ROYAL borough of GREENWICH

First Year Emissions Report and Review

CARBON NEUTRAL PLAN

Executive Summary: Carbon Neutral Plan First Year Review

The Council's Carbon Neutral Plan (CNP) outlines the Borough's path to become carbon neutral by 2030, in line with the scientific target necessary to limit global temperature rise to 1.50C. It requires concerted action at all levels: individuals, communities, organisations, national government and international organisations.

In November 2019 Element Energy, on behalf of the Council, produced an Evidence Base to support the development of a pathway to carbon neutrality by 2030 and which the Carbon Neutral Plan was developed. Actions outlined in the Carbon Neutral Plan are how residents and stakeholders can hold the Council's progress in achieving carbon neutrality to account.

The Carbon Neutral Plan was approved by Full Council in November 2021, and the Plan clearly sets out our ambitions to become carbon neutral by 2030 under seven key themes:

- Buildings
- New Development
- Transport
- Energy Supply
- The Circular Economy
- The Natural Environment
- Empowering Wider Change

We cover both the Council's own operational emissions and the borough's emissions separately under these key themes. For operational emissions we review the actions agreed and undertaken for the financial year 2021/22 and provide an assessment of the progress made. This uses the most up to date data we have recorded. For the borough we provide 2020 calendar year emissions data, and the remedial actions taken in 2021-22. 2020 data is the most recent available data nationally as there is a reporting time lag of about 18-24 months as emissions are verified.

This document is a first-year monitoring report and provides an interim review of the Plan. Subsequent annual reports will be published reflecting our progress in undertaking the agreed action plan. We provide summary commentary in each area of action and highlight key initiatives. Where possible we will always report on emissions saved (actual or estimated), cost savings and projections against our 2030 target.

Our headline achievements for our first year includes:

Buildings

Operational

Buildings are the Council's largest source of emissions, with Council owned homes (70%) and temporary accommodation (9%) placing the domestic sector as an area of priority given the co-benefits (health, financial) of reduced energy bills for residents. The Housing Capital Programme totalling £25.2m carried out improvement works benefitting 3,860 homes, of which 597 tCO2e were saved from 2020/21- 2021/22. Corporate property stock accounts for 25% (6.5 ktco2e) of RBG's built environment responsibilities when excluding council owned homes. RBG successfully applied to the Public Sector Decarbonisation Scheme (PSDS) to provide the capital for 8 Council sites, totalling at approximately £1,567,000. Data is not available to confirm the projected kWh and tco2 savings as we have yet to run the new systems for a 12-month period since completion. Schools account for 24% (6.13 ktco2e) of RBG's emissions when excluding Council owned homes. An additional PSDS

grant, totalling £2,755,259.28, covers a range of decarbonisation measures, such as air source heat pumps (ASHPs), photovoltaic panels (PV), LED lighting upgrades and valve/pipe insulation. An annual saving of £48,433 is estimated, with approximately 310 tco2e per annum. Street lighting (and additional unmetered supplies) accounts for 10% of RBG's total carbon emissions – excluding council owned homes. The carbon savings are estimated at 153 tCO2e per annum. The specific financial savings based on reduced energy consumption amount to an estimated £410,000 per annum.

Borough

The largest share of emissions in the borough by sector is homes (42%), with gas consumption within this accounting for a substantial 31% of total borough emissions. Most properties (46%) are rated at SAP band D, with the plurality (approximately 23,000 homes) being built between 1900 and 1929. The average carbon emissions per dwelling is 3 tco2 per annum. We estimate that some 14,285 (12%) households in the borough are in fuel poverty. It is broadly accepted that retrofitting existing housing stock is set to be the costliest of the climate measures and is also high risk in deliverability. Our fuel poverty outreach service supported 376 households, resulting in an average saving of £567, with a total estimated saving of £213,297 by all participating households over 3 years. The total carbon saved was 132 tco2e. We estimate 2,299 jobs that could be created per annum from a household net-zero retrofitting programme up to 2030. Industry and commercial CO2 emissions are responsible for 23% of the borough's carbon footprint. Capital for retrofit works may prove harder to access than previous years as most businesses have seen their energy costs rise significantly since 2021 and many companies are now at risk of insolvency. Nor is the landlord's consent guaranteed. Our energy efficiency outreach partners are at various project development stages supporting decarbonisation initiatives at several sites across the borough.

New Development

Operational

We are on track to achieve phase one of the Greenwich Builds programme which aims to deliver 750 new Council homes. We have completed the development of 31 sites that have received planning permission with achievements of upwards of 90% above the Part L baseline. Emissions saved will be verified after one year of full occupancy.

Borough

The total recorded operational carbon prevented due to local planning policy criteria is approximately 352 tco2e per annum, or 10.6 ktco2e over the buildings' 30-year lifespan. These emissions are likely to be higher, but we are working to record and monitor the planning data all in one place. These emissions are based on completed works in the calendar year 2020.

Transport

Operational

Council fleet emissions are down by 3% on the previous year to 70 tCO2e. We now have 30 EVs in the Council's fleet. The transition to an entire EV fleet is currently being impeded by technological and infrastructure issues at the Birchmere Centre. Additional feasibility reports are underway to identify solutions.

Borough

Transport emissions are the second largest category of emissions (31%) behind Homes. Overall, emissions have decreased by 15.6%. The COVID-19 pandemic saw huge changes in the way people travelled, how often and the modes they used. Transport emissions were calculated using the best available data and this will require verification in subsequent reports. We received approximately £985k funding from TfL in 2021/22, compared to between £2.3 million and £4 million a year anticipated pre-pandemic. A couple of actions have been put on hold due to the revocation of funding. Significant progress has been made on strategy and plans specifically referenced by the CNP or required to deliver a number of its actions. We have consulted on a draft Transport Strategy which was since approved in October 2022.

Energy Supply

Operational

All work is progressed in Borough analysis.

Borough

Energy demand reductions are generally the most cost-effective way to reduce carbon emissions with less systemic change required. However, supply is essential to ensure what is consumed is sourced from low/zero carbon sources. We estimate 114 tco2e has been saved through the Big London Energy Switch. Our heat network feasibility has progressed to the next stage. Our ambient GSHP Closed Loop is also in its next stage and will eventually enable up to 1000 households to switch from gas heating to heat pumps.

Circular Economy

Operational

Council's circular green waste practises have saved approximately 44.5 tco2e of emissions.

Borough

The Covid pandemic disrupted our waste service's plans in this area and all staff were focused on maintaining frontline service delivery in particularly challenging conditions. As the total household numbers increased, waste generation per household also increased from 972kg to 993kg. The recycling rate also dropped from 33.2% to 31.5% over the same period. Despite the increase in total municipal and per household waste, emissions actually dropped by 0.4 ktCO2e (-7%) compared to the previous year. This is due to a 25% reduction in the landfill emissions factor. Our Circular Economy workshops and Kiosks have resulted in approximately 4.5 tco2e in avoided consumption emissions.

Natural Environment

Operational

We have surpassed our tree planting target for the financial year. Since 2020 we have planted a net total of 1253 trees across the borough. The estimated total carbon saved by the end of the decade is 75 tco2e. Switching our plant machinery from petrol to electric has resulted in a 20% drop from the

previous year. Although a modest amount of our Operational Emissions, a high visible initiative shows the public we are leading by example.

Borough

The natural environment delivers benefits beyond carbon sequestration including healthier living, increased biodiversity, air quality improvements, climate adaptation measures such as flood prevention and overheating. It also adds hedonic value to property prices as living closely to green spaces is highly desirable in London. We have introduced new conservation grass areas into 16 large parks and now have 26 park/cemetery conservation grass areas that equates to approximately 35% - 40% of the RBG parks green space.

Empowering Wider Change

Operational

Most of our Empowering Wider Change actions are related to reducing borough emissions and so more information can be found in Section 8. However, we continue to acknowledge the areas where our decisions can reduce carbon emissions, including our procurement processes and pension investments. As a London Borough we have relatively strong buying power which can lever influence over our procurement and investment decisions.

Borough

The Council is developing partnerships and empowering our communities to develop new projects, initiatives and actions that reduce carbon emissions. Our communities include businesses, council staff and education providers, and voluntary organisations as well as residents. Greener Business in Greenwich, has exceeded its target of a minimum of 150 business engagement sessions by March 2023. To date the Greener Businesses in Greenwich programme has delivered: outreach to over 250 businesses with direct engagement with over 60 businesses. However, there is little support or grant capex funding for businesses to implement efficiency measures which is problematic in making reductions in this area. We are currently working with Local London to take the recent cross-London report on green jobs and skills further and examine green jobs, skills and business. The council developed a retrofit employment and skills programme, in partnership with London South-East Colleges (LSEC), to support local residents to gain an understanding of green skills and emerging jobs available within the retrofit market. We have seen 16 businesses access the fund with 29 apprenticeships starts to date. We have committed to the Sustains Food for the Planet campaign and will use the 'Every mouthful Counts' toolkit to consider further food growing best practice. Food clubs from March – Jun 2022 data shows that 14,120 tonnes of food have been delivered by the Felix Project and distributed at food clubs mitigating 126 tCO2e.

We have achieved this in very challenging circumstances as our services and budgets have continued to suffer from the effects of the Covid-19 pandemic. As the global economy has started to recover from lockdown, we have faced new pressures in delivering the CNP such as:

- **National Policy:** In 2021 the Government unveiled its plans to decarbonise the UK power system by 2035 earliest, which does not currently align with our own 2030 target

- **Supply Chains**: supply chain bottlenecks as economies continue to emerge from recent lockdowns

- **Energy Crisis:** Whilst expensive energy rates will make cases for investment more attractive (due to a shorter payback period), the increase in our energy bills will severely impact our available capital to invest in the CNP's actions

- **Covid-19:** Continues to impact service budgets (e.g. TfL funded initiatives withdrawn) with future rounds of national schemes closed (LAD funding). A return to business as usual (BaU) has also exacerbated gas price rises

Our emissions trajectory currently places us ahead of both the baseline and maximum ambition scenarios, although we are surpassed by the latter in the second half of the decade. Our current trajectory is not sufficient to meet our 2030 carbon neutral target. We are therefore mindful that whilst we continue to make good progress, we are dependent upon the national policy such as the acceleration of grid decarbonisation and further funding for retrofit schemes if we are to meet our targets.

Section 1: Purpose of CNP

The Council's Carbon Neutral Plan (CNP) outlines the Borough's path to become carbon neutral by 2030, in line with the scientific target necessary to limit global temperature rise to 1.50C. It requires concerted action at all levels: individuals, communities, organisations, national government and international organisations.

This Carbon Neutral Plan builds on the Evidence Base presented to the Council in 2020, setting out short term priority actions for the first three years (up to 2023). Achieving these actions should result in rapid progress in the Plan's early years whilst simultaneously learning about opportunities for implementation at the Plan's later stage.

Opportunities to further develop these options will be kept open to consider developments in the national and international response. This is particularly pertinent given the current inflation, cost of living and energy crisis.

The CNP outlines the areas of action across seven interconnected themes and therefore action in one theme may complement another theme, realising efficiencies in resource allocation and officer time. Officers have explicit ownership of these areas of action and will therefore be driving forward specific items of work related to their service area.

Political oversight is key, and a Cabinet Member has been identified against all of the actions which demonstrates the agenda is embedded across the Council.

A performance management framework has been developed to monitor and report progress against our operational and borough-wide emissions.

Section 2: Evidence Baseline

In November 2019 Element Energy, on behalf of the Council, produced an Evidence Base to support the development of a pathway to carbon neutrality by 2030 and which the Carbon Neutral Plan was developed.

The Evidence Base provides the key technical information and subsequent analysis regarding greenhouse gas (GHG) emissions across the borough. Actions for carbon mitigation are appraised under several metrics including cost, risks, co-benefits, type of carbon impact etc. Such an exercise enables the prioritisation of actions that can be delivered efficiently with the limited resources the Council currently has.

Actions outlined in the Carbon Neutral Plan are how residents and stakeholders can hold the Council's progress in achieving carbon neutrality to account.

Therefore, data analysis and progress are not only measured against the actions outlined in the CNP, but are also measured against the emissions pathways that the Evidence Base considers achievable.

Analysis of Decarbonisation Pathways

Against the 2015 baseline, the Evidence Base provides three future decarbonisation pathways for analysis:

(i) **Baseline:** where mitigating actions are taken but are insufficient to meet national legislative targets (2050)

(ii) **2030 Maximum Ambition:** involves the implementation of many or all of the highest ambition policies, accelerating decarbonisation ahead of national targets to keep on the 2030 trajectory.

(iii) **2030 Maximum Ambition (Full Grid Decarbonisation):** Same as above but also includes the assumption that the renewable energy sources have replaced fossil fuel as the dominant energy supply to the national grid.

The report identifies the major emissions sources in RBG as:

- building usage
- road transport
- A third category represents a significantly smaller proportion of total emissions across the remaining sectors of industry, waste, river and non-road mobile machinery. These sectors are a small fraction of Greenwich's emissions, accounting for 5% of the 2030 Baseline.

The smaller scale of emissions savings reflects a lower degree of council control in these sectors. However, the waste sector does fall under significant Council control.

Figure 1 below summarises the decarbonisation pathways and provides a breakdown of emissions by source and by the remaining total emissions left unmitigated by 2030.

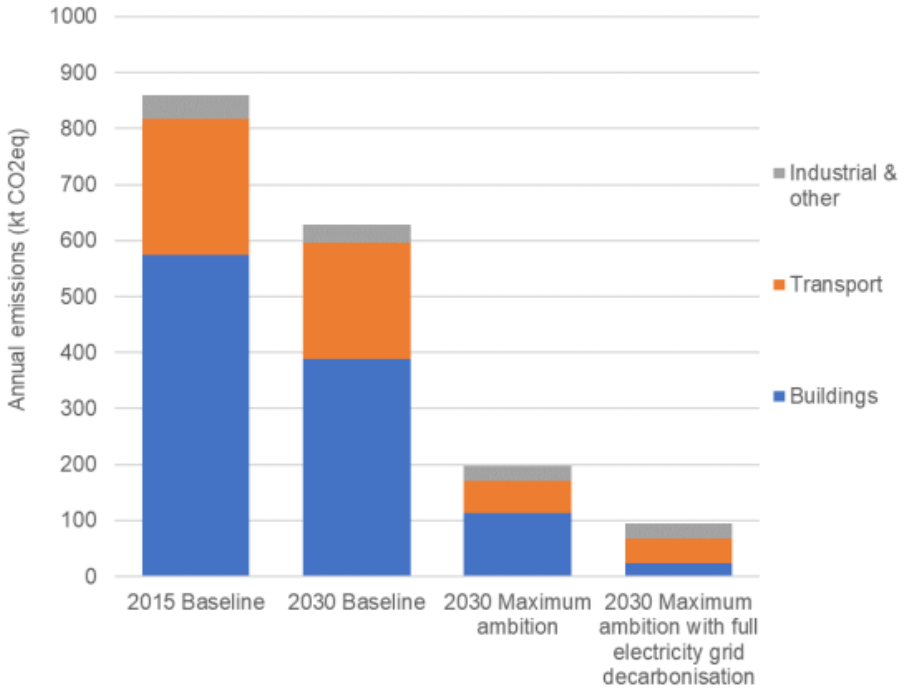


Figure 1

The range of measures assumed in the Maximum ambition scenario achieve a 69% reduction in emissions relative to the 2030 baseline and a 77% reduction relative to 2015. If full electricity grid decarbonisation is assumed by 2030 then a further reduction in emissions is achieved: 85% in total relative to 2030 and 89% relative to 2015.

While the carbon intensity of the electricity grid is not under RBG's ability to directly control, it can be influenced by the supply of local renewably generated electricity which could serve to offset the emissions associated from physical power stations.

Evidence Base: Putting the Plan into action

Our ability to fulfil the ambitions set out in the Carbon Neutral Plan depend on:

- changes to national policy (of particular concern for grid decarbonisation);
- further funding being available to drive forward investments; and
- the collaboration of the people and organisations of Royal Greenwich.

The choices we each make will decide if we succeed in averting dangerous climate change. How we travel, how we use energy at home, what we buy and the waste we create all play a big part. The Council will work to make changing what we do more attractive, by improving infrastructure and helping people understand the options. However, we cannot do this alone, and individuals must also play their part if we are to reach our target. Taking individual action now can help to build a coalition of individuals and organisations working collaboratively to set us on the path to becoming carbon neutral by achieving the goals set out in the CNP.

Climate Officers Group and Risk Register

We have set up a Climate Officers Group to monitor the Plan's progress against the published actions. The board has political leadership oversight and all services and departments across the Council are represented. This group is responsible for reviewing progress against the key workstreams by taking a cross departmental approach to the Carbon Neutral Plan agenda.

The first annual review of the CNP has given us the opportunity to appraise its current working arrangements and to assess the external impacts to its operations such as Covid-19 pandemic, the cost-of-living crisis for its residents and significant additional costs borne from energy price inflation. Acknowledging these risks will enable us to not only tackle the climate crisis but increase our ability to recover our financial losses in a more sustainable way, realise efficiency savings and generate sustainable revenue streams in the process.

We have therefore placed the CNP on the corporate risk register - identifying the risks and potential impacts of non-delivery of the CNP's 2030 target. This includes the possible causes of non-delivery and the subsequent effects to services, our residents and the Royal Borough Greenwich as local authority. Measures are identified in how we can mitigate these risks – including establishing a monitoring framework, a strong lobbying presence, innovative funding models etc.

Implementing a Performance Management Framework

Crucial to the delivery of the CNP is a robust set of processes to monitor the actions' progress and performance, capture (and therefore explain) the associated risks and costs. An internal performance management framework (PMF) outlines which services, with key operational officers, are best placed to provide the required data for the carbon calculations. Milestones and targets are also covered in the PMF.

As stated in the CNP, we can influence some sources of emissions more than others. In some cases, we are almost entirely dependent on a "bottom-up" approach - with action taken by individuals to achieve our initiatives. And to the contrary, a "top-down" approach will also affect our delivery as the policy decisions (particularly around grid decarbonisation) are taken at the national level. Total support and participation from all stakeholders across the borough should not be expected nor will

national policy remain static as it responds to external factors (such as the global energy crisis because of the conflict in Ukraine). For these reasons the general approach to our Plan is staggered into three stages, which are summarised in Figure 2 below.

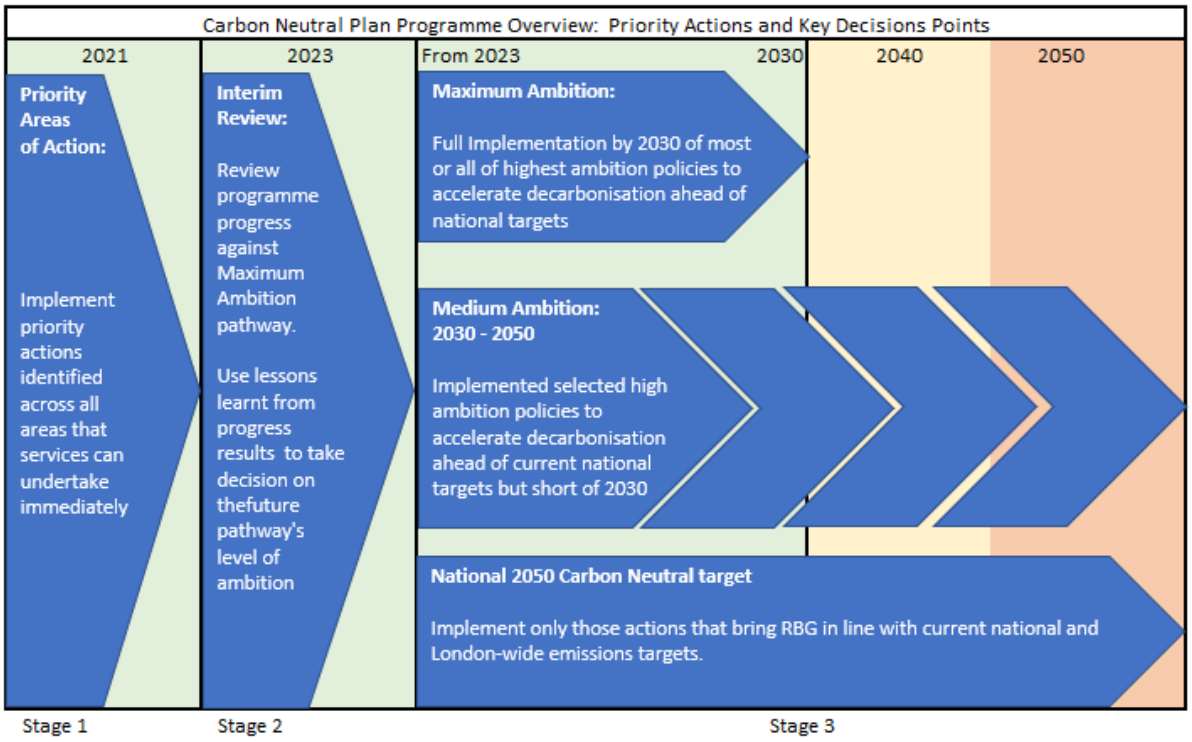


Figure 2

This document presents the findings of stage 2. The following sections of this report form the reasoning behind such a review; progress made in each CNP theme against the Maximum Ambition Pathway and an assessment of both successes and challenges for each theme. This analysis takes place for both our operational and borough emissions, in sections 7 and 8 respectively.

Section 3: Purpose of CNP review

The Carbon Neutral Plan was approved by Full Council in November 2021, and the Plan clearly sets out our ambitions to become carbon neutral by 2030 under seven key themes. It is important that we are flexible in our long-term planning to allow us time to respond to the volatile energy market and ability to access funding.

This document is a first-year monitoring report and provides an interim review of the Plan. Subsequent annual reports will be published reflecting our progress in undertaking the agreed action plan. We provide summary commentary in each area of action and highlight key initiatives. Where possible we will always report on emissions saved (actual or estimated), cost savings and projections against our 2030 target.

We review the actions agreed and undertaken for the **period of 2021/22 for operational emissions** and provide an assessment of the progress made. This uses the most up to date data we have recorded.

However, at the time of writing, the datasets for **borough emissions have only been released for the calendar year 2020**. This is an industry standard as the Department of Business, Energy & Industrial Strategy (BEIS) typically release national data 18 – 24 months *after* the reporting year-end

(as it takes time to verify the changes in emissions levels). As the Plan was adopted in late November 2021, progress and initiatives reported in Section 8 (borough emissions) were undertaken in the financial year 2021-22. Therefore, unless stated otherwise, any initiatives that reduce borough emissions are *estimated* and will be verified in subsequent reports once the national data has been reported after the publishing time lag.

Consequently, there is a discrepancy in the emissions reporting periods between Sections 7 and 8 of this report. Whereas Section 7 deals with our operational emissions activities in the financial year 2021-2022; Section 8 deals with the emissions arising from the 2020 calendar year, and the remedial actions taken in 2021-22. These sections follow the same structure, but readers must note the difference in these reporting periods as they are not a like-for-like comparison. Naturally, the following annual report will provide commentary and verification on any assumptions and carbon estimates made regarding borough wide emissions. We contextualise the progress of these emissions by providing data from previous reporting periods. This reporting approach is summarised in the table 1 below.

	OPERATIONAL EMISSIONS	BOROUGH EMISSIONS	Comments
Historic Reporting periods	Baseline: FY 16/17 FY 2019/20 FY 2020/21	Baseline: Calendar Yr. 2015 Calendar Yr. 2019	These previous reporting periods are included to provide context to the annual changes in emissions levels.
Reporting period for first CNP review	FY 2021/22	Calendar Yr. 2020	The 18-24 month lag in borough data cannot be avoided. Where relevant, we have made it explicit that reporting activity in the borough is not comparable to similar activities reported within the operational emissions section. Borough initiatives conducted in FY 21-22 are estimated and do not have bearing on 2020 data; but will be reviewed in subsequent annual reports for verification.

Table 1

This report will also reflect in sections 4 and 5 on the achievements and challenging changes in policy, funding regimes and the impact of macro environmental factors on the CNP's outlined actions.

