CITY OF WOLVERHAMPTON COUNCIL

Climate Change,Housing and Communities Scrutiny Panel Meeting

Thursday, 19 October 2023

Dear Councillor

CLIMATE CHANGE, HOUSING AND COMMUNITIES SCRUTINY PANEL - THURSDAY, 19TH OCTOBER, 2023

I am now able to enclose, for consideration at next Thursday, 19th October, 2023 meeting of the Climate Change, Housing and Communities Scrutiny Panel, the following report that was unavailable when the agenda was printed.

Agenda No	Item
3	**Council 2028 Net Zero Progress Review (report to follow) (Pages 3 - 24)**

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Agenda Item No: 3

CITY OF WOLVERHAMPTON COUNCIL

Climate Change, Housing and Communities Panel

19 October 2023

Report title Council 2028 Net Zero Progress Review

Report of David Pattison, Chief Operating Officer
Perminder Balu, Head of Green Cities & Circular Economy
Oliver Thomas Service Manager Green Cities & Circular Economy

Portfolio City Environment & Climate Change

Recommendation(s) for action or decision:

The Climate Change, Housing and Communities Scrutiny Panel is recommended to comment and ask questions on the report, including any suggestions for improvement.

1.0 Purpose

1.1 As the Council has a clear commitment to Climate Action, the Chair of the Climate Change, Housing and Communities Scrutiny Panel has asked for an update to be provided to the Panel including a review of the Council's Progress against its Net Zero target. The Report sets out the current options for achieving Net Zero by 2028.

1.2 This report does not cover the 2041 strategy for Net Zero for the City (as opposed to the Council) as this will be the subject of a separate report to the Panel in early 2024.

1.3 The report is intended to show the positive trajectory already underway, including an approximate 1/3 reduction in our carbon footprint to date since 2019 on our route to meeting the target by the end of 2028 (and 60% reduction if renewable energy tariffs are included), and several steps are in train to significantly increase that in coming months and years.

1.4 Background - 2019 Climate Emergency Declaration & Our Commitment

1.4.1 City of Wolverhampton Council's ("CWC") 2019 Climate Emergency Declaration outlined several commitments, including two principal Net Zero carbon targets. Firstly, CWC set the ambition to achieve Net Zero across "all Council activities" by 2028. Secondly CWC committed to supporting decarbonisation across the city by 2041, in line with regional targets.

1.4.2 Following public consultation and a Citizens Assembly, the 'Future Generations: Our Commitment' document was approved at Full Council in September 2020, which explained the Council's commitment as including emissions from centralised corporate controlled sources, such as our gas central heating from corporate buildings and fleet fuel consumption (all Scope 1 emissions), electricity usage across our buildings and street lighting (all Scope 2 emissions), and business mileage (part of Scope 3 emissions). A breakdown of the different emissions scopes has been included for reference as Appendix 1.

1.4.3 Following a bench marking exercise of other local Authorities (Section 7 below), the results showed CWC's approach is typical of that taken by other local authorities in relation to their corporate Net Zero targets.

1.4.4 For clarification, the 2041 Net Zero objectives for the City will address the remainder of Scope 3 emissions for contracts, outsourced services, and any out-of-scope emissions.

1.4.5 It is important to note that Climate Action is recognised as one of the three underpinning principles in Our City: Our Plan and that Climate Action is being built into every relevant decision being made by the authority. It is through this One Council approach that genuine progress will be made.

2.0 Action Plan Progress to Date

2.1 July 2021 saw the carbon approval of CWC's 2028 Net Zero Action Plan, which included 89 actions across the themes of: Governance, Funding, Engagement, Transportation, Built Environment and Energy; and Consumption, Waste and Circular Economy. At this time, funding was also secured from the Climate Change Reserve for interim resourcing to help develop and deliver key actions.

2.2 Changes to approved Action Plan

2.2.1 Since the original approval, several changes have been made to the Action Plan, as outlined below:

A. Consolidation of 5 actions into two more succinct actions that encompassed elements of the others. The Governance and Engagement actions duplicated or overlapped work already covered in other actions.

B. Rewording or reframing of 22 actions to make them more specific.

C. Addition of five new actions, 3 of which were novel and 2 were follow on actions from previously completed actions.

D. Removal of 3 actions due to relevance and feasibility following engagement with relevant service areas

E. Reassignment of 2 actions from the 2028 action plan due to their relevance to the Council's 2028 target.

2.2.2 Following A to E above, the Action Plan now consists of 86 actions.

2.2.3 The reviewed list of 86 actions is broken down based on their impact on CWCs in-scope emissions.

Emission Scope	Number of Actions
Scope 1	28
Scope 2	7
Scope 3	21
Cross cutting	30

Table 1 Number of actions broken down by impact on emission Scope.

2.3 Progress Against Action Plan

2.3.1 As part of ongoing Action Plan update review the current progress report is as follows.

Emission Scope	Number of Actions	As percentage of Total
Completed	17	19%

Continuous (ongoing with no defined deadline)	13	15%
Ongoing – with deadlines	31	36%
Planned 2024 – 2028	25	29%

Table 2 Breakdown of Actions by Status

2.3.2 The Action Plan review as detailed in Section 2.1 and further *'Internal Audits'* in due course will continue in consideration of progress and deadlines in collaboration with accountable Service Areas.

