STRATEGIC SCRUTINY COMMITTEE

Date: Thursday 11 September 2025
Time: 5.30 pm
Venue: Rennes Room, Civic Centre, Paris Street, Exeter

Members are invited to attend the above meeting.

If you have an enquiry regarding any items on this agenda, please contact Liz Smith, Democratic Services Officer (Committees) on 01392 265425.

Entry to the Civic Centre can be gained through the Customer Service Centre, Paris Street.

Membership -
Pole (Chair), Mitchell, K (Deputy Chair), Atkinson, Haigh, Harding, Hussain, Ketchin, Miller-Boam, Knott, Palmer, Rolstone, Wetenhall and Williams, M

Agenda

1 **Apologies**

To receive apologies for absence.

2 **Minutes** (Pages 5 - 12)

To approve and sign the minutes of the Strategic Scrutiny Committee held on 5 June 2025.

3 **Declarations of Interest**

Councillors are reminded of the need to declare any disclosable pecuniary interests that relate to business on the agenda and which have not already been included in the register of interests, before any discussion takes place on the item. Unless the interest is sensitive, you must also disclose the nature of the interest. In accordance with the Council's Code of Conduct, you must then leave the room and must not participate in any further discussion of the item. Councillors requiring clarification should seek the advice of the Monitoring Officer prior to the day of the meeting.

4 **Local Government Act 1972 - Exclusion of Press and Public**

It is considered that the Committee would be unlikely to exclude the press and public during the consideration of the items on this agenda, but if it should wish to do so, then the following resolution should be passed:

"**RESOLVED** that, under Section 100A (4) of the Local Government Act 1972, the press and public be excluded from the meeting for the particular item(s) of business on the grounds that it (they) involve the likely disclosure of exempt information as defined in the relevant paragraph(s) of Part 1, of Schedule 12A of the Act."

5 **Questions from Members of the Public Under Standing Order No.19**

Details of questions should be notified to Democratic Services via the democratic.services@exeter.gov.uk email by 10.00am at least three working days prior to the meeting. For this meeting any questions must be submitted by 10.00am on Monday 8 September 2025.

For details about how to speak at Committee, please click the following link - https://exeter.gov.uk/council-and-democracy/councillors-and-meetings/public-speaking-at-meetings/overview/

6 **Questions from Members of the Council Under Standing Order No.20**

To receive questions from Members of the Council to the relevant Portfolio Holders for this Scrutiny Committee. The Portfolio Holders reporting to this Scrutiny Committee are:

Councillor Bialyk -	Leader of the Council;
Councillor Wright -	Deputy Leader & Portfolio Holder for Corporate Services, Community Safety and City Centre;
Councillor Foale -	Portfolio Holder Arts, Culture and Tourism;
Councillor Patrick -	Portfolio Holder City Development;
Councillor Vizard -	Portfolio Holder for Climate, Ecological Change and Communities; and
Councillor Wood -	Portfolio Holder for Leisure Services & Healthy Living.

Advance questions from Members relating to the Portfolio Holders above should be notified to Democratic Services.

7 **Portfolio Holder report - Councillor Vizard** (Pages 13 - 20)

To receive a report from Councillor Vizard, the Portfolio Holder for Climate, Ecological Change and Communities.

8 **Exeter City Council's Costed Organisational Carbon Footprint Projections to 2030** (Pages 21 - 122)

To receive the report of the Strategic Director for Place and to hear evidence from the Centre for Energy and the Environment.

9 **Citywide Net Zero** (Pages 123 - 130)

To receive the report of the Strategic Director Place.

10 **Forward Plan of Business and Scrutiny Work Plan** (Pages 131 - 132)

Please see for noting a link to the schedule of future business proposed for the Council which can be viewed on the Council's web site. This on-line document is a source for Members to raise issues at Scrutiny on forthcoming Executive agenda items:-
https://exeter.gov.uk/council-and-democracy/councillors-and-meetings/forward-plan-of-executive-decisions/

Also attached is a draft work plan of future scrutiny items.

Should Members wish to raise issues in respect of future business please notify Liz Smith in advance of the meeting.

Date of Next Meeting

The next scheduled meeting of the Strategic Scrutiny Committee will be held on **Thursday 20 November 2025** at 5.30 pm in the Civic Centre.

Individual reports on this agenda can be produced in other formats on request to Democratic Services on 01392 265425.

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STRATEGIC SCRUTINY COMMITTEE

5 June 2025

Present:
Councillor Councillor Liz Pole (Chair)
Councillors Mitchell, K, Harding, Hussain, Ketchin, Miller-Boam, Knott, Palmer, Wetenhall and Williams, M

Apologies:
Councillors Atkinson, Haigh and Rolstone

Also present:
Strategic Director for Corporate Resources, Strategic Director for Place, Legal Advisor, Head of Service - City Centre and Net Zero and Democratic Services Officer (LS)

In attendance as Portfolio Holder:
Councillors Bialyk, Vizard, Wood and Wright

1 **Minutes**

The minutes of the meeting held on 3 April 2025 were taken as read, approved and signed by the Chair as correct, subject to the amendment that in Minute 64 the addition of the words 'the necessity for a' were added before "15 year commitment to keep the building open".

2 **Declarations of Interest**

Councillor Miller-Boam declared a Disclosable Pecuniary Interest in Minute 5 Markets & Street Trading in Exeter and withdrew from the room whilst the item was heard.

3 **Questions from Members of the Public Under Standing Order No.19**

In accordance with Standing Order No. 19, the following question was submitted by Mr Cleasby who was present at the meeting:

"Given its aim to make Exeter a healthy city, does the Council consider it doing enough to control junk food outlets?"

The Leader, Councillor Bialyk responded as follows:

"The Council shares the concern regarding the potential impact of an over-concentration of hot food takeaway outlets on community health, particularly in areas close to schools and where healthier food options may be limited.
At present, there is no legislative basis within environmental health licensing to restrict takeaway outlets on public health grounds. However, the planning system does offer a means through which such matters can be considered.
The National Planning Policy Framework (NPPF) encourages local planning authorities to support healthy communities and specifically calls for planning policies and decisions to promote healthier lifestyles (paragraph 92). This includes ensuring access to healthier food environments.
In terms of local policy, the current Exeter Local Plan includes only one location-specific restriction on takeaway outlets (in Cathedral Yard) and does not address broader health-related impacts or proliferation citywide.

However, this is being addressed through the emerging Exeter Plan 2021–2041, which includes proposed policy wording to:
"Avoid an over-concentration of hot food takeaways, particularly along routes to schools."
This provision is located within the 'Healthy Communities' section of the draft plan. This reflects growing recognition of the link between planning, food environments, and public health.
In summary, while current planning powers are limited, the emerging Exeter Plan will provide a more robust framework to manage the distribution of takeaway outlets and support public health objectives. In the meantime, planning applications are assessed case-by-case, with material consideration given to location, amenity, and cumulative impact."

Mr Cleasby asked a supplementary question asking that the Leader look at the new report on town and Country planning which included a section on Restricting the Appeal of Junk Food in England and consider the role of Local Authorities and encourage the LGA to lobby Government. The Leader responded that he would look into this and that he would also investigate other avenues politically and that he did not believe the Government would be against this.

4 **Questions from Members of the Council Under Standing Order No.20**

In accordance with Standing Order No. 20, the following questions were submitted by Councillors Wetenhall in relation to the Portfolio of Councillor Bialyk who attended the meeting. The questions were circulated at the meeting to Members of the Committee. The responses of the Leader are set out below:

Question
"School Streets action by Council

On December 17th 2024, Council passed a Motion which included the resolutions to:
"1. Call on Devon County Council to work with schools and communities to increase the number of School Streets in Exeter, where schools are willing to explore this option.
2. Provide a progress report on this activity to the ECC Transport Member Working Group in six months' time."

Has Exeter City Council followed up the resolution by approaching Devon County Council yet and if not, when will this be done?

Can Cllr Bialyk provide an update to this committee on any action taken in relation to contacting Devon County Council since the Motion was passed and if no action taken, when he expects Executive to consider an action?"

Response from the Leader, Councillor Bialyk
"Officers from the Council's Live and Move team are engaged with Devon County Council sustainable transport team regarding active travel and school streets in particular. DCC maintains an active school streets application process that is open to all schools and we are aware that DCC have recently commissioned a project to support a number of Exeter Schools with Travel Plan measures. We will report back

on progress and any specific school applications/projects at the next Exeter Transport Steering Group meeting."

Supplementary Question and Response
Councillor Wetenhall asked if DCC had been formally approached in compliance with the motion and whether this had been a direct written request, by whom and when. The Leader responded that he would request information from officers but that there was no formal channel for the council to communicate with DCC but it would be good to have one and he would seek better channels of communication for district councils to bring things to the attention of DCC.

In accordance with Standing Order No. 20, the following questions were submitted by Councillors Wetenhall in relation to the Portfolio of Councillor Wood who attended the meeting. The questions were circulated at the meeting to Members of the Committee and the responses of the Portfolio Holder are set out below:

Question
"Regarding the proposed closure of Northbrook pool, actioned at the February budget council meeting, has the administration assessed the potential legal costs of a challenge under the Equality Act or other legislation, or the risk of compensatory claims from those affected?"

Response from the Portfolio Holder for leisure services and healthy living, Councillor Wood
In June, the Executive will be asked to consider a recommendation to close the pool, based on key income and expenditure data and information gathered following public consultation. This information will be included in the report along with the comprehensive EQIA.
The council is obliged to formally consult with those affected when there is a substantive potential change to the provision of a service. This legal obligation has been met.

Supplementary Question and Response
Councillor Wetenhall asked if the Council was put at risk by the EQIA not having been carried out when the closure was proposed in February? Councillor Wood responded stating that he could not comment on the law but that a decision to close had not been made when the budget was agreed and an EQIA had been carried since.

Question
If schools that currently use Northbrook Pool for swimming are forced to transfer classes to St Sidwell's Point, can the council guarantee there will be the timetable availability for those schools, and that they can bring their own swimming teachers?

Response
The potential closure of Northbrook Swimming Pool may impact vulnerable groups, such as children, the elderly, or people with disabilities. The Council has taken time to consider the impact of closure on these groups and is confident that if the Council decides to close the pool, alternative provision within our other centres can be offered, providing a suitable, safe environment.

Supplementary Question and Response
Councillor Wetenhall asked if there was availability at other pools? Councillor Wood responded in the affirmative that should a decision be made to close the pool Exeter

Leisure would ensure availability at St Sidwells Point of Riverside and that current terms and conditions would remain in place.

Question from Councillor Moore for Councillor Wood
"Given the Council occupies Northbrook swimming pool under a 99-year lease that commenced on 18th March 1996 and expires on 17th March 2095 - so there's just under 70 years remaining. Why did the Council decline to commit to running the pool for the 15 years which would have released investment from funders?"

Response
Councillor Wood stated that Directors would respond outside of the meeting.

Supplementary Question and Response
In a supplementary question Councillor Moore asked given how long the lease was should the Council pursue grants and committee to the 15 years required? Councillor Wood responded stating that the capital costs and annual deficit would be available in a report to the Executive in the near future and that he couldn't answer without knowing where all the funding would come from rather than one grant in isolation.

Other questions:
Councillor Palmer asked if schools would travel to Riverside to swim given the additional time and the cost of a coach? Councillor Wood responded stating that he had attended a schools festival and spoke to teachers and would look to mitigate the impact on schools.

Councillor Palmer asked a supplementary question was regular data received from Devon County Council on rates of deprivation in the city? The Strategic Director for Place advised the Member to put this in writing in order that it be properly researched. Councillor Mitchell asked that any responses be forwarded to all members of the Committee.

5 **Markets & Street Trading in Exeter**

Councillor Miller-Boam withdrew from the room whilst the item was heard.

The Strategic Director for Place presented the report making the following points:

- that the running of both markets was at no cost to the council; and
- Matford provided a valuable source of income.

The Strategic Directors for Place and Corporate Resources responded to Members questions in the following terms:

- Section 5 set out the differences between street trading and markets;
- there were no resources available to provide or support further markets;
- a Briefing Paper had been requested at the previous committee;
- there were no officer resources available to investigate markets further at this time;
- the Markets Team dealt with the livestock market and street licenses but it was unlikely that a team would hold information concerning private markets within the city;
- consent from the City Council was not required to hold a market on private land with no more than 4 stalls;

- Visit Exeter website held a list of current markets including the farmers market, Exeter Potters market, Matford Sunday market and car boot sale and Topsham Saturday market.

Councillor Knott stated that this had been a good discussion of the matter and that the question now be put.

The Chair proposed and Councillor Knott seconded that the Customer Focus Scrutiny Committee note the report on Markets and Street Trading in Exeter and following a vote was CARRIED.

Councillor Miller-Boam rejoined the committee.

6 **Progress Report Shared Prosperity Fund - Update**

The Strategic Director for Place presented the report making the following points:

- this report was a six-monthly updated as requested by the committee and would be presented in January and September 2026;
- the three year programme had ended and transition funding was concentrating on continuing existing projects, in effect providing a one year extension;
- the total award was £360,000 which was less than the three year allocation of approximately £1 million;
- grant funding had been allocated;
- the key difference were that the funds were allocated to Devon and Torbay CCA who would project manage; and
- there was an overview of proposals and funding detailed in the report.

It was noted that there was a factual error in 4.2 as the actual spend was 99.5% rather than 100% as a last-minute refund had been issued.

The Strategic Directors for Place and Corporate Resources and the Head of Service - City Centre and Net Zero responded to questions from Members in the following terms:

- Parklets had been provided through grant funding run by InExeter and where they were placed had been considered and one had been moved since which time no concerns or complaints had been received;
- there was a full appraisal framework and annual returns to Government based on their criteria which were more about the metrics set rather than success or failure.
- joint commissioning arrangements had been requested for business support and the winning company did not achieve all of their outcomes therefore not spending all of the allocated funds, which resulted in a small amount of grant funding being handed back to Government;
- some of the costs to repair broken cameras would be covered by the new transition funding;
- a review was underway of the costs of maintaining current camera stock and replacing the remaining analogue cameras with digital CCTV cameras;
- there had been two consultations on what might go into a city centre strategy, one with stakeholders and then one with Members and the next would be with the public;

- following consultation a draft city centre strategy would be written and consulted upon with a view to Council considering the strategy early in 2026. Meanwhile the city would continue to improve and bring vitality. A temporary car park would be considered but would not affect long term strategic approach to the city centre;
- the walkway between Rougemont Gardens and Northernhay had been closed for safety reasons and there were a number of areas of the city wall which required repair. Work was currently underway near the City Gate. Repair work had been out to tender twice as the first was over £1 million and the second £500,000 but had increased to £680,000 and the Assets Team were working on all sections which were at risk.

Councillor Kevin Mitchell proposed the recommendations that:

- Members note the impact of UKSPF in Exeter and the plans for transition funding for 2025-26.
- The Head of Service City Centre & Net Zero provide a further update to Strategic Scrutiny on the delivery and management of the UKSPF transition funding, the next being January and June 2026, when UKSPF has come to an end.

Councillor Knott seconded the proposal and following a unanimous vote was CARRIED.

7 **Scrutiny Annual Report**

Councillor Matthew Williams presented the report of the Scrutiny Programme Board making the following points:

- the report was now in line with the municipal year which explained why two had been presented close together;
- there was a new format for which he thanked officers for improvements which meant that the report went beyond a list of issues which had been considered and began to look at the impact of scrutiny; and
- the Scrutiny Programme Board would look to make further improvements.

During discussion Members asked questions and made the following points:

- had the suggestion to offer family membership been progressed?
- it appeared that nothing had happened with regard to active travel for those with a disability; and
- Transport Member Working Group minutes had not been received and were requested.

Councillor Williams moved the recommendations as set out in the report, seconded by Councillor K Mitchell which following a vote were CARRIED.

8 **Forward Plan of Business and Scrutiny Work Plan**

The Chair invited Councillor Moore to speak under Standing Order no. 44. Councillor Moore expressed disappointment that that Citywide work on climate change had not been given due priority but understood that the item would be heard in September and that time for scrutiny of the devolution proposal ought to be scheduled despite the vote taken at the previous meeting of the committee. In response the Chair stated that the climate item had been heard in December 2024 and would be again in

September but the Councillor could contact her should there be further issues to resolve.

The Chair stated that there was a Stagecoach item to timetable and scope and suggested that the Portfolio Holder report on what was heard at Transport Working Group. There was a discussion regarding possible Stagecoach scrutiny:

- what services Stagecoach receive public funding for;
- are there existing customer focus groups to hear views of the public directly such as Devon Bus Forum;
- to hear unheard voices including those with disabilities and those on lower incomes;
- to hear from InExeter with regard to the extent to which transport in the city was important to commercial success;

Having received officer advice, Councillor Kevin Mitchell proposed and Councillor Miller-Boam seconded a motion that the Stagecoach item be timetabled for November and the Scrutiny Programme board be asked to scope, and following a vote was CARRIED.

Following a vote the draft Scrutiny Work Plan as amended was **AGREED.**

The meeting commenced at 5.30 pm and closed at 7.11 pm

Chair

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REPORT TO STRATEGIC SCRUTINY COMMITTEE

Date of Meeting: 11 September 2025

PORTFOLIO HOLDER'S REPORT TO SCRUTINY COMMITTEES

Councillor Matt Vizard – Portfolio Holder Climate, Ecological Change and Communities

1. Issues relating to achieving the Council's published priorities

Local Economy

A new City Centre Vision & Strategy is being developed, which primarily sits with Cllr Laura Wright. The new Vision & Strategy will have a focus on connectivity, supporting active and sustainable transport to the City Centre; enabling residents, shoppers, visitors and workers to access the city sustainably. It will also have a focus on city centre living, supporting new homes in the city centre, reducing the dependency on car ownership.

People

- Intended Outcomes:
  - Communities will be more resilient
  - A safe and thriving city with great things to see and do for everyone

The Net Zero team attend the Devon, Cornwall & Isles of Scilly Climate Impacts Group, where adaptation measures and progress are discussed. The Net Zero Risk Register has been expanded to cover adaptation measures to support service delivery and to protect our communities in Exeter.

Homes

- Intended Outcomes
  - Better quality, energy efficient and more affordable homes to buy or rent
  - New housing developments that are well integrated into existing communities
  - Fewer people will be homeless or in temporary housing
  - The number of people on the social housing waiting list will reduce

The City Council continues to focus on retrofitting our homes, with 920 homes retrofitted to date. The new 3 year Retrofit Contract to be signed shortly will continue to target the achievement of the government 2030/2035 targets for Energy Performance in our properties, whilst also identifying properties that have historic issues with damp and mould along with components that have exceeded there lifecycle regardless of the current EPC to maximise all opportunities to proactively reduce the risk of damp and mould and reduce the carbon footprint of our assets.

The Draft Exeter Plan and its housing related policies The New Local Plan – the Exeter Plan - About the Exeter Plan - Exeter City Council have a focus on large, brownfield sites located close to the city centre and key transport hubs.

Sustainable Environment

- Intended Outcomes
    - A city taking action to mitigate and adapt to the impacts of climate change
    - A Net Zero Carbon City
    - Well-maintained parks, open spaces and biodiversity across the city

A comprehensive update is provided below in Section 2.

2. Update or commentary on any major ongoing programmes of work

Making Exeter City Council operations Net Zero by 2030

Public Sector Decarbonisation Scheme (PSDS)

As previously reported to Strategic Scrutiny, a £3.5M bid for the PSDS Phase 4 fund was successful for the Riverside Leisure Centre. The three-year project includes replacement of the outdated boiler and heating system with air-source heat pumps, a heat recovery system, and upgraded roof deck to boost thermal efficiency whilst accommodating the new roof-mounted heat pumps. The project represents the greatest potential for decarbonisation of any of the Council's Leisure sites and will provide a long term sustainable and efficient building for years to come. Work underway includes a full detailed design before procurement of the installation and building work in 2026.

South West Energy and Environment Group (SWEEG)

The City Council continues to be a full member of the SWEEG. SWEEG is a collaborative research partnership of South West public organisations and provides the City Council access to detailed technical work by academics from the University of Exeter's Centre for Energy and Environment. Numerous studies have supported the Planning team, with studies and research in developing the draft Exeter Plan. SWEEG provide the annual GHG inventory for Exeter, the City Council, and more recently a full study to establish the financial cost of achieving Net Zero for the City Council by 2030.

Costed Organisation Carbon Footprint Report

The Costed Organisational Carbon Footprint Projections report provides three scenarios to establish the financial cost of reducing GHG emissions across five sectors of the City Council's operations. The Study was reported to Executive July 2024 and is to be presented at September's Strategic Scrutiny Committee, together with a presentation by Andrew Rowson, a Senior Research Fellow at SWEEG. Following Strategic Scrutiny, a further report will be considered at Executive to identify options for how carbon reduction measures can be incorporated into Annual Service Plans to enable prioritisation of service led GHG emission reduction measures.

Photo Voltaic (PV) Feasibility Study

The City Council secured £100k from the South West Net Zero Hub, which was created to support South West Local Authorities to support net zero opportunities, unlock barriers and get stalled projects moving. The City Council utilised the fund to carry out a full PV feasibility exercise to evaluate solar opportunities across suitable City Council buildings. The final business case for sites where solar PV is viable will be presented to SMB. New PV installations will support decarbonisation of City Council owned buildings, provide protection against energy price increases and long-term savings.

PV Solar

The City Council's solar estate of 3.4MW is a sizable solar estate, located on the roofs of key City Council sites. Work has been ongoing to implement increased maintenance and cleansing to address the needs of an ageing solar installation. This has involved working with industry experts to find solutions, the council being an early adopter of Solar PV.

Regional Energy Strategic Plan

The Net Zero team and Planning Officers recently facilitated a visit to the innovative and pioneering Water Lane Smart Grid and Storage Project by the Regional Energy Strategic Plan (RESP). RESP will deliver accountability and coordination for strategic planning of the distribution system, as part of the independent National Energy System Operator (NESO). They will convene regional stakeholders around a common view of how the energy system will develop to support local planning and development priorities (the Exeter Plan) as well as delivering national goals. During the visit the team were able to share hurdles the City Council had to overcome to make the Water Lane project happen. The Net Zero team highlighted that there is a need for a more joined up approach to network and infrastructure planning so that projects are able to connect in a timely fashion.

Carbon Literacy

The Net Zero Team have delivered Carbon Literacy training to 307 members of staff, including members of the Strategic Management Board, Organisational Management Board and Councillors. 154 Councillors and staff are certified as being Carbon Literate, which secures Carbon Literate Organisational Bronze Status for the City Council. The team have a rolling programme of monthly training courses planned for the next 6 months, which staff can sign up to via a Microsoft booking form on the intranet.

There is a plan to offer Carbon Literacy training to external organisations, this will require additional officers with the Net Zero team to be certified to deliver the training due to the Net Zero Data Officer recently leaving the organisation. A Business Case was approved by SMB to deliver Carbon Literacy training externally, to outside organisations, community groups and residents. After the recruitment and training of the post of Net Zero Support Officer, this will be progressed with and promoted locally.

Local Electric Vehicle Infrastructure (LEVI) funding

The City Council is currently working with Devon County Council and other Devon District Councils to secure Local Electric Vehicle Infrastructure (LEVI) funding. The fund from government was allocated Devon County Council to support the expansion of on street residential and off street electric vehicle (EV) charging infrastructure. The City Council has provided a full schedule of sites to install new EV charging facilities on City Council owned car parks (off-street) in line with the Council's EV Infrastructure Plan, which was reported in the Councillors Information Bulletin April 2025.

Housing warm home grants

The new Housing Warm Home grants scheme is to be distributed by Devon CC and will be open from autumn 2025 and run for three years.

Healthy Homes grants are also administered by ECC for occupants that qualify, and the Private Sector Housing Team work alongside Exeter Community Energy (ECOE).

Exeter City Council administer Warm Up grants; this is a top up grant and last year ECC paid out £12,000 to help people improve the warmth of their homes.

Working across the City to implement the Net Zero Road Map 2030

A Climate and Nature Group has been established as part of The Exeter Partnership, bringing together representatives from organisations, businesses and community groups, to work collaboratively together to deliver the Exeter Net Zero 2030 Plan. This group meets virtually on a quarterly basis with a rotating chair. Members of this group represent organisations, businesses and communities across the city. The first meeting of Climate and Nature Group took place in March 2025 with a focus on attendees introducing themselves and their organisations, followed by a discussion to explore priorities, challenges and areas/themes for this group to address at future meetings. The second meeting took place in June 2025 with a focus on sustainable travel as transport emissions were the source of 23% of Exeter's greenhouse gas emissions in 2022.

CUA Sustainability Advisory Group continues to meet to discuss areas of joint opportunities, activities and collaboration, group is chaired by Exeter City Council. The group has had a focus on sustainable transport and active travel and agreed to set up a CUA Sustainable Travel Group to focus on sharing travel plans, travel to work approaches/learning, data and best practice.

GWR/Green Circle project: Thanks to a successful bid for funding by the City Council from the GWR Customer and Community Improvement Fund, this project (with additional funding from DCC and the University of Exeter) is connecting and promoting city centre train stations and their proximity to Exeter's Green Circle walking route.

Nature Towns and Cities accreditation is a new scheme (from the National Trust, Natural England, and the Heritage Lottery Fund) that Exeter City Council together with partners and communities across the city could apply for. Further discussions are taking place internally and with external partners in the coming months to ascertain whether to apply for accreditation

Promoting support across the city in combating the ecological & climate change

A number of multi-stakeholder groups convene around habitat mitigation, SANG's, biodiversity and green infrastructure management, which sit under City Development.

Transport

City Council Travel Survey

The 2025 Staff Travel Survey has recently closed. Data from the survey will be analysed and compared to data from the 2024 survey (first year undertaken).

The City Council's Green Travel Plan is currently being reviewed by the Strategic Director for People and will be presented to the next Transport Working Group. Data from 2024 &

2025 Staff Travel Survey will inform the revised Green Travel Plan. Once reviewed, delivery of the Green Travel Plan will form part of the work of the Net Zero team.

Transport Working Group

Members of the Net Zero team attend the quarterly Transport Working Group, chaired by Cllr Vizard. The Transport Working Group uses levers available to the Council to support a positive change across the city, including planning, City Council Green Travel Plan, influencing Devon County Council as the Transport & Highway Authority, lobby public transport providers and government, apply for relevant funding where appropriate. Recent presentations have included Stagecoach and Devon County Council, focusing on the bus network across the city and the electrification of the fleet.

The Net Zero team are working on a number of projects and business cases that have a transport element to them, including the GWR/Green Circle project (mentioned above) and how we support staff and residents to travel across the city by Bike.

Newtown Community Active Travel Project

After extensive engagement with the residents and stakeholders, a scheme to make it easier and safer to get around and improve access to green spaces for everyone, has been recently approved by ECC and DCC HATOC. The project will commence this year and will**:**

- Make green spaces more useful and attractive for residents – for instance, by creating small parks and increasing the amount of green space
- Making it easier and safer for people to walk, wheel and cycle around and through Newtown
- Make it easier for people walking, wheeling and cycling to find their way around in Newtown and to destinations beyond

District Heating Networks

The proposed Energy Centre for the city centre District Heat Network has been approved by the Planning Committee. The Strategic Director for Place is the Senior Responsible Officer for City Council touchpoints with 1Energy, with the Head of Service for City Centre & Net Zero supporting the Director. An open space disposal consultation has commenced and officers anticipate securing authority to dispose of part of Grace Road Fields at Executive November 2025.

An internal officer working group is held once a month to discuss touchpoints, with an additional meeting held with 1Energy representatives to update on the energy centre and the development of the district heat network. 1Energy are undertaking groundwork investigations on Grace Road site, with the necessary licences being sought from the City Council. 1Energy continue to work closely with Devon County Council, as the Highway Authority, in finalising the route across the city, minimising works on the public highway.

The University of Exeter, Exeter College, the Royal Devon University Hospital and Devon Partnership Trust have all received PSDS 4 grant funding to connect to the DHN to decarbonise buildings. Global City Futures has been supporting these four City Institutions in developing their outline and final business case.

Community Engagement

Part of my Portfolio Holder covers Communities, i attend Safer Exeter, the Community Safety Partnership, Executive meetings. Data to develop the 2026 annual Action Plan will shortly be received from Safer Devon, which will enable priorities and Operational Sub-Groups to be re-evaluated.

3. Issues that may impact service delivery/financial performance/future budget requirements

Government recently announced there will be no further rounds of PSDS funding, which supports the decarbonisation of public sector buildings. The City Council awaits further announcements on grant opportunities to decarbonise buildings owned and occupied by the City Council.

Over the next 12 months, the City Council will be reviewing which buildings to connect to the City Centre District Heat Network.

As highlighted in Section 2, the Net Zero team have been working across the organisation on a *PV Feasibility Study. For buildings that are viable, there would be a future ask*

The revenue budget for the delivery of net zero for both City Council and city wide activity continues to be funded from earmarked reserves.

4. Potential changes to services/provisions being considered

Three roles within the Net Zero Team were temporary, and from next year will be funded from car park income; the posts have recently been made permanent. Net Zero budget that would have previously been earmarked to cover salaries will now be directed towards projects, research and delivery of activity.

The Net Zero Data Officer recently left the Council in July to take promotion at another Local Authority in the South West. This role is an integral part of the team in supporting services to reduce GHG emissions, they also deliver the City Council's Carbon Literacy training programme. The role has recently been advertised, with significant interest received which will provide for a positive recruitment process.

Over the next 12 months, the City Council will be reviewing which buildings to connect to the City Centre District Heat Network.

5. Other matters the Portfolio Holder wishes to raise with the Scrutiny Committee

From the work to reduce GHG emissions both within the City Council and across the wider city, there are additional wider societal benefits including:

- reduced pollution
- healthier homes and buildings that are cheaper to heat and run
- cleaner working practices for officers

- biodiversity enhancement
- local green jobs
- innovation
- local leadership

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REPORT TO EXECUTIVE

Date of Meeting: 8 July 2025

Report of: Strategic Director of Place

Title: Exeter City Council's Costed Organisational Carbon Footprint Projections Study to 2030

Is this a Key Decision?

No

1. What is the report about?

1.1. The report presents a summary of the "Costed Organisational Carbon Footprint Projections to 2030" study, produced for the City Council by the Centre for Energy and Environment (CEE) at the University of Exeter. For the first time, it includes estimates of the capital and operational costs associated with decarbonisation over the period 2023/24 to 2030/31.

1.2. The assessment of potential measures uses a theoretical model based on three different scenarios, (Business as Usual, Mid-Term and Max Net Zero) across five sectors of the City Council's operation, to reduce our corporate Greenhouse Gas (GHG) emissions.

1.3. The study includes GHG emissions from Scope 1 (direct use of fossil fuels) and Scope 2 activities (indirect emissions from purchased electricity), plus the additional Scope 3 emissions associated with these activities.

1.4. The report provides scenarios that allow the City Council to prioritise measures which services can undertake for GHG emission reduction but does not commit the City Council to achieving them. The scenarios outlined in the study are both ambitious and challenging. The focus on costs will enable the City Council to prepare investment bids and to plan budgets accordingly. Further details of emissions included in each scope is included in section 6.3. The ability of the City Council to successfully deliver measures under the different scenarios is largely dependent on securing external funding.

1.5. Further work is required to explore how additional BAU measures can be incorporated into Service Plans, beyond those measures which have already been fully costed and committed. This will be in the form of a revised Carbon Reduction Plan, which Members can consider.

2. Recommendations:

2.1. The Carbon Footprint Projections, study including associated challenges and cost to the City Council, are noted and this information will be reported to Strategic Scrutiny Committee in September 2025.

2.2. Members note progress to date and further carbon reduction potential under the assessment of Scope 1 and 2 carbon reduction scenarios available to achieve net zero.

2.3. A further report is considered by Executive, which identifies options for how Business as Usual (BAU) carbon reduction measures can be incorporated into annual Service Plans, to enable prioritisation of service led GHG emission reduction measures.

2.4. The Net Zero team works in collaboration with relevant Services to plan future funding bids to secure additional resources, prioritising social housing, buildings and transport services to support emission reductions.

3. Reasons for the recommendation:

3.1. To understand measures as set out in the Costed Organisational Carbon Footprint Projections 2030 Study which includes three costed scenarios to achieve net zero (Study included as Appendix A).

3.2. The Mid and Max scenarios provide reduction of carbon emissions of 73% and 99% by 2030/31. To enable wider discussion, the study is given due consideration and scrutiny by Strategic Scrutiny Committee.

3.3. Highlight positive outcomes already in fruition, classified as the Business as Usual (BAU) scenario in the study, that will decrease scope 1 and 2 GHG emissions by 29% by 2030/31.

3.4. Continue engagement from all City Council services, especially in housing, buildings (property owned by the City Council) and transport (fleet), so that measures can be integrated into Service Plans and enable the Council to be better prepared to access grant funding to implement measures.

3.5. The carbon reduction measures provide associated social value and wider benefits. The study allows the City Council to assess its priorities for Net Zero activity, in line with the strategic priorities set out in the draft Corporate Plan.

4. What are the resource implications including non-financial resources

4.1. Exeter City Council declared a Climate Emergency in 2019 and as part of this commitment, aims to achieve net zero GHG emissions for its own activities by 2030. The definition of ‘net zero’ in this context includes all GHG emissions arising from the City Council’s direct activities (termed Scope 1 and 2) and from other indirect activities (Scope 3).

4.2. The study includes three costed scenarios to achieve net zero, both operational and capital costs and across all services. The estimated capital and operational costs will allow for better financial planning of resources and inform annual service plans across the organisation. These costs and the evidence which supports them can also be used in any subsequent bids for government funding.

5. Section 151 Officer comments:

5.1 The report sets out the significant financial challenge associated with continuing the path to net zero. It will be essential to attract additional funding, but even then, where there are match funding obligations, this may cause significant challenges to both the General Fund and HRA.

6. What are the legal aspects?

6.1 Section 1 of the Climate Change Act 2008 states that it is the duty of the Secretary of State to ensure that the net UK carbon account for the year 2050 is at least 100% lower than the 1990 baseline. The target was originally 80% and was increased to 100% by the Climate Change Act 2008 (2050 Target Amendment) Order 2019.

7. Monitoring Officer's comments:

7.1 Members will note the statutory obligations set out in the legal aspects above. The Monitoring Officer has no additional comments.

8. Costed Organisational Carbon Footprint Projection to 2030 Study

8.1 The Centre for Energy and the Environment (CEE) at the University of Exeter has produced the City Council's GHG inventory for the previous 6 years. The inventory was updated for the 2023/24 and included in the Costed Organisational Carbon Footprint Projections Study.

8.2 In 2022, CEE assessed the potential to achieve net zero by reducing emissions across five sectors: council-owned housing, non-domestic buildings, transport, renewable energy and land use change/afforestation. The Study updates and extends that analysis to include, for the first time cost estimates and considers three scenarios:

- **Business as Usual (BAU):** The level of activity that is already planned for and/or committed to by the City Council. Activity will require additional funding from government, or other external sources.
- **Mid Case (Mid):** An escalation of activity beyond the BAU scenario i.e., a 'stretch target' which would also require additional government grant funding and operational costs.
- **Net Zero (Max):** A theoretical maximum level of uptake of measures, which would have considerable impact on cost, skills, supply chain and capacity.

8.3. The focus of the study is on Scope 1 and 2 activities only. It does not include the costs of decarbonising the City Council's supply chain (Scope 3). Assessment of Scope 3 emissions is currently data poor and there is no published methodology or data to extend this study to costed Scope 3 GHG emissions reduction projections.

Scope 1 (direct emissions from owned sources), including combustion of fuel in boilers in council owned buildings for heating and hot water, refrigerant leaks from council equipment and fuel in council vehicles.

Scope 2 (indirect emissions from generation of purchased electricity) which covers all electricity use across the council's services

Scope 3 (other indirect) including GHG emissions embodied in all material and services bought by the council, business travel, grey fleet use and commuting, waste disposal, and Well to Tank (WTT).

8.4 The assessment of Scope 1 and 2 GHG emissions includes the appraisal of central government policy, input and consultation with City Council Heads of Service and officers in relevant departments, a review of relevant City Council documents, as well as internal and external data sources. Source based estimates of capital (CAPEX) and operational (OPEX) costs associated with measures are estimated for the period 2023/24 to 2030/31. OPEX was calculated differently for each section. For Council Social housing, non-domestic buildings and renewables, this was using energy consumption data. Transport OPEX was calculated through lease and maintenance costs, and Land Use Change calculated based on maintenance costs.

8.5 Each sector assessment provides several potential measures to reduce GHG emissions ranging from straightforward energy efficiency to far more challenging solutions. There are no pre-determined trajectories, but a range of scenarios for reducing emissions for demonstration purposes.

8.6 The study also includes the City Council's most up to date organisational GHG emissions inventory for 2023/24 (highlighted below). Trends in GHG emissions have not changed significantly since 2018/19, but it is recognised emission reductions modelled in the BAU scenario will see a decline in the trajectory.

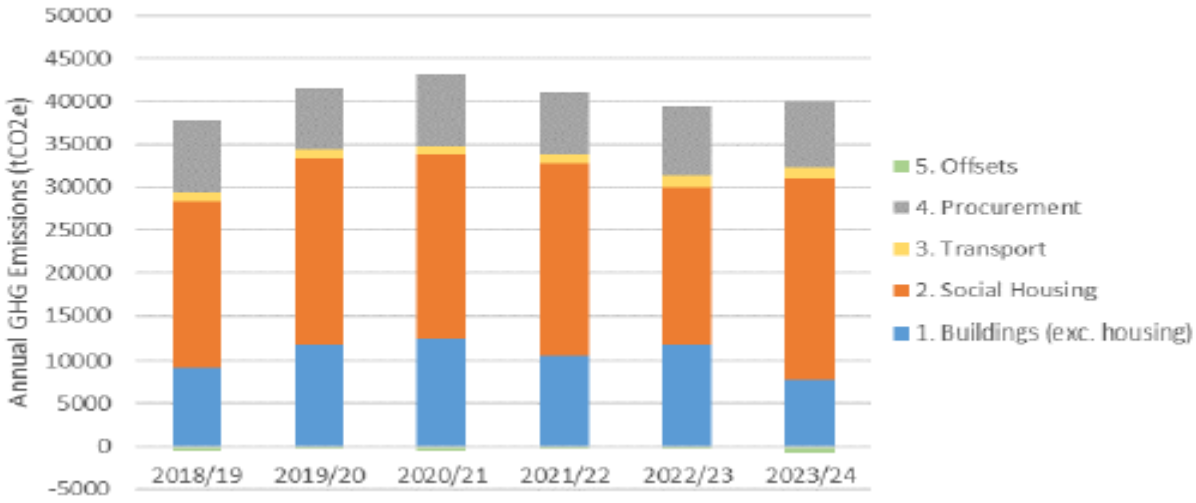
GHG Inventory 2023/24

8.7 The table below is a breakdown of the most up to date GHG inventory results at 39,340 tCO2e which is for the period of 2023/24, and is split into each sector. As in previous GHG inventories, Scope 1 and 2 and Scope 3 emissions are included. Categories shown in red, are ones that fall outside the projections in the study.

8.8 Emissions have not changed significantly over the period. The reduction of over 7,000 tCO2e reduction from last year's published inventory is due to more accurate data on leased assets provided by the City Council which have been applied across the restated timeseries in the figures below.

Category	Scope 1	Scope 2	Scope 3	Offset	Total
1. Buildings (exc. housing)	1,049	1,146	5,551		7,746
1.1 Corporate Estate	366	307	159		832
1.2 Leisure Centres	684	405	244		1,333
1.3 Other Non-Domestic		434	142		576
1.4 Waste from Buildings			*3*		*3*
1.5 Homeworking Energy			*173*		*173*
1.6 Construction and Maintenance			*897*		*897*
1.7 Leased Out			*3,933*		*3,933*
2. Social Housing	11,467	2,946	8,816		23,229
2.1 Operational emissions	11,467	2,946	2,858		17,270
2.2 Construction and Maintenance			*5,958*		*5,958*
3. Transport	688		612		1,300
3.1 Own Vehicles	688		168		856
3.2 Grey Fleet			*16*		*16*
3.3 Business Travel			*10*		*10*
3.4 Commuting			*417*		*417*
4. Procurement			7,839		7,839
4.1 Goods			*3,444*		*3,444*
4.2 Services			*4,394*		*4,394*
5. Offsets	-155			-619	-774
5.1 Exported Renewable Energy				-619	-619
5.2 Land Use Change	-155				-155
Total (entire footprint)	13,050	4,092	22,817	-619	39,340

Graph 1 below illustrates Exeter City Council's GHG emissions footprint each sector from 2018/19 to 2023/24.