Section 4: Summary of achievements

Summary of achievements

- Investment within the Council corporate estate, retrofitting 28 buildings, saving 750 tco2e per annum
- Street lighting (LED replacements) programme is ahead of schedule with 16,000 LEDS already replaced and reducing energy in excess of 80%
- Successful PSDS funding: over £7m in total secured for Corporate Stock and £2.7m for schools
- £25.2m invested in 3860 Council Homes – achieving 597 tco2e estimated savings
- Over 1200 additional trees planted since 2020
- 750 low or zero carbon Council homes secured planning consent of which 31 have been built
- Installed over 250 electric vehicle charging points
- Grant funding for Heat Network feasibility

The market has changed considerably during this period and has been reflected in increased energy costs, availability of goods and an increase in commodity costs for technologies and services. Whilst this market has been a challenge, we have delivered or are on course to deliver, the majority our first set of actions published in the plan, which is summarised in Figure 3 below.

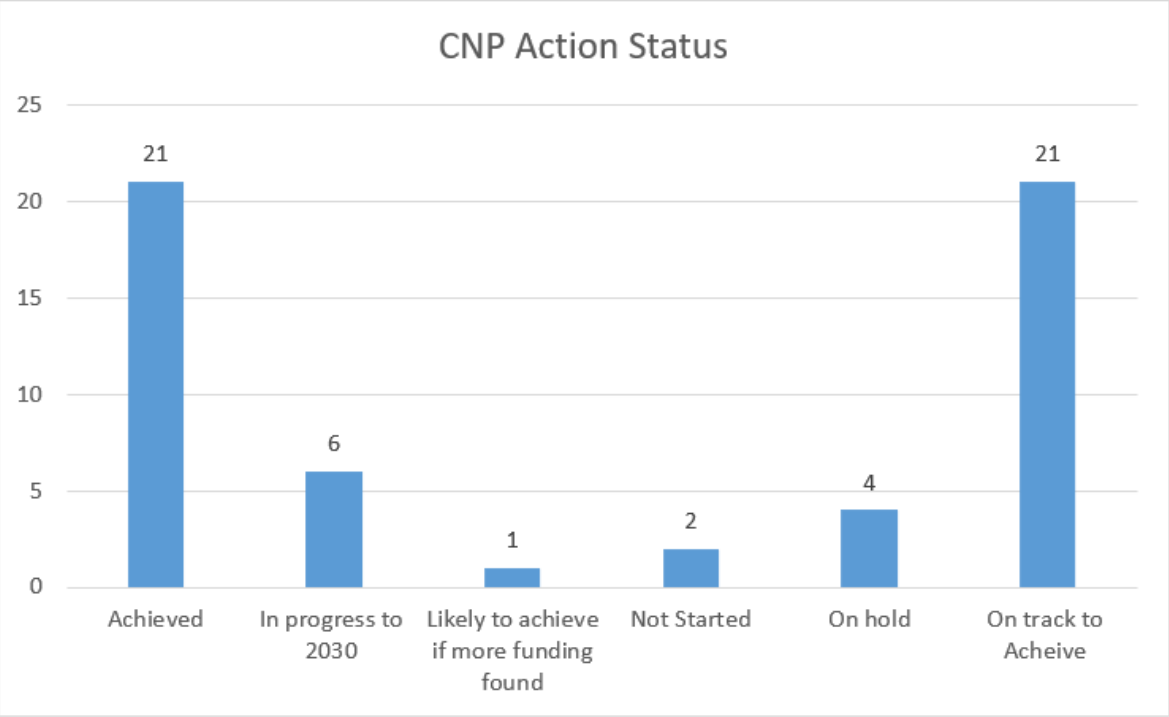


Figure 3

Figure 3 shows the breakdown of the actions' status at the time of writing. 76% of actions have been achieved or are on track to be achieved. Some targets are recognised as higher level actions that will continue to 2030 (11%), such as the continued fuel poverty support to Council tenants and district heat network consideration in the planning application process. The action that is likely to be achieved if additional funding is found is the EV electrification of the Council's fleet. This is further

discussed below in the transport chapter. At the time of writing, the actions on hold (7%) include adopting a tiered carbon offset price in the planning application process, which will financially incentivise developers to make further on-site carbon reductions, as we await further feedback and lessons learnt from other local authorities. Cycle Parking and Cycling Infrastructure actions were also placed on hold as these actions were primarily funded from TfL and these funds were temporarily withdrawn due to the financial impact of Covid. Those actions that were not started (4%) were the staff travel survey (to understand staff commuting emissions) and developing a carbon neutral commitment through partner organisations. In both cases this was due to a resourcing and expertise capacity. The Sustainability Team has grown in size since then and will be assisting the appropriate services with the technical expertise to measure commuting emissions and drafting the carbon commitment for partner organisations. The Sustainability Team is currently consulting with services if these status categories are fit for purpose and may change the format in subsequent reports.

Since the adoption of the CNP, we have received over £7m from multiple Public Sector Decarbonisation Scheme applications to retrofit our corporate estate, we have secured £2.8M funding to retrofit 300 homes in the private sector, we have revised our Transport Strategy, secured funding for detailed design work for extensive heat networks, we have reviewed some of our planning policy in relation to installing solar panels within conservation areas and produced a Heat Decarbonisation plan for our corporate estate.

Figures 4 and 5 show our estimated borough emissions trajectories based on our current progress. Figure 6 similarly shows our operational emissions trajectories: it provides a forecast based on our previous reduction rate (Current Trajectory) and the average emissions reduction required to reach to zero emissions (Required Trajectory). These trajectories are provided for both operational emissions that include and exclude our Council owned housing stock. In all cases, the trajectories are for illustrative purposes to contextualise the scale of mitigation by 2030. In reality, emissions may go up before they go down. For example, construction emissions associated with the installation of renewable systems may result in an overall increase short term only to drop in subsequent years as emissions are offset due to onsite generation.

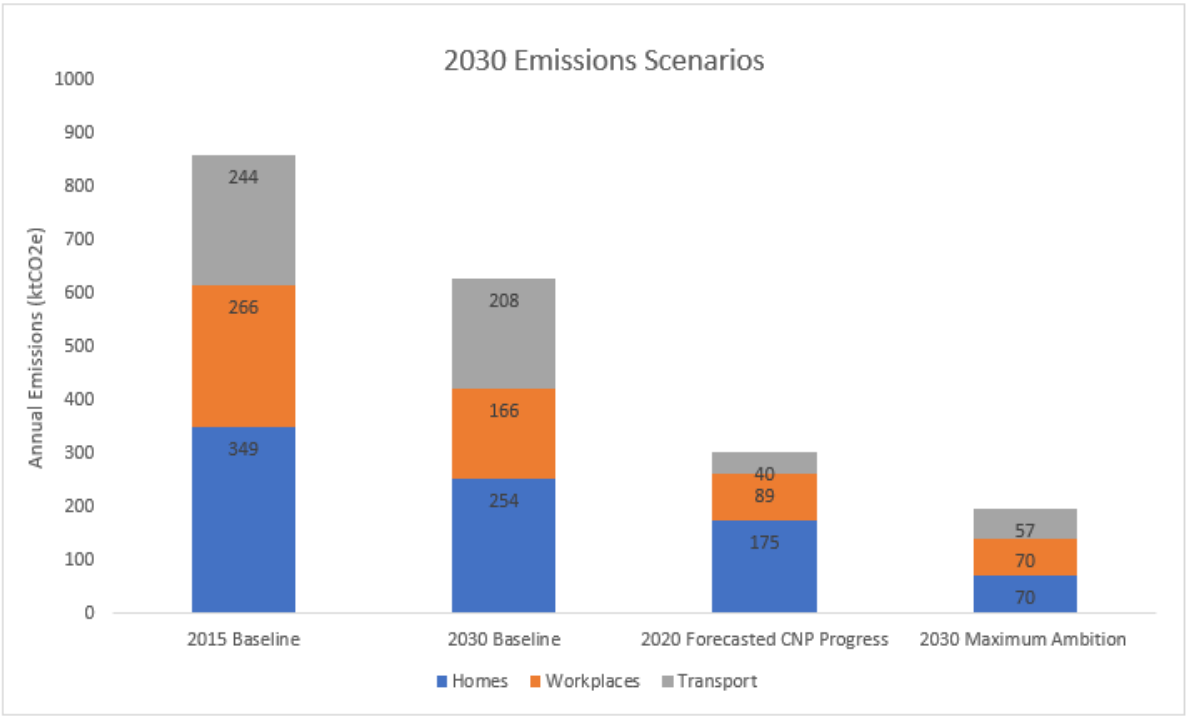


Figure 4

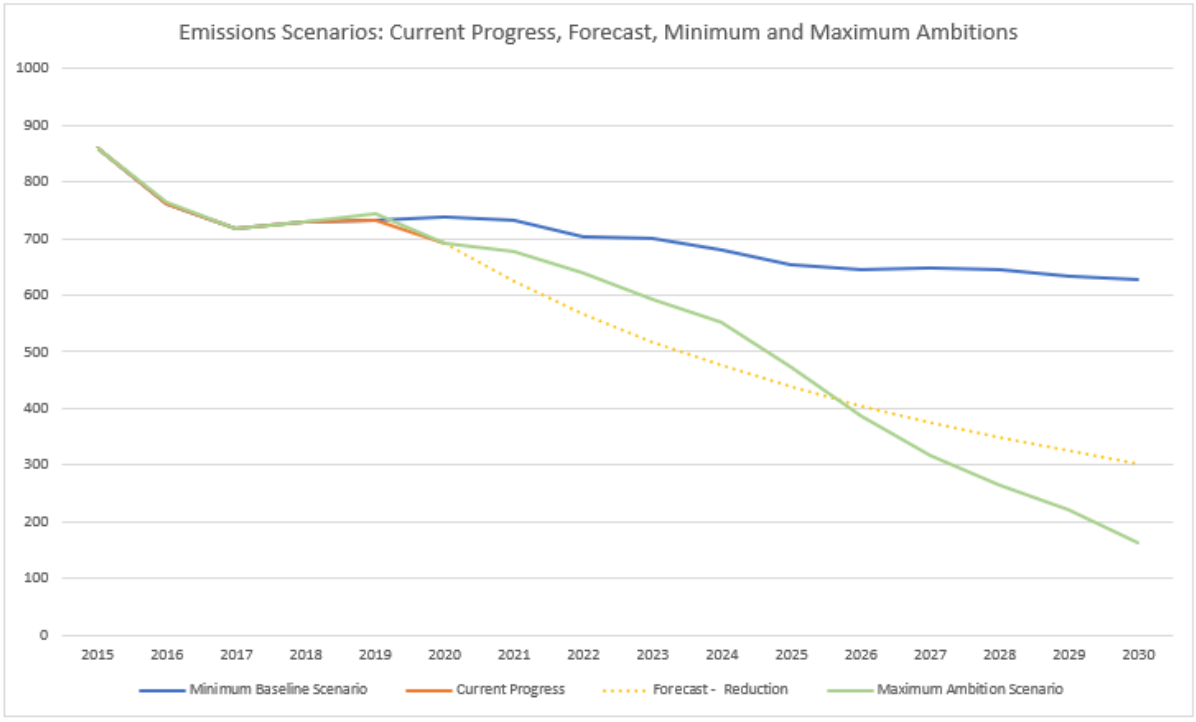


Figure 5

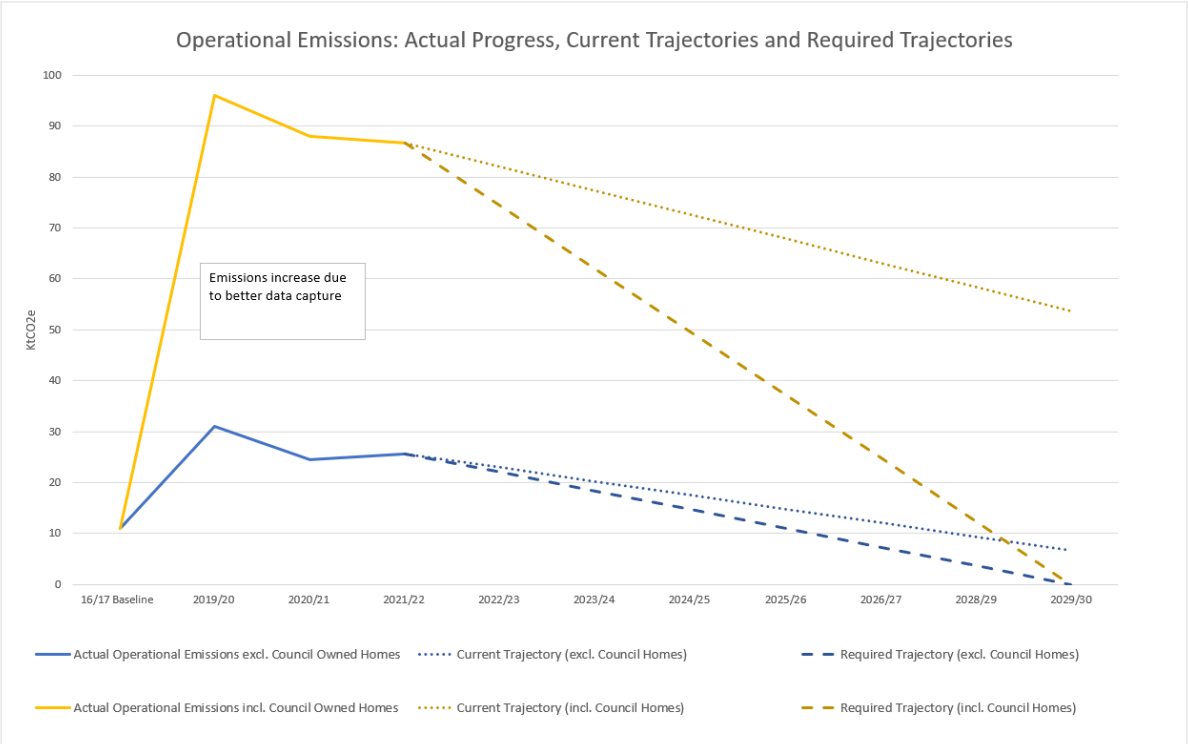


Figure 6

Section 5: Summary of Challenges facing all themes

There are a number of external historic, current and anticipated challenges which have and will continue to impact the delivery of the CNP's objectives.

1. National and Regional Policy

In 2018, the Mayor of London published the *London Environment Strategy and Zero Carbon London: A 1.5°C Compatible Plan,* which presented a range of energy system scenarios for London consistent with a 2050 Net Zero target. At the time of publication of the 1.5°C Plan, the UK's ambition was to achieve an 80% reduction in emissions by 2050. Since then, both national and local climate ambition has increased. At a national level, the UK has committed to reach a 68% reduction in emissions by 2030 (relative to 1990 levels) and to reach a legally binding target of net zero emissions by 2050. The Mayor has committed to bring forward London's net zero target from 2050 to 2030. Like most London's local authorities, we have followed suit. We were explicit in our carbon neutral plan that a 2030 target represents a substantial increase in ambition relative to a 2050 target and will require action at a London-level in a timeframe that goes beyond that which is supported or funded at the national-level.

In late 2021, the Government unveiled its plans to decarbonise the UK power system by 2035, with a focus on building a secure, home-grown energy sector that reduces reliance on fossil fuels and exposure to volatile global wholesale energy prices. This brings forward, by 15 years, the government's commitment to a fully decarbonised power system by 2050.

Although bringing this ambition forward is clearly good news, it does not align with our own 2030 carbon neutral target, and this has been exacerbated by 2 years' worth of covid disruption.

2. Covid

Councils are doing remarkable work to address the challenges brought by COVID-19. We have seen the local government sector pool its resources, respond to new problems with innovative solutions, as well as recovery and renewal. The same approach can be taken in tackling the climate crisis. The national economy has suffered unprecedented shocks and has impacted the Government's ability to continue to fund certain services, these impacts are significant: the lack of funding received from Transport for London (TfL) over the past two financial years has directly affected the delivery of the CNP. This is because TfL itself had lost significant revenue from reduced ticket sales due to social distancing restrictions. Household retrofitting programmes such as the Local Authority Delivery (LAD) schemes are due to be discontinued at the end of 2023. Economies also experienced further issues as they emerged from lockdown. As countries began to recover from the pandemic, demand for gas started to increase again and could not be met due to a shortage in supply, causing gas prices to increase in 2021.

3. Energy Crisis

An energy crisis happens when there isn't enough supply to meet demand and it becomes more expensive to buy wholesale gas and coal. This can happen for a variety of reasons including wars, overconsumption, market manipulation, tax hikes, regulation of the energy sector, strikes, problems at the oil refineries and ageing infrastructure. The UK is currently experiencing an energy crisis because of 'a perfect storm of market forces' that has hit the sector

- Working from home during the pandemic increased demand
- Natural gas and coal prices reached record highs due to global competition
- Extreme weather conditions have caused problems with supply

- Energy regulator Ofgem increased its price cap that limits what suppliers can charge
- Infrastructure of energy supply has required maintenance – further reducing delivery of supply
- Russia invaded Ukraine (they supply around 12% of the world's gas)

Whilst expensive energy rates will make cases for investment more attractive (due to a shorter payback period), the increase in our energy bills will severely impact our available capital to invest in the CNPs actions.

4. Resource Implications and Access to funding

Covid and the subsequent energy crisis has inevitably affected our ability to invest in carbon saving initiatives and the delivery of the CNP. There is currently not as much money available as was assumed when the CNP was drafted – either from our own internal funding streams, GLA regional funding, or the from the impending closure of national grant funding. Furthermore, given the recent political and economic disruption at the national level, we are expecting austerity to make a return to the public sector. There is currently no indication what services are likely to be cut but we expect any cuts will either have a direct or indirect impact to the deliverability of the actions outlined in the action plan.

5. Supply Chains

Businesses around the globe are facing supply chain bottlenecks as economies continue to emerge from recent lockdowns. However, the situation in the UK has worsened on account of Brexit, which has caused major supply chain disruptions. Over the recent months, there have been delayed deliveries, stock shortages, and increased prices. A quarter (26%) of medium and large firms have been affected by supply chain disruption due to Brexit and coronavirus, according to ONS figures. Almost one-third (30%) of businesses in manufacturing and wholesale and retail trade reported being impacted by global supply chain disruption. The solar panel market has been impacted from supply chain disruptions due to reduced manufacturing output, increased production costs, stock shortages and a post-covid shipping industry. Through feedback from our services, we have captured the most commonly stated issues that has disrupted our ability to deliver the CNP, this is summarised in figure 7 below.

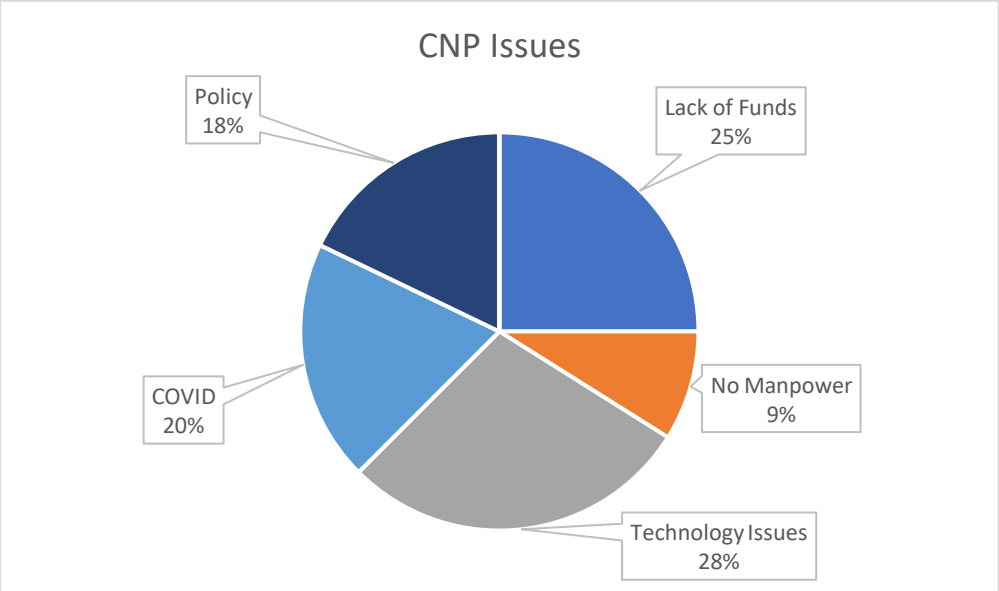


Figure 7

Section 6: Thematic Overview – The CNP's 7 Climate Themes

The Transport and Environment Committee (TEC), a London wide group made up of elected Members (LEDNet) have issued a joint statement identifying the need to act rapidly and collectively on climate change, and to support seven priority programmes that boroughs should work together to deliver. LEDNet is the membership association for London's Environment Directors. The network allows London Environment departments to collaborate in delivering more effective and efficient environmental services as a key component of place-shaping.

The key focus for LEDNet has shifted in light of the climate emergencies declared by most of its members. Facing the impending social, environmental, and economic risks of climate change; the demands from the public to do more; the moral obligation to future generations; the group issued a programme of seven priorities for how London boroughs can respond to climate change together. The group agreed to principles in supporting climate-informed decision-making including governance, citizen engagement and dedicated resourcing. They are summarised in the table below:

TEC-LEDNet Climate Priorities	Priority descriptor
#1 Buildings	Retrofit all domestic and non-domestic buildings to an average level of EPC C by 2030.
#2 Low Carbon Development	Secure low carbon buildings and infrastructure via borough planning.
#3 Halve Petrol and Diesel Journeys	Halve road journeys made by petrol and diesel via combined measures that can restrict polluting journeys and incentivise sustainable and active travel options
# 4 Renewable Power for London	Secure 100% renewable energy for London's public and domestic sectors now and in the future
# 5 Reduce Consumption emissions	Reduce consumption emissions by two thirds, focusing on food, clothing, electronics and aviation
#6 Build the Green Economy	Develop London's low carbon sector and green our broader economy
# 7 Creating a Resilient and Green London	Develop adaptation measures

Table 2

In winter and spring 2021, the Council carried out an online consultation on the draft Carbon Neutral Plan and hosted online events with residents, selected businesses and other organisations, to gather feedback, comments and suggestions on The Council's Climate Change agenda. In the interests of strategy alignment and the opportunities for knowledge sharing and lessons learnt, Royal Borough Greenwich has set out its own seven priorities that mirror the strategic work being undertaken at a pan London level, whilst also reflecting the views of the borough's residents.

The seven key themes are listed below. Progress in reducing our operational emissions and the borough's emissions is assessed through these key themes. Many themes overlap as they are complementary in their objectives – this makes the CNP more efficient in its delivery but also ensures a holistic approach is taken when implementing climate specific initiatives.

	RBG Climate Theme	Theme Descriptor
1.	Buildings	Retrofitting existing buildings to consume less energy, save carbon and money
2.	New Development	Ensure newly constructed buildings are low carbon and are of quality environmental and social design
3.	Transport	Reduce transport emissions
4.	Energy Supply	Renewable energy generation and consumption
5.	The Circular Economy	Reduce waste sent to landfill and reduce consumption of natural resources
6.	The Natural Environment	Natural and regenerative solutions to climatic stresses, preserving our beautiful green spaces
7.	Empowering Wider Change	Develop partnerships and empowering our communities to develop new projects, initiatives and actions that reduce carbon emissions.

Section 7 (Operational Emissions) and Section 8 (Borough Emissions) will assess the progress of the CNP in these seven themes and will be further split as follows:

- Chapter Headline: key summary information on the theme's progress
- Summary: the local context and scale of the issue the theme addresses
- Progress: action plan review – progress and lessons learnt

Given the split between borough and operational emissions, the asymmetrical level of emissions emitted by source and the nature of mitigation works across these areas, there will be much to say for some themes and less to say in others.

Section 7: Reporting Operational Emissions

Scope of Reporting Operational Emissions

We are taking big steps towards meeting our goal of net zero emissions by 2030, from electrifying the vehicle fleet, to large-scale retrofitting of schools and council owned homes, to improved data capturing processes.

This part of the report uses the term "operational emissions" to describe emissions data on council operations from buildings and vehicles that are directly operated by the council. Operational emissions associated with RBG's activities are reported through the CNP's seven main categories: Buildings, New Development, Transport, Energy Supply, Circular Economy, Natural Environment and Empowering Wider Change.

The Greenhouse Gas Protocol (GHG Protocol) provides a standard methodology for businesses and cities to report their emissions. This approach categorises emissions into "scope 1" (emissions released on-site from energy use, usually gas or transport fuel) "scope 2" (emissions released off-site from energy use, typically from generating electricity) and "scope 3" (indirect emissions from everything else an organisation purchases or sells).

This approach has been adopted by a growing number of local authorities and is summarised in table 3 below.