2.4 Decarbonising Actions

2.4.1 Of the total actions in the Plan currently, 16 contribute directly to the reduction of carbon emissions as part of the Council's 2028 Net Zero target and underpin the priority actions that need to be delivered to achieve net zero.

Emission Scope	Emission Source	Number of Actions
Scope 1	Buildings (Gas)	5
	Fleet (Fuel)	4
Scope 2	Buildings (electricity)	2
	Streetlighting	1
Scope 3	Business Mileage	4
Total		16

Table 3 Number of Actions with Direct Impact on Carbon Emissions

3.0 Carbon Monitoring Report 2022/23

3.1.1 Since 2019 when the climate emergency declaration was made, CWC's carbon footprint has reduced significantly.

3.1.2 When calculating CWC's emissions, two methodologies can be used to account for Scope 2 emissions:

A. Location Based methodology:
Reflects national grid carbon intensities and a more accurate reflection of an organisation's emissions, under this approach:

- CWCs carbon footprint for 2022/23 would be 11,500 tCO2e, compared to the 2019 Base Year of 16,050 tCO2e, a reduction of 4,550 tCO2e (28%).

B. Market Based methodology:
Reflects the Council's renewable energy tariff whereby Scope 2 emissions would be zero tCO2e, under this approach:

- CWC's carbon footprint for 2022/23 would be 6,700 tCO2e, compared to the 2019 Base Year of 16,050 tCO2e, a reduction of 9,350 tCO2e (59%).

3.1.3 Best practice under the Greenhouse Gas Reporting Guidelines advises that unless an organisation is purchasing electricity *directly* from a renewable electricity generator, and/or generating it's own renewable electricity (neither of which are applicable to CWC), then the Location Based methodology should be used (this also avoids any double counting), but also that the Market Based emissions should be reported alongside for comparison purposes (as in Figure 1 below).

3.2 Therefore, the location-based methodology is applied throughout the rest of this Report, and further details on Scope 2 carbon accounting can be found in Appendix 3.

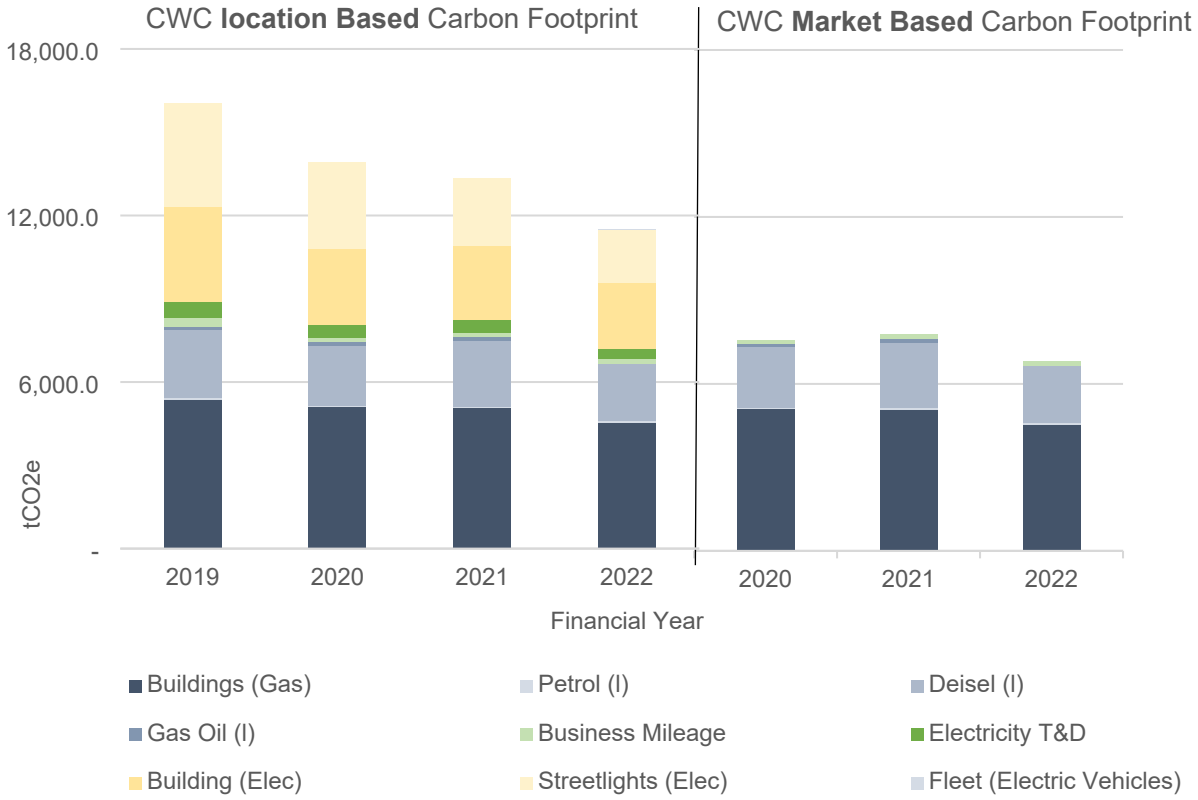

Figure 1 CWCs 2022/23 comparison chart of the council's location-based and market-based carbon footprints, using government supplied greenhouse gas conversion factors.

