020-2021**	**% Change**
Buildings	298	202	-32%
Transport	1,149	1,133	-1%
Waste	6	6	0%
Water	16	9	-44%
Total emissions	*1,468*	*1,350*	*-8%*
Sequestration[2]	-338	-258	24%
Renewable generation	0	0	0%
Total offset	-338	-258	24%
Total net baseline (Emissions minus offset)	**1,130**	**1,092**	**-3%**

[2] Sequestration values are impacted by a newly updated Natural England conversion factor used in 2020 and 2021.

Transport emissions were impacted by COVID-19, as staff travel was heavily reduced. Reported mileage driven was 50% less than baseline. Similarly, there was a reduction in the use of some contracted vehicles, including a reduction in fuel use by refuse collecting vehicles.

The nature of the Council's buildings means the impact of COVID-19 energy use and carbon emissions has been different across the buildings. These differences can be seen in Table 9. The changes in working practice and building occupancy meant that water use was also 61% down on the baseline.

Table 8: 2020-2021 carbon footprint compared to 2019-2020.

	tCO2e generated (market-based method)		
Source	**2019-2020**	**2020-2021**	**% Change**
Buildings[3]	322	202	-37%
Transport	1,279	1,133	-11%
Waste	6	6	0%
Water	23	9	-61%
Total emissions	*1,496*	*1,350*	*-10%*
Sequestration	-252	-258	2%
Renewable generation	0	0	
Total offset	*-252*	-258	2%
Total net baseline (Emissions minus offset)	**1,378**	**1,092**	**-21%**

[3] Buildings and renewable electricity analysis include more stock in 2020 and 2021 compared to 2019

Table 9: Changes in emissions from gas use before and during the COVID-19 pandemic

Building	Tonnes CO_2e from energy use (market-based method)			Notes
	2018-2019	2019-2020	2020-2021	
Southfields	88	99	69	The NHS have leased the ground floor of the Southfields Road office as part of the response to COVID-19. Their estimated contribution to the building's emissions have been removed from the 2020-2021.
Loughborough Town Hall	113	118	86	Building closed since Monday 16th March 2020.
Woodgate Chambers	51	55	35	Building occupancy was impacted by COVID-19 resulting in an overall decrease in energy usage in last year. Many tenants work with vulnerable people which meant Glebe House, CAB and Aspire Life Skills being fully or partially closed, under LCC guidance.
Charnwood Museum	30	27	20	Building closed since Monday 16th March 2020. Park-facing café has been open for takeaway between 4th June 2020 and 15th November 2021 and opening again in Spring 2021. Energy consumption is not metred separately.
ICS Building	12	13	16	The ICS building continued to be in operation during the pandemic. It is speculated that the small increase energy usage could have been caused by more continuous connection of remote workers IT equipment to the servers.
The Oak	4	4	5	Building remained open to tenants. Heating supplied centrally from one boiler, so occupancy does not affect gas use.
Other locations	4	5	4	Locations include Public Conveniences, Shelthorpe Golf Course, Queen's Park Bowling Club, Nanpantan Sports Ground, Limehurst Depot.

Building	Tonnes CO_2e from energy use (market-based method)			Notes
	2018-2019	2019-2020	2020-2021	
Total	**302**	**322**	**235**	

Forming the Carbon Neutral Plan

Building the Carbon Neutral Plan has required consultation with all parts of Charnwood Borough Council. There were two stages of internal stakeholder engagement both pre-COVID and during COVID. These required different parts of the Council being engaged to ensure our projects match the ambition of the Council, are aligned with service delivery plans and budgets, and are financially prudent.

The Pre-COVID stakeholder engagements occurred between November 2019 and May 2020. The more recent engagement occurred between April and May 2021, which revisited many of the stakeholders to understand progress and priority changes to their respective Carbon Neutral projects plans.

First engagement (pre-COVID)

Face-to-Face Meetings with building managers and Heads of Service

In November and December 2019, multiple visits were made to Charnwood Town Hall, Charnwood Museum, Woodgate Chambers, the Oak Business Centre, the Ark Business Centre, and our Southfield Road and ICS building complex.

Building managers played an important role in providing information and data to inform our projects, as well as describing what they would like to happen and the challenges they face. A carbon footprint and energy audit has been prepared for each of the buildings. These include technical details on the projects in this plan, and a number of other potential projects which have been ruled out.

Meetings with corporate and delivery services have taken place throughout the project, starting in November 2019 and continuing to April 2020. This has been to ensure the projects we propose complement existing plans rather than conflict with them, and to inform the timeline of project delivery.

Workshop with Heads of Services and building managers

In 2019 a half-day workshop was held with around 20 staff from Charnwood Borough Council, representing a range of delivery and corporate services and building managers.

Working in groups, participants created a vision statement for how to achieve a net carbon neutral Council. Then, reflecting on achievements so far, participants brainstormed and prioritised a number of projects and delivery actions. The range of projects in this plan match those identified in the workshop and the roadmap designed by each group. A key area of focus from each group was the importance of culture change at a Corporate Leadership level to enable large and impactful projects to happen.

Members briefing event

In February 2020, an evening briefing event was delivered to Members. Led by Councillor Rollings, over 30 Members attended to learn about our Carbon Neutral Plan 2030 and to ask questions. During the discussion, the enthusiasm of the Members to be engaged and involved in successfully reaching our aim was clear.

Corporate Leadership Team and Board Meetings

Our work on the Carbon Neutral Plan began with an introductory meeting to the Corporate Leadership Team to capture their priorities. This has been followed up by

quarterly Project Board meetings to discuss the proposed projects. The Project Board is made up of Officers and elected Members.

Second engagement (during COVID)

Video Meetings with building managers and Heads of Service

Between April and May 2021, due to social distancing restrictions, multiple video meetings were conducted with the same Charnwood Borough Council's service leaders engaged prior to COVID.

This was to understand how council services have had to adapt operationally and financially due to COVID, and any impact this has had on progress made on previously planned carbon neutral priority activities. These insights have been incorporated into the 2030 Carbon Neutral Plan, reflecting the current policy priorities and funding restrictions that are in place.

Delivering the Plan

Managing and delivering projects

Co-ordinating the whole Council activity to ensure that Carbon Neutral projects are embedded across our capital programme and services is likely to require additional resources.

To be most effective, there is a need for a dedicated resource with an overview of each Service area to coordinate activity between Service Managers within and across Directorates.

Many of the projects in this plan are cross-directorate and will have a golden 'window of opportunity' to deliver. For example, if a building is being renovated then this is likely to be the most efficient and cost-effective time to deliver carbon saving and energy generation projects. It will be essential to ensure that these carbon reduction projects are considered and included in the plans for renovation and that such opportunities are not missed. We will consider the support required for Council Services in writing funding bids, identifying best practice examples, and working with procurement, partners and suppliers during project delivery.

This plan is designed to be flexible. The menu of projects and the prioritisation tool later in this report allow the Council to respond to funding opportunities and new technologies and delivery models which may emerge.

There will be a need for concerted action from across the Council and additional resources will be needed to drive forward our ambition to become a carbon neutral council by 2030. This will include resources for selecting projects, delivering them, and identifying new opportunities. Using the Carbon Accounting Tool provided, there will also be a need to ensure monitoring and evaluation of projects is overseen, with accurate and timely progress reports provided to members.

