

CABINET MEETING: 14th October 2021

**REPORT TITLE:
ONE PLANET CARDIFF STRATEGY AND ACTION PLAN**

**CABINET PORTFOLIO TITLE
CLEAN STREETS, RECYCLING AND ENVIRONMENT
COUNCILLOR MICHAEL MICHAEL**

AGENDA ITEM:

Reason for this Report

1. To approve the 2021 One Planet Cardiff Strategy (OPC) which sets out the Council's plan to deliver a Carbon Neutral Council by 2030 and to work with city-wide partners to develop a road map and action plan for a Carbon Neutral City by 2030.

Background

2. Notwithstanding the depth of the Covid-19 crisis, the Council has recognised that Climate Change remains the defining global challenge of our generation. The message could not be clearer; the UN's Intergovernmental Panel on Climate Change (IPCC) report¹ published in August 2021 assessing the impact of global warming to 1.5C above pre-industrial records has provided the starkest warning yet that if we don't act to reduce greenhouse gas emissions immediately the world will be facing climate catastrophe with increasingly extreme heatwaves, droughts and flooding, and a key temperature limit being broken in just over a decade. The impacts of climate change, are putting tens of millions of people and their jobs across the globe at direct risk. These issues are already impacting the Cardiff area and its population, therefore the extent of the current climate emergency and scale of the challenge cannot and should not be underestimated
3. Cardiff Council declared a climate emergency in 2019 and has since been preparing the One Planet Strategy which sets out how we will respond and tackle this emergency and become carbon neutral Zero as a Council and a City by 2030. A draft One Planet strategy was published for consultation in October 2020 and public feedback on this, alongside a detailed analysis of the Council and city's current carbon position, have informed and shaped the final 2021 One Planet Cardiff Strategy report and its recommendations and action plan.

¹ [Sixth Assessment Report \(ipcc.ch\)](https://www.ipcc.ch)

4. Both Climate Change and COVID-19 require Cardiff as a city, its organisations businesses and citizens, to make changes to shift our behaviour and adapt to a different way of working, living, utilising and moving in and around the city. In tackling both Climate Change and COVID-19 crises, there is opportunity for Cardiff to emerge as a greener, healthier and more prosperous city with more equity across communities. By addressing and mitigating climate change in an ambitious and proactive manner, wider co-benefits of addressing fuel poverty, improving public transport and active travel provision and providing many healthier, green spaces and cleaner air can be realised. A series of reports on the City's recovery was presented to Cabinet in May 2021 at which the importance of OPC and measures to address the climate emergency were underlined and consolidated.
5. In producing the 2021 OPC Strategy the Council has now completed a detailed carbon baselining and impact assessment. This key milestone has enabled an understanding of the current carbon position, both of Council operations and also of the wider City,
6. The assessment quantified the carbon implication of Council immediate activities – i.e. running and operating buildings, assets and fleet - and has also looked at the much wider emissions that are “caused”, for example through purchasing activities, construction, maintenance and staff commuting.
7. The impacts that live OPC projects and policies will have on this have been modelled and this has identified gaps that now need to be addressed in the Council journey to Carbon Neutrality.
8. The current known projects and policies will have a significant positive effect on our direct emissions (approximately a 60% reduction by 2030). However, our carbon study has also now fully quantified the very significant challenges, especially in our “caused” emissions, that we know we need to address urgently.
9. The carbon position for the whole of Cardiff has been analysed. This City wide data shows that the largest impact is from emissions from transport and domestic premises.
10. This 2021 strategy provides an appropriate response which has been led by the evidence in our carbon emissions assessment, acknowledges what stakeholders across the city want us to prioritise, and captures the need to work collaboratively to make the huge shift to a Carbon Neutral city by 2030 whilst also delivering a post-COVID recovery.
11. The OPC Strategy confirms the Council's commitment to ensuring that Cardiff will become a Carbon Neutral Council by 2030. It also confirms our commitment to work in partnership with city wide stakeholders to determine a pathway to achieve a Carbon Neutral City by 2030.

12. Whilst we have been able to quantify the impacts of our approved projects, and have specified the target areas for future work to close the gaps, this process will inevitably be an iterative one. We recognise the need for close monitoring of our work, ensuring that new projects are accelerated where possible and that lessons learned on completed projects are addressed effectively, informing and improving our approach as we move forward. We will also be tracking the effects of national and regional projects and emerging policy change, ensuring that we capture the benefits of these appropriately, and that we are able to lobby for change from an informed position where this is sensible and effective. On this basis we have developed action planning approach to the OPC work, returning each year with a review of progress and, if necessary refining our approach to address emerging gaps and issues as early as possible. The OPC Strategy is fundamentally committed to ensuring that we deliver the carbon neutral target in the most informed, impactful, timely and cost effective way.
13. Within this report, the Council sets out how we will lead, govern, engage and work collaboratively with citizens, business and public sector across the city to deliver a green revolution. The report sets out our priorities for action against each of our key seven themes; Built Environment, Green Infrastructure and Biodiversity, Energy, Waste, Water, Food and Transport as well as a Carbon appraisal of short term projects which will look to make an immediate or short term impact on reducing Carbon.

Regulations and Policy

14. There is a wealth of legislation, policy, strategy, and ministerial ambition now in place to tackle climate change, supporting the transition to a low carbon future whilst realising wider benefits.
15. The Council recognises that alongside decarbonisation of energy use, responding to the climate change emergency has broader environmental, social and economic benefits and opportunities that align with requirements of the Well-Being of Future Generations Act and a raft of supportive economic development policy including our own Corporate Plan and our 'Greener, Fairer, Stronger - City Recovery and Renewal Strategy.'
16. Actions identified in One Planet Cardiff will be fundamental to supporting delivery of Cardiff's strategy for a Greener, Fairer, Stronger: City Recovery and Renewal. This strategy set out the Council's response to the COVID-19 pandemic, outlining the initial recovery actions we will take to help get the city economy and city life back up on its feet alongside the longer term priorities for renewal aligned to 7 Key Missions.