3.2.1 The comparison shows that the majority of progress over the last 3 years has resulted from a reduction in Scope 2 emissions due to; the LED Streetlight Programme, asset rationalisation; and national grid decarbonisation.

3.2.2 Scope 1 emissions have only reduced by 500 tCO2e over the same period, however the proposed approach in relation to fleet decarbonisation, set out in section 5.1.1 should be noted, as the steps CWC is proposing to take in coming months will make a significant dent in those Scope 1 emissions.

3.3 LED programme

3.3.1 The LED programme has produced significant energy efficiency savings of around 40%, this has translated into carbon savings of 1,800 tCO2e since 2019. The reduction in energy consumption has also enabled the Council to avoid significant costs that would otherwise have been incurred because of the Energy Crisis. Approximately 85% of LED streetlights have been installed, with the remaining 15% taking place shortly.

3.4 Fleet Electrification

3.4.1 Fleet fuel consumption has dropped in CO2e terms by around 380 tCO2e since 2019.

3.4.2 The fleet transformation programme that has been delivered over the last 2 years has replaced older less efficient vehicles with new models, including the introduction of 32 electric vehicles into fleet (6% of vehicles) and 32 electric vehicle charging points across the Council's depots to enable recharging.

3.4.3 Details on the proposed next steps (including "Quick Wins") are set out below in Section 5.1.

3.5 Asset Decarbonisation

3.5.1 Asset decarbonisation across electricity and gas consumption will be able to be progressed once we have completed the asset energy audits. Electricity emissions as detailed above have reduced in line with the carbon intensity of the national grid, but no material changes to the energy efficiency of the estate have been undertaken to date but will be shortly.

3.5.2 Energy audits are now underway, with the Civic Centre audit report completed, which helps to guage a high level overview of necessary interventions to bring emissions in line with our net zero target.

3.5.3 Detailed design and feasibility is required to get a clearer picture of the cost and benefits implications which is taking place over coming months in readiness for future funding options and will form a key part of CWC's forthcoming asset strategy.

4.0 CWC's Carbon Reduction Progress vs Its Carbon Budget

4.1.1 To align to the national carbon budget as agreed within the Paris Climate Agreement 2015, the City of Wolverhampton has an apportioned city-wide carbon budget of 6 million tCO2e between 2020 and year end 2041 (see Appendix 4 - Tyndall Centre Carbon Budget Report for the city).

4.1.2 To adhere to the city-wide carbon budget targets, CWC has an apportioned carbon budget of 72,400 tCO2e between 2020/21 and 2027/2028, and a further carbon budget of around 30,000 tCO2e up to 2042.

4.1.3 Between 2020/21 and 2022/23 CWC was required to stay within a carbon budget of 36,700 tCO2e. To date, under the location-based methodology, CWC have emitted circa 38,700 tCO2e, leading to a budget deficit of 2,000 tCO2e (figure 2).

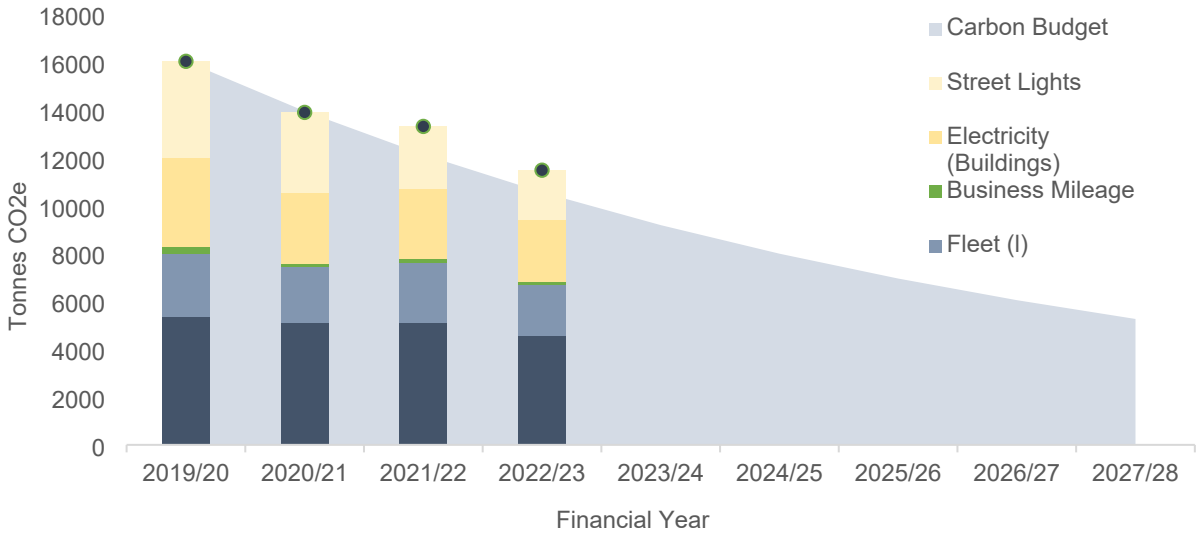

Figure 2 CWC carbon emissions vs its top-down apportioned carbon budget

4.1.4 To meet its carbon budget of 9,240 for 2023/24, CWC will need to achieve carbon savings of circa 2,300 tCO2e against 2022/23 emissions (table 4).