Action 1	**Ensure dedicated resources are in place to implement the management and delivery of the Carbon Neutral Plan.**

Reducing emissions is a whole Council activity

In developing this Carbon Neutral Plan, we have worked closely with different areas of the Council responsible for service delivery. The projects presented are designed to

complement and build on our existing budget plans to reduce the Council's carbon footprint.

Eliminating the carbon footprint of the Council's assets, operations and services is not about, and cannot be about, one area of Council activity pursuing a stand-alone agenda. Making corporate decisions which enable and encourage all services to reduce carbon emissions will need to become the new normal during the course of this plan and, as such, is a whole Council activity.

As a Council we are well placed to make the corporate and cultural changes needed to deliver the Carbon Neutral Plan. Our Lead Member for Transformation sits on the Council's Cabinet with a remit including the Environment and climate change agenda. The Council also has a climate change champion Member to promote the Council's objectives.

Action 2	**Formalise and embed a process for evaluating the impact arising from the council's decisions on carbon emissions.**

For the Council to become carbon neutral by 2030, there are four key enabling factors; taking responsibility, joined-up working, procuring outcomes, and learning from data. Unlocking these factors requires changes to the way we work at a corporate level (Figure 5).

Figure 5: Enabling factors for long-term carbon neutral project delivery

Delivering Carbon Neutral Projects and reaching net zero by 2030 will need dedicated resource for owning and delivering projects.

Co-ordinating the whole Council activity to ensure that Carbon Neutral projects are embedded across our capital programme and services is likely to require additional resources.

This requires changes that facilitate collaborative actions and work towards a shared goal across disciplines to effectively reduce carbon emissions. Embedding sustainability and climate change in Council decision making is part of this process. Making a Sustainability /

2. Joined-up decision making

Climate Change checklist as a mandatory inclusion in Cabinet / Council reports is one way to achieve this.

One practical example is on reducing the emissions from the Council's fleet and grey fleet vehicles. This doesn't just require new vehicles. It requires new infrastructure for charging them, and Human Resource policy changes to how employees use and access vehicles, and mileage payments. Without breaking down silos and involving all service directorates and corporate functions of the Council, we will not be able to grasp the available opportunities to reduce our carbon footprint.

3. Learning from data

Monitoring the impact of the projects in this plan is important. This means that embedding a standardised way of collating and reporting on tracking and the monitoring of data is important. To achieve this, the different teams responsible for delivering the projects understand the value of data in:

- Clearly tracking which projects have been deployed and at what cost to demonstrate progress to Elected Members and citizens.
- Monitoring changes in energy use, vehicle fuel use and energy generated to show the progress towards net carbon neutrality.
- Reporting on financial savings and revenues to make the case for further investment as the plan progresses.
- Creating feedback loops from pilots to learn what works in order to inform future projects.

Internal standards can be used so that procurement considers carbon emissions and data collection – either by explicitly asking tenderers to answer a question on carbon emissions in tenders, or by simply by making an internal assessment of potential carbon impact. This can enable the Council to maximise opportunities to achieve carbon

4. Procuring outcomes

savings, embed monitoring data, as well as achieving the intended social and economic outcomes.

Strategic procurement should focus on long-term benefits over quick wins. Whilst technology applications change rapidly, underlying infrastructure such as low carbon vehicle infrastructure or housing can be designed and built in a way that is future proofed from the start. For example, new or renovated buildings can be built in a way that enables them to adopt fully zero-carbon heating, power, and mobility in the future, even if these are not available now.

Roles and Responsibilities

The Carbon Neutral Projects identified have been specifically chosen to build and add value to existing council activities and plans (at all levels), by filling delivery gaps and joining-up resources to support Council commitment to achieve Carbon neutrality by 2030.

Council-wide collaboration is needed to deliver the Carbon Neutral Plan. To provide clarity on roles and responsibility the PACE framework for project management will be used for each project during the life of the Carbon Neutral Plan.

PACE is designed to enable fast decision making, accountability and consensus building to co-ordinate the different council stakeholders.

Each letter within PACE specifies the level of ownership and responsibility for a given Council stakeholder. For Carbon Neutral projects, roles and responsibilities will be assigned as shown in Table 10.

Table 10: PACE framework roles and responsibilities

Role		Responsibility
P	**P**roject Owner	Responsible for planning and monitoring projects to ensure they are on time, on-budget and meet requirements. They coordinate and inform other stakeholders and seek necessary approvals.
A	**A**pprover	Responsible for reviewing key project milestones and approving any final decisions.
C	**C**ontributor	Responsible for providing expert consultation and enabling support.
E	**E**xecutor	Responsible for “on the ground” project implementation.

Prioritising Projects

A Carbon Neutral Project Screening Tool can be used by project managers and Heads of Services who are responsible for developing and promoting carbon reduction projects.

The Tool provides a mechanism for scoring projects against 11 criteria which have been designed to reflect different considerations in our decision-making process, from carbon emissions reduction to financial payback.

To turn these 11 individual scores into recommendations, the tool calculates two combined scores:

- **Impact score:** 6 impact criteria scores added together.
- **Deliverability score:** 5 financial deliverability criteria scores added together.

These two scores can then be plotted on two-by-two matrix which will recommend whether projects should be prioritised. For example, projects which have a high impact score, and high deliverability score are prioritised as 'must do', as shown below (Figure 6).

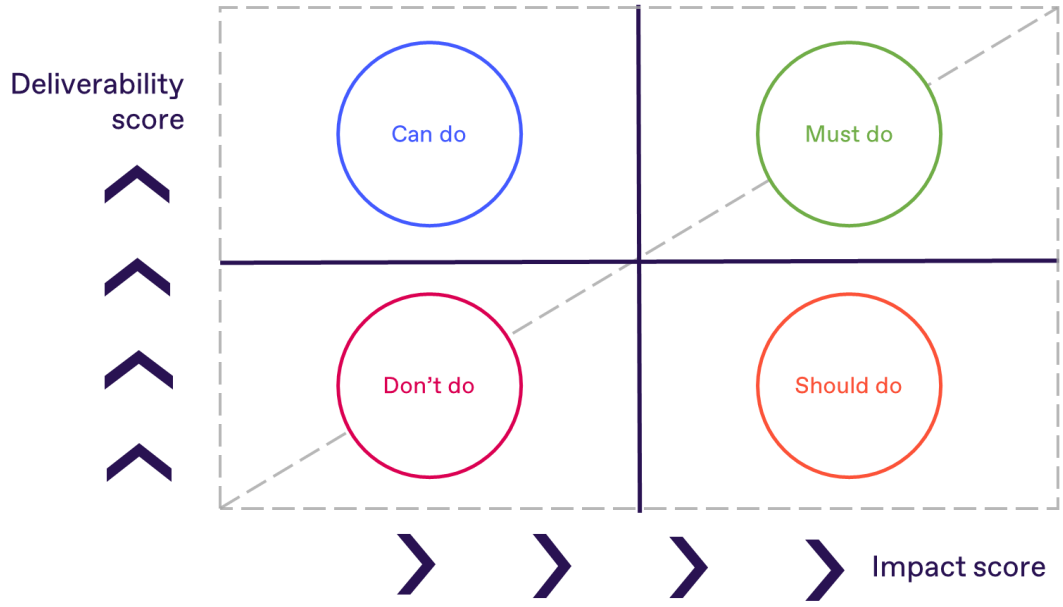


Figure 6: Prioritisation matrix

The impact criteria are:

C1	Targeted	**Is the project tackling the biggest carbon emitters and most urgent priorities to address**
		Is the project tackling a major source of Charnwood Borough Council's carbon emissions?
C2	Carbon impact	**Scale of carbon reduction**
		Does the project make a significant contribution to reducing carbon?
C3	Visible	**People see and feel the benefits of the Net Zero Plan**
		Charnwood Borough Council staff see real change and the project is a visible demonstration of action to communities across the Borough.
C4	Scalable	**Is the project scalable across the whole Charnwood Borough Council estate/fleet/operations, if required?**
		If the project is a pilot, or focusing on just a part of Charnwood Borough Council's estate or fleet, will it be scalable across the rest of the estate or fleet?
C5	Intelligent	**Responsive and future-proofed solutions**
		Is the project using the best solution or technology for the long-term and is preparing Charnwood Borough Council for integrating future technologies or responding to future policy?
C6	Added value	**Is the project adding value to or topping-up planned Charnwood Borough Council activity rather than duplicating or conflicting?**
		Is the project using Carbon Neutral Plan budget to enhance or improve the energy and carbon performance of activity planned by different Services across Charnwood Borough Council rather than funding a new or stand-alone activity?

The deliverability criteria are:

D1	Deliverability	**Ability to deliver and realise benefits in the short term.**
		Does Charnwood Borough Council have the ability to deliver with current capacity and resources?
D2	Readiness	**Project readiness level**
		Is the project 'off the shelf' or already progressed through stages of design and feasibility, meaning it can be implemented
D3	Cost	**Scale of investment needed**
		Is the level of investment needed affordable within existing budgets or known sources of funding?
D4	Return on investment	**Timescale for payback**
		Will the project payback either through revenue generation or cost savings within five years? If funded by external loans, will annual savings exceed loan repayments?
D5	Alignment with funding opportunities	**Does the project provide an opportunity to secure funding?**
		Is the project aligned (in terms of outcomes, sector, focus, and scale) with priorities of UK government funding for Local Authority internal projects, research funding via universities, or private investment funds?

Funding and Partnerships

Financing large scale energy efficiency and energy generation schemes is a big challenge for local authorities around the country. This is no different for us here in Charnwood, especially as we emerge from the unprecedented situation created by COVID-19.

As the costs of the required carbon neutral projects are outside our available budget additional forms of funding and finance are needed. The majority of this will be from external sources.

External funding

We recognise the need for a step change in how we develop projects to reach net zero, and a number of national organisations can be important partners in navigating different finance options.

A key organisation to engage is Local Partnerships. Local Partnerships is described as a joint venture between HM Treasury, the Local Government Association and Welsh Government. Local Partnerships focus on helping the public sector deliver projects to reduce carbon emissions and maximise value for money.

Local Partnerships run the Re:fit programme. Re:fit is a procurement initiative for public bodies wishing to implement energy efficiency measures and local energy generation projects on their assets. Local authorities can access the Re:fit framework for development and delivery of long-term capital programmes to reduce carbon emissions and improve the performance of existing and newly created assets.

Forming a regular dialogue with Local Partnerships will be an important aspect of delivering the plan. This will include understanding fully how Local Partnerships can help us deliver the Carbon Neutral Plan and to help us access the wider range of guidance on finance provided by the Local Government Association.

Loans and debt finance

Government funding and finance often takes place in phases and waves. For example, two funding streams became available for short periods in the first half of 2021:

- **Phase 2 Public Sector Decarbonisation Scheme replaced the SALIX Energy in 2-Efficiency Loan Scheme**. This scheme, funded by BEIS and administered by SALIX provides Local Authorities with loans to fund heat decarbonisation and energy efficiency measures, with a focus on a whole buildings approach.

- **The Public Sector Low Carbon Skills**. This fund provided grants to help all eligible public sector bodies to source specialist and expert advice to identify and develop energy efficiency and low carbon heat upgrade projects for non-domestic buildings.

It is likely that that these schemes will re-open for new phases in the future and it is important we are fully prepared for this event. To do this, we will:

- Maintain dialogue with the Local Government Association and BEIS so we know when application rounds are coming
- Continue with feasibility studies and project proposal development so we have 'off the shelf' projects ready for a quick response to funding calls.

Progressing feasibility studies and project proposals will also be required to access established forms of public sector borrowing.

As well as waves of funding, there are established, and emerging forms of finance backed by the UK Government.

The Public Works Loan Board (PWLB) is the most established source of finance for local authorities. The PWLB generally offers the lowest rate of interest available to local authorities and is provided on a more flexible basis than most private sector funding. Warrington Borough Council borrowed £58.7m from the PWLB to build two solar farms which opened in 2019 and 2020. Projects do not have to be delivered withing Charnwood for us to access this finance. For example, Warrington's projects are a 34.7MWp solar farm plus a 27MW battery storage facility near York and a 25.7MWp solar farm in Hull.

Community Municipal Bonds are a relatively new but growing way for Local Authorities to raise finance for infrastructure investment. A form of public sector crowdfunding, with members of the local community able to invest in projects for a rate of return. West Berkshire Council raised £1m to fund new rooftop solar power on Council-owned buildings. A total 640 investors, 20% from within the local authority, invested with West Berkshire Council paying returns of 1.2 per cent per year over a 5-year term.

The Salix Recycling Fund provides capital investment in energy-efficient technologies across the public sector. It is a ring-fenced fund with capital provided by Salix and matched by the partner organisation, to be spent on energy-saving projects with paybacks up to 10 years. The financial savings delivered by the projects are returned to the fund allowing further spending on front line services, hence the term 'Recycling Fund'.

The UK Infrastructure Bank (UKIB) will provide a total of £4billion loans to local authorities for strategic infrastructure projects. Unlike private projects, local authority projects do not need to be revenue generating in themselves, but the Bank will seek evidence that the project is financially sound, and that the authority has the ability to repay the loan. The minimum loan is £5million. This is a larger amount than we may need, however the UKIB provides advice to support collaboration and partnership working meaning we can work together with other organisations and local authorities. The UKIB is planning to start further engagement with local authorities during Summer 2021 and will also be releasing further guidance. Liaising with UKIB and exploring opportunities for collaborative projects will be important.

Grants

A selection of available and relevant grants is summarised below. An aspect of delivering the Carbon Neutral Plan will be to monitor new grant announcements on a regular basis. Ensuring sufficient resources and capacity is available to work on funding bids will be important to avoid missing opportunities that arise.

The Office for Low Emissions Vehicles (OLEV) Workplace Charging Scheme a voucher-based scheme that provides support towards the up-front costs of the purchase and installation of electric vehicle chargepoints at workplaces, including public sector organisations.

The Heat Networks Investment Project (HNIP) is a government funding programme to increase the number of heat networks being built in towns and cities. The scheme offers grants and loans to both the public bodies for heat networks serving 2 or more buildings. This could provide an opportunity to help other organisations in Charnwood decarbonise their heating at the same as we do for our own buildings.