	Scope 1	Scope 2	Scope 3
Level of Influence	**Direct Emissions:** GHG emissions directly from operations that are owned or controlled by the reporting company	**Indirect Emissions:** Indirect GHG emissions from the generation of purchased or acquired electricity, steam, heating, or cooling consumed by the reporting company	**Indirect Emissions:** All indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions
Examples	Fuel combustion Company vehicles Fugitive emissions	Purchased electricity, heat and steam	Purchased goods and services Business travel Employee commuting Waste disposal Use of sold products Transmission and Distribution (T&D) losses Investments Water consumption Leased assets and franchises

Table 3

However, the "scopes" approach does not fully capture the range of emissions sources over which local authorities have varying levels of influence such as its pension portfolio, transmission and distribution (T&D) losses of the energy it consumes and the procurement of goods and services. We state what scope 3 emissions are included when reporting progress made in the seven key themes.

The report also includes schools and council owned homes as part of this analysis. Strictly speaking these emissions should be evaluated as part of the borough wide analysis because the Council does not pay for their energy bills. However, the Council recognises its responsibility in maintaining the borough's schools and council homes which includes improving the energy consumption performance of these sites. This approach therefore goes beyond the GHG Protocol by including more carbon emissions for measurement and action.

Summary of Operational Emissions

A baselining exercise of our operational emissions was a key action outline in the CNP. Recorded data has been collected from the services and subsequently calculated into carbon emissions. While the reporting on emissions from in-house council operations is relatively well-developed, it remains incomplete. It has not yet been possible to measure the emissions associated with water consumption, procured goods and services or office waste for example. However, where we did have some scope 3 data, it has now been included to reflect our ability to influence these emissions – such as paper consumption and T&D losses. Given this continuing data refinement, it is not possible to reliably compare total in-house emissions reported in the baseline – the increase in emissions from the low baseline evidence improvements to data collection, rather than an increase in emissions. Better data scrutiny and the onboarding of additional scope 3 emissions demonstrates we are committed to improving our monitoring, reporting and mitigation of the emissions categories within our ability to lever influence.

It should be noted that we first reported these emissions separately across our online published CNP, this review presents the first opportunity to consider all operational emissions in one place. Operational emissions are summarised in table 4 and figures 8, 9 and 10 below. As stated above, we provide the emissions from the previous reporting periods to contextualise the progress made in our first year:

- Due to covid restrictions our operational emissions dropped from 31 ktco2e in 2019/20 to 25.7 ktco2e in 2020/21 – a 21% drop
- This has modestly increased by 1 ktco2e (4.5%) in 2021/22 since the lifting of restrictions and a partial return to the office
- In 2020/21 our corporate stock saw a 2.2 ktco2e decrease from 2019/20..
- Schools also saw a decrease around 1.7 ktco2e from 2019/20 – 2020/21.
- Schools' emissions rose by 19% (approx. 1 ktco2e) in 2021/22, which is in line with the return of pupils to classrooms.
- Our temporary accommodation made modest reductions of approximal 500 tco2e in 2020/21 in the same period, but has remained at that figure in 2021/22

Although solely provided to serve as context for our first year's progress, 2020-21 should be considered an outlier in the data analysis given the reduced occupancy rates. It is therefore perhaps best to compare emissions in 2021-22 to those in 2019-20 for a better like-for-like comparison. When we take this comparison**, our current 25.7 ktco2e operational emissions are 5.4 ktco2e (17%) lower than 2019/20**. This is promising to see as we have managed to ensure a net loss of emissions even when accounting for the reduced services associated with covid restrictions. The slight increase of 4.5% is to be expected, but we will work to ensure these emissions do not continue this trajectory.

Table 4

	CNP Operational Emissions Progress						
	16/17 Baseline Year Emissions (ktCO2e/yr)	**2019/20 Emissions (ktCO2e/yr)**	**2020/21 Emissions (ktCO2e/yr)**	**2021/22 Emissions (ktCO2e/yr)**	**Annual ktco2e Change**	**Annual Percentage change**	**% of total emissions**
Corporate	6	8.4	6.2	6.5	0.3	4%	25%
Temporary Accomodation		8.5	8	8	-0.03	-0.4%	31%
Schools	0.1	6.7	5	6	1	19%	24%
Unmetered Supply (Street lighting etc.)	4.8	4	2.68	2.65	0	-1%	10%
Fleet		3.5	2.4	2.3	-0.1	-3%	9%
Plant Machinery			0.07	0.06	-0.02	-22%	0.2%
Office Waste							
Water							
Office Paper Use				0.01	0.01		0.1%
Total (tCO2e/yr) excl. Council Owned Homes	11	31	24.6	**25.7**	1.1	4%	100%
Council Owned Homes	Not Recorded	65	63	61	-2	-3.6%	70%
Total (tCO2e/yr) incl. Council Owned Homes	11	96	88	**87**	-1	-1.4%	

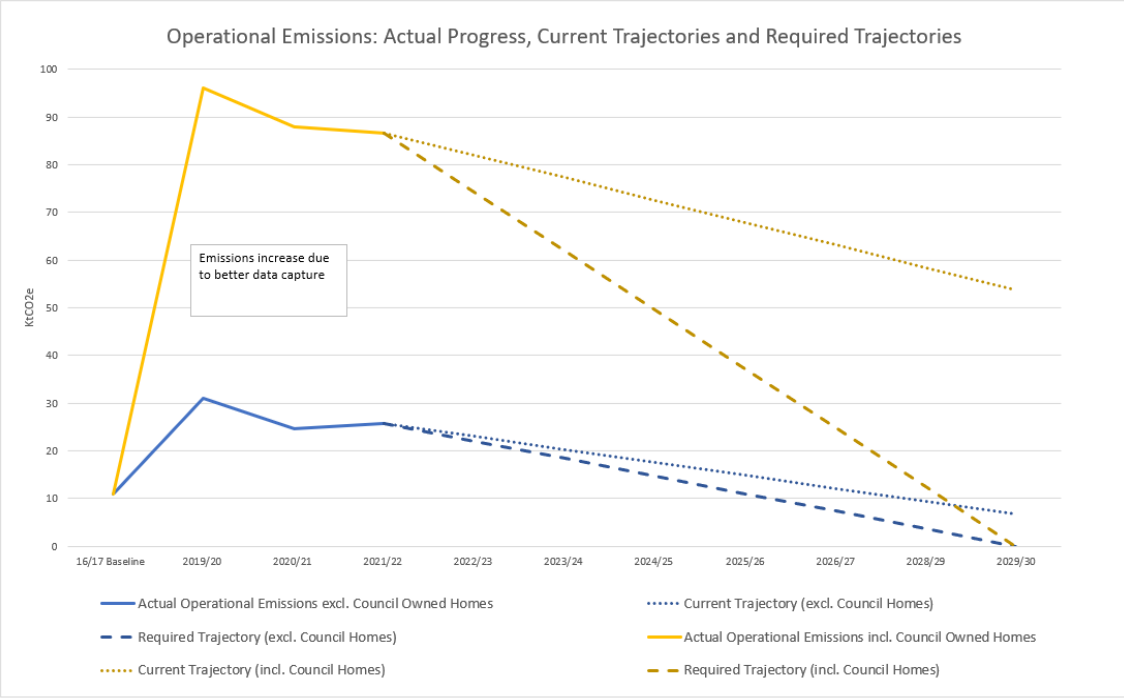


Figure 8

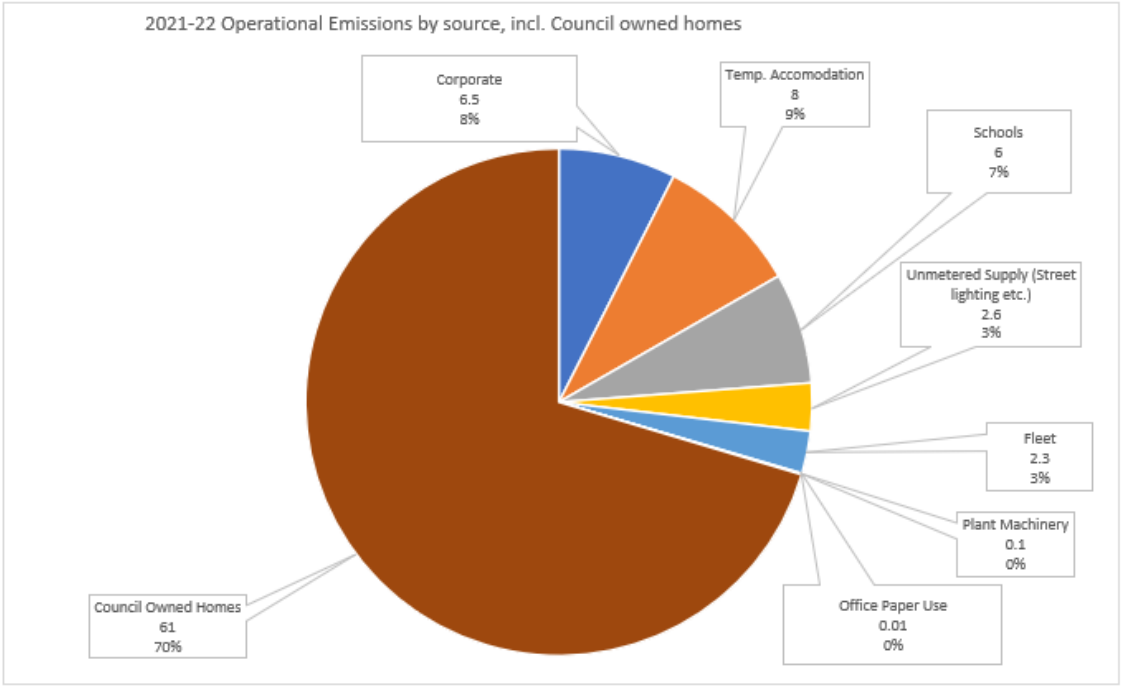


Figure 9

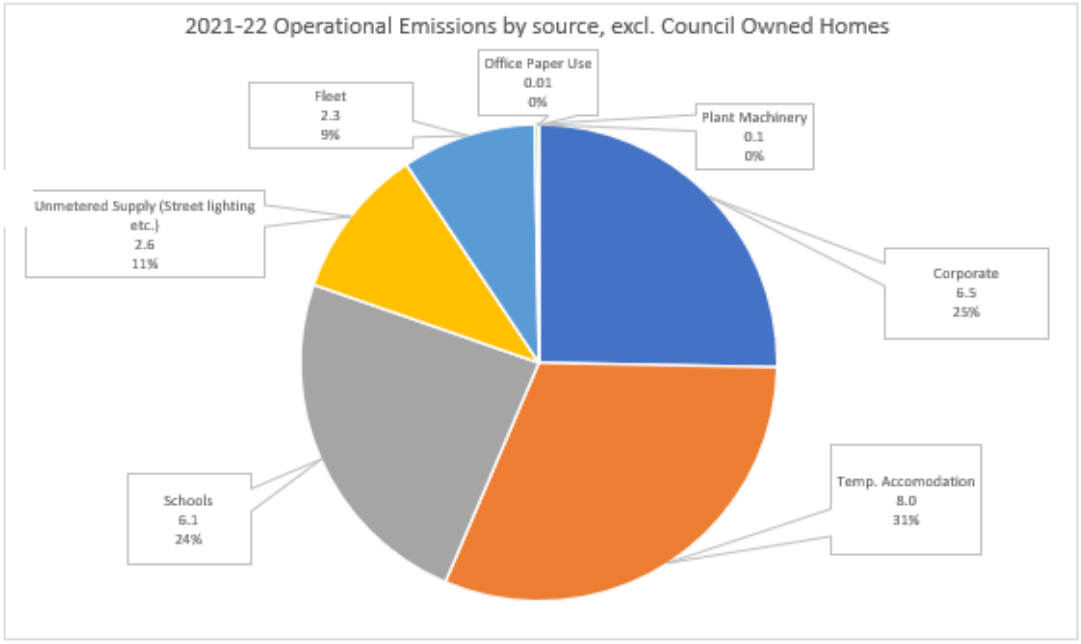


Figure 10

7.1 Buildings

Headline

Buildings are the Council's largest source of emissions, with Council owned homes (70%) and temporary accommodation (9%) placing the domestic sector as an area of priority given the co-benefits (health, financial) of reduced energy bills for residents. The Housing Capital Programme totalling £25.2m carried out improvement works benefitting 3,860 homes, of which 597 tCO2e were saved from 2020/21- 2021/22. Corporate property stock accounts for 25% (6.5 ktco2e) of RBG's built environment responsibilities when excluding council owned homes. RBG successfully applied to the Public Sector Decarbonisation Scheme (PSDS) to provide the capital for 8 Council sites, totalling at approximately £1,567,000. Data is not available to confirm the projected kWh and tco2 savings as we have yet to run the new systems for a 12-month period since completion. Schools account for 24% (6.13 ktco2e) of RBG's emissions when excluding Council owned homes. An additional PSDS grant, totalling £2,755,259.28, covers a range of decarbonisation measures, such as air source heat pumps (ASHPs), photovoltaic panels (PV), LED lighting upgrades and valve/pipe insulation. An annual saving of £48,433 is estimated, with approximately 310 tco2e per annum. Street lighting (and additional unmetered supplies) accounts for 10% of RBG's total carbon emissions – excluding council owned homes. The carbon savings are estimated at 153 tCO2e per annum. The specific financial savings based on reduced energy consumption amount to an estimated £410,000 per annum.

7.1.1 Buildings: Council Owned Homes

Summary

Council owned homes make up 70% of the emissions (61 ktco2e) that RBG has some level of influence over. This equates to approximately 9% of total borough emissions.

The energy performance of the UK's social rented sector is generally better than private housing, partly because of energy efficiency and fuel poverty regulations, and partly because social landlords (RSLs) are proactively tackling the energy efficient retrofit of their properties. The sector is already investing and driving innovation in this area. As a result, 64% of housing association homes already have an EPC rating of C or above, according to The National Housing Federation's report, 'Decarbonisation: a guide for housing associations' (2021), compared to 35.6% of owner-occupied homes.

Yet the full cost of getting social housing to net zero is still daunting. Using *Parity Projects Portfolio* - local authority housing stock software, we can forecast the costs to reach net zero by the end of the decade. Without financial support from central government, it is obvious RBG is severely limited in what it can achieve. Figure 11 below shows the cost of retrofitting the borough's social housing stock to zero carbon.

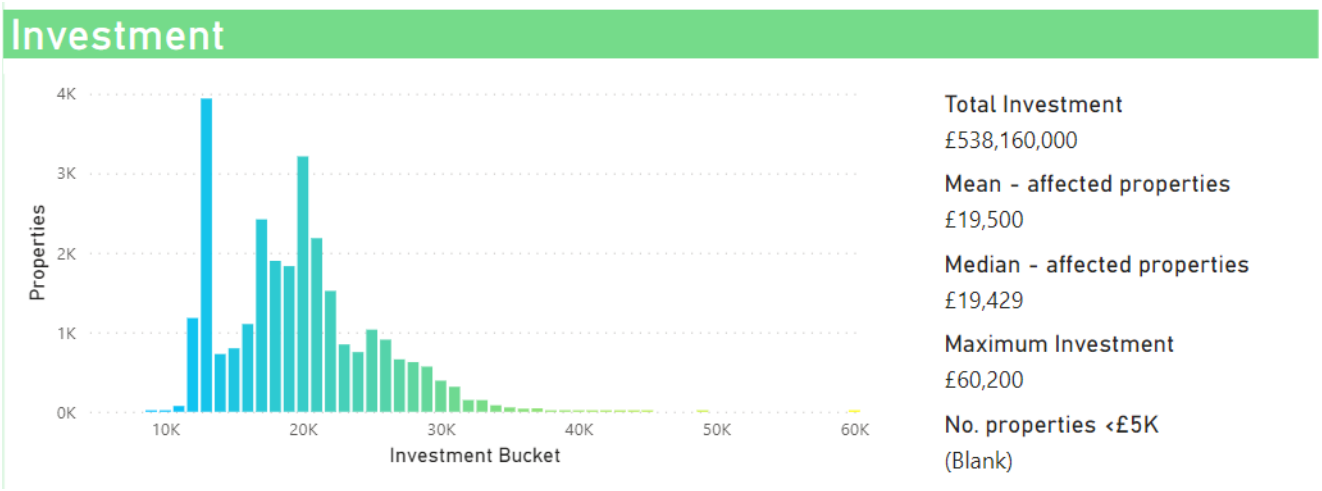


Figure 11

Progress

In 2021/22 the Repairs and Investment team delivered a Housing Capital Programme totalling £25.2m, against a £29m ASR (Annual Spend Requirement), carrying out much needed and overdue works benefitting 3,860 homes. These projects were delivered despite a challenging year, with Covid-19 restrictions still very much in place and having to manage Contractors who are suffering from an industrywide supply chain problem and general economic difficulties. Capital Investment are continuing to work to the transition of Council homes towards zero carbon. Table 5 details the specific works delivered over the past 2 reporting periods that will realise carbon savings. Boiler replacements was the measure most implemented and also achieved the most carbon savings. Going forward, this will be measured and quantified as part of contract delivery and a dashboard has been set up to help track delivery.

Carbon saving measures implemented to our Council Houses				
	2020-21		**2021-22**	
Type of works	**Homes**	**tco2e**	**Homes**	**tco2e**
Individual Boiler replacement - *Installation of 'A Rated" boilers*	398	169	619	260
Communal Heating replacement and Renewal of Services	331	141	296	
Lateral mains replacements including communal lighting and emergency lighting upgrades	351	12	419	15
Total tCO2e Saved		**322**		**275**

Table 5

The carbon savings are good progress but do not account for the total emissions reductions in the table above. It is assumed that these reductions are also in part due to grid decarbonisation also.

7.1.2 Buildings: Temporary Accommodation

Summary

Under Housing Law, if a person or family becomes homeless and urgently needs a home, the Council may provide temporary accommodation while helping them find long-term housing. This is called temporary accommodation because it is a temporary solution, and therefore differs from the council owned homes we assess in the preceding chapter.

Progress

The location, size, and rent of these properties may vary; temporary housing includes:

- a private flat or house
- a council or housing association flat
- housing with support (i.e., you have your own home and support is put in place to help you live independently.)

Temporary accommodation is the largest source of operational emissions (31%) when excluding council owned homes. Emissions dropped by 500 tco2e in 2020/21 and this has decreased again by 0.4% in 2021/22. As figure 9 shows, **Temporary Accommodation and Council owned homes make up 79% of the emissions** that we consider within our ability to influence. Domestic sector emissions, whether considering operational or borough, remain the singular largest source of emissions.

7.1.3 Buildings: Corporate Property Stock

Summary

Corporate property stock accounts for 25% (6.5 ktco2e) of RBG's built environment responsibilities when excluding council owned homes. 2020-21 saw significant reductions in carbon emissions due to the lower energy consumption at the offices (a 2.2 ktco2e decrease). This is due to the Covid-19 retractions as staff were working from home. Emissions rose in 2021-22 as a partial return to the office occurred in line with the lifting of restrictions. T&D losses have been included in this report's analysis given they are directly tied to our consumption activity and therefore somewhat within our ability to reduce through better energy demand management practises. Our intention is to pilot new technologies and monitor progress to prove the case for a wider roll out of technological solutions to deliver a net zero position in line with our RBG policy.

Managing the council's building stock has a direct impact on the CNP's delivery. Whether that involves constructing new buildings to meet modern standards to reduce carbon emissions, undertaking maintenance to improve assets or ensuring facilities management services are undertaken to minimise carbon emissions, the role is all about the built environment therefore directly linking carbon emissions of the council's owned assets. Following a competitive tendering process through the RE:FIT Framework, Asset+ were appointed as an Energy Partner to the Royal Borough of Greenwich to assist their carbon reduction objectives through the delivery of a comprehensive energy performance contract. Bids have been submitted and been successful in securing funding from the Governments Public Sector Decarbonisation Scheme (PSDS).

Recent activities have resulted in Low carbon heating (air source heat pumps) installed at 28 sites via PSDS funding with an estimated 750 tonnes co2 per annum reduction. £5.8m of PSDS grant funding was received for these works.

Our stock condition surveys of corporate property assets have identified circa £190m of condition issues across the estate, with circa £50m of demand in the next 5 years. **The cost to decarbonise the entire corporate property estate is circa £500m.** Whilst RBG can continue to make good progress in its PSDS applications, we are very much dependant on further government funding if we are to reach our targets.

Progress

We have produced a heat decarbonisation plan (HDP) for our corporate property assets. The purpose of the HDP is to replace fossil fuel reliant heating systems with more energy efficient sustainable measures that reduce the council's heat energy demand. This will help reduce carbon emissions and promote new technologies such as renewable energy and heat pumps. Through proactive action, government funding was secured to undertake analysis and produce a Heat Decarbonisation Plan (HDP) for the corporate estate.

8 Council sites were identified where carbon reduction technologies could be utilised to reduce the energy consumption and related CO2 created during building operations. RBG successfully applied to the Public Sector Decarbonisation Scheme (PSDS) to provide the capital for the works, totalling at approximately £1,567,000. We are committed to working as efficiently as possible and so the carbon reduction works were delivered alongside other general improvement/refurbishment works. All PSDS works have now completed and Salix has confirmed the output calculations and project data as acceptable.

Data is not available to confirm the projected kWh and tco2 savings as we have yet to run the new systems for a 12-month period since completion. However, savings are currently estimated at 149 tco2e per annum – this will be verified and presented in subsequent reports once all data has been collected. At time of writing the estimated annual financial savings are £36,400, although given the current energy crisis this may be higher.

Following successful completion of the pilot PSDS works a further bid for PSDS phase 3B has been made and we await the outcome of this bid. If successful works will take place in 2023/24.

7.1.4 Buildings: Schools

Summary

Schools account for 24% (6.13 ktco2e) of RBG's emissions when excluding Council owned homes. This is up from 5.17 Ktco2e the previous year – a 19% increase in emissions. This increase is due to the return of pupils after lockdown restrictions were lifted. We refer to council maintained schools in our analysis and do not include academies – who are responsible for their own upkeep (and therefore we have little to no influence in these emissions).

Schools are large consumers of energy and stretched budgets have been exacerbated with the cost of energy crisis – with some seeing a 200% increase to their energy bills. Properly insulated schools are essential to providing a comfortable learning environment for the borough's students and prevents illness. This is especially important given many families will be forced to reduce heating their homes this winter due to rising costs. Reducing schools' energy consumption across the borough therefore achieves educational, health and financial co-benefits, alongside the carbon reduction for environmental purposes.

Progress

The Royal Borough of Greenwich has successfully compiled and completed Phase 1 of the PSDS (Public Sector Decarbonisation Scheme) on behalf of 8 schools across the Borough. A further seven schools also applied on their own accord. The PSDS grant, totalling £2,755,259.28, covers a range of decarbonisation measures, such as air source heat pumps (ASHPs), photovoltaic panels (PV), LED lighting upgrades and valve/pipe insulation. An annual saving of £48,433 is estimated, with approximately 310 tco2e per annum. The savings will be realised and verified after one full year of operations. Progress in this area is summarised below:

3. PSDS Final Scope

Headline Figures

- Carbon saving:
  - 309.72 tonnes/pa
- Energy saving:
  - 1,931,671 kWh/pa
- Financial saving:
  - £48,433/pa
- Compliancy*[1]
  - £494.63tCO2eLT
- Total Grant Award
  - £2,755,259.28

[1]To qualify for the grant the scheme needed to be under £500/tCO2eLT

Final Scope Matrix

	Energy Conservation Measures				
School	ASHP	LED Lighting	Solar PV	Battery Storage	Power Upgrade Works
Ealdham		X	X	X	
Gordon	X				X
Greenacres	X	X			
Greenslade	X	X			
Middle Park		X	X	X	
Newhaven	X	X	X	X	X
Plumcroft - Plum Lane, Genesta Bldg			X		
Pound Park			X		
Henwick		X			
Mulgrave		X			
Sherington		X			
Haimo Primary			X	X	
Discovery Primary School	X	X	X	X	X
James Wolfe School (Randall Place Campus)	X	X	X		X
James Wolfe School (Royal Hill Campus)	X	X	X		X

7.1.5 Buildings: Street Lighting

Summary

We have already upgraded approximately 16,000 streetlights and the Council set itself the target to replace a further 17,365 inefficient streetlights with LED lighting – to realise cost and carbon savings. Street lighting (and additional unmetered supplies) accounts for 10% of RBG's total carbon emissions – excluding council owned homes. There has been a decrease in emissions on the previous year by about a 1% decrease.

