



**FOR PUBLICATION**

**DERBYSHIRE COUNTY COUNCIL**

**IMPROVEMENT AND SCRUTINY COMMITTEE - CLIMATE CHANGE,  
BIODIVERSITY AND CARBON REDUCTION**

**MONDAY, 16 SEPTEMBER 2024**

**Report of the Executive Director - Place**

**Offsetting the Council's Residual Carbon Emissions**

**1. Purpose**

- 1.1 To provide the Improvement and Scrutiny Committee for Climate Change, Biodiversity and Carbon Reduction with information on the work being undertaken to establish an approach to carbon offsetting (including nature-based solutions) to support the Council's and County's net zero targets.
- 1.2 To seek support for proposed next steps.

**2. Information and Analysis**

**The need to tackle residual emissions**

- 2.1 Like many local authorities, Derbyshire County Council ("the Council") has a target to be a net zero organisation in advance of the UK Government's legally binding target of 2050. In the Council's case this is by 2032, or sooner. Four emission sources are included in the Council's net zero target:
  - Corporate property (gas, electricity, oil and propane use) – excluding schools
  - Streetlighting (electricity use)
  - Core fleet (mileage)
  - Grey fleet (mileage)

- 2.2 The Council must continue to reduce emissions from these four sources to get emissions as close to zero as possible. This is through activities such as switching to electric fleet vehicles, replacing old heating systems in corporate buildings with low carbon alternatives (such as heat pumps) and increasing the amount of renewable energy generated on Council-owned buildings and land.
- 2.3 The Council's emissions have reduced by 71% since 2009-10, and further modest reductions are expected over the next few years. However, without further significant action and investment in carbon reduction projects, the most recent annual review of Council emissions, which was considered by Cabinet on 11 January 2024 (Minute No. 11/24 refers), estimates that 7,250 tonnes per year of residual carbon emissions could remain in 2032.
- 2.4 The reasons for residual emissions remaining in 2032 include:
- Neither mains gas nor electricity will be zero carbon by 2032, so energy used in buildings will still have a carbon footprint.
  - Not all core fleet vehicles (e.g. Heavy Goods Vehicles and gritters) will have suitable electric or zero emission replacements by 2032, and even electric vehicles will still have a small carbon footprint.
  - Not all employee-owned vehicles will be electric, and petrol and diesel fuelled vehicles will have similar carbon intensity to today.

### **Overview of Offsetting**

- 2.5 To achieve net zero (or interim targets) residual emissions can be addressed ("offset") through two general approaches:
1. Investing in mechanisms that remove greenhouse gases (such as carbon dioxide) from the atmosphere, such as nature-based solutions like tree planting and peat creation.
  2. Investing in mechanisms to generate renewable energy (such as solar and wind) that can be used by exported (sold) to the national grid.
- 2.6 Offsetting can sometimes be seen as a controversial topic as some companies have purchased cheap and poorly verified offsetting credits to enable net zero claims to be made without taking significant steps to decarbonise their own activities. However, it is important to note that offsetting can be done transparently and effectively, which is assumed in the Council's Climate Change Strategy as detailed below:

*“In the event of residual emissions, we will be offsetting these through certified nature-based GHG removal techniques as a short-term solution whilst we continue to seek decarbonisation opportunities”.*

- 2.7 As set out by the Taskforce on Scaling Voluntary Carbon Markets<sup>1</sup>, good practice offsetting measures should:
- **Remove emissions:** measures should remove carbon dioxide from the atmosphere and not just slow down its release.
  - **Be lasting and additional:** measures should be sustainable and deliver year-on-year benefits. Additional benefits should be provided on top of what is already happening or planned.
  - **Be free of unintended consequences:** measures should not lead to any unintended negative environmental or social impacts.
  - **Be certified and credible:** measures should meet a standard that allows for quantification and be evidence-based.
  - **Be nature-based where possible:** relying on natural systems is preferable, rather than technical solutions.
- 2.8 The adoption of net zero targets and dealing with any residual emissions remains non-mandatory for local authorities and there is no currently available authoritative offsetting guidance available for the sector. This gives rise to a variety of approaches and levels of understanding across local authorities.
- 2.9 Several standards exist, or are in development, to provide quality assured offsetting schemes, such as the Woodland Carbon Code and Peatland Carbon Code. These certification schemes offer guarantees around the credibility and quantification of carbon removal rates. Following such standards means that quantifiable claims can be made and factored into carbon reporting, for example *“tree planting to Woodland Carbon Code standards with certified sequestration has been completed, equating to x tonnes of carbon removal this year”*.
- 2.10 However, due to the time and resources required to apply to and comply with such codes, it would not be a time and cost effective option for many potential small-scale offsetting solutions and projects that offer local benefit, and so the benefits would only be described in narrative terms, for example *“we have supported tree planting by local residents which could be expected to remove x tonnes of carbon from the atmosphere”*.