Emissions (tCo2e)	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28
Gas	5,383	5,125	5,085	4,556					
Fleet	2,595	2,315	2,535	2,127					
Business Mileage	320	137	168	151					
Electricity (Buildings)	3,708	2,956	2,898	2,599					
Streetlights	4,037	3,374	2,633	2,056					
Total Emissions (tCO2e)	**16,050**	**13,900**	**13,320**	**11,500**					
Change from Base year (%)		- 13	- 17	- 28					
Annual Carbon Budget (tCO2e)		**13,980**	**12,170**	**10,600**	**9,240**	**8,000**	**7,000**	**6,100**	**5,300**

Actual Emissions Vs CO2 Budget	- 74	1,150	900

Table 4 CWC annual carbon footprint broken by source vs annual carbon budgets, and required carbon budgets up to 2028

4.1.5 However, even if all carbon budgets are met, CWC will still need to find carbon savings of approximately 5,300 tCO2e to meet Net Zero by 2028, either through in-depth decarbonisation, offsetting through renewable energy, or a mix of both.

4.1.6 If no further action is taken by CWC i.e., Business as Usual (BAU), by 2028:

- CWC emissions would be circa 9,900 tCO2e (accounting for on-going grid decarbonisation) but no CWC interventions.
- a carbon budget deficit of 4,200 tCO2e for 2027/28, and
- a cumulative carbon budget deficit of 19,600 tCO2e for the period of 2020 to 2028.

4.1.7 Therefore, staying within our carbon budget and achieving net zero by 2028 requires further and concerted direct intervention by CWC.

5.0 CWC interventions to Achieve Net Zero by 2028

5.1 Quick Wins & Opportunities

5.1.1 A series of short-term deliverables (quick wins) which deliver large carbon reductions and energy cost savings without significant investment are outlined below.

A. **HVO (Hydrogenated Vegetable Oil)** is a drop-in diesel replacement produced from waste vegetable oil and waste animal fats whilst the Council waits for more availability/affordability of electric vehicles. Using HVO instead of diesel would produce immediate carbon savings of around 1,800 tCO2e per year.

B. **Optimising Building Energy Management** is outlined in the options above but offers a streamlined and cheap option for reducing carbon emission by improving energy management within our buildings through better sensors and smart controls which can moderate building temperatures more efficiently, leading to less waste. Typical energy and carbon savings of 15% could be achieved.

C. **LED lighting in retained stock** could help to reduce energy demand from lighting by up to 50% by converting from low efficiency bulbs to LEDs. Across the estate this could be anywhere between 10% and 20% of building electricity consumption depending on building type and its energy needs.

D. **Building renewable energy into new build assets** from the initial design stage will ensure that measures are costed as part of the new build which would avoid expensive retrofit measures in the future ensuring new buildings have designed to maximise thermal efficiency and solar capacity would help to futureproof the stock and keep energy costs low from the outset.

E. **Renewable energy rollout** Through the direct energy cost savings, investment in renewable energy across our assets (buildings and car parks) is supported with strong business case and could produce 2,000 tonnes in CO2e savings for the council. Availability of carparks for solar canopies will be subject to strategic review of car parks across the city.

F. **Asset Rationalisation** is also an option for disposing of unwanted or underutilised assets and is an ongoing process through the strategic asset review. The energy audit reports will help to feed into the process.

6.0 Decarbonisation Pathway

6.1 Focusing on quick wins will help to bring CWC's emissions back in line with its carbon budget and provide a buffer for developing further detailed understanding of investment need across assets.

6.2 Where there is opportunity to decarbonise our main assets (Civic Centre) should funding be available, then it would be advised to do so but ensuring that detailed designs have been conducted to understand true costs and compatibility of energy systems and ensuring alignment with the developing corporate asset strategy.

6.3 2023/24 - Implement quick wins.

6.3.1 To achieve stay within the carbon budget of 9,240 tCO2e for 2023/24, the Council will need to reduce emissions by 2,260 tCO2e. The following measures will help to do so:

#	Mitigation Measure	tCO2e Savings
1	**Action**: Finish delivery of the LED streetlight programme	320
2	**Action:** Introduce HVO fuel across all fleet vehicles subject to results of Pilot	1,800
	Total Reductions	**2,120**
	Residual Emissions	**9,370**
	Carbon Budget for year:	**9,240**

6.3.2 The outcome of these measures will bring CWC within 2% of its carbon budget target for the year.

6.3.3 This year will also require exploration of other opportunities such as energy optimisation and LED lighting for roll out in the next year.

6.4 2024/25 - Small Scale Energy Efficiency & Renewables

6.4.1 Subject to achieving the previous year's target a further reduction of 1,370 tCO2e is required to keep CWC within its carbon budget of 8,000 tCO2e.