Social Housing

8.9 The Social Housing sector accounts for the largest amount of the City Council's GHG emission footprint. Under the BAU scenario, social housing emissions will decrease by 26% by 2030/31 which is modelled on stock disposal, construction of new homes and continuation of the existing retrofit programme. The Mid scenario sees accelerated insulation and solar PV rollout and an increase in heat replacement, electrification and the removal of gas from homes. The Max scenario is a full expansion of the heat replacement (electrification) and increased solar PV installation, with GHG emissions reducing by 87% in total.

8.10 The greatest challenge associated with implementing measures under the three scenarios for Social Housing is the significant capital investment required and is dependent on significant government grants. However, there is a clear pathway to achieving a significant reduction in GHG emissions presented by an extensive decarbonisation of heat. This requires the current retrofit programme and fabric first

approach to ensure homes are sufficiently insulated and energy efficient, so that electric heating can operate effectively without leading to high electricity bills for tenants. Officer capacity within the City Council and grant funding will be an enabling factor.

8.11 The delivery of the City Council's social housing retrofit programme continues at pace, with available funding and measuring factors other than just carbon, particularly in measuring regulated energy, has delivered the following to date:

- 3,135 tonnes of CO2 saved per annum
- 776 properties retrofitted to the fabric first approach
- 378 (49%) of completed upgrades achieved the maximum EPC Band 'A'
- 321 (41%) of completed upgrades achieved EPC status 'B'
- Average fuel consumption for tenants reduced by 40-50%
- £11.5m invested with £3.1m of Government grant funding obtained

To continue the delivery of the retrofit programme, a bid for £4.34m of Warm Homes Social Housing Fund Wave 3 has been submitted, supported by £5.6m of co-funding. If successful, will deliver 140 property retrofit completions per year for the next 3 years, including 184 solid wall (non-traditional) properties.

8.12 For social homes that are retrofitted, there are wider benefits including: improved insulation makes for warmer homes therefore reduced energy consumption, reduced carbon emissions, reduced energy bills for tenants, as well as improved physical and mental wellbeing for tenants. Retrofit works support the development of green skills and the development of local jobs within the city.

Buildings (excluding housing)

8.13 The City Council's non-domestic building stock includes leased assets (such as The Senate and the Guildhall Shopping Centre), Leisure Centres, and corporate buildings including MRF, RAMM, Exeter Corn Exchange, The Matford Centre, The Custom House, Civic Centre and our Car Park estate.

8.14 The City Councils Non-Domestic Building Stock is the second highest emitter of GHG emissions. The BAU scenario will reduce emissions by 57% by 2030/31. The Mid scenario, which includes insulation works, installation of air source heat pumps at three of the City Council's leisure centres, PV installed at the ISCA centre and RAMM, would result in a total emissions decrease of 68%. Installing air source heat pumps throughout the City Council's corporate estate and leisure centres would result in a Max case reductions in emissions estimated at 78% in 2030/31.

8.15 All three scenarios are faced with the challenge of a financial capital commitment each year, alongside operational energy costs. A breakdown of GHG emission reduction and measures for each scenario are detailed in the study. The large spending shown in the 2029 Max scenario is due to the installation of a £5.3 million Air Source Heat Pump at RAMM, however this cost would be greatly reduced if RAMM connects to the proposed City Centre District Heat Network.

8.16 Meeting the requirements of each scenario for the City Council's non-domestic stock will face challenges like those for Social Housing. Energy efficiency improvements, such as the installation of solar PV, decarbonisation of heat and installation of

insulation is technically feasible but would need to be supported by a business case, as well as successful government grant funding applications.

8.17 The City Council does not purchase the energy for leased buildings and due to current lease structures, are unable to control energy use and how each leased out building is heated.

8.18 The development and the rollout of the proposed District Heat Network across the city centre would enable some buildings owned and leased out by the City Council to decarbonise. Connection and retrofit costs could be funded by a successful application to the Public Sector Decarbonisation Scheme (PSDS) fund. During 2025, the Net Zero team will be assessing which buildings to connect along the route of the proposed District Heat Network, considering both energy and GHG emission savings.

8.19 Delivery of schemes to reduce carbon emissions include the recent successful bid for £3.548million PSDS funding to decarbonise the Riverside Leisure Centre by 2028. In addition, to a new Multi Reclamation Facility at Marsh Barton.

8.20 Wider benefits of the above include supporting services by reducing energy consumption and repair costs, as well as reducing operational costs. In addition, the schemes demonstrate best practice and sharing the benefits of successful decarbonisation projects serves to influence and lead businesses in the city.

8.21 Energy consumption associated with Data Centres at Oakwood House and The Civic Centre is captured in Scope 2 emissions. The move to cloud-based data storage by the Council's IT provider, will reflect a decrease in energy consumption at both sites.

8.22 In the Council’s recent Budget Consultation (January 2025), high levels of agreement were reported in relation to the City Council investing in securing affordable, clean and secure energy, with 81% of residents agreeing.

Transport

8.23 The majority of the City Council’s transport emissions stem from the City Council’s own vehicles, with diesel Refuse Collection Vehicles (RVCs) accounting for 61% of overall emissions. Enabling the decarbonisation of these vehicles will strongly influence the trajectory of reduction pathways.

8.24 Under the BAU scenario, Scope 1 & 2 transport emissions fall slightly, but the Mid scenario, with the introduction of biofuel (HVO) and/or the electrification of fleet, GHG emissions fall steadily. Under the Max scenario, GHG emissions quickly fall due to the full electrification of the refuse and our general vehicle fleet. The predominance of vehicle leasing means that most costs are classified as OPEX.

8.25 As mentioned above, the largest proportion of the City Council’s transport emissions stem from RCVs and are therefore the highest priority for reducing transport emissions. Whilst the study assumes that the electricity to charge these vehicles comes at no extra cost (renewable energy supply), refuse collection vehicles come with the highest lease cost uplift, with electric alternatives costing an additional £4,500 per month to lease. The study includes a range of emissions reduction pathways; including an affordable but effective route to decarbonise the City Council’s transport fleet. Additional funding is required for the procurement of leasing alternatives for

diesel replacement, to accelerate decarbonisation and efforts can result in in a 92% reduction in transport emissions by 2030/31.

8.26 There may be additional challenges in securing suitable electric vehicles for more specialist activities in Parks & Open Spaces, as well as the transition from diesel hand-held machinery to electric.

8.27 The full range of assumptions made for each combination of measures and scenarios, including the use of alternative fuels, are detailed in the study. The City Council has its own dedicated renewable charging supply for electric refuse vehicles (eRCVs), and it is therefore a priority to investigate ways in which vehicle lease costs can be made affordable when supported by reduced fuel costs, so allowing the electrification of the refuse fleet to be accelerated.

8.28 There are considerable added wider benefits realised by replacing diesel fuel, reducing the environmental impact of air pollution in the city, and cleaner environment for refuse crews working behind the vehicles. Operating considerably quieter vehicles also provides for safer working conditions as crews can hear each other more easily. The Water Lane Solar Farm and the renewable supply to the EV charging infrastructure at the City Council's Depot is a flagship project which has received national interest and many visits from neighbouring organisations.

Offsets using Renewable Electricity Generation

8.29 The installation of solar photovoltaic (PV) arrays delivers carbon savings as their output replaces alternative fossil fuel energy sources, and exporting renewable energy (electricity that is not directly used on site by services) simultaneously offsets the City Council's gross GHG emissions footprint, it also generates a financial revenue. In 2023/24, the City Council's solar PV portfolio exported 2,989 MWh of the total 4,576 MWh generated, with the balance being self-consumed, offsetting -619 tCO_2e.

8.30 Additional solar PV deployment on our social homes, non-domestic buildings and utilising ground mounted arrays increase PV exports in 2030/31 to 4,298 MWh, 4,965 MWh and 10,475 MWh in the BAU, Mid and Max scenarios, respectively. The increases in offset emissions illustrated in the study reflect the development of new renewable energy projects, particularly in 2026/27 when 3.2MWp of additional PV could be installed. However, uncertainties apply, such as land use, building structure, condition of roof spaces and electricity grid connection agreements required for solar PV installations will be very challenging.

8.31 The council's non-domestic estate of over 3.4 MW, represents a sizable portfolio regionally, with wider benefits including long term income streams and financial savings on reduced energy imports for the City Council. The rollout of renewable electricity generation continues to be financially attractive. A strong business case, supporting local energy resilience and hedges against rising energy prices, and in some cases can overcome national grid constraints.

8.32 Falling national grid electricity GHG emissions mean that despite increasing renewable generation by 2030, its role in offsetting carbon emissions in other sectors will reduce over time. The decarbonisation of the electricity grid reduces the grid electricity factor, diminishing the potential of offsets from exporting renewable energy.

Offsets using Land Use Change

8.33 Afforestation of unforested land delivers valuable carbon sequestration, as trees capture carbon from the atmosphere and transform it into biomass, a process that has the potential to offset carbon emissions on the pathway to net zero. The City Council owns 409 ha of parks and greenspaces, including the 162 ha of the city's Valley Parks, which are managed by the Devon Wildlife Trust.

8.34 The report assumes the City Council's own Parks & Green Spaces have a 24% canopy cover in line with the city, this entails ~98 ha of canopy cover, sequestering -155 tCO_2e annually. Additional tree planting scenarios to further offset the City Council's GHG emissions were modelled using data from the Sixth Carbon Budget, which provides GHG emission savings from planting different types of biomasses of different yield classes.

8.35 Under the BAU scenario, annual offsets in 2030/31 will increase to -161 tCO2e, costing a total of £1m in OPEX to 2030/31. Increasing canopy cover to 30% in a Mid scenario increases annual offsets in 2030/31 to -309 tCO2e, with £0.3m of additional costs of which £0.2m is CAPEX. Increasing canopy cover to 100% in a Max scenario would offset -2,032 tCO2e in 2030/31, costing a further £4m on top of the Mid scenario of which £2.3m is CAPEX.

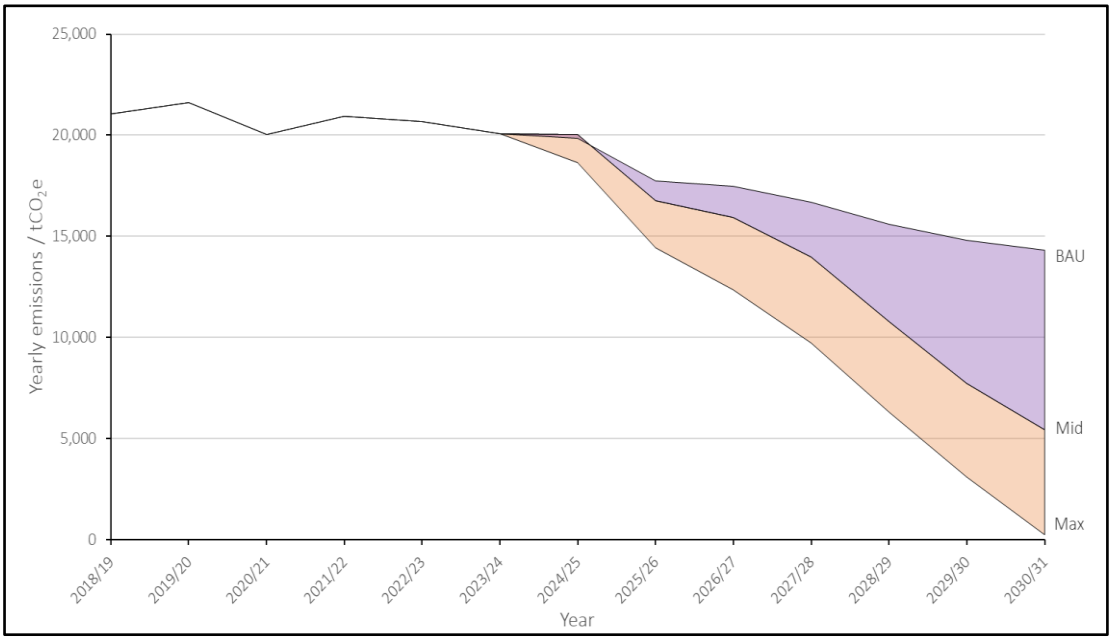
8.36 While the Mid scenario represents valuable progress towards net zero, the Max scenario of 100% canopy cover and potential to increase potential offset emissions eight-fold. 100% canopy cover is not advisable, as land owned by the City Council has various uses, such as biodiversity and recreation, which supports a healthy resident population. Opportunities to expand current planned efforts and increase canopy cover to 30% on a whole City basis is a strategy being targeted for 30 years from 2024/25 by Parks and Green Spaces Team.

8.37 Successful tree planting efforts by the City Council have increased the tree stock by 748 trees (107 standard trees, 50 heritage variety fruit trees, and 591 broadleaf whips). Assuming a planting density of 1,600 trees ha^{-1} and a broadleaf yield class, these will account for 0.35 tCO_2e emissions in 2023/24. Additionally, the challenges associated with this scenario include the availability of suitable land, the additional capital and revenue costs, capacity internally to maintain the additional tree canopy cover, are considerations outlined in the assumptions made for each combination of measure and scenario in the study.

8.38 Additional benefits of tree planting include reduced surface water runoff, improved air quality, improved biodiversity and habitat, and cooling to address warmer summers.

Overall Results

8.39 The overall reduction of the City Council's projected Scope 1 and 2 organisational GHG emissions footprint to 2030/31 is illustrated below. The graph models the cumulative emissions over the seven modelled years and highlights rigorous decarbonisation efforts in all three scenarios (BAU, Mid and Max). Individual sector projections are detailed in the study, of which the Social Housing operational GHG emission projection exhibits a similar shape graph because the sector accounts for a considerable proportion of the organisational GHG footprint (86% in 2023/24).



Graph 2. Projected ECC Scope 1 and 2 organisational emissions under the BAU, Mid and Max decarbonisation scenarios.

8.40 The estimated overall costs associated with delivering each scenario is summarised in the table below. Over the period 2023/24 to 2030/31, meeting the BAU Scenario costs £55.5m. The Mid scenario is estimated to cost an additional £19.2m (£74.7m in total), whilst reducing emissions by 73%. The Max Scenario is an estimated additional £73.5m (£129m in total) and represents a theoretical maximum level with far more challenging and potentially contentious solutions.

Scenario	2023/24	2030/31	Change % or from BAU
BAU			
Emissions tCO2e	20,094	14,322	-29%
Total CAPEX £m		£25.1m	
Total OPEX £m		£30.4m	
Total cost £m		£55.5m	
Mid			
Emissions tCO2e	20,094	5,424	-73%
Total CAPEX £m		£42.9m	£17.8m
Total OPEX £m		£31.8m	£1.4m
Total cost £m		£74.7m	£19.2m
Max			
Emissions tCO2e	20,094	266	-99%
Total CAPEX £m		£93.7m	£68.6m
Total OPEX £m		£35.5m	£5.1m
Total cost £m		£129m	£73.5m

Table 2: Comparison of emissions and costs across BAU, Mid and Max scenarios in 2023/24 and 2030/31

Conclusion

8.41 The study allows the City Council to assess its priorities for Net Zero activity, in line with the strategic priorities set out in the draft Corporate Plan. The carbon reduction

measures set out in the scenarios will provide services (sectors) with the knowledge needed to prepare for investment bids and to plan annual Service Plans and budgets.

8.42 It is important to note that these are not pre-determined trajectories, but a range of different scenarios for reducing GHG emissions for demonstration purposes. The assessment of forecasted measures, projects, and policy applicable at the time of the study. The challenges to reduce corporate GHG emissions are extensive, and measures set out in this study are desk based, as there was no scope for detailed site visits or audits. Therefore, potential measures to reduce emissions range from straightforward energy efficiency to far more challenging and, in some cases unfeasible solutions. The range of different scenarios for reducing GHG emissions are dependent on funding streams, capacity of both staff but also the capacity of businesses, skills and new technologies. Financial forecasts will become outdated and be subject to inflation and shifts in market supply and demand. In addition, changes in government and local based GHG emission reduction targets could extend or shorten the requirement for net zero.

8.43 The BAU scenario enables the City Council to assess opportunities to reduce GHG emissions, with some of the work already underway or planned for. The continuation of decarbonisation work, whilst dependent on securing external funding to deliver projects, will enable each service to consider BAU measures in Service Plans.

8.44 The Mid Case scenario sees much more progress towards net zero for the City Council. It illustrates the potential to achieve a significant reduction in GHG emissions at a practical pace, the electrification of heat in our social housing is a significant contributor to reducing GHG emissions in this scenario. The Net Zero team will work in collaboration with Heads of Service to plan future funding bids to secure additional resources needed to deliver the BAU and Mid Case Scenarios.

8.45 The impact of offsets is highlighted in the Max scenario, but reducing the City Council`s own GHG emissions is prioritised over offsetting, as direct mitigation addresses the root generation of GHG and ensures long term sustainability for the City Council’s services and assets.

8.46 Delivering the measures set out in the study will require the engagement of each service throughout the City Council, particularly those involved with social housing, buildings and transport. To embrace the measures set out in the Costed Organisational Carbon Footprint Projection Study, further work in collaboration with services will be taken forward using annual Service Plans and cross department working, accelerating projects that can be financially supported.

8.47 This study is also being presented to Strategic Scrutiny Committee in September, for further consideration.

8.48 Extensive additional benefits are detailed under each sector in this report. The advantages listed below are not expanded on in the study, its focus being an analysis of costs borne by the City Council in decarbonising its direct Scope 1 and 2 activities. Benefits of GHG emission reduction include:

- reduced use of fossil fuel lowers pollution levels
- healthier more comfortable homes and buildings

- energy efficient, cheaper to run social homes and buildings
- biodiversity enhancement
- improved health for our workers and residents
- reduced operational costs supporting sustainable City Council services
- improved budget security from a self-supply of renewable energy generation
- local leadership and dissemination for replication of decarbonisation measures
- Decarbonisation works provide for 'green' jobs and skills training
- Collaboration and innovation benefit the city and region

9. How does the decision contribute to the Council's Corporate Plan?

9.1 This report and the work of the Net Zero team links directly to the draft Corporate Plan 2025-28. Once the new plan is adopted, all activity to reduce our GHG emissions will link to key priorities set out in the new Corporate Plan in collaboration with City Council services, including using specific and measurable metrics to track progress against priorities and intended outcomes.

Exeter Vision	Innovative & Analytical City	The team has developed a range of data sets to monitor City Council carbon emissions
	Heathy & Inclusive	Ensure City Council owned homes and buildings are energy efficient and healthier. Use of EV and renewable energy sources to provided services and reduce pollution.
	The Most active city in the UK	Projects to be developed to support active travel for employees.
	Accessible world-class education	Studies and projects undertaken in collaboration with experts.
	Liveable & connected	Commercial and residential properties are energy efficient and built to the best possible standard.
	A leading sustainable city	The City Council is a role model for other organisations in Exeter.
	City of Culture	Decarbonisation of City Council owned cultural and heritage facilities to support sustainable services.
Corporate Plan	Local Economy	Working with Building Greater Exeter to support green skills and training and local employment opportunity, as part of new development.
	Sustainable Environment	Net Zero team focuses on reducing City Council carbon emissions to deliver Net Zero. Decarbonisation reduces energy consumption and energy bills, reducing service delivery costs and supporting sustainable council services.
	Homes	The housing retrofit programme delivers warmer homes reduced energy consumption, reduced carbon emissions, energy bills and improved physical and mental wellbeing for tenants. Through Liveable Exeter, working collaboratively with developers in developing sustainable and accessible neighbourhoods and new homes, using sustainable construction methods.
	People	Working in partnership with Live & Move in developing sustainable travel options and sustainable travel options.

		Supporting leisure services through better energy management and procurement, to maintain affordable facilities. Tree planting provides for reduced surface water runoff, improved air quality, improved biodiversity and habitat, and cooling to address warmer summers.

10. What risks are there and how can they be reduced?

10.1 The City Council's GHG inventory and the Net Zero Risk Register has informed the work programme of the Net Zero team and that of other services and is presented to Strategic Scrutiny every six months.

10.2 The City Council's Service Plan template has been amended and now includes a section for each Head of Service to complete on net zero, which will link back to the Study. It also includes measurements and metrics to highlight progress for each service in reducing GHG.

10.3 Ownership and understanding of the measures needed to reduce GHG emissions is constantly reviewed by the Net Zero Team. The team aim to increase understanding within the organisation of change required, with initiatives undertaken such as Net Zero Ambassadors and Carbon Literacy Training.

10.4 The financial cost to deliver net zero is significant, this report is the first costed Carbon Footprint Projection for corporate GHG emissions. If the City Council is not successful in obtaining significant funding, the measures required to reduce GHG emissions will not be delivered.

11. Equality Act 2010 (The Act):

11.1 In delivering Net Zero, the team will take into account the potential impact of actions in relation to age, disability, race/ethnicity (includes Gypsies and Travellers), sex and gender, gender identity, religion and belief, sexual orientation, pregnant women and new and breastfeeding mothers, marriage and civil partnership status in coming to a decision. A separate EQIA is developed for each project.

12. Carbon Footprint (Environmental) Implications:

12.1 The City Council declared a Climate Emergency in 2019 and as part of this commitment, it aims to achieve net zero emissions for its corporate activities by 2030. The Costed Organisational Carbon Footprint Projections Study provides a clear roadmap to reduce City Council GHG emissions.

12.2 Strategic decisions made, either have a positive or negative effect on City Council GHG emissions. Additional work needs to be undertaken prior to decisions being made to determine the impact on City Council GHG emissions.

12.3 The Net Zero Risk Register considers the GHG reduction measures required to achieve net zero, and measures needed to address the impact of extreme weather events to reduce financial risk and to protect City Council services. This is reported to Audit & Governance every six months.

13. Are there any other options?

13.1 There is the option of not continuing existing or committing additional financial and non-financial resources in working towards net zero within the City Council. This would result in a lack of co-ordination, strategic direction and delivery in reducing our GHG emissions.

13.2 A further report will be brought to Executive alongside a revised Carbon Reduction Plan for further consideration to draw out options from all scenarios.

13.3 On a regular basis, the Net Zero team are sourcing and applying for external funding to support the delivery of the City Council's Corporate Carbon Reduction Plan, working with services to identify capacity and match funding within the City Council. However, without aligning the report to Service Plans and accelerating measures where possible, the reduction in emissions forecast in the report will not be achieved.

Strategic Director Place

Author: Net Zero Project Manager

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University of Exeter | Centre for Energy and the Environment

Exeter City Council's Costed Organisational Carbon Footprint Projections to 2030

Centre for Energy and the Environment

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1.3	DL, IB, EF, RR	27/11/24	Draft including ECC comments
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3.0	DL	19/12/24	Intermediate version
4.0	DL	7/1/25	Final version
5.0	DL	22/1/25	Minor edits and updates to numbers (social housing costings and Riverside PV exports)
6.0	DL	29/5/25	Very minor changes to Table 1

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Cover image: Decarbonising Riverside leisure centre will considerably reduce ECC's organisational footprint (Photo courtesy of Exeter Leisure)

Management Summary

Exeter City Council (ECC) declared a Climate Emergency in 2019 and as part of this commitment aims to achieve 'net zero' greenhouse gas (GHG) emissions for its own activities by 2030. The definition of 'net zero' in this context includes all greenhouse gas (GHG) emissions arising from ECC's direct activities (termed Scope 1 and 2) and from other indirect activities including its supply chains (termed Scope 3), which together result in the Council's total GHG emissions. The Centre for Energy and the Environment (CEE) at the University of Exeter has produced ECC's GHG inventory for each of the past 6 years. The inventory is updated here for the 2023/24 financial year.

Additionally, in 2022, the CEE assessed the potential to achieve net zero by reducing emissions across five sectors: council-owned housing, non-domestic buildings, transport, renewable energy and land use change/afforestation. This work also updates and extends that analysis to include costs and considers three scenarios:

- Business as Usual (BAU): The level of activity that is already planned for and/or committed to by ECC.
- Mid Case (Mid): An agreed escalation of ambition beyond the BAU scenario i.e., a 'stretch target' that could be contingent for example, on securing additional government grant funding.
- Net Zero (Max): A theoretical maximum level of uptake for measures with less consideration of potential constraints (e.g., cost, skills, supply chain capacity etc.).

The focus of this analysis is on the costs to be borne by ECC in decarbonising its direct Scope 1 and 2 activities. It does not include the costs of decarbonising ECC's supply chains (Scope 3). Assessment of Scope 3 emissions themselves is currently data poor and there is no published methodology or data to extend this to costed Scope 3 emissions reduction projections.

The assessment of Scope 1 and 2 carbon reduction potential within each sector includes the appraisal of central government policy, input from discussions with ECC service leads and other officers in relevant departments, and consultation with key ECC documents and data sources. Source based estimates of capital (CAPEX) and operational (OPEX) costs associated with measures are estimated over the period 2024/25 to 2030/31. Where applicable, OPEX costs have been calculated from projected energy consumption and prices, with additional expenditure included for transport leases or tree planting maintenance.

The sector assessments are desk based, as there was no scope for detailed site visits or audits. Each sector assessment provides a number of potential measures to reduce emissions ranging from straightforward energy efficiency to far more challenging and potentially contentious solutions. It is important to note that these are not pre-determined trajectories, but a range of different scenarios for reducing GHG emissions for demonstration purposes.

ECC's organisational GHG emission in 2023/24 for all scopes are 39,340 tCO_2e, a 0.7% increase over the 39,072 tCO_2e in 2022/23. Emissions for the reduced costed emissions Scope 1 & 2 total 20,094 tCO_2e. In both cases emissions have not changed significantly since 2018/19 and do not exhibit a downward trend consistent with achieving net zero by 2030.

2023/24 Scope 1 & 2 emissions from social housing are 17,270 tCO_2e. Under the BAU scenario, social housing emissions will decrease by 26% (to 12,818 tCO_2e) by 2030/31 and cost a total of £19.9m in CAPEX. The Mid scenario sees accelerated insulation and PV rollout and the electrification of heat. These measures will cost an extra £14.1m compared to BAU and reduce emissions by 71% (to 5,094 tCO_2e). The Max scenario costs an additional £37.9m on top of the Mid CAPEX, or £52m on top of BAU but will see a reduction of 86% (to 2,337 tCO_2e).

The ECC's non-domestic stock emitted an estimated 2,740 tCO_2e of Scope 1 & 2 emissions in 2023/24. BAU measures such as insulation works at the Corn Exchange and heat pump installation at Riverside will reduce these emissions by 57% (to 1,170 tCO_2e) by 2030/31. These measures are estimated to cost a total of £5.2m in CAPEX on top of £14.1m in OPEX (the total energy costs from 2024/25 to 2030/31). Under the Mid scenario, three of ECC's leisure centres: Riverside, Northbrook and Wonford receive thorough insulation works and air source heat pumps. PV is installed at the ISCA centre and RAMM, electric heating is also installed in the latter. These upgrades will cost a further £3.5 million in CAPEX, with minimal operational cost changes and see total emissions decrease by 68% (to 884 tCO_2e). Installing air source heat pumps throughout ECC's corporate estate and leisure centres results in the Max scenario costing a further £8.1m in CAPEX. Total OPEX reduces by £0.7m from BAU. Max case reductions in emissions are estimated at 78% (to 590 tCO_2e) in 2030/31.

The majority of ECC's 2023/24 transport emissions stem from the council's own vehicles (Scope 1 & 2) of 856 tCO_2e. Refuse vehicles contribute 524 tCO_2e (61%) meaning that the overall emissions reduction pathways are strongly influenced by the decarbonisation trajectory for these vehicles. Under BAU, Scope 1 & 2 transport emissions fall slightly from 856 tCO_2e in 2024/25 to 766 tCO_2e in 2030/31. BAU is unable to accelerate electrification despite ECC's own dedicated renewable charging supply for electric refuse vehicles (eRCVs) due to the high vehicle lease costs. Under the Mid scenario, the introduction of biofuel (HVO) combined with gradual electrification leads emissions to fall steadily to 79 tCO_2e in 2030/31. Under the Max scenario emissions quickly fall to 79 tCO_2e in 2025/26 due to the full early electrification of the vehicle fleet then slowly decreases to 77 tCO_2e in 2030/31 as electricity decarbonises further. The predominance of vehicle leasing means that most costs are classified as OPEX. BAU total OPEX to 2030/31 of £16.3m increases by £1.5m in the Mid scenario and by a further £3.5m in the Max scenario.

Exporting renewable energy simultaneously offsets ECC's gross footprint and generates financial revenue. In 2023/24, ECC's solar photovoltaic (PV) portfolio exported 2,989 MWh of the total 4,576 MWh generated, with the balance being self-consumed, offsetting -619 tCO_2e. Additional deployment on homes, non-domestic buildings and, in the Max scenario, on ground mounted arrays increase PV exports in 2030/31 to 4,298 MWh, 4,965 MWh and 10,475 MWh in the BAU, Mid and Max scenarios, respectively. However, by 2030 decarbonisation of the electricity grid reduces the grid electricity emission factor, diminishing potential offsets from exporting renewable energy. As a result, despite increasing generation, offset emissions from additional domestic and non-domestic PV installation in 2030/31 will be -268 tCO_2e in the BAU scenario, -309 tCO_2e in the Mid scenario, and -652 tCO_2e in the Max scenario. Selling

renewable energy exports from non-domestic buildings from 2024/25 to 2030/31 generates revenue of £1.1m in the BAU scenario, £1.1m in the Mid scenario, and £1.9m in the Max scenario. The Max scenario also includes ground mounted array CAPEX of £2.3m.

The Council owns 409 ha of greenspaces which currently has 24% (98 ha) canopy cover and offsets its footprint by sequestering -155 tCO_2e annually. Under the BAU scenario, annual offsets in 2030/31 will increase to -161 tCO_2e, costing a total of £1m in OPEX to 2030/31. Increasing canopy cover to 30% in a Mid scenario increases annual offsets in 2030/31 to -309 tCO_2e, with £0.3m of additional costs of which £0.2m is CAPEX. Increasing the canopy cover to 100% in a Max scenario would offset -2,032 tCO_2e in 2030/31, costing a further £4m on top of the Mid scenario of which £2.3m is CAPEX.

Overall, Scope 1 and 2 emissions reductions for the three scenarios and the estimated costs associated with delivering each are summarised in the table below.

Scenario	2023/24	2030/31	Change % or from BAU
BAU			
Emissions tCO2e	20,094	14,322	-29%
Total CAPEX £m		£25.1m	
Total OPEX £m		£30.4m	
Total cost £m		£55.5m	
Mid			
Emissions tCO2e	20,094	5,424	-73%
Total CAPEX £m		£42.9m	£17.8m
Total OPEX £m		£31.8m	£1.4m
Total cost £m		£74.7m	£19.2m
Max			
Emissions tCO2e	20,094	266	-99%
Total CAPEX £m		£93.7m	£68.6m
Total OPEX £m		£35.5m	£5.1m
Total cost £m		£129m	£73.5m

The Max scenario, although theoretically, possible is beset with challenges. Costs aside, there are likely to be significant practical constraints on the skills and supply chains needed to provide the measures required particularly, for example, in the retrofit of social housing. The Mid scenario illustrates that a more moderate level of additional spending may have the potential to achieve significant emissions reduction at a more practical pace. This said, aspects of the Mid scenario remain ambitious for example the extensive decarbonisation of heat in the City Council's housing. Business as usual sees more modest reductions in emissions. However, it should be recognised that the BAU emission reductions modelled still considerably exceed the trajectory of emission reduction seen over recent years.

Delivering the scenarios will require the engagement of each service in the Council and particularly those involved with housing, building and transport. Investment, at least in part, needs to be driven by service led emission reduction objectives and appropriate prioritisation metrics which look for effective GHG emissions reduction per £ spent and maximise co-benefits.

Contents

1 Introduction

Exeter City Council (ECC) declared a Climate Emergency in 2019 and as part of this commitment aims to achieve 'net zero' greenhouse gas (GHG) emissions for its own activities by 2030. The definition of 'net zero' in this context includes all greenhouse gas (GHG) emissions arising from ECC's direct activities (termed Scope 1 and 2) and from other indirect activities including its supply chains (termed Scope 3), which together result in the Council's total GHG emissions. The aim is to achieve GHG emissions as close to zero as practicable by 2030. Netting the remaining emissions would require the purchase of carbon offsets but there is a desire to achieve net zero with as little reliance on offsets as possible.

Following an initial decarbonisation pathway projection by the Centre for Energy and the Environment (CEE) at the University of Exeter in 2022 [1], the CEE was commissioned by ECC to reassess the potential to achieve the 2030 commitment with the addition of information on the costs involved. The focus of the analysis is on the costs to be borne by ECC in decarbonising its direct Scope 1 and 2 activities (plus the additional Scope 3 emissions associated with these activities, for example Well to Tank (WTT) emissions associated with gas use in a boiler). The analysis does not include the costs of decarbonising ECC's supply chains (other Scope 3 emissions). Assessment of Scope 3 emissions themselves is currently data poor and there is no published methodology or data to extend this to a costed emissions reduction trajectory.

The CEE has produced ECC's carbon footprint annually since 2018/19. This work updates the footprint for the 2023/24 financial year and assesses the potential to reduce emissions across five sectors: council-owned housing, non-domestic buildings, transport, renewable energy and land use change/afforestation. The 2022 report included separate sections for f-gases, waste and procurement. Here, f-gases are included in buildings, the de minimis emissions from waste are not included and procurement is excluded as it is purely Scope 3.

The assessment of carbon reduction potential within each sector includes the appraisal of central government policy, input from discussions with ECC service leads and other officers in relevant departments, and consultation with key ECC documents and data sources. This process enables the identification of both passive (e.g., the general reduction in carbon intensity of the national electricity grid) and active (e.g., fitting insulation to council-owned buildings) carbon reduction measures. The CEE's 2022 report [1] sought to understand the level of carbon reduction possible for each measure with very aggressive levels of uptake. In many cases, it is likely that this will not be possible due to technical, economic and political factors. The analysis uses three 2030 scenarios as follows:

- Business as Usual Scenario (BAU): The level of activity within a measure that is already planned for and/or committed to by ECC.
- Mid Case Scenario (Mid): An agreed escalation of ambition beyond the BAU scenario i.e., a 'stretch target'. Such a scenario could be contingent for example, on securing additional government grant funding.
- Net Zero Scenario (Max): A theoretical maximum level of uptake for a measure with less consideration of potential constraints (e.g., cost, skills, supply chain capacity etc.).

For each measure within a sector, the level of implementation for each of the three scenarios includes discussions with ECC officers and source-based estimates of capital (CAPEX) and operational (OPEX) costs associated with each measure. Outdated cost figures are adjusted for inflation to 2024 using the Consumer Price Index (CPI) [2]. The sector assessments are desk based, as there was no scope for detailed site visits or audits. Each sector assessment provides a number of potential measures to reduce emissions ranging from straightforward energy efficiency to far more challenging and potentially contentious solutions. It is important to note that these are not pre-determined trajectories, but a range of different scenarios for reducing GHG emissions for demonstration purposes.

2 ECC's Current Organisational Footprint

ECC's organisational GHG emissions in 2023/24 for all scopes totalled 39,340 tCO_2e (see Table 1). Categories that fall outside the projections in this analysis are show in red italics. Table 2 summarises those categories which are included i.e. omitting Scope 3 emissions except WTT emissions associated Scope 1 and 2 activities. The resulting footprint of 20,081 tCO_2e is approximately half the total footprint.

Emission from all Scopes have increased by 268 tCO_2e (0.7%) from 2022/23. Trends in emissions for the total footprint from 2018/19 to 2023/24 are shown in Figure 1 by Scope, and in Figure 2 by emissions category. Trends in emissions included in the scope of this study (i.e. Table 2) are shown in Figure 3. Emissions have not changed significantly over the period, and do not show a downward trend consistent with achieving net zero by 2030. The reduction of over 7,000 tCO_2e reduction from last year's published inventory is due to more accurate data on leased assets provided by ECC [3] which have been applied across the restated timeseries in the figures below.

Table 1: ECC total GHG Inventory results 2023/24. Scope 3 categories denoted in red.