Defra's Air quality grant programme provides funding to eligible local authorities to help improve air quality. Primarily funding goes to community-wide projects, however this is not always the case. For example, in March 2021 Buckinghamshire Council were awarded over £97,000 for a pilot of an electric vehicle employer salary sacrifice scheme.

The Urban Tree Challenge Fund (UTCF) opened 26 April 2021 as part of the Government's Nature for Climate Fund, supporting the planting of 44,000 large 'standard' trees over a two-year period: 2021/22 to 2022/23. Funding is open to both block bids and individual applications. A block bid is designed for organisations to apply for funding for multiple projects that can be geographically dispersed

The Rural Community Energy Fund (RCEF) is a £10 million programme which supports rural communities in England to develop renewable energy projects. Grants of up to £40,000 for a feasibility study for a renewable energy project. Following this, grants of up to £100,000 are provided for business development and planning of feasible schemes. This funding is available to town and parish councils which are designated as rural. Developing projects would require partnership working between us and parish councils, and the Midlands Energy Hub who administer the funding.

Carbon Neutral Plan

Investment the Council makes will achieve meaningful carbon reductions and be cost effective. This Carbon Neutral Plan is the start of our journey, presenting key challenges and actions which can be delivered.

An immediate work programme of action to address our carbon emissions is set out in this section, underpinned by the steps needed to deliver the plan discussed in the previous section.

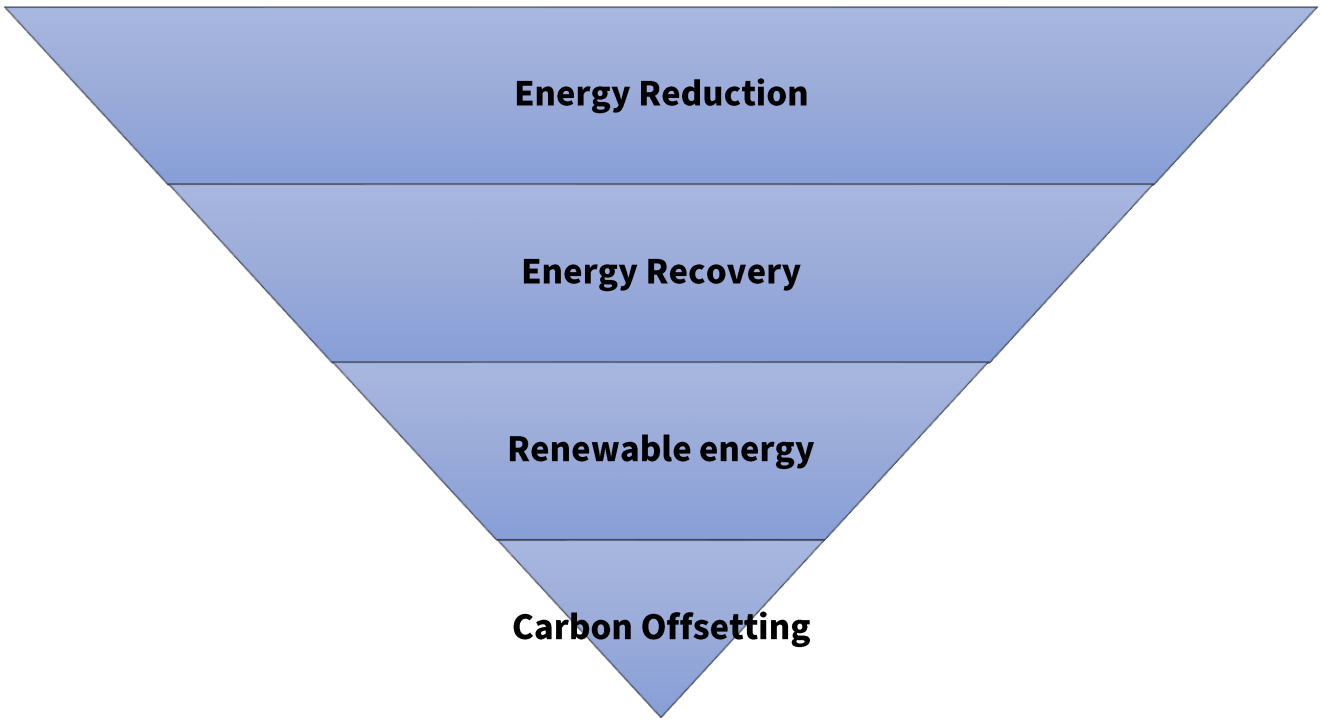
The work programme reflects the main challenges we need to address during the next ten years. It is important to acknowledge that reducing emissions over the next ten years will be more difficult than the previous five years as we have successfully completed ‘quick win’ projects, with outstanding actions much more substantial in scale.

Strategy

Our strategy to become carbon neutral is based on two principles of best practice: the energy hierarchy and navigating the "path of least regret."

The Energy Hierarchy

The energy hierarchy takes the following format:



Therefore, the analysis below identifies ways in which energy is currently being used to identify projects that can realistically reduce the energy consumption of the site to the point where renewable energy can reduce the footprint to zero.

The Path of Least Regret

Within the analysis, there are inevitably options in which a trade-off between the energy hierarchy principles and achieving the goal of zero-carbon is necessary. For example, technological advances may change the nature of the projects, or even create new opportunities that have not been included in this plan. The current national and local socio-economic situation created by COVID-19 will also likely have a long-lasting influence on the funding opportunities and prioritisation decisions made by the Council, between 2021 and 2030.

Main Challenges

The tracking of our carbon footprint demonstrates we have three main challenges which we need to address to reach carbon neutrality by 2030:

1. **Reducing net carbon emissions from buildings**
2. **Reducing net carbon emissions from transport**
3. **Investing in carbon positive activities**

To succeed, we will also need to ensure that there are sufficient resources available at the right time. Given that we are in the early stages of this programme, and that some of the projects that we are going to undertake will be complicated, we have included feasibility studies as well as short-term projects in our plan. Some of the larger projects have costs that cannot be predicted at this moment. A selection of these projects is shown in Appendix 1 alongside indicative costs and benefits of projects in the work programme, and these will be reviewed as the funding and technology environment changes.

1. Reducing net emissions from buildings

The carbon footprint of our buildings is dominated by gas consumption. While we will continue to look at reducing our electricity use, not least because it makes financial sense not to waste energy, our focus will be in decarbonising our use of heating and hot water, which is currently largely driven by burning fossil-fuel gas.

Challenge: Gas use must be reduced or eliminated.

Opportunity	Sub-Challenge	How we are responding
Reduce gas demand in buildings though energy efficiency improvements.	The age and design of buildings with the highest energy consumption means they are difficult or impossible to improve or renovate.	The Carbon Neutral Plan includes a small number of more feasible projects to make progress where we can. Larger scale investments will be considered as part of a 'whole buildings' approach.

Replace gas use in buildings with alternative energy forms.	Switching from gas to electricity is expensive. In some buildings changing the heating system is physically difficult or impossible.	Feasibility studies have been included in the Carbon Neutral Plan to explore options. Where we have no choice but to keep current heating systems, we will prioritise energy efficiency measures.
Procure green gas, in the same way we do electricity.	This project would not actively reduce our gas use. As green gas is likely to have a higher price, it would add to our energy bills if we did not simultaneously reduce our consumption.	Sourcing green gas shows our commitment to ending reliance on natural gas and reducing emissions from the UK gas network. This enables us to make progress towards net zero whilst we plan how to tackle the bigger challenges.