Issues

The Scale of the Challenge

17. The scale of the challenge of achieving a Carbon Neutral Council and City by 2030 should not be underestimated. It will require a monumental effort across the city. The One Planet Cardiff Action Plan sets targets and our responding actions will be refreshed annually to reflect how both we as a Council and a City are progressing on our journey to meet the target. The Action Plan includes a defined list of agreed and costed projects that make a significant impact on our emissions, but also sets out longer term solutions and target areas for closing the gap that we've now identified through our carbon baselining and modelling exercise.
18. The action plan is diverse and hits a very wide range of activities and sectors. The common, underlying action that we need to take is clear. We must reduce our overall energy demand and reliance on fossil fuels and increase our ability of capture and offset residual carbon emissions. In short, we must:
 - a. Reduce direct energy use and increase energy efficiency in all buildings, commercial and domestic;
 - b. Increase renewable energy supply;
 - c. Shift to more sustainable and more active modes of transport ;
 - d. Understand and reduce the amount of greenhouse gas emissions from purchased goods and services;
 - e. Make smarter choices to waste less and recycle more;
 - f. Increase the opportunity to absorb emissions with our green infrastructure;
 - g. Increase resilience to climate change impacts across the city by improving infrastructure to cope with extreme heat and rainfall; and
 - h. Prioritise actions to get the best return for our investments both environmentally, economically and socially.
 - i. Grow more of our own food and promote healthy eating
19. The development of the OPC has been underpinned by a deep and detailed analysis of carbon emissions to develop a 2019/20 baseline from which the Council can assess the impacts of actions taken to meet our Carbon Neutral ambition.
20. The assessment of our baseline reflects the recently published Welsh Government Net Zero Carbon Reporting guidance² ensuring that we have assessed our direct emissions including buildings, fleet, waste in operations and land emissions and indirect emissions including procurement and business travel. These emissions are categorised as follows:
 - a. **Scope 1 GHG Emissions (Direct):** GHG emissions arising from the operation of buildings and vehicles owned by a reporting organisation (excluding electricity)

² [Welsh Public Sector Net Zero Carbon Reporting Guide](#)

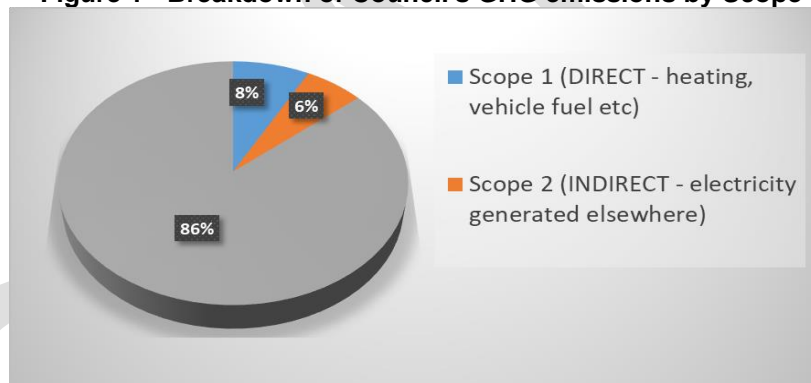
- b. **Scope 2 GHG Emissions (Energy Indirect):** GHG emissions arising from the generation or purchased electricity and district heating used in a reporting organisation's buildings/sites.
- c. **Scope 3 GHG Emissions (Other Indirect):** GHG emissions arising from wider operations of a reporting organisation, including procurement, business travel, grey fleet travel, water, waste, and leased assets.

21. BEIS data has been used to monitor the emissions across the City, focusing on Scope 1 and 2 direct emissions from the combustion of fuel such as gas and oil and use of electricity and emissions from transport and domestic properties.

22. This exercise has set our baseline emissions as follows:

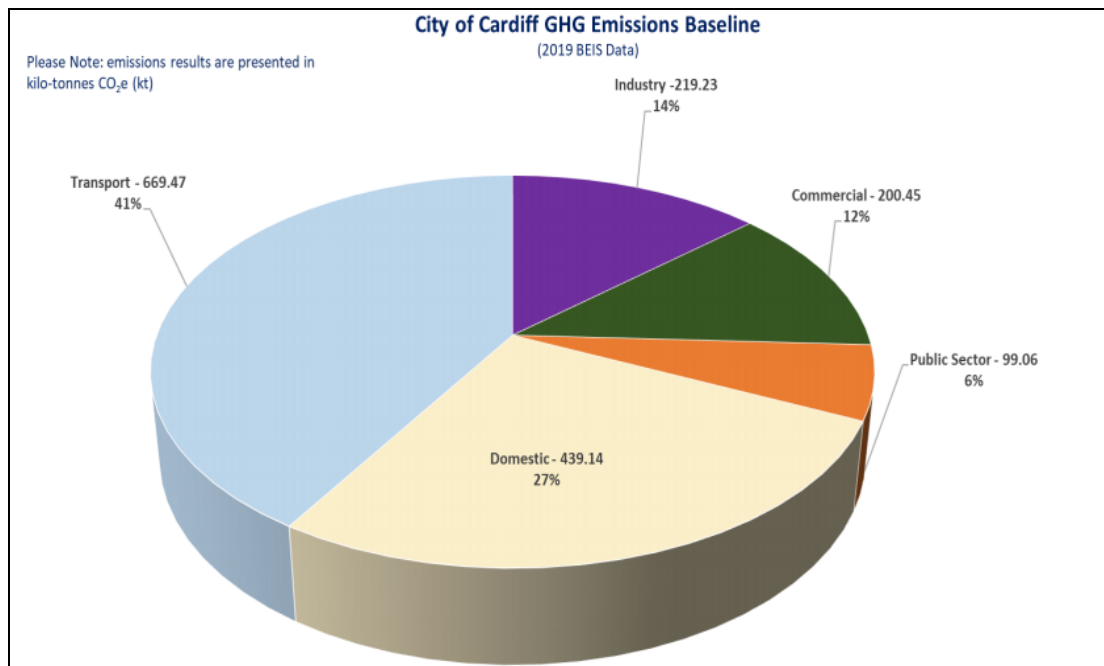
- a. For the **Council's activities**, we estimate that the total emissions in 19/20 – and therefore the level of emissions that need to be removed by 2030 are **184,904 (tonnes CO₂e) per annum**. We've also estimated that the vast majority of these are "Caused" or Scope 3 emissions, that result from our purchasing and staff commute activities. The percentage breakdown of the Council's emissions by Scope is detailed in Figure 1.

Figure 1 - Breakdown of Council's GHG emissions by Scope



- b. For the **whole city** Government (BEIS) data estimates that the City of Cardiff generates **1,626,059 (tonnes CO₂e) per annum** within its boundaries, with transport and domestic emissions making the largest contribution. The breakdown of these emissions is presented in Figure 2.

23. **Figure 2 - Breakdown of City of Cardiff GHG emissions by Sector**



24. A more detailed summary of this analysis is contained in Appendix 3.

Achievements to Date

25. The Council has managed to reduce total Carbon Emissions from its operations covering buildings, machinery, street lighting and transport from 23,958 t/CO₂e to 12,800 t/CO₂e since 2016/17- an average overall reduction per year over 3 years of 17% per year Scope 1 and 2 Emissions.