Progress

The LED programme started on time and is near completion, 10 months ahead of schedule. Monthly updates are provided from the street lighting team on progress which in turn is sent to our energy administrators to update our inventory which they calculate into reduced costs for the council. Measures implemented such as dimming profiles and improved day daylight saving hours calculations allowed for reduced consumption and more accurate half hourly ready for energy pricing. The reduced maintenance that is required for LED means that there are less vehicles on the road carrying out repairs which equates to less vehicle emissions. All these works equate to over £1 million a year saving on the council's street lighting energy budget. The carbon savings are estimated at 153 tCO2e per annum. The specific financial savings based on reduced energy consumption amount to an estimated £410,000 per annum.

Some areas of the borough require less output due to the white light of the LED's. We are currently investigating further output reductions in line with the British Standards that will reduce kWh and CO2 even further. Due to the reductions in costs, we are also proposing to reduce the energy consumption on other street furniture which includes traffic signs and bollards etc. This will be

achieved by either converting to LED or de-illuminating altogether in line with the TSRDG – Traffic Signs Regulation and General Direction 2016.

7.2 New Development

Headline

We are on track to achieve phase one of the Greenwich Builds programme which aims to deliver 750 new Council homes. We have completed the development of 31 sites that have received planning permission with achievements of upwards of 90% above the Part L baseline. Emissions saved will be verified after one year of full occupancy.

Summary

Although retrofitting the corporate stock improvement will achieve direct financial savings and tackling RBG's housing stock is the opportunity for the biggest carbon savings; we must also ensure that any new developments do not require the same extent of retrofitting in the years to come. Designing and developing builds with sustainability principles considered from the outset will mitigate on-site carbon operational emissions, realise energy savings and will make homes more pleasant to live in through the use of smart architectural design such as *passive haus* measures.

Progress

Our role in Greenwich Builds is to design and develop new Council homes, that are net zero-carbon, at council rent for those on the Council waiting list. We are on track to achieve phase one of the GBs programme which aims to deliver 750 new Council homes. **We have completed development of 31 sites** that have received planning permission with achievements of upwards of 90% above the Part L baseline. Two exceptions are Kidbrooke Park Road North and South, which reach 71% and 73% respectively, to which carbon credits are being purchased to offset and make NZC. We are unable to achieve the 100% reduction on these two projects as they are apartments of 11/12 storeys and we do not have enough land/roof area to install photovoltaics etc. Orangery Lane has the highest carbon reduction and will achieve 110% above part L – with most sites above 100%. Tenants are feedbacking positively on the new homes and the benefits of modern NZC homes.

7.3 Council's Fleet

Headline

Council fleet emissions are down by 3% on the previous year to 70 tCO2e. We now have 30 EVs in the Council's fleet. The transition to an entire EV fleet is currently being impeded by technological and infrastructure issues at the Birchmere Centre. Additional feasibility reports are underway to identify solutions.

Summary

This part of the report assesses progress against the Council's fleet emissions. For all other emissions arising from transport, please see what we are doing in Section 8 of the report. Fleet emissions currently make up 8.7% of RBG's total emissions, and have registered a slight decrease in emissions, 70 tco2e (-3%), on the previous year.

Progress

So far 30 electric vehicles (EVs) were successfully integrated into the fleet that operated within Street Services, Caretaking, Repairs & Investment, Disability & Home Improvement, and Safer Spaces. This is out of a fleet of 532 vehicles (including 76 of our contractors). 5 Vehicle to Grid chargers were successfully installed and used at the Birchmere Centre as part of a GLA led Innovate UK funded trial.

Further EV transition was not possible due to power constraints within the Birchmere depot that would be maximised by the total of 30 EVs. DG Cities were commissioned in 2020 to undertake a feasibility study to get a better understanding of the costs and further research required to transition the fleet to 100% EV by 2030. The feasibility study highlighted the environmental benefits of transition, the estimated costs of EVs in terms of Opex and Capex (that determined a higher overall cost than a diesel fleet given the journey types undertaken within the Borough). The Birchmere electrification/investment strategy has now been reviewed and is in its second phase. This will set the direction for the further work that will be required on this project.

7.4 Energy Supply

We consider reducing energy demand in the built environment as the most cost-effective way to reduce emissions given the associated health and financial co-benefits that our residents will achieve (reduced risk of excess cold exposure and savings on energy bills respectively). However, we must also ensure that what energy does get supplied to our buildings is generated from renewable and zero carbon sources such as solar, wind, heat pumps etc. The means in which our energy is delivered is also often overlooked when we consider energy supply, and we must consider the capabilities of the national grid when exploring energy supply alternatives. In some places such as West London, the grid is already at capacity[1], meaning we must explore options of local generation to ensure supply resiliency. **All work we have progressed in this area is therefore appraised in the borough emissions section.**

7.5 The Circular Economy

Headline

Most Circular Economy initiatives are addressed in Section 8. The Council's circular green waste practises have saved approximately 44.5 tco2e of emissions.

Summary

We do not currently record the office waste generated from our corporate stock and so cannot measure the associated carbon reduction from any waste saving initiative that we may be able to influence. To see progress made against the emissions arising from our municipal waste, please read section 8. Despite this, we implement circular economy practices around the waste that we do capture from our parks and open spaces.

Progress

Per annum our parks and open spaces produce approximately 500 tonnes of our own organic mulch, made from green waste, bark and wood chips. As mulch decomposes over time it adds nutrients and

[1] West London Electrical Capacity Constraints

texture to the soil during this process. These added nutrients improve the health and fertility of the soil. Nutrient-Rich soil is ideal for plants and increasing biodiversity locally as well as the worms and other insects that aerate the soil. We estimate this results in **44.5 tco2e of emissions prevented** through municipal waste processes.

7.6 The Natural Environment

Headline

We have surpassed our tree planting target for the financial year. Since 2020 we have planted a net total of 1253 trees across the borough. The estimated total carbon saved by the end of the decade is 75 tco2e. Switching our plant machinery from petrol to electric has resulted in a 20% drop from the previous year. Although a modest amount of our Operational Emissions, a high visible initiative shows the public we are leading by example.

7.6.1 Tree Planting Programme

Summary

Planting trees benefits the community by improving the air quality, removing pollution, absorbing and storing carbon, alleviating rainwater run-off and cooling the local environment. Maintaining plants and protecting council trees supports a long-term increase in tree canopy cover, also encourages habitats for wildlife and enhances biodiversity. Trees are the 'lungs of our city' and they can make a real difference improving quality of life of our residents.

Extreme weather conditions (record high temperatures, drought conditions) had a significant impact on young tree establishment. Despite an increase in planned watering there is likely to be an increase in tree morbidity over the typical 90% success rate although this will not be known until the onset of the next growing season (many trees being able to recover). Additional funding for watering beyond the first year needs to be included in future tree planting costings.

Progress

Despite these challenges, the Council set itself the target to plant 300 trees in 2021-22 and we are very proud to say that this figure has been surpassed. 323 individual 'standard' trees have been planted on highways and parks sites during the winter 2021/22 planting season including 23 COVID memorial trees. An additional 48 standard trees were planted on Housing sites. The Service has also supported multiple other small scale parks tree planting projects. The specification and location of trees based upon species characteristics and site factors were considered when planting. Since 2020 we have planted a net total of 1253 trees across the borough.

Calculating the carbon sequestered by trees is dependent on various factors including species, urban/rural location, the attrition rates, density of planting, established size at nursery etc. Carbon sequestration also increases as the tree matures so sequestration is not a fixed annual rate. As such, the calculated carbon captured by these trees planted forecasts to a 10-year maturity period, estimated at 22 tco2e by 2031. Including planting activity since 2020**, the estimated total is 75 tco2e saved by the end of the decade.**

7.6.2 Plant Machinery/ Hand Tools

Summary

Plant machinery is now being recorded separately from our fleet emissions (total petrol usage previously reported without split). Plant machinery currently makes up only 0.2% (58 tco2e) of our operational emissions, this is down by 20% from the previous year. However, this equipment is highly visible to the public and therefore whilst these emissions may not form an area of priority, the transition away from petrol equipment demonstrates to our residents that we are leading by example.

Progress

We are in the process of phasing out 2 stroke petrol powered hand-operated grounds maintenance machinery associated with high emission levels. The plan is to undertake a phased transfer towards battery-powered equipment that can help lessen carbon emissions and noise pollution impact. The Target for 2023 has been met for achieving 25% battery handheld tools through a step-change programme of replacing Parks Grounds Maintenance and Arboricultural blowers, replacing older or scrapped items of equipment where suitable alternatives exist on the market and general consolidation of the fleet size. We have been at the forefront of the transition to battery-powered equipment and have developed innovative solutions to ensuring that the charging network is in place (charging banks, inverters fitted in vehicles, etc.). We have involved and consulted staff on our changes to ensure that concerns are addressed e.g. alternative carrying systems to reduce weight of equipment. Block replacement of blowers has enabled smoother / faster transition but has required substantial financial investment.

We are currently investigating how the abated emissions arising from this transition can be calculated and look forward to sharing the results in the next review.

7.7 <u>Empowering Wider Change</u>

Headline

Most of our Empowering Wider Change actions are related to reducing borough emissions and so more information can be found in Section 8. However, we continue to acknowledge the areas where our decisions can reduce carbon emissions, including our procurement processes and pension investments. As a London Borough we have relatively strong buying power which can lever influence over our procurement and investment decisions.

7.7.1 Pension Divestments

Summary

We committed to reducing our investments in fossil fuels and to reallocate the capital into sustainable initiatives. A key starting position was to measure the current Fund's associated carbon footprint. The RBG Pension Fund undertook initial groundwork ahead of the consultation in relation to reporting on its carbon footprint metrics. In December 2021 the Pension Investment and Administration Panel (the 'Panel) received an initial report on the carbon footprint information available to the Fund, including information on the 'Meaning and Metrics' of carbon footprint data and the 'Coverage and Availability' of this data within the Fund. This work was driven by the Funds ideal to include environmental, social and governance (ESG) factors within its day-to-day operation and is the foundation for production of the Funds updated Responsible Investment (RI) Policy. In line

with the Fund's strategy, officers spent time researching and collaborating with other counterparties on the metrics for carbon footprint information.

Progress

Officers reviewed different third-party services on ESG/carbon footprint reporting to select a provider. Following this exercise, the London Collective Investment Vehicle (LCIV) Climate Analytics reporting was selected. Panel & Board members attended a dedicated Responsible Investment Away Day in February 2022 during which the LCIV presented information on climate analytics covering subjects such as carbon neutrality, decarbonisation targets and fossil fuel and carbon footprint metrics. The Fund has therefore achieved its target of appointing a provider for carbon metric data. In line with its Net Zero Roadmap, the Fund is due to finalise the carbon metrics data and frequency of reporting in Q4 2022. Training on TCFD will also be undertaken by the end of Q1 2023.

In September 2020, following an asset/liability study the Pension Investment and Administration Panel formally agreed a new asset allocation. In order to reduce the pension fund's carbon footprint further and to maximize the opportunities provided by climate change, the Fund has looked at the impact investing via the London Collective Investment Vehicle (LCIV). The LCIV Renewable Infrastructure Fund focuses on investing in 100% in renewable energy infrastructure assets ('renewables') by investing in brownfield and greenfield investments. This will include generation, transmission, and distribution assets.

We are on track to achieve this. In June 2021 the Panel agreed to invest 2.5% of its new 5% infrastructure allocation in the London Collective Investment Vehicle (LCIV) Renewable Infrastructure Fund, leaving a further 2.5% to be allocated to other areas on infrastructure to provide further diversification.

We also committed to investigating partnerships with other London boroughs in the same fund. In line with the LGPS pooling agenda, the Fund looks to pool its investments via the LCIV appropriate and possible. The Fund must, however, do this in line with its fiduciary duty to its members. The LCIV includes all London Boroughs and the City of London.

In July 2022, the Pension Fund Panel received a paper on the Pension Fund carbon footprint data, which provided a detailed review of each fund managers footprint and the largest contributors in their portfolio. In September 2022, the Panel noted a paper regarding the next steps for reviewing low carbon alternatives. The paper introduces the review of the Pension Fund's listed equity investments, with follow up discussion to take place at the Strategy Away Day in November and a Fund selection exercise being undertaken early in 2023. The LCIV low carbon equity fund will be reviewed as part of this exercise.

7.7.2 Procurement Processes

Summary

Sustainable procurement is the process of making purchasing decisions that meet an organization's needs for goods and services in a way that benefits not only the organization but society as a whole, while minimizing its impact on the environment. This is achieved by ensuring that the working conditions of its suppliers' employees are decent, the products or services purchased are sustainable, where possible, and that socio-economic issues such as inequality and poverty are addressed. Commissioning and procurement of goods and services also provides the best opportunity to re-evaluate the business-as-usual way of delivering services for our residents. Given

its purchasing power, RBG can ask more from its suppliers by not only setting strong contract criteria, but also investigating alternative business models. Such business models for exploration should seek to deliver the core contracts' functions but also ensure environmental and social issues are holistically considered at the beginning of the procurement process as opposed to being added on at the end as if it were an afterthought.

Progress

Procurement is currently consulting across departments to inform the drafting of the low the carbon criteria requirements for tender documentation and internal reports. The inclusion of low carbon criteria within social value outcomes sought is ongoing but the extent of this very dependent on the department's priorities and the nature of the service to be procured as some services will benefit more from such criteria than others.

7.8 Operational Emissions - Conclusion

Operational emissions have been re-baselined as we have continued to improve our data collection and reporting processes. We have included several sources of scope 3 emissions that we did not have to report as our own – such as council owned homes, T&D losses and paper consumption – but are included as we recognise that we can influence these emissions through investment and managing our consumption. This is not yet complete as more sources can be monitored such as office waste and our water consumption. Given this continuing data refinement, it is not possible to reliably compare total in-house emissions reported in the baseline year. The increase in emissions from the low baseline evidence improvements to data collection rather than any particular increase in consumption.

Emissions around the RBG's building use dropped significantly in the CNP's 2nd year with schools seeing a 3.8 ktco2e decrease from the previous year. Corporate building stock also saw a decrease around 800 tco2e. As lockdown was lifted and staff and pupils returned to council offices and schools emissions rose by 19% and 8% respectively, an increase that was always expected. Year 2 of the CNP is therefore considered an outlier in the data analysis given the reduced occupancy rates. It is therefore perhaps best to compare the most recent progress to Year 1 for a better like-for-like comparison.

We have made significant progress in our action plan – particularly with our successful applications to the PSDS retrofit programmes for our corporate stock and schools, which secured multi-million pounds worth of funding. Although a smaller share of emissions, we have exceeded our plant machinery and our tree planting programme targets. We are also making headway in our pension divestments – with a very clear pathway forward in understanding the carbon impacts of our fund.

In some areas, such as the Circular Economy and Energy Supply, are further explored further in section 8 as most actions within the CNP relate to borough emissions reductions.

By the same principles, most of our work in the transport theme is strategic and will enable carbon mitigation at the borough level. However, we strongly believe in leading by example and have made good progress in decarbonising our own fleet.

There is still much to do in for our operations to achieve carbon neutrality by 2030 – but we have made significant progress against our listed actions despite a challenging period presented by covid and the energy crisis.

Section 8: Reporting Borough Emissions

8.1 Scope of Reporting Borough Emissions

The borough wide emissions is reported using a mixture of nationally distributed data and some assumptions taken where the data is not considered accurate or available. Examining total emissions by separate sectors highlights the distinct areas for action at a high level, borough wide basis. The Council will continue to calculate co2 emissions in the sections the evidence base conducted its initial report.

- Homes: emissions arising from residential properties
- Workplaces: emissions arising from business, public sector, industry sectors
- Transport: emissions arising from the transport sector

Emissions included within the Council's carbon neutral 2030 target are those arising from sectoral activities, and the production of energy used, within the Royal Borough of Greenwich's boundaries. The analysis of these sectors covers a wide range of emissions sources, which are categorised as follows:

Scope 1: Emissions occurring directly inside the borough.

Scope 2: Emissions taking place outside the borough arising from energy use in the borough (this mainly covers emissions from electricity demand in the borough, but also emissions from district heating where the heat is generated outside the borough).

Scope 3: Other emissions taking place outside the borough, covering embedded emissions and travel outside the borough.

The analysis currently excludes most forms of 'Scope 3' emissions (embedded emissions) but we recognise that actions to address these emissions must be considered as part of wider climate change ambition strategies. In addition, emissions from the disposal of waste generated within the borough but disposed outside of its boundaries are included, reflecting the level of influence the council has in encouraging residents to produce less waste. The most significant sources of emissions excluded within this definition are the embedded emissions of products and services and further research needs to be undertaken in this area to inform our own procurement decisions and encouraging the public to consume more sustainably. The inclusion of the emissions scopes, and their activities, are summarised in Figure 12 below.

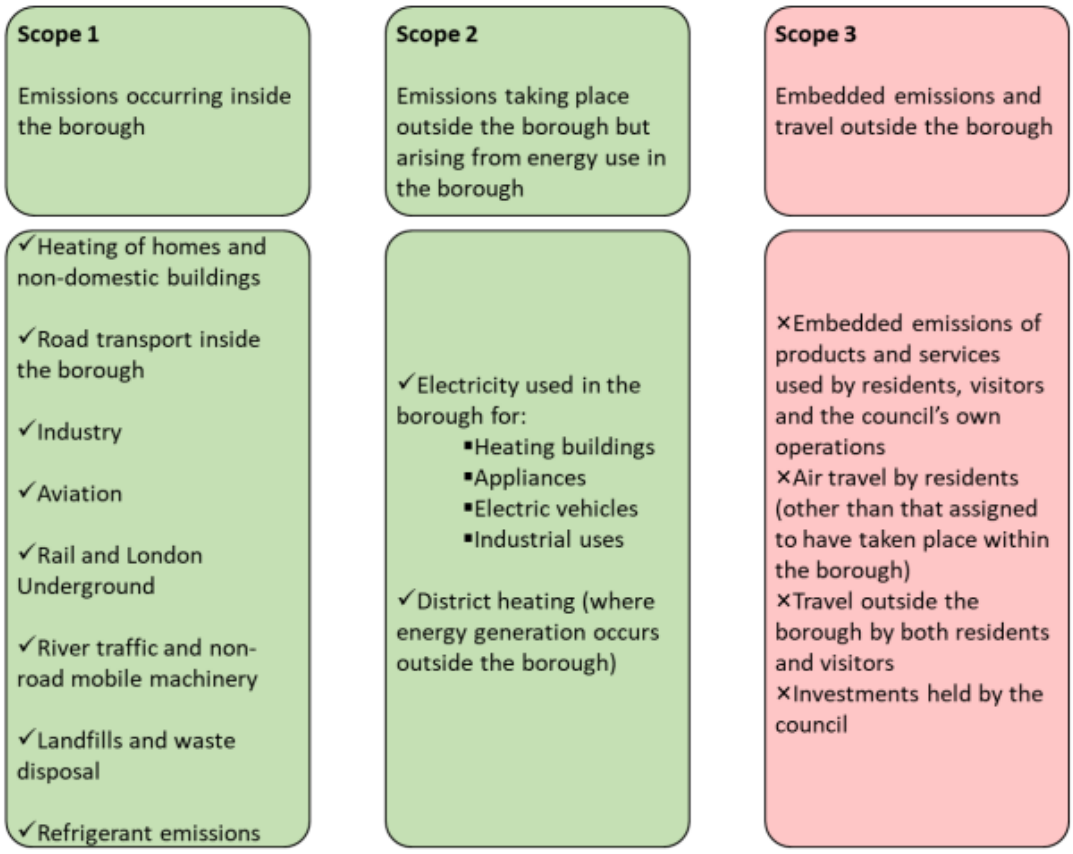


Figure 12

By focusing on scopes 1 and 2, the approach has the advantage of avoiding the risk of double counting emissions and of mapping most closely onto available policy levers. The approach taken is also reflective of our ability to influence and where control is greatest over the emissions directly taking place within the borough. When covering each of the CNP's themes, analysis will discuss scopes 1 and 2 unless otherwise explicitly addressing scope 3 emissions.

8.2 Measuring Emissions – Commentary on Datasets

As discussed in Section 2 (Evidence Base chapter), The Evidence Base takes the year 2015 as the baseline against which progress is measured and as the starting point of its modelling, both for the Baseline Scenario and for the Maximum Ambition Scenario. This allows straightforward comparison with the London Environment Strategy, which states the ambition to become 'zero carbon' by 2050, using 2015 as its baseline year.

The Evidence Base uses many separate and complementary datasets to arrive to a bespoke carbon analysis – (please see Fig. 7.1 in the Evidence Base). For various reasons it is not possible to continue with such a methodology for each year such as: the resources required to access the datasets, license fees, officer time, 3rd party availability, technical expertise. There are also issues with the availability of up-to-date datasets. In 2022, the Department of Business, Energy & Industrial Strategy (BEIS) released national data for 2020 Carbon Dioxide (CO2) emissions by local authority. National CO2 data is released annually by BEIS 18 – 24 months after the reporting year-end. The data in these reports relates to the calendar (rather than financial) year and is expressed either as 'total' (the borough as a whole) or 'per capita' (average emissions per person) to provide more meaningful interpretation.

Therefore, there is a discrepancy in the emissions reporting years between sections 7 and 8 of this report. Whereas section 7 deals with the activities the Council has undertaken in the financial year 2021-2022, section 8 deals with the emissions arising from the 2020 calendar year. Whilst these parts follow the same structure, readers must note the difference in these reporting periods as they are not a like-for-like comparison. Naturally, the following annual report will provide commentary on any assumptions made regarding borough wide emissions.

The Council will continue to appraise the utility and value of the datasets to calculate the borough wide carbon emissions. New datasets will be appraised in line of best practise, what is practical in terms of resourcing, and in their availability. At the time of writing, datasets and tools such as the SCATTER Cities and the London Emissions Greenhouse Gas Inventory (LEGGI) are yet to publish 2020 data. These issues must be balanced with the Council's commitments to publish its plan annually.

8.2.1 Methodology

As mentioned in section 5 (summary of challenges) – the Covid-19 pandemic had a significant impact to all sectors of society, with "business as usual" completely disrupted. 2020 emissions are therefore expected to be an anomaly given the significant changes to the public's working and social habits. Emissions are expected to decrease across most sources of emissions. The impacts of this disruption are still being measured and contextualised to regional analysis (such as the LEGGI dataset which has yet to be released at time of writing). We have primarily used the 2020 BEIS dataset given that this is currently the only verified information available from a reputed source. We consider BEIS has historically over reported emissions in the transport sector, especially when comparing to more regionally contextualised datasets such as the LEGGI. The Evidence Base also produced close extrapolations to the LEGGI toolkit, giving confidence that BEIS over-reports these emissions. The BEIS dataset recorded a 15.6% reduction between calendar years 2019 to 2020. Transport emissions for 2020 are therefore calculated by applying the reduction rate in transport emissions to the LEGGI 2019 transport data. **Such figures serve as an interim figure** which can be reassessed when the data is made available in the future. The Borough emissions data sources are summarised in **table 6 below.**

Category	ktCO2e	Data Source
Homes	286	BEIS 2020 data
Workplaces	188	BEIS 2020 data
Transport	217	LEGGI 2019 actual data with BEIS annual transport reduction rate (-15.6%) applied
Total	**691**	

Table 6

To avoid the issues of data availability and resources spent on a multitude of datasets, in future, we will look to publish the annual CNP review 6 months later than currently scheduled which allows for time in collating and analysing the published datasets. We will also investigate the utility of setting up or commissioning our own bespoke borough emissions toolkit calculator to analyse borough emissions in line with the original assumptions set out in the Evidence Base.

8.3 Summary of Borough Emissions

At this stage it is important to note the baseline and reporting calendar years' progress (figures are rounded). Total borough emissions have dropped by an estimated 6% from calendar years 2019 to 2020. This is a drop in all sectors measured:

	Baseline year: 2015		2019		Year 2 - 2020		
	Emissions (kt CO2eq/year)	Percentage of total	Emissions (kt CO2eq/year)	Percentage of total	Emissions (kt CO2eq/year)	Percentage of total	% Change from previous year
Homes	349	41%	302	41%	286	42%	-5%
Workplaces	266	31%	203	27%	188	27%	-7%
Transport	244	28%	238	32%	217	31%	-4%
Total	859	100%	743*	100%	**691**	**100%**	**-6%**

Table 7

*Please note that the previous figure provided online for 2019 borough emissions is 733 ktco2e. This has been remeasured slightly as changes were made to non-road transport data by using the LEGGI data instead of the BEIS figures (a change from 5ktco2e to 15ktco2e). This results in a remeasured 2019 emissions at 743ktco2e, an increase by 10ktco2e.