#	Mitigation Measure	tCO2e Savings
1	**Action: Energy Optimisation** through Building Energy Management system on energy consumption, particularly gas usage, across the estate	300 to 1000
2	**Action:** LED programme across all corporate buildings	300
3	**Action:** 6 MWp Solar PV roll-out across estate and car parks subject to further investigation	1,000
	Total Reductions	**1,600 – 2,300**
	Residual Emissions	**7,800 – 7,100**
	Carbon Budget for year:	**8,000**

6.4.2 These measures could help to reduce CWCs emissions by a further 1,600 – 2,300 tCO2e. Under the low scenario CWC would be within its carbon budget of 8,000 tCO2e by 2.5%, and in the high scenario by 11.5%, providing room within the carbon budget in subsequent years.

6.5 2025/26 – Key Assets & Further Renewables

6.5.1 In 2025/26 CWC will require carbon savings of between 800 and 100 tCO2e, to meet its carbon budget of 7,000 tCO2e, this could be surpassed by the following:

#	Mitigation Measure	tCO2e Savings
1	**Action:** Retrofit and Heating Decarbonisation of assets which accounts for 25% of asset emissions	1,080
2	**Action:** further deployment of 6MWp of solar across assets & carparks (further investigation needed)	1,000
	Total Reductions	**2,000**
	Residual Emissions	**5,720 – 5,020**
	Carbon Budget for year:	**7,000**

6.5.2 Delivering these actions in full or in part will be able to deliver the necessary savings to surpass the carbon budget for that year, building in further flexibility into the carbon budget for the remaining 2 years.

6.5.3 It must be noted, however, that investment in assets will be informed by the Strategic Asset Review including the energy audits, detailed design and subject to availability of funding.

6.6 2026/2028 – Offsets & wider Strategic Investments

6.6.1 For the fiscal years 2026 – 2028 the residual emissions of approximately 5,020 - 5,720 tCO2e are likely to be apportioned as follows:

Emission Source	Minimum Approximate Residual tCO2e
Fleet	300
Buildings (gas)	3,000
Buildings (Electricity)	1,200
Streetlighting	500
Business mileage	150
Approximate Total	**5,020 – 5,720**

6.6.2 Further investment is required to decarbonise and/or offset remaining emissions. A high-level indicative approach for the purpose of this report has been outlined below. These will need to be revisited and refined through future analysis and detailed design.

#	Mitigation Measure	tCO2e Savings
1	**Action:** Energy Efficiency retrofit and delivery of low carbon heating (Air Source Heat Pumps) across the wider estate following Energy Audits and Asset review. ASHPs, are the preferred heating technology but this may change when full feasibility is undertaken. ASHPs would reduce Gas emissions to zero but would increase electricity consumption leading to higher bills, however when implemented as part of a fabric first approach, net energy cost savings would be achieved.	Up to 2,500
2	**Action:** Finding additional solar opportunities inside or outside the city could deliver further savings, but more investigation is required over the availability of space for this level of deployment, if space is unavailable then, emissions would need to be offset instead	1,000
3	**Action**: Continue with fleet electrification to deliver additional fleet emissions savings following roll out of HVO	200
4	**Action**: Offset residual emissions using renewable energy investment	
	Total Reductions	**2,700 - 3,700**
	Residual Emissions	**2,400 – 1,500**
	Offset Required	**2,400 – 1,500**
	Carbon Budget for 2026 - 2028:	**11,400**

6.7 Decarbonisation Pathway Summary

6.7.1 As shown in figure 3 below, the Council is tracking closely to its carbon budget and is currently on track, based on the actions outlined above, to meet its carbon budget and 2028 net zero target.

6.7.2 Many of the low-cost/high-impact actions (quick wins) produce significant energy savings which translates directly into reduced energy costs with relatively short pay back periods.