26. Since the draft OPC was launched we have continued to progress a number of key projects that will support the Council in achieving the carbon neutral ambition namely:

- i. Continued energy efficiency retrofit of the Council estate.
- ii. Rationalisation of the Council fleet with the start of a transition to electric vehicles underway.
- iii. Securing of the first phase of a low carbon district heat network serving the Cardiff Bay, due to start on site this autumn/winter;
- iv. The 9MW solar farm at Lamby Way is operational;
- v. The allocation of Capital Funding to accelerate number of new projects such as Heat Source Pumps at Rhiwbina Library, Carbon Reduction and Heat Recovery at Thornhill Crematorium, EV Charging Pilot, improved real-time air quality monitoring and improved food composting for 9 schools.
- vi. A commitment to designing all of forthcoming new build buildings to near zero carbon performance levels from 2024;
- vii. With the Public Service Board and Partners a Climate Emergency Board has been established to identify and

- implement mutually beneficial projects in partnership and to aggregate the effects of our collective carbon reduction plans, and
- viii. Engagement with the Centre for Climate Change and Social Transformation (CAST) to develop a wide reaching public engagement and behaviour change Programme;

Consultation Outcomes

27. In 2020 and early 2021, the Council consulted with city wide stakeholders, including the general public, businesses, key stakeholders and Cardiff's youth on the draft OPC. The feedback was positive and constructive and has been incorporated into the final Strategy that sets out how we are going to achieve our ambitious 2030 targets. The OPC Cabinet Report published in May 2021 contains a detailed appraisal of this consultation.
28. The results of the consultation overall show the respondents identified a reduction in energy consumption/ reliance on fossil fuels as most important area of work for us to focus, and the theme of Green Infrastructure and Biodiversity as second.
29. **Cross Cutting Themes** - In response to the consultation it is evident that three key cross cutting themes emerged and the Council has already recognised the importance of these and have embedded them into the 2021 OPC. These cross cutting themes are:
- i. **Economy and Green Jobs** - Cardiff's post COVID-19 economic recovery strategy Greener, Fairer, Stronger: City Recovery and Renewal Strategy set out the Council's response to the COVID-19 pandemic, outlining the initial recovery actions that the Council will take to ensure the city economy and life back up on its feet alongside the longer-term priorities for renewal aligned to 7 Key Missions. Longer term actions that mitigate Climate Change are at the heart of this strategy with a recognition that building greener infrastructure across the city including active travel measures, pocket parks, local neighbourhoods, and rebranding city centres as cultural hubs accessible to all will support the economic recovery of Cardiff as a city post pandemic.
 - ii. **Education** –The consultation response on the draft One Planet Strategy highlighted that the final strategy needed to include more on detail on Education and climate change related education for all ages as well as schools. The curriculum for Wales 2022 in Cardiff offers all learners rigorous, inspiring, relevant, contextualised opportunities to become ambitious and capable learners, ethical informed citizens, enterprising and creative contributors and healthy and confident individuals. This provides the perfect opportunity to embed One Planet Cardiff into the Cardiff school curriculum to engage, inspire and harness the enthusiasm and passion of future generations.

- iii. **Governance, Leadership and Resource** – New governance arrangements have already been formalised in order to drive the necessary change, not only in the Council, but also our public sector partners and more widely across the City. A One Planet Cardiff Steering Group Chaired by the Leader has been established including senior Cabinet members. This is an internal working group where key updates on projects are provided to the Leader and supporting Cabinet members who are then able to steer progress. The Cardiff Youth Council are also active participants, reflecting the need for young people and future generations to have a clear voice in this agenda. We have established a Climate Emergency Board consisting of Public Service Board members including all public service organisations and wider city partners and stakeholders to provide a robust oversight of the 2030 City target.

30. In a continuation of the draft Strategy, the 2021 OPC still remains focussed on 7 key themes namely.

- a. **Energy:** This includes how energy is used, how it's sourced, distributed and generated. Our aim is to use less, to source more from clean renewable generation and to help build business around this growing sector.
- b. **Built Environment and Housing Quality:** We need to constantly improve the energy efficiency and resilience of our new and existing buildings and communities, and capture the skills and jobs required to achieve this for the benefit of the local economy.
- c. **Green Infrastructure:** Take bold steps to add to the natural green assets of the city, increasing their carbon capturing capabilities, and making a healthy, clean, biodiverse, environmentally positive place in which citizens and business can thrive.
- d. **Transport:** Plans to replace as many single user, fossil fuelled trips as possible with sustainable low carbon modes of travel and this will be fundamental to the wider decarbonisation of the City.
- e. **Waste Management:** Reduction of our carbon footprint by reducing overall waste production and recycling residual waste in the right way, engagement of citizens in this activity, helping them to understand and lower the impact of the city's waste, encouraging reuse, repurposing, recycling and smarter purchasing choices.
- f. **Food:** The production, transportation, processing and disposal of food is a major source of emissions and our proposals are aimed at supporting smarter, more localised and more socially equitable food systems that can also boost the local food economy.
- g. **Water:** How we source, use and manage water, and how we protect ourselves against drought and flooding is crucial to our aim

of building climate resilience. The strategy outlines a series of current and future responses to this challenge.

31. The 2021 OPC strategy and the action plan provide clear goals and commitments that will be updated and assessed annually to demonstrate the progress the Council is making to the 2030 target.

Achieving Carbon Neutral

32. In order to meet our carbon neutral commitment the Council needs to identify projects that reduce greenhouse gas emissions, and sequester any residual emissions not just for the Council but for the emissions generated across the City of Cardiff.
33. Council appointed consultants GEP have developed a Carbon Impact Evaluation Tool to review a selection of immediate OPC projects. This tool will assist the Council to prioritise projects considering both the Carbon and Social Impacts against the following assessment indicators:
- a. Carbon benefit of delivering the proposed project (Pre/post carbon emissions impact evaluation);
 - b. Supporting people out of poverty (includes fuel poverty);
 - c. Cardiff grows in a resilient way;
 - d. Cardiff is a great place to grow older;
 - e. Safe, coherent and empowered communities;
 - f. A capital city that works for Wales; and
 - g. Modernising and integrating our Public Services
34. The annual carbon savings and lifetime carbon savings of projects can be compared side-by-side in a Summary Dashboard and utilising this tool projects can then be evaluated and prioritised to assess their contribution to deliver the OPC. The full carbon assessment tool outputs are presented in Appendix 4.

Carbon Neutral Council by 2030

35. Carbon impact evaluation modelling for the following selected projects from the OPC to provide an overview as to the potential magnitude of emission reductions **post implementation**. The following projects have been identified as directly benefitting the Council's footprint and their impacts are summarised in Table 1;
- a. Cardiff Heat Network (Phases 1 & 2 only);
 - b. Council Fleet Transition to EV (all implementation phases);
 - c. Strategic Estates Retrofit, Schools Estate Retrofit; and
 - d. Street lighting upgrade to LED/

36. **Table 1 - Scope 1 & 2 Combined GHG Emissions Reductions**

GHG Emission Source	19/20 Baseline GHG Emissions (t CO ₂ e)	Emissions removed (t CO ₂ e)	Residual (t CO ₂ e)	Percentage Reduction (%)
Heating (corporate estate)	10,105	6,063	4,042	-60% *
Electricity (corporate estate)	8,795	5,277	3,518	-60% *
Council fleet	4,640	2,747	1,893	-59%
Street Lighting	2,578	753	1,825	-29%
Total	26,118	14,840	11,278	-57%

*presumed reductions to be included in Estates Decarbonisation Strategy 2021.