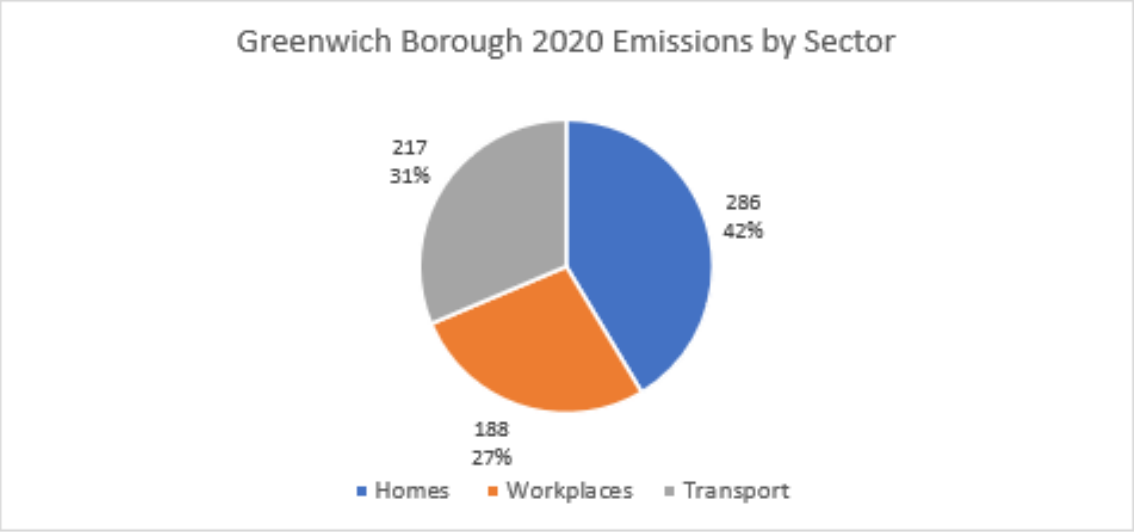


Figure 13

- The largest drop is workplaces (7%) which can most likely be attributed to the national restrictions put in place to mitigate the spread of Covid-19, which meant increased numbers of the public were working from home.

- Transport emissions were also expected to decrease given less commutes were made as people continued to work from home and the associated less vehicle usage by businesses. The transport emissions figures should be understood in the commentary on the datasets raised above.

- Consumption in homes was expected to go up given the increased energy usage throughout times when the public are normally outside their homes. Instead, a 4% drop in emissions on the previous year is estimated in this area. The assumed explanation is an increased decarbonisation of the grid and the associated emissions factors.

Although Homes, Workplaces and Transport are useful sectors to broadly assess the borough's emissions, a breakdown provides a more granular analysis and further separates emissions into areas of action. Figure 14 provides this breakdown, with some commentary on the data provided.

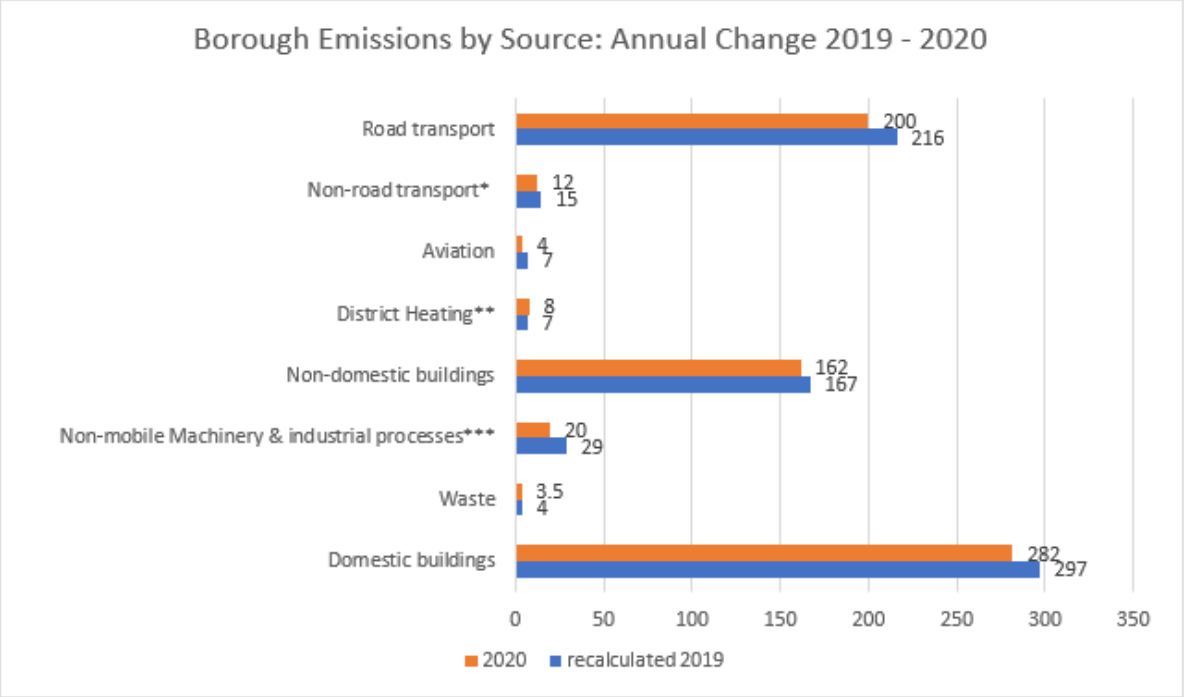


Figure 14

* Changes were made to non-road transport data by using the LEGGI data instead of the BEIS figures (a change from 5ktco2e to 15ktco2e on previous year).

** For illustrative purposes, district heating figures have been separated from domestic buildings and non-domestic buildings. They are factored back into Homes and Workplaces categories in table 7.

***BEIS also does not record non-mobile machinery emissions, making such granular analysis problematic. However, it appears to be included in "Industrial "Other" " BEIS dataset category and therefore non-mobile machinery has been combined with Industry to accommodate a like-for-like reporting process.

The single largest source of total emissions by emissions source is domestic buildings (42% of total emissions). When combined with non-domestic sector buildings (23%), the built environment accounts for 64% of total borough emissions in 2020. Addressing these emissions will require both energy demand reduction and alternative clean energy supply initiatives. Figure 15 shows that 2020 gas use in Homes makes up 72% emissions, **this accounts for 31% of total borough emissions**. Most of this consumption is associated with the use of gas boilers and stoves. Whilst being mindful of other sources of emissions (particularly transport due to the co-benefits of additional PM and NOX

emissions mitigation) **initiatives promoting the adoption of electrical heating systems and cooking appliances would naturally form the area of priority for the Council to influence borough wide emissions.**

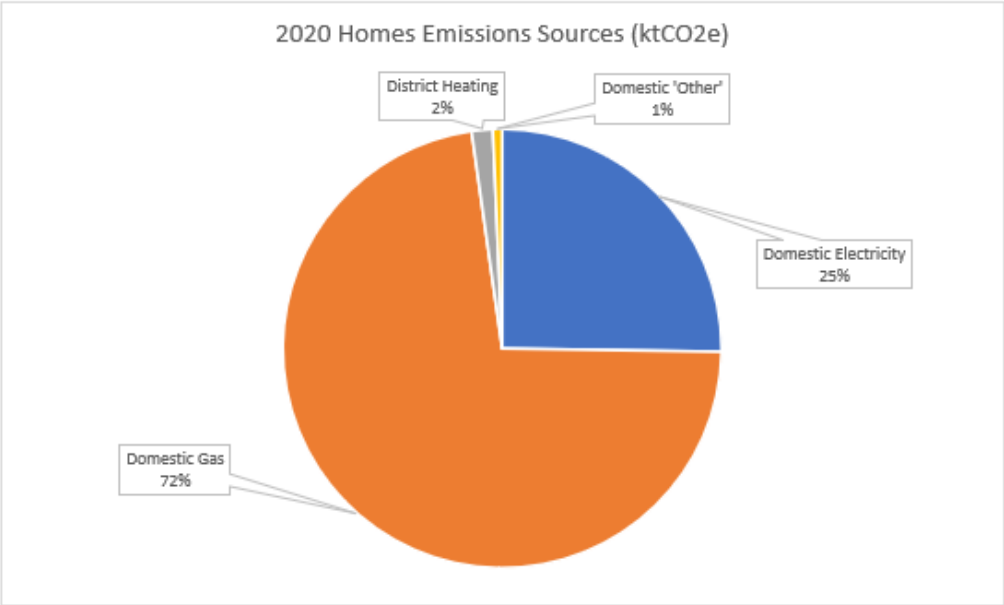


Figure 15

8.3.1 Sectoral per Capita Co2 Emissions

Figure 16 compares RBG sectoral (homes, workplaces, and transport) per capita emissions against Greater London averages. Independent figures are rounded up.

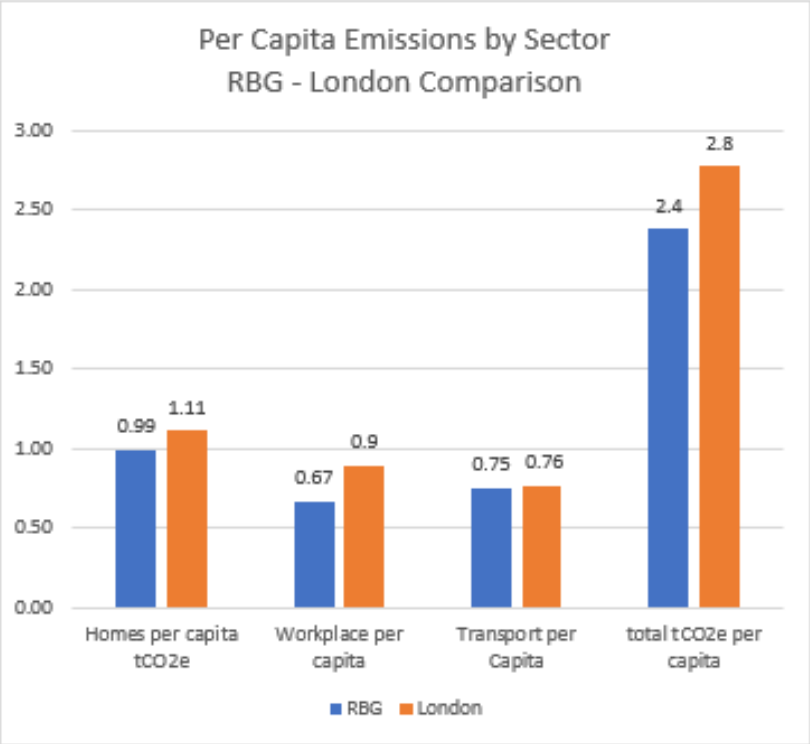


Figure 16

The per capita co2e emissions profile shows that RBG is lower in all cases than the London averages, although these are essentially statistically equal in some cases. On both a total emission and sectoral per capita measurement, the Council should consider prioritising mitigation activity in the domestic sector. Domestic gas consumption should be the specific source of emissions that requires prioritisation. Transport is also a key priority given the additional associated health risks of particulate matter and nitrous oxide. Despite the workplace sector being relatively low, business leaders have an opportunity to lead by example to their surrounding communities through energy efficiency measures.

8.3.2 Measuring Progress Against Scenarios

It is necessary to measure the borough's current progress against the established baseline and maximum ambition scenarios to understand if we are on track to achieve the CNP's target. As mentioned above, the availability and quality of datasets significantly influences the emissions that are recorded for the reporting period. Subsequent annual reports will always review the previously stated figures (particularly where estimates and extrapolations have been undertaken) and provide amendments and commentary where needed. As these emissions figures may shift from year-to-year, annual reports may not be suitable for direct comparison. The latest reports should therefore be considered as the most accurate with the caveat that these figures may be superseded in the following year.

Since 2019, total emissions have dropped from **743 ktco2e to 691 ktco2e, a 6% decrease.** This progress is currently faring better than the baseline emissions scenario as figure 17 highlights. Current emissions are also doing slightly better than expected under the maximum ambition scenario. If borough emissions continue to drop as they have done in 2020, then we will continue to outperform the maximum ambition scenario until 2026 – at which point the Max Ambition pathway assumes electrification and district heating will mitigate domestic gas use to some extent and see emissions drop significantly.

The 6% total reduction is not consistent across all sources of emissions, as some sources saw much larger percentage reductions (road transport) than this whilst others saw less (non-domestic buildings). By applying each source's previous annual reduction to subsequent years, an asymmetrical forecast is provided to the end of the decade. The carbon neutral target will not be achieved by the end of the decade if emissions were to continue to follow this forecast.

The reality will not see a decrease in emissions in such a consistent manner, and emissions may go up in some years before they go down. One such example of this could be the increased on-site emissions arising from big infrastructure projects such as district heating, before it delivers savings to the built environment through clean energy delivery post-completion of works. Any forecasts on the line graphs will therefore be measured against in subsequent years for verification.

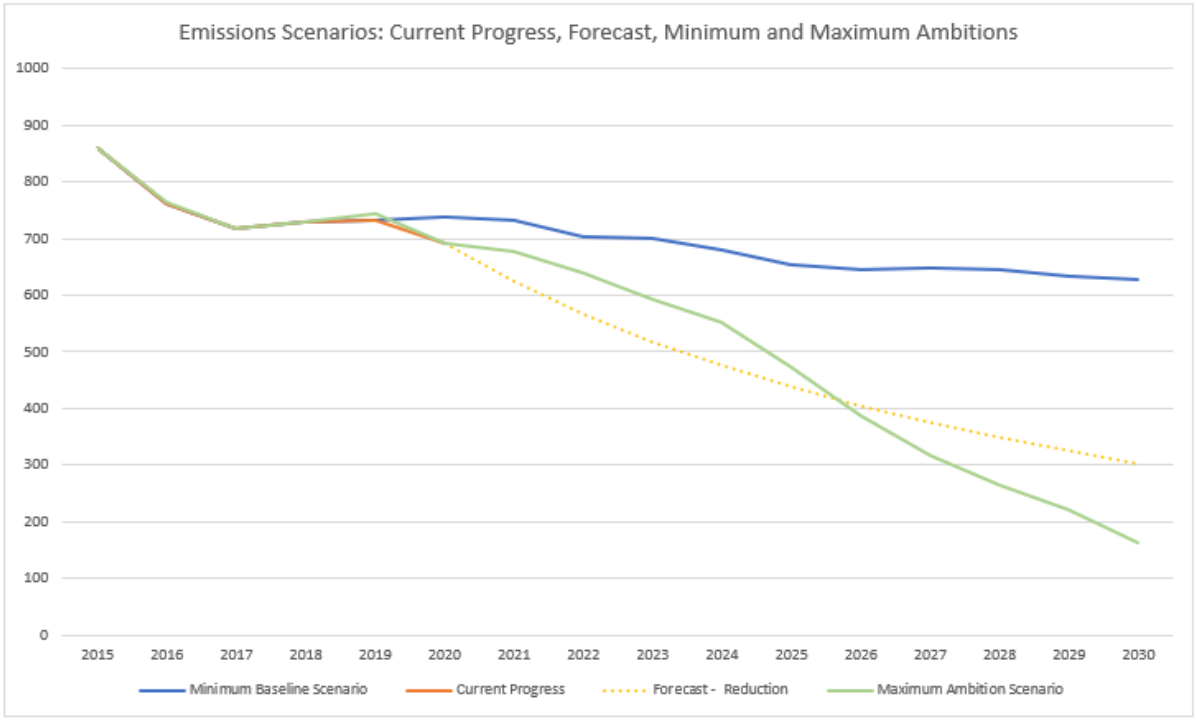


Figure 17

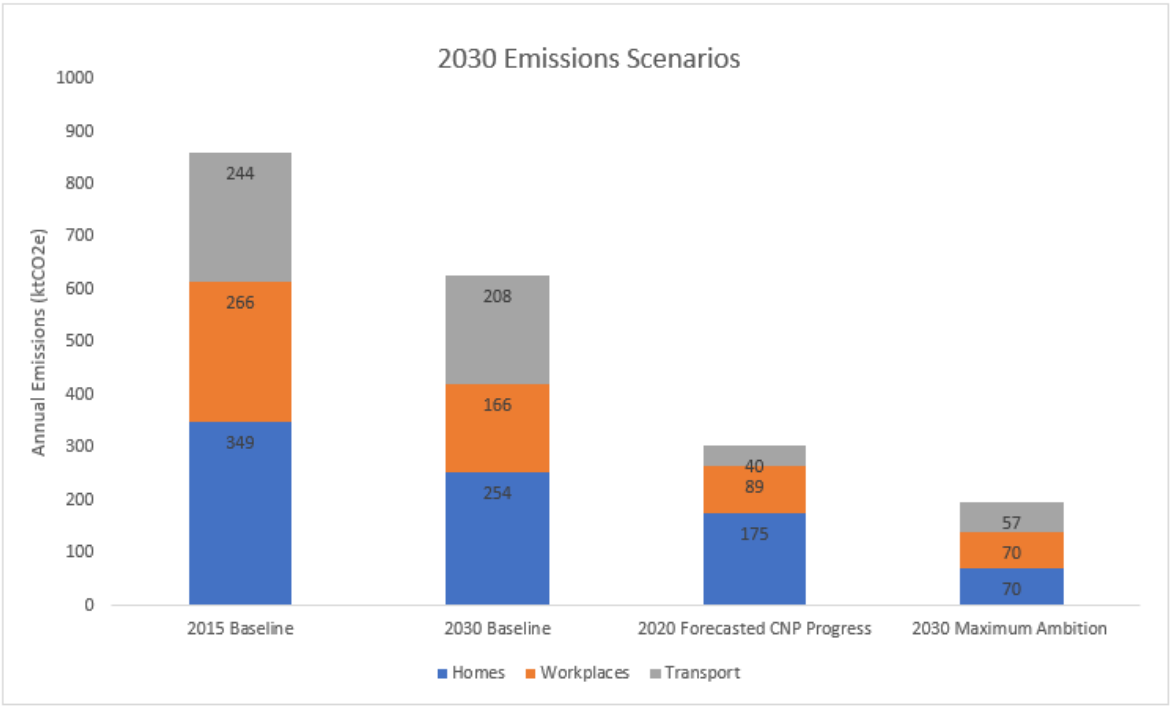


Figure 18

Figure 18 shows the breakdown of residual emissions by emissions sector by the programme's final year. In all cases, there are residual emissions which will require offsetting to be considered carbon neutral. Findings are promising in that if emissions continue in this reduction trajectory, they will surpass the baseline. As the CNP matures, diminishing returns on carbon savings will occur as works will become costlier and less technically viable to treat smaller and smaller residual carbon emissions. Therefore, it should not be assumed that in the programme's latter years any additional

resources and stronger aspirations to meet the maximum ambition pathway will result in straight forward reductions. These figures are also significantly dependant on external factors beyond the Council's control, such as grid decarbonisation and external funding for further carbon mitigation schemes.

8.4 Borough Emissions: Thematic Progress

8.4.1 Buildings

Headline

The largest share of emissions in the borough by sector is homes (42%), with gas consumption within this accounting for a substantial 31% of total borough emissions. Most properties (46%) are rated at SAP band D, with the plurality (approximately 23,000 homes) being built between 1900 and 1929. The average carbon emissions per dwelling is 3 tco2 per annum. We estimate that some 14,285 (12%) households in the borough are in fuel poverty. It is broadly accepted that retrofitting existing housing stock is set to be the costliest of the climate measures and is also high risk in deliverability. Our fuel poverty outreach service supported 376 households, resulting in an average saving of £567, with a total estimated saving of £213,297 by all participating households over 3 years. The total carbon saved was 132 tco2e. We estimate 2,299 jobs that could be created per annum from a household net-zero retrofitting programme up to 2030. Industry and commercial CO2 emissions are responsible for 23% of the borough's carbon footprint. Capital for retrofit works may prove harder to access than previous years as most businesses have seen their energy costs rise significantly since 2021 and many companies are now at risk of insolvency. Nor is the landlord's consent guaranteed. Our energy efficiency outreach partners are at various project development stages supporting decarbonisation initiatives at several sites across the borough.

8.4.1.1 Buildings: Homes

Summary

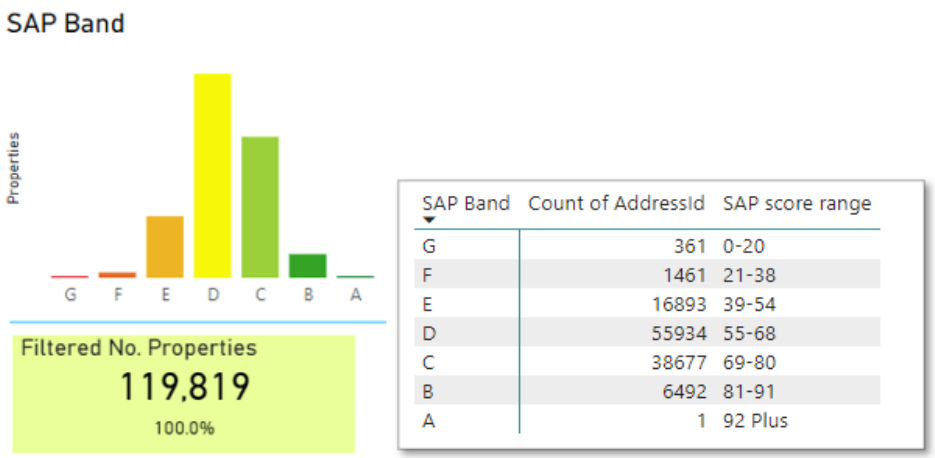
There are approximately 120,000 homes and over 2 million metres squared of non-domestic floor space in the borough. Heat and electricity used in buildings in the borough accounted for 65% of emissions in Greenwich in 2020. The largest share of emissions in the borough by sector is homes (42%), with gas consumption within this accounting for a substantial 31% of total borough emissions. Clearly any strategy attempting to mitigate emissions within the borough would need to consider this a priority requiring substantial investment.

Reducing these emissions will involve a combination of:

- making buildings more energy efficient
- replacing fossil fuel heating systems with low carbon alternatives
- deployment of renewable energy and district heat networks
- behavioural change – operating our buildings more efficiently

We have access to the *Parity Projects Pathways* housing stock software which enables us to run borough wide reports investigating the housing stock across the borough. This is similar software to the Portfolio software used for our own council house stock. Although not the only means of measuring a home's ability to use energy efficiently; SAP bands are an easy-to-understand scoring system to give energy consumers an indication for how energy efficient their homes are, with A-rated properties being the most energy efficient and G-rated the worst. The housing stock is greatly

varied across the borough and figures are to contextualise the issue to the individual household for the benefit of our residents. The software uses a mixture of actual data and extrapolations to typical housing stock profiles to provide a borough wide analysis. Averaged figures for a typical household should therefore be taken with caution given this approach.