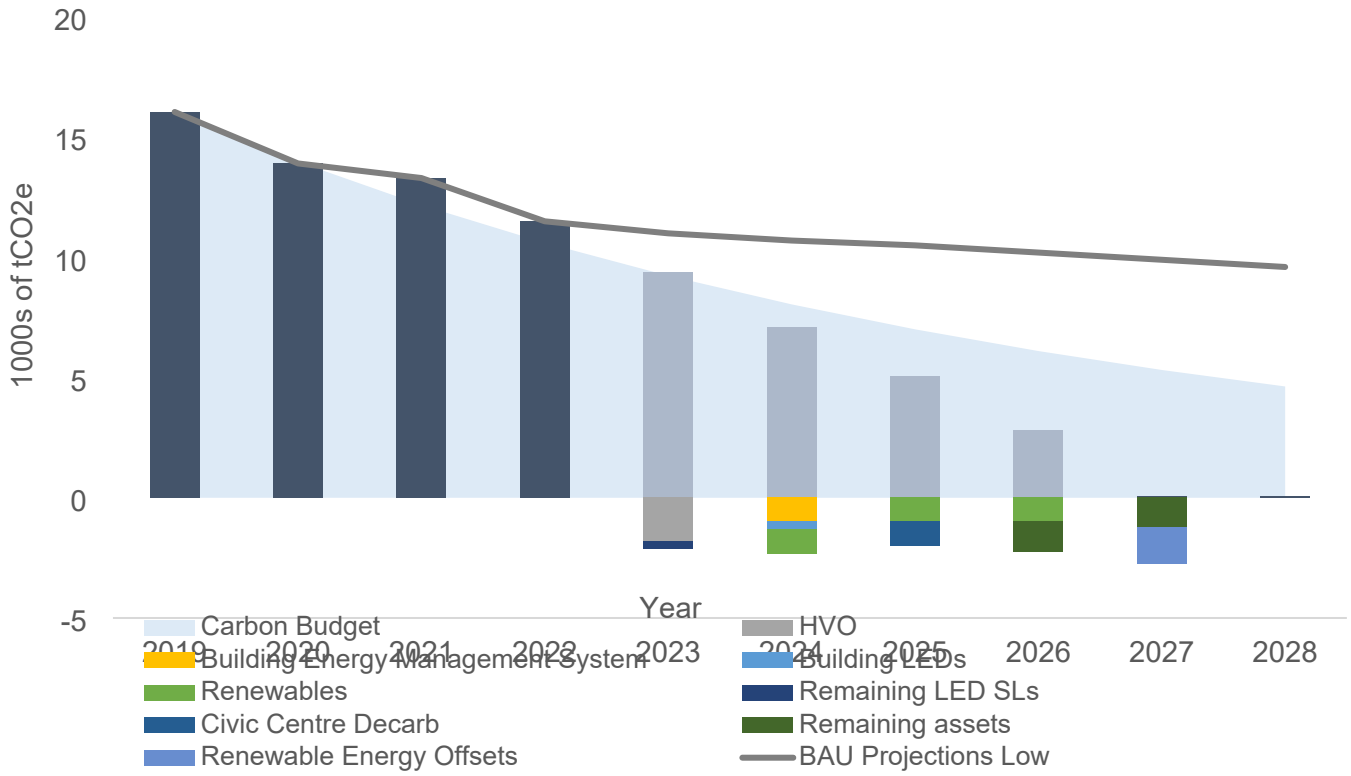

Figure 3 Decarbonisation pathway for CWC through implementation of the outlined measures up to 2028

6.7.3 Prior to 2025/26 detailed feasibility and development work is necessary to outline the investment required in the years following, up to 2028. Decarbonising assets through retrofit or disposal are both viable solutions and will be guided by affordability/funding opportunities, and outcomes of the Strategic Asset Review.

6.7.4 Even with 'full decarbonisation' there will still be a requirement for a sizeable proportion of offsetting (between 10% and 30% of current emissions) which can be addressed through investment in renewable energy with significant potential returns.

6.7.5 Low Business as Usual (BAU) trajectory illustrates the expected emissions projections if no further action is taken by CWC.

6.8 Challenges

6.8.1 **Cost:** One of the key challenges is the affordability of the measures needed to meet the Net Zero 2028 targets, for example the costs of electric vehicles are significantly higher than those of fossil fuels alternatives. Work is well underway to model the financial costs in future years of the steps needed and will form part of future updates. CWC continues to look closely at grant funding options for the significant costs of making some of the larger changes.

6.8.2 **Market Availability/Demand:** for example, demand for vehicles and services related to decarbonisation has increased in recent years. Difficulties in procuring electric vehicles have been accentuated through the semiconductor shortages that occurred mid-COVID which reduced the manufacturing rates, driving up lead in times and costs.

6.8.3 Similar challenges are reported across other Local Authorities as detailed in section 7.2 below.

7.0 CWC Progress vs Local Authority Benchmarking

7.1.1 Many local authorities are in a similar position to Wolverhampton. A high-level review of 19 local authorities with similar corporate targets to Wolverhampton was conducted in April 2023 to understand how Wolverhampton compared in its approach and progress. Most of these local authorities had organisational targets for 2030 or after, two or more years after Wolverhampton's target.

7.1.2 Typically, those with corporate targets have focused their attention on Scope 1 and 2 emissions from Council corporate activities, plus business mileage (Scope 3) in line with Wolverhampton's ambitions. Progress is mixed across the Local Authority sample with some Local Authorities reporting greater success than others (figure 4 below). The size and complexity of a Local Authority's Net Zero target is dependent on its LA status. With Wolverhampton being a Unitary Authority, it is difficult to generalise on tier two and county authorities with different operations and responsibilities.

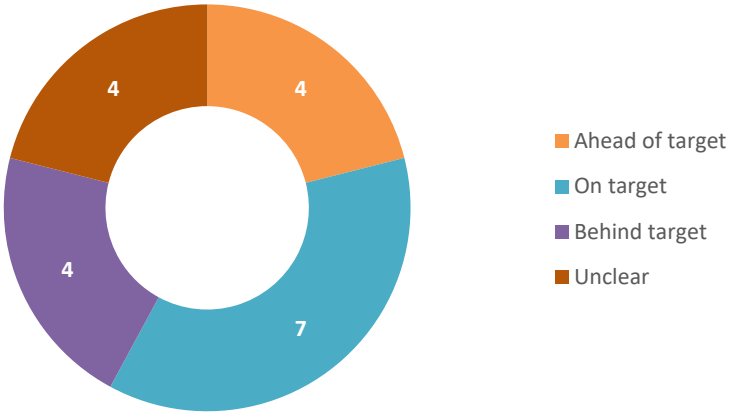

Figure 4 Example Local Authority Net Zero targets broken down by delivery status.