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<sup>1</sup> A private sector-led initiative working to scale an effective and efficient voluntary carbon market to help meet the goals of the Paris Agreement ([www.iif.com/tsvcm](http://www.iif.com/tsvcm))

- 2.11 Furthermore, to be able to formally claim any offsetting benefits, an organisation must have the right to claim the savings, so they are not double-counted by two organisations. If the Council is to formally claim any offsetting benefits, it must show that it owns and has paid for or commissioned the work.

### **Offsetting the Council's Residual Emissions – Options**

- 2.12 In order to offset residual emissions, local authorities can look to invest in a range of solutions, as set out below. It is likely that the Council will need to apply a range of these solutions to enable its net zero target date to be achieved. Where possible, local solutions that provide one or more of the following local co-benefits are preferable:

- asset investment and improvement
- nature recovery – enhancing biodiversity and habitats
- supporting Biodiversity Net Gain (BNG)
- natural flood management
- improvements to air quality
- amenity benefits
- adaptation to climate change

- 2.13 The sub-sections below outline the offsetting solutions available to the Council and the associated proposed next steps.

### **2.14 Renewable Energy Projects**

- 2.14.1 Renewable energy generation produces very low or no carbon emissions. Building-mounted solar panels on the Council's buildings directly reduces the amount of grid electricity consumed by these buildings and therefore reduces the carbon impact. Any electricity generated by such technology and then exported to the grid, or off-site renewable energy projects (e.g. ground mounted solar panels or wind turbines) that feed directly into the grid can be described as displacing energy consumed by the Council.

- 2.14.2 For example, a 3.75 megawatt (MW) solar farm (similar to the scheme proposed at Williamthorpe) could produce the same amount of electricity used by the Council's seven highest energy using buildings.

- 2.14.3 Therefore, on-site renewable energy generation will reduce the Council's carbon emissions through offsetting or displacing the Council's energy demand. However, due to the high costs associated with developing renewable energy projects, renewable energy

generation alone is unlikely to be a financially feasible option to reduce all Council residual carbon emissions to zero.

2.14.4 **Proposed next step:** conduct further feasibility studies for solar and wind power generation to offset the energy used in corporate buildings and streetlighting.

## 2.15 Nature-Based Projects

2.15.1 Nature-based projects include more than just tree planting and woodland creation, but because these are the most developed in terms of carbon quantification and reporting, it is sensible to focus any opportunities and analysis on tree planting.

2.15.2 One rule of thumb is that a tree can remove one tonne of carbon over a 100-year lifetime, mostly during the rapid growth period between 20-60 years of age. So, while 1,000 trees would remove 1,000 tonnes of carbon over their lifetime, in year 10 of their life they might only remove 1-2 tonnes per year in total. Offsetting benefits are also dependent on how many trees are planted, the type of trees planted, and how they are maintained.

2.15.3 For context, the Council's countryside sites cover approximately 1,640 hectares (ha) (16.4km<sup>2</sup>) of which 850ha is already established woodland. If the remaining 790ha was planted with mixed broadleaf trees in 2024-25 and 2025-26 (an unfeasible task), this would remove around 2,600 tonnes of carbon per year in 2032<sup>2</sup>. However, by 2050, the trees would be removing 10,600 tonnes of carbon per year.

2.15.4 These figures show that even a huge tree planting programme would not be sufficient to remove the amount of carbon needed to tackle the Council's estimated residual emissions and ensure the Council achieves its net zero target by 2032, or sooner.

2.15.5 Carbon removal rates for other nature-based solutions, such as peatland, hedgerow, grassland and wetland creation or enhancement have greater uncertainty and many are estimated to be lower than woodland creation.

2.15.6 The Million Trees project and the Heartwood Community Forest creation are key initiatives to improve local biodiversity and provide community benefit. They will also remove carbon from the atmosphere. However, the Council will need to be careful about attributing carbon

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<sup>2</sup> Using an approximation of the Woodland Carbon Code calculations

savings to these activities. This is because most trees will be planted by and on land owned by other organisations or individuals who will be entitled to claim any resulting carbon removals.

2.15.7 **Proposed next step:** continue to assess how tree planting and other forms of habitat creation can be used to offset emissions and deliver wide co-benefits.