Our Southfields office on Southfield Road is one of the biggest contributors to carbon emissions from our built estate. However, there is uncertainty on how this building will be used in the future due to changes in staff working patterns following COVID-19. There is an ongoing review of our buildings with a decision yet to be made on the future of Southfields. For this reason, we have not included any projects at Southfields in this plan.

Loughborough Town Hall requires feasibility study to assess the overall heating upgrade potential of the building, including new more energy efficient heating system and insulating the backstage area which is currently an uninsulated metal wall. This major heat loss area challenge needs to be addressed for other town hall projects, such as installing a new boiler, to be effective. The boiler itself is 20 years old and there are currently no plans to change it until it fails beyond economic repair. A simple upgrade to the rear door of the building which currently allows heat to flow out and cold air in can be delivered in the meantime.

For **Charnwood Museum** two stand-alone projects were identified relating to wall, roof and glazing insulation. In addition, a new round of **LED lighting upgrades initiatives across all council buildings** and other locations have been identified that will save further energy and money. However, because the Council already use zero carbon electricity, replacing lights with LEDs cannot be officially counted towards carbon footprint reduction targets. The current LED programme status is that some of the buildings LED upgrades have been completed in full, whilst the Town Hall aims to have all

fittings, hard wired lights complete by Sep 2021 and the museum will introduce LEDs and sensor controls in staff areas.

The final project is an overall procurement project. Building on the success of our renewable electricity procurement, we will also invest in procuring **renewable gas**. This will involve supporting, through our purchasing power, the introduction of non-fossil fuel gas into the gas grid in the same way that our procurement of renewable electricity helps to decarbonise the whole grid. We will use Renewable Gas Guarantees of Origin (RGGO) to demonstrate that our gas is zero carbon.

Action 3	**Install a solid and better insulating door at the rear entrance of the Town Hall (stage door) to eliminate the current loss of heat and cold draughts.**
Action 4	**Commission a technical feasibility study for low or zero carbon heating options to replace the 20-year-old boiler at the Town Hall.**
Action 5	**Renew quotes for double glazing and flat roof insulation at Charnwood Museum and procure the best option.**
Action 6	**Complete LED installations in Museum staff areas with person-in-room sensors.**
Action 7	**Continue to replace bulbs when needed with best available LED option across the estate.**
Action 8	**Procure renewable gas**

2. Reducing net emissions from transport

The carbon footprint of our vehicles is dominated by diesel consumption and makes up 84% of our total emissions. We have already started to introduce electric vehicles, but we are also looking at ways to reduce the mileage travelled by our fleet. Fuel consumption from fleet vehicles has reduced during 2020-2021, however the long-term impact of COVID-19 on fleet use remains to be seen.

Challenge: Council-owned fleet of vehicles are biggest contributor to our carbon footprint and must be decarbonised.

Opportunity	Sub-Challenge	How we are responding
Switch our owned and operated vehicles to electric.	Our fleet is heterogenous and some of the vehicles are specialised. There are operational and HR concerns from moving to electric vehicles.	We will run a pilot programme which will ensure that we can successfully retire our fossil-fuel powered vehicles by 2030.
Switch our waste collection vehicles from diesel to electric.	Our fleet is only recently purchased (2019) and we cannot justify replacing this in the short or medium term.	We will plan to replace our fleet after 2030.
Introduce biofuels into our waste collection vehicles instead of diesel.	The investment needed to build biofuel storage tanks and pumping stations is likely to be prohibitive. Compatibility between	Short to medium-term options for mitigations will be explored and we will plan to replace our fleet after 2030.

	engines and fuel needs to be confirmed.	
Pay for diesel offsetting from third party providers.	These schemes do not always prevent emissions[4], and would require research to find schemes where carbon savings from tree planting are genuinely realised.	We will consider options to procure high quality credits to offset any of our emissions, not just diesel as a last resort measure in 2028-2029.

Two feasibility studies and two implementation projects have been identified for the Council's transport related low-carbon projects. The transport projects of the Carbon Neutral Plan mainly focus on activities that relate to fleet vehicles.

In the long-term, we can eliminate nearly all carbon emissions from our fleet vehicles, including waste and maintenance fleets. In coming years, we will be able to capitalise on technology and market developments. For example, forecasts suggest electric cars could be cheaper to buy than petrol or diesel cars from 2025 onwards. This means the ideal time to migrate to a new system of electric vehicles to reduce the carbon emissions is now.

Successful projects have been undertaken or are underway. The mayoral car that has already been replaced by an electric version in 2021 and **electric vehicles ordered for the upgraded street management pest control fleet**. Charging points for these vehicles have been installed and funded. The pest control fleet is being reduced to two vehicles, with the current diesel vans being replaced with electric vehicles. Street management already have two electric cars which are being upgraded, and this project will see the current diesel van switched to electric.

Despite progress, there are still several challenges to delivering these projects that need to be addressed.

The part of our fleet that has the largest footprint is our waste collection fleet. We have already purchased a more fuel-efficient fleet of waste collection, recycling and street cleaning vehicles that will reduce our carbon emissions by over 10% per year. However, we need to do more. Other Councils have used **Smart Bins** to optimise their waste collection frequency. Smart Bins operate by installing low-cost sensors in existing bins in high streets, parks and other open spaces to monitor waste fill levels. The sensors would

[4] https://www.greenpeace.org.uk/news/the-biggest-problem-with-carbon-offsetting-is-that-it-doesnt-really-work/

then enable the council's street cleaning teams to remotely check when specific bins need emptying. This real time information on fill levels will help the council understand the optimal times for waste collections and provide up-to-date recommendations on the most efficient collection routes. This smart bin technology has potential to reduce unnecessary waste collection travel, especially in rural areas, reducing mileage, fuel use and CO_2 emissions, and improve service delivery.

As a council we will have to conduct a **cross-service electric pool car and charging feasibility study** to decide whether, and when, some of these vehicles can be replaced with electric alternatives – and whether future ways of working and office locations make pool cars effective. We do not yet know for sure how many staff will be working in each of our buildings each day. However, if different staff are on site each day spreading demand for pool cars across the week, then just a small number of electric pool cars could be part of this flexible working pattern. A smaller fleet would also make charging the vehicles easier.

There are 31 diesel fleet vans which will be due for replacement by 2026. At the time of writing there are a range of practical barriers to this electrification, including issues around charging infrastructure and the fact that operatives keep vehicles at home. This will require joint working across a range of departments including HR. Therefore, initially, we will run **a cross-service maintenance vehicle feasibility & pilot project**. A feasibility study will be undertaken to identify the optimum number and locations of electric vehicle chargers; the best operatives and vehicles to take part in the pilot; and to estimate the time and fuel cost savings from using electric vehicles.

Following the feasibility study, we will undertake a pilot with a small number of vehicles to identify operational and HR issues prior to full electrification of the fleet in 2026. The project will include charge points at sheltered accommodation so that operatives can plug in when they arrive on site and leave the vehicle to charge whilst working. The pilot project will collect on the ground data on the operational impact of using electric vehicles after which a decision on a future roll-out can be taken.