7.1.3 Interventions that have made the most significant CO2e reductions across the sample and accelerated the transition to Net Zero include: Deploying renewable energy supply (e.g., solar panels, heat pumps) for Council owned facilities; Streetlight LED replacement; and electrifying the vehicle fleet (ULEV), all which Wolverhampton is also actively engaged in and progressing.

7.2 Key Barriers to Delivery

7.2.1 Across the authorities reviewed in the sample, key barriers and risks that have the potential to hinder the transition to Net Zero are identified:

A. Several local authorities refer to the impact of fiscal pressures, inflation, and funding gaps on their ability to progress with actions in their roadmap to Net Zero and keep within set timescales.

B. Some local authorities refer to the impact of Covid-19 in slowing progress towards key projects and actions.

C. Projects more likely to be at risk throughout the sample LA's, due to inflationary pressures and funding gaps, included: Purchase of green tariffs; and retrofit of Council owned buildings.

D. Energy and cost-of-living crisis.

7.2.2 These challenges reflect a change in the economic landscape that was not anticipated prior to the wave of climate emergency declarations in 2019.

7.3 Internal Audit

7.3.1 To ensure CWC has confidence that the critical work on Climate Action was being progressed, the service commissioned an internal audit to report on status and progress.

7.3.2 Internal audit conducted a review (March 2023) of the Council's climate change programme via a series of internal interviews and data collection. In conclusion the findings of the report identified several elements that needed addressing to provide such confidence.

7.3.3 These findings have been addressed urgently including establishment of the Climate Action Programme Board and the appointment of a new Senior Responsible Officer, namely the Chief Operating Officer who the team report direct to; and, additional staff being appointed to address the main issue identified, namely lack of sufficient resource within the Green City and Circular Economy team. An update on progress against the audit recommendations is set out in the table below.

Internal Audit Findings and Progress	Status
1. Governance structures required updating Progress:	Completed

This has been achieved through the formalisation of the 'Climate Action Programme Board' with an agreed terms-of-reference.	
2. Over reliance on a single employee to coordinate and progress the plan Progress: This has been mitigated through investment in the creation of the Green Cities and Circular Economy service area. Three permanent employees currently in post with expansion plans for an additional three over the next few months	Completed
3. Limited engagement was reported by Service Area leads/managers on the actions Progress: The Climate Emergency Working group has been restructured into a 2028 Working Group including relevant service managers and deputies to support with on-going monitoring and risk management. Programme Board has also been established and the Head of Service and Service Manager have addressed Leadership Forum and Operational Managers Network, respectively. Furthermore, decision making reports are being altered to include a detailed climate action section to ensure all projects and decision consider climate impact from the outset.	In progress
4. Serval targets had been missed on the agreed action plan Progress: Additional staff now in place, and a clear trajectory on how Council intends to meet 2028 commitment set out in this and other reports with regular reporting, will ensure this is not repeated. A wider cleanse and benchmarking of actions is underway.	In Progress
5. A lack of formal reporting on the progress of the Plan Progress: Production of an annual report now taking place, the first annual report will be produced following on from Scrutiny Panel's comments. It is intended that next year's (2023/24) annual report will go to Cabinet September next year.	Completed
6. Plan is not underpinned by a focussed risk register Progress:	In Progress

The work on the register has started and will be completed shortly and will be included in the report to Cabinet later this year.	
7. Clarity of the Plan of Actions Progress: The Action Plan has changed slightly over time to reflect latest information, a retrospective piece of work has been undertaken which details how the action plan has changed, section 2 of this Report summaries the findings.	Completed

Appendix 1 – Emissions Scopes & Green House Gas (GHG) reporting Guidelines.

Under agreed GHG reporting guidelines there are two generally boundaries that determine which activities fall within the reporting responsibilities of an organisation:

A. *Financial Control boundary* – activities within Council's direct financial influence, where Council is ultimately responsible for overall budget decisions for service delivery. This would include a wider range of responsibility across Council activities, including schools, WV Homes and other outsourced or contracted services (in the case of CWC this includes the Energy from Waste operation).

B. *Operational Control boundary* – where Council has direct control over operational decision making and policy setting, which would typically exclude arm's length organisations, outsourced services, and includes corporate contracts.

Emissions Scopes

The emissions that arise from above activities within a chosen reporting boundary can be categorised into three broad Emissions Scopes (see illustration below)

A. Scope 1 emissions: all 'direct emissions' from on-site burning of fossil fuels for either central heating of buildings, fleet fuel usage, and refrigerant gases (also known as fugitive emissions).

B. Scope 2 emissions: indirect emissions from the consumption of imported energy (gird electricity), where emissions produced elsewhere (a power station).