## 2.16 Carbon Removal from Existing Land

2.16.1 It is likely that the Council's land holdings already remove carbon from the atmosphere from existing woodland and other natural habitats. However, there are no standards available for quantifying or reporting the carbon removed from existing woodland and any calculations would be high-level estimates and could only be reported in a narrative sense.

2.16.2 **Proposed next step:** estimate carbon removal rates from existing land, along with levels of confidence.

## 2.17 Alternative Options

2.17.1 The following carbon offsetting options (explained in Appendix 2) could also be considered to help reduce the Council's residual emissions:

- Technical approaches, such as carbon capture, use and storage (CCUS)
- Biochar, a stable charcoal product e.g. from waste wood
- Changes in land management practices
- Changes in agricultural practices
- Enhanced rock weathering
- Carbon reduction external to the Council's current reporting boundaries
- Purchase of carbon credits

2.17.2 While the Council is currently unlikely to be able to invest in these measures directly, awareness of these techniques and technologies can inform land management practices and the Council has a role in working with partners to better understand and promote these measures across the county.

2.17.3 **Proposed next step:** continue to monitor alternative local carbon offsetting solutions, and funding opportunities, and discuss with relevant partners.

## 2.18 Offsetting Funds

2.18.1 Some other UK local authorities operate funded carbon offsetting programmes, for example, collecting Section 106 funds to offset the operational carbon of new developments through local carbon saving projects. This is not something that takes place in Derbyshire and would need to be pursued through planning controls and changes to legislation.

2.18.2 Several UK local authorities also coordinate community offsetting investment (e.g. community bonds) which fundraise for local projects – mostly for carbon reduction projects (e.g. reducing emissions from schools or community facilities) but occasionally for offsetting.

2.18.3 **Proposed next step:** hold discussions with councils that have implemented offsetting funds and community investment schemes to assess the potential for Derbyshire.

## 2.19 Establishing a Consistent Approach Across the Region

2.19.1 Other Derbyshire and Nottinghamshire councils have committed to similar net zero target dates, and some have statements around offsetting. There have been officer-level discussions across a range of councils to try to establish a common understanding and approach to offsetting. Consensus from these discussions is that:

- **All councils are forecasting residual emissions by their net zero target dates.** Offsetting is important to all councils and nature-based solutions are preferred due to the co-benefits they provide.
- **Local projects are preferred to national or international ones.** This may include work outside organisational boundaries subject to benefits being realised locally (e.g. investing in upstream peat improvement or woodland projects that reduce flood risk downstream). Transparency and integrity of solutions is vital to ensure political and public support.
- **Nature-based solutions take time to develop and implement and large land areas are needed to deliver significant savings.** Tree planting, for example, takes at least 10 years for significant carbon removal to be achieved. These projects can also be expensive, especially if land purchase is required.
- **Alternative finance options and a pipeline of projects need to be identified.** It will be important to quantify co-benefits of projects, as it may prove difficult to justify the costs of a tree planting programme (for example) simply by carbon emission benefits.

- **Alternative options need to be considered.** For example, some councils are interested in supporting work that helps other local organisations reduce their carbon emissions. Some councils are also at early stages of investigating the alternative techniques and technologies explained in Appendix 2.

2.19.2 The overarching agreement from these discussions is that offsetting projects can be costly, complex and time-consuming to deliver, and therefore carbon reduction should remain the priority. Further collaborative work is now planned with other Derbyshire and Nottinghamshire councils (districts, boroughs, cities and county) to:

- Estimate likely total residual emissions for all regional councils.
- Estimate the timescales and area of land required from different nature-based solutions to offset these emissions.
- Identify potential future partnerships and models to pursue, including ways to fund offsetting projects.

2.19.3 **Proposed next step:** continue to work with other local councils, including through the East Midlands Combined County Authority (EMCCA), and seek to adopt local solutions to offsetting.

## 2.20 County-Wide Emissions

2.20.1 While this report and discussions with other councils has focussed on offsetting operational council emissions, it is worth noting the scale of the challenge associated with county-wide emissions and ensuring Derbyshire is net zero by 2050.

2.20.2 Carbon emissions from Derbyshire's local authorities account for less than 2% of total county-wide emissions, which were 8.1 million tonnes of carbon in 2022. Industrial emissions (mainly from the mineral products industry), homes, other buildings, transport, agriculture and waste management will require effective and robust action to decarbonise and offset.

2.20.3 By a long margin, there will not be sufficient land available to offset current emissions within Derbyshire from nature-based projects, so decarbonisation is a key priority. Large sources of industrial emissions may require carbon capture, utilisation and storage (CCUS) technologies. For example, the Peak Cluster (representing cement and lime industries in the north of the county) is actively investigating the capture, transport and permanent storage of carbon dioxide emissions



from a range of industries and locations<sup>3</sup>. This proposes pumping carbon dioxide from flue and process emissions to be permanently stored under the Irish Sea.