Action 9	**Upgrade and switch to electric vehicles in the street management & pest control fleet.**
Action 10	**Smart bin feasibility study.**
Action 11	**Cross-service electric pool car and charging feasibility study.**

Action 12	**Cross-service maintenance vehicle feasibility & pilot.**

3. Investing in carbon positive activities

Swithland Wood Country Park in Charnwood Forest. Source: www.britannica.com. Image: Kev747

To achieve carbon neutrality, we will invest in carbon positive activities as well as reducing the footprint of our existing operations. We will use both renewable energy and sequestration to achieve this. Ultimately, we may also need to invest in other forms of activities, and we will revisit this as the decade progresses.

Challenge: We will need to invest in projects that will create a positive carbon footprint.

Opportunity	Sub-Challenge	How we are responding
Charnwood has existing assets which could be used for renewable energy installations.	The Council is reassessing its estate and investment in renewable energy is a long-term commitment which is not prudent given the current economic uncertainty.	We are looking at both existing and potential assets rather than limiting ourselves to the sites we own now.
The Borough has several sites that have been identified for renewable energy installations.	The current economic uncertainty means that it is hard to predict what will be possible to invest in over this decade.	Feasibility studies have been included in the Carbon Neutral Plan to explore options. We will work with partners to develop more substantial investments which

		will give us economies of scale and reduce project risks.
Charnwood has many sites that could be replanted. This sequestration could provide a substantial positive footprint.	There is a lot of competition for land within the Borough. Sequestration does not provide a good financial return on investment, and other benefits, like amenity, are sometimes hard to justify.	We are committed to working with local partners to ensure our tree planting programme is cost effective and delivers the benefits we need.

Our tree planting strategy to secure the planting of 100,000 trees in the Borough is already underway with many reaching maturity and starting to remove carbon from the atmosphere. A significant part of tree planting programme will come from using funding to plant woodland on former agricultural land. Most notably, we will be planting **13,000 to 14,000 trees at Hathern during Autumn/Winter 2021-2022**.

These larger council tree planting projects are supported by smaller initiatives such as the Earthwatch (green recovery fund), which enabled 600 trees to be planted in Holt drive Loughborough.

In addition to the Carbon Neutral Plan and Local Plan, we are currently developing our report *'Nature P.O.Sitive; Understanding the potential for biodiversity net gain in Charnwood open space'*. This recommends three actions:

1. Introduce the pilot project to reduce mowing frequency on selected CBC sites from the start of 2022. Review the success of the project after two years and if appropriate identify additional sites.
2. Engage with Parish Councils and the LCC to explore opportunities to provide local community led biodiversity enhancements and restoration of select roadside verges. Review progress towards this goal after two years
3. Investigate the feasibility of introducing cut and collect mowing techniques and the use of grass cuttings for small scale local energy generation.

Embedding Nature P.O.Sitive in the Carbon Neutral Plan is an important next step. As well as reducing the cost of grass mowing the Carbon Neutral Plan Accounting Tool can be used to assess the impact on emissions from reduced mowing. Similarly, as biodiversity is increased, the impact on climate change mitigation and our net carbon footprint through carbon sequestration should be measured. This would require a further technical study as different plant species and soil types will absorb carbon emissions at different rates.

We have identified that there are opportunities for a portfolio of renewable energy developments to generate zero carbon electricity. This includes **land-based solar PV installations, rooftop solar PV installations,** and **wind energy generation**. To achieve carbon neutrality, it is likely that the portfolio will include both large developments, which could have a capacity in excess of 2MW, and smaller installations, which could be as small as 4kW. For example, a preliminary assessment of the opportunity in Nanpanten identified that a 2.5 MW solar PV array could produce a positive carbon impact of up to 320 tonnes CO_2e per annum.

All energy generation projects will require feasibility studies before a decision can be made to take them forward and implement. These feasibility projects could be delivered individually or as a package.

What are solar PV projects?

Solar Photovoltaic (PV) is a technology that converts sunlight (solar radiation) into direct current electricity. Solar PV technology is generally deployed on a panel. A solar PV project is the term we use to describe the installation of solar panels, either on an existing building roof, a purpose-built structure, or on the ground.

Electricity can be sold to the national grid, directly to tenants, or used directly by the Council. For consistency, across all the solar PV projects in this plan we have assumed a sale of electricity to the grid. This means the financial benefits are a conservative estimate.

Action 13	**Progress tree programme including 13,000 to 14,000 trees at Hathern during Autumn/Winter 2021-2022.**
Action 14	**Embedding Nature P.O.Sitive in the Carbon Neutral Plan**
Action 15	**Site feasibility studies for solar PV installations on Council owned land, including land purchased for the purpose.**
Action 16	**Borough-wide feasibility study for land-based solar PV installations, for example at Council-owned car parks.**

Action 17	**Feasibility study for rooftop solar PV installations across our built estate.**
Action 18	**Site feasibility studies for wind energy generation taking account of Local Plan Opportunity Areas.**

Actions recap

An actions recap is shown in Table 11 alongside an indication of roles and responsibilities using the PACE framework, and potential KPIs for monitoring progress.

Table 11: Actions

Action		PACE Roles and Responsibilities	KPI(s)
Action 1	Ensure dedicated resources are in place to implement the management and delivery of the Carbon Neutral Plan.	P – Head of Planning & Regeneration A - Senior Leadership Team C - Carbon Neutral Board E – Group Leader for Plans, Policies and Place-Making & Human Resources	Resource review completed and implemented
Action 2	Formalise and embed a process for evaluating the impact arising from the council's decisions.	P – Sustainability Officer A - Senior Leadership Team C - Carbon Neutral Board E – Procurement	Number of decisions made with a beneficial carbon impact
Action 3	Install a solid and better insulating door at the rear entrance of the Town Hall (stage door) to eliminate the current loss of heat and cold draughts.	P = Strategic Asset Manager A = Strategic Director for Commercial Development, Asset and Leisure C = Town Hall Manager, Procurement, Carbon Neutral Board E = Strategic Asset Management Team	Building gas use reduced

Action		PACE Roles and Responsibilities	KPI(s)
Action 4	Commission a technical feasibility study for low or zero carbon heating options in the Town Hall. This replace the 20-year-old boiler and would be installed as part of a full building renovation.	P = Strategic Asset Manager A = Strategic Director for Commercial Development, Asset and Leisure C = Town Hall Manager, Procurement, Carbon Neutral Board E = Strategic Asset Management Team	Preferred option identified
Action 5	Renew quotes for double glazing and flat roof insulation at Charnwood Museum and procure the best option.	P = Strategic Asset Manager A = Strategic Director for Commercial Development, Asset and Leisure C = Museum Manager, Procurement, Carbon Neutral Board E = Strategic Asset Management Team	Building gas use reduced
Action 6	Complete LED installations in Museum staff areas with person-in-room sensors.	P = Strategic Asset Manager A = Strategic Director for Commercial Development, Asset and Leisure C = Museum Manager, Procurement, Carbon Neutral Board E = Strategic Asset Management Team	Building electricity use reduced
Action 7	Continue to replace bulbs when needed with best available LED option across the estate.	P = Strategic Asset Manager, Head of Landlord Services, Property Manager A = Strategic Director for Commercial Development, Asset and Leisure, Strategic Director for Community, Planning and Housing C = All Building Managers, Procurement, Carbon Neutral Board E = Strategic Asset Management Team, Housing Management Team	Building electricity use reduced