37.If all currently identified projects are implemented, the Council's combined Scope 1 and Scope 2 per annum GHG emissions footprint is modelled to reduce by nearly 60% (14,840 tonnes CO₂e). The Cardiff Heat Network (Phases 1 & 2) is modelled to have the largest impact upon GHG emissions (62% reduction compared to baseline); reducing reliance of the Corporate Estate upon mains gas. Transition of the Council vehicle fleet to EV/hybrid will significantly reduce tailpipe GHG emissions (modelled as a 59% reduction) if transition phases 1-3 are implemented.

38.The Council may achieve further reductions through passive decarbonisation of the National Grid (particularly for Scope 2 GHG emissions sources). This impact has not yet been modelled in this initial analysis.

Next Steps: Identifying Future Interventions to Deliver a Carbon Neutral Council

39.The reduction by 57% on the Council's emissions is a significant achievement but it is recognised that further reductions will be required over the coming 9 years as the Council looks to reduce our Scope 1 and 2 emissions by a further 43 %.

40.The initial action plan to address the residual 43% emissions from Scope 1 and 2 are summarised as follows:

- a. **Ensure Near zero carbon new-build alongside estate relinquishment programme;** it is proposed that by 2024 any Council procured new build development will be Carbon Neutral, exceeding current Building Regulations standards. In addition where council property is surplus to operational requirements, property can be relinquished reducing operational carbon;
- b. **Maximise direct renewable energy production;** it will be imperative that the Council increases its direct renewable energy generation to power our buildings and charge our fleet as it transitions. This will reduce Council reliance on energy derived from fossil fuels and bring Cardiff Council ahead of the grid

decarbonisation programme. The aim is to increase the generation capacity by a further 20 MW across the estate.

- c. **Business mileage initiatives** ; Given then given the contribution from staff commute to Scope 3 emissions the Council needs to consider and assess how we can reduce such emissions, where travel is still deemed necessary. Interventions for the Council to assess include;
 - i. EV Car Club/ pool cars
 - ii. Mileage claim policy
 - iii. EV salary sacrifice scheme
- d. **Behaviour change** – the Council has engaged the Centre for Climate Change and Social Transformation (CAST) to support the development of a toolkit and monitoring instruments to enable the Council to embed carbon-neutral thinking across the Council. This will also include a focussed Schools engagement plan to embed One Planet Cardiff into the Cardiff school curriculum to engage, inspire and harness the enthusiasm and passion of future generations.

41. The above areas have been identified as key areas that will address our residual Scope 1 and 2 emissions, it will be imperative for the Council, to continually review and assess potential interventions particularly where innovative solutions may emerge that as yet have not been considered with the OPC.

Scope 3 Reductions

42. Owing to the complex nature of assessing the impacts from Scope 3 emissions the necessary actions to address these emissions will be a significant challenge for the Council to overcome.

43. In order to prioritise action, our consultants have developed an assessment tool which has baselined the Council's procurement spend data for the 2019-20 reporting period. This assessment enables the Council to identify the spend categories that contribute the largest GHG emissions. An initial assessment indicates that priority spend categories for reducing the Council's carbon footprint are expected to include, **Waste Management, Passenger Transport Services, Buildings Construction Projects, Information and Communication Technology and General Building Services.**

44. Some key opportunities in terms of how the Council can reduce our Scope 3 emissions are outlined below.

Procurement Opportunities

- a. **Root and branch review** of what we buy, identifying the high carbon areas, alternatives and quick wins;
- b. **Training for specifiers** - Smarter specification and Circular Economy thinking;

- c. **Encourage and favour lower carbon supplies** in tender evaluations; and
 - d. **Public sector collaboration and market engagement** to signal changed requirements from suppliers
45. The Council will deliver a socially responsible procurement approach to ensure that we consider the whole life impacts of procurement choices to reduce our carbon footprint. The Procurement Pipeline will be used to identify opportunities to reduce carbon at the outset of the planning for the procurement. We will refresh the Council's Buying Responsibly Policy and develop new guidance so that procurement decision makers:
- a. Consider whether the purchase should be made at all;
 - b. Look beyond short terms needs and consider the longer term impacts;
 - c. Utilise existing assets within the Council where available;
 - d. Repair or refurbish existing assets where viable; and
 - e. Where viable procuring refurbished or remanufactured assets ahead of new;
46. The analysis shows staff commuting emissions are low in comparison to procurement, however, it is still a major contributor overall (responsible for 9,000 T CO₂e of our baseline) and so it is imperative that action is taken to reduce our staff commuting impacts. The following opportunities have been identified positive action policies and projects to address them will be considered and embedded in the action plan in the next year.
- a. **Hybrid working policy.** Many Council staff have been working from home during the Covid Pandemic. Plans are being developed to retain the best features of this agile/hybrid working arrangement for the long term. This will have a direct impact on the extent of commuting our staff undertake;
 - b. **Transport Strategy** - Modal shift initiatives and staff parking regime could further impact on our emissions, making it easier for our staff and workers across the city to make more sustainable travel choices;
 - c. **EV Salary Sacrifice scheme** – the Council could support an EV Salary Sacrifice to help accelerate shift to Low Emission Vehicles for our workforce, especially for staff who rely on cars for business purposes.

Carbon Neutral City by 2030

47. Carbon impact evaluation modelling for the following selected projects from the Council's One Planet Strategy has been undertaken. The results of this modelling should be treated as advisory and are designed to provide an overview as to the potential magnitude of emissions reductions **following implementation**. The following projects have been identified with the model as directly benefitting the whole City's footprint and are included in the modelling results detailed in Table 2 below:
- a. Cardiff Heat Network (Future Phases)

- b. Major Renewable Energy Projects
- c. Cardiff's Urban Forest (Coed Caerdydd – 30% canopy coverage by 2030)
- d. Private Housing & Council Housing Retrofit
- e. Transport White Paper

Table 2 - City Wide GHG Emissions Reductions from Known/Modelled Council Projects
(t CO₂e)

2019 GHG baseline	1,626,059
Cardiff Heat Network	9,046
Major Renewables	2,977
Coed Caerdydd	13,372
Private Housing Retrofit	2,546
Council Housing Retrofit	2,455
Transport White Paper	328,576
Other Sequestration	1,277
Post Implementation GHG Emissions	1,265,809
GHG Emissions Reduction (modelled)	360,250
	22%

48. The implementation of identified OPC projects upon the City's GHG emissions footprint will lead to a 22% reduction in per annum emissions. The most significant emissions reductions that are forecasted to be achieved are from the implementation of the Transport White Paper provided it meets its ambition to reduce GHG emissions from road travel by 50% across the City.