2.20.4 The Council has programmes and projects which support emission reductions in each sector, including programmes to increase the uptake of low carbon transport solutions, decarbonise homes and support the move to a circular economy.

2.20.5 **Proposed next step:** continue to promote decarbonisation and credible carbon offsetting in industrial and other sectors through existing partnerships.

### **Moving Forward**

2.21 Further work is needed to develop solutions to deal with the Council's residual emissions to reach net zero emissions by 2032, or sooner (highlighted as proposed next steps above).

2.22 Ongoing investment to reduce emissions through measures such as installing low carbon heating systems in corporate buildings, moving to a fleet of low carbon vehicles, and installing building mounted renewable energy installations, will lessen the need for offsetting. Therefore, emissions reduction should remain the focus with offsetting used to tackle any emissions that remain.

2.23 The proposed next steps, alongside the work already undertaken, will be used to develop an Offsetting Framework and Action Plan for the Council by the end of 2024-25, setting out the preferred solutions and implementation requirements (such as funding, timescales, partnership working etc.).

2.24 Offsetting activities will also be reported in annual carbon reports going forward, either as a direct quantified figure against emissions or in narrative form.

2.25 Discussions with other local councils will continue and offsetting should ideally form an area of work within the net zero workstream of the EMCCA, particularly to ensure county-wide emissions and offsetting are also addressed in a consistent and structured manner.

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<sup>3</sup> [www.peakcluster.co.uk/](http://www.peakcluster.co.uk/)

### **3 Consultation**

- 3.1 An earlier version of this report was presented to and endorsed by the Climate Change and Environment Programme Board, chaired by the Executive Director – Place, on 18 April 2024.
- 3.2 Further consultation requirements will be considered on any offsetting projects proposed.

### **4 Alternative Options Considered**

- 4.1 **No action:** Taking no action to identify, assess and implement projects and initiatives to help offset the Council's and county's residual emissions would mean that there would be a significant risk of net zero targets not being achieved and the related co-benefits not being delivered. Therefore, this option is not recommended.

### **5 Implications**

- 5.1 Appendix 1 sets out the relevant implications considered in the preparation of the report.

### **6 Background Papers**

- 6.1 Derbyshire County Council Climate Change Strategy: Achieving Net Zero (2021-2025) – approved by Cabinet on 14 October 2021 (Minute No. 150/21 refers).
- 6.2 Derbyshire County Council Climate Change Strategy: Annual Review of Progress (2023) – approved by Cabinet on 11 January 2024 (Minute No. 11/24 refers).

### **7 Appendices**

- 7.15 Appendix 1 – Implications.
- 7.2 Appendix 2 – Alternative offsetting approaches.

### **8 Recommendations**

- 8.1 That the Committee:
  - a) Notes the work being undertaken to establish an approach to carbon offsetting (including nature-based solutions) to support the Council's and county's net zero targets.

b) Supports the proposed next steps detailed within this report.

## **9 Reason for Recommendations**

- 9.1 To ensure that the Improvement and Scrutiny Committee for Climate Change, Biodiversity and Carbon Reduction is informed of, understands and supports the work being undertaken on offsetting.

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## **Implications**

### **Financial**

- 1.1 The delivery of any next steps may have financial implications for the Council. These will be considered on a project-by-project basis.

### **Legal**

- 2.1 There is no statutory obligation on the Council to undertake work to identify, assess and implement measures to offset its residual emissions.
- 2.2 The delivery of any next steps may have legal implications for the Council. These will be considered on a project-by-project basis.

### **Human Resources**

- 3.1 The delivery of some of any next steps may have human resources implications for the Council. These will be considered on a project-by-project basis.

### **Information Technology**

- 4.1 The delivery of some of any next steps may have information technology implications for the Council. These will be considered on a project-by-project basis.

### **Equalities Impact**

- 5.1 The delivery of some of any next steps may have equalities impact implications for the Council. These will be considered on a project-by-project basis.

### **Corporate objectives and priorities for change**

- 6.1 The delivery of projects and actions to offset residual emissions supports the Council's ambition to be a net zero organisation by 2032, or sooner, and for the County to be net zero by 2050. This work will also help deliver the following Council Plan priorities: Resilient, Healthy and Safe Communities; High Performing, Value for Money and Resident-Focused Services; A Prosperous and Green Derbyshire.