Category	Scope 1	Scope 2	Scope 3	Offset	Total
1. Buildings (exc. housing)	**1,049**	**1,146**	**5,551**		**7,746**
1.1 Corporate Estate	366	307	159		832
1.2 Leisure Centres	684	405	244		1,333
1.3 Other Non-Domestic		434	142		576
1.4 Waste from Buildings			*3*		*3*
1.5 Homeworking Energy			*173*		*173*
1.6 Construction and Maintenance			*897*		*897*
1.7 Leased Out			*3,933*		*3,933*
2. Social Housing	**11,467**	**2,946**	**8,816**		**23,229**
2.1 Operational emissions	11,467	2,946	2,858		17,270
2.2 Construction and Maintenance			*5,958*		*5,958*
3. Transport	**688**		**612**		**1,300**
3.1 Own Vehicles	688		168		856
3.2 Grey Fleet			*16*		*16*
3.3 Business Travel			*10*		*10*
3.4 Commuting			*417*		*417*
4. Procurement			**7,839**		**7,839**
4.1 Goods			*3,444*		*3,444*
4.2 Services			*4,394*		*4,394*
5. Offsets	**-155**			**-619**	**-774**
5.1 Exported Renewable Energy				-619	-619
5.2 Land Use Change	-155				-155
Total (entire footprint)	**13,050**	**4,092**	**22,817**	**-619**	**39,340**

Table 2: ECC GHG inventory results 2023/24 for the scope of this study (Scopes 1 and 2, and associated WTT emissions)

Category	Scope 1	Scope 2	Scope 3	Offset	Total
1. Buildings (exc. housing)	**1,049**	**1,146**	**545**		**2,740**
1.1 Corporate Estate	366	307	159		832
1.2 Leisure Centres	684	405	244		1,333
1.3 Other Non-Domestic		434	142		576
2. Social Housing	**11,467**	**2,946**	**2,858**		**17,270**
2.1 Operational emissions	11,467	2,946	2,858		17,270
3. Transport	**688**		**168**		**856**
3.1 Own Vehicles	688		168		856
5. Offsets	**-155**			**-619**	**-774**
5.1 Exported Renewable Energy				-619	-619
5.2 Land Use Change	-155				-155
Total (scope of this study)	**13,050**	**4,092**	**3,571**	**-631**	**20,094**

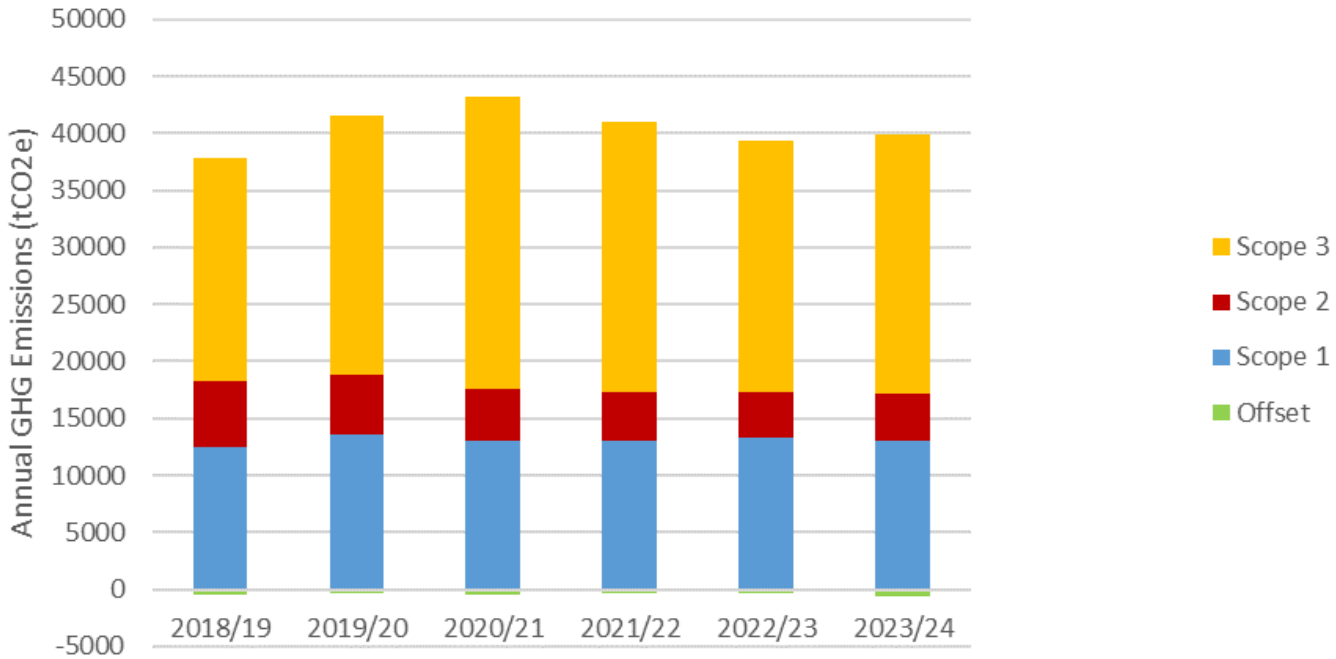

Figure 1: ECC total footprint by scope

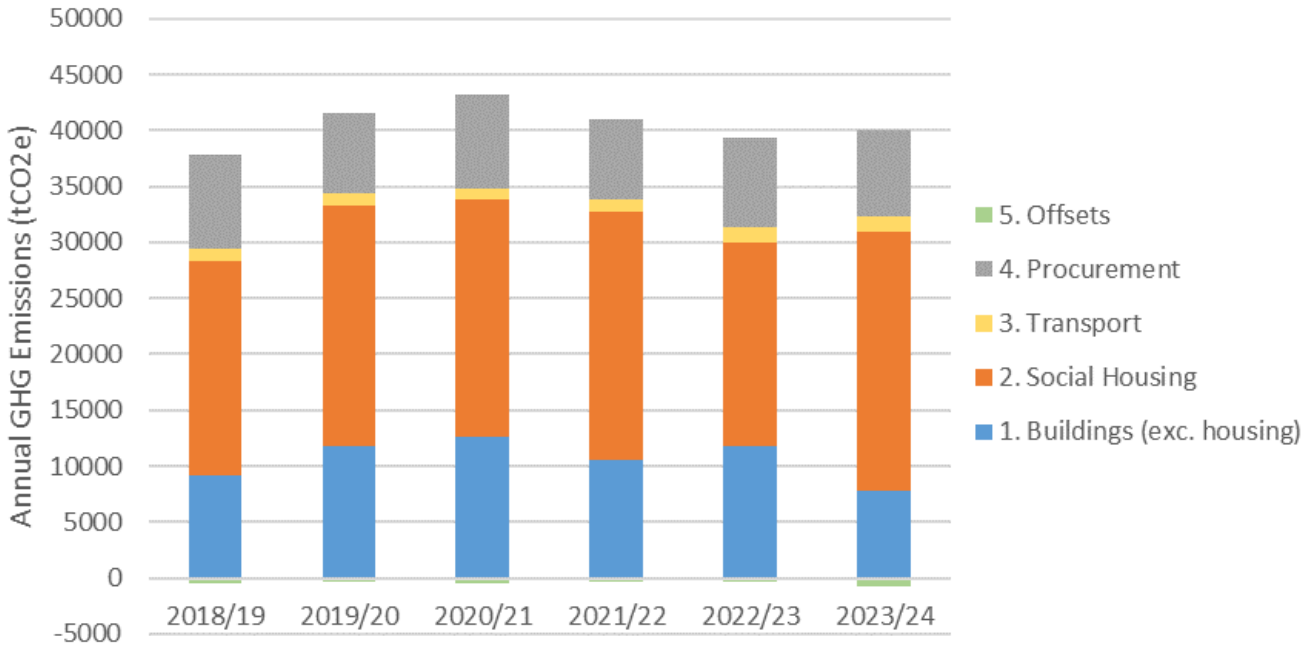

Figure 2: ECC total footprint by category

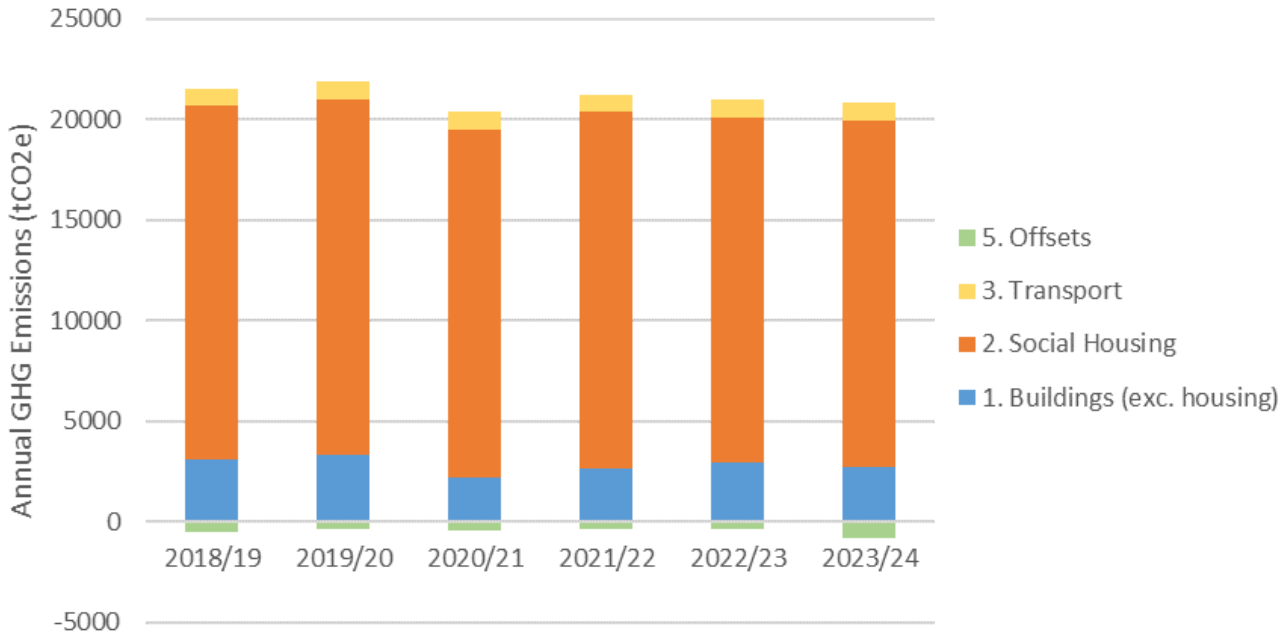

Figure 3: ECC footprint by category for the scope of this study (Scopes 1 and 2 and associated WTT emissions)

3 Housing

3.1 Current sector summary

2023/24 emissions from ECC's social housing (all scopes) are estimated at 23.2 $ktCO_2e$, an increase of 5.0 $ktCO_2e$ from 2022/23. ECC's social housing emissions have two major contributors: operational emissions (Scope 1 & 2) and construction emissions (Scope 3). Operational emissions arise from the consumption of fuel, either directly or indirectly, and leakage from Refrigeration, Air Conditioning, and Heat Pump (RACHP) equipment to meet domestic energy demand. Construction emissions are the embodied emissions associated with materials used in the construction and maintenance of homes.

Figure 4 shows the change in housing emissions over time. In 2023/24, 74% (17,270 tCO_2e) of emissions are due to domestic energy consumption. This value has remained constant over time (< 5% change), largely due to the modelling methodology used in lieu of reliable data. Domestic energy consumption was modelled in the 2022 report using EPC data [1]. This has been adjusted to account for the change in housing stock and the method altered slightly to account for PV installations which partially reduce electricity consumption. The remaining 26% (5,958 tCO_2e) is due to construction and maintenance emissions, which have been estimated here using a high-level spend-based method. The lower construction emissions in 2022/23 are due to less expenditure being assigned to housing costs in that year.

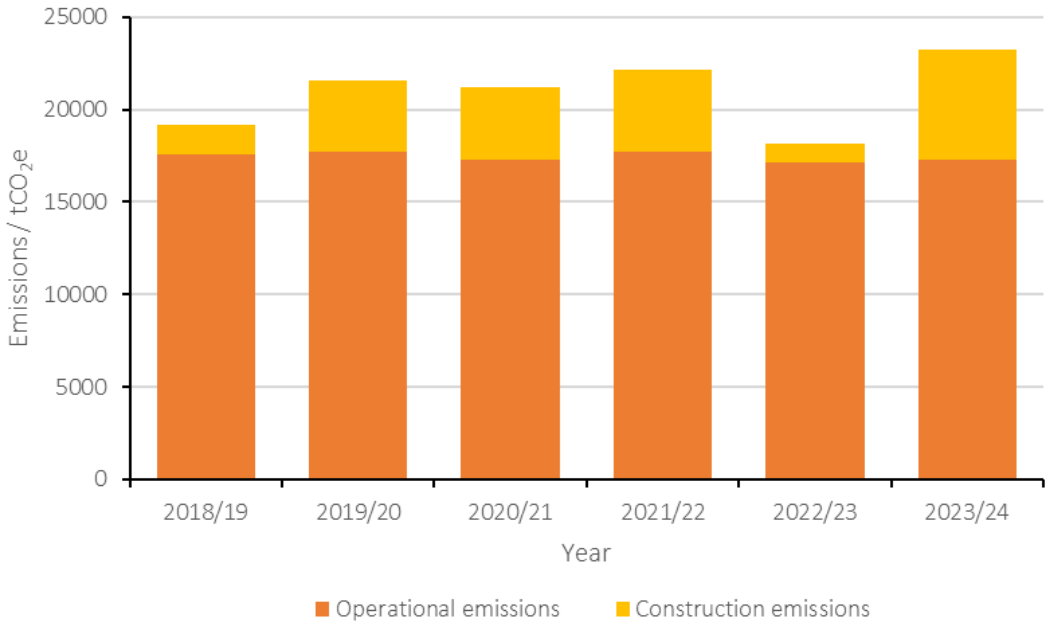

Figure 4: Emissions from social housing (tCO_2e) over time for operational and construction & maintenance.

3.2 Disposal of stock

Disposal of social housing stock occurs through either demolition or Right-to-Buy, a scheme that allows eligible tenants in social housing to purchase their home. Stock disposal to 2030 is assumed to be the same under all three scenarios. To model future energy demand, the 11

worst EPC rated homes are scheduled for demolition. Statistics produced by the Ministry of Housing, Communities and Local Government, show that around 33 homes are purchased through the scheme in Exeter each year[a] [4]. To model this, 33 homes, not scheduled for demolition, are randomly selected and their energy demand removed from the ECC housing stock each year. Therefore, each year, ECC's 'existing stock' (before new construction is accounted for) decreases by 44 homes. The term 'existing stock' will be used to refer to the currently built homes not scheduled for demolition or purchased in a given year.

In the scenarios, the existing stock list is used when determining the number of homes available for potential future energy efficiency measures. It is assumed that ECC would not install PV or a heat pump, for example, on houses scheduled for demolition or being purchased and that no new homes constructed (see Section 3.3) will see energy efficiency measures retrofitted.

No costs or income are associated with demolition or Right-to-Buy, respectively, as these are not energy or carbon-specific measures.

3.3 Construction of new stock

ECC has committed to constructing 500 new Passivhaus homes between 2020 and 2030 [5]. 100 are currently built, and under all scenarios it is assumed that the remaining 400 are constructed at a linear rate across the remaining seven years to 2030. The Passivhaus standard ensures that a home must have a specific primary energy consumption of ≤ 46.2 $kWhm^{-2}yr^{-1}$ [6][b]. The floor area of the new stock was taken as the median floor area of the current social housing stock (66 m^2). Each home was assumed to be electric only, thus, the electricity consumption of ECC's social housing stock increased by ~174,000 $kWhyr^{-1}$ each year, as shown below. After completion, the total increase in electricity consumption is estimated at 1,220 $MWhyr^{-1}$.

The cost uplift to meet Passivhaus standard for a new residential property is 8% [7]. According to a report by the Passivhaus Trust, it costs approximately £1,400 m^{-2} to build Passivhaus properties in Exeter [6], a cost uplift on a normal residential construction of £112 m^{-2}. Multiplying by the median floor area (66 m^2) provides an estimate of the Passivhaus quality uplift at £7,400 per property. At 57 homes per year, the total cost uplift to meet Passivhaus standard for all would require an additional £422,000 per year.

3.4 Insulating existing stock

To promote maximum efficiency (for example to undertake several jobs at a time to extract maximum value from scaffolding, or to make use of a dwelling whilst it is decanted), ECC looks to implement energy efficiency measures with other maintenance measures using a 'whole-house approach'.

[a] Based on a five-year rolling average.

[b] Determined by dividing the Passivhaus primary energy demand of 120 $kWhm^{-2}yr^{1}$ by a primary energy factor of 2.6.

In conversation with ECC, only two insulation measures are chosen for the energy modelling in this analysis, namely cavity wall insulation (CWI) and loft insulation (LI). Whilst other associated interventions such as replacing doors and windows do save energy, the amount they save relative to their cost mean they are generally not economic for that reason alone (although they do provide a wide range of other co-benefits). Some other measures, e.g. improvements to rainwater goods, do not impact energy performance at all. The costs of these associated measures and their benefits have therefore not been included as they would disproportionately skew the results.

Cost and energy savings for heating controls are assumed to occur alongside heat decarbonisation measures in Section 3.6 and PV is discussed in Section 3.7.

The energy savings from the individual measures must be treated carefully as they will interact. For example, the energy savings arising from installing a heat pump in Section 3.6 and improving the insulation of a dwelling is not simply the sum of each measure's independent contribution. The savings for insulating (Section 3.4), appliance efficiency improvements (Section 3.5), and heat decarbonisation (Section 3.6) are calculated together. It is therefore not possible to dissect individual savings for each measure, so their respective components are discussed in each section with the final result given in Section 3.6.

The 2023/24 ECC retrofit schedule shows 181 homes are planned for insulation works; all three scenarios assume that this rate continues each year. The 2020 NEED Framework statistics determine a median relative energy saving from the combined installation of CWI and LI at 13.8% [8].

Homes to be retrofitted have a general survey and a loft survey that cost on average £324 and £109 per home, respectively. Each home also requires cavity extraction, costing £1,835, before new insulation can be installed. The average cost of installation is £1,092 for CWI £459 for LI. Therefore, the total average cost of retrofitting a home with CWI and LI is £3,820[c]. The 181 homes retrofitted per year will cost an estimated £691,000 a year, or £4.8 million to 2030.

In conversation with ECC, it is understood that it costs an average of £40,000 per home improved. In this analysis, only loft insulation, cavity wall insulation and PV (Section 3.7) measures are costed, but the additional expenditure required to provide the other measures accompanying retrofit works is discussed in Section 3.9.

3.5 Improvement in appliance efficiency

The Climate Change Committee (CCC) reports that electricity consumption fell by 12% in 10 years from 2008-2018, despite a 7% increase in population, the CCC predicts this to continue [9]. In this analysis, the electricity saving is calculated with Eq. 1.

$$\text{Saving\%} = 100 - \left(\sqrt[10]{100 - 12}\right)^{Y} \qquad \textit{Eq. 1}$$

[c] Cost data from ECC retrofit schedule

Where Y is the number of years from the current reported year (2023/24), e.g. $Y = 1$ for 2024/25 projections. This produces an approximate 1.2% increase in electricity saved every year.

No capital expenditure from ECC is associated with these efficiency increases as they arise due to tenant behaviour.

3.6 Decarbonising heat

Gas consumption accounts for 76% of the current social housing emissions, a large proportion of which is for heating and hot water demand. Heat decarbonisation represents the greatest potential for reaching net zero emissions but also the greatest challenge.

In the BAU scenario, all gas boilers (assumed 85% efficiency) are replaced with 90% efficient boilers at end of life. Assuming an average 12-year boiler lifespan means that, in the existing stock list, around 400 boilers are replaced each year. Accounting for all relevant interventions, gas consumption is modelled to reduce by an average of 587 MWh each year, 4,110 MWh by 2030/31. Improvements to appliance efficiency are the only electrical measure modelled in this scenario, saving an average of 170 MWh of electricity a year, 1,190 MWh by 2030/31.

In the Mid case scenario, electric heating is installed into all homes on the existing stock list. For the purposes of modelling, only well-insulated homes receive electric heating; installing electric heating without insulating thoroughly can lead to high electricity bills. There are around 4,500 homes modelled, 94% of which have gas heating. Therefore, in the Mid scenario 609 homes per year will need electric heating installed. When combined with insulation measures, this is modelled to save around 8,420 MWh a year of gas each year with an increase in electricity consumption by 6,680 MWh each year. Decarbonisation of grid electricity will result in this swap producing reduced emissions over time.

In the Max scenario, air source heat pumps (ASHPs) are installed into every home on the existing stock list (609 per year). The amount of electricity required by the heat pump to produce the necessary heat demand depends on its coefficient of performance (CoP), the ratio of heat supplied to the electricity consumed. The CoP is influenced by many factors, including the temperature differential, but with improvements in heat pump technology, the CCC predicts the CoP to reach 3.5 in 2030 [10]. This analysis assumes a linear increase from the current UK average of 2.8 to 3.5 in 2030 [11]. Therefore, installing 609 ASHPs per year will save 8,420 MWh of gas each year but will result in only an approximate 1,790 MWh per year increase in electricity consumption.

The installation of ASHPs to provide low carbon heating to homes will have knock-on effects on emissions from F-gases. ASHPs hold charges of refrigerants, and leakages increase atmospheric concentrations of these greenhouse gases. The resulting F-gas emissions from different ASHP installation scenarios in ECC's domestic estate has been included in the projections.

Leakage was estimated assuming a 16 kW ASHP with a charge of 2.2kg of R32 is installed[d]. The analysis assumes a linear uptake of ASHPs every year and uses a standard 3% leakage rate.

Table 3 summarises the modelling assumptions used to estimate annual leakages and emissions from domestic ASHP installation from 2023/24 to 2030/31.

Table 3: Domestic ASHP number of installations, refrigerant type, refrigerant charge, and annual leakage from 2023/24 to 2030/31 under the Max scenario

Financial year	Nº of ASHPs installed	Annual leak rate	Refrigerant type	Refrigerant charge per ASHP (kg)	Annual leakage (kg yr^{-1})
2023/24	0	3%	R32	2.2	0
2024/25	609	3%	R32	2.2	33.13
2025/26	1217	3%	R32	2.2	65.80
2026/27	1826	3%	R32	2.2	98.01
2027/28	2434	3%	R32	2.2	129.69
2028/29	3043	3%	R32	2.2	161.04
2029/30	3651	3%	R32	2.2	191.86
2030/31	4260	3%	R32	2.2	222.22

Cost data for the BAU and Mid case scenario are inflation adjusted values from a 2018 Delta-ee report commissioned by BEIS, which interviewed various installers to gain insight into installation prices [12]. For installing a new gas boiler, the report details different types of installation depending on installer or desired heating system. For BAU, the most appropriate installation scenario is the "24kW combi for combi direct swap by regional installer (including labour and fittings but excluding controls and heat distribution system)" costing £3,300 [12]. Replacing 400 boilers every year would cost £1.3 million, a total of £8.8 million over the seven years.

The Delta-ee report also gives average costs based on different scenarios for electric heating. Notably, "Install a new system with high-end electric radiators (which have a small storage capacity), including controls" in a one- or three-bedroom house [12]. Analysis of EPC data shows that the median social home in Exeter has two bedrooms. The cost of the two scenarios is averaged to give an estimated cost of £4,900 per installation. To meet the Mid scenario of 609 installations a year would cost around £3.0 million, a total of £20.9 million after seven years.

For the Max scenario, MCS data on the average cost of an ASHP installation in Devon is used [13]. A three-year average is calculated at £12,100. To install 609 ASHPs per year would approximately cost £7.3 million, totalling £51.3 million after seven years. Despite the high CAPEX, the greater efficiency of ASHPs reduces the electricity bills of tenants compared to direct electric heating, although the cost is likely to be similar to gas heating.

3.7 PV installation

The BAU, Mid and Max scenarios assume PV is installed on all suitable homes by 2050, 2040 and 2030 respectively. The electricity saving from a PV array depends on a multitude of factors,

[d] See https://www.jouleuk.co.uk/products/16kw-r32-air-source-heat-pump/

such as the number of panels, the capacity of each panel, the solar resource, intrinsic panel properties and the self-consumption factor.

The PV potential of ECC's social housing stock was modelled by the CEE in 2021 [1]. The number of panels that can be installed was modelled from the roof area, estimated using EPC data of floor areas and property types. This study concluded that 25,700 panels can be installed across a total of 2,700 suitable homes – an average of 9.6 panels per home.

Further data provided by the ECC shows that 799 homes already have PV arrays, giving an estimated 7,700 panels installed already. To install PV arrays on the remainder 1,900 homes would require rates of 70 homes, 110 homes and 270 homes per year, respectively.

The panel capacity is assumed at 0.4 kWp[e]. When estimating generation, using data from ECC on the installation years of social housing PV arrays, any panels installed from 2014 onwards are given a 0.4 kWp capacity. To account for improvements in PV capacity over time, any installations prior to this are given a 0.18 kWp capacity based on product specifications from PV manufactures (see Section 6.1).

The solar resource, the amount of sunlight available at a location, is modelled with PVGIS v5.3 [14]. This models the solar intensity at a location and combines this information with some intrinsic properties of the solar panel to produce an estimate of the energy a panel at that location will generate within a year. Due to the wide variation in the location, angle and facing direction of the ECC's social housing roofs an average value is determined and used in analysis. The settings used in PVGIS are listed below. With these settings, PVGIS models an average annual energy generation of 826 $kWhyr^{-1}kWp^{-1}$, this is 330 $kWhyr^{-1}$ for a 0.4 kWp panel.

- Location: 50.718, -3.522 – a central point within the Exeter.
- Solar radiation database: PVGIS-SARAH3 – works well with European destinations.
- PV technology: Crystalline Silicon – most common type of panel used.
- Installed peak PV power (kWp): 1 kWp – allows the yearly generation output to be independent of kWp.
- System loss (%): 14% – default value used by PVGIS for the module efficiency of a monocrystalline silicon PV cell [15].
- Mounting position: Roof added / Building integrated
- Azimuth (°): 90° – west-facing, balanced option for determining an average value.
- Slope (°): 30° – good compromise for an average value when using a west-facing azimuth [16].

Energy generated by a solar array is either consumed directly by the household (self-consumption) or exported to the grid; exports are covered in Section 6.2. To determine the electricity saving from a PV array requires the self-consumption ratio, the proportion of

[e] In-line with values used by Currie & Brown in their reports on decarbonising two of ECC's leisure centres – (see Section 4.2.4) [18,19].

electricity generated that is consumed directly. This was modelled as part of the 2021 footprint and the median value, of the eligible homes, is calculated at 35%.

Combining all this information together gives a yearly electricity saving increase of 76 MWh, 120 MWh and 300 MWh for the BAU, Mid and Max scenarios, respectively. Over seven years to 2030, accounting for the decay of the PV cells[f], the arrays will reduce electricity consumption by 531 MWh, 843 MWh and 2,050 MWh under the three scenarios.

This analysis has not modelled the effect of installing PV alongside electric heating as there is no reliable way of determining if a home can have retrofitting, heat decarbonisation and PV measures implemented. This is important to note as when electric heating is installed into a home with PV, the self-consumption ratio will increase.

The ECC retrofit schedule suggests that the average cost of installing PV is £6,740 per house, including £204 for a PV survey and £339 for scaffolding. To meet each scenario would require a yearly spend of £470,000 yr^{-1}, £750,000 yr^{-1} and £1.8 million yr^{-1} for the BAU, Mid and Max scenarios, respectively. Over seven years this accumulates to £3.3 million, £5.2 million and £12.7 million respectively.

The main financial incentives for PV are reduced energy bills through self-consumption and income generated through exporting excess energy, both of which would reduce annual OPEX. However, no financial savings are modelled here as ECC are not responsible for social housing bills and data limitations makes estimating export payments impractical (see Section 6.2).

3.8 Summary of Modelling Assumptions

The full range of assumptions made for each combination of measure and scenario as discussed in the previous sections is shown in Table 4.

Table 4: Modelled assumptions for housing

Measure	BAU Scenario	Mid Scenario	Max Scenario
Disposal of stock	**11 homes demolished a year** – least energy efficient **33 homes lost a year through Right-to-Buy** – randomly allocated	Same as BAU	Same as BAU
Construction of new homes – operational targets	**500 new homes to Passivhaus standard till 2030** – 120 $kWhm^{-2}$.	Same as BAU	Same as BAU
Insulation	**Current nature and rate of insulation continues** – 181 homes a year with CWI and LI	Same as BAU	Same as BAU

[f] Most manufacturers provide a guarantee that a panel will retain 80% of its generation capacity after 20 years. This means that year the output decreases by $\left(1 - \sqrt[20]{0.80}\right) \times 100 = 1.1\%$ each year.

Measure	BAU Scenario	Mid Scenario	Max Scenario
Decarbonising heat	**Replace gas boilers like for like at end of life** – ~400 replacements a year	**Linear installation rate of direct electric heating to all gas homes by 2030** – 609 installations a year	**Linear installation rate of ASHPs to all gas homes by 2030** – 609 installations a year
Increasing appliance efficiency	**12% reduction in electricity consumption from increased appliance efficiency** – ~1.2% a year	Same as BAU	Same as BAU
PV installation	**Install PV on all suitable homes by 2050** – 70 homes a year	**Install PV on all suitable homes by 2040** – 111 homes a year	**Install PV on all suitable homes by 2030** – 269 homes a year

3.9 Projected Emissions to 2030/31

Historical and projected operational emissions under the three scenarios are shown in Figure 5. The shaded areas show the projected emission ranges under the three scenarios, purple between BAU and Mid, and orange between Mid and Max. The BAU trajectory represents the upper limit, the Max scenario represents the lower limit, and the middle trajectory represents the Mid scenario.

Under the BAU scenario, the 2030/31 operational emissions are estimated at 12,818 tCO_2e, primarily due to grid decarbonisation. Thus, with heat electrification, the energy demand of social housing in the Mid scenario would produce an estimated 5,094 tCO_2e of emissions for the 2030/31 inventory. The enhanced electrical efficiency of ASHPs compared to electric heaters and accelerated PV rollout means that far less grid electricity is consumed in the Max scenario. This results in 2030/31 operational emissions of 2,297 tCO_2e. This includes the exponential increase in F-gas emissions from < 1 tCO_2e in the current footprint to 191 tCO_2e in 2030/31 and illustrates how the carbon saving achieved from transitioning to low carbon heating significantly outweighs the negative feedback from increased F-gas emissions. It should be mentioned that the BAU scenario is predicted to have fewer emissions in 2024/25 than the Mid scenario as the electrification of heat in the Mid scenario produces more emissions than gas heating due to electricity having a greater emission factor in that year.

Over the seven years to 2030/31, total operational emissions from social housing are modelled as 103,112 tCO_2e, 81,374 tCO_2e and 63,553 tCO_2e under the BAU, Mid and Max scenarios, respectively.

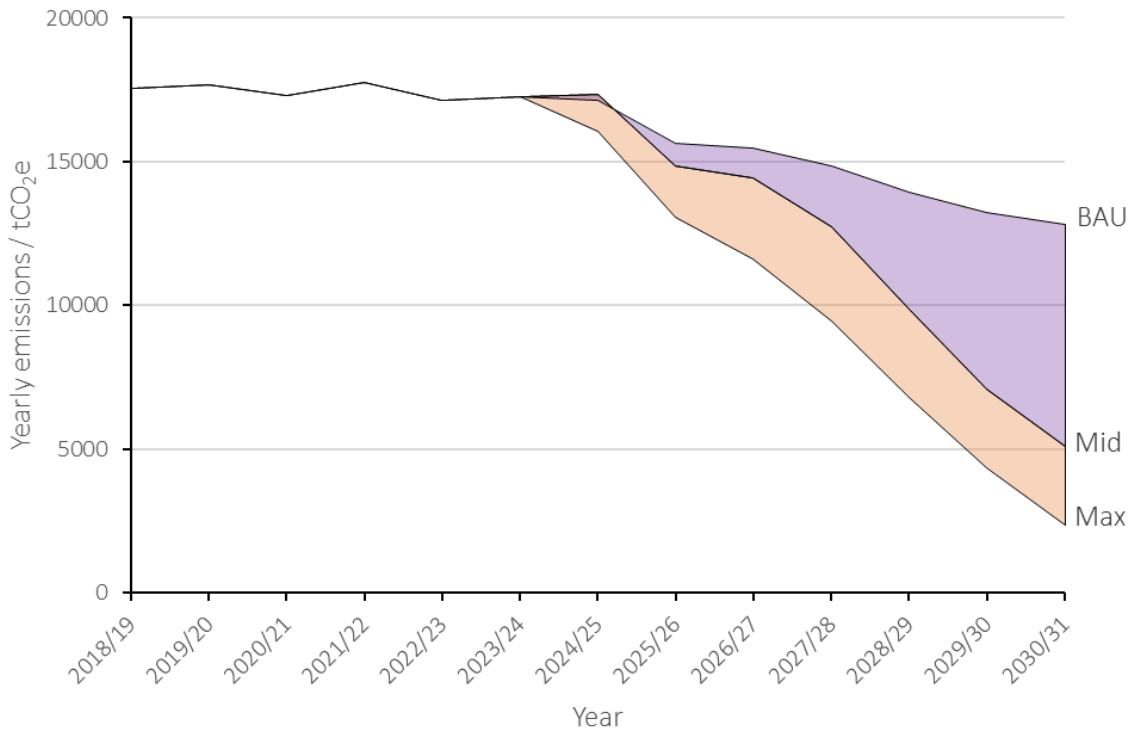

Figure 5: Projected operational emissions (tCO_2e) from social housing under the three scenarios.

The capital costs associated with implementing the measures under the three scenarios are shown in Figure 6 and Table 5. In Figure 6 each bar represents the capital expenditure (CAPEX) needed every year to meet each scenario's requirements. There are no operational costs (OPEX) for social housing as tenants are financially liable for their energy consumption. The constant or linear implementation trajectories for the measures means the annual upfront costs have remained largely constant at £2.91 million, £4.85 million and £10.3 million for the BAU, Mid and Max scenarios, respectively.

As mentioned in Section 3.4, ECC's whole-house approach has social homes receiving maintenance and retrofitting works concurrently at an average cost of £40,000 per home. Only a quarter of this (£10,600) is assigned to energy efficiency-specific interventions in this analysis. As such, a further £29,400 is required per property to deliver these measures alongside the other works. At 181 homes per year for each scenario, this additional cost is calculated at £5.33 million per year, a total of £37.3 million by 2030/31.

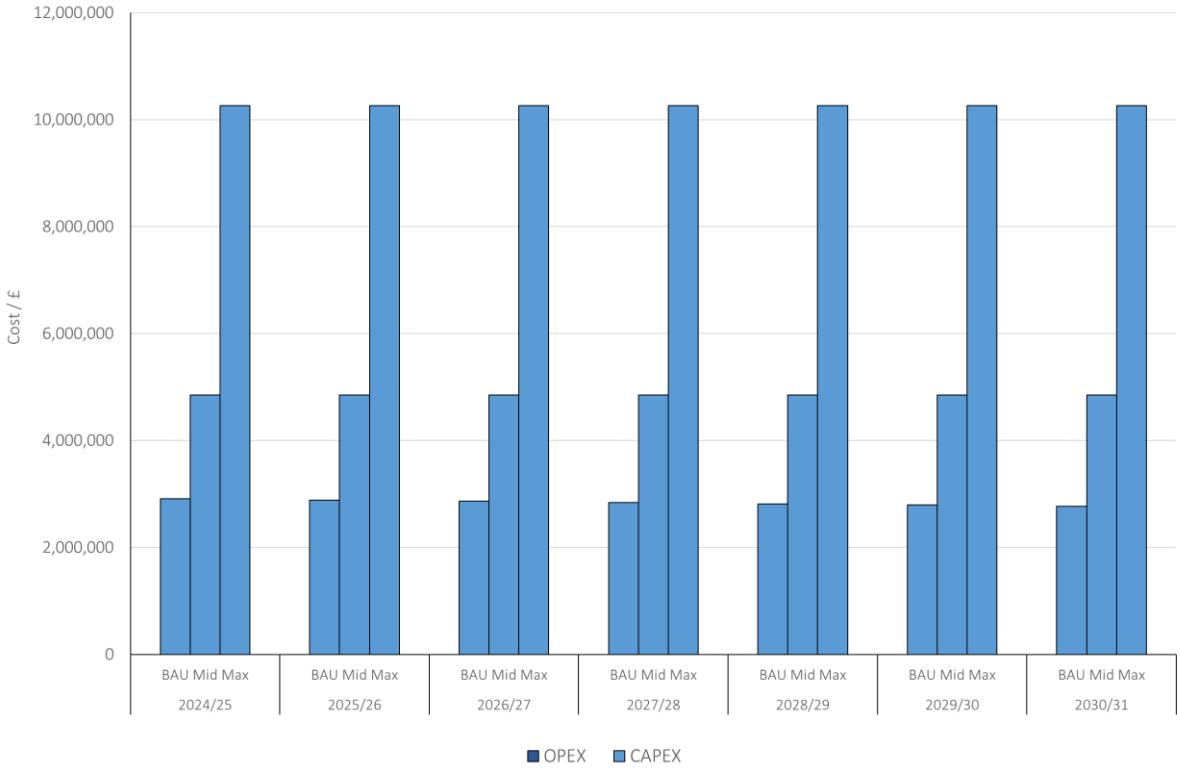

Figure 6: Annual CAPEX of decarbonising ECC's social housing under the three scenarios.

*Table 5: Cost breakdown of social housing emission reduction scenarios. Only measures with costs associated with them are shown. * Denotes that these costs are provided as part of a £40,000 per house maintenance and retrofit package. Totals may not sum due to rounding.*

Year	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total
BAU Scenario								
CAPEX	£2,910,000	£2,890,000	£2,860,000	£2,840,000	£2,820,000	£2,790,000	£2,770,000	£19,900,000
of which…								
Construction of new stock	£422,000	£422,000	£422,000	£422,000	£422,000	£422,000	£422,000	£2,960,000
Insulating existing stock*	£691,000	£691,000	£691,000	£691,000	£691,000	£691,000	£691,000	£4,840,000
Decarbonising heat	£1,330,000	£1,300,000	£1,280,000	£1,260,000	£1,230,000	£1,210,000	£1,180,000	£8,790,000
PV installation*	£470,000	£470,000	£470,000	£470,000	£470,000	£470,000	£470,000	£3,290,000
OPEX	£0	£0	£0	£0	£0	£0	£0	£0
Total	£2,910,000	£2,890,000	£2,860,000	£2,840,000	£2,820,000	£2,790,000	£2,770,000	£19,900,000
Mid Scenario								
CAPEX	£4,850,000	£4,850,000	£4,850,000	£4,850,000	£4,850,000	£4,850,000	£4,850,000	£34,000,000
of which…								
Construction of new stock	£422,000	£422,000	£422,000	£422,000	£422,000	£422,000	£422,000	£2,960,000
Insulating existing stock*	£691,000	£691,000	£691,000	£691,000	£691,000	£691,000	£691,000	£4,840,000
Decarbonising heat	£2,990,000	£2,990,000	£2,990,000	£2,990,000	£2,990,000	£2,990,000	£2,990,000	£20,900,000
PV installation*	£747,000	£747,000	£747,000	£747,000	£747,000	£747,000	£747,000	£5,230,000
OPEX	£0	£0	£0	£0	£0	£0	£0	£0
Total	£4,850,000	£4,850,000	£4,850,000	£4,850,000	£4,850,000	£4,850,000	£4,850,000	£34,000,000
Difference from BAU	£1,940,000	£1,960,000	£1,990,000	£2,010,000	£2,040,000	£2,060,000	£2,080,000	£14,100,000
Max Scenario								
CAPEX	£10,300,000	£10,300,000	£10,300,000	£10,300,000	£10,300,000	£10,300,000	£10,300,000	£71,800,000
of which…								
Construction of new stock	£422,000	£422,000	£422,000	£422,000	£422,000	£422,000	£422,000	£2,960,000
Insulating existing stock*	£691,000	£691,000	£691,000	£691,000	£691,000	£691,000	£691,000	£4,840,000
Decarbonising heat	£7,330,000	£7,330,000	£7,330,000	£7,330,000	£7,330,000	£7,330,000	£7,330,000	£51,300,000
PV installation*	£1,810,000	£1,810,000	£1,810,000	£1,810,000	£1,810,000	£1,810,000	£1,810,000	£12,700,000
OPEX	£0	£0	£0	£0	£0	£0	£0	£0
Total	£10,300,000	£10,300,000	£10,300,000	£10,300,000	£10,300,000	£10,300,000	£10,300,000	£71,800,000
Difference from BAU	£7,350,000	£7,370,000	£7,400,000	£7,420,000	£7,450,000	£7,470,000	£7,490,000	£52,000,000
Difference from Mid	£5,410,000	£5,410,000	£5,410,000	£5,410,000	£5,410,000	£5,410,000	£5,410,000	£37,900,000

4 Non-domestic Buildings

4.1 Current sector summary

2023/24 emissions from ECC's non-domestic building stock (all scopes) are estimated at 7.7 $ktCO_2e$, a reduction of 4.1 $ktCO_2e$ from 2022/23. The change is predominantly due to the fewer emissions associated with Scope 3 construction and maintenance due to completion of St Sidwell's Point in April 2022. A breakdown of non-domestic building emissions by type is shown in Figure 7.

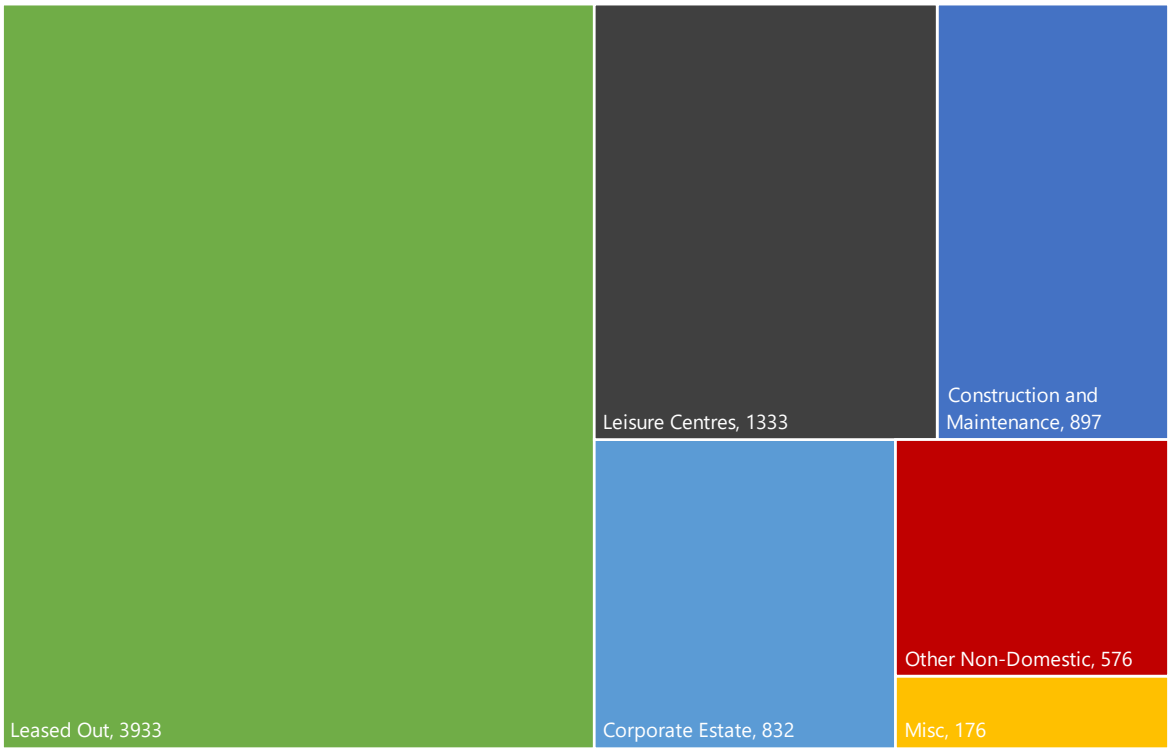

Figure 7: Breakdown of ECC's 2023/24 non-domestic emissions for all scopes (tCO_2e).

Just over half (51%) of emissions, 3,933 tCO_2e, arise from the energy demand of ECC's Scope 3 downstream leased assets. This is a reduction of two thirds from the value reported in the 2022/23 inventory due to better data allowing ground lease emissions to be removed [3]. ECC is not financially responsible for the utility bills of leased assets so there is limited financial incentive for implementing energy efficiency measures. Without meter readings, the emissions are calculated using energy benchmarks from CIBSE TM46 [17]. These comprise consumption values per unit floor area for gas and electricity depending on property type. For each leased asset, the property type is determined through visual inspection. The emissions are estimated by multiplying the corresponding energy benchmark for gas and electricity by the total floor area, adjusting according to the EPC score[g] and multiplying by a corresponding emission factor. This methodology has enabled historic emission figures to be updated slightly from the previous inventory.