49. It is critical that the delivery of the key Transport White Paper projects are achieved, namely

- a. Expanding on the Metro plans for new tram-train routes and stations, including a city cross rail;
- b. Introducing new Bus Rapid Transit services, Park & Ride sites, and making bus travel far cheaper to increase the number of bus journeys made;
- c. Re-prioritisation of our streets to give more space to people walking and cycling to encourage the cleanest and mostly sustainable forms of transport;
- d. Supporting and facilitating the transition to electric/ zero emission vehicles.

Next Steps: Identifying Future Interventions for a Carbon Neutral City

50. In terms of the impacts on the City wide emissions there will be a 'natural' decarbonisation process, through the implementation of a number of national policies to meet national decarbonisation targets. However the Council can look to further accelerate change through the following opportunities:

- a. Model the potential impacts of collective PSB/Public Sector Carbon Neutral Strategies since each partner organisation is also developing a carbon neutral position;
- b. Engage with WG Energy Planning Service to identify at a very detailed level the main causes of the city's emissions and develop a collaborative action plan to address these;
- c. Develop a partnership and project basis for stimulating wider residential retrofit not just in Cardiff but across the wider City Region;
- d. Support and stimulate accelerated transport decarbonisation in the City;
- e. Support and stimulate Citizen behaviour change;
- f. Embed carbon neutral policies with the updated LDP.

Council and City Wide Behaviour Change Plan

- 51. One clear outcome from the consultation was the need for a targeted public behaviour change strategy to support the Council in delivering the aims of the strategy. The Council has engaged the Centre for Climate Change and Social Transformation (CAST) to support the development of a toolkit and monitoring instruments to enable the Council to embed carbon-neutral thinking across the Council and the City through a behaviour change and engagement programme.
- 52. Behaviour change to reach carbon neutral will require a fundamental change in lifestyle and the scale of the climate challenge means we need to accelerate progress and think beyond small-scale actions. These behavioural changes could improve our health and wellbeing, save money, and strengthen communities.
- 53. CAST have already identified list of key behavioural changes which have an evidential basis to demonstrate the largest carbon reduction impacts that individuals can have. These are summarised as follows:
 - a. Living Car Free;
 - b. Shifting to EVs;
 - c. Flying Less especially long haul;
 - d. Using Renewable Energy;
 - e. Shifting to Public Transport;
 - f. Retrofitting Buildings;
 - g. Shifting to a plant based diet;
 - h. Installation of heat pumps;
 - i. Using Energy efficient cooking equipment; and
 - j. Using renewable based heating.
- 54. Through a City-wide engagement programme, CAST will help identify the most meaningful interventions to support delivery of One Planet Cardiff along with a mechanism to track the impact of behaviour change and engagement interventions.
- 55. As part of this programme the Council will commission both a Council Staff survey and a wider Cardiff Residents survey which will assess the

impacts the COVID-19 pandemic has had on behaviour change and how such changes can be locked in longer term, to support the transition to a carbon neutral City by 2030. This engagement strategy, following very clear expert and public feedback, will need to be a continuous process and not a one off event and the OPC strategy outlines an action plan around this.

56. It is important that the youth of the city have a clear understanding of the climate issues that face them as they mature, and that they have a clear voice in our strategy as it moves forwards. It is clear that the youth of the city are in a unique position to become powerful ambassadors for the city wide change that we need to triggers. We have therefore set up a direct relationship with the OPC strategy and our Schools Service that will help to embed climate change as part of the new curriculum and where individual schools will be able to develop and work on site specific action plans and targets alongside OPC.

Next Steps Implementation and Monitoring of One Planet Cardiff

57. In conjunction with the One Planet Cardiff Strategy, the Council has developed a dynamic action plan that will be reviewed and updated regularly to communicate progress and present project ideas to ensure we effectively address our residual emissions to ensure we achieve our carbon neutral targets for the Council and the City.
58. The Action Plan will use the Carbon Impact Evaluation tool to appraise proposed projects for carbon and social benefit and it will be imperative that we assess the measures to determine and prioritise the projects that will have the most significant impact on the residual emissions.
59. The Council will monitor the impact of our actions by calculating annually;
- a. The Council's Carbon Emissions using Welsh Government methodology for calculating emissions covering Scope 1, 2 and 3;
 - b. The City's Carbon Emissions using BEIS data;
 - c. The Social Impact of proposed projects using our Carbon Impact Evaluation Tool;
60. The goals and commitments above are detailed in our dynamic action plan that will be an iterative process that will be reviewed on a 6 monthly basis with an annual progress report produced to show progression towards the 2030 target. The progress will be evaluated by regularly updating the OPC Action Plan setting out progress against targeted Carbon Neutral by 2030 targets and engaging with City-Wide stakeholders.

Action Plan Summary

61. A summary of the short, medium and long term actions for One Planet Cardiff is provided in Table 3 below. This summary table provides an overview of the proposed actions with further details on the calculated or estimated likely carbon savings from the projects provided in the full Action Plan in Appendix 1.

Table 3 - Action Plan Summary

Immediate/Short Term Actions	
Project Title	Project Details
Transport White Paper	Continue to implement the approved Transport White Paper projects with a target to reduce GHG emissions from road travel by 50% across the City.
Energy Efficiency Retrofit in the Council Estate	A new Corporate Property Strategy 2021-26 to be published in November 2021 which will outline how the Council will reduce the carbon output of its operational and schools estate, and off-set with new renewable energy sources, targeting a 60% reduction by 2030.
Heat Network Delivery of Phase 1	Begin construction of Phase 1 of the Cardiff Heat Network by winter 2021.
Council Fleet Transition	Develop and Implement Council Vehicle Replacement Strategy in line with the Low Emission Strategy to deliver a Low Carbon Fleet ensuring that as a minimum of 90 Council vehicles are replaced by EVs by 2022.
Coed Caerdydd Cardiff's Urban Forest	Development of a holistic programme approach to tree planting and land management city wide to increase biodiversity and expand the city's tree canopy by 25%.
Zero Carbon <u>New Build</u> for Council Housing Estate	The Council has implemented a large housing development programme delivering ~2,700 new council homes over the next 6-7 years. Over 2,000 council home new builds (planned over 10 year programme) will meet higher standards. Around 500 built out or in construction to exceed building regulations the previous standard (SAP B+).
Energy Efficiency Retrofit for Council Housing Estate	Energy Retrofit Scheme for low rise public housing blocks. The programme will be phased to tackle the worst performing blocks first over a 10-year period which eventually should see over 700+ low rise blocks improve their energy efficiency.
LED Street Lighting	Continued implementation of LED replacement and dimming measures
Cardiff Food Strategy	Promote healthy, local and low-carbon food by delivering the Cardiff Food Strategy by 2024. This includes the development of a strategy for a carbon responsive , holistic approach to food in schools across Cardiff, measures to address food deserts in the city and initiatives to increase sustainable local growing
Schools Engagement and Action Plan	Establish a curriculum integrated climate emergency education programme to stimulate the creation and implementation of school specific action plans.
City Wide Behaviour Change Programme	Roll out an ongoing programme of engagement with citizens, businesses and workers, targeting high impact areas of behaviour change, and set in place a systematic methodology for measuring and monitoring impacts.
Medium/Longer Term Actions	
Project Title	Project Details