Action		PACE Roles and Responsibilities	KPI(s)
Action 8	Procure renewable gas	P = Sustainability Officer/Dedicated Officer A = Senior Leadership Team C = Carbon Neutral Board, Building Managers E = Procurement	Building gas use reduced.
Action 9	Upgrade and switch to electric vehicles in the street management & pest control fleet.	P = Head of Cleansing and Open Spaces, Fleet Manager A = Strategic Director for Environmental and Corporate Services C = Carbon Neutral Board, Procurement E = Strategic Environmental Team	Fuel use reduced from fleet.
Action 10	Smart bin feasibility study.	P = Head of Cleansing and Open Spaces A = Strategic Director for Environmental and Corporate Services C = Carbon Neutral Board, Procurement E = Strategic Environmental Team	Decision made on whether to procure. If procured: mileage and fuel use reduced in waste collection fleet
Action 11	Cross-service electric pool car and charging feasibility study.	P = Sustainability Officer/Dedicated Officer A = Strategic Director for Environmental and Corporate Services C = Fleet Managers, Procurement, Carbon Neutral Board E = Strategic Environmental Team	Preferred option identified

Action		PACE Roles and Responsibilities	KPI(s)
Action 12	Cross-service maintenance vehicle feasibility & pilot	P = Improvement and Organisational Development Manager A = Strategic Director for Environmental and Corporate Services C = Fleet Managers, Procurement, Carbon Neutral Board E = Strategic Environmental Team	Feasibility study complete and viable pilot project identified.
Action 13	Progress tree programme including 13,000 to 14,000 trees at Hathern during Autumn/Winter 2021-2022.	P = Head of Cleansing and Open Spaces A = Strategic Director for Environmental and Corporate Services C = Carbon Neutral Board E = Strategic Environmental Team	14,000 trees planted
Action 14	Embedding Nature P.O.Sitive in the Carbon Neutral Plan	P = Head of Cleansing and Open Spaces A = Strategic Director for Environmental and Corporate Services C = Carbon Neutral Board, Ecologist E = Strategic Environmental Team	Carbon emissions impact calculated
Action 15	Site feasibility studies for Solar PV installations on Council owned land, including land purchased for the purpose.	P = Strategic Asset Manager A = Strategic Director for Commercial Development, Asset and Leisure C = Procurement, Carbon Neutral Board E = Strategic Asset Management Team	Short-list of options identified

Action		PACE Roles and Responsibilities	KPI(s)
Action 16	Borough-wide feasibility study for land-based solar PV installations, for example at Council-owned car parks.	P = Strategic Asset Manager A = Strategic Director for Commercial Development, Asset and Leisure C = Procurement, Carbon Neutral Board E = Strategic Asset Management Team	Technical supplier procured and preferred option identified
Action 17	Feasibility study for rooftop solar PV installations across our built estate	P = Strategic Asset Manager, Head of Landlord services, Property Manager A = Strategic Director for Commercial Development, Asset and Leisure, Strategic Director for Community, Planning and Housing C = All Building Managers, Procurement, Carbon Neutral Board E = Strategic Asset Management Team, Housing Management Team	Short-list of options identified
Action 18	Site feasibility studies for wind energy generation taking account of Local Plan Opportunity Areas	P = Sustainability Officer/Dedicated Officer A = Senior Leadership Team C =Procurement, Planning, Carbon Neutral Board E = Strategic Assets	Short-list of options identified

Inspiring change: partnership & leadership

Our 2030 Carbon Neutral Plan is more than just a chance for us to become a more efficient and responsible council. It is also an opportunity to demonstrate leadership.

Loughborough has a history of innovation in low carbon technology, whether that be research undertaken at the Gas Research Technology Centre in hydrogen fuel cells more than twenty years ago, or the recent Low Emission Freight and Logistics Project co-ordinated by Cenex. Building on this reputation will enable the Council to co-create innovative projects that could demonstrate technologies and techniques that could radically reduce emissions nationally

Partnership example:

County-wide solar charging hubs

The Council is already working in partnership with other local authorities in Leicestershire. Recognising the need for joint action to tackle climate change, we are part of a multi-council collaborative bid for funding to build solar powered electric vehicle charging hubs across the county. We would hope to see two of these in Charnwood, demonstrating our commitment to helping residents, visitors, and businesses travelling in and through the Borough to switch to electric vehicles.

Example solar charging hub in Sunderland.

As a Council, we have a powerful potential ally locally in the University of Loughborough, which has a strong sustainability aspect to its business school teaching, and the world-renowned Centre for Renewable Energy Systems Technology (CREST). Local businesses are also well placed to support radical climate action, including Cenex and Intelligent Energy, many of which are clustered in the Loughborough University Science & Enterprise Park. Other potential corporate allies taking significant climate action, such as 3M and the National Grid, are also located in the District and may be collaboration partners.

At the same time, Charnwood is at the geographic centre of an expanding list of local Councils working towards reaching net zero carbon emissions and have set the same target for carbon neutrality by 2030. Joining Charnwood in Leicestershire are Blaby District, Harborough District, Hinckley and Bosworth Borough, Leicester City, North West Leicestershire District, Oadby and Wigston Borough and with Leicestershire County Council. The County Council have started the process for developing a Net Zero Carbon Roadmap and we will explore opportunities for shared projects as this develops.

Partnership opportunity:

Renewable Energy Centre

Loughborough used to have a refuse disposal site which included a landfill site on the east of the town. This space is contaminated land and provides opportunities to work in partnership with neighbouring Councils or private investors to develop the site for energy generation. One example could be a Renewable Energy Centre (REC). As well as a solar array, the site may be appropriate for biogas extraction and storage. This would also provide substantial education opportunities. A £4.5million (including £1m for R&D, feasibility and procurement) REC would generate 5GWh per year.

Partnership working will be required. The opportunity naturally lends itself to partnering with neighbouring local authorities and the County Council who will benefit from the scheme, Loughborough University, and organisations like Green Fox Community Energy Co-op, who operate a solar farm in Northwest Leicestershire and an energy Co-op in Hinckley.

These partners, along with other specialists from further afield can help Charnwood to build a compelling set of effective sustainable leadership initiatives. Our Borough's history and geography is also a helpful asset. The Borough is home to numerous shallow

mines and quarries, including Newhurst Quarry, the site of a proposed energy from waste plant. These may offer ideal energy storage or large-scale renewable energy sites, potentially using technologies pioneered at the proposed Renewable Energy Centre. Similarly, Loughborough's strong history of hydrogen research, which included the installation of a trial hydrogen refuelling station by Air Products, means that the District is well placed to help lead in the decarbonisation of heating using green hydrogen.

The Borough's location, as a potential transport hub, could be supported by the creation of intermodal goods transfers; a zero-emission, last mile delivery system based on cross-docking at strategic locations, such as the motorway junction and railway station. This would be an opportunity to demonstrate this technology. Similarly, over the coming decade the implementation of a zero-emission fleet across the Council, including refuse vehicles, will help demonstrate to local businesses the viability of a zero-emission fleet.