[g] An EPC score of 71 would have its energy use data multiplied by 0.71 as an EPC rating of 100 is theoretically an average building.

17% of non-domestic emissions, 1,333 tCO_2e, are produced to meet the energy demand for ECC's six leisure centres: Riverside Leisure Centre, Northbrook Swimming Pool, Wonford Sports Centre, ISCA Centre, Exeter Arena and St Sidwell's Point Leisure Centre. This is a 163 tCO_2e reduction on last year, despite increased usage of backup gas use at St Sidwell's Point. The reduction is mostly due to the lower emissions factor of grid electricity. Leisure centres represent the greatest potential for decarbonisation across ECC's estate.

ECC's corporate buildings are responsible for 832 tCO_2e (11%) and comprising a wide range of ECC uses including council offices, cultural buildings and waste management centres. Some of the buildings are listed making fabric changes difficult and/or show minimal decarbonisation potential.

Scope 3 construction and maintenance conducted by the ECC emitted 897 tCO_2e (12%), occurring due to the carbon associated with materials purchased by ECC for various projects. This is down from 4,761 tCO_2e the year before due to completion of St Sidwell's Point in April 2022.

The remaining 9%, 752 tCO_2e, of non-domestic emissions is comprised of emissions from car park energy use (referred to as "Other Non-Domestic"), as well as waste treatment and the energy associated with remote working (collectively referred to as "Misc"). There is not a substantial difference in these emissions compared to last year.

2023/24 Scope 1 and 2 emissions total 2,740 tCO_2e with 49% emitted from leisure centres, 30% from corporate buildings and 21% from other non-domestic properties.

4.2 Leisure Centres

2023/24 emissions from ECC's leisure centres (all scopes) are estimated at 1,333 tCO_2e, a reduction of 163 tCO_2e from 2022/23. A breakdown of ECC's 1,333 tCO_2e Scope 1 and 2 leisure centre emissions is given in Figure 8. Just under half (47%) of all leisure centre emissions are due to the energy demand of Riverside leisure centre, producing 624 tCO_2e. This is a down from 882 tCO_2e last year, a reduction of 29%, likely due to better building management including refinement of heating controls. As the ECC's most carbon intensive leisure centre, Riverside has been chosen as a priority for decarbonisation, with potential retrofitting measures beginning in 2025.

The new Passivhaus St Sidwell's Point is responsible for 30% of leisure centre emissions (398 tCO_2e). Despite high levels of energy efficiency, its large size results in high electricity consumption. A quarter of emissions are due to a gas boiler temporarily supplementing the installed heat pumps for longer periods than normal due to commissioning faults and repair delays. St Sidwell's Point opened in 2022 and no energy saving measures are modelled beyond transitioning away from the gas backup and PV installation.

The other swimming pool operated by ECC, Northbrook, makes up 9% of leisure centre emissions (122 tCO_2e). The non-swimming pool leisure centres, ISCA centre, Wonford, and Exeter Arena collectively comprise 14% of total emissions at 103 tCO_2e, 46 tCO_2e and 39 tCO_2e, respectively. None of these have seen any considerable change from the previous inventory.

Finally, fluorinated gas (F-gas) leakage from 28 Refrigeration, Air Conditioning, and Heat Pump (RACHP) units accounts for 9 tCO_2e.

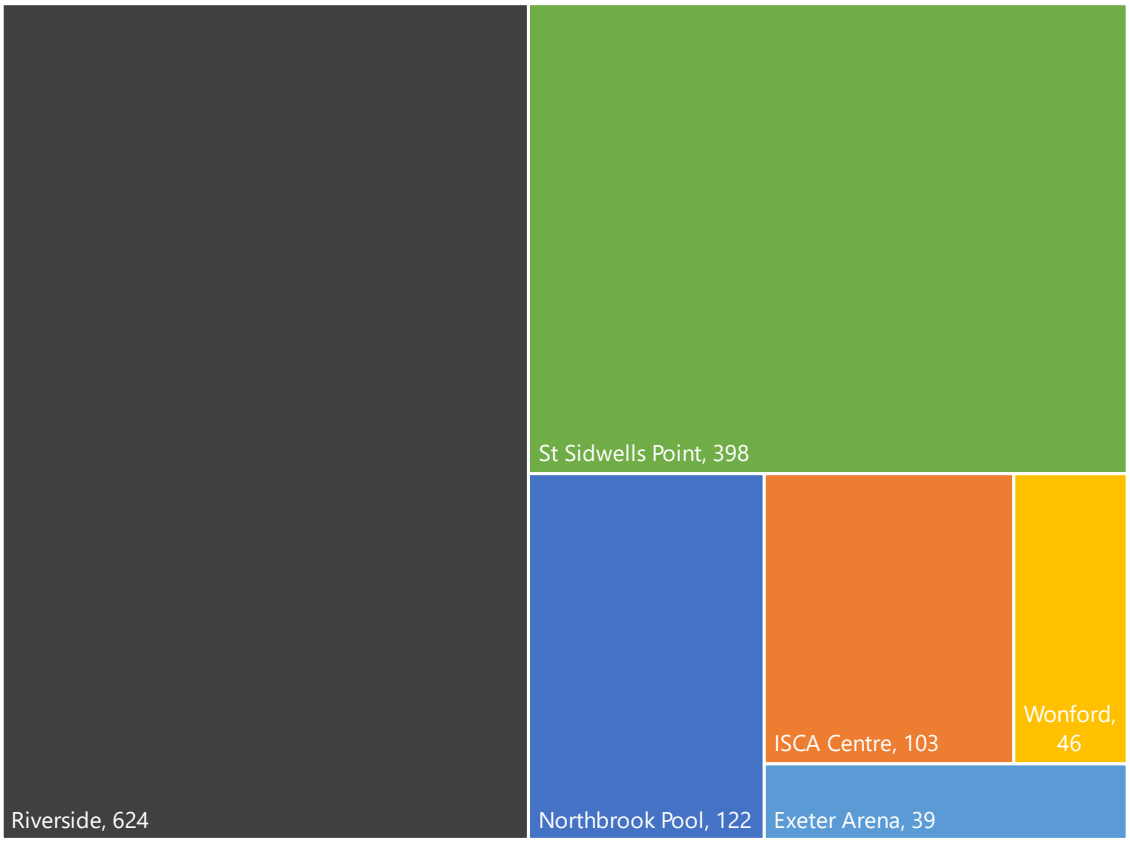

Figure 8: Breakdown of 2023/24 Scope 1 & 2 leisure centre emissions (tCO_2e).

Projections include energy saving measures being installed into a different leisure centre each year with the priority determined by current gas consumption. Energy savings are modelled from the installation year.

1. Riverside, 2025
2. Northbrook, 2026
3. ISCA Centre, 2027
4. Wonford, 2028
5. Exeter Arena, 2029

The priority order above does not apply to PV installations (see Section 6.3).

4.2.1 Change in stock

The only change in stock modelled in the leisure centre analysis is the hypothetical closure of Northbrook in 2025 in the Max scenario. No cost is associated with the closure as it is not an energy saving-specific measure.

4.2.2 Efficiency improvements

A range of thermal and electrical efficiency measures have been modelled for ECC's leisure centres based on conversations with ECC service leads. Where possible, costs and savings data have been adapted from two decarbonisation reports by Currie & Brown (C&B) on Riverside

[18] and Northbrook [19]. Using these reports, relative savings are determined for each measure. Future gas and electricity consumption is modelled by finding the product of the relevant savings and multiplying by the current consumption values. CWI for Riverside, Northbrook and Wonford is assumed for the Mid scenario in their respective upgrade years, costing approximately £44,000.

It should be noted that roof upgrades proposed in the Mid scenario for Northbrook, Wonford and the ISCA centre are not included in this analysis. These works are not energy efficiency-specific measures but rather to replace roofs at their end-of-life or to allow for a PV array. The total cost for all three roofs is estimated at £1,450,000 using data from the C&B report and roof areas from Google Maps [19]. Thus, the large CAPEX required for minimal energy savings would produce a misleading conclusion about necessary maintenance works.

Glazing upgrades and draught-proof external doors are also modelled for the Mid case scenario for Riverside and Northbrook as per Currie & Brown. C&B propose triple glazing for the pool halls of both leisure centres and the curtain walling of Northbrook. Double glazing is suggested for the rooflights of both centres, the curtain walling of Riverside and the remaining windows of Northbrook. Currie & Brown also calculate additional thermal savings due to draught-proofing in addition to these works and these have been apportioned to each of the measures based on their initial efficiency savings. The total capital cost associated with these upgrades is £1.7 million. Note that under the Max scenario, Northbrook is projected to close so upgrades to its fabric are only modelled in the Mid scenario.

Increasing the electrical efficiency of Riverside and Northbrook is achieved by upgrading all fluorescent lighting fixtures to LEDs (costing £100,000) and is modelled in the BAU scenario for Riverside and the Mid scenario for Northbrook. Energy efficient LEDs have recently been installed into the ISCA centre, but current energy data does not reflect this. Future annual electricity consumption for the ISCA centre has been reduced to account for this with no costs associated.

4.2.3 Decarbonising heat

Decarbonising heat in leisure centres is more expensive than other non-domestic buildings due to the increased hot water demand. ASHP installation will remove all future gas consumption but increase electricity consumption. Data provided by Currie & Brown is used to model costs and energy impacts [18,19]. C&B assume a gas boiler efficiency of 85% and an ASHP coefficient of performance (CoP) of 2.6. These figures are used with the modelled gas consumption data following efficiency measures to estimate the increase in electricity demand for each leisure centre. ASHP installation was modelled for the BAU scenario of Riverside, Mid scenario for Wonford and Northbrook and Max scenario for Exeter Arena and ISCA centre.

The effects on F-gas emissions from different ASHP installation scenarios in ECC's non-domestic estates is also modelled. The heating capacity, refrigerant type, refrigerant charge, and installation year for each building in each scenario are shown in Table 6. To estimate F-gas emissions, all ASHPs are given a standard 3% leakage rate and assumed to be charged with R32 refrigerant with a global warming potential of 677 $kgCO_2e\ kg^{-1}$. Refrigerant charges for each

building were estimated using a generic refrigerant charge rate derived from a standard commercial heat pump. A standard 100 kW R32 commercial heat pump has a refrigerant charge of 25 kg[h], resulting in a refrigerant charge rate of 0.25 kgR32 kW^{-1}.

Table 6: ASHP heating capacity, refrigerant type, refrigerant charge, installation year, and scenario for each building in ECC's non-domestic estate

Building	Scenario	Capacity (kW)	Refrigerant type	Refrigerant charge (kg)	Annual leak rate	Annual leakage (kg yr^{-1})	Installation year
Riverside	BAU	1500	R32	375	3%	11.25	2024/25
Northbrook	Mid	200	R32	50	3%	1.50	2025/26
ISCA	Max	750	R32	188	3%	5.63	2026/27
Wonford	Mid	400	R32	100	3%	3.00	2027/28
Exeter Arena	Max	200	R32	50	3%	1.5	2028/29

Costs for the ASHPs at Riverside and Northbrook are taken from the Currie & Brown reports and are apportioned on a per kW basis for other sites [18,19]. However, determining the capacity of a potential ASHP requires an assessment of the building's peak heat demand, which is beyond the scope of this report. An estimate is calculated using data from a CEE report analysing the heat load of buildings on the University of Exeter's Streatham campus [20]. The average demand of the ECC's leisure centres is determined from metered data and multiplied by a peak demand to average demand ratio from an analogous University of Exeter building rounded up to produce an estimate for the ASHP capacity needed for the ECC building. The total CAPEX calculated is £8 million. The installation of an ASHP at Riverside, funded through the Public Sector Decarbonisation Scheme (PSDS), accounts for half of this [21].

For St. Sidwell's Point, the BAU scenario assumes a transition away from the temporary gas backup boiler as the ASHP is reconfigured, saving an estimated 450 MWh of gas with a corresponding 150 MWh increase in electricity consumption. No costs are associated with this measure. The building also has a connection point for a potential future heat network which is not modelled as it is assumed that no ECC capital costs would be directly associated with the change and there would be no additional carbon or energy benefits on top of the current BAU scenario.

4.2.4 PV installation

This section covers the impact of a PV installation on each leisure centre's electricity consumption. Section 6.3 models the potential for offsetting provided by the export of excess non-domestic PV generation to the grid.

Five leisure centres are potential sites for new PV arrays. Information on the size of each array is sourced from ECC representatives. For the BAU case, a 72 kWp, 49 kWp and 146 kWp PV array is modelled for Exeter Arena, Wonford and St Sidwell's Point respectively. For the Mid case scenario, 21.6 kWp and 158 kWp arrays are also installed at Northbrook and ISCA Centre.

Self-consumption from these sites is modelled as part of Section 6.3, using data on load factors and self-consumption ratios from current ECC PV sites. The output from each site is decreased

[h] Available at: https://library.mitsubishielectric.co.uk/pdf/book/MECH_MEHP#page-1

by 1.1% each year to account for gradual cell deterioration. This analysis calculates an annual electricity saving of 66 MWh for the BAU scenario – a total of 332 MWh over the five years from installation to 2030. With two additional sites, the Mid scenario has a larger average annual electricity saving at 111 MWh, a total saving of 555 MWh.

Costs are derived from the C&B reports and applied on a per kWp basis [18,19]. Meeting the requirements of the BAU scenario would cost £272,000. The Mid scenario would cost ECC £457,000 to implement. Only the financial saving arising from self-consumption is detailed in this section and manifests itself as lower OPEX each year. Income generated by selling exported energy is included in Section 6.3.

4.2.5 Leisure Centre Summary

Figure 9 shows the projected emissions from leisure centres under the three scenarios. In 2030/31 emissions from ECC's six leisure centres total 471 tCO_2e for BAU, 343 tCO_2e for Mid and 250 tCO_2e for Max. The cumulative emissions from 2024/25 to 2030/31 are estimated as 5,130 tCO_2e, 4,530 tCO_2e and 4,148 tCO_2e in the BAU, Mid and Max scenarios, respectively.

Figure 10 and Table 7 show the costs (CAPEX and OPEX) associated with the measures identified across the ECC's six leisure centres. Operating costs are determined by multiplying the consumption of each fuel type by future fuel prices estimated by DESNZ in Annex M of the energy and emissions projections [2].

The large CAPEX in 2025/26 is to decarbonise the energy intensive Riverside leisure centre. The £1,110,000 difference between the BAU and Mid scenarios is due to fabric and glazing improvements in the Mid scenario which will ensure lower electricity consumption. Additionally, in 2026/27, the main contributors to the £1.3 million CAPEX in the Mid scenario are energy efficiency upgrades for Northbrook. In the Max scenario, this site is closed so the only costs are for four PV installations at other sites.

Under the Max scenario, all six sites are disconnected from gas, relying on electric ASHPs. Whilst electrification has a significant effect on emissions reduction, there is only a minimal difference in OPEX because while an ASHP is around 300% efficient[i], electricity typically costs about three times more than gas. The reduction in OPEX from £1.2 million in 2024/25 to £408,000 in 2030/31 in the Max scenario is predominantly due to the fuel price reductions projected by DESNZ [2].

[i] Uses three times less kWh of electricity than kWh of gas needed by a gas boiler to produce the same heat demand.

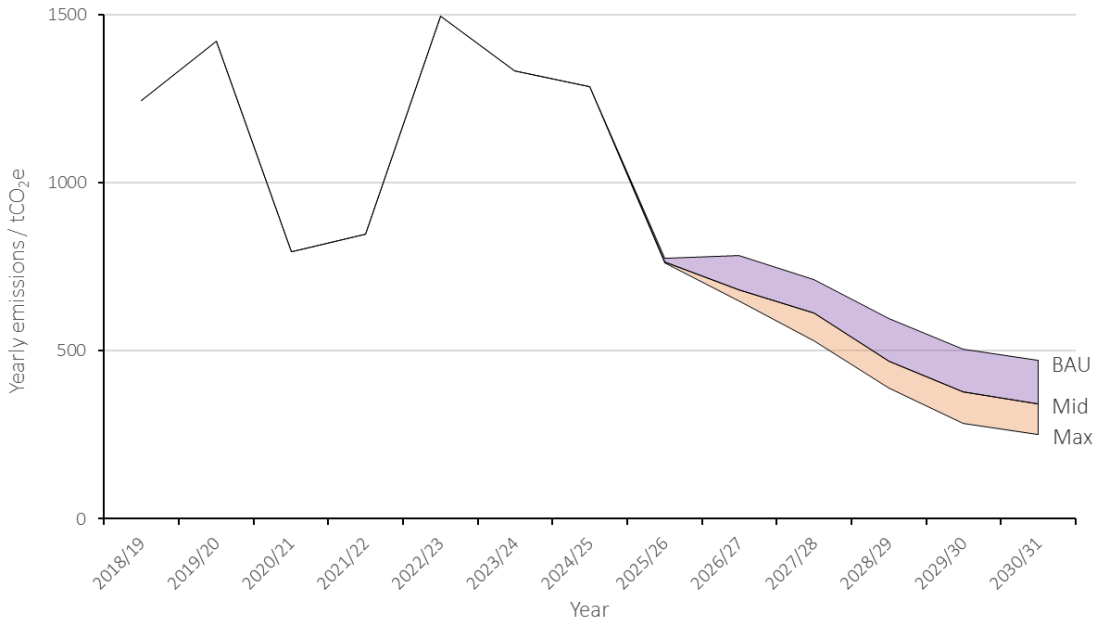

Figure 9: Projected leisure centre emissions (tCO_2e) under the three different scenarios.

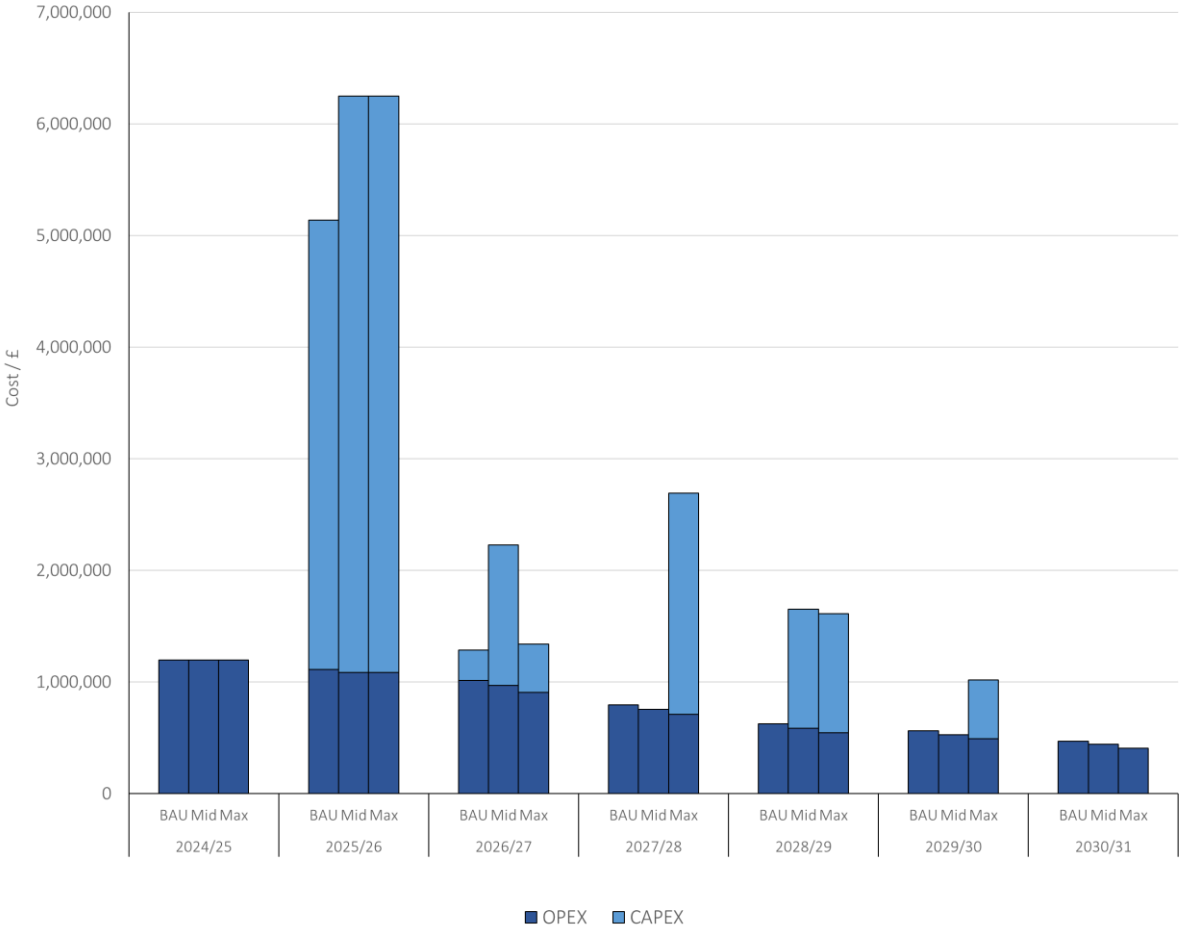

Figure 10: Annual capital and operating costs associated with decarbonising ECC's leisure centres under the three different scenarios.

Table 7: Cost breakdown of leisure centre emission reduction scenarios. Only measures with costs associated with them are shown. Totals may not sum due to rounding

Year	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total
BAU Scenario								
CAPEX	£0	£4,020,000	£272,000	£0	£0	£0	£0	£4,300,000
of which…								
Efficiency improvements	£0	£85,400	£0	£0	£0	£0	£0	£85,000
Decarbonising heat	£0	£3,940,000	£0	£0	£0	£0	£0	£3,940,000
PV installation	£0	£0	£272,000	£0	£0	£0	£0	£272,000
OPEX	£1,200,000	£1,110,000	£1,010,000	£797,000	£624,000	£562,000	£471,000	£5,780,000
Total	£1,200,000	£5,140,000	£1,290,000	£797,000	£624,000	£562,000	£471,000	£10,100,000
Mid Scenario								
CAPEX	£0	£5,160,000	£1,260,000	£0	£1,070,000	£0	£0	£7,480,000
of which…								
Efficiency improvements	£0	£1,620,000	£216,000	£0	£8,600	£0	£0	£1,840,000
Decarbonising heat	£0	£3,550,000	£585,000	£0	£1,060,000	£0	£0	£5,190,000
PV installation	£0	£0	£457,000	£0	£0	£0	£0	£457,000
OPEX	£1,200,000	£1,090,000	£970,000	£757,000	£586,000	£528,000	£441,000	£5,560,000
Total	£1,200,000	£6,250,000	£2,230,000	£757,000	£1,650,000	£528,000	£441,000	£13,000,000
Difference from BAU	£0	£1,110,000	£942,000	-£40,000	£1,030,000	-£34,300	-£30,500	£2,970,000
Max Scenario								
CAPEX	£0	£5,160,000	£433,000	£1,980,000	£1,070,000	£529,000	£0	£9,170,000
of which…								
Efficiency improvements	£0	£1,620,000	£0	£0	£8,600	£0	£0	£1,620,000
Decarbonising heat	£0	£3,550,000	£0	£1,980,000	£1,060,000	£529,000	£0	£7,110,000
PV installation	£0	£0	£433,000	£0	£0	£0	£0	£433,000
OPEX	£1,200,000	£1,090,000	£908,000	£710,000	£546,000	£491,000	£408,000	£5,350,000
Total	£1,200,000	£6,250,000	£1,340,000	£2,690,000	£1,610,000	£1,020,000	£408,000	£14,500,000
Difference from BAU	£0	£1,110,000	£56,100	£1,900,000	£988,000	£457,000	-£62,900	£4,440,000
Difference from Mid	£0	£0	-£885,000	£1,940,000	-£40,200	£492,000	-£32,300	£1,470,000

4.3 Corporate Estate

2023/24 emissions from ECC's leisure centres (all scopes) are estimated at 832 tCO_2e, a reduction of 151 tCO_2e from 2022/23. A breakdown of the 832 tCO_2e of Scope 1 & 2 emissions associated with ECC's corporate estate is given in Figure 11. The largest greenhouse gas emitter across the estate is the Royal Albert Memorial Museum (RAMM) at 457 tCO_2e, 55% of ECC's corporate estate emissions. The 66 tCO_2e reduction from last year's inventory is due to better controls of the heating and cooling system as well as reprogramming of the building

management system which has resulted in lower fuel consumption. However, the RAMM's Grade II listed status limits the scope for future works [22].

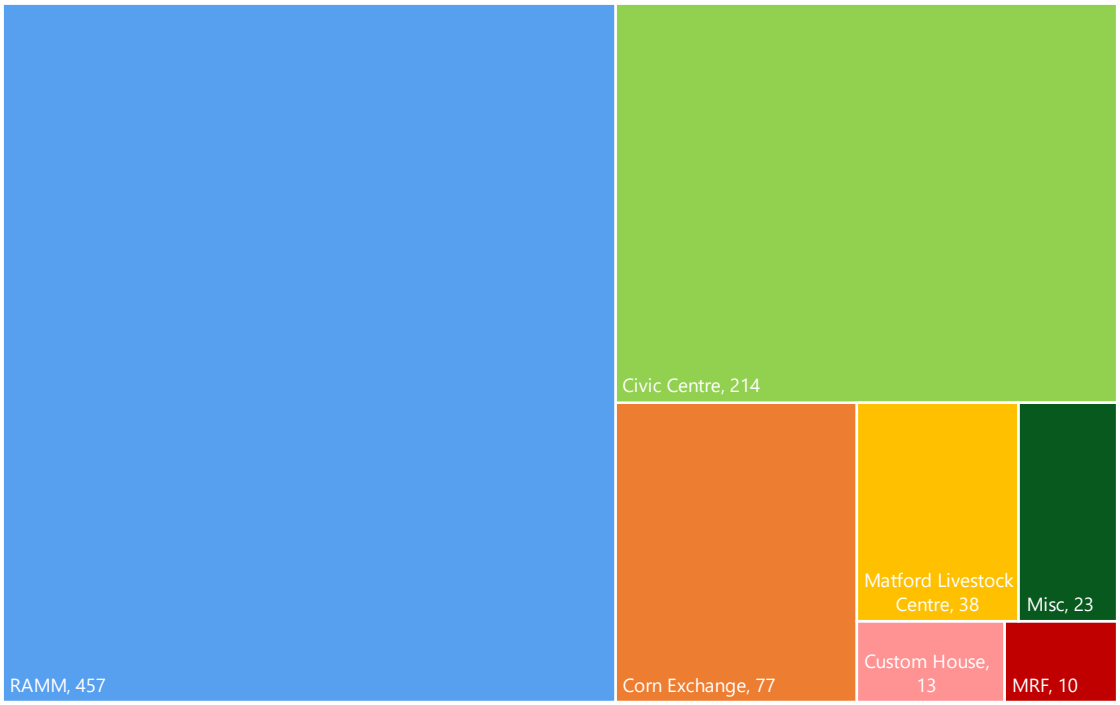

Figure 11: Breakdown of 2023/24 corporate estate emissions (tCO_2e).

26% of ECC's Corporate Estate emissions (214 tCO_2e) arise from its offices at the Civic Centre. Plans to potentially move ECC offices to alternative sites and sell the Civic Centre means that no retrofitting interventions are modelled for this building [23]. Energy use at the Corn Exchange is responsible for 9% of corporate estate emissions (77 tCO_2e). An estimated 22 tCO_2e (3%) was emitted from other ECC corporate stock such as Oakwood House and the Underground Passages. Their small individual impacts mean that no energy efficiency measures have been identified for them. All estimates include the impact of refrigerant leakage from 27 RACHP units identified across the Corporate Estate.

The Matford Livestock Centre, Materials Reclamation Facility and Grade I listed Custom House emit 38, 10 and 13 tCO_2e, respectively [24]. Only the Custom House has had energy efficiency measures modelled.

4.3.1 Change in stock

The only stock change modelled in this analysis is the assumed sale of the Civic Centre in 2030/31 in the Max scenario resulting in zero electricity and gas emissions arising from this building for 2030/31. No costs have been associated with this as it is not a direct energy efficiency measure.

4.3.2 Efficiency improvements

Energy efficiency improvements are only modelled for the Corn Exchange and RAMM. Energy savings have been calculated similarly to leisure centres, applying data from the Currie & Brown reports for Riverside and Northbrook, where appropriate [18,19].

In the BAU scenario, the Corn Exchange sees a variety of improvements in 2027: double glazing, CWI, roof insulation, and LEDs. Roof insulation in 2024 is also modelled for the RAMM in this scenario, funded through the Museum Estate and Development (MEND) scheme [21].

Cost data is sourced from the Currie & Brown reports or Energy Systems Catapult [18–20]. Meeting the BAU scenario will require an estimated expenditure of £563,000.

4.3.3 Decarbonising heat

Heat decarbonisation is modelled for the Corn Exchange in 2027, Custom House in 2028, and the RAMM in 2029. In the Mid scenario, electric heating is installed into the RAMM. In the Max scenario, ASHPs are installed into all three buildings, with the RAMM being subsidised through PSDS funding [21] (the Max scenario assumes electric heating is not already installed in the RAMM). The RAMM has also been identified as a potential connection point on the Exeter heat network. The uncertainty around the scheme being operational by 2030 means that it is not included in the analysis.

The effect of F-gas emissions from these ASHP installations is also modelled using the same assumptions in Section 4.2.3. The heating capacity, refrigerant type, refrigerant charge, and installation year for each building in each scenario are shown in Table 8.

Table 8: ASHP heating capacity, refrigerant type, refrigerant charge, installation year, and scenario for each building in ECC's non-domestic estate

Building	Scenario	Capacity (kW)	Refrigerant type	Refrigerant charge (kg)	Annual leak rate	Annual leakage (kg yr^{-1})	Installation year
RAMM	Max	2000	R32	500	3%	15.00	2029/30
Corn Exchange	Max	400	R32	100	3%	3.00	2027/28
Custom House	Max	100	R32	25	3%	0.75	2028/29

Energy and cost data is derived as described in Section 4.2.3, using Energy Systems Catapult or Currie & Brown cost figures [18–20]. The Mid scenario costs ECC £182,000. Installing ASHPs in the three buildings requires an upfront cost of £6.6 million.

4.3.4 PV installation

As described in Section 6.3, a 29.5 kWp PV installation is modelled in 2026 for the Corn Exchange in the BAU scenario. The Mid scenario adds an additional 30 kWp array for the RAMM in 2026.

The amount of self-consumed PV electricity is modelled in Section 6.3, using information from ECC's current PV sites and accounting for the gradual decay of solar cells. In the BAU scenario, an estimated 7,300 kWh of electricity is saved annually, a total of 37,000 kWh up to 2030/31. Savings increase to 15,000 kWh annually in the Mid scenario, saving 74,000 kWh by 2030/31.

The installation cost of these arrays is derived on a per kWp basis from the Currie & Brown reports [18,19]. The Corn Exchange array in the BAU scenario will cost an estimated £30,100. This increases to £60,600 in the Mid scenario due to the additional RAMM array. As with leisure centres, only the reduction in OPEX due to self-consumption is modelled in this section, exporting excess generation is covered in Section 6.3.

4.3.5 Corporate Estate Summary

Modelled future emissions for each scenario are shown in Figure 12. The 2030/31 corporate estate emissions are estimated as 531 tCO_2e, 373 tCO_2e and 174 tCO_2e under the BAU, Mid and Max scenarios, respectively. Cumulative emissions from 2024/25 to 2030/31 are estimated as for 4,737 tCO_2e BAU, 4,554 tCO_2e for Mid and 4,123 tCO_2e for the Max scenario. Decarbonisation of the electricity grid is a powerful driving force, especially in the Max scenario. Gas emission factors are more static, so insulation works in the BAU scenario are vital to achieve net zero but also build a strong case for future heat electrification in the buildings.

The costs associated with meeting the three scenarios are shown in Figure 13 and Table 9. The total CAPEX required over all seven years is estimated at £600,000 for BAU, £870,000 for Mid and £7.3 million for the Max scenario. The dramatic increase in CAPEX from the Mid to the Max scenario is due to the expensive ASHP installations in the Corn Exchange and RAMM in 2027 and 2029, respectively.

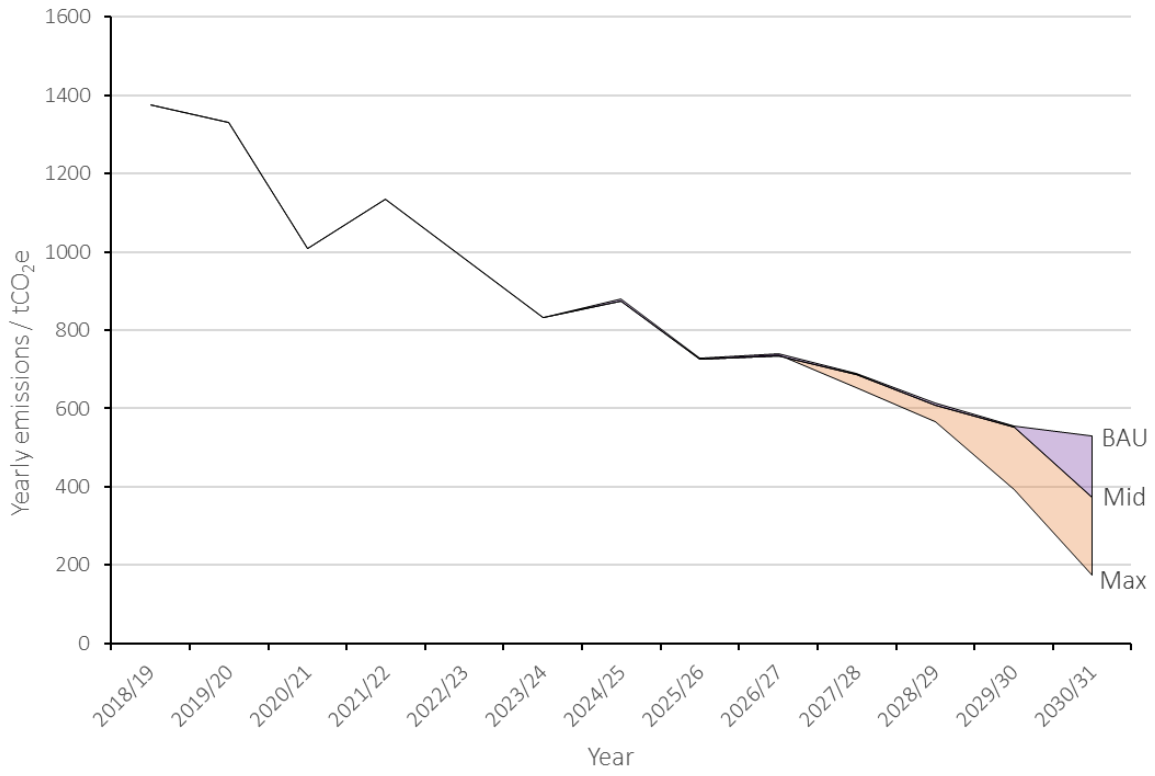

Figure 12: Projected corporate estate emissions (tCO_2e) under the three different scenarios.

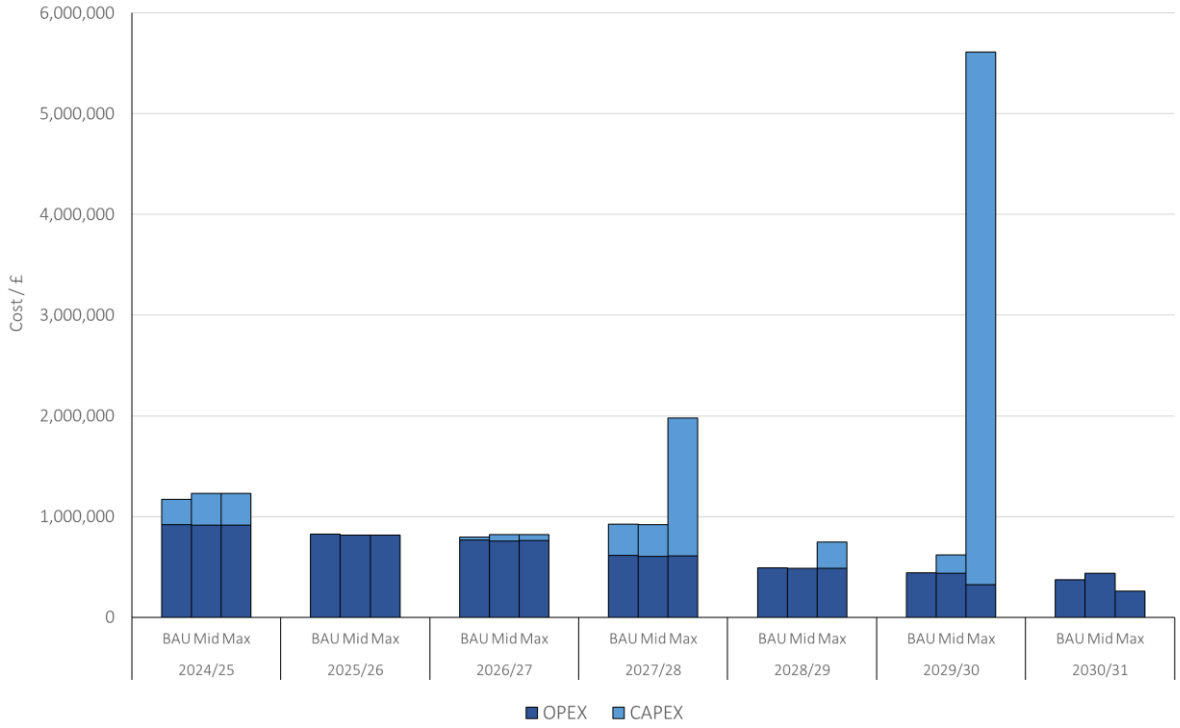

Figure 13: Annual capital and operating costs (£) associated with decarbonising ECC's corporate estate under the three different scenarios.

Table 9: Cost breakdown of corporate estate emission reduction scenarios. Only measures with costs associated with them are shown. Totals may not sum due to rounding

Year	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total
BAU Scenario								
CAPEX	£250,000	£0	£30,100	£312,000	£0	£0	£0	£593,000
of which…								
Efficiency improvements	£250,000	£0	£0	£312,000	£0	£0	£0	£563,000
Decarbonising heat	£0	£0	£0	£0	£0	£0	£0	£0
PV installation	£0	£0	£30,100	£0	£0	£0	£0	£30,100
OPEX	£921,000	£823,000	£767,000	£613,000	£491,000	£442,000	£374,000	£4,430,000
Total	£1,170,000	£823,000	£797,000	£925,000	£491,000	£442,000	£374,000	£5,020,000
Mid Scenario								
CAPEX	£314,000	£0	£60,600	£312,000	£0	£182,000	£0	£869,000
of which…								
Efficiency improvements	£314,000	£0	£0	£312,000	£0	£0	£0	£627,000
Decarbonising heat	£0	£0	£0	£0	£0	£182,000	£0	£182,000
PV installation	£0	£0	£60,600	£0	£0	£0	£0	£60,600
OPEX	£913,000	£816,000	£758,000	£606,000	£486,000	£438,000	£438,000	£4,450,000
Total	£1,230,000	£816,000	£818,000	£918,000	£486,000	£619,000	£438,000	£5,320,000
Difference from BAU	£55,800	-£7,280	£21,200	-£7,180	-£5,490	£177,000	£64,700	£298,000

Year	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Max Scenario								
CAPEX	£314,000	£0	£60,600	£1,370,000	£264,000	£5,290,000	£0	£7,300,000
of which…								
Efficiency improvements	£314,000	£0	£0	£312,000	£0	£0	£0	£627,000
Decarbonising heat	£0	£0	£0	£1,057,000	£264,000	£5,290,000	£0	£6,610,000
PV installation	£0	£0	£60,600	£0	£0	£0	£0	£65,000
OPEX	£913,000	£816,000	£760,000	£607,000	£483,000	£324,000	£260,000	£4,160,000
Total	£1,230,000	£816,000	£821,000	£1,980,000	£748,000	£5,610,000	£260,000	£11,500,000
Difference from BAU	£55,800	-£7,280	£23,800	£1,050,000	£256,000	£5,170,000	-£114,000	£6,430,000
Difference from Mid	£0	£0	£2,540	£1,060,000	£262,000	£4,990,000	-£179,000	£6,140,000

4.4 Other Facilities

Scope 1 and 2 emissions from other non-domestic properties in 2023/24 total 576 tCO_2e. Other facilities comprise remaining ECC assets such as Belle Isle, the Canal Offices, and car parks. However, following discussions with various ECC representatives, only two measures are modelled in this analysis, both for 2026. The Guildhall car park receives a 321 kWp PV array in the BAU scenario, costing £327,000 and saving around 80,000 kWh of electricity a year, a total of 400,000 kWh by 2030/31. In the Max scenario, energy efficient LEDs are installed into the Princesshay 2 car park. Using data from the Energy Systems Catapult, this would save 18,000 kWh of electricity annually. In conversation with ECC representatives, this upgrade will cost £30,000. It is noted this upgrade will also require a further £45,000 for necessary works on the electrics system but this is not accounted for in this analysis as it is not an energy saving-specific measure.