New Build in the Council's Corporate and Schools Estate	To ensure delivery of the One Planet Cardiff carbon reduction targets, within both the Education and Corporate estate, it is proposed that by 2024 any Council procured new build development will be Carbon Neutral, exceeding current Building Regulations standards.
Major Renewable Energy Projects	Develop a pipeline of potential renewable energy generation projects for subsequent approval and implementation from 2022.
Single Use Plastic Position Statement & Action Plan	Develop a strategy with a focus on procurement. All council procurement activities need to be considered for sustainable alternatives to single use plastics. Provision of re-useable refuse sacks to reduce single use plastics. Currently at a trial stage with a view towards future implementation.
Low Energy Private Housing Retrofit	Develop a co-ordinated partnership strategy to promote and upscale housing energy efficiency retrofit across all tenures of housing targeting up to 2,000 houses per year by 2024.
Business Travel Initiatives	Develop a strategy to reduce emissions from grey fleet and business travel by facilitating a low carbon pool car/car club approach, reviewing mileage claim policies and considering the introduction of salary Sacrifice schemes for EV.
Low Carbon/Circular Economy Procurement Strategy	Develop and publish a revised procurement strategy to assist in lower carbon specification, to favour low carbon supply activities and to embed circular economy principles where possible.
Staff Commute Initiatives	Promote opportunities to reduce the carbon impact of staff commute by progressing hybrid working opportunities, promoting a shift to sustainable forms of travel and considering a Salary Sacrifice scheme for ULEV.
Public Sector Partnership working	Collate total impact of collective carbon reduction strategies in the city and identify opportunities for acceleration through collaboration.

62. The Council will also build on our current annual report with an aim to report to the Carbon Disclosure Project to report annually the progress our City is making towards both adaptation and mitigation.

Governance and Partnerships

63. A Climate Emergency Board has been established consisting of Public Service Board members including all public service organisations and we have expanded this further to include wider city partners and stakeholders to provide a robust oversight of the 2030 City target.

64. Cardiff Council OPC 2030 targets are overseen by Steering Group which consists of relevant Cabinet Members and Senior Officers from across all directorates and is chaired by the Leader of the Council.

65. The OPC agenda needs to be delivered in collaboration with all city wide stakeholders including citizens, businesses and public bodies. Cardiff Council are taking the lead but we will be working with partners across the city. A central part of our project governance structure in this regard is our Climate Emergency Board which brings together the major public sector partners, utility companies and academia in a regular meeting to share our individual carbon reduction plans and progress and to work collaboratively on areas where partnership working will bring greater impact.

66. The Council will examine the necessary resources to ensure appropriate allocation is afforded in light of the scale of the work that will be required to support the actions to deliver OPC. A recurring Capital Fund has been allocated to help deliver smaller OPC projects and 'quick win' projects. Revenue has also been allocated to assist with feasibility and impact studies to support project analysis and prioritisation.
67. It is envisaged that there will be significant engagement with Higher Education establishments to support delivery and develop vocational skill sets to support the transition to a low carbon economy.
68. The Council has incorporated consultation feedback in the 2021 OPC and we have ensured that has been incorporated into key goals and actions that will facilitate the city-wide low carbon transition, realising multiple economic and social co-benefits for city residents.
69. The organisational change programme for the Council will be fully aligned to the commitments and ambition set out the 2021 OPC.

Local Member consultation (where appropriate)

70. Local Member consultation has not occurred with regards the overall One Planet Strategy. Where individual projects outlined in the OPS have a local impact, then appropriate consultation with Local Members will take place.

Scrutiny Consideration

71. The Environmental Scrutiny Committee considered the final One Planet Cardiff Strategy on October 5th 2021.

Reason for Recommendations

72. To approve the 2021 One Planet Cardiff Strategy (OPC) which sets out the Council's plan to deliver a Carbon Neutral Council by 2030 and to work with city wide partners to develop a road map and action plan for a Carbon Neutral City by 2030

Financial Implications

73. The One Planet Cardiff (OPC) Strategy is comprehensive in its coverage and as a consequence, the financial resources required to deliver the strategy's target of Net Zero by 2030 will be significant. Although there will be a focus on securing external collaboration and external funding, consideration must be given as to the extent that individual strategy elements can be approved without a clear understanding of the financial impact on the Council in the context of significant medium term financial pressures. As such, any resource requirements outside of current budgetary allowances will require that appropriate decision making arrangements are put in place.

74. Detailed financial projections to support the OPS strategy are still to be developed by the Directorate and as a consequence the development of robust business cases and identification of budgets, whether council funded or external grants to support specific projects will be fundamental in demonstrating the affordability to the Council of individual projects in the Strategy. In particular with Invest to Save schemes, which have a reliance on income generation and / or cost saving, to repay committed external capital financing charges robust financial modelling to demonstrate potential financial risks and the mitigation of these financial risks will be required. The financial projections in business cases will also need to outline any on-going revenue funding implications from both operating and financing these projects.
75. Any financial implications from undertaking the staff and residents survey and the monitoring of the One Planet Cardiff Strategy will be met from existing resources. Alternative funding sources for any additional resources identified will need to be found in order to ensure sustainable funding solutions are in place.

Legal Implications (including Equality Impact Assessment where appropriate)

76. The report seeks approval of the 2021 One Planet Cardiff Strategy and Action plan. The strategy and action plan cover many proposed actions, measures and projects, as such it is not possible in the confines of this legal advice to comment on the legal implications raised by each such action, measure or project. Detailed legal advice will need to be taken on each of the proposed actions, measures and projects as the same are developed. To the extent that any of the proposed actions, measures or projects require any changes to be made to any of the documents, which comprise the Council's Policy Framework, then such matters will be subject to decision of Council. To the extent that the action plan provides, without caveat, that specified actions will be undertaken, then the adoption of the plan and strategy will serve to create a legitimate expectation that such actions will be undertaken by the Council. The report refers to consultation undertaken. It should be noted that consultation gives rise to the legitimate expectation that the outcome of the consultation will be taken into account when developing and determining to adopt the strategy and action plan.

Equalities & Welsh Language

77. In considering this matter the decision maker must have regard to the Council's duties under the Equality Act 2010 (including specific Welsh public sector duties). Pursuant to these legal duties Councils must, in making decisions, have due regard to the need to (1) eliminate unlawful discrimination, (2) advance equality of opportunity and (3) foster good relations on the basis of protected characteristics. Protected characteristics are: (a) Age, (b) Gender reassignment, (c) Sex, (d) Race – including ethnic or national origin, colour or nationality, (e) Disability, (f) Pregnancy and maternity, (g) Marriage and civil partnership, (h) Sexual orientation, (i) Religion or belief – including lack of belief.