C. Scope 3 emissions: all other (often market based) emissions produced within the wider supply chain via 3rd parties because of Council activities, contracts, and service delivery:

Upstream Scope 3 emissions: all contracted or non-contracted emissions produced prior to the delivery of a service, or production of goods.

Downstream Scope 3 emissions: all contracted or non-contracted emissions produced during or after the delivery of a product or service and includes end of life waste management and disposal.

The guiding principle is that an organisations Scope 3 emissions is someone else's Scope 1 and 2 emissions, which the organisation would have little to no control over. The influence therefore lies within altering behaviours and choices (particular through tendered contracts) and limiting consumption in general, as well as exercising better waste management practices. But there is a limit on market reactivity to these kinds of contractual demands if alternative services

or solutions are not available which in turn limits the effectiveness of indirect emissions reduction.

Focussing on emissions which CWC has a greater degree of control and influence over was what was reflected and ultimately approved within the Future Generations: Our Commitment Report. This was reaffirmed as part of the 2021 Cabinet Report 21 07 2021 for the 2028 Net Zero Action Plan, and has been central to the Council's carbon monitoring and reporting thereafter, including:

A. Scope 1: Building heating, Fleet fuels.

B. Scope 2: Building electricity, Streetlighting, Electric fleet Vehicles.

C. Scope 3: Business mileage

(Appendix 1 Continued) **- Emissions Scope illustration**

Appendix 2 - Local Government Association (LGA) Carbon Accounting Tool

The LGA carbon accounting tool is based on the Green House Gas (GHG) protocol guidelines, The table below summarises and provides a guide on what is typically monitored and reported under different Emission Scopes. The emissions the Council choses to focus on within its 2028 Net Zero target are at its discretion.

The 2021 LGA Climate Change Survey indicates that 86% of local authorities are reporting on Scope 1 and 2 emissions for their own operations, with a further 54% reporting on some Scope 3 for their own operations. CWC is in-line with commonly adopted Local Authority approach to GHG reporting.

Scope	Emissions Type	Emissions (tCO_2e)	Percentage of Total Emissions
Scope 1	Heating	0.00	0.0%
	Fugitive Emissions	0.00	0.0%
	Authority's Fleet	0.00	0.0%
Scope 2	Electricity	0.00	0.0%
Scope 3	Staff Business Travel	0.00	0.0%
	Outsourced Fleet	0.00	0.0%
	Transmission & Distribution Losses	0.00	0.0%
	Water	0.00	0.0%
	Material Use	0.00	0.0%
	Waste generated from own operations	0.00	0.0%
	Outsourced Scope 3	0.00	0.0%
Total Emissions		***0.00***	***0%***

Summary of typically reported local government emissions

Appendix 3 - Understanding CWC's Electricity Tariff

In October 2019, the Council procured a renewable energy tariff, backed by 'Renewable Energy Guarantee of Origin (REGO) certificates.

REGOs are an OFGEM (Office of Gas and Electricity Markets) administered carbon credit scheme allowing energy retailers to pass on the carbon credits from renewable energy generators to their customers via their tariffs.

Despite being an accepted method of accounting for emissions under the Green House Gas protocol and overseen by OFGEM, they have drawn scrutiny over greenwashing and should be reported externally with caution. When doing so organisations must consider two different approaches:

A. The 'location based' method
   - reveals what the organisation is physically putting into the air based on the carbon intensity of grid supplied electricity, reflecting the average carbon intensity of the nation's current energy mix. CWC electricity emissions under this method are 4550 tCO2e.

B. The 'market-based' method
   - the emissions the organisation is responsible for through its purchasing decisions (its energy tariff). Based on our decision to purchase a "renewable energy tariff" our electricity emissions can be recorded internally as 0 (zero) tCO2e.

Location-based emissions are more accurate reflection of the organisation's physical impact on the national carbon budget, that said, market-based emissions should also be reported alongside for comparative purposes.

To date, CWC internal reporting has focused on the location-based method to avoid confusion and misrepresentation in line with the GHG reporting guidelines. The only way the Council can physically reduce its electricity emissions to zero is through "additionality" which is the installation of new renewable energy provision to offset the carbon footprint of its electricity consumption.

Appendix 4 – Tyndall Centre Carbon Budget Report for City of Wolverhampton

The Tyndall Carbon Budget Tool presents climate change targets for UK local authority areas that are based on the commitments in the United Nations Paris Agreement, informed by the latest science on climate change and defined by science-based carbon budget setting (Local and Regional Implications of the United Nations Paris Agreement on Climate Change (manchester.ac.uk).

The report provides Wolverhampton with budgets for Carbon Dioxide (CO2) emissions for 2020 to 2100.To do so Wolverhampton City must stay within a maximum cumulative carbon dioxide emissions budget of 6.3 million tonnes (MtCO2) for this period.

For context Wolverhampton Council's corporate carbon footprint is 1% of the whole City.

The city should aim to achieve net zero by no later than year end 2041 (95% reduction), by cutting year on year emissions by a minimum of 12.8% and achieving interim cuts of 80.9% by the year 2030.

These targets set out in the Tyndall report have been used to calculate CWCs apportioned carbon budget regarded as a top-down carbon budget.