The result of these measures is shown in Figure 14. The lack of major interventions beyond BAU means that all three scenarios are closely aligned with grid decarbonisation being the major driving force behind future emissions reductions.

It should be noted that PV installations have also been modelled for the Guildhall Shopping Centre and Exeter Bus Station. No energy savings have been calculated for these arrays in this section as the leased status of these buildings means that ECC is not financially responsible for any electricity consumption at these sites. However, exported electricity is included in Section 6. In the BAU case, installing a 346 kWp array atop the Guildhall Shopping Centre and a 40 kWp array atop Exeter Bus station, will cost £393,000.

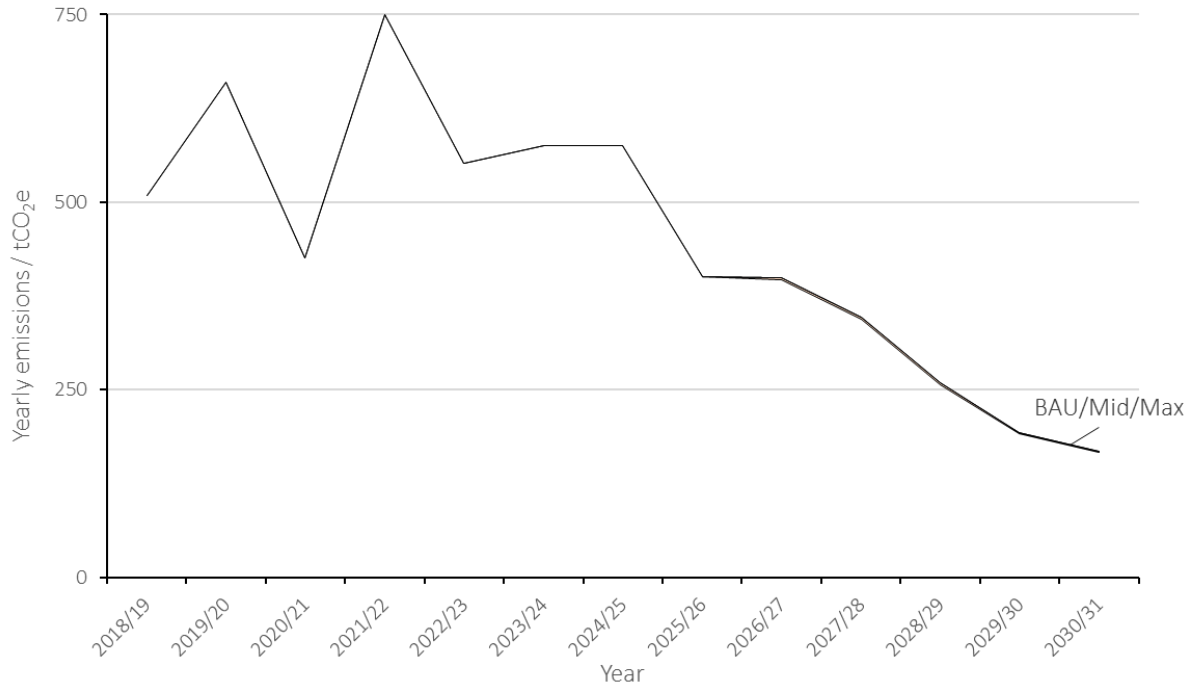

Figure 14: Projected other non-domestic emissions (tCO_2e) under the three scenarios.

4.5 Summary of Modelling Assumptions

The full range of assumptions made for each combination of measure and scenario as discussed in the previous sections is shown in Table 10.

Table 10: Modelled assumptions for non-residential buildings.

Building	BAU Scenario	Mid Scenario	Max Scenario
Riverside	• ASHP • LEDs	BAU and • CWI • Double glazing curtain walling • Double glazing rooflights • Draught-proofing external doors • Triple glazing windows	Same as Mid
Northbrook	As is	• CWI • Double glazing rooflights • Double glazing windows • Draught-proof external doors • LEDs • PV – 21.6 kWp • ASHP • Triple glazing windows	• Closure only
Wonford	• PV – 49 kWp	BAU and • CWI • Roof insulation • ASHP	Same as Mid
ISCA Centre	As is	• PV – 158 kWp	Mid and • ASHP
Exeter Arena	• PV – 72 kWp	Same as BAU	BAU and • ASHP

Building	BAU Scenario	Mid Scenario	Max Scenario
St. Sidwell's Point	• Reconfigure ASHP • PV – 146 kWp	Same as BAU	Same as BAU
Corn Exchange	• Double glazing windows • CWI • Roof insulation • LED • PV – 29.5 kWp	Same as BAU	BAU and • ASHP
Civic Centre	As is	As is	• Closure
Custom House	As is	As is	• ASHP
RAMM	• Roof insulation	BAU and • PV – 30 kWp • LED • Electric heaters	BAU and • PV – 30 kWp • LED • ASHP
Car Parks	• PV, Guildhall car park – 321 kWp	Same as BAU	BAU and • LEDs, Princesshay 2 car park

4.6 Projected Emissions to 2030/31

Modelled Scope 1 and 2 emission trajectories for ECC's non-domestic building stock under the three scenarios are shown in Figure 15. Leisure centres contribute a large proportion of ECC's Scope 1 and 2 emissions (49% in 2023/24), as such, this graph is similar to Figure 9 in Section 4.2. Thus, measures for ECC's six leisure centres will be crucial in decarbonising this sector. The 2030/31 Scope 1 and 2 emissions are estimated at 1,170 tCO_2e, 884 tCO_2e and 590 tCO_2e under the BAU, Mid and Max scenarios, respectively. Grid decarbonisation and heat pump installation into many of ECC's non-domestic stock in the Max scenario ensures the sector quickly approaches net zero. The cumulative emissions from 2024/25 to 2030/31 are calculated as for 12,211 tCO_2e BAU, 11,427 tCO_2e for the Mid and 10,602 tCO_2e for the Max scenario.

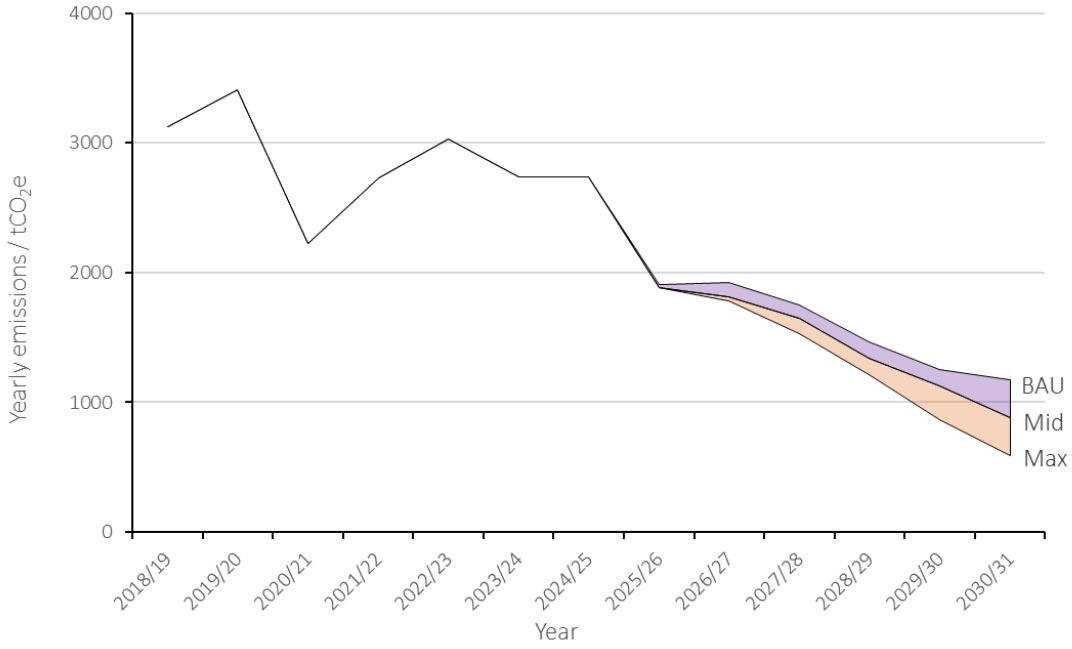

Figure 15: Projected non-domestic emissions (tCO_2e) under the three scenarios.

In the Max scenario in 2030/31, F-gases become an increasingly prominent source of emissions, accounting for 8% of the total non-domestic footprint (compared to the previous < 1%). It is important that F-gas losses are closely scrutinised, and mitigation strategies designed, including reducing leakage rates by improving refrigerant handling and equipment maintenance, and switching to refrigerants with lower a global warming potential, where possible [25].

Figure 16 and Table 11 show the upfront financial commitment required to meet each scenario each year alongside the operational energy costs. Decarbonisation of Riverside leisure centre dominates the 2025/26 CAPEX. The large spending shown in the 2029 Max scenario is due to the installation of a £5.3 million ASHP at the RAMM. Meeting the requirements of each scenario for ECC's non-domestic stock will cost a total of £5.2 million for BAU, £8.7 million for Mid and £16.8 million for the Max scenario. Including yearly operational energy costs brings the total spend on ECC's non-domestic buildings by 2030/31 to a total of £19.3 million, £22.6 million and £30.2 million for BAU, Mid and Max respectively.

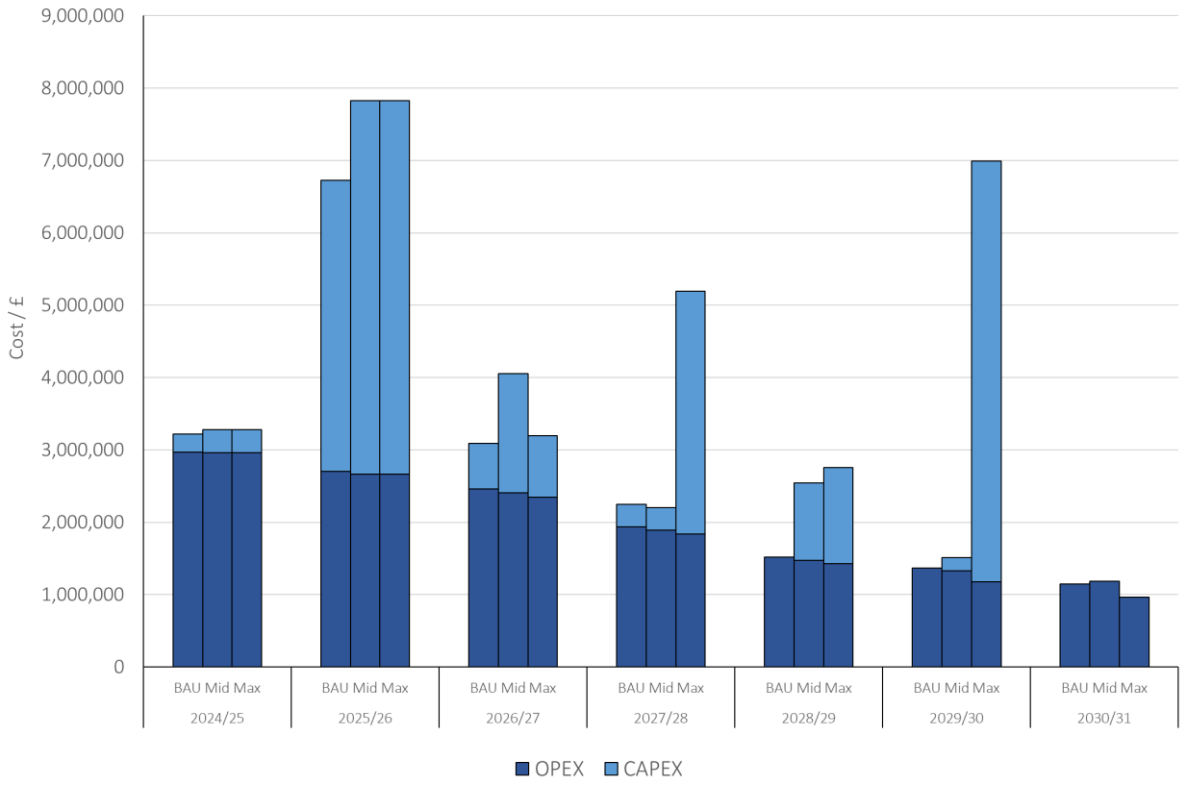

Figure 16: Annual capital and operational costs (£) associated with decarbonising ECC's non-domestic building stock under the three different scenarios.

Table 11: Cost breakdown of non-domestic emission reduction scenarios. Totals may not sum due to rounding

Year	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total
BAU Scenario								
CAPEX	£250,000	£4,020,000	£629,000	£312,000	£0	£0	£0	£5,220,000
of which…								
Leisure centres	£0	£4,020,000	£272,000	£0	£0	£0	£0	£4,300,000
Corporate estate	£250,000	£0	£30,100	£312,000	£0	£0	£0	£593,000
Other non-domestic	£0	£0	£327,000	£0	£0	£0	£0	£327,000
OPEX	£2,970,000	£2,700,000	£2,460,000	£1,940,000	£1,520,000	£1,370,000	£1,150,000	£14,100,000
of which…								
Leisure centres	£1,200,000	£1,110,000	£1,010,000	£797,000	£624,000	£562,000	£471,000	£5,780,000
Corporate estate	£921,000	£823,000	£767,000	£613,000	£491,000	£442,000	£374,000	£4,430,000
Other non-domestic	£855,000	£764,000	£681,000	£526,000	£404,000	£363,000	£302,000	£3,890,000
Total	£3,220,000	£6,730,000	£3,090,000	£2,250,000	£1,520,000	£1,370,000	£1,150,000	£19,300,000
Mid Scenario								
CAPEX	£314,000	£5,160,000	£1,640,000	£312,000	£1,070,000	£182,000	£0	£8,680,000
of which…								
Leisure centres	£0	£5,160,000	£1,260,000	£0	£1,070,000	£0	£0	£7,480,000
Corporate estate	£314,000	£0	£60,600	£312,000	£0	£182,000	£0	£869,000
Other non-domestic	£0	£0	£327,000	£0	£0	£0	£0	£327,000
OPEX	£2,960,000	£2,670,000	£2,410,000	£1,890,000	£1,480,000	£1,330,000	£1,180,000	£13,900,000
of which…								
Leisure centres	£1,200,000	£1,090,000	£970,000	£757,000	£586,000	£528,000	£441,000	£5,560,000
Corporate estate	£913,000	£816,000	£758,000	£606,000	£486,000	£438,000	£438,000	£4,450,000
Other non-domestic	£855,000	£764,000	£681,000	£526,000	£404,000	£363,000	£302,000	£3,890,000
Total	£3,280,000	£7,830,000	£4,050,000	£2,200,000	£2,540,000	£1,510,000	£1,180,000	£22,600,000
Difference from BAU	£55,800	£1,100,000	£963,000	-£47,200	£1,020,000	£142,000	£34,200	£3,270,000

Year	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Max Scenario								
CAPEX	£314,000	£5,160,000	£851,000	£3,350,000	£1,330,000	£5,820,000	£0	£16,800,000
of which…								
Leisure centres	£0	£5,160,000	£433,000	£1,980,000	£1,070,000	£529,000	£0	£9,170,000
Corporate estate	£314,000	£0	£60,600	£1,370,000	£264,000	£5,290,000	£0	£7,300,000
Other non-domestic	£0	£0	£357,000	£0	£0	£0	£0	£357,000
OPEX	£2,960,000	£2,670,000	£2,340,000	£1,840,000	£1,430,000	£1,180,000	£968,000	£13,400,000
of which…								
Leisure centres	£1,200,000	£1,090,000	£908,000	£710,000	£546,000	£491,000	£480,000	£5,350,000
Corporate estate	£913,000	£816,000	£760,000	£607,000	£483,000	£324,000	£260,000	£4,160,000
Other non-domestic	£855,000	£764,000	£675,000	£521,000	£400,000	£360,000	£300,000	£3,870,000
Total	£3,280,000	£7,830,000	£3,190,000	£5,190,000	£2,760,000	£6,990,000	£968,000	£30,200,000
Difference from BAU	£55,800	£1,100,000	£104,000	£2,940,000	£1,240,000	£5,620,000	-£179,000	£10,900,000
Difference from Mid	£0	£0	-£859,000	£2,990,000	£218,000	£5,480,000	-£214,000	£7,610,000

5 Transport

5.1 Current Sector Summary

ECC's 2023/24 emissions from all transport scopes amount to 1,300 tCO2e, a 19 tCO_2e increase from 2022/23, mostly attributable to an increase in Scope 3 commuting emissions from 390 tCO_2e in 2022/23, to 417 tCO_2e in 2023/24. A comparison of emissions by category for 2023/24 is shown in Figure 17. The largest contributor to transport emissions are the council's own vehicles, emitting 856 tCO_2e in 2023/24 (Scopes 1 & 2). Commuting follows at 417 tCO_2e whilst grey fleet and business travel contribute 16 tCO_2e and 10 tCO_2e respectively (all Scope 3 emissions).

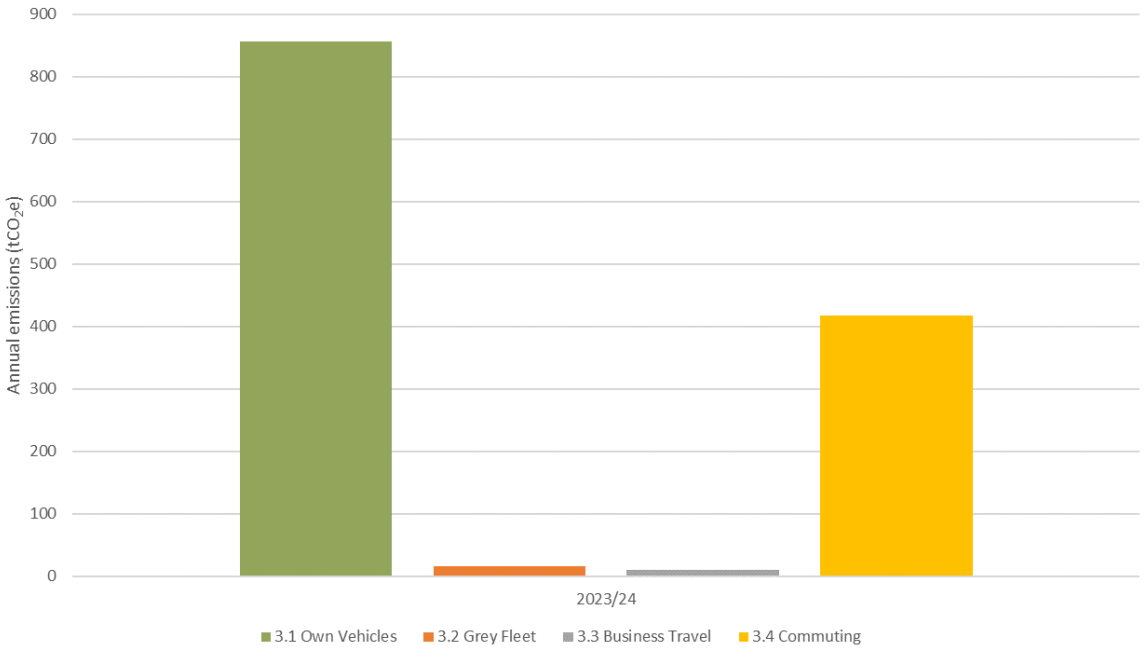

Figure 17: Annual emissions by sector 2023/24 (all scopes)

5.2 Own vehicles

Emissions form the council's own vehicles are under the direct control of the council and fall within Scope 1 & 2. Changes in emission are split into five sources, and three emission reduction scenarios modelled for each.

5.2.1 Growth of fleet

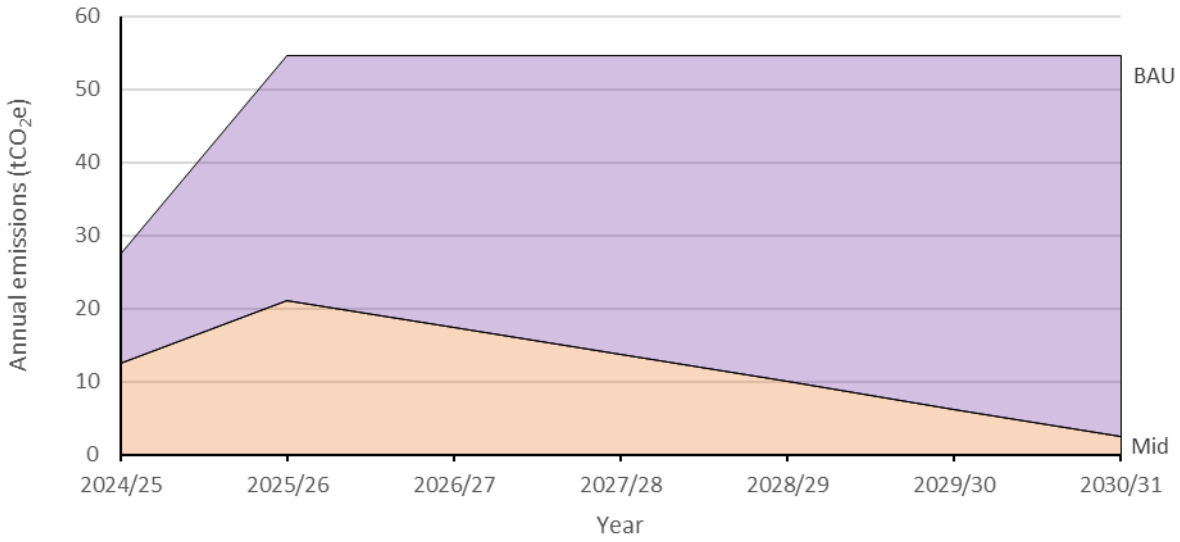

Figure 18: Growth of fleet emissions scenarios

The ECC fleet is assumed to grow in all emissions scenarios, with the addition of three food waste collection vehicles and a dedicated glass collection lorry. Under BAU, all vehicles procured are diesel, resulting in emissions from the growth of fleet increasing to and remaining at 55 tCO2e. An average fuel consumption of ECC's refuse collection vehicles (RCVs) from 2023/24 is used as a fuel use estimate for the newly procured RCVs. The cost of fuel per litre is projected to 2030 according to changes in crude oil price published by DESNZ [26]. These fuel price projections are used throughout the analysis. Each diesel RCV has an estimated monthly lease cost of £5,100 [27–29]. As the lease includes maintenance costs, monthly payments are categorised as OPEX. In total, increasing the fleet by four diesel RCVs has a lease cost of £244,800 per annum.

Under the Mid scenario, it is assumed that two of the vehicles procured are electric, alongside a phased introduction of Hydrotreated Vegetable Oil (HVO) from 2025/26 at 17% annual increments. HVO is a 'drop in fuel' and therefore can directly replace diesel without any modifications to the vehicle [30]. The price of HVO is assumed to be 47 pence higher per litre than diesel [31]. Each electric RCV has a lease cost of £9,600 per month, plus an initial CAPEX of £9,600 for a 40 kW rapid commercial charger per vehicle [32], [33]. The annual lease cost for two diesel RCVs and two eRCVs amounts to £352,800 [27–29], plus a CAPEX of £19,000 in 2024/25 for two chargers. It is assumed that all electricity used to charge refuse vehicles is supplied by the council's private wire solar connection at Water Lane, at no extra cost or emissions. The Mid case scenario results in an initial increase in emissions to 21 tCO2e in 2025/26, falling to 2 tCO2e in 2030/31 as the proportion of HVO used increases.

Under the Max scenario, all vehicles procured are electric and assumed to be charged using electricity from Water Lane. In consequence, there are no additional emissions for the growth of fleet under the Max scenario. Vehicle lease costs total £460,800 per annum, with a £38,000 CAPEX in 2024/25 for four 40 KW chargers.

5.2.2 Refuse vehicles

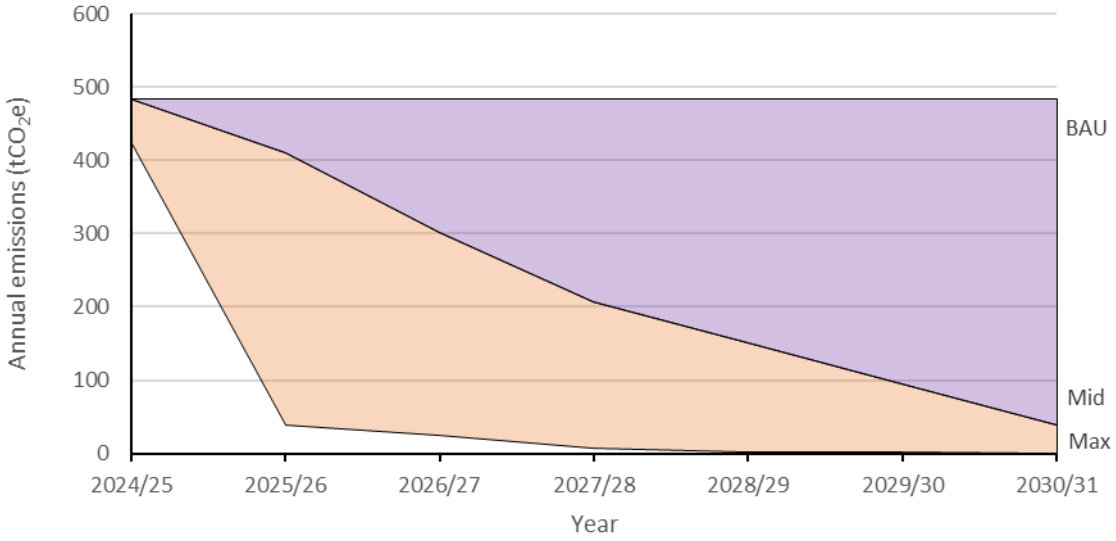

Figure 19: Refuse collection vehicle emissions reduction scenarios

Under BAU, it is assumed that RCVs are replaced with diesel vehicles at the end of their lease due to supply/ budget constraints. In consequence, emissions from RCVs remain at 483 tCO_2e, shown in Figure 19. The same cost assumptions used in 5.2.1 are used here providing a total lease cost of approximately £1 million per year for 17 vehicles.

Under the Mid scenario, three RCVs due for renewal in 2026 are replaced with electric vehicles and assumed to be charged via the Water Lane private wire connection at no extra cost or emissions. These have a total lease cost of £345,600, in addition to £856,800 for 14 diesel vehicles. Three 40 kW chargers are installed in 2026/27 with a CAPEX of £28,500. A phased introduction of HVO from 2025/26 at 17% annual increments is also assumed. Emissions therefore decrease from 483 tCO_2e in 2024/25 to 38 tCO_2e in 2030/31.

Under the Max scenario, all RCVs are replaced with electric RCVs at the end of their seven-year lease and assumed to be charged by Water Lane solar farm renewable supply. RCVs are therefore replaced incrementally, with a final lease cost of £2 million in 2030/31 when all RCVs are electric. All diesel is assumed to be replaced by HVO from 2025/26. Emissions fall steeply from 426 tCO_2e in 2024/25 to 39 tCO_2e in 2025/26, reducing to 0 tCO_2e in 2030/31.

It is assumed that the vehicle is replaced mid-way through the vehicle replacement year, resulting in 6 months emissions from diesel, and 6 months from electricity. Where vehicles lacked a replacement date on the fleet list, a replacement year of 2027/28 was assumed. These assumptions are made throughout the analysis.

5.2.3 Other vehicles

'Other vehicles' includes non-specialist vehicles such as pool cars and vans. Under BAU it is assumed that all non-specialist vehicles are replaced with an electric equivalent at the end of their lease. The assumed lease costs of the fossil fuel vehicle and its electric equivalent are listed in Table 12.

Table 12: Non specialist vehicle lease costs [27,29]

Vehicle type	Approximate monthly lease cost
Petrol car	£750
EV car	£544
Small diesel van	£544
Small electric van	£680
Medium diesel van	£840
Medium electric van	£1,500
Diesel tipper	£880
Electric tipper	£1,580

Vehicle efficiencies of 30% for diesel and 20% for petrol versus 90% for electric vehicles are assumed and used to calculate the number of kWh_e/l, providing an estimated conversion of 3.5 kWh/l which is used throughout the analysis. The DESNZ energy and emissions projections, volumed weighted electricity prices, are used to estimate electricity costs throughout [26].

The same scenario is assumed under the Mid and Max scenarios, with the addition of a phased HVO introduction of 17% per year in the mid case and a total replacement of diesel with HVO in 25/26 under the maximum scenario. Across the scenarios, a vehicle to charger ratio of 3:1 is assumed, with a cost of £1,000 per standard charger [33,34]. All scenarios result in 4 tCO_2e in 2030/31, however the Max scenario has a far steeper emissions reduction, falling from 44 tCO_2e in 2024/25 to 6 tCO_2e in 2025/26

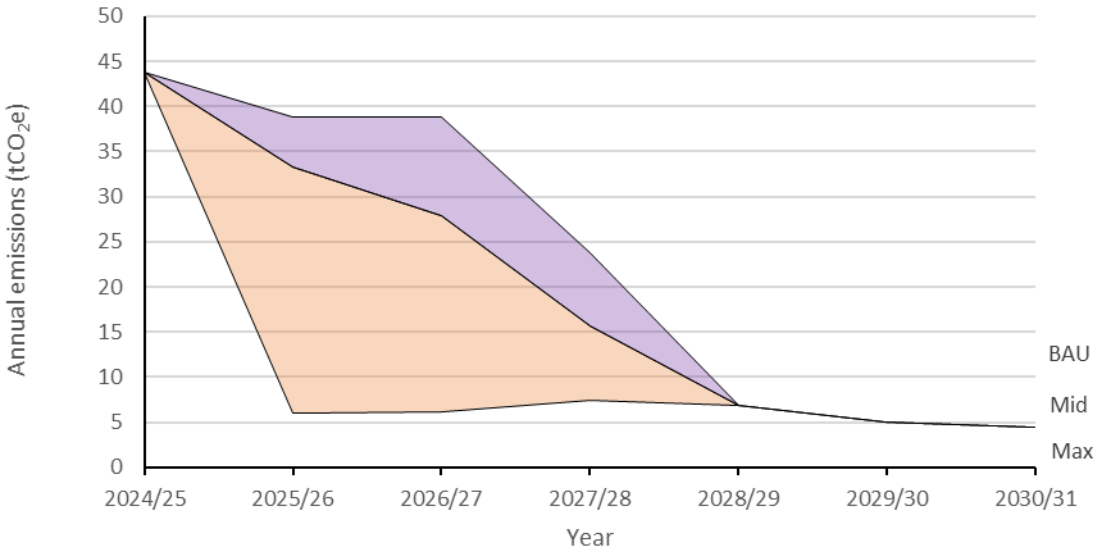

Figure 20: Other vehicles emissions reduction scenarios

5.2.4 Specialist vehicles

Under BAU, all specialist vehicles are assumed to continue to use fossil fuels, with emissions at a constant of 168 tCO_2e.

The Mid scenario assumes that 4% of specialist vehicles are electrified each year, summing 25% by 2030/31. A phased HVO introduction of 17% per year is also assumed from 2025/26 onwards. It is assumed that two vehicles are replaced with electric each year. As tipper vehicles are the most abundant in the specialist vehicle fleet, it is assumed that these vehicles will be replaced with an electric equivalent, increasing the lease from £880 to £1,580 monthly [27]. Small and large tractors are assumed to remain diesel with lease costs of £1,900 and £2,500 per vehicle per month respectively [35,36]. Figure 21 shows that under this scenario, emissions reduce gradually, from 169 tCO_2e in 24/25, to 17 tCO_2e in 30/31.

The Max scenario also assumes that 4% of specialist vehicles are electrified each year from 25/26 onwards, and that all fuel is replaced with HVO. This causes a steep decline in emissions shown in Figure 21, from 169 tCO_2e in 24/25 to 18 tCO_2e in 25/26. By 2030/31 emissions fall to 17 tCO_2e alike the mid case scenario.

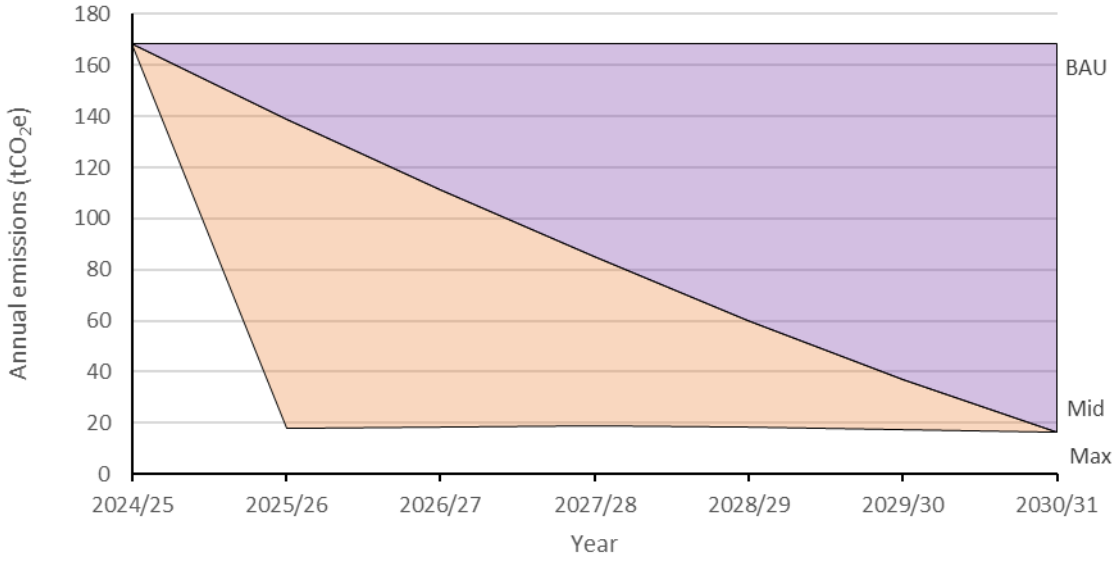

Figure 21: Specialist vehicles emissions reduction scenarios

5.2.5 Portable equipment

Under BAU, portable equipment remains unchanged, with emissions remaining at 55 tCO_2e. Under the Mid scenario, a phased introduction of HVO of 17% per annum from 2025/26, is assumed causing a gradual decline from 55 tCO_2e in 2024/25 to 6 tCO_2e in 30/31.

The Max scenario assumes that all fuel is replaced with HVO from 2025/26, and that 4% of portable equipment is replaced with an electric equivalent each year, summing 25% of equipment by 2030/31. It is assumed that two items of portable equipment are replaced annually, with an estimated CAPEX uplift of £300 compared to the fossil fuelled machinery. This is based on the price of a diesel versus electric mower (including the charger and a spare battery) [37]. Figure 22 shows that the Max scenario has a far steeper rate of decline compared to the mid case, falling from 55 tCO_2e to 6 tCO_2e between 2024/25 and 2025/26.

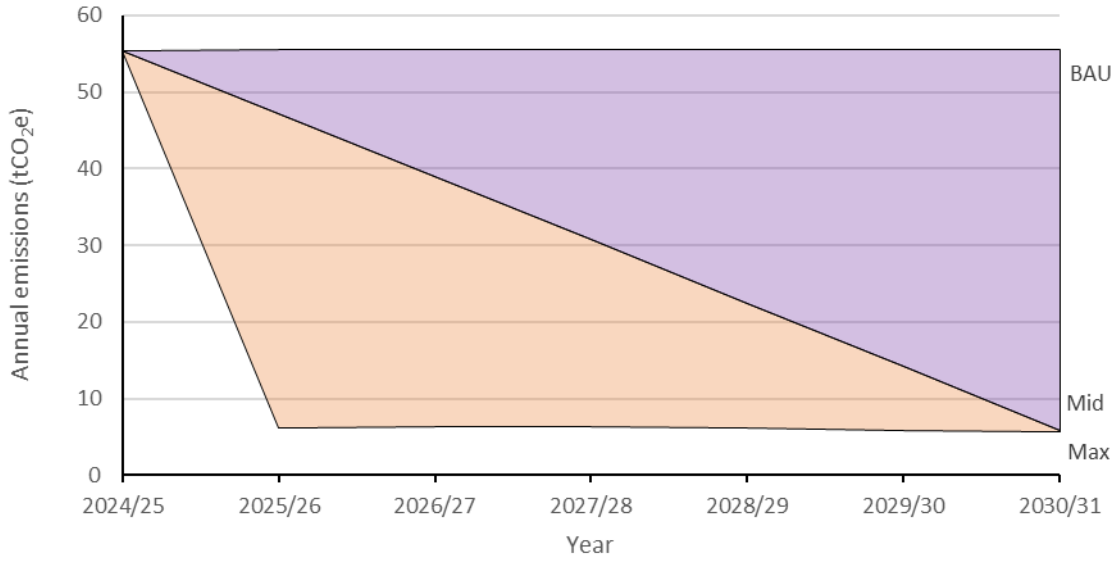

Figure 22: Portable equipment emissions scenarios

5.3 Summary of Modelling Assumptions

The full range of assumptions made for each combination of measure and scenario as discussed in the previous sections are shown in Table 13.

Table 13: Modelled assumptions for transport

Measure	BAU Scenario	Mid Scenario	Max Scenario
Growth of fleet	Procurement of three new food waste collection vehicles and one glass collection vehicle, all diesel	As BAU, half of vehicles procured are electric	As BAU, all vehicles procured are electric
Refuse vehicles	As is	Three electric RCVs procured Phased introduction of HVO from 2025- 20% increased per annum to 100% in 2030	Assume all vehicles replaced with EVs when lease period ends. The balance use HVO from 2025/26.
Other vehicles	Assume all non-specialist vehicles are replaced with EVs at the end of current lease period.	As BAU, with phased introduction of HVO from 2025/26, 17% per annum to 100% in 2030/31	As BAU, balance use HVO from 2025

Measure	BAU Scenario	Mid Scenario	Max Scenario
Specialist vehicles	As is	Phased introduction of HVO from 2025/26. 17% increase per annum to 100% in 2030/31	Assume 25% electrified by 2030/31 with balance using HVO
Portable equipment	As is	Phased introduction of HVO from 2025/26. 17% increase per annum to 100% in 2030/31	Assume 25% electrified by 2030/31 with balance using HVO

5.4 Projected Emissions to 2030/31

Figure 23 shows projected emissions from ECC's own vehicles under the three different scenarios. Under the Max scenario, overall emissions from council owned vehicles fall steeply from the current 856 tCO_2e to 69 tCO_2e in 2025/26 and to 27 tCO_2e in 2030/31. The Mid scenario follows a gradual trajectory, where emissions fall to 67 tCO_2e in 2030/31, shown by the middle line in Figure 23. In contrast, emissions under BAU increase slightly from 2024/25 levels to 801 tCO_2e in 2025/26. This number remains high, reducing only to 766 tCO_2e by 2030/31.