78. An equalities impact assessment is attached to this report and the decision maker should have regard to the same in reaching its decision.
79. The decision maker should be mindful of the Welsh Language (Wales) Measure 2011 and the Welsh Language Standards.

The Well-being of Future Generations (Wales) Act 2015

80. The Well-Being of Future Generations (Wales) Act 2015 ('the Act') places a 'well-being duty' on public bodies aimed at achieving 7 national well-being goals for Wales - a Wales that is prosperous, resilient, healthier, more equal, has cohesive communities, a vibrant culture and thriving Welsh language, and is globally responsible. In discharging its duties under the Act, the Council has set and published wellbeing objectives designed to maximise its contribution to achieving the national wellbeing goals. The well-being objectives are set out in Cardiff's Corporate Plan 2021 -24.
81. When exercising its functions, the Council is required to take all reasonable steps to meet its wellbeing objectives. This means that the decision makers should consider how the proposed decision will contribute towards meeting the well-being objectives and must be satisfied that all reasonable steps have been taken to meet those objectives.
82. The well-being duty also requires the Council to act in accordance with a 'sustainable development principle'. This principle requires the Council to act in a way which seeks to ensure that the needs of the present are met without compromising the ability of future generations to meet their own needs. Put simply, this means that Council decision makers must take account of the impact of their decisions on people living their lives in Wales in the future. In doing so, the Council must:
- Look to the long term
 - Focus on prevention by understanding the root causes of problems
 - Deliver an integrated approach to achieving the 7 national well-being Goals
 - Work in collaboration with others to find shared sustainable solutions
 - Involve people from all sections of the community in the decisions which affect them
83. The decision maker must be satisfied that the proposed decision accords with the principles above; and due regard must be given to the Statutory Guidance issued by the Welsh Ministers, which is accessible on line using the link below: <http://gov.wales/topics/people-and-communities/people/future-generations-act/statutory-guidance/?lang=en>

Policy and Budget Framework

84. The decision maker must be satisfied that the proposal is within the Policy and Budget Framework, if it is not then the matter must be referred to Council.

HR Implications

85. The HR implications in this specific report are limited to the fact that a staff survey will be carried out to ascertain behaviour change as set out in the report. However, there are a number of elements within the action plan that will be further assessed and these may have an impact on staff. If any of these items are to be developed further then further reports will be brought forward and full consultation will take place with trade unions at that time.

Property Implications

86. The One Planet Strategy and objective to achieve a carbon neutral estate by 2030 carries significant implications for the Council's property estate ranging from the impact on strategic decision making, resources, budgets and procurement through to the day to day use and management of land and property.
87. The OPC strategy specifically identifies the Built Environment as one of seven central streams, the scope of which includes Corporate property together with Education and also Housing. This is a broader scope than the Council has reported carbon performance on previously and responsible services areas will need to adopt a corporate approach to delivery, supported by suitable governance, new benchmarking principles, consistency of reporting and common terminology to fully understand the current position and track change effectively over time. Work is currently ongoing to re-benchmark the estate and enhance systems and data to better report on the Council's carbon and energy usage.
88. The other six streams of the strategy (Energy, Green Infrastructure, Transport, Food, Water and Waste) will also require (to the lesser or greater extent) elements of land and property to deliver. Strategic projects such as Heat Network, Solar farms, Battery Charging, Wind, Hydro and also projects relating to green infrastructure, food growing and electrical charging points will require strategic estates involvement, at least from a transactional perspective in accordance with the Council's constitution and delegated authority processes relating to disposals, leases and other transactions.
89. The Corporate Property Strategy 2021-2026 due to be presented to cabinet in Autumn 2021 provides an overview of the Built Environment OPC approach. At a strategic level, achieving the net zero carbon target across the Built Environment will require:
- Carbon Reduction – circa 60%. Reducing carbon output in new and existing buildings through physical and behavioural change

- Carbon Offsetting – circa 40%. New projects to implement sustainable energy production measures on specific sites e.g. solar, wind etc.

Carbon Reduction

90. The principle means of achieving carbon reduction in the Built Environment to date has been through property relinquishment – the disposal of property or termination of leases. It is important to note the scale and rate of property relinquishment has slowed since the completion of the property strategy 2015-2020 (which included the office rationalisation programme and Leisure Centre ADM) as the Council has a leaner estate and therefore fewer surplus properties proposed to sell or relinquish. As a consequence, carbon reduction anticipated to be achieved through relinquishment will likely decrease over time and will need to be complimented by additional reduction measures. Examples include modernisation of the retained estate and behavioural change.
91. Relinquishment will remain an important theme however and the adoption of a hybrid working model may result in the need for a smaller corporate estate footprint which could lead to additional properties becoming surplus.
92. Modernisation, in the form of repair and refurbishment of the retained estate, is an area that will need to be enhanced significantly to meet the carbon reduction objectives. Historically the Council has implemented schemes such as, refit to improve energy performance in a small number of selected buildings via an “invest to save” model (salix funded). This will need to be scaled up and applied across the extent of the retained corporate, education and housing portfolios with appropriate supporting budget, resource and governance.
93. Day to day repair and replacement of property components will also need to be aligned with OPC which will require current anticipated Asset Renewal budgets to be enhanced. Minimum standards of energy performance of components will need to be imbedded within the procurement process which may increase costs. Opportunities to pursue estate wide replacement of more energy efficient components may take advantage of economies of scale. Examples include new heating systems, lighting, window replacements etc. However initial capital cost for such schemes is likely above existing asset renewal allocation and case by case business cases may be required.
94. The Strategic Estates, Education and Housing mission statement to reduce the carbon footprint for any retained, refurbished property to as close to zero as possible will be pursued on a case by case basis and in accordance with affordability. The carbon footprint of property proposed for acquisition for operational use in the future will need to be a consideration in the decision making process.
95. Behavioural change is noted within the body of the report and the impact of managing the use of properties more efficiently is estimated to be just

as significant as the physical building adaptations in reducing carbon. This has already been observed in the carbon output reductions over the COVID period as the Council vacated the vast majority of the premises. Education, training and management support of new practices to staff, managers and building users will be required to ensure efficient use of council property over the short, medium and long term.

Offsetting

96. To meet the carbon neutral target, site specific offsetting measures will be required to compliment reduction measures. To date limited examples of offsetting measures have been implemented in Council property primarily within the schools estate through solar panel roofs. The opportunities for offsetting each retained premises across the corporate, education and housing estate may need to be explored. This is potentially an extensive and specialised programme that will need specific focus and resource to properly explore and implement.