SAP Band	Count of AddressId	SAP score range
G	361	0-20
F	1461	21-38
E	16893	39-54
D	55934	55-68
C	38677	69-80
B	6492	81-91
A	1	92 Plus

Figure 9

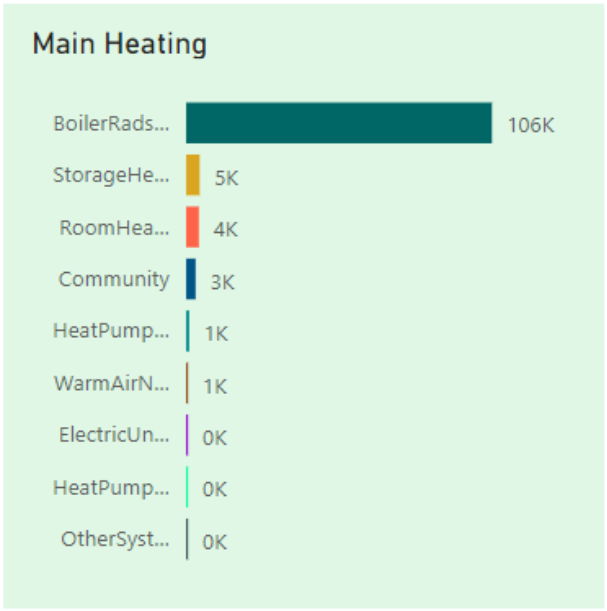


Figure 20

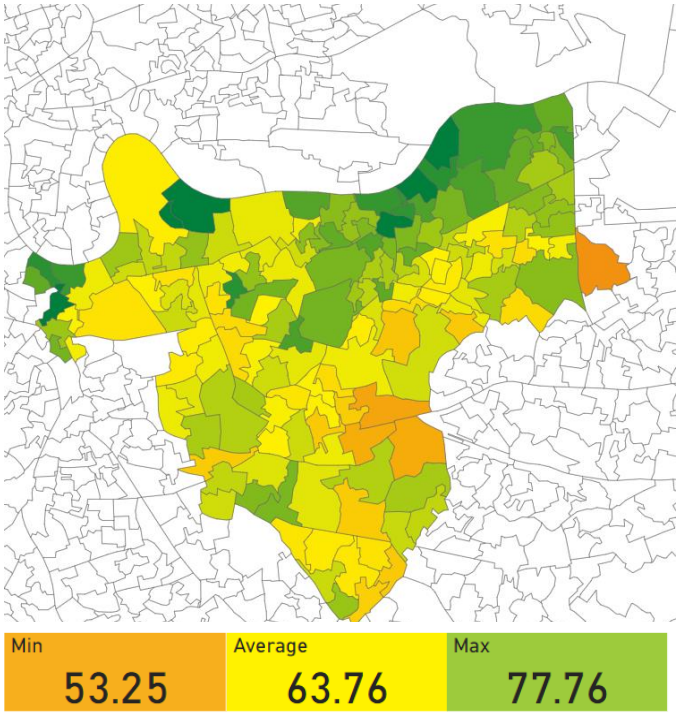


Figure 21

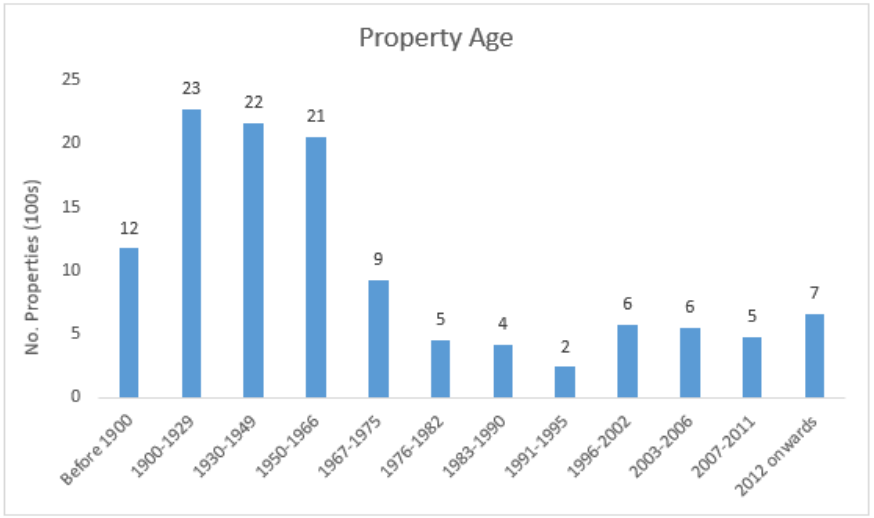


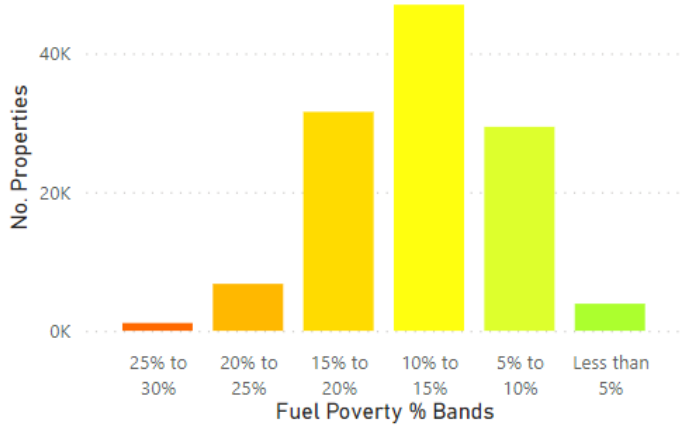
Figure 22

As Figure 19 shows, most properties (46%) are rated at SAP band D, with the plurality (approximately 23,000 homes) being built between 1900 and 1929 (as shown by Figure 22). Figure 21 shows the average household SAP Band by the borough's neighbourhoods, with the northeast of the borough having the most energy efficient households. Figure 20 confirms our summary analysis that gas heating is the largest source of domestic emissions. It is encouraging to see that there are only 361 (or 0.3% of total) homes that are G-rated. Eradicating G rated EPCs through targeted energy efficiency savings is not only an achievable milestone, but also clearly indicates the commitment to targeted reductions in borough wide initiatives. The average carbon emissions per dwelling is 3 tco2 per annum.

Fuel Poverty

Although the CNP focuses on carbon targets, it also recognises the cost-effective co-benefits of implementing the CNP. Retrofitting the borough's housing stock will not only reduce the borough's carbon emissions but will also save individual households money and keep homes warmer. This is immensely important given the current cost of living crisis, where households are seeing energy bills average £2,500 annually. Such prices are clearly not sustainable for residents, particularly those most vulnerable in society and/or at risk of being pushed into (or further into) fuel poverty. We estimate that **some 14,285 (12%) households in the borough are in fuel poverty.** Anecdotally speaking this is likely to be an underestimate given the huge increases to energy rates over the past 18 months and there is an expectation that many more households are likely to be pushed into fuel poverty in the coming winter of 2022/23.

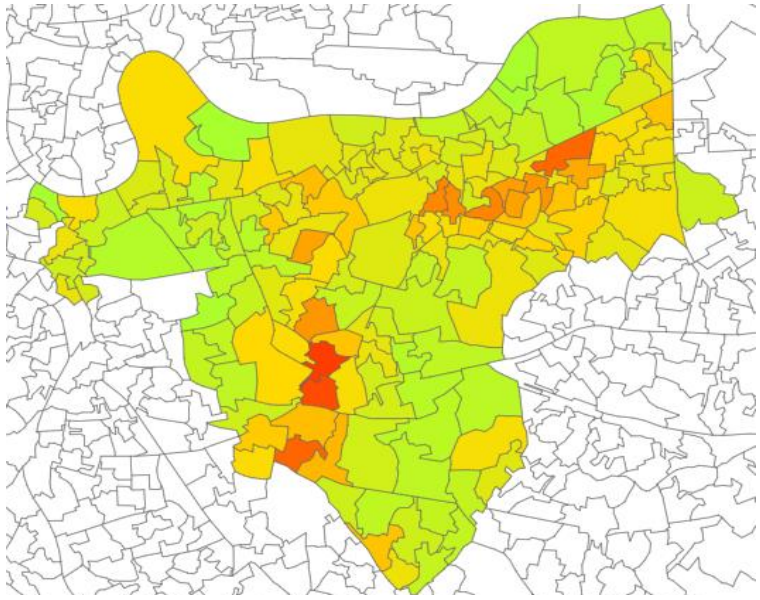
Figure 23 provides high level analysis of the levels of fuel poverty across the borough in 2022. The map illustrates the density in where fuel poverty is expected by providing percentages - the higher the percentage, the higher the number of households in the neighbourhood expected to be in fuel poverty. Such spatial mapping will help us allocate our resources and our fuel poverty outreach work in a targeted approach to those areas that most need it.



Estimated number of fuel poor households in all the filtered LSOAs:

14,285

No. properties located in LSOAs with FP risk %	
Fuel Poverty Risk % Bands	No. Properties
25% to 30%	1,123
20% to 25%	6,771
15% to 20%	31,572
10% to 15%	47,028
5% to 10%	29,418
Less than 5%	3,907
Total	119,819



Greater than 30% Band	25% to 30% Band	20% to 25% Band	15% to 20%	10% to15% Band	5% to 10% Band	Less than 5% Band
(Blank)	1,123	6,771	31,572	47,028	29,418	3,907

The number of filtered properties that are located in LSOAs with the stated Fuel Poverty Risk %. e.g. (Blank) properties are in an LSOA that has over 30% of the households expected to be in fuel poverty. N.B. if your properties are only a subset of the properties in the LSOA then you should not expect the % risk to directly apply to your properties as they may not be representative of the LSOA.

Figure 23

All tiers of government and all sectors of society are aware that a highly ambitious retrofitting agenda is needed to mitigate the worst effects of these issues. There have been several funding programmes for such schemes with local authorities being allocated significant sums based on their borough's housing stock profile. These schemes experienced mixed success in their deliveries. We have participated in a number of these national schemes, progress and outcomes are explained below in the "current activity" part of this chapter.

It is broadly accepted that retrofitting existing housing stock is set to be the costliest of the climate measures and is also high risk in deliverability. This is due to the dependence upon maintaining public engagement and uptake; supply chain resiliency (national and international); availability of skilled labour such as manual labour; retrofit co-ordinators; quality assurers etc. The magnitude of these risks is underpinned by the amount of funding allocated to their mitigation. Capital cannot only just be supplied for capex installations but is also required to create the market space to facilitate such a programme. This means a skilled workforce, working relationships with businesses in the borough, community engagement and outreach etc.

All of this must be delivered at unprecedented pace – the 2030 carbon neutral target is now under a decade away and time has been lost due to the Covid-19 pandemic. Figures 24 shows a scenario where a retrofitting programme achieve net zero for the entire housing stock in Royal Borough Greenwich by 2030. Figure 25 shows the investment required by retrofitting measure. These figures paint a drastic picture – the scale of the issue is simply too large and costly for local authorities to implement on their own accord. The software takes a whole building approach when considering the investment scenario. On average, each dwelling will require an estimated £24,600 worth of investment. Although as evidenced in figure 24, some will require significantly lower (less than £5,000) or higher (most expensive costing £144,200) than this. **The total programme is estimated at a cost of £2.94bn. Figure 25 shows the housing stock profile once these works have taken place.**

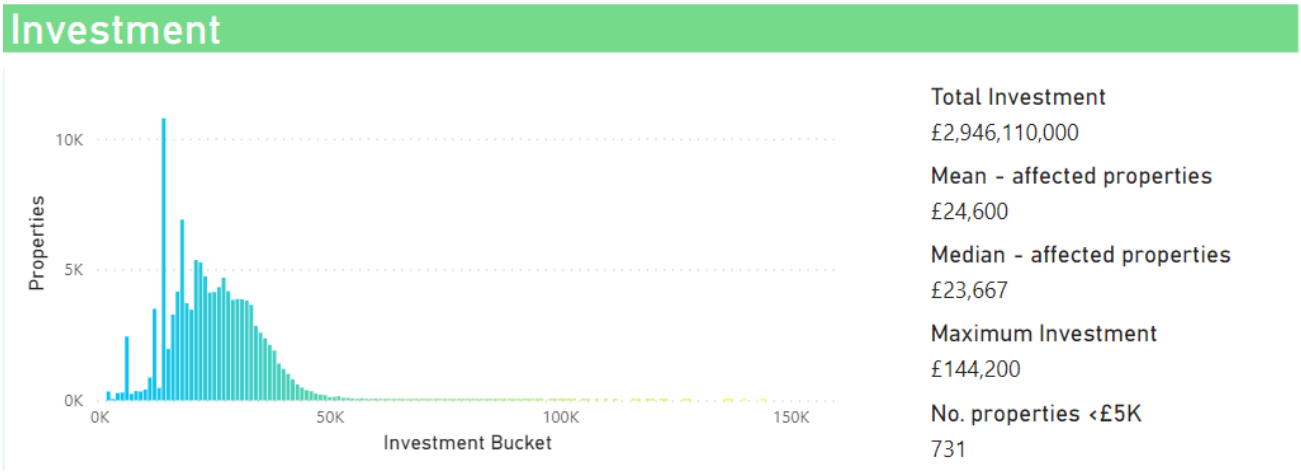


Figure 24

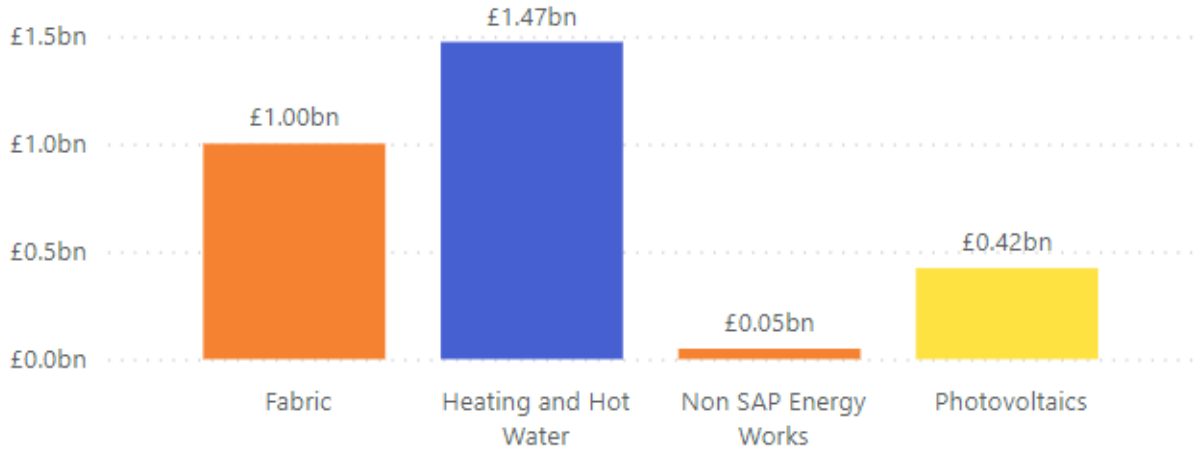


Figure 25

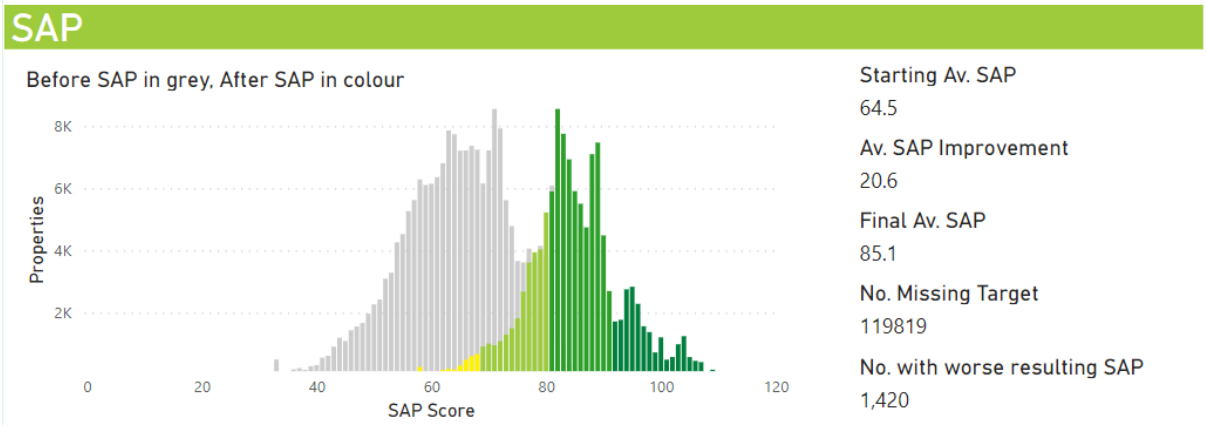


Figure 25

Such a retrofitting scenario considers how rapidly the grid is decarbonised. As seen in **figure 26,** although significant progress is made over the decade, the current rate at which the grid is decarbonised (based on BEIS figures) is insufficient to meet the 2030 target. Such landscape pressures are beyond the Council's ability to influence. Therefore, whilst the Council must support households undertaking retrofitting programmes, aligning this with the CNP's carbon targets are dependent upon decisions taken at the national level.

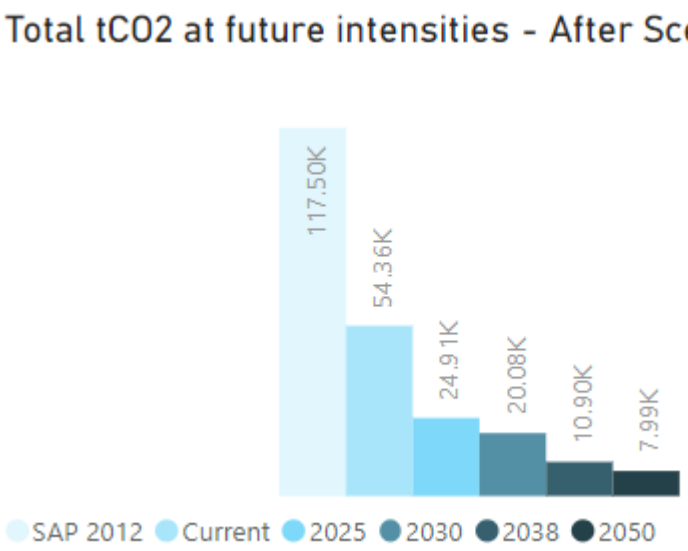


Figure 26

Progress

8.4.1.1.1 Fuel Poverty Outreach

We are represented at The South London Energy Efficiency Partnership, (SLEEP) a consortium of South London boroughs which aims to promote energy efficiency within homes. The borough-based local outreach partners, South East London Community Energy (SELCE) provide a wide range of functions ranging from behavioural change workshops to facilitating energy efficiency upgrades in residents' home. Such services include but are not limited to: home energy efficiency advice; referrals to national and regional grants/initiatives; debt relief, switching tariffs, home visits, energy audits, excess cold risk assessments and more. These deliver many co-benefits including fuel poverty alleviation, increased physical and mental wellbeing (by making homes warmer), saving residents money on their bills and more.

Funding for the consortia, which is led by Lewisham Council, was secured through the GLA's Warmer Homes Advice Service and finances SELCE to conduct the outreach above work. The SLEEP also acts as a consortium to secure more funding by providing more attractive bids with higher bargaining power due to its membership.

Table 8 summarises the domestic energy efficiency advice outreach work to the borough's residents which was undertaken by SELCE in 2021/22. Estimates on financial savings are conservative, considering expected drops in level of engagement from participants. In a similar manner, the carbon calculations were also conservatively estimated and similarly reflected a drop in consistent behavioural change as participants become fatigued with good practise behaviour. As discussed previously, these estimated savings will require verification in subsequent reports and have no bearing on the 2020 borough emissions.

Outreach Activity	Households Engaged*	Approx. Financial Savings per household 1st Year	Approx Cumulative Financial Savings for 3 years* per household	Approx. Financial Savings - Total Households 1st Year	Summed Financial Savings (Total Households - 3rd year)	Approx. Total Lifetime Carbon Savings (tCO2)
Summary Overview						
Advice Session: Home Visits/1-2-1 Advice session/Phone Call	376	£567	£814	£120,429	£213,297	132

Table 8

8.4.1.1.2 Employment Opportunities

Achieving net zero homes in the borough is impossible without central government financing which immediately raises implications of the equity of resource allocation from central government funding. Other local authorities, for example, may require even more than the required £2.94 bn for RBG in this sector alone (as we have yet to calculate the anticipated cost of retrofitting buildings in the commercial and industry sector), raising real concerns of competition for limited funding.

Despite the huge costs some encouraging data does emerge. The employment opportunities for both potential investment scenarios are attractive. By tackling domestic emissions, we have a huge opportunity to invigorate the local economy through decreased unemployment, increased economic activity with local businesses and supply chains, targeted young apprenticeships, and savings to local health services. Many of these opportunities exist as actions within the existing action plan, especially under the Empowering Wider Change theme. Public policy around climate initiatives therefore requires reframing. A measure such as deep, targeted retrofitting to the borough's housing stock should be seen as an investment with many co-benefits rather than a cost.

Figure 27 shows the employment opportunities through such a retrofitting scheme. The 2,299 jobs that could be created per annum from a household net-zero retrofitting programme up to 2030 demonstrate the potential and co-benefits of such a scheme. These jobs are focused on the labour required to install these works. There may be many tertiary jobs that are created due to increased market activity that are not yet recorded, so the real figure may be higher than currently stated. Such a large number is currently problematic for policy makers as there is no sufficient resourcing capacity able to upskill people required to fill the jobs needed to meet the target.

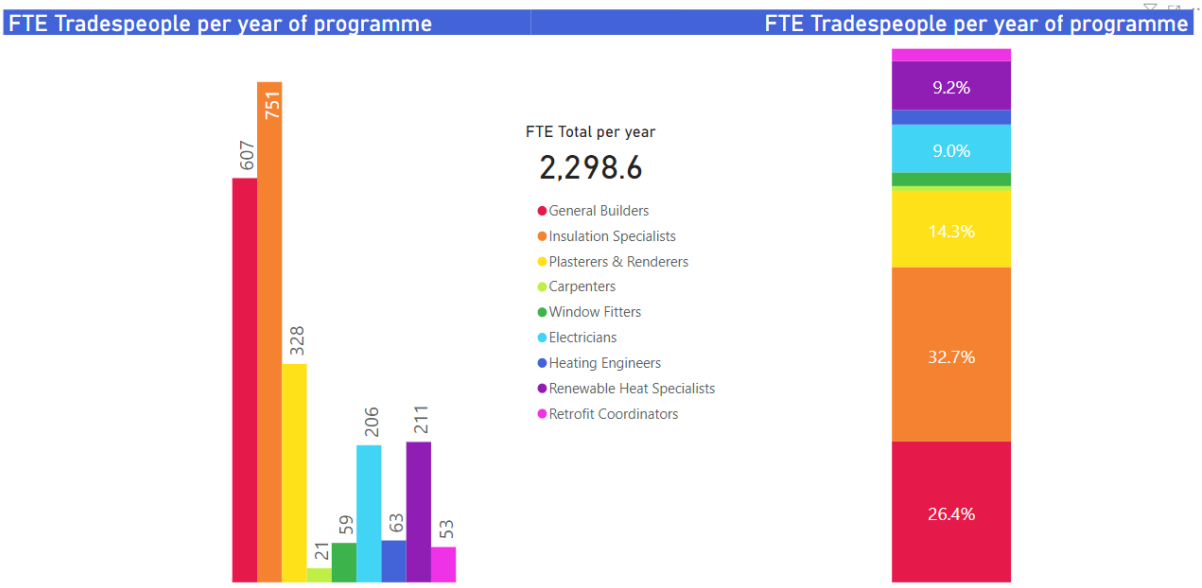


Figure 27

At the time of writing, further rounds of funding for the LAD schemes are due to open, continuing government funded retrofit measures for poorly insulated, low-income households. Given the success in the delivery of the fuel poverty outreach service provided by SELCE, the service should be continued, refined where lessons have been learnt, and expanded - resources permitting.

8.4.1.2 Buildings: Non-Domestic Sector

Summary

Industry and commercial CO2 emissions are responsible for 23% of the borough's carbon footprint. Similar retrofit domestic measures are likely to be implemented for commercial premises, although the opportunities to achieve economies of scale are expected. Anecdotally, it is assumed that the process to implement the works will require less time than engaging with residents in the domestic sector. This is in part due to the lack of household eligibility criteria that requiring verification and the time taken to provide the required assurances (particularly with vulnerable residents) to such households. The commercial sector has several further advantages over the domestic sector including access to capital, relevant expertise, better stakeholder management and instruction, better asset management processes, and the ability to achieve economies of scale.

Despite these advantages the private sector has little access to national grant funding schemes, as most are reserved for public buildings such as schools and hospitals. Capital for retrofit works may prove harder to access than previous years as most businesses have seen their energy costs rise significantly since 2021 and many companies are now at risk of insolvency. Nor is the landlord's consent guaranteed. Such an increase will limit the available capital to spend on invest-to-save projects as the bills must be met in the short term. Although business cases may prove more attractive given these current higher energy costs (improved payback time and higher expected savings) this is meaningless if companies do not have the sufficient funds to implement such schemes in the first place. Provision to assist workplaces to tackle these problems with tangible energy saving reductions is therefore needed. Although the energy crisis has no bearing on 2020

borough emissions, it is important that the review considers these issues so it may inform the next set of published actions.