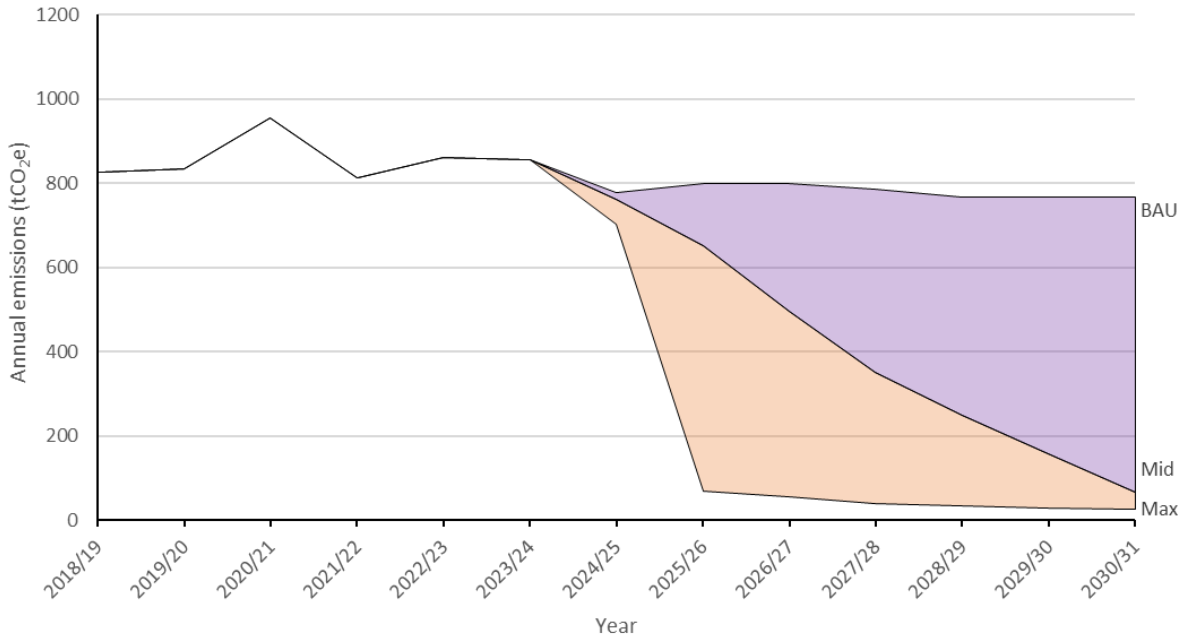

Figure 23: Own vehicles emissions scenarios

Figure 24 summarises the associated CAPEX and OPEX for each scenario across the years, including lease, maintenance, fuel and infrastructure costs. Capital costs are infrequent and small in comparison to operational costs due to vehicles being leased instead of purchased. Table 14 provides a full cost breakdown and cost difference across all transport scenarios

Table 14 shows an approximate £1.4 million cost difference between the BAU and Mid scenario total expenditure and a further £3.6 million to the Max scenario. The Max scenario

leads to the fastest emissions reductions, with overall emissions reducing to a tenth of the previous year's emissions by 2025/26. The largest proportion of the council's transport emissions stem from RCVs. Refuse vehicles are therefore the council's highest priority for reducing transport emissions. While it is assumed that the electricity to charge these vehicles comes at no extra cost, these are the vehicles with the highest cost uplift (£4,500 per month) between diesel and electric alternatives. The main cost difference between the Mid and Max scenarios, stems from the proportion of eRCVs in the fleet. The Max scenario focusses on electrification of the fleet, with 100% of RCVs electric by 2030, with a cumulative Opex of £12.3 million. In comparison, only five RCVs are electrified in the mid case, including two in 'growth of fleet', therefore the increase in vehicle lease costs is far lower than in the maximum scenario. The focus instead is on increasing the proportion of HVO used in diesel vehicles to decarbonise the fleet and cumulative Opex sums £9.6 million.

The second largest emitter is the specialist vehicle fleet. Although 2030/31 emissions reach 17 tCO2e in both the Mid and Max scenarios, the Max falls to 18 tCO2e by 2025/26 whilst cumulative Opex amounts to £29,000 above the Mid. As Figure 29 shows, there is a range of emissions reduction between each pathway, thus an affordable but effective pathway can be found to decarbonise the council's fleet.

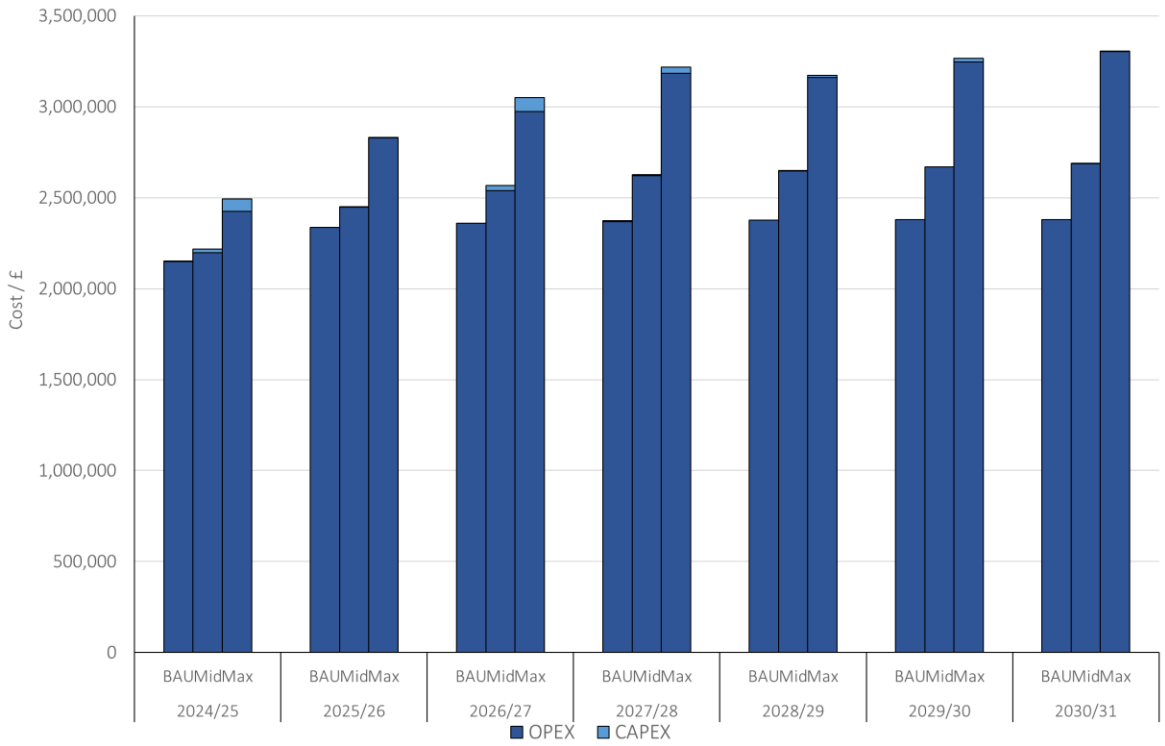

Figure 24: Costs of transport emissions reduction scenarios

Table 14: Cost breakdown of transport emissions reduction scenarios

Year	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total
BAU Scenario								
CAPEX	£1,000	£0	£0	£5,000	£0	£0	£0	£6,000
of which…								
Other vehicles	£1,000	£0	£0	£5,000	£0	£0	£0	£6,000
OPEX	£2,151,000	£2,337,000	£2,359,000	£2,369,000	£2,377,000	£2,380,000	£2,379,000	£16,351,000
of which								
Growth of fleet	£134,000	£272,000	£274,000	£274,000	£274,000	£274,000	£274,000	£1,775,000
Refuse vehicles	£1,255,000	£1,283,000	£1,296,000	£1,296,000	£1,296,000	£1,298,000	£1,298,000	£9,021,000
Other vehicles	£147,000	£154,000	£155,000	£165,000	£174,000	£173,000	£172,000	£1,141,000
Specialist vehicles	£589,000	£599,000	£603,000	£603,000	£603,000	£604,000	£604,000	£4,205,000
Portable equipment	£26,000	£29,000	£31,000	£31,000	£31,000	£31,000	£31,000	£208,000
Total	**£2,152,000**	**£2,337,000**	**£2,359,000**	**£2,374,000**	**£2,377,000**	**£2,380,000**	**£2,379,000**	**£16,357,000**
Mid Scenario								
Year	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total
CAPEX	£20,000	£1,000	£29,000	£6,000	£1,000	£0	£1,000	£58,000
of which…								
Growth of fleet	£19,000	£0	£0	£0	£0	£0	£0	£19,000
Refuse vehicles	£0	£0	£29,000	£0	£0	£0	£0	£29,000
Other vehicles	£1,000	£0	£0	£5,000	£0	£0	£0	£6,000
Specialist vehicles	£0	£1,000	£0	£1,000	£1,000	£0	£1,000	£4,000
OPEX	£2,198,000	£2,448,000	£2,540,000	£2,621,000	£2,648,000	£2,670,000	£2,685,000	£17,810,000
of which…								
Growth of fleet	£182,000	£366,000	£366,000	£367,000	£367,000	£370,000	£368,000	£2,385,000
Refuse vehicles	£1,255,000	£1,290,000	£1,358,000	£1,414,000	£1,418,000	£1,423,000	£1,426,000	£9,585,000
Other vehicles	£147,000	£155,000	£156,000	£166,000	£174,000	£173,000	£172,000	£1,143,000
Specialist vehicles	£589,000	£607,000	£627,000	£642,000	£656,000	£670,000	£684,000	£4,475,000
Portable equipment	£26,000	£30,000	£32,000	£33,000	£33,000	£34,000	£35,000	£223,000
Total	**£2,218,000**	**£2,449,000**	**£2,568,000**	**£2,627,000**	**£2,649,000**	**£2,670,000**	**£2,686,000**	**£17,868,000**
Difference from BAU	**£66,000**	**£112,000**	**£209,000**	**£253,000**	**£272,000**	**£290,000**	**£308,000**	**£1,511,000**
Max Scenario								
Year	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total
CAPEX	£68,000	£2,000	£77,000	£35,000	£11,000	£20,000	£2,000	£213,000
of which…								
Growth of fleet	£38,000	£0	£0	£0	£0	£0	£0	£38,000
Refuse vehicles	£29,000	£0	£76,000	£29,000	£10,000	£19,000	£0	£162,000
Other vehicles	£1,000	£0	£0	£5,000	£0	£0	£0	£6,000
Specialist vehicles	£0	£1,000	£0	£1,000	£1,000	£0	£1,000	£4,000
Portable equipment	£0	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£4,000

OPEX	£2,424,000	£2,828,000	£2,974,000	£3,184,000	£3,162,000	£3,246,000	£3,303,000	£21,121,000
of which…								
Growth of fleet	£230,000	£461,000	£461,000	£461,000	£461,000	£461,000	£461,000	£2,995,000
Refuse vehicles	£1,433,000	£1,556,000	£1,690,000	£1,879,000	£1,839,000	£1,912,000	£1,958,000	£12,266,000
Other vehicles	£147,000	£158,000	£158,000	£166,000	£174,000	£173,000	£172,000	£1,148,000
Specialist vehicles	£589,000	£620,000	£634,000	£646,000	£659,000	£672,000	£684,000	£4,504,000
Portable equipment	£26,000	£34,000	£33,000	£31,000	£30,000	£28,000	£27,000	£208,000
Total	**£2,492,000**	**£2,829,000**	**£3,051,000**	**£3,219,000**	**£3,173,000**	**£3,265,000**	**£3,305,000**	**£21,334,000**
Difference from BAU	**£340,000**	**£492,000**	**£692,000**	**£845,000**	**£796,000**	**£886,000**	**£926,000**	**£4,977,000**
Difference from Mid	**£274,000**	**£380,000**	**£483,000**	**£592,000**	**£524,000**	**£596,000**	**£618,000**	**£3,466,000**

6 Renewable Energy

6.1 Current Sector Summary

Renewable electricity generation through installation of solar photovoltaic (PV) arrays delivers carbon savings as their output replaces alternative fossil fuel-based energy sources. PV mounted on ECC buildings, where the electricity generated is self-consumed in the buildings, is accounted for by reducing the amount of imported grid electricity and the carbon saving is reflected in Sections 3 and 4. This section considers electricity that is not directly used on site by ECC but is exported and therefore has the potential to offset carbon emissions on the pathway to net zero. In 2023/24, ECC's PV arrays generated 4,576 MWh, of which 2,989 MWh were exported, offsetting -619 tCO_2e (Figure 25).

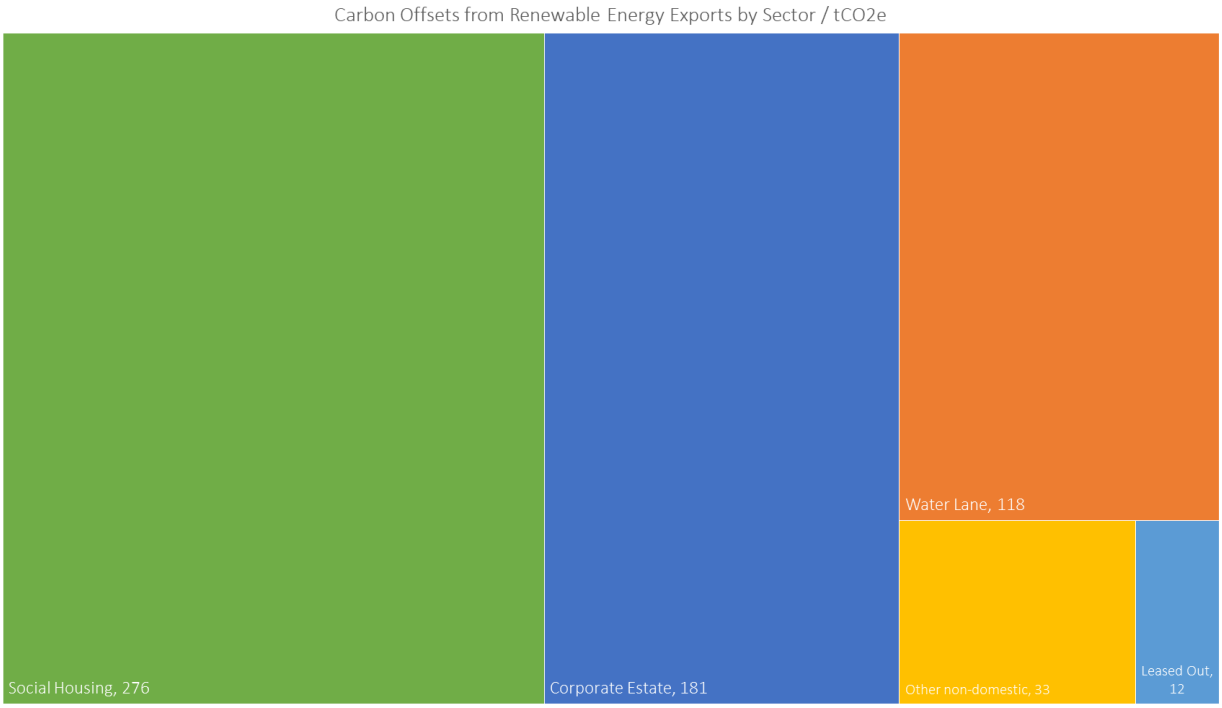

Figure 25: Breakdown by sector of 2023/24 offset emissions associated with energy exports from ECC's PV arrays in tCO_2e

In social housing, ECC's asset list indicates that 799 properties on the domestic estate have roof-mounted PV installations with a total estimated capacity of 2.5 MWp. In 2023/24 ECC's domestic PV arrays generated 2,062 MWh, of which 1,330 MWh were exported, offsetting -276 tCO_2e (Table 15).

Table 15: Estimated number of installations, electricity production, own use, and export from ECC's current domestic PV arrays in 2023/24

Installation date	N° of homes	N° of panels	Estimated generation (MWh)	Estimated own use (MWh)	Estimated export (MWh)	Average panel capacity (kWp)
Pre-2013	269	2,580	383	136	247	0.18
Post-2013	530	5,082	1,679	596	1,083	0.40
Total	**799**	**7662**	**2,062**	**732**	**1,330**	

The number of panels installed is derived from the PV modelling analysis carried out for ECC's 2020/21 carbon footprint [1]. On average, 9.6 panels are installed per home, totalling 7,662 panels. PV capacity is determined using the product specifications of most standard polycrystalline solar panel brands, assuming a 0.18 kWp average panel capacity for panels installed pre-2013 and a 0.4 kWp average panel capacity for panels installed post-2013. Generation is then estimated using a factor modelled on PVGIS[j] that indicates the average annual generation (in kWh) per unit of capacity (kWp) for an east or west facing panel (825.9 kWh yr^{-1} kWp^{-1}; see Section 3.7 for methodology). The reduced output compared to a south facing property accounts for properties where output might be compromised by shading or where the orientation or tilt are sub-optimal. Finally, exports and self-consumption (also derived from the PV modelling analysis carried out for ECC's 2020/21 carbon footprint [1]) are estimated and give a median self-consumption factor of 35% per home.

ECC has 3.4MWp of PV capacity in its non-domestic estate, including 12 roof-mounted arrays and the Water Lane ground-mounted installation. In 2023/24 ECC's non-domestic PV installations generated 2,513 MWh, of which 1,658 MWh were exported, offsetting -343 tCO_2e (Table 16).

Table 16: Electricity production, own use, export, and CO_2 emissions offset from ECC's current non-domestic PV arrays in 2023/24 (indicates leased building)*

Site	Array size (kWp)	Estimated generation (MWh)	Estimated own use (MWh)	Estimated export (MWh)	Carbon offset from exported energy (tCO_2e)	Solar generation data source
Water Lane	1,500	1,035	464	571	118	ECC Website
Livestock Centre	1,200	930	136	794	164	ECC Website
MA Car Park	150	135	36	99	20	ECC Website
JL Car Park	122	77	19	58	12	ECC Website
Riverside	120	119	119	0	0	ECC Website
Civic Centre	70	65	32	33	7	FIT PPA
MRF	50	34	17	17	3	FIT PPA
Ark	40	15	8	7	1	FIT PPA
Climb Centre*	29	32	0	32	7	FIT PPA
Wat Tyler House*	26	24	0	24	5	FIT PPA
RAMM	25	24	12	12	3	FIT PPA
Oakwood House	22	18	9	9	2	FIT PPA
Belle Isle	8	5	3	2	1	FIT PPA
Total	**3,362**	**2,513**	**855**	**1,658**	**343**	

Generation data is calculated from export data provided by ECC from Feed-In Tariff (FIT) Power Purchasing Agreements (PPAs), with estimated export assumed as 50% of the total generation. For sites without FIT PPAs, generation data is from ECC's published solar PV generation figures [38]. For leased sites all the generation is considered to be energy exported by the council (either to tenants or to the national grid). For sites owned by ECC, export data was obtained either from FIT PPAs or metered exports. No export data was provided for Riverside, so generation data was extracted from ECC's published solar figures [38], and exported energy

[j] Available at: https://re.jrc.ec.europa.eu/pvg_tools/en/

was estimated as 50% of the total generation. Own use by ECC included in Sections 3 and 4 is the difference between the generation and the assumed export.

6.2 Domestic PV Installation

Projections quantifying the installation of PV arrays on ECC's domestic estate use EPC data to identify suitable homes based on roof area (estimated from floor area) and roof tilt. Overall, 1,882 homes are identified as suitable for PV installation, with sufficient area for 18,058 panels. Assuming a 0.4 kWp average capacity per panel [39], this results in an additional 7.2 MWp installed capacity on ECC's domestic PV arrays.

The BAU scenario, assumes ECC will develops new PV on all suitable homes by 2050. The Mid scenario assumes the same milestone is achieved by 2040 and the Max scenario models the outcome if new PV opportunities are installed in all suitable homes by 2030. In all scenarios, PV installation is assumed to occur linearly until the target year, i.e. and equal number of installations every year.

As above, PV generation (in kWh) is modelled using the factor modelled in PVGIS[k] that provides average annual generation (in kWh) per unit of capacity (kWp) for an east or west facing panel (825.9 kWh $yr^{-1}kWp^{-1}$). The efficiency of PV panels deteriorates over time with most manufacturers providing a guarantee that the panel will retain 80% of its generating capacity after 20 years of service (equivalent to an average annual decrease of 1.1%). This factor is included in projections of PV generation. Exports are estimated using the 35% median self-consumption factor per home derived from the previous PV modelling analysis [1].

The CAPEX for PV installation on ECC's domestic buildings is included in section 3. However, the OPEX of exporting renewable energy generated by ECC's domestic estate has been excluded from this analysis, as there is insufficient information on the who benefits from selling renewable energy or the purchasing schemes and agreements that are or would be in place for current or future schemes. For example, installations prior to 2019 receive Feed-In Tariffs that reward both the generation and export of renewable energy. The rates are set annually by Ofgem and vary for each installation depending on size, installation date, and home energy efficiency. Installations post-2019 receive Smart Export Guarantee (SEG) tariffs that are set by and agreed on directly with energy suppliers. Estimating income from exporting renewable energy from ECC's diverse social housing PV stock without detailed information id therefore impractical. The assumption of no income leads to an overestimate of the overall costs, as the cost of domestic PV installation is quantified but its financial benefits are not.

6.3 Non-domestic PV installation

Installation of new PV arrays on ECC's non-domestic estate with potential to offset emissions via energy exports includes ten rooftop systems (Table 17). The installation date for these projects is assumed to be late 2025, although in practise there are uncertainties surrounding the timing including the future of some buildings in the ECC property portfolio and difficulties in gaining timely access to the electricity grid.

[k] Available at: https://re.jrc.ec.europa.eu/pvg_tools/en/

Table 17: ECC's currently identified non-domestic PV opportunities (indicates leased building)*

Site	Array size (kWp)
Exeter Arena	72
Wonford Sports Centre	49
Corn Exchange	29.5
Guildhall Shopping Centre*	346
Exeter Bus Station*	40
St Sidwell's Point Leisure Centre	146
Guildhall Car Park	321
ISCA	158
RAMM	30
Northbrook	21.6
Total	**1213.1**

Data on the installed capacity of potential PV projects was provided by ECC. The average load factor of ECC's current installations (9%), and the 1.1% annual panel deterioration factor is applied to estimate PV generation from future installations.

Exports from projected generation assumes the current export to generation ratio (66%) is maintained for sites occupied by ECC, with the remaining generation (34%) being self-consumed. For leased out buildings, exports are assumed to be 100% of the generation.

The BAU scenario assumes that ECC develops new roof-mounted PV installations on Exeter Arena, Wonford Sports Centre, Corn Exchange, Guildhall Shopping Centre, Exeter Bus Station, St Sidwell's Point Leisure Centre, and Guildhall Car Park. The Mid scenario assumes all new roof-mounted opportunities are implemented and the Max scenario models the outcome if all new roof-mounted PV opportunities are installed except Northbrook, which is projected to be closed under a Max Scenario (see Section 4).

The financial implications of exporting renewable energy generated from PV on ECC's non-domestic estate are modelled. The initial capital investment for PV installation is included in Section 4, while the financial benefits of selling renewable energy exports from 2024/25 to 2030/31 are quantified here[l].

Sales projections from 2024 to 2030 are made using the volume-weighted electricity wholesale prices obtained from Annex M from the 'Energy and Emissions Projections: 2022 to 2040' report by the Department for Energy Security and Net Zero (DESNZ) [2]. Values are from the reference scenario (which assumes average fossil fuel prices and economic growth and includes existing and planned policies (Table 18)) and are used to estimate export sales for both existing and new PV developments, ignoring any existing PPAs in place. Income from solar generation (not just exports) on solar sites with FIT PPAs is also excluded, as the analysis focuses on the impacts and benefits for renewable energy exports. For leased out buildings, there is no price distinction made between energy exports to the grid or energy sold to the tenant, and the volume-weighted wholesale prices are also assumed. For solar sites installed

[l] Note this analysis provides indicative estimates of income by assuming a general market price each year. Individual sites can potentially optimise their income through power sales agreements and/or market strategies.

on buildings occupied by ECC, the savings from self-consuming the energy generated are reflected as reduced electricity imports, which is included in the cost analysis in Section 4.

Table 18: Projected volume-weighted wholesale energy prices from 2023/24 to 2030/31

Year	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Price (p kWh^{-1})	10.85	11.96	10.68	9.90	7.65	5.87	5.28	4.39

6.4 Ground-mounted PV installation

Installation of free-standing ground-mounted PV arrays (GPV) on ECC's estate is modelled on the University fields at Streatham together with a second ground-mounted array in Water Lane, near Grace Road (Table 19). The installation date for these projects is assumed to be 2025 and 2028, respectively. As with the non-domestic PV installations, there is considerable uncertainty surrounding the timing and feasibility of these schemes.

Table 19: ECC's currently identified ground-mounted PV opportunities

Site	Array size (kWp)	Assumed initial financial year of production
University fields (Streatham)	2,000	2026/27
Water Lane II	2,600	2028/29
Total	**4,600**	

The analysis combines ECC data on the proposed installed capacity with the average load factor of ECC's current installations (9%), and the 1.1% annual panel deterioration factor and assumes exports to be 100% of the generation.

The BAU and Mid scenarios assume that ECC does not develop any new GPV. The Max scenario models both GPV arrays being installed.

The financial analysis includes the CAPEX to developing the arrays and the OPEX revenue from selling renewable energy exports from 2024/25 to 2030/31.

The CAPEX of GPV can vary greatly depending on the nature of the site, its capacity and solar PV market dynamics. Exeter City Council's 1.2MW array on the difficult Water Lane site cost £840,000 per MW[m] however, economies of scale on larger arrays and installation on potentially easier sites can reduce Capex to around £500k per MW [40]. The initial capital investment for developing GPV is modelled using the lower figure.

The methodology to estimate OPEX from 2024/25 to 2030/31 is the same as for non-domestic PV installations. Projections were made using the volume-weighted electricity wholesale prices shown in Table 18.

6.5 Summary of Modelling Assumptions

The assumptions made for each combination of measure and scenario is shown in Table 20.

[m] Private correspondence with Exeter City Council

Table 20: Modelled assumptions for renewable energy

Measure	BAU Scenario	Mid Scenario	Max Scenario
Domestic PV installation	Install PV on all suitable homes by 2050 – 70 homes a year	Install PV on all suitable homes by 2040 – 111 homes a year	Install PV on all suitable homes by 2030 – 269 homes a year
Non-domestic PV installation	New PV arrays in Exeter Arena, Wonford Sports Centre, Corn Exchange, Guildhall, Exeter Bus Station, St Sidwell's Point, and Guildhall Car Park– installation in late 2025	All new PV opportunities implemented– installed in late 2025	All new PV opportunities implemented, except Northbrook– installation in late 2025
Ground-mounted PV installation	None	None	University fields array installed in 2028, and Water Lane II installed in 2025

6.6 Projected Emissions to 2030/31

In the BAU scenario, ECC's PV array exported energy offsets -641 tCO_2e in 2024/25, -581 tCO_2e in 2026/27 (when new non-domestic and ground-mounted PV is installed) and -268 tCO_2e in 2030/31.

The Mid scenario, by implementing all new roof-mounted opportunities, offsets -659 tCO_2e in 2024/25, -633 in 2026/27, and -309 tCO_2e in 2030/31.

In the Max scenario, pursuing all new PV opportunities scoped offsets -726 tCO_2e in 2024/25, increasing to -997 tCO_2e in 2026/27, when 3.2MWp of additional PV capacity is installed. In 2030/31 PV exports offset -652 tCO_2e.

Figure 26 shows the comparison of the current and future scenarios for emissions reduction through renewable energy exports from both domestic and non-domestic PV arrays.

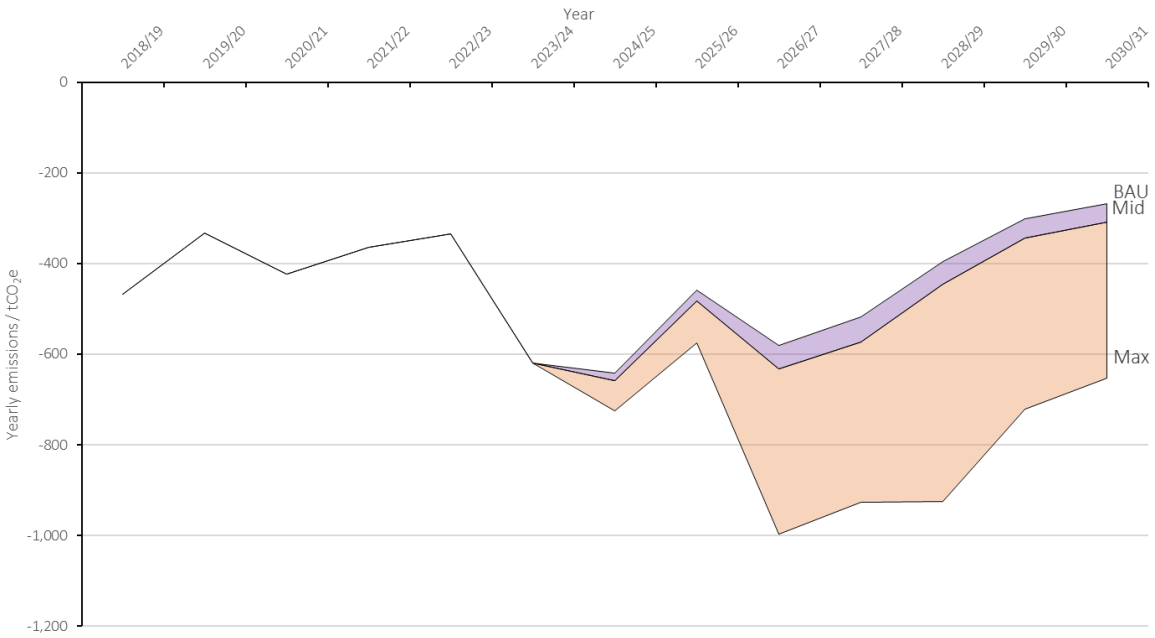

Figure 26. Annual GHG offset through renewable energy exports in different PV installation scenarios

The increases in offset emissions in Figure 26 reflect the development of new renewable energy projects, particularly in 2026/27 when 3.2MWp of additional PV are installed in the Max scenario.

Most of the offsets in 2030/31 under a Max scenario come from the domestic PV arrays (47%), and GPV (32%), with the remainder being exported by non-domestic PV arrays (21%). However, Figure 26 illustrates the annual year-on-year reduction in future carbon offsets achieved through renewable energy exports which is partly due to solar panel efficiency deterioration, but mainly due to the continuing fall in grid electricity emission factors caused by national electricity grid decarbonisation. In 2030 the grid emission factor is projected to have fallen by 70% from the current 0.207 kg CO_2e kWh^{-1} to 0.062 kg CO_2e kWh^{-1}.

From a financial perspective, in the BAU scenario, after the initial CAPEX investment reflected in the Section 4 costs, exporting ECC's non-domestic PV will provide an OPEX benefit £196,000 in 2024/25 and £92,000 in 2030/31. In the Mid scenario, exports will generate £196,000 in 2024/25, £228,000 in 2026/27 and £97,000 in 2030/31 and in the Max scenario, exports from non-domestic PV and GPV will generate £196,000 in 2024/25, £375,000 in 2026/27, and £242,000 in 2030/31 (Figure 27). The Max scenario includes capital investments of £1 million in 2025/26 and £1.3 million in 2027/28 to develop the GPV installations. OPEX is shown as a negative cost in Figure 27 as it represents an income rather than an expenditure[n].

[n] Revenue will notably increase if income from exporting domestic PV is considered

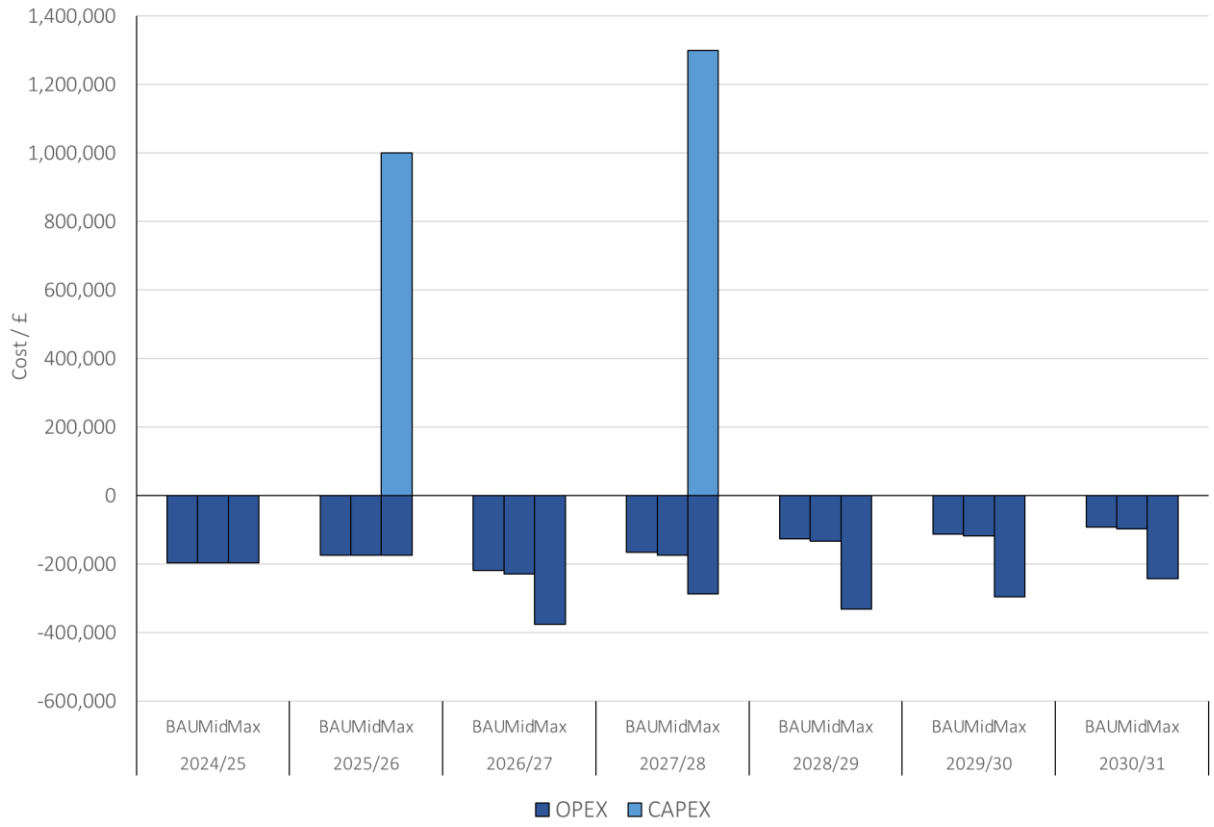

Figure 27. Annual costs from exporting renewable energy in different PV installation scenarios

A further breakdown of the costs is shown in Table 21. Overall, from 2024/25 to 2030/31 the Mid scenario generates £35,000 more than the BAU, and the Max scenario generates £780,000 more than the Mid-case and £815,000 more than the BAU. When including the CAPEX of developing GPV the cumulative costs of the Max scenario are £1.5 million higher than the BAU and the Mid scenarios, although this will reduce if considered beyond 2030 as ECC's PV portfolio continues to offset emissions and generate income.

Table 21: Breakdown of annual OPEX, CAPEX, and cost differences from exporting renewable energy between PV installation scenarios.

Year	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total
BAU Scenario								
CAPEX	£0	£0	£0	£0	£0	£0	£0	£0
OPEX	-£196,000	-£173,000	-£218,000	-£166,000	-£126,000	-£112,000	-£92,000	-£1,083,000
Total	-£196,000	-£173,000	-£218,000	-£166,000	-£126,000	-£112,000	-£92,000	-£1,083,000
Mid Scenario								
CAPEX	£0	£0	£0	£0	£0	£0	£0	£0
OPEX	-£196,000	-£173,000	-£228,000	-£174,000	-£132,000	-£118,000	-£97,000	-£1,118,000
Total	-£196,000	-£173,000	-£228,000	-£174,000	-£132,000	-£118,000	-£97,000	-£1,118,000
Difference from BAU	£0	£0	-£10,000	-£8,000	-£6,000	-£6,000	-£5,000	-£35,000
Max Scnario								
CAPEX	£0	£1,000,000	£0	£1,300,000	£0	£0	£0	£2,300,000
OPEX	-£196,000	-£173,000	-£375,000	-£286,000	-£331,000	-£295,000	-£242,000	-£1,898,000

Year	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Total	-£196,000	£827,000	-£375,000	£1,014,000	-£331,000	-£295,000	-£242,000	£402,000
Difference from BAU	£0	£1,000,000	-£157,000	£1,180,000	-£205,000	-£183,000	-£150,000	£1,485,000
Difference from Mid	£0	£1,000,000	-£147,000	£1,188,000	-£199,000	-£177,000	-£145,000	£1,520,000

The annual reduction in future income from exporting renewable energy is due both to solar panel efficiency deterioration producing less electricity and the projected fall in energy prices. In 2030, wholesale energy prices are projected to have fallen by 60% from the current 10.85 p per kWh to 4.39 p per kWh. Increases in revenue reflected in each scenario in Figure 27 are due to development of new PV arrays.

While renewable electricity generation with a business case will continue to be financially attractive, add local energy resilience, and hedge against rising energy prices, falling national grid electricity emission factors mean that its role in offsetting carbon emissions in other sectors will reduce over time.

7 Land Use Change/Afforestation

7.1 Current Sector Summary

Land use change through afforestation of unforested land delivers valuable carbon sequestration as trees capture carbon from the atmosphere and transform it into biomass, a process that has the potential to offset carbon emissions on the pathway to net zero.

ECC owns 409 ha of parks and greenspaces (P&GS), including the 162 ha of the city's Valley Parks which are managed by the Devon Wildlife Trust (Table 22).

Table 22: ECC P&GS areas [o]

Greenspace	Area (ha)
Ludwell Valley Park	80
Riverside Valley Park	40
Mincinglake Valley Park	19
Barley Valley Park	11
Duryard & Belvidere Valley Park	11
Whitycombe Valley Park	1
Other ECC owned Greenspaces	247
Total	**409**

Currently, ECC's P&GS has a 24% canopy cover (~98 ha), which sequesters -155 tCO_2e annually. The carbon sequestration rate for this calculation was derived from a recent study by Treeconomics on Exeter's treescape [41], which estimated Exeter's full canopy cover (950 ha) sequestered 1,510 tCO_2e every year (average sequestration rate = -1.6 $tCO_2e\ ha^{-1}\ yr^{-1}$).

Further tree planting efforts by ECC have increased their tree stock by 748 trees [42] (107 standard trees, 50 heritage variety fruit trees, and 591 broadleaf whips). Assuming a planting density of 1,600 trees ha^{-1} and a broadleaf yield class, these will account for 0.35 tCO_2e emissions in 2023/24.

7.2 Tree Planting

Additional tree planting scenarios to further offset the council's GHG emissions were modelled using data from the Sixth Carbon Budget [9], which provides GHG savings from planting different types of biomasses of different yield classes (Figure 28). Broadleaf YC6- managed has been assumed as a generic broadleaf yield class for the calculations, although in reality the tree species planted may differ.

[o] Source: Devon Wildlife Trust

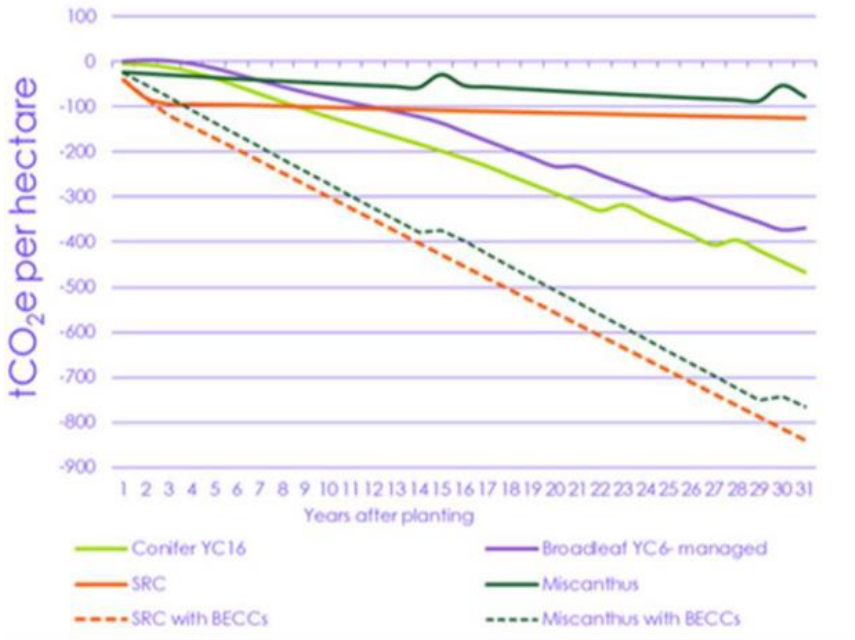

Figure 28. Cumulative GHG savings over time from planting different types of biomasses [9]

The BAU scenario assumes no additional tree planting. The Mid scenario models an increase the canopy cover of its P&GS to 30% (planting an additional 24.5 ha), as stated in ECC's Tree and Woodland Strategy 2023-2033 [43] and in its Net Zero Carbon Reduction Plan version 4.0 [42]. Assuming a planting density of 1,600 trees ha^{-1}, this would entail planting over 39,000 trees. The Max scenario, although unfeasible, models the carbon offset achieved if ECC planted 100% of its owned P&GS with woodlands. This would entail planting almost 500,000 trees to cover the entirety of the P&GS. In all scenarios, planting is assumed to take place evenly between 2024 and 2030.