97. In summary, the OPC strategy proposals carry significant property implications. Carbon output and energy efficiency will become a key consideration in the decision process for the acquisition or disposal of property. Additional revenue, capital and staff resource will be required to implement the necessary changes within the retained estate, the detail of which is currently being understood.

RECOMMENDATIONS

Cabinet is recommend to:

1. Approve the 2021 One Planet Cardiff Strategy included in Appendix 1.
2. Approve the 2021 One Planet Cardiff Action plan which sets out the current actions to be undertaken over a short to long term range to address the residual carbon emissions aimed at achieving a carbon neutral target by 2030.
3. Approve the undertaking of a staff survey and resident's survey to assist in the development of a Behaviour Change Action Plan for the Council and the City and for this Action Plan to be brought back to Cabinet for approval and a date to be confirmed.

SENIOR RESPONSIBLE OFFICER	Director Name
	Andrew Gregory
	Date submitted to Cabinet office

The following appendices are attached:

Appendix 1 –2021 One Planet Cardiff Strategy

Appendix 2 – One Planet Action Plan 2021

Appendix 3 – GEP Carbon Analysis Summary Reports

The following background papers have been taken into account
Full Carbon Analysis Outputs from GEP – Excel Spreadsheet

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APPENDIX 2

Baseline Carbon Emissions Analysis: How Much Needs to be Removed?

1. In order for the Council to assess the level of action needed to meet reach the 2030 target of a Carbon Neutral Council and City it was imperative that we undertook detailed assessment of the Council's Baseline Emissions and the Citywide Emissions. This would then enable us to assess the impact that planned interventions will have on reducing the carbon emissions and enable the Council to assess the residual carbon emissions and assess what further interventions will be needed over the next decade to achieve the 2030 target.

Council Baseline Emissions Assessment

2. In order for the Council to understand, the level of interventions required to achieve a carbon neutrality by 2030 it is imperative that we fully understand our existing baseline emissions. A detailed baseline assessment has been completed to demonstrate the Council's existing emissions, with a baseline year of 2019/2020. This assessment has been undertaken in line with the recently published, Welsh Government's Public Sector Net Zero Carbon Reporting guidance, which sets out how local authorities should measure and manage their Carbon Footprint with the aim of achieving carbon neutral by 2030. This now includes Scope 3 carbon emissions as part of the carbon footprint reduction.
3. In order for the Council to assess our baseline Green House Gas (GHG) emission, we have appointed specialist GEP who have undertaken this assessment. Summary reports of both Councils and the City Emissions are presented in Appendix 2, with key findings presented in the following paragraphs.
4. In order to provide a representative baseline year it has been decided that the 2019/20 financial period provided the most suitable baseline year to assess our emissions owing to the impacts of the COVID pandemic and subsequent lockdowns would have if a 2020/21 period was utilised.
5. In line with the Net Zero reporting guidance, **Error! Reference source not found.** provides the baseline GHG emissions for the FY 2019/20 reporting period are **189,559.36 tonnes CO₂e**. These results represent the combined total of the Council's direct and indirect emissions footprint, inclusive of all Scope 3 emissions.

Table 4 - Cardiff Council 2019-20 GHG Baseline Emissions Inc Procurement

Reporting Scope	GHG Emissions (tonnes CO ₂ e)	Percentage of total (%)
Scope 1 (Direct) GHG Emissions	14,745.19	7.8%
Scope 2 (Energy Indirect) GHG Emissions	11,373.08	6%
Scope 3 (Other Indirect) GHG Emissions	163,441.10	86.2%
(Gross) Total GHG Emissions (t CO ₂ e)	189,559.36	-

Land-use Sequestration (t CO ₂ e)	-4,654.84	-
(Net) Total GHG Emissions (t CO₂e)	184,904.52	

6. In terms of Scope 1 and 2 emissions the majority of these emissions are associated with energy consumption across the Corporate Estate (including schools), and fuel used by the Council's vehicle fleet.
7. Staff commuting accounts for the majority of the Council's direct Scope 3 GHG emissions footprint. Negative values in the table above, represent modelled GHG emissions sequestration from land-use and land-use change of the Council's land assets
8. The most significant outcome of the baseline assessment is the significance of our Scope 3 caused emissions in terms of the Council's total emissions. These emissions account for an estimated 86% of total Council emissions, with 82% of this value from procurement activities alone. These results are significantly higher than the Council had anticipated.
9. There are some concerns on how accurate this assessment reflects our true emissions. This is mainly owing to the fact that the WG Carbon Reporting Guidance utilised to assess the impacts from our procurement activities has **significant limitations**, and thus the impacts from procurement will need further consideration over the coming months and will be a key priority in our action plan.
10. The main concerns to be highlighted is that the reporting guidance relies on national "carbon factors" (kg of emissions per £ spent) for different spend categories which may not fully represent Cardiff's existing position. As such, there needs to be a further review undertaken to allow a detailed review of spend coding and to assess any areas where there is the potential for double counting between Scopes.

City Wide Baseline

11. A summary of the citywide baseline GHG emissions for the 2019/20 reporting year (1st April – 31st March) are presented in the following paragraphs. GHG emissions calculations have been previously undertaken by BEIS and results are sourced from published GHG emissions inventories for UK Local Authority and Regions.³
12. Between 2005 and 2019 Cardiff has seen significant decreases in CO₂ emissions. A 48% decrease in per capita emissions and 40% decrease in absolute emissions.
13. Our Citywide baseline GHG emissions for the 2019 reporting period have been calculated to be **1,626,059 tonnes CO₂e (or 1,626 kilo-tonnes CO₂e)**. Results are presented in units of carbon dioxide equivalent

³ <https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2019>

(CO_{2e}) which includes all six greenhouse gases (GHGs), and are summarised in **Error! Reference source not found.**

Table 5 - City Wide Baseline Emissions 2019

GHG Emissions Category (BEIS)	GHG Emissions (tonnes CO_{2e})	Percentage of Total (%)
Transport	669,465	41%
Domestic	439,137	27%
Industry	219,225	13%
Commercial	200,451	12%
Public Sector	99,055	6%
(Gross) Total GHG Emissions (t CO _{2e})	1,627,336	-
LULUCF (t CO _{2e})	-1,277	-
(Net) Total GHG Emissions (t CO_{2e})	1,626,059	

14. The majority of the City's GHG emissions are associated with emissions from transport (41%) activity within the City. This includes the use of motorways, trunk roads, diesel railways, and other modes of transport including shipping etc. Emissions from energy use within the City's domestic housing are also significant, accounting for 27% of total emissions for 2019.
15. Public Sector emissions account for the lowest proportion of the City's baseline GHG emissions footprint. This category factors in operations from all public sector organisations (e.g., NHS, Emergency Services, Civil Service). Negative values in the table above represent modelled GHG emissions sequestration from land-use and land use change of land areas within the local authority boundary of Cardiff.