Charnwood has also been recognised by Highways England as part of the strategic electric charging network. A wide application of electric charging points across the Council owned estate could be a very powerful resource for vehicle to grid (V2G) applications, which is an emerging technology heavily supported by energy providers. The Council could also inspire a generation of drivers in Charnwood and the wider East Midlands to become zero-emission themselves.

We want to demonstrate strong political leadership to further inspire the community of Charnwood to implement other projects that can drive the Borough to become zero carbon. Demonstrations of zero carbon living in the Council's own stock, particularly considering the Future Homes Standard and the recent drive across the UK to build houses that use demonstrably less energy, could become beacons for developers, builders and refurbishers. For example, we are planning to complete an insulation feasibility study for our estate of sheltered accommodation in 2021-2022. As we have a total social housing stock of 5,868, this also provides us with the opportunity to positively impact a sizeable number of our own citizens and their own carbon footprints.

The Carbon Neutral Plan presents an opportunity to link to other strategic initiatives. For example, the Loughborough Town Deal Board has prepared a Town Investment Plan and has secured £16.9m from the Towns Fund. The Town Deal Board is an extensive partnership, featuring Charnwood Borough Council, Loughborough University, Loughborough College, Love Loughborough, Leicestershire County Council, the Leicester and Leicestershire Enterprise Partnership, Charnwood Together Economy and Skills Group, local businesses and Loughborough MP. Projects which facilitate more walking

and cycling, and which reduce the need to travel by providing better local facilities and events are likely to be confirmed in a final list of projects, which will be decided by the Board in the late summer of 2021.

Similarly, we hope the Council's endeavours will demonstrate how business operations can become net zero carbon in a way that is financially prudent and improves service. We have an opportunity to help business in Charnwood learn from successful action by some companies in the Borough to reduce emissions on their sites. Local examples include Samworth Brothers, which have been operating on 100% renewables since October 2017 and the demonstrator work at West Beacon Farm, which uses a variety of renewable energy and low carbon heat sources[5].

Charnwood's 2030 Carbon Neutral Plan gives us the opportunity to produce a clarion call that will inspire communities and business across Charnwood to reduce their own carbon emissions and help the whole Borough become carbon neutral.

[5] Renewables – West Beacon Farm

Appendix 1: Menu of actions and details

This Appendix sets out the indicative costs and benefits of the work programme, as well as a number of additional potential projects which were not included for various reasons.

As we move closer to 2030 newer technologies like electric vehicles and electric heat pumps are likely to get cheaper, whilst government policy is likely to make fossil fuels more expensive. Therefore, it is important that we continue to review these projects in the coming years as projects which are less financially viable today are likely to be more viable in the coming years. Where possible at time of writing, an estimate of the costs and benefits have been given and are subject to final feasibility assessments.

The following are a some of the projects not included in the Carbon Neutral Plan work programme but provide further potential areas for reducing emissions from our buildings and fleets:

For the **Server Rooms in ICT**, a few stand-alone projects were identified. However, the hot/cold server initiative cannot be explored until after the Council's current cloud computing migration is completed. There is also a possibility of the servers themselves eventually being relocated from ICT, but this requires a decision from accommodation before proceeding.

For **Woodgate Chambers**, stand-alone projects were identified including a roof replacement to enable thermal savings and a more efficient air handling /heat recovery system. However, given the age of the building, a decision needs to be made by the council on whether to keep building or not before exploring any further.

An **EV depot, waste fleet, charging scoping and feasibility study** will be required to decarbonise our fleet either shortly before 2030 or shortly afterwards. This will likely require an adjustment of the contractor procurement criteria to ensure future contractors can access a depot with the electric vehicle charging needs. The feasibility study will also have to take into consideration that the current waste vehicles being used are 30 Tonne capacity vehicles. Currently the maximum capacity of electric waste vehicles is only 26 Tonne. Therefore, moving to these smaller capacity electric vehicles would require more

collection rounds, which may offset any cost efficiencies gained from electrification of the vehicles.

Reducing net emissions from buildings

Feasibility Studies		**Cost**
Actions within work programme:		
Action 4	Commission a technical feasibility study for low or zero carbon heating options to replace the 20-year-old boiler.	£40,000
Action 5	Renew quotes for double glazing and flat roof insulation at Charnwood Museum and procure the best option.	£5,000
Additional potential actions:		
New server room efficiency, cooling and heat recovery feasibility study.		£10,000
Woodgate Chambers roof replacement for thermal savings		£35,000
Support the Housing Revenue Account Team to undertake a feasibility study for the best performing insulation option in Sheltered Accommodation.		£50,000

Projects		Indicative capital cost	Indicative savings per year	Indicative tCO_2e reduced	Indicative payback (Years)
Loughborough Town Hall:					
Action 3	Install a solid and better insulating door at the rear entrance of the Town Hall (stage door) to eliminate the current loss of heat and cold draughts.	£1,000	£160	1.3	6.3
Indicative follow on from Action 4	Boiler Upgrade	Additional £117,000 on top of standard boiler	£7,100	114.3	16
Woodgate Chambers:					
Switch-off campaign		£0	£710	3	Instant
Charnwood Museum					

Indicative follow on from Action 5	Internal Insulation of walls and roof as **only** as part of wider wall redecorating or refurbishment.	£5.20/m^2 as top up funding to normal re-plastering.	£6.90/m^2	8.9 kg/m^2	9 months
Action 6	Complete LED installations in Museum staff areas with person-in-room sensors.	£2,090	£251	5.1 (to UK grid, not CBC)	11.1
Procurement:					
Action 8	Green gas procurement. Capital costs include procurement and cost of change.	£17,000	-£8,000	102	N/A

Reducing net emissions from transport

Feasibility Studies		**Cost**
Action 10	Smart bin feasibility study.	£5,000
Action 11	Cross-service electric pool car and charging feasibility study.	£25,000

Action 12	Cross-service maintenance vehicle feasibility & pilot.	£10,000

Projects		**Capital cost**	**Savings per year**	**tCO_2e reduced**	**Payback (Years)**
Action 9	Upgrade and switch to electric vehicles in the street management & pest control fleet.	Lease costs estimated at £700 higher per vehicle per year.	Fuel cost savings estimated to be up to £900 per vehicle per year.	7.3 from pest control. 5.4 tonnes from street management.	1 month. Fuel cost savings offset increase rental costs.

Investing in carbon positive activities

Energy Feasibility Studies		**Cost**
Action 15	Site feasibility studies for Solar PV installations on Council owned land.	£65,000

Action 16	Borough-wide feasibility study for land-based solar PV installations, for example at Council-owned car parks.	£40,000
Action 17	Feasibility study for rooftop solar PV installations across our built estate	£25,000
Action 18	Site feasibility studies for wind energy generation taking account of Local Plan Opportunity Areas	£20,000

Projects		**Capital cost**	**Savings per year**	**tCO_2e reduced**	**Payback (Years)**
Action 13	Progress tree programme including 13,000 to 14,000 trees at Hathern during Autumn/Winter 2021-2022.	TBC	0	29.2 in year 1.	
Action 14	Embedding Nature P.O.Sitive in the Carbon Neutral Plan	N/A			

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