The financial implications of each tree planting scenario include the initial CAPEX of planting a tree and the OPEX arising from tree maintenance costs. The National Trust estimates it costs £5 to plant a new tree sapling [44]. However, prices for tree planting can vary depending on the age of the tree, tree species, plantation size, planting location, planting density, and the service provider. There are also numerous initiatives subsidising large scale tree planting projects to make them more affordable, such as the MOREwoods scheme by the Woodland Trust which can reduce costs to as little as £1 per tree [45]. These opportunities are available to local authorities but involve undergoing an application and selection process, so they are not guaranteed. A conservative cost of £5 per tree is assumed for this analysis. A planting density of 1,600 trees ha^{-1} is also assumed.

OPEX is calculated as the overall maintenance costs for an area of woodland, including watering, mulching, pruning, weed control, pest and disease management, and monitoring. A 2011 study for the Woodland Trust estimated the annual average cost of maintaining a woodland in a managed green space is £1,065 per hectare [46]. Accounting for inflation, the revised estimated annual cost of maintaining a woodland assumed in this analysis is £1,488 per hectare. OPEX is modelled in all scenarios for both the existing tree stock, and for additional

tree planting. Inflation or deflation in tree planting and maintenance prices in future years is not included in the analysis.

7.3 Summary of Modelling Assumptions

The assumptions made for each combination of measure and scenario is shown in Table 23.

Table 23: Modelled assumptions for land use/afforestation

Measure	BAU Scenario	Mid Scenario	Max Scenario
Tree Planting	No additional tree planting	Increase P&GS canopy cover to 30% – ~5,600 trees every year	Increase P&GS canopy cover to 100% – ~71,000 trees every year

7.4 Projected Emissions to 2030/31

The BAU scenario, ECC's current tree stock (including tree planting during 2023, modelled using Figure 28) will offset -154 tCO_2e in 2024/25 and -162 tCO_2e in 2030/31.

The Mid scenario, increasing ECC's P&GS canopy cover to 30% by planting broadleaf woodland would emit 3 tCO_2e in 2024/25, and offset -148 tCO_2e by 2030/31, shifting ECC's total offsets through afforestation to -151 tCO_2e and -310 tCO_2e, respectively.

The Max scenario, increasing ECC's P&GS canopy cover to 100% by planting broadleaf woodland would emit 34 tCO_2e in 2024/25, and offset an additional -1,871 tCO_2e by 2030/31, shifting ECC's total offsets through afforestation to -121 tCO_2e and -2,033 tCO_2e, respectively.

Figure 29 shows the comparison of the current and future scenarios for emissions reduction through afforestation. Note that after initial planting, broadleaf trees can be a net source of carbon, emitting up to 3 $tCO_2e\ ha^{-1}\ yr^{-1}$ [9]. This is because in the initial stage of development plant respiration can exceed photosynthetic activity as the sapling is establishing its roots. Furthermore, root establishment can disturb soils, releasing the organic carbon stored in them.

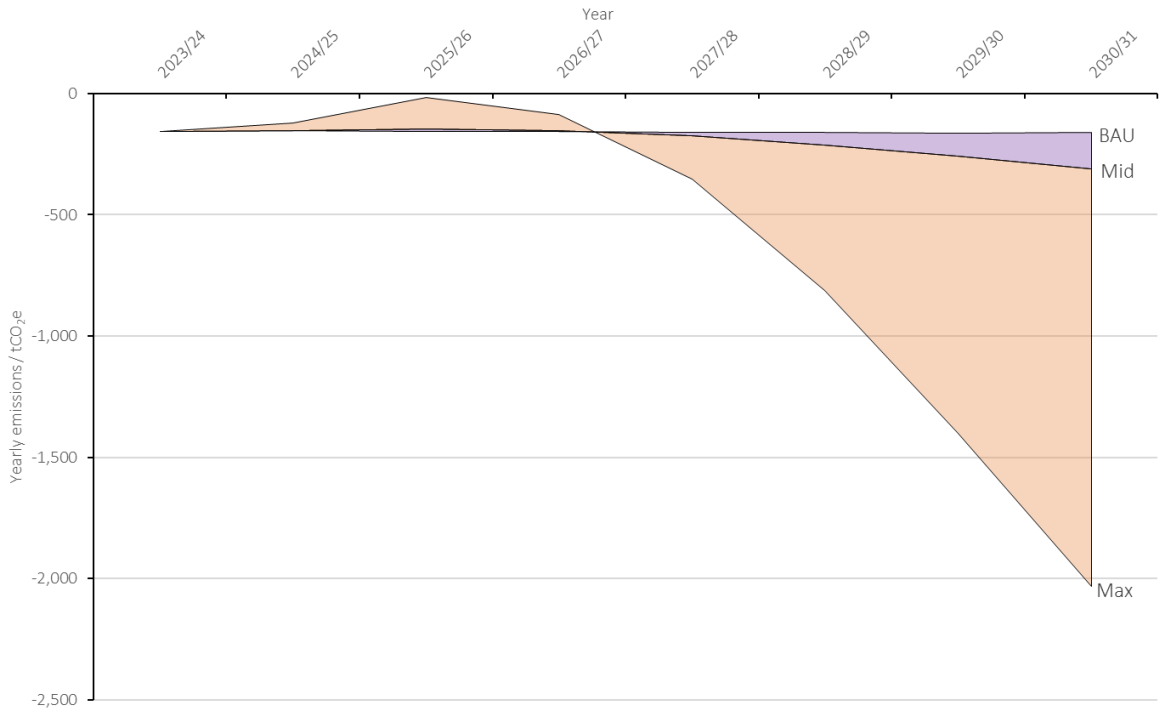

Figure 29: Annual GHG offset through land use change in different tree planting scenarios

While the Mid scenario represents valuable progress towards net zero, the ambitious scenario of 100% canopy cover in ECC's P&GS has the potential to increase potential offset emissions eight-fold. Opportunities to expand current planned efforts and increase canopy cover beyond 30% should perhaps be considered.

From a financial perspective, maintenance costs for the existing tree stock in a BAU scenario without additional planting will amount to £146,000 annually from 2024/25 to 2030/31. Increasing canopy cover to meet the goals set out in the Mid scenario will cost £28,000 annually if planting occurs evenly from 2024/25 to 2030/31. This increases annual maintenance costs by over £5,000 every year, leading to an OPEX of £151,000 in 2024/25, and £183,000 in 2030/31. Planting 71,000 trees every year to increase the P&GS canopy cover to 100% in the Max scenario would cost £355,000 annually and increases annual maintenance costs by over £66,000 every year compared to the BAU scenario, leading to an OPEX of £212,000 in 2024/25, and £609,000 in 2030/31 (Figure 30).

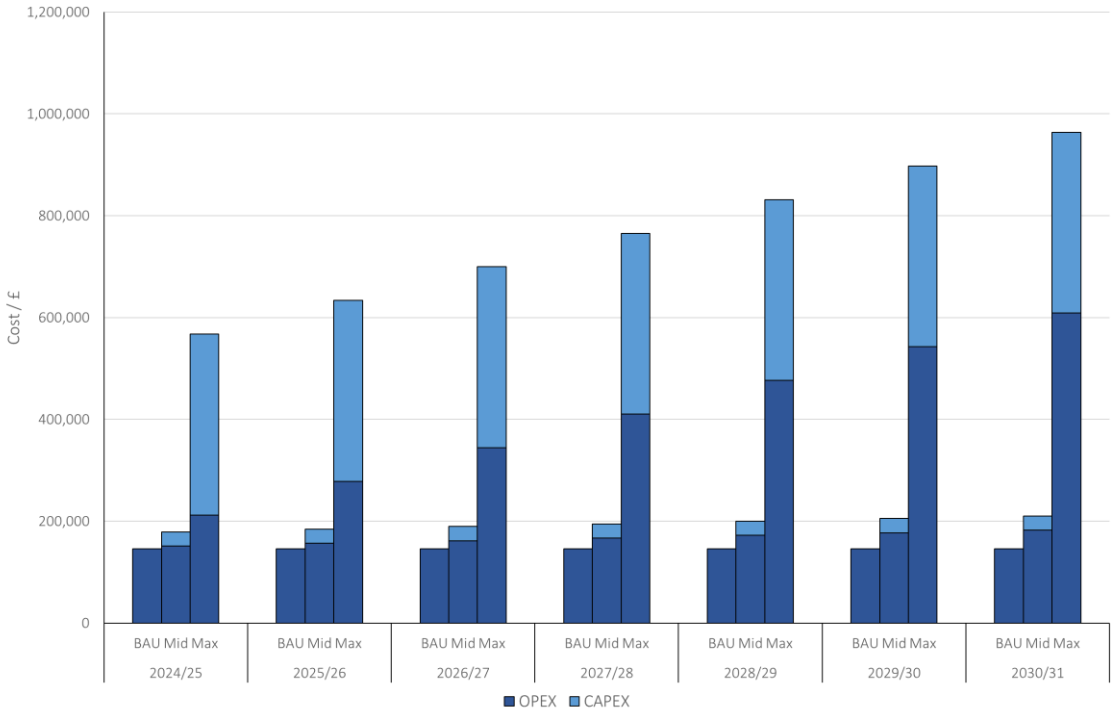

Figure 30: Annual costs for offsetting emissions through land use change in different tree planting scenarios.

A further breakdown of costs is shown in Table 24. Overall, from 2024/25 to 2030/31 the Mid case scenario costs £342,000 more than the BAU, and the Max scenario costs £4 million more than the BAU.

Table 24: Breakdown of annual OPEX, CAPEX, and cost differences from offsetting emissions though land use change between tree planting scenarios

Year	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total
BAU Scenario								
CAPEX	£0	£0	£0	£0	£0	£0	£0	£0
OPEX	£146,000	£146,000	£146,000	£146,000	£146,000	£146,000	£146,000	£1,022,000
Total	**£146,000**	**£146,000**	**£146,000**	**£146,000**	**£146,000**	**£146,000**	**£146,000**	**£1,022,000**
Mid Scenario								
CAPEX	£28,000	£28,000	£28,000	£28,000	£28,000	£28,000	£28,000	£196,000
OPEX	£151,000	£156,000	£162,000	£167,000	£172,000	£177,000	£183,000	£1,168,000
Total	**£179,000**	**£184,000**	**£190,000**	**£195,000**	**£200,000**	**£205,000**	**£211,000**	**£1,364,000**
Difference from BAU	£33,000	£38,000	£44,000	£49,000	£54,000	£59,000	£65,000	£342,000
Max Scenario								
CAPEX	£355,000	£355,000	£355,000	£355,000	£355,000	£355,000	£355,000	£2,485,000
OPEX	£212,000	£278,000	£344,000	£410,000	£476,000	£543,000	£609,000	£2,872,000
Total	**£567,000**	**£633,000**	**£699,000**	**£765,000**	**£831,000**	**£898,000**	**£964,000**	**£5,357,000**
Difference from BAU	£421,000	£487,000	£553,000	£619,000	£685,000	£752,000	£818,000	£4,335,000
Difference from Mid	£388,000	£449,000	£509,000	£570,000	£631,000	£693,000	£753,000	£3,993,000

An important aspect to consider before designing a tree planting strategy is the increased carbon sequestration offered by conifers due to their faster growth rates (Figure 28). However, native tree species mixes provide a greater benefit to the local wildlife and biodiversity [47]. Climate resilience and tree diseases also need to be accounted for when selecting tree species to ensure the longevity of ECC's tree stock, e.g., the ash dieback epidemic threatens to wipe out over 80% of ash trees across the UK [48]. Finally, management practices stipulated for each yield class need to be considered to maximise carbon uptake of the afforested land.

While the analysis illustrates the potential of afforestation to reduce ECC's emissions the impact of tree planting must not be overestimated and relied upon, as even in the most ideal scenario tree planting only has the theoretical potential to offset -2,033 tCO_2e by 2030. Nevertheless, it provides an invaluable asset for long-term carbon capture and storage that will help progress towards net zero, as well as providing other benefits such as biodiversity enhancement, ecotourism, and air quality improvement.

8 Overall Results

ECC's projected Scope 1 and 2 organisational footprint to 2030/31 under the three scenarios is shown in Figure 31. The graph exhibits a similar shape to the social housing operational emission projections in Figure 5 because the sector accounts for a considerable portion of ECC's organisational footprint (86% in 2023/24) and is modelled with the most rigorous decarbonisation efforts in all the three scenarios.

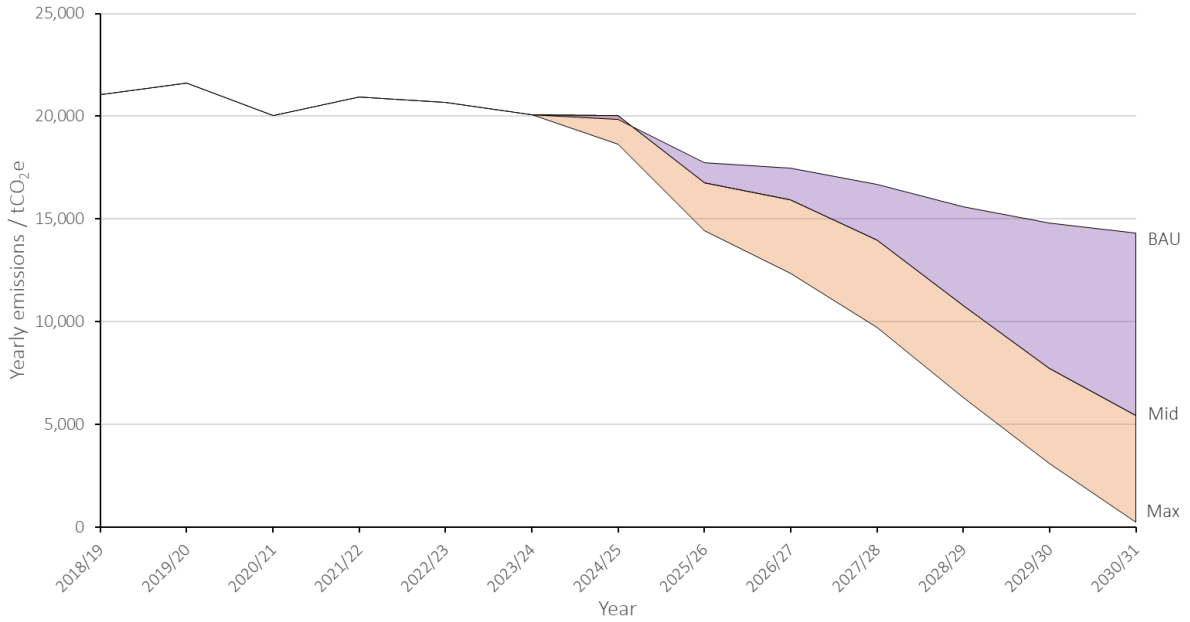

Figure 31: Projected ECC Scope 1 and 2 organisational emissions under the BAU, Mid and Max decarbonisation scenarios.

Figure 32 shows the total projected Scope 1 and 2 emissions for each year by sector under the BAU scenario. The total 2030/31 Scope 1 and 2 emissions are estimated as 14,325 tCO_2e, a 29% reduction from 2023/24 levels. Despite a 26% reduction from 2023/24 levels, social housing continues to dominate the organisational footprint with 12,818 tCO_2e in 2030/31. ECC's commitment to new Passivhaus constructions is a positive step in providing low carbon social housing but there remains a need to retrofit and decarbonise existing stock as shown in the more ambitious scenarios. Non-domestic buildings are estimated to produce 1,170 tCO_2e in 2030/31 (a 57% reduction from the 2023/24 inventory). The remaining emissions are attributed to transport which only reduce slightly in this scenario. In 2030/31, Scope 1 and 2 transport emissions are estimated at 766 tCO_2e (11% reduction from 2023/24). The lease of diesel vehicles remains the dominant procurement decision and four additional diesel RCVs are procured on top of the existing diesel fleet. Only the non-specialised vehicles are replaced with an electric equivalent. Without future tree planting and only six new non-domestic PV arrays the extent of offsets decreases to -429 tCO_2e in 2030/31 (45% *decrease*) [p]. The cumulative emissions over the seven modelled years are shown in Figure 33 and show a near linear increase.

The Mid scenario (Figure 34) sees more progress towards net zero, reaching 5,427 tCO_2e in 2030/31, a 73% reduction. The complete electrification of heat throughout social housing is a significant contributor in reducing their carbon emissions to 5,094 tCO_2e in 2030/31, a 71% reduction from the 2023/24 inventory. Widespread insulation and ASHP installation help reduce ECC's non-domestic building stock to 884 tCO_2e in 2030/31 under the Mid scenario (68% reduction). There is a large reduction in transport emissions to only 67 tCO_2e in 2030/31 (92% reduction) as the proportion of HVO and electric vehicles in the fleet increases. Despite an increase in tree planting, offsetting continues to decline in the Mid scenario to -619 tCO_2e in 2030/31 (20% reduction) due to the falling emission factor for grid electricity reducing the emissions saved by consuming exported PV energy. Figure 35 shows the cumulative emissions from 2024/25 to 2030/31, the sigmoidal relationship shows the accelerating decarbonisation efforts under this scenario.

Figure 36 details the near net zero result of the Max scenario decarbonisation measures, with Scope 1 and 2 emissions falling to just 269 tCO_2e in 2030/31. The dramatic increase in tree planting allows offsets to compensate for -2,685 tCO_2e a year which is a 247% increase from the 2023/24 extent. Without offsets, the total 2030/31 Scope 1 and 2 emissions are modelled at 2,954 tCO_2e. Extensive ASHP and PV rollout throughout ECC's social housing significantly reduces the electricity consumption compared to the Mid scenario. Offsets will be crucial in helping to mitigate residual emissions such as those arising from ASHP leakage. With all new vehicles being replaced with EVs, transport emissions stay near net zero at 27 tCO_2e in 2030/31. Cumulative emissions are shown in Figure 37, the incremental change from 2029/30 to 2030/31 highlights the impact of impact of offsets in the Max scenario.

[p] Reported as negative to indicate that these emissions are offsets.

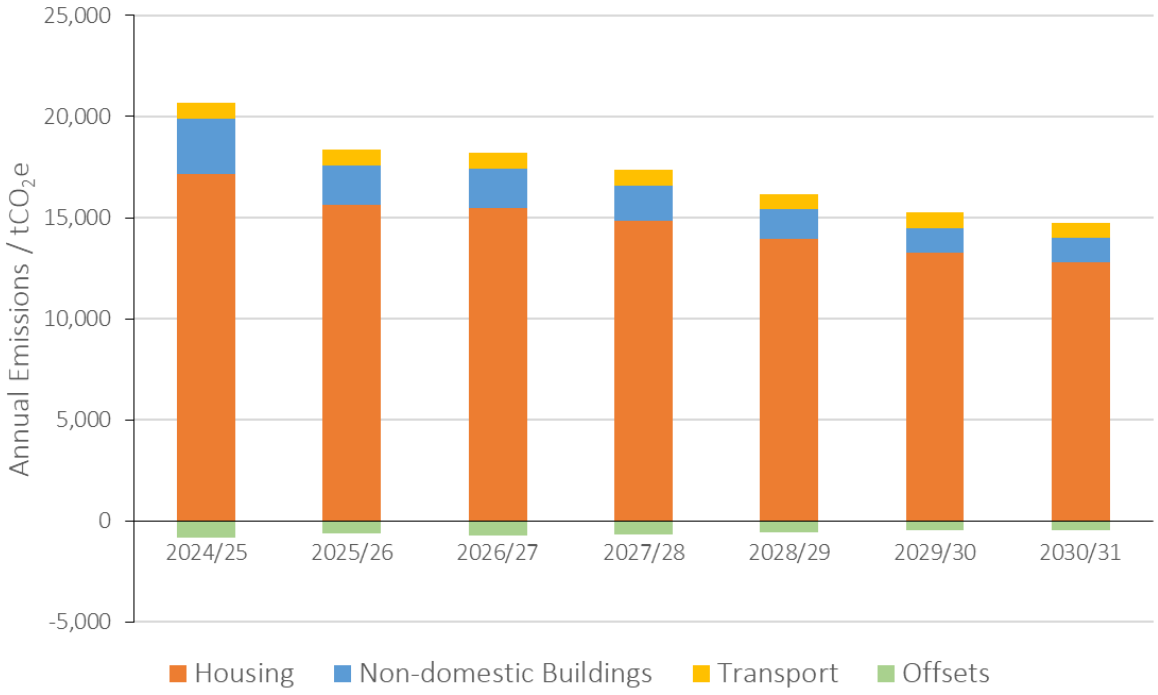

Figure 32: ECC's projected BAU annual Scope 1& 2 emissions by sector

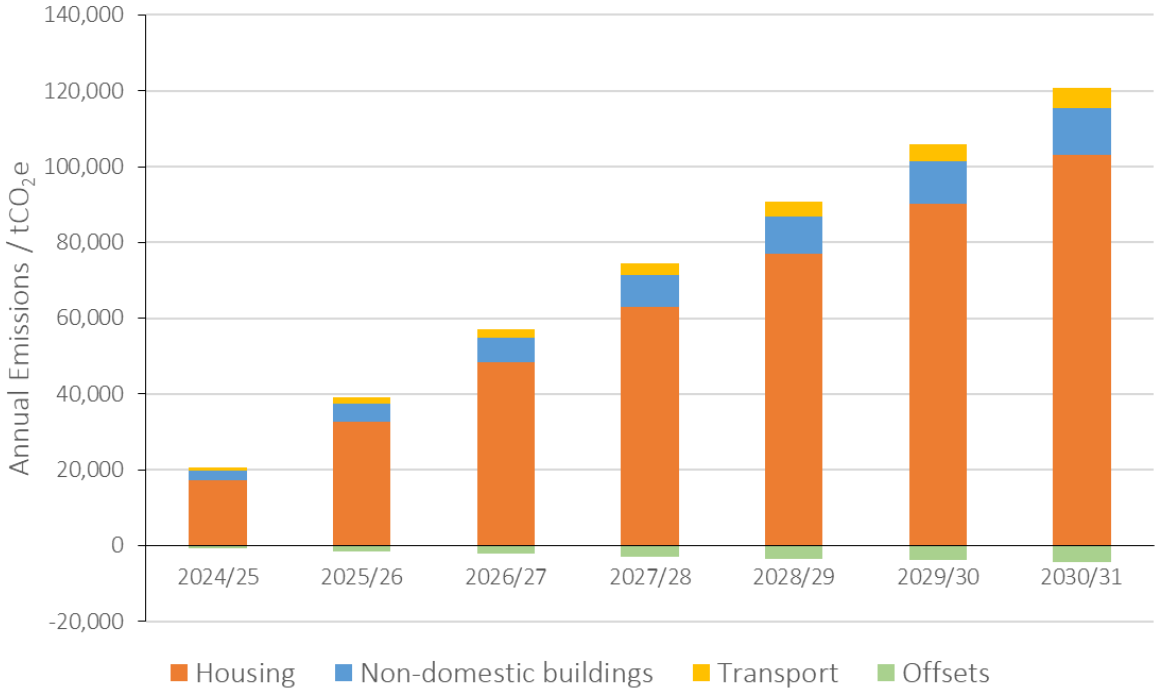

Figure 33: ECC's cumulative projected BAU Scope 1 & 2 emissions by sector

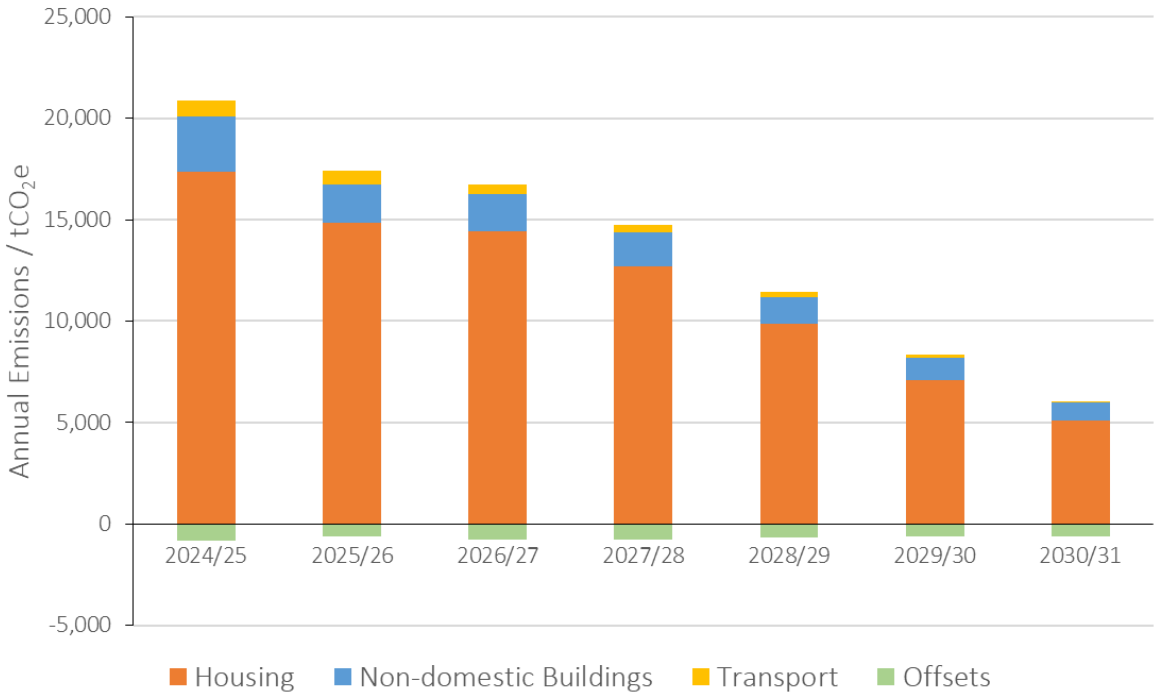

Figure 34: ECC's projected Mid scenario annual Scope 1 & 2 emissions by sector

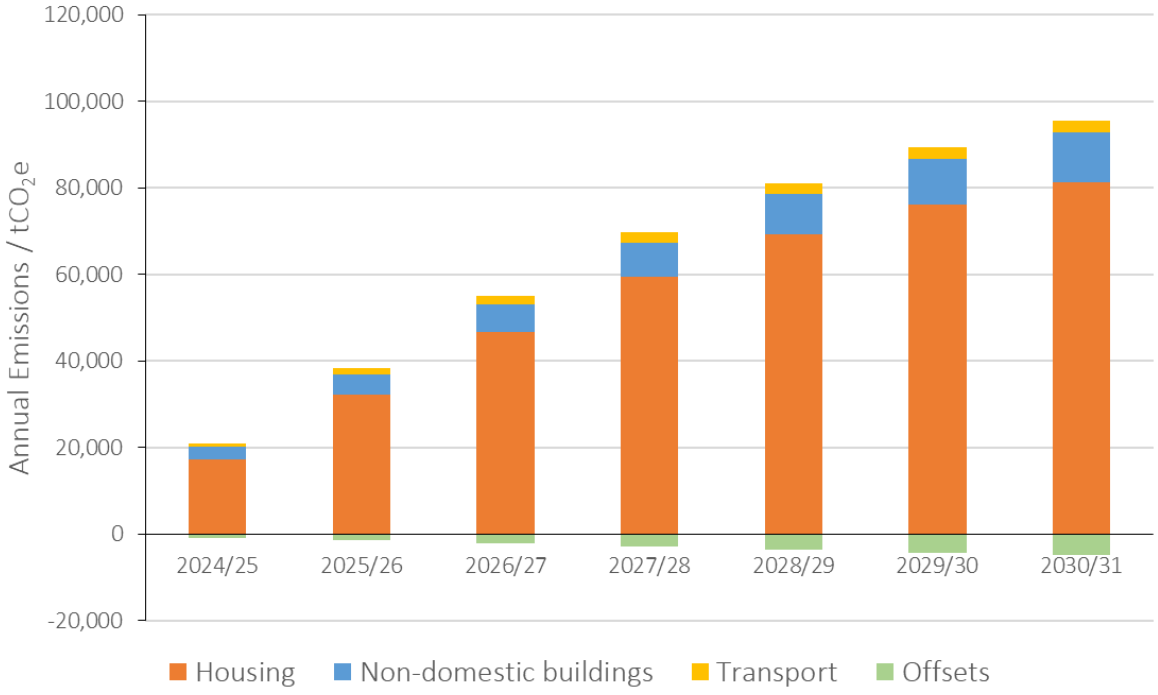

Figure 35: ECC's cumulative projected Mid scenario Scope 1 & 2 emissions by sector

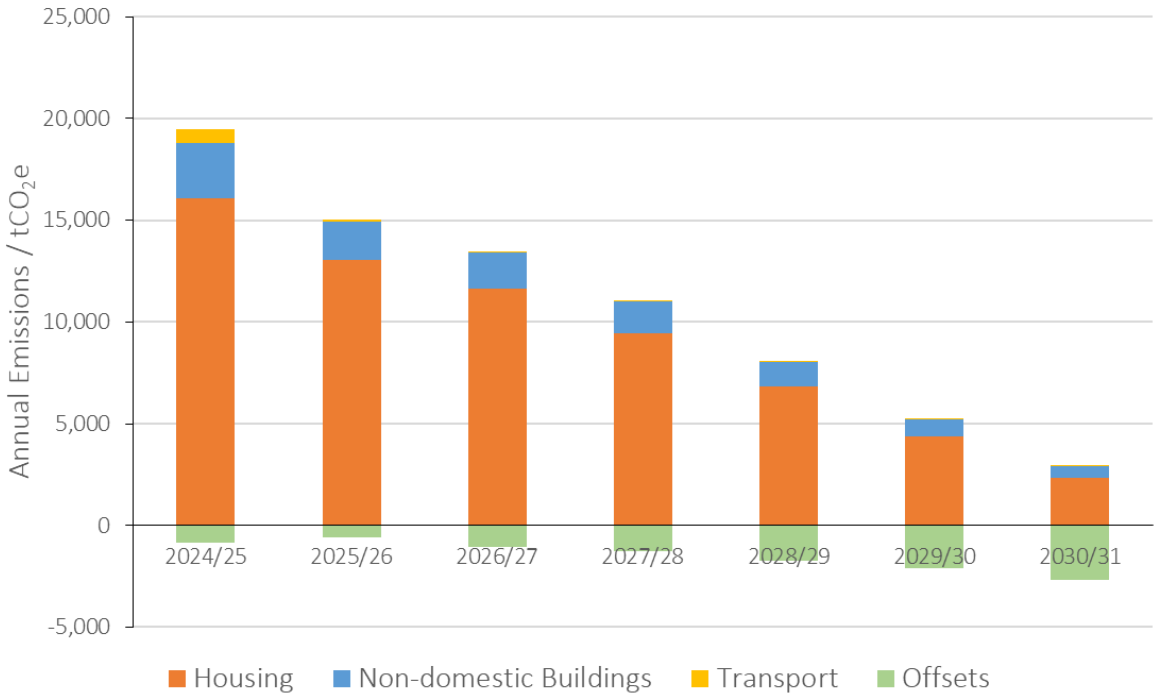

Figure 36: ECC's projected Max scenario annual Scope 1&2 emissions by sector

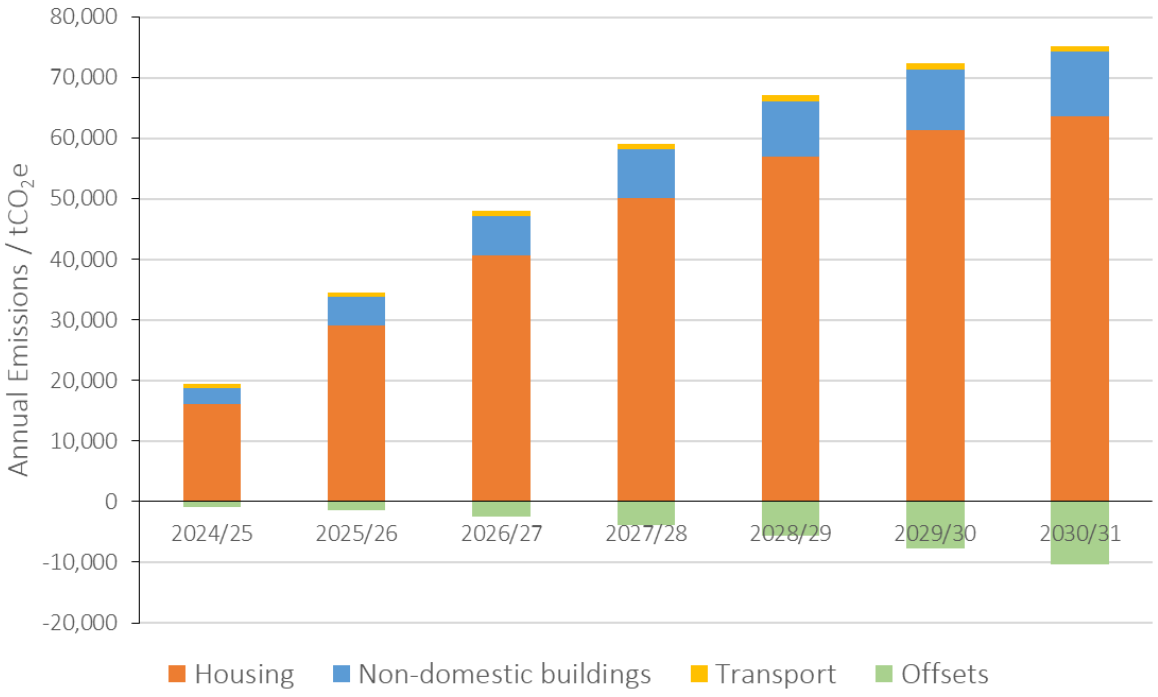

Figure 37: ECC's cumulative projected Max scenario Scope 1 & 2 emissions by sector

The total costs associated with these three scenarios are shown in Figure 38. Given that most of the capital expenditure arises from social housing the bars closely resemble that of Figure 6 but with sharp peaks in specific years/scenarios for the costly Riverside and RAMM upgrades discussed in section 4.2.5 (Figure 16). Total operational expenditure is heavily influenced by transport operational costs (Figure 24).

Over the period 2024/25 to 2030/31, meeting the BAU costs a total of £55.5 million with CAPEX of £25.1m and OPEX of £30.4m. The Mid scenario results in total estimated CAPEX of £42.9m and a further £31.8m in operational expenditure and the Max scenario in CAPEX of £93.7m and OPEX of £35.5m.

These significant costs illustrate the challenges of ECC achieving net zero Scope 1 & 2 emissions by 2030/31 and highlight that, even in the near net-zero Max scenario, some element of purchased offsets may be needed to achieve net zero in 2030/31.

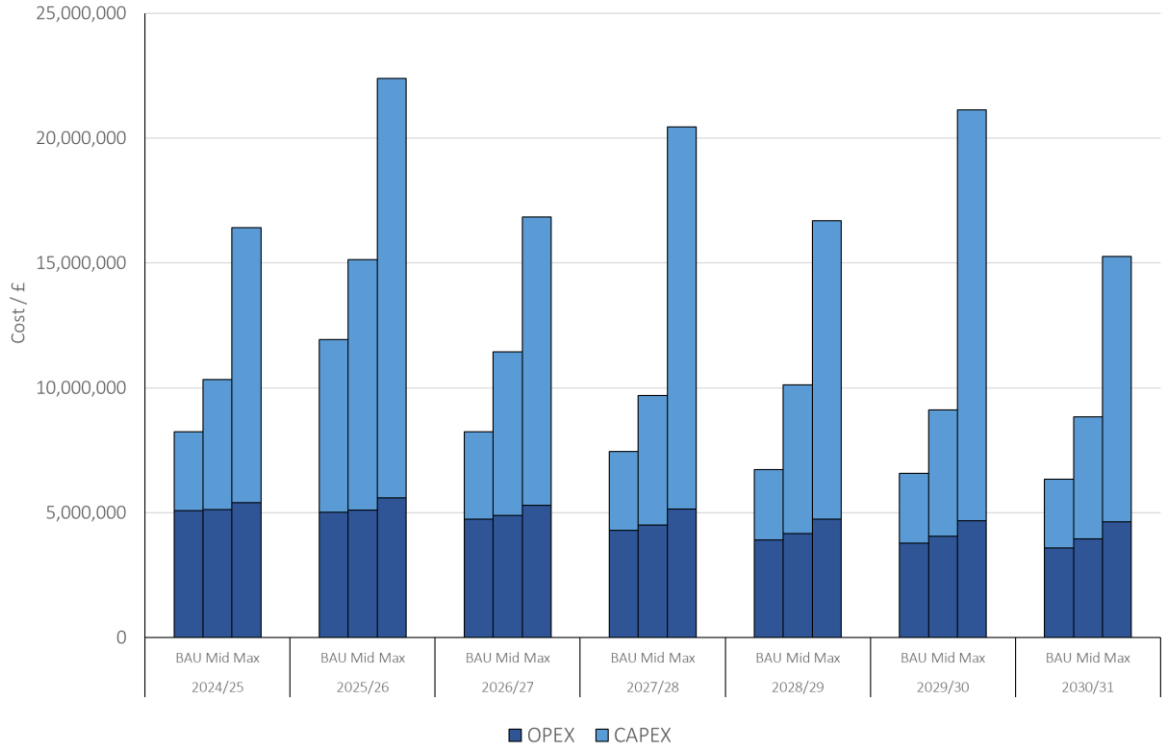

Figure 38: Annual capital and operating costs associated with decarbonising ECC's various assets under the three different scenarios.

Table 25: Cost breakdown of ECC organisational emission BAU decarbonisation scenarios. Totals may not sum due to rounding.

BAU Scenario								
Year	**2024/25**	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**	**Total**
CAPEX	£3,160,000	£6,910,000	£3,490,000	£3,160,000	£2,820,000	£2,790,000	£2,770,000	£25,100,000
of which…								
Housing	£2,910,000	£2,890,000	£2,860,000	£2,840,000	£2,820,000	£2,790,000	£2,770,000	£19,900,000
Non-domestic buildings	£250,000	£4,020,000	£629,000	£312,000	£0	£0	£0	£5,220,000
Transport	£1,000	£0	£0	£5,000	£0	£0	£0	£6,000
Offsets	£0	£0	£0	£0	£0	£0	£0	£0
OPEX	£5,070,000	£5,010,000	£4,750,000	£4,280,000	£3,920,000	£3,780,000	£3,580,000	£30,400,000
of which…								
Housing	£0	£0	£0	£0	£0	£0	£0	£0
Non-domestic buildings	£2,970,000	£2,700,000	£2,460,000	£1,940,000	£1,520,000	£1,370,000	£1,150,000	£14,100,000
Transport	£2,150,000	£2,340,000	£2,360,000	£2,370,000	£2,380,000	£2,380,000	£2,380,000	£16,400,000
Offsets	-£50,000	-£27,200	-£71,500	-£20,100	£20,000	£33,800	£53,800	-£61,200
Total	£8,240,000	£11,900,000	£8,240,000	£7,440,000	£6,730,000	£6,570,000	£6,350,000	£55,500,000

Table 26: Cost breakdown of ECC organisational emissions Mid decarbonisation scenarios. Totals may not sum due to rounding

Mid Scenario								
Year	**2024/25**	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**	**Total**
CAPEX	£5,210,000	£10,000,000	£6,550,000	£5,200,000	£5,950,000	£5,060,000	£4,880,000	£42,900,000
of which…								
Housing	£4,850,000	£4,850,000	£4,850,000	£4,850,000	£4,850,000	£4,850,000	£4,850,000	£34,000,000
Non-domestic buildings	£314,000	£5,160,000	£1,640,000	£312,000	£1,070,000	£182,000	£0	£8,680,000
Transport	£20,000	£1,000	£28,500	£6,000	£1,000	£0	£1,000	£57,500
Offsets	£28,000	£28,000	£28,000	£28,000	£28,000	£28,000	£28,000	£196,000
OPEX	£5,120,000	£5,100,000	£4,880,000	£4,500,000	£4,160,000	£4,060,000	£3,950,000	£31,800,000
of which…								
Housing	£0	£0	£0	£0	£0	£0	£0	£0
Non-domestic buildings	£2,960,000	£2,670,000	£2,410,000	£1,890,000	£1,480,000	£1,330,000	£1,180,000	£13,900,000
Transport	£2,200,000	£2,450,000	£2,540,000	£2,620,000	£2,650,000	£2,670,000	£2,690,000	£17,800,000
Offsets	-£44,800	-£16,700	-£66,100	-£7,040	£40,100	£59,800	£85,900	£51,300
Total	£10,300,000	£15,100,000	£11,400,000	£9,700,000	£10,100,000	£9,120,000	£8,830,000	£74,700,000
Difference from BAU	£2,090,000	£3,220,000	£3,190,000	£2,260,000	£3,380,000	£2,550,000	£2,480,000	£19,200,000

Table 27: Cost breakdown of ECC organisational emissions Max decarbonisation scenarios. Totals may not sum due to rounding.