**Other (for example, Health and Safety, Environmental, Sustainability, Property and Asset Management, Risk Management and Safeguarding)**

**Environmental Sustainability**

- 7.1 The delivery of projects and actions to support the decarbonisation of Derbyshire's schools will improve the environmental sustainability of the Council and the county and, in particular, will reduce greenhouse gas emissions.
- 7.2 The delivery of some of the recommendations may have other implications for the Council. These will be considered on a project-by-project basis.

## Alternative Offsetting Approaches

Option	Comments and considerations	Cost implications
<p><b>Technical approaches:</b> This includes carbon capture, use and storage (CCUS) technologies that are typically best suited to large industrial and power generation installations</p>	<p>CCUS technologies are not yet sufficiently developed for widescale use. Some may be appropriate for high emission industries in the county. It is being pursued as an option by the mineral products industry through the <a href="#">Peak Cluster</a> project.</p> <p><b>Worth monitoring developments and investigating options for Derbyshire.</b></p>	<p>Significantly more expensive than nature-based solutions.</p>
<p><b>Biochar:</b> This is a stable charcoal product e.g. from waste wood that can be used to improve soil health and remediate polluted soils, thereby improving carbon storage</p>	<p>Biochar production and use is currently being researched and trialled by other councils e.g. Lancashire County Council and Shropshire Council. It is too early to form definitive conclusions on its ability to support carbon absorption and storage in soils.</p> <p><b>Worth monitoring developments elsewhere and investigating options for Derbyshire.</b></p>	<p>High up-front capital costs for equipment to produce the material, but potential income stream from products.</p>
<p><b>Changes in land management practices:</b> This includes activities such as peatland restoration and grassland and wetland creation and improvement.</p>	<p>There is varying confidence about the amounts of carbon absorbed and stored by these methods and it is also highly dependent on the management applied. Carbon removal rates are mostly less than for trees and woodland, although wetlands and peat could both be significant if managed appropriately and at scale.</p> <p><b>Worth monitoring developments elsewhere and investigating options for Derbyshire.</b></p>	<p>Changes in land management practices may remove carbon at relatively low cost but will be site-specific and hard to measure.</p>

Option	Comments and considerations	Cost implications
<p><b>Changes in agricultural practices:</b> This includes activities such as setting aside land for grassland creation and reinstatement of hedgerows.</p>	<p>Several programmes offer farmers the chance to ‘sell’ carbon savings for changes in land management to increase soil carbon. However, these are not well understood or applied, and long-term funding is unclear.  <b>Worth monitoring developments and discussing with partners, e.g. NFU.</b></p>	<p>Without clear long-term funding programmes in place, establishing the long-term cost implications of such schemes is difficult.</p>
<p><b>Enhanced Rock Weathering:</b> This involves crushed basalt rock being spread onto soils to absorb carbon as it weathers. It slowly increases soil pH and so is also an alternative to lime-spreading.</p>	<p>This solution is currently undergoing verification in the UK and so is not yet mature enough to be applied at scale.  <b>Worth monitoring development and discussing with partners, e.g. NFU.</b></p>	<p>Unknown. At least one company is testing this in the UK with free provision to farms in Scotland and northeast England.</p>
<p><b>Financing carbon reduction external to the Council’s current reporting boundaries:</b> This could include activities like investing in housing decarbonisation projects within the county</p>	<p>Given the need for rapid decarbonisation rates there is an argument that helping others decarbonise (particularly those who struggle to afford it) has a place in offsetting strategies. However, it would be difficult to quantify and report figures reliably and could only be reported in a narrative sense.  <b>Worth listing Council activities that could lead to county-wide carbon reduction and assessing if credible data is available.</b></p>	<p>It is unlikely that the cost of helping others to decarbonise would be significantly less than decarbonising the Council’s own activities. However, this could be an opportunity to establish a local carbon reduction funding programme.</p>

Option	Comments and considerations	Cost implications
<p><b>Purchase of carbon credits:</b> These are paper-based solutions whereby organisations with carbon removing (or reducing) projects sell the carbon savings to other organisations or individuals.</p>	<p>These approaches can be criticised, although transparent and verified carbon credits are available. Credits are only likely to be available on a UK or global basis (there are insufficient projects in Derbyshire that offer such transparent and verified credits). <b>Worth monitoring developments.</b></p>	<p>Carbon credits can be currently purchased for £8 – 41 per tonne<sup>4</sup>. Every thousand tonnes of carbon would therefore cost £8-41,000 per year in offsetting credits.</p>

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<sup>4</sup> E.g. <https://marketplace.goldstandard.org/collections/projects>