Progress

Throughout 2021/22 SELCE also offer their services to businesses across the borough (any carbon savings are estimated here will require verification in succeeding reporting periods and have no impact on the 2020 borough emissions) This includes support for businesses across the Royal Borough of Greenwich with tools, knowledge, and best practice for implementing a robust sustainability strategy leading to a cleaner, greener, and healthier borough. Community centres and public buildings are also supported in submitting applications to regional grants such as the London Community Energy Fund (LCEF). The LCEF provides much-needed support to get community energy projects up and running and deployed faster to reboot the economy and benefit hard-hit communities. There are separate funding streams to fund energy efficiency projects at various stages of their implementation (preliminary feasibility studied (Stream C), full feasibility (Stream A); and 1/3 capex (Stream B)). The fifth phase of LCEF supported project development and, capital grants to help get projects over the line and completed. With a high standard of applications, the GLA awarded over £600,000 in grant funding to 38 projects across 23 boroughs. This means that LCEF has now allocated over £1.5m across 5 rounds since 2017 to support 126 projects across London.

A breakdown of the retrofitting support given to businesses is provided below. These are activities that are expected to lead to direct, measurable carbon savings and do not include behavioural change initiatives such as advice sessions where the carbon savings have not been estimated.

Stream C: At the time of writing, SELCE are completing pre-feasibility studies in up to 30 sites across Greenwich, Lewisham, and Bromley for LED upgrade programmes. So far 3 organisations have signed up from Greenwich (out of a total 18). They include:

Address	Building Type
Clockhouse Community Centre, Defiance Walk, London SE18 5QL	Community Hall/Community Centre;
Notre Dame School Woolwich SE18 3SJ	Primary School;
Mycenae House, 90 Mycenae Road, Blackheath, London, SE3 7SE	Community Hall/Community Centre;

The pre-assessment studies will be completed by December 2022 and will include a high-level calculation of the capex costs to retrofit the site with LEDs, the payback period, and the expected carbon savings. SELCE intend to apply to the LCEF again to progress the feasible sites to a full feasibility study (LCEF stream A funding).

Stream A: SELCE are also completing full feasibility studies in 6 sites and have estimated the annual carbon savings which will be verified if the works take place:

- Newhaven Kings Park Academy – 3.5 tco2e
- Mulberry Park Children's Centre & Grace Nursery – 0.6 tco2e
- Morden Mount – 0.5 tco2e
- Orchard Community Hall – 0.6 tco2
- New Haddo community Centre – 1.6 t co2e

- Waterways Children's Centre – 0.7 tco2e

Contractors are currently providing quotes to finalise the cost and carbon savings estimates for each site. Once these have been finalised further LCEF funding for 1/3rd of the capital costs (Stream B) of these sites (where they prove feasible) will be applied for.

Stream B: SELCE are currently completing capital investment/installations in 5 sites, 1 in Greenwich, including:

- Greenwich West Community & Arts Centre

We're finalising quotes form contractors and the work should be completed shortly.

8.4.2 New Development

Headline

The total recorded operational carbon prevented due to local planning policy criteria is approximately 352 tco2e per annum, or 10.6 ktco2e over the buildings' 30-year lifespan. These emissions are likely to be higher, but we are working to record and monitor the planning data all in one place. These emissions are based on completed works in the calendar year 2020.

Summary

Although retrofitting the borough's domestic sector is the opportunity for the biggest carbon savings, we, as the local planning authority, must also ensure that any new developments do not require the same amount of retrofitting in years to come. Designing and developing builds with sustainability principles considered from the outset will mitigate on-site carbon emissions, realise energy savings and will make homes more pleasant to live in through the use of smart architectural design such as *passive haus* measures.

Progress

Our Local Plan was adopted in 2014 and, in conjunction with the London Plan, is used to determine planning applications. For a comprehensive understanding of how the Council influences and requires developers to build sustainably, please read the plan here. The Local Plan sets out the planning policies, site allocations and land designations borough wide and is the central document in the Borough's Development Plan. The Local plan sets out clear objectives for environmental management and protections and recognises the link between well protected green spaces and health and wellbeing.

All major developers planning to build in the borough must submit a sustainability statement appraising the environmental and social consequences of the development. Such statements require improvement in the environmental performance of buildings, consideration of climate change mitigation and adaptation measures, the intensity of resource use during and post construction of buildings; are healthy and adaptable; and make the most of natural systems including, for example, the use of passive solar design or local ecosystems. Such pre-requisites allow the Council to influence and guide those who wish to develop in the borough in a more sustainable manner.

The total *recorded* operational carbon prevented due to local planning policy criteria is approximately 352 tco2e per annum, or 10.6 ktco2e over the buildings' 30-year lifespan. These emissions are likely to be higher, but we are working to record and monitor the planning data all in

one place. These emissions are based on completed works in the calendar year 2020. The Council committed to investigating a tiered offset price that developers would pay – financially incentivising those developers that mitigated more on-site emissions than the required minimum.. The Core Strategy (adopted 2014) does not currently set the carbon offsetting price, and the new Local Plan for Royal Greenwich is not anticipated to be adopted until 2025. However, we currently charge the fee as set out in the London Plan of £95/tonne and can apply any subsequent updated fee published by the GLA.

We are improving our climate resilience supplementary planning documents (SPDs). SPDs are non-statutory documents which are linked to, and provide further guidance on, policies contained within the Royal Borough's Local Plan. The SPD will contribute to the delivery of both the Local Plan and London Plan policies relating to developments within the borough. Additionally, the SPD will support the delivery of Greenwich's Carbon Neutral Plan in line with the commitment to achieve Net Zero Carbon by 2030. The original objective of the SPD was to provide guidance for the following areas:

- New Developments Design Principles;
- New Developments Energy Targets;
- Retrofit Design Principles & Energy Targets;
- Approach to heritage assets/historic environment; and
- Carbon Offsetting

There have been policy changes at the London level such as the new minimum on-site carbon reduction target of 35% over Part L 2021. It should be noted that there are also ongoing discussions to introduce a new Part Z requirement to regulate embodied carbon.

8.4.3 Transport

Headline

Transport emissions are the second largest category of emissions (31%) behind Homes. Overall, emissions have decreased by 15.6%. The COVID-19 pandemic saw huge changes in the way people travelled, how often and the modes they used. Transport emissions were calculated using the best available data and this will require verification in subsequent reports. We received approximately £985k funding from TfL in 2021/22, compared to between £2.3 million and £4 million a year anticipated pre-pandemic. A couple of actions have been put on hold due to the revocation of funding. Significant progress has been made on strategy and plans specifically referenced by the CNP or required to deliver a number of its actions. We have finished our public consultation on the draft Transport Strategy.

Summary

Collaboration between Transport for London (TFL) and RBG is needed to develop infrastructure that is supportive of sustainable and active travel, as well as exploring potential localised solutions such as low, or zero emissions zones. However, we must acknowledge that journeys using private vehicles are here to stay and we cannot force residents away from vehicle ownership. The challenge is to persuade the public to voluntarily switch to low/zero carbon alternatives and use public transport. Regional and national policy will play a significant role in this.

The COVID-19 pandemic saw huge changes in the way people travelled, how often and the modes they used. People worked from home, walked and cycled more. There was also an increase in car use across London, as people moved away from public transport. This has had a lasting effect on the

way we travel and significantly affected TfL's finances, as fares are its single largest source of income (around 47% in 2019/20). As a result, crucial TfL funding for the Royal Borough's transport work, particularly that proposed in our Local Implementation Plan for transport, was reduced and provided in a very uncertain way.

As noted in the borough emissions methodology – transport emissions were calculated using the best available data and this will require verification in subsequent reports. The following section details what the Council has done in financial year 21/22 to mitigate transport emissions. The estimated emissions reduced from these CNP activities will also require verification in later reports. **Whilst these activities are not comparable to the stated 2020 calendar year emissions**, we felt it important to report our progress in tackling the borough's transport emissions.

Progress

The CNP sets out the following top level transport indicator:

"Reduction in car use – car vehicle km travelled in the borough by residents and visitors must decrease by 45% compared to 2015; likely the upper limit achievable through available measures"

Department for Transport annual figures show the relevant traffic levels: Traffic by local authority. This sets a 2015 baseline of 1,187 million vehicle kilometers (mvkm), with a target of reducing to 653 mvkm by 2030. Figure 28 illustrates progress in this area and the forecasted trajectory required to meet the 2030 target:

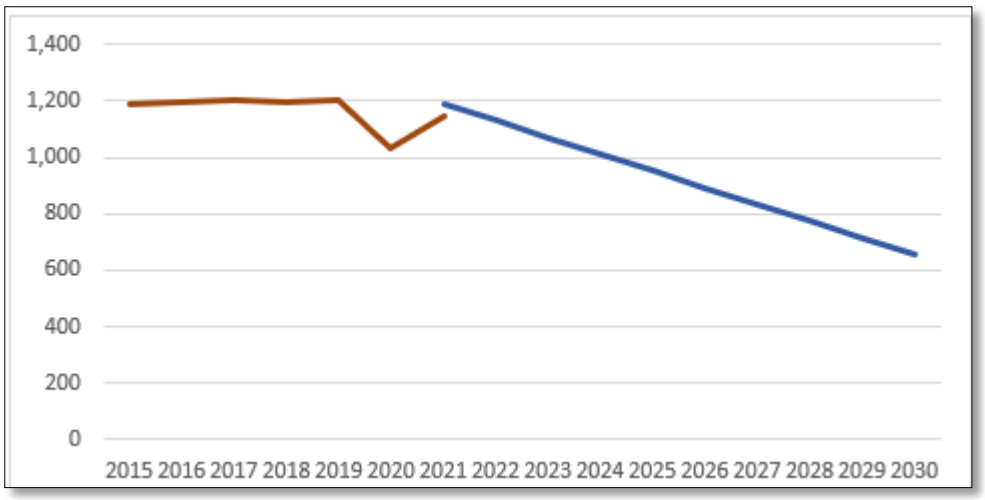


Figure 28

We received approximately £985k funding from TfL in 2021/22, compared to between £2.3 million and £4 million a year anticipated pre-pandemic. The higher level of funding anticipated at the time of the CNP's development informed measures it was assumed the Council would continue to invest in. The loss of this funding affected the ability to deliver activities included in the CNP (and Evidence Base). Short funding periods and varying criteria for securing/using funding over this period compounded the impact on the ability to deliver the specific schemes anticipated in our plans and/or deliver as efficiently as envisaged previously.

- **Some activities were accelerated,** such as the trial Greenwich to Woolwich Cycleway Scheme. The COVID-19 pandemic also actually accelerated the delivery of some schemes, including the Borough's most strategically important cycle route between Greenwich and Woolwich. The first section of this route was delivered in 2020/21 under the Mayor of

London's London Streetspace Plan. The delivery of a key section of the route on our strategic road network has been largely successful in challenging circumstances and should lay the foundations for expanding the network. We have a very good working relationship with Transport for London which will be our key delivery partner on most of the cycle network schemes.

- **Some activities were continued as:** the TfL funding that was secured or by identifying other funding sources (e.g. developer contributions).

- Other activities**, that could not be funded, were either paused or delayed**. More widely, transport services and improvements anticipated to be delivered by others (particularly by TfL and public transport operators) reduced in this period and continue to be at significant risk due to these travel behaviour changes.

    - **Cycling Hangars:** Analysis by TfL has shown that many trips in the borough currently made by private car could be walked or cycled. A lack of adequate walking and cycling infrastructure in one of the ways to enable these trips to be switched. New and improved walking and cycling infrastructure, including cycle parking, is therefore needed to provide people travelling in the borough with attractive alternatives to private car use We have a number of cycle hangars on street already. These are almost all full. There is a large waiting list of requests for new hangars (approximately 700 individual requests). Reliability of funding has impacted the delivery of hangars on highway land, with no new hangars installed in the FY21/22 or 22/23 to date.

Progress

Significant progress has been made on strategy and plans specifically referenced by the CNP or required to deliver a number of its actions. We have consulted the public on a draft Transport Strategy which was since approved in October 2022. The Transport Strategy is designed to offer a step-change in the approach to making the borough a cleaner, greener, safer and healthier borough. It responds to the Carbon Neutral Plan directly. You can find out more here.

The Transport Strategy will be accompanied by a series of Policy Framework Action Plans. Together, these documents are intended to create the policy basis needed to effectively deliver several actions set out in the CNP's Transport Theme. These include walking and cycling infrastructure; parking and kerbside management; electric vehicle charging; and 20mph zones. This will inform actions and measures to be included in future Progress Reports.

Progress for all outlined transport actions are summarised in table 9 below:

CNP Transport Action	Status	Commentary
Develop Kerbside Management Action Plan and Parking Strategy	On-track	The Kerbside Management Policy Framework Action Plan will focus on how the way we manage our kerbside space and how parking can deliver our transport objectives. Plays a pivotal role in the delivery of the Carbon Neutral Plan. This is required to deliver the following Carbon Neutral Plan priorities: • Develop and adopt banded parking permit charges that vary with vehicle emissions • Increase the number of residential electric vehicle charging points in the borough and assess business charging needs • Reduce car parking spaces and increase cycle parking • Introduce a borough-wide controlled parking zone
Expand the coverage of Controlled Parking Zones (CPZ) to the whole borough; and Re-prioritise kerbside space,	On-track	Work undertaken to inform the Kerbside Management Policy Framework Action Plan highlights the need for changes to the way we deliver CPZs to effectively deliver an expansion in the number of CPZs across the borough. Controlled Parking Zones (CPZs) and permit parking areas are effective and widely used methods of managing demand for kerbside space in urban areas, discouraging private car ownership and use.
Explore potential for establishing system of emissions-based parking charges	On-track	An emission-based charging structure will accelerate the purchase of lower emission vehicles in Royal Greenwich. Currently awaiting the consultation's results. If well received, it will provide the policy basis to take forward this Action.
Business travel planning	On-track	Business travel planning encourages businesses to shift to more walking, cycling and public transport.
20mph limits on residential roads	On-track	Smoother driving will generate less emissions than high speed stop-starts in built up, congested areas. The draft Transport Strategy is being developed to be considered for adoption alongside a Road Safety Policy Framework Action Plan.
Electric vehicle charging	On-track	We consider this action relating to non-council operations, and therefore borough emissions. The draft Transport Strategy is being developed to be considered for adoption alongside an Electric Vehicle Policy Framework Action Plan in November 2022. The draft Transport Strategy included the following policy proposal, which if adopted will provide the policy basis to take forward this Action.

Table 9

8.4.4 Energy Supply

Headline

Energy demand reductions are generally the most cost-effective way to reduce carbon emissions with less systemic change required. However, supply is essential to ensure what is consumed is sourced from low/zero carbon sources. We estimate 114 tco2e has been saved through the Big London Energy Switch. Our heat network feasibility has progressed to the next stage. Our ambient GSHP Closed Loop is also in its next stage and will eventually enable up to 1000 households to switch from gas heating to heat pumps.

8.4.4.1 Energy Supply: Big London Energy Switch

Summary

Energy demand reductions are generally the most cost-effective way to reduce carbon emissions with less systemic change required – e.g., efficiency measures such as LED upgrades do not require significant behavioural change from the users. This is, in part, what makes retrofitting buildings the most attractive for RBG from a strategic point of view.

The Council encouraged residents to switch to renewable energy tariffs by promoting the Big London Energy Switch (BLES) scheme. Despite today's high energy prices, many consumers have yet to change their energy supplier, meaning they're missing out on potential savings and opportunities to shift to green tariffs. Nearly 60% of households in the UK are still on standard variable rate tariffs which are generally considered the most expensive. Furthermore, 23% of the public have never switched their energy provider. A shift to renewables at the household level, if scaled up nationwide, would instruct the market that there is an increased demand in the national energy mix for renewables. The benefits are therefore felt not just at the local level, but also helps the nation meet its legally binding climate change targets. The Council will continue promoting these benefits and encourage residents to make the switch if it is sensible to do so.

Progress

In 2020, 114 residents switched their energy supplier under the BLES scheme. This resulted in an estimated 112 tCO2 saved. There is currently great deal of uncertainty around energy prices and volatility in the energy market – the BLES scheme is currently suspended until a sense of stability has returned.

8.4.4.2 Energy Supply: District Heat Networks Studies

Summary

Our vision for the Borough is to deliver cost-competitive low carbon energy of heat and power which will help to eradicate fuel poverty, reduce overall carbon emissions, and facilitate the transition and investment to a low carbon economy and meet the Borough's net zero target by 2030.

Progress

We were successful in securing funding in 2020 from BEIS HNDU (Heat Network Delivery Unit). The aim was to investigate the development of decentralised heat networks related to areas of high potential, Charlton Riverside, Thamesmead and Abbey Wood and a wider strategic transition line from east of the borough to Greenwich Peninsula, including Woolwich Town Centre. To this effect we have achieved our target to complete a techno-economic feasibility study in March 2022. The study looked at 5 clusters for heat networks, collectively all 5 clusters are viable to develop into heat networks, the results of this study secured additional funding from BEIS for DPD, this work will commence Q4 2022.

Moving forward, commercial business cases will be developed as part of the DPD, this will need to be considered against Net Zero targets, financial viability, and availability to secure grant funding for inward investment. This work will feed into the wider economic strategy, re skills and green job opportunities. The Green Heat Network Fund could be a possible source of infrastructure funding, this would need to explored following the viability of the commercial business case for each cluster.

8.4.4.3 Energy Supply: GSHP Ambient Loop Pilot Progress

Summary

Networked ground source heat pumps have the potential to provide the lowest cost, lowest carbon decarbonisation pathway. This project aims to enable up to 1,000 households to replace their gas boiler with a networked heat pump that is affordable and simple to understand. If successful, this project could be used as a blueprint for neighbourhoods, to roll out urban heat pumps at scale, in-line with Government targets to have 600,000 heat pumps installed per year by 2028.

Progress

Funding has been secured via a private sector partnership, which includes Kensa (Heat Pump Installer), an energy supplier and an estate agent. This project is in early phase feasibility with no output other than an update on progress at this point. Early engagement with a small sample of residents went well, stimulating interest in the project.

8.4.5 The Circular Economy

Headline

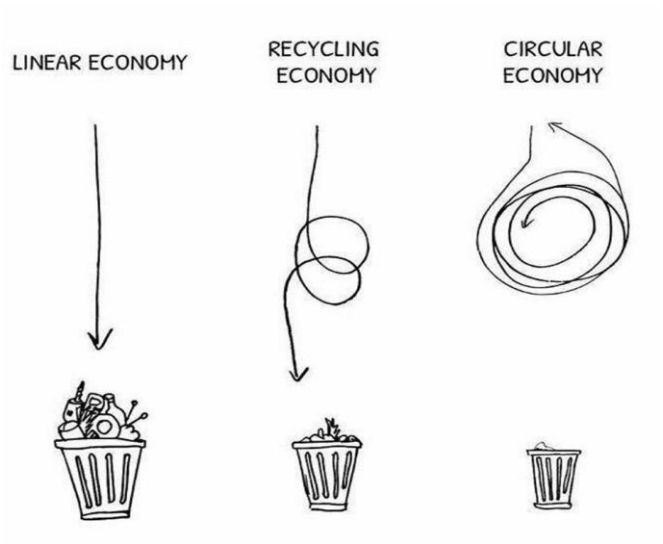
The Covid pandemic disrupted our waste service's plans in this area and all staff were focused on maintaining frontline service delivery in particularly challenging conditions. As the total household numbers increased, waste generation per household also increased from 972kg to 993kg. The recycling rate also dropped from 33.2% to 31.5% over the same period. Despite the increase in total municipal and per household waste, emissions actually dropped by 0.4 ktCO2e (-7%) compared to the previous year. This is due to a 25% reduction in the landfill emissions factor. Our Circular Economy workshops and Kiosks have resulted in approximately 4.5 tco2e in avoided consumption emissions.

Summary

Similar to transport, reducing waste emissions requires nothing short of a cultural change for the borough's residents. We are raising awareness on consumer behaviour and the sustainability implications of the products and services they purchase. Guidance on sustainable supply chains including product accreditation, the location of product origin, the resources used (palm oil, rare earth materials etc.) will all help inform residents to purchase more sustainably. Such guidance encourages residents to buy locally, helping to drive the local economy whilst minimising supply chain emissions (less travelling emissions).

We are keen to embed the circular economy across all sectors of society by encouraging uptake amongst residents, businesses and our suppliers. The circular economy is the approach of designing out waste from the traditional "make-use-dispose" linear economy, reducing the environmental impacts of continually extracting new resources whilst also creating a significant amount of jobs, nationally and locally. Put simply, circular economy principles allow for the maximisation of resource utility whilst minimising environmental damage. Circular economy principles are even starting to

become law, with all major developments in London required to submit a "circularity statement" – in essence outlining a robust waste minimisation and management strategy.



Progress

Different waste processing methods (composting, incineration, landfill etc.) have different associated emissions factors – with landfill producing significantly higher emissions than composting for example. These factors are multiplied by the tonnage of the waste, meaning the emissions generated from waste are dependent on the amount of municipal waste processed by various waste management practices.

The Council has statutory waste management duties and takes these responsibilities very seriously. By prioritising the waste hierarchy and promoting waste minimisation (i.e. subsiding home compost bins) and reuse (i.e. in preference to recycling), we aim to reduce the amount of waste that occurs in the first place, thereby reducing both supply chain and post-life carbon emissions.

The borough agreed the 'Towards Zero Waste' policy package, including to introduce fortnightly collections of residual waste, a no side waste policy and a stricter contamination policy by February 2023, in a bid to increase the recycling rate by c.5%. This is expected to increase the waste hierarchy's effectiveness. We also increased the number of Environment Champions during the pandemic to over 800 individuals. Table 10 shows the progress made in the municipal waste emissions.

	2019	2020	Annual Total Change	Annual % Change
Number of households	117,990	119,910	1,920	2%
Total Municipal Waste	114,712	119,058.36	4,346	4%
Kg municipal waste/household	972	993	21	2%
ktCO2e	3.8	3.5	-0.3	-7%

Table 10

The Covid pandemic disrupted our waste service's plans in this area and all staff were focused on maintaining frontline service delivery in particularly challenging conditions. Waste generation per household increased from 972kg to 993kg per household between 2019 and 2020. The recycling rate also dropped from 33.2% to 31.5% over the same period. This is believed to be directly related to the pandemic as residents spent greater time at home, there was an increase in the number of home improvements carried out and the clearing out unwanted belongings, there was an increase in the amount of disposable packaging and PPE, etc. There were also disruptions to waste collections with clinical and residual waste collections being prioritised in line with government guidance. Some services, such as waste electrical and textile collections, were ceased entirely when staffing levels were low.

The total number of households increased by 1,920 between reporting periods also – adding further demand to the services. Despite the increase in total municipal and per household waste, emissions actually dropped by 0.4 ktCO2e (-7%) compared to the previous year. This is due to a 25% reduction in the landfill emissions factor. Figures 29 and 30 show the significant amount of carbon emissions associated with landfill emissions. Despite making up only 2.3% of the municipal waste, this accounts for 35% of the emissions arising from this source. We therefore continue to make reductions to the

total tonnage sent to landfill (despite its low tonnage figures), making circular economy principles central to reducing carbon emissions arising from waste.