Max Scenario								
Year	**2024/25**	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**	**Total**
CAPEX	£11,000,000	£16,800,000	£11,500,000	£15,300,000	£12,000,000	£16,500,000	£10,600,000	£93,700,000
of which…								
Housing	£10,300,000	£10,300,000	£10,300,000	£10,300,000	£10,300,000	£10,300,000	£10,300,000	£71,800,000
Non-domestic buildings	£314,000	£5,160,000	£851,000	£3,350,000	£1,330,000	£5,820,000	£0	£16,800,000
Transport	£67,500	£1,600	£76,600	£35,100	£11,100	£19,600	£1,600	£213,000
Offsets	£355,000	£1,360,000	£355,000	£1,660,000	£355,000	£355,000	£355,000	£4,790,000
OPEX	£5,400,000	£5,600,000	£5,290,000	£5,150,000	£4,740,000	£4,670,000	£4,640,000	£35,500,000
of which…								
Housing	£0	£0	£0	£0	£0	£0	£0	£0
Non-domestic buildings	£2,960,000	£2,670,000	£2,340,000	£1,840,000	£1,430,000	£1,180,000	£968,000	£13,400,000
Transport	£2,420,000	£2,830,000	£2,970,000	£3,180,000	£3,160,000	£3,250,000	£3,300,000	£21,100,000
Offsets	£16,100	£105,000	-£30,500	£124,000	£145,000	£248,000	£366,000	£974,000
Total	£16,400,000	£22,400,000	£16,800,000	£20,400,000	£16,700,000	£21,100,000	£15,300,000	£129,000,000
Difference from BAU	£8,170,000	£10,500,000	£8,590,000	£13,000,000	£9,960,000	£14,500,000	£8,910,000	£73,600,000
Difference from Mid	£6,070,000	£7,240,000	£5,400,000	£10,800,000	£6,590,000	£12,000,000	£6,420,000	£54,500,000

9 Glossary

ASHP – Air Source Heat Pump

BAU – Business as Usual scenario

BEIS – Department for Business, Energy and Industrial Strategy

C&B – Currie and Brown

CAPEX – Capital Expenditure

CCC – Climate Change Committee

CIBSE – Chartered Institution of Building Services Engineers

CoP – Coefficient of Performance

CPI – Consumer Price Index

CWI – Cavity wall insulation

DESNZ – Department for Energy Security and Net Zero

ECC – Exeter City Council

eRCV– Electric Refuse Collection Vehicle

EPC – Energy Performance Certificate

EV– Electric Vehicle

F-gas – Fluorinated gas

FIT – Feed-In Tariff

GHG – Greenhouse gas

GPV – Ground-mounted solar photovoltaic

HVO – Hydrotreated Vegetable Oil

ha – Hectare

kW – Kilowatt

kWh – Kilowatt hour

kWp – Kilowatt peak

LI – Loft Insulation

Max – Net Zero scenario

MEND – Museum Estate and Development Fund

MCS – Microgeneration Certification Scheme

Mid – Mid Case scenario

MWh – Megawatt hour

MWp – Megawatt peak

MWh – Megawatt hours

NEED – National Energy Efficiency Data

Ofgem – Office of Gas and Electricity Markets

OPEX – Operational Expenditure

ONS – Office for National Statistics

P&GS – Parks and greenspaces

PPA – Power Purchasing Agreement

PSDS – Public Sector Decarbonisation Scheme

PV – Photovoltaic

PVGIS – Photovoltaic Geographic Information System

R32 – HFC-32 refrigerant (Difluoromethane)

RACHP – Refrigeration, Air Conditioning, and Heat Pump

RAMM – Royal Albert Memorial Museum

RCV– Refuse Collection Vehicle

SEG – Smart Export Guarantee

tCO_2e – Tonnes of carbon dioxide equivalent

YC – Yield Class

10 References

[1] D. Lash, T. Mitchell, A. Norton, A. Rowson, Exeter City Council corporate carbon footprint. Achieving net zero by 2030, 2022. Centre for Energy and the Environment Internal Document 1005.

[2] Department for Energy Security and Net Zero, Annex M: Growth assumptions and prices in Energy and emissions projections 2022 to 2040, 2023. https://www.gov.uk/government/publications/energy-and-emissions-projections-2022-to-2040 (accessed October 17, 2024).

[3] D. Lash, Exeter City Council's Carbon Footprint 2022/23, Exeter, 2024. Centre for Energy and the Environment Internal Document 1043.

[4] MHCLG, Live tables on social housing sales, (2024). https://www.gov.uk/government/statistical-data-sets/live-tables-on-social-housing-sales (accessed October 15, 2024).

[5] Exeter City Council, Work begins to create dozens of new low energy council homes in Exeter, (2023). https://news.exeter.gov.uk/work-begins-to-create-dozens-of-new-low-energy-council-homes-in-exeter/ (accessed October 15, 2024).

[6] K. Mead, R. Brylewski, Passivhaus primer: Introduction An aid to understanding the key principles of the Passivhaus Standard, Watford, n.d.

[7] Passivhaus Trust, Passivhaus Construction Costs, London, 2019. www.passivhaustrust.org.uk (accessed October 15, 2024).

[8] DESNZ, National Energy Efficiency Data-Framework (NEED): impact of measures data tables 2023, (2023). https://www.gov.uk/government/statistics/national-energy-efficiency-data-framework-need-impact-of-measures-data-tables-2023 (accessed October 16, 2024).

[9] Climate Change Committee, The Sixth Carbon Budget - Methodology Report, 2020.

[10] Climate Change Committee, CCC Mitigation Monitoring Framework, London, 2022. https://www.theccc.org.uk/publication/ccc-monitoring-framework/?chapter=3-buildings#indicators (accessed October 17, 2024).

[11] Energy Systems Catapult, Electrification of Heat Demonstration Project – Interim Heat Pump Performance Data Analysis Report, Birmingham, 2023.

[12] M. Myers, E. Kourtza, D. Kane, S. Harkin, The Cost of Installing Heating Measures in Domestic Properties The Delta-ee Team, 2018.

[13] MCS, The MCS Data Dashboard, (n.d.). https://datadashboard.mcscertified.com/ (accessed July 10, 2024).

[14] European Commission Joint Research Centre, JRC Photovoltaic Geographical Information System, (2022). re.jrc.ec.europa.eu (accessed August 22, 2024).

[15] CIBSE, CIBSE GUIDE F: Energy efficiency in buildings, London, 2012.

[16] E. Feaver, A. Rowson, Heathfield Rooftop PV Assessment, Exeter, 2024. Centre for Energy and the Environment Internal Document 1067.

[17] J. Field, B. Bordass, H. Bruhns, R. Cohen, L. Delorme, H. Davies, S. Irving, P. Jones, C. Lillicrap, P. Martin, Energy benchmarks. CIBSE TM46: 2008, London, 2008.

[18] Currie & Brown, Riverside Leisure Centre Decarbonisation Strategy Report, London, 2023.

[19] Currie & Brown, Northbrook Swimming Pool Decarbonisation Strategy Report, London, 2023.

[20] Energy Systems Catapult Ltd., Decarbonisation intervention estimator, (2024).

[21] Exeter City Council, Carbon reduction plan - February 2024 update, (2024). https://exeter.gov.uk/climate-emergency/carbon-footprint/carbon-reduction-plan/february-2024-update/ (accessed October 22, 2024).

[22] Historic England, ROYAL ALBERT MEMORIAL MUSEUM, Non Civil Parish - 1267392, (1974). https://historicengland.org.uk/listing/the-list/list-entry/1267392 (accessed October 2, 2024).

[23] Exeter City Council, Councillors back proposals to progress City Council office relocation, (2024). https://news.exeter.gov.uk/councillors-back-proposals-to-progress-city-council-office-relocation/ (accessed October 2, 2024).

[24] Historic England, CUSTOM HOUSE, WHARFINGER'S HOUSE AND ATTACHED WAREHOUSE, Non Civil Parish - 1223038, (1991). https://historicengland.org.uk/listing/the-list/list-entry/1223038 (accessed October 22, 2024).

[25] R. Gluckman, P. Brown, N. Webb, J. Watterson, E. Kilroy, A. Adamson, A. Kanji, D. Lail, D. Crawley, G. Maidment, A. Woodcock, Assessment of the potential to reduce UK F-gas emissions beyond the ambition of the F-gas Regulation and Kigali Amendment, 2019. https://www.theccc.org.uk/publication/assessment-of-potential-to-reduce-uk-f-gas-emissions-ricardo-and-gluckman-consulting/ (accessed October 7, 2024).

[26] DESNZ, Energy and emissions projections: 2022 to 2040, (n.d.). https://www.gov.uk/government/publications/energy-and-emissions-projections-2022-to-2040 (accessed August 7, 2024).

[27] T.A. Mitchell, Evaluation of the case for electrification of the refuse collection vehicle fleet in Exeter, 2023. Centre for Energy and the Environment Internal Document 1029.

[28] Spelthorne Borough Council, Procurement of Waste Collection & Street Cleansing Vehicles, 2022.

[29] Dacorum Borough Council, Appendix B to Appendix 1-Council Vehicles 2, 2020. https://democracy.dacorum.gov.uk/documents/s24274/Appendix%20B%20to%20Appendix%201%20-%20Council%20Vehicles%202.pdf (accessed October 23, 2024).

[30] W. Szeto, D.Y.C. Leung, Is hydrotreated vegetable oil a superior substitute for fossil diesel? A comprehensive review on physicochemical properties, engine performance and emissions, Fuel 327 (2022). https://doi.org/10.1016/j.fuel.2022.125065.

[31] Stevenage Borough Council, GF - Appendix E - HVO Switch Executive Report Feb2024, (2023).

[32] EVEC, 40KW DC rapid commercial EV Charger- vecBOLT, (n.d.). https://evec.co.uk/40kw-dc-rapid-commercial-ev-charger-vecbolt/ (accessed October 23, 2024).

[33] Office for Zero Emission Vehicles, Authorised chargepoint model list, (n.d.). https://www.gov.uk/government/publications/authorised-chargepoint-model-list (accessed October 23, 2024).

[34] RAC, Commercial EV charging costs, (n.d.). https://www.rac.co.uk/business/news-advice/advice-guides/commercial-ev-charging-costs (accessed October 23, 2024).

[35] Truckwells, John Deere 4052R Compact Utility Tractor, (n.d.). https://www.tuckwells.com/shop/john-deere-4052m-compact-utility-tractor/ (accessed October 23, 2024).

[36] Farm Machinery Locator, 2024 John Deere 6120M, (n.d.). https://www.farmmachinerylocator.co.uk/listing/for-sale/238235811/2024-john-deere-6120m-100-hp-to-174-hp-tractors (accessed October 23, 2024).

[37] ETESIA, ETESIA UK LTD- Retail price list 1st October 2023, 2023.

[38] Exeter City Council, Renewable Energy, (2024). https://exeter.gov.uk/climate-emergency/net-zero-projects/renewable-energy/ (accessed September 23, 2024).

[39] Solar Energy UK, Corporate buyers' guide. The benefits of onsite commercial solar power projects, 2022. https://solarenergyuk.org/resource/corporate-buyers-guide/ (accessed October 10, 2024).

[40] T. Benn, Are Solar Farms Worth It? Costs and Benefits, (2024). https://lumifyenergy.com/blog/are-solar-farms-worth-it/ (accessed October 17, 2024).

[41] B. Coles, H. Munt, Valuing Exeter's Urban Forest, 2023. https://treeconomics.co.uk/resources/reports/ (accessed June 18, 2024).

[42] Exeter City Council, Exeter City Council Corporate Net Zero Carbon Reduction Plan 2022 - 2030 Version 4.0, 2024. https://exeter.gov.uk/climate-emergency/carbon-footprint/carbon-reduction-plan/february-2024-update/ (accessed June 18, 2024).

[43] Exeter City Council, Tree and Woodland Strategy 2023 - 2033, 2023.

[44] National Trust, Plant a tree for charity, (2024). https://www.nationaltrust.org.uk/support-us/plant-a-tree (accessed October 21, 2024).

[45] Woodland Trust, Plant Trees on Your Land with MOREwoods, (2020). https://www.woodlandtrust.org.uk/plant-trees/trees-for-landowners-and-farmers/morewoods/ (accessed October 21, 2024).

[46] Land Use Consultants, Trees or turf? Best value in managing urban green space SUMMARY, 2011. https://www.woodlandtrust.org.uk/media/45394/trees-or-turf-summary.pdf#page=2.00 (accessed October 21, 2024).

[47] J. Liu, F. Slik, Are street trees friendly to biodiversity?, Landsc Urban Plan 218 (2022) 104304. https://doi.org/10.1016/j.landurbplan.2021.104304.

[48] T.L.R. Coker, J. Rozsypálek, A. Edwards, T.P. Harwood, L. Butfoy, R.J.A. Buggs, Estimating mortality rates of European ash (Fraxinus excelsior) under the ash dieback (Hymenoscyphus fraxineus) epidemic, Plants People Planet 1 (2019) 48–58. https://doi.org/10.1002/ppp3.11.

Equality Impact Assessment: Costed Organisational Carbon Footprint Projections to 2030

The Equality Act 2010 includes a general duty which requires public authorities, in the exercise of their functions, to have due regard to the need to:

- **Eliminate discrimination**, harassment and victimisation and any other conduct that is prohibited by or under the Act.
- **Advance equality of opportunity** between people who share a relevant protected characteristic and people who do not share it.
- **Foster good relations** between people who share a relevant protected characteristic and those who do not

In order to comply with the general duty authorities must assess the impact on equality of decisions, policies and practices. These duties do not prevent the authority from reducing services where necessary, but they offer a way of developing proposals that consider the impacts on all members of the community.

Authorities which fail to carry out equality impact assessments risk making poor and unfair decisions which may discriminate against particular groups and worsen inequality.

Committee name and date:	**Report Title**	**Decisions being recommended:**	**People with protected characteristics potentially impacted by the decisions to be made:**
8 July Executive	Costed Organisational Carbon Footprint Projections to 2030	1. The Carbon Footprint Projections, study including associated challenges and cost to the City Council, are noted and this information will be reported to	At present none

Committee name and date:	Report Title	Decisions being recommended:	People with protected characteristics potentially impacted by the decisions to be made:
		Strategic Scrutiny Committee in September 2025. 2. Members note progress to date and further carbon reduction potential under the assessment of Scope 1 and 2 carbon reduction scenarios available to achieve net zero. 3. A further report is considered by Executive, which identifies options for how Business as Usual (BAU) carbon reduction measures can be incorporated into annual Service Plans, to enable prioritisation of service led GHG emission reduction measures. 4. The Net Zero team works in collaboration with relevant Services to plan future funding bids to secure additional resources, prioritising	

Committee name and date:	Report Title	Decisions being recommended:	People with protected characteristics potentially impacted by the decisions to be made:
		social housing, buildings and transport services to support emission reductions.	

Factors to consider in the assessment: For each of the groups below, an assessment has been made on whether the proposed decision will have a **positive, negative or neutral impact.** This is must be noted in the table below alongside brief details of why this conclusion has been reached and notes of any mitigation proposed. Where the impact is negative, a **high, medium or low assessment** is given. The assessment rates the impact of the policy based on the current situation (i.e. disregarding any actions planned to be carried out in future).

High impact – a significant potential impact, risk of exposure, history of complaints, no mitigating measures in place etc.
Medium impact –some potential impact exists, some mitigating measures are in place, poor evidence
Low impact – almost no relevancy to the process, e.g. an area that is very much legislation led and where the Council has very little discretion

Protected characteristic/ area of interest	Positive or Negative Impact	High, Medium or Low Impact	Reason
Race and ethnicity (including Gypsies and Travellers; migrant workers; asylum seekers).	Negative	Medium	There could be the potential of land that gypsies and travellers use for temporarily means, not being available. E.g. afforestation
	Positive	High	There could be the potential for jobs for migrant workers within construction sector and others that support net zero and clean growth
Disability: as defined by the Equality Act – a person has a disability if they have a physical or mental impairment that has a substantial and long-term	Positive	High	The building of new sustainable and active travel routes, would support positive mental health and wellbeing and increase accessibility for those less able
	Positive	High	Buildings built to Passivhaus standard, would support mental health & wellbeing for individuals.

Protected characteristic/ area of interest	Positive or Negative Impact	High, Medium or Low Impact	Reason
adverse impact on their ability to carry out normal day-to-day activities.	Negative	High	If city car parks are used for alternative means, those less able may not be able to access city centre parking and use a car park not at their desired location, or to using park & ride.
Sex/Gender	Neutral	Low	N/A
Gender reassignment	Neutral	Low	N/A
Religion and belief (includes no belief, some philosophical beliefs such as Buddhism and sects within religions).	Negative	Low	Concerns regarding the retrofitting of places of worship include the importance of maintaining the original character and historical significance of places of worship. Balancing the need for energy efficiency and reduction of carbon emissions with religious and cultural values.
Sexual orientation (including heterosexual, lesbian, gay, bisexual).	Neutral	Low	N/A
Age (children and young people aged 0-24; adults aged 25-50; younger older people aged 51-75/80; older people 81+; frail older people; people living with age related conditions. The age categories are for illustration only as overriding consideration should be given to needs).	Negative	High	Reduced use of fossil fuel lowers pollution levels.
Pregnancy and maternity including new and breast feeding mothers	Neutral	Low	N/A
Marriage and civil partnership status	Neutral	Low	N/A

Actions identified that will mitigate any negative impacts and/or promote inclusion

Officer: Jo Pearce
Date updated: 18 August 2025

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Minute Extract – Executive Committee – 8 July 2025

Minute No. 57 - Costed Organisational Carbon Footprint Projections to 2030

The Executive received the report presenting a summary of the “Costed Organisational Carbon Footprint Projections to 2030”, study carried out by the University of Exeter.

Particular reference was made to:

- that this had been a truly groundbreaking study, and had been able to highlight the true cost of decarbonising put services;
- the report considered three scenarios- business as usual (BAU), Mid-term and Max-term net zero;
- scope 1 and 2 emissions were direct emissions such as fleet vehicles, and indirect emissions such as when buying electricity;
- business as usual were measures that were already being taken or committed to, to reduce carbon emissions. Retrofit within Council Housing was given as an example;
- the mid and max terms required much larger reductions to be considered. New technologies would be required for homes. Fundamentally it would be switching from gas to electric, this would cause energy prices to go up;
- most mid and max measures were unaffordable currently;
- the next stage would be to understand how the council could explore additional BAU measures;
- BAU would be challenging, and additional funding would be required; and
- to escalate to mid and max, significant capital investment would be needed.

During discussion, Executive Members raised the following points and questions:

- the Council were very lucky to have this incredible knowledge on their doorstep;
- BAU was a misnomer and suggested that nothing was being done which was not the case;
- integration across the council was needed;
- the opportunity for scrutiny to look at this report in September was welcomed;
- the report was extremely useful to be able to refer to and provided a sounding board;
- would the next report go into the detail of service-led prioritisation?
- BAU was dismissive of the amount of work which had been carried out by officers;
- Exeter had the first Passivhaus swimming pool in the country;
- could officers provide more information about decarbonisation of the national supply?
- carbon footprint could indicate running cost, and the cost of running a swimming pool was high, how can we decrease?
- it was incredibly difficult to retrofit and bring down the carbon footprint of a building such as the RAMM;
- the Leader was interested to know if the report should have provided more information on investment in trees.

Councillor Moore as an opposition group leader raised the following points and questions:

- she hoped government would be lobbied for funding to undertake this work;
- would the next report set out the savings to the council in terms of the return on the investment being made?
- would there be benefits for taxpayers and residents as bills to the Council would decrease?
- when looking to continue BAU route, there were many areas which either did not show reductions or they were minimal by 2030;
- if BAU was pursued, when would reductions in carbon emissions be evident? And
- would the Executive include investment in nature as one of their priorities?

In response to questions raised, the Strategic Director for Place and the Net Zero Project Manager advised that:

- the next report would cover in detail the service-led prioritisation;
- there were a range of things which could be done under BAU, such as building more council houses, if these were built to a certain standard it would reduce the carbon footprint;
- St Sidwell's Point was a groundbreaking project, but it was a large building and did consume a lot of energy;
- there was an aspiration to add Solar PV at the site; and
- at Riverside a large amount of emissions were from the gas heating and the swimming pool which the heat pumps would remove and therefore show a huge improvement;
- trees related to sequestering or off-setting carbon emissions.

The Leader moved the recommendations and Councillor Wright seconded, were voted upon and CARRIED.

Agreed:

RESOLVED that

(1) The Carbon Footprint Projections, study including associated challenges and cost to the City Council, are noted and this information will be reported to Strategic Scrutiny Committee in September 2025.
(2) Members note progress to date and further carbon reduction potential under the assessment of Scope 1 and 2 carbon reduction scenarios available to achieve net zero.
(3) A further report is considered by Executive, which identifies options for how Business as Usual (BAU) carbon reduction measures can be incorporated into annual Service Plans, to enable prioritisation of service led GHG emission reduction measures.
(4) The Net Zero team works in collaboration with relevant Services to plan future funding bids to secure additional resources, prioritising social housing, buildings and transport services to support emission reductions.

REPORT TO STRATEGIC SCRUTINY COMMITTEE

Date of Meeting: 11 September 2025

Report of: Strategic Director of Place

Title: City Wide Net Zero

Is this a Key Decision?

Scrutiny is a non-decision making committee

Is this an Executive or Council Function?

Executive

1. What is the report about?

1.1 This report provides an update on City Wide Net Zero activity from January to August 2025, and outlines the work planned for September 2025 to February 2026.

2. Recommendations:

2.1 Members note and support the work being undertaken to deliver the Net Zero Exeter 2030 Plan and reduce city wide Greenhouse Gas (GHG) emissions.

3. Reasons for the recommendation:

3.1 In 2019, the Council declared a climate emergency and made a pledge made to work towards net zero by 2030.

3.2 In August 2025, the Council published its new Corporate Plan for 2025 to 2028 which sets out the key priorities over the next four years. Extensive consultation has taken place with residents to ensure that identified priorities match those of residents and communities as well as those who visit or work in Exeter.

3.3 After carefully considering the feedback, the new Corporate Plan will prioritise delivery in four key areas - Local Economy, Homes, People and Sustainable Environment. City Wide Net Zero is a cross-cutting theme which links to all four priorities and is particularly focused on the Sustainable Environment.

3.4 Under the Sustainable Environment priority, the Council will work to reduce its own carbon emissions and work with city's key partners, businesses, communities and residents to take action to mitigate and adapt to the impacts of climate change.

3.5 Intended outcomes include:

- A city taking action to mitigate and adapt to the impacts of climate change.
- A Net Zero Carbon City.
- Well-maintained parks, open spaces and biodiversity across the city.

3.6 To achieve this the Council`s strategic efforts will focus on working in partnership to reduce carbon emissions, by supporting the delivery of District Heat Networks, securing affordable clean and secure energy for the city and bringing forward an Electric Vehicle Strategy for the city.

3.7 Delivery of the Corporate Plan will be carefully monitored against key metrics which have been set out to ensure it is successful in meeting the needs of residents, communities, and businesses.

3.8 The Programme Manager City Wide Net Zero works in partnership across Council services and with city stakeholders to implement the Net Zero Exeter 2030 Plan and the new Corporate Plan.

4. What are the resource implications including non-financial resources

4.1 A report was presented to Council on 10 June entitled 'Generating income to fund Net Zero activity' which recommended that the net income from a temporary car park on the former bus station site "will provide an ongoing budget to fund the net zero team and its activities at the Council." The recommendation was passed with the salary of the Programme Manager City Wide Net Zero (who is part of the Executive Office team) being paid from the General Fund from the financial year 2026/27.

4.2 Of the £200,000 committed previously from earmarked reserves for city wide net zero activity, £36,638 remains for project activity in 2025/26 and £21,104 in 2026/27.

City Wide Net Zero	2024/25	2025/26	2026/27
Associated salary costs	£20,990	£66,781	£0
Project activity	£10,000	£36,638	£21,104
TOTAL	**£30,990**	**£103,419**	**£21,104**

5. What are the legal aspects?

5.1 Section 1 of the Climate Change Act 2008 states that it is the duty of the Secretary of State to ensure that the net UK carbon account for the year 2050 is at least 100% lower than the 1990 baseline. The target was originally 80% and was increased to 100% by the Climate Change Act 2008 (2050 Target Amendment) Order 2019.

6. City Wide Net Zero update – stakeholder engagement and partners

6.1 Stakeholder engagement: The Programme Manager City Wide Net Zero facilitates engagement with stakeholders across the city including public sector partners and organisations, businesses and community groups. From the original proposal in January 2024, it was proposed that Net Zero team would engage with two main groups, the Strategic Climate Change Group and the Community Climate Change Group. The Strategic Climate Change Group has evolved into the Exeter Partnership Climate and Nature Group, with community engagement through this group also.

6.2 Exeter Partnership Climate and Nature Group: A Climate and Nature Group has been established as part of The Exeter Partnership, bringing together representatives from organisations, businesses and community groups to work collaboratively together to deliver the Net Zero Exeter 2030 Plan. This group meets virtually on a quarterly basis with a rotating chair. Members of this group represent organisations, businesses and communities across the city including: Devon & Cornwall Police, Devon Climate Emergency, Devon County Council, Devon Wildlife Trust, Diocese of Exeter, Exeter Chamber, Exeter Chiefs RFC, Exeter City Council, Exeter City FC, Exeter College, Exeter Community Alliance (Climate Action Hub), Exeter Community Energy Advice, GWR, In Exeter, Inclusive Exeter, Livewest, Met Office, Michelmores, Oxygen House, Pennon Group/South West Water, RDUH, Sport England, Stagecoach, and the University of Exeter.

6.2.1 March 2025 meeting: the first meeting of Climate and Nature Group took place in March 2025 with a focus on attendees introducing themselves and their organisations, followed by a discussion to explore priorities, challenges and areas/themes for this group to address at future meetings including:

- Active and Sustainable Travel: collaboration opportunities, knowledge sharing
- Nature and Biodiversity: opportunities, engagement and connection
- Energy and Buildings: renewable energy, energy advice and retrofit
- Circular Economy: local supply chain, procurement, waste and recycling
- Exeter's Net Zero Target
- Engagement: culture, communication and behaviour change, knowledge sharing, best practice and Exeter as a sustainable city
- Adaptation in Exeter and the surrounding areas.

6.2.2 June 2025 meeting: the second meeting took place in June 2025 with a focus on sustainable travel as transport emissions were the source of 23% of Exeter's greenhouse gas emissions in 2022. Actions included to share a summary of travel progress against the net zero goals, to connect Exeter City FC with Exeter Chiefs for fan travel collaboration, for the RDUH and University of Exeter to explore further lift share opportunities for staff, and to distribute the GWR/Green Circle campaign materials. The discussion at the meeting included the following areas:

- Net Zero Exeter 2030 Plan – Travel Focus
- Civic University Agreement – Travel Group
- Organisational Best Practice Sharing
- Devon County Council Transport Strategy
- Great Western Railway (GWR) Strategy
- GWR/Green Circle Project

6.2.3 The next meeting will take place in September with a focus on nature and biodiversity.

6.3 University of Exeter Civic University Agreement (CUA): The Civic University Agreement Exeter recognises that the University is fundamentally linked to the place and people of Exeter. At the heart of this Agreement is a belief that partnership is the catalyst that sets progress in motion. The missions present clear calls to action for

the University and its partners and include ‘Support the sustainable and inclusive growth of the city’ and ‘Innovate towards a sustainable low-carbon economy for the City of Exeter’.

6.3.1 CUA Sustainability Advisory Group continues to meet to discuss areas of joint opportunities, activities and collaboration. This group is chaired by Exeter City Council. The group has had a focus on sustainable transport and active travel and agreed to set up a CUA Sustainable Travel Group.

6.3.2 CUA Community Panel hosted a discussion about the Net Zero Exeter 2030 Plan, and how communities and other stakeholders can work collaboratively together.

6.3.3 CUA Sustainable Travel Group As part of the CUA agreement, sustainability and travel leads have started working collaboratively together with a focus on active and sustainable travel exploring joint opportunities and activities. This group integrates with the work of the Exeter Partnership Climate and Nature group. A data sharing agreement has been signed between the CUA partners to enable better understanding of the partners’ employee travel across the city. As well as CUA partners, Devon Partnership NHS Trust, In Exeter and Exeter Chiefs have joined this group. Sharing of employee travel survey questions and ways of encouraging active travel to work were the focus of the first meeting in August.

6.4 Exeter Green and Blue Wellbeing Network: This new group is led by CoLab focused on connecting communities to green and blue spaces for wellbeing.

6.5 Exeter Climate Forum (organised by the University of Exeter) took place between 30 June and 4 July with the aim to bring ‘together world-leading climate researchers, businesses, policymakers and young people, to shape and engage with the priorities for COP30 and beyond’. Council members and officers attended various events including the Opening Event, a Business Reception, and the Global Tipping Points conference. Community events took place at the Exeter Science Centre and The Phoenix.

6.6 Devon Climate Emergency: The Devon Climate Emergency Coalition Tactical Group meets every six weeks. There is also attendance at the Devon, Cornwall and Isles of Scilly (DCIoS) Climate Impacts Group, as well as the LRF Extreme Heat Workshop in February and the Devon Climate Emergency partnership workshop with the Carbon Trust in April.

7. City Wide Net Zero projects and ongoing activity from January 2025

7.1 Electric buses in Exeter: Stagecoach South West announced in March that thanks to a successful joint investment of £4.4 million from the transport provider and the Department for Transport (DFT) an additional ten double decker electric buses have been secured for Exeter due to be rolled out over the summer.

7.2 Exeter Energy Grants: Through UK Shared Prosperity Fund, grants of up to £1,000 were made available to residents to pay for upgrades to their homes to improve energy efficiency, reduce energy bills, carbon emissions and levels of fuel poverty.

The grant has contributed to loft insultation, the replacement of drafty windows and doors and new and improved heating. 34 grants were awarded to the residents of Exeter.

7.3 Warm Home Discount and Warm Up Grant: Exeter City Council provides the Government's Warm Home Discount and Warm Up Grant for residents. The Warm Home Discount Scheme can provide £140 off electricity bills during the winter and the Warm Up Grant can provide payments up to a maximum of £3,000 per property to provide top-up funding for energy efficiency measures. Both are subject to eligibility criteria.

7.4 Energy Saving Devon helps people make their homes healthier to live in and more energy efficient to run. The Energy Saving Devon project is delivered by a partnership between all the local authorities in Devon, their strategic partners and local community energy organisations. It is administered by Devon County Council.

7.5 Exeter Energy Network/District Heat programme: the Programme Manager City Wide Net Zero regularly attends meetings regarding the District Heat Network with the Head of Service Net Zero and City Centre the primary contact for this project led by 1Energy.

7.6 Local Electric Vehicle Infrastructure (LEVI) funding: the City Council is currently working with Devon County Council and other Devon District Councils to deliver new charging facilities having secured Local Electric Vehicle Infrastructure (LEVI) funding. The fund from government is allocated to Tier 1 authorities (DCC), to support the expansion of on-street residential electric vehicle (EV) charging infrastructure as well as public charging facilities in car parks across the County. The City Council seeks to install new EV charging facilities in City Council owned car parks (off-street) in line with the City EV strategy. On street residential charging will be carried out by the Highways authority, Devon County Council.

7.7 Bike Hubs: The Net Zero team is coordinating this project to develop bike hubs. This will be a phased project, with phases 1 and 2 focusing on what is within the gift of the City Council (staff and Housing) focusing on land owned by the City Council. Phases 3 and 4 is focusing on supporting commuters and residents across the wider city. A report is being developed and will be presented to the City Council's Transport Working Group and Senior Management Team, once the review of the Green Travel Plan has been completed.

7.8 Green Skills Advisory Panel (GSAP): This is a quarterly summit led by Exeter College. Through UK Shared Prosperity Fund, the Net Zero team has provided funding to Exeter College. The funded project achieved its core objectives, notably the successful installation of six green skills training bays. Funding allowed Exeter College to deliver project aims proficiently, exceeding the initial target of 98 learners, with 107 individuals benefitting from the new facility within just six weeks of its installation. Feedback from participants and prospective employers highlights a marked improvement in employability and skill levels, demonstrating strong alignment with our original success criteria.

7.9 Doughnut Economics: options for using the doughnut economics model are currently being researched, with internal discussions planned in the coming months.

7.10 Plant based treaty: information about the plant based treaty is currently being researched.

7.11 Newtown community active travel project: This is a collaboration between Exeter City Council (Live and Move), Sport England and Devon County Council. The scheme, funded by Sport England, has been developed since 2021 following recurring engagement with the local community and local businesses. It will make walking and cycling journeys more accessible and will increase green space to improve people's health and wellbeing, while also helping to reduce carbon emissions in the city centre.

7.12 GWR/Green Circle project: Thanks to a successful bid for funding by ECC from the GWR Customer and Community Improvement Fund, this project (with additional funding from DCC and the University of Exeter) is connecting and promoting city centre train stations and their proximity to Exeter's Green Circle walking route. The stations involved are St Davids, Marsh Barton, and Polsloe Bridge, all located within easy reach of sections of the Green Circle. New maps and information boards are being developed along with new sticker signage for the whole route. ECC is leading this work and collaborating with colleagues from GWR, Devon County Council, the University of Exeter, and Devon Wildlife Trust. Partners and stakeholders from across the city have expressed support for the project and agreed to share campaign materials with their audiences during the September launch.

7.13 Nature Towns and Cities accreditation is a new scheme (from the National Trust, Natural England, and the Heritage Lottery Fund) that Exeter City Council together with partners and communities across the city could apply for. Further discussions are taking place internally and with external partners in the coming months to decide whether Exeter will apply for accreditation. This will be discussed further with partners at the Exeter Partnership Climate and Nature Group September meeting.

8. Net Zero Exeter 2030 Plan: update on activity and implementation

Theme	Activity/update	Next steps
Energy (Built Environment) Goals: Reduced Energy Consumption, Access To Renewable Energy, Affordable Healthy Homes	The Exeter Partnership Climate and Nature Group has agreed Energy/Built Environment as a focus for an upcoming meeting. Energy Saving Devon, Green Skills Advisory Panel (GSAP), Exeter Energy Grants, the Shared Prosperity Funding and District Heat Network projects and activities all support this area.	The Exeter Partnership Climate and Nature Group meeting in December (tbc) will be focusing on Energy and the Built Environment.

Mobility (Sustainable Travel) Goals: Reliable Journeys and Resilient roads, Reduced Dominance of Cars	The Exeter Partnership Climate and Nature Group meeting in June focused on sustainable travel, with activity taking place across the city in this area including electric bus plans and Devon County Council Transport strategy, GWR strategy and the Green Circle project.	The CUA Sustainable Travel Group has recently been established to continue collaboration and joint projects around sustainable travel.
Sustainability (Biodiversity/ Circular Economy/Adaptation) Goals: Green Spaces and Local Produce, Clear Air, Efficient Resource Management, Regenerative Design	The Exeter Partnership Climate and Nature Group meeting in September will focus on nature and biodiversity.	The Exeter Partnership Climate and Nature Group is planning meetings on the Circular Economy and Adaptation in 2026.
Capability (Engagement/ Procurement) Goals: Collective Action, Analytic Approach, Locally Controlled Finance	Stakeholder engagement and collective action has been a priority over the past year with the Exeter Partnership Climate and Nature group and CUA Sustainable Travel Group being established.	Sustainability Stakeholder groups will continue to work together collectively with community engagement planned as a focus of a future Exeter Partnership Climate and Nature group meeting in 2026.

9. How does the decision contribute to the Council's Corporate Plan?

9.1 This report and the work of the Programme Manager City Wide Net Zero supports the 'Sustainable environment' priority in the new Corporate Strategy.

10. What risks are there and how can they be reduced?

City Wide Net Zero risks are registered on the Corporate Risk Register.

10.1 Challenges:

10.1.1 Greenhouse gas (GHG) emissions have trended slightly down over the past four years. Overall, GHG emissions have reduced by 39% (-300 kt CO2e) since 2008. This is mainly attributable to the power sector, which has seen a 69% reduction in emissions through the national decarbonisation of electricity production. A linear decline in emissions from the projected 2024 value to zero in 2030 requires an annual reduction of 74 kt CO2e, 16% of 2022 emissions, for each of the six years to 2030. This amount is 7.4 times the reduction rate of the current trend. (From Exeter's Greenhouse Gas Inventory Reporting 2022).

10.1.2 Achieving the 2030 target relies on collective action from businesses and organisations across Exeter as well as from citizens (residents, commuters and

visitors) alongside funding and investment from central government and other public/private bodies

10.1.3 Limited resources available for city wide net zero activity.

10.1.4 Cost of living challenges (for both businesses and residents) impacting the speed of change

10.2 Potential Impacts: Exeter does not meet its citywide target of becoming Net Zero by 2030.

10.3 Mitigations and Controls: Sections 6 and 7 outline the mitigations and controls that are in place.

11. Equality Act 2010 (The Act)

11.1 For each project Exeter City Council leads on in the delivery, an EQIA will be undertaken to ensure no project discriminates against any protected characteristic.

11.2 An EQIA is currently in development for the GWR/Green Circle Project.

12. Carbon Footprint (Environmental) Implications:

12.1 This report details action being taken to reduce city wide GHG emissions.

13. Are there any other options?

13.1 The Programme Manager City Wide Net Zero continues to research external funding opportunities to delivering projects of scale, as well as projects that support small scale change.

Director: Strategic Director for Place

Report Author: Programme Manager City Wide Net Zero

Local Government (Access to Information) Act 1972 (as amended)

Background papers used in compiling this report:-

None

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WORK PLAN FOR SCRUTINY ITEMS 2025/26

Working Draft

Strategic Scrutiny Committee	Item	Strategic Director	Portfolio Holder	Origin of Business	Status
11 September 2025	Portfolio Holder Update (Cllr Vizard)	Strategic Director for Place	Portfolio Holder for Climate, Ecological Change and Communities		
11 September 2025	Exeter City Council's Costed Organisational Carbon Footprint Projections to 2030	Strategic Director for Place (IC), Service Lead Net Zero & Business (VH)	Portfolio Holder Climate & Ecological Crisis (Cllr Vizard)	Report from Strategic Scrutiny Committee 29 September 2022 half yearly report	Moved 4 March as being presented to Executive in June.
11 September 2025	City Wide Net Zero - Programme of work and update on delivery	Strategic Director for Place (IC) Service Lead Net Zero & Business (VH)	Portfolio Holder Climate, Ecological Change and Communities (Cllr Vizard)		
20 November 2025	Portfolio Holder Update (Cllr R Williams & Cllr Wright)	Strategic Director for Operations(AP) &	Portfolio Holder for City Management & Deputy Leader		
20 November 2025	Performance and Service Provided to Customers and Stakeholders of Stagecoach South West in Exeter	Strategic Director for Place (IC)	Communities (Cllr Vizard)	Scrutiny proposal Cllrs Snow, Parkhouse and Hughes	
20 November 2025	Air Quality Performance	Strategic Director for Operations (AP)	Portfolio Holder for City Management (Cllr R Willaims)		

Strategic Scrutiny Committee	Item	Strategic Director	Portfolio Holder	Origin of Business	Status
15 January 2026	Portfolio Holder Update (Cllr Foale)	Strategic Director for Place	Portfolio Holder for Arts, Culture and Tourism (Cllr Foale)		
15 January 2026	Progress Report Shared Prosperity Fund - Update	Strategic Director for Place (IC) Service Lead Net Zero & Business (VH)	Portfolio Holder Climate & Ecological Crisis (Cllr Vizard)	Report from Strategic Scrutiny Committee 29 September 2022 half yearly report	
12 March 2026	Portfolio Holder Update (Cllr Wood)	Strategic Director for Place	Portfolio Holder for Leisure Services & Healthy Living		
12 March 2026	City Wide Net Zero - Programme of work and update on delivery	Strategic Director for Place (IC) Service Lead Net Zero & Business (VH)	Portfolio Holder Climate, Ecological Change and Communities (Cllr Vizard)		
12 March 2026	Live and Move Programme Update	Chief Executive	Portfolio Holder Leisure Services & Healthy Living (Cllr Wood)	Report from Strategic Scrutiny Committee 16 March 2023 half yearly	

Items to be timetabled 11 September 2025:

Air Quality Action Plan	