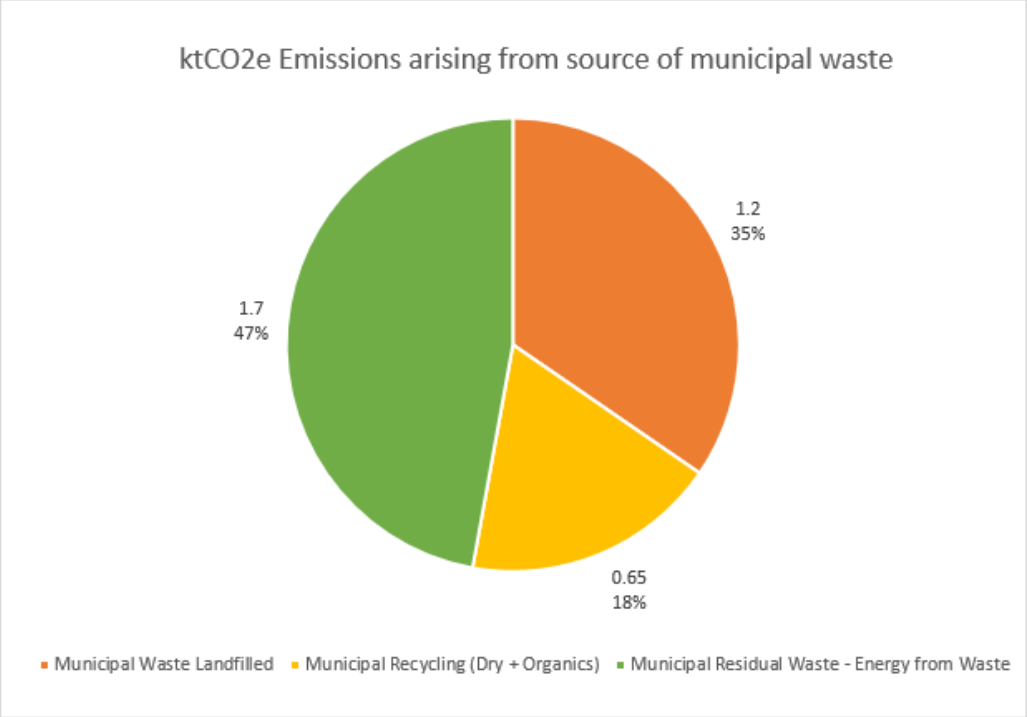


Figure 29

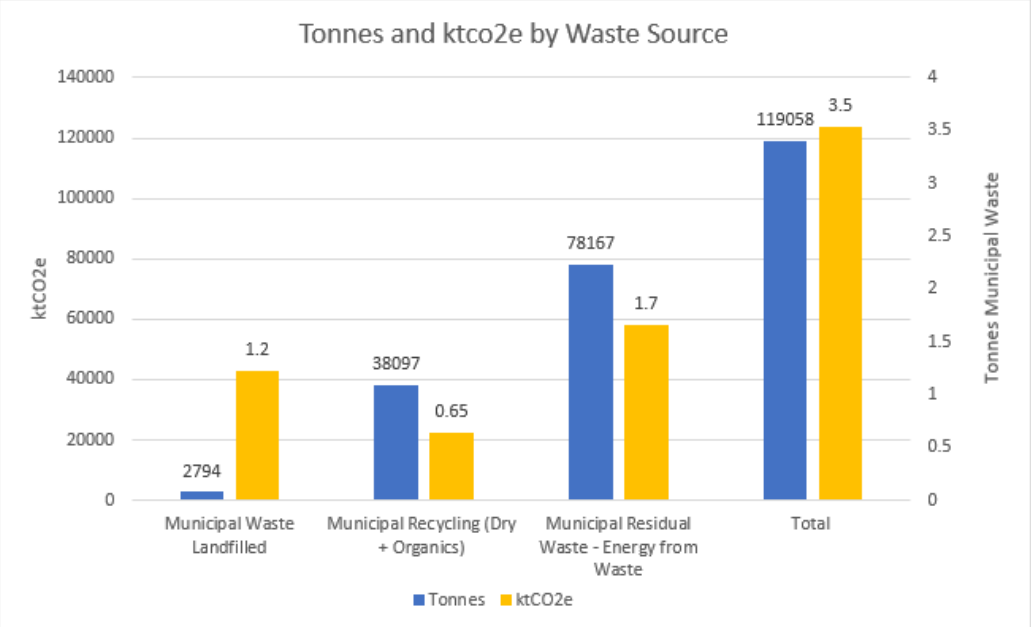


Figure 10

8.4.5.1 The Greenwich and Bexley Community Hospice RePurpose

Summary

We support The Greenwich and Bexley Community Hospice RePurpose upcycling shop which receives usable waste from the adjacent Refuse and Reuse Recycling Centre and creates/refurbishes objects such as furniture for sale. Following circular economy principles, upcycling reduces the environmental impact of manufacturing as existing resources are used in lieu of extracting more virgin materials. Emissions arising from processing this waste are also mitigated.

Progress

In 2020 RePurpose prevented 13 tonnes of waste from being processed – saving a total of 0.3 tco2e (if the waste were separated and recycled) or 6 tco2e (if all waste went to landfill). There is a social benefit to the RePurpose upcycling shop as it financially supports The Greenwich and Bexley Community Hospice. This is a fantastic example of how good environmental initiatives can deliver social co-benefits to the local community.

8.4.5.2 The Woolwich Library of Things

Summary

A Library of Things (LoT) leases typical household items that are not for everyday use, such as drills, lawn mowers, carpet cleaners etc. The principal philosophy is to support consumer affordability, promote resource efficiencies and community participation in developing a net zero carbon and circular economy within the borough. LoT will influence consumer emissions through discouraging the unnecessary purchase of such items when a lease per use will suffice; thereby reducing household refuse and the associated borough wide emissions as less “things” are bought. With over

10 locations already established with participating councils across London, the service has proved very popular with stakeholders of all types and is a flagship circular economy project.

Progress

In partnership with Better, we set up a LoT in the Woolwich Centre Library in March 2022. The LoT reports periodic activity and has so far achieved:

- 2.2 tonnes of waste avoided
- 4.2 tco2e of carbon mitigated
- 615 visitors
- And £8,200 saved in total through purchase prevention

The carbon calculations are independently verified and the programme is summarised in table 11. There are also opportunities to deliver behavioural change workshops to residents about how they can be more resourceful and save money. **As this activity is outside of the 2020 reporting period, these figures will be verified in subsequent reports.**

Location		Borrowing							
		Borrows			Unique borrowers using LoT			Concession borrowers	
Name	Open since	All-time	This qtr	Qtrly variance	All-time	This qtr	Qtrly variance	All-time	This qtr
Woolwich	15/03/2022	333	180	+27% vs prior qtr	246	142	+27% vs prior qtr	13%	13%

Location		Estimated Impact							
		Saved by residents (£)		Waste avoided (t)		Carbon saved (t)		Extra visitors	
Name	Open since	All-time	This qtr	All-time	This qtr	All-time	This qtr	All-time	This qtr
Woolwich	15/03/2022	£8.2k	£4.4k	2.2t	1.3t	4.2t	2.3t	615	355

Table 11

8.4.6 The Natural Environment

Headline

The natural environment delivers benefits beyond carbon sequestration including healthier living, increased biodiversity, air quality improvements, climate adaptation measures such as flood prevention and overheating. It also adds hedonic value to property prices as living closely to green spaces is highly desirable in London. We have introduced new conservation grass areas into 16 large parks and now have 26 park/cemetery conservation grass areas that equates to approximately 35% -40% of the RBG parks green space.

Summary

We take pride in our beautiful natural environment. The Covid-19 pandemic and social restrictions has given many of us a renewed appreciation for the Borough's parks and greenspaces. We know the physical and mental health benefits that come from access to these spaces and this is especially important for those who do not have access to a garden. Considering the environmental benefits, they have a regenerative function by restoring degraded ecosystems through specific initiatives such as the rewilding projects across the borough's estates, encouraging increased flora and fauna biodiversity.

Green infrastructure – the integration of the built environment with nature to solve urban and climatic challenges – is increasingly recognised as a necessary consideration when implementing new builds. This approach no longer treats the urban and the natural as mutually exclusive and demonstrates the CNP's holistic, cross-cutting action plan where initiatives are complementary across themes. Green infrastructure can therefore serve as a key preventative measure if placed at the heart of a strategy of adaptation measures to make the Borough (and London) prepared for the worst effects of a changing climate. Such solutions include increased tree canopy cover to reduce the urban heat island affect – which in turn will lower the risk of excess heat exposure to vulnerable residents.

The natural environment and green infrastructure has many benefits including:

- promoting healthier living, providing spaces for physical activity and relaxation
- cool the city and absorb stormwater to lessen the impacts of heatwaves and flooding respectively
- filter pollutants to improve air and water quality through "green screens"
- make streets clean, comfortable and more attractive to encourage walking and cycling
- store carbon in soils and woodlands
- create better quality and better-connected habitats to improve biodiversity and ecological resilience

Investment in green infrastructure has the potential to mitigate the damaging consequences of severe flooding (sustainable underground storage), heatwaves (increased tree canopy cover) , pollution (green/living walls) , and carbon (via sequestration) in the atmosphere – all of which have a social and financial cost. Flood zones already render some properties uninsurable – significantly affecting the property prices. Excess heat exposure will result in more demand to public health

services as the vulnerable are at particular risk to increased levels of humidity caused by the urban heat island effect. The social and health costs of unmitigated levels of pollution costs London £10.32bn per annum (£1,173 per person) in premature deaths, missed workdays, hospital treatments etc. Much more research needs to be done into the cost of adaptation and resiliency measures, with a great deal of uncertainty in many areas, which the government must address. What is generally accepted however, is that the cost of inaction will be far greater than financing any preventative measures.

8.4.6.1 Grassland Conservation

Summary

Protecting and enhancing RBG green spaces can lock in carbon and boost biodiversity in addition to improving resilience to heatwaves and floods. Maintaining rich grasslands within the borough can encourage many insects, birds, small mammals and species of wildflower to grow in these sites. Reduced mowing frequencies linked to meadow and conservation grass maintenance results in a reduction in fuel usage with both vehicle travel to sites and machinery use to cut the areas, this in turn leads to reduced emissions and reduced costs for stretched budgets.

Progress

The introduction of new meadow areas in parks and estates and maintenance of existing conservation areas in parks is considered a success. During 2021/22 we have introduced new conservation grass areas into 16 large parks and now have 26 park/cemetery conservation grass areas that equates to approximately 35% -40% of the RBG parks green space.

Work is on-going to develop a consistent methodology to calculate the carbon savings from established wild meadows and there is an on-going debate between woodland and wild meadow establishment in terms of which can capture more carbon. There is currently more literature around woodland and tree sequestration rates than wild meadows.

8.4.7 Empowering Wider Change

Headline

The Council is developing partnerships and empowering our communities to develop new projects, initiatives and actions that reduce carbon emissions. Our communities include businesses, council staff and education providers, and voluntary organisations as well as residents. Greener Business in Greenwich, has exceeded its target of a minimum of 150 business engagement sessions by March 2023. To date the Greener Businesses in Greenwich programme has delivered: outreach to over 250 businesses with direct engagement with over 60 businesses. However, there is little support or grant capex funding for businesses to implement efficiency measures which is problematic in making reductions in this area. We are currently working with Local London to take the recent cross-London report on green jobs and skills further and examine green jobs, skills and business. The council developed a retrofit employment and skills programme, in partnership with London South-East Colleges (LSEC), to support local residents to gain an understanding of green skills and emerging jobs available within the retrofit market. We have seen 16 businesses access the fund with 29 apprenticeships starts to date. We have committed to the Sustains Food for the Planet campaign and will use the 'Every mouthful Counts' toolkit to consider further food growing best practice. Food clubs from March – Jun 2022 data

shows that 14,120 tonnes of food have been delivered by the Felix Project and distributed at food clubs mitigating 126 tCO2e.

Summary

We cannot drive progress to a 2030 carbon neutral borough by ourselves and this report's structure reflects the levels of influence RBG has over its own direct emissions (operational) and those less easy to influence (borough emissions). Residents must therefore be the change they want to see, and it is our responsibility to not only lead by example; but to educate and empower residents so they can make that change. The Council is developing partnerships and empowering our communities to develop new projects, initiatives and actions that reduce carbon emissions. Our communities include businesses, council staff and education providers, and voluntary organisations as well as residents.

Much focus is, quite rightly, based on the cost-of-living crisis. But we are also mindful that a cost-of-doing-business crisis is also threatening many residents' livelihoods. There are more than 11,000 businesses in the borough, mostly made up of micro-businesses employing below 10 people. Around 2,000 enterprises are engaged in construction-related activities which account for approximately 3% of emissions from the borough. Assisting businesses across the borough in reducing their energy consumption will cut down on emissions but will also reduce the huge rise in uncapped energy costs that businesses are facing.

The GLA is currently consulting on formulating a "Green New Deal" aiming to help London to recover from the Covid-19 pandemic by creating new jobs and skills for Londoners. It will ensure London becomes a zero-carbon, zero pollution city by 2030 and a zero-waste city by 2050 and improve air quality by doubling the size of London's green economy by 2030 to accelerate job creation for all.

8.4.7.1 Greener Business in Greenwich Programme

Summary

We commissioned our energy efficiency outreach partners, SELCE, to engage with SMEs across the borough so they may improve their energy consumption, lower carbon emissions, and encourage growth in the local community.

Progress

The programme, called Greener Business in Greenwich, has exceeded its target of a minimum of 150 business engagement sessions by March 2023. To date the Greener Businesses in Greenwich programme has delivered:

- outreach to over 250 businesses,
- direct engagement with over 60 businesses,
- 25 business audits initiated,
- 15 audit reports generated.

The programme was funded with a total of 75K from Sector Business Recovery Funds from BEIS to Greenwich. 10 organisations were funded to provide business support of various kinds. Overall, it

was good to engage businesses and help them understand where their emissions are coming from and how they can reduce them.

However, as mentioned in the buildings chapter, there is little support or grant funding for businesses to decarbonise after that. No businesses went on to install energy saving measures, due to the high upfront cost, and because many businesses used a leased premises and did not have their landlord's permission to make material changes (and their business leases were 5 years or less, by which time many measures would not have paid back). This therefore highlights the lack of support in the business sector, something which requires the input from government.

8.4.7.2 Business Support – Employment and Skills Brokerage

Summary

We set ourselves the task to set up a skills brokerage programme to promote green skills training and develop pilot training projects and related support into employment. As noted in the Buildings chapter – the employment opportunities in retrofitting the borough's housing stock to net zero by 2030 are significant. The 2,299 jobs that could be created per annum from a household net-zero retrofitting programme up to 2030 demonstrate the potential and co-benefits of such a scheme. RBG has a huge opportunity to invigorate the local economy through decreased unemployment, increased economic activity with local businesses and supply chains, targeted young apprenticeships, and savings to local health services.

Progress

The Green Local London Jobs and Skills Partnership was established to support residents in our sub-region capitalise upon the predicted boom in 'green' jobs with 110,000 roles in the green economy projected by 2050.

We are currently working with Local London to take the recent cross-London report on green jobs and skills further and examine green jobs, skills and business. This report also investigates which types of activities make up the green sector such as green finance, climate adaptation and renewables research and development activities within Greenwich also form a part of green sector activity. As part of the Local London sub-region, the report notes that prominent green sectors for the area are the power and construction industries. The Council is keen to engage with the wider green finance sector over and above the "Carbon Finance" LCEGS sub sector referred to in the introduction to the survey.

The research and partnership led to the successful bid by LSEC for a green and digital skills academy for the area and the development of a green jobs and skills partnership. The scale of the green sector and geographical factors mean that provision of green skills and access to green jobs is being managed at a sub-regional level with Borough input.

As part of the annual review of adult community learning (ACL) provision, officers will work with Adult Skills Providers to ensure as far as possible that the concept of net zero is embedded in all courses, so learners understand the impact their actions have on the climate and the environment, alongside ensuring teachers have access to appropriate CPD and understand the changing nature of the labour market and growth in 'green jobs'.

8.4.7.3 Job Creation Scheme – Training and Apprenticeships

Progress

Progress has been made in driving up skills. Apart from the Building Green Skills – Youth Construction Training, the Council now works on sub-regional schemes to maximise the chance of funding and to draw from a wider pool of expertise.

Alongside securing the £4m Public Sector Decarbonisation Programme funding, the council developed a retrofit employment and skills programme, in partnership with London South-East Colleges (LSEC), to support local residents to gain an understanding of green skills and emerging jobs available within the retrofit market aligned to plan work across several corporate buildings and schools. The 6-week pre-employment pilot, included low carbon construction methods, including:

- air and ground source heat pumps,
- Solar PV,
- Battery Storage and
- LED lighting.

The pilot programme ran from July to September 2021, with 17 learners completing the training, to gain a Level 1 in Health & Safety, CSCS accreditation and insight into emerging green technologies within the retrofit construction sector through contractors delivering industry talks. To date, 76% (13) of learners have secured employment since completing the bootcamp.

We continue to promote apprenticeships relevant to the Digital and Green sectors, as part of its Greenwich Access to Apprenticeships Fund. The fund was launched in Sept 2020, to use the unspent levy to support creation of apprenticeships in the borough. This is following introduction of the apprenticeship levy scheme in 2017, which allows levy-paying employers, including the Council, to transfer up to 25% of the value of their annual levy fund to other employers, or apprenticeship training agencies.

With the development of several new standards, come opportunities to work with local businesses to support workforce development in areas such as Level 3- Plumbing and Domestic Heating Technician, Level 3 Junior Energy Manager, and the Level 4 Building Energy Management Systems Control Engineer standard. We have seen 16 businesses access the fund with 29 apprenticeships starts to date. Businesses include Helix 3D Ltd, Visit Greenwich, Woolwich Works and Jamores Homes.

To date no local businesses have addressed the green apprenticeship provision through this fund. Work is underway to develop a plan to support the take-up of provision with a particular emphasis on promoting provision that supports the delivery of the borough's carbon-neutral plan.

8.4.7.4 Sustainable Food

Summary

Community food growing spaces include allotments, growing spaces, schools, spaces open to the public, estates, communal gardens and shared gardens. Growing spaces are an opportunity to improve biodiversity and create nature rich habitats locally.

Progress

We have committed to the Sustains *Food for the Planet* campaign and will use the 'Every mouthful Counts' toolkit to consider further food growing best practice. Across the borough, 46 growing sites are mapped on the Good Food in Greenwich growing map. 5 community gardens are managed on an ongoing basis and 11 structured food growing sessions have taken place since last October 2021. Sitopia farm of land being used and commercialised for food growing being such an example. 3 residents associations have also been supported to establish growing sites. The Barnfield Estate is another good practice example of community food growing as is the work across Thamesmead as part of Peabody's living in the landscape agenda.

Children centres are an essential means of support for young families to establish healthy and sustainable behaviours. Equally schools are important settings to reinforce messages and practice relating to food and sustainability. All children's centres can access food growing support, but engagement has been low due to the pandemic. Most early years settings have some form of food growing and food waste reduction and must follow the Eat Better Start Better model which promotes healthy and sustainable food. All children's centres have some form of food growing as part of the Healthy Early Years framework.

The Council set itself the action to move from as a bronze level 'Sustainable Food Place' to Silver level. This has been achieved with the following results:

- Promotion of sustainability and food waste messaging

- Surplus food redistribution to community groups supporting low-income residents. 15 tonnes were redistributed in the first 2 quarters of the food environments contract and prevented being sent to landfill. This has resulted in 0.13tco2e saved in associated waste emissions.

- Surplus food usage in community meals and food clubs. Food clubs from March – Jun 2022 data shows that 14,120 tonnes of food have been delivered by the Felix Project and distributed at food clubs ensuring 126 tonnes of CO2 has been saved from the atmosphere.

- Cookery clubs using sustainable food practices

- The adoption of an advertising policy that prohibits the advertising of foods high in sugar, salt and fat (more processed foods)

- Reduced meat options on school meal menus

- The Good Food in Greenwich charters and catering guidelines promoting sustainable food

- 9 schools have bronze level Food for Life and the new Good Food in Greenwich model and online resource is due to be complete Jan 2023.

8.5 Conclusion of Borough Emissions

Borough wide emissions are reported using a mixture of nationally distributed data and some assumptions taken where the data is not considered accurate or available. Examining total emissions by separate sectors highlights the distinct areas for action at a high level, borough wide basis. We will continue to calculate CO2 emissions in the sections the evidence base conducted its initial report.

- Homes: emissions arising from residential properties
- Workplaces: emissions arising from business, public sector, industry sectors
- Transport: emissions arising from the transport sector

We also highlighted methodology issues and the availability of up-to-date datasets. In 2022, the Department of Business, Energy & Industrial Strategy (BEIS) released national data for 2020 Carbon Dioxide (CO2) emissions by local authority. National CO2 data is released annually by BEIS 18 – 24 months after the reporting year-end. These reports relate to the calendar (rather than financial) year. There is therefore a discrepancy in the emissions' reporting years between Sections 7 and 8 of this report. Whereas Section 7 deals with the activities the Council has undertaken in the financial year 2021-2022, Section 8 deals with the emissions arising from the 2020 calendar year. Whilst these parts therefore follow the same structure, readers must note the difference in these reporting periods as they are not a like-for-like comparison. Naturally, the following annual report will provide commentary on any assumptions made regarding borough wide emissions.

Total borough emissions have dropped by an estimated 6% from calendar years 2019 to 2020. This is a drop in all sectors measured. The largest drop is workplaces (7%) which can most likely be attributed to the national restrictions put in place to mitigate the spread of Covid-19, which meant increased numbers of the public were working from home. Transport emissions were also expected to decrease given less commutes were made as people continued to work from home and the associated less vehicle usage by businesses. The transport emissions figures should be understood in the commentary on the datasets raised above. Consumption in homes was expected to go up given the increased energy usage throughout times when the public are normally outside their homes. Instead, a 4% drop in emissions on the previous year is estimated in this area. The assumed explanation is an increased decarbonisation of the grid and the associated emissions factors.

We know where our priorities lie. The single largest source of total emissions by emissions source is domestic buildings (41% of total emissions). When combined with non-domestic sector buildings (23%), the built environment accounts for 64% of total borough emissions in 2020. Addressing these emissions will require both energy demand reduction and alternative clean energy supply initiatives. Gas use in the domestic sector makes up accounts for 31% of total borough emissions. Most of this consumption is associated with the use of gas boilers and stoves. Whilst being mindful of other sources of emissions (particularly transport due to the co-benefits of additional PM and NOX emissions mitigation) initiatives promoting the adoption of electrical heating systems and cooking appliances would naturally form the area of priority for the Council to influence borough wide emissions.

We have made progress in all areas – in particular with our empowering wider change initiatives and our fuel poverty engagement. We continue to place our residents at the heart of climate action delivery and have delivered many co-benefits through carbon mitigation – such as increased health and financial benefits for our residents.

Conclusion: Carbon Neutral Plan First Year Review

The Council's Carbon Neutral Plan (CNP) outlines the Borough's path to become carbon neutral by 2030, in line with the scientific target necessary to limit global temperature rise to 1.50C. It requires concerted action at all levels: individuals, communities, organisations, national government and international organisations.

This document reports the progress of the CNP's first year and reviews such progress against our carbon neutral 2030 target. We covered both the Council's own operational emissions and the borough's emissions separately under our seven climate themes; providing a summary of the emissions by specific sources and the carbon reduction initiatives we committed to implementing in these areas. We provide actual or estimated carbon figures where possible and use qualitative evidence when we are unable to do so.

For operational emissions we review the actions agreed and undertaken for the financial year 2021/22 and provide an assessment of the progress made. This uses the most up to date data we have recorded internally. For the borough we provide 2020 calendar year emissions data, and the remedial actions taken in 2021-22. 2020 data is the most recent available data nationally as there is a reporting time lag of about 18-24 months as emissions are verified.

We follow the scopes approach to our carbon accounting, and we are continuously improving our data collection processes to better reflect the influence we have over some additional carbon emissions. Better data scrutiny and the onboarding of additional scope 3 emissions demonstrates we are committed to improving our monitoring, reporting and mitigation of the emissions categories within our ability to lever influence.

Our operational emissions have decreased and then increased in-line with implementing and lifting of COVID restrictions. This document records our operational emissions in one place for the first time and will allow us to action areas identified as a priority for carbon mitigation.

Total borough emissions have dropped by an estimated 6% from calendar years 2019 to 2020. We have used the best available data to calculate our borough emissions. Due to the reporting period where we have implemented our climate initiatives most carbon savings are estimates which will require verification in subsequent annual reports when the data is made available.

Homes, transport and workplaces all saw emissions drop compared to the previous 2019 calendar year. The domestic sector is the largest source of borough emissions with 42% of the total, with approximately 90% of homes supplied with gas heating, forming an area of priority.

The largest drop was found in workplaces (7%) which can most likely be attributed to the national restrictions put in place to mitigate the spread of Covid-19, which meant increased numbers of the public were working from home. Transport emissions were also expected to decrease given less commutes were made as people continued to work from home and the associated less vehicle usage by businesses. Despite an increase in household numbers accessing our services our waste emissions have also gone down, which can be attributed better waste management practices and improved emissions factors.

Our emissions trajectory currently places us ahead of both the baseline and maximum ambition scenarios, although we are surpassed by the latter in the second half of the decade.

Our current trajectory is not sufficient to meet our 2030 carbon neutral target. We are therefore mindful that whilst we continue to make good progress, we are dependent upon the national policy

such as the acceleration of grid decarbonisation and further funding for retrofit schemes if we are to meet our targets.