TEWKESBURY BOROUGH COUNCIL CN2030
ANNUAL EMISSIONS REPORT:
2021 AGAINST 2019 BASELINE

TEWKESBURY BOROUGH COUNCIL

JUNE 2022

PRODUCED FOR:

TEWKESBURY BOROUGH COUNCIL

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INTRODUCTION

TBC declared a climate emergency at full council on 1st October 2019. A key part of this declaration was the preparation of revised Terms of Reference to include an audit of the Council's current position, an action plan to achieve carbon neutrality by 2030.

A baseline and high level 10 year Action Plan to achieve carbon neutrality from council buildings and core services was approved in July 2020, and this report provides a review of year 2 activity, Greenhouse Gas emissions update for 2021 & review against the baseline and finally an overview of the Action Plan for Year 3.

The Council's carbon footprint was established by analysing data associated with the Greenhouse Gas Protocol's scope 1, 2 and 3 emissions[1], with each subsequent years' data calculated using annually updated Government published carbon conversion factors.

The Council has committed to doing all in its power to become carbon neutral by 2030 specifically by addressing CO_2 emissions from operations for which it is directly responsible. This includes the following:

- Electricity, gas and water consumption from owned buildings that are used to provide a public service, therefore excluding any buildings used for commercial purposes. Therefore the TBC estate included is as follows:
    - TBC Council Offices – less areas occupied by tenants
    - Tewkesbury Leisure Centre
    - Roses Theatre
    - Tewkesbury Cemetery
    - 7 x domestic properties providing housing support (increased from 5 properties in 2019)
- TBC Fleet (including vehicles of waste contractors UBICO)
- TBC Grey Fleet – specifically being vehicles owned and used by employees or Councillors of TBC for Council purposes.
- Office Waste from the Public Service Centre (added from 2021)

[1] **Scope 1:** Direct emissions from activities owned or controlled by your organisation: ***Gas & Owned Transport;***
Scope 2: Indirect energy emissions released into the atmosphere that are associated with your consumption of ***purchased electricity;***
Scope 3: Other indirect emissions that are a consequence of your actions occurring at sources you do not own or control and are not classed as Scope 2 emissions. For example: ***business travel (staff vehicles or public transport), waste disposal, materials or fuels (water) purchased***

It is important to note that whilst 2019 is referred to as the baseline year, it was not possible to determine all 'in scope' emissions at that time. As such the inclusion of emissions from new areas (for example office waste) will mean that direct comparison of emission between the two years is compromised. There are other external factors that influence emission levels that should be considered which include national infrastructural grid greening (reflected in the annual conversion factors) measures as well as the impact on Business As Usual from COVID-19.

YEAR 2 ACTIVITY REVIEW

It is encouraging to report that action (at the PSC) against each of the recommendations made has been commenced as part of work during 2022. The table below provides a summary of the specific recommendations (Green highlighted indicates primary focus) and the current status or work against each.

Summary of Energy Saving Recommendations from Decarbonisation Plan (2020)	Current status of progress against recommendations
Replace obsolete gas fired heating system with low carbon alternative (Rec ASHP)	**Application to PSDS3 (£705,000) for ASHP system approved but grant funding pot fully allocated. Resubmission planned Q3 '22**
Upgrade/replace current Building Management System for more localised and accurate control	Upgrade to BMS incorporated in to PSDS (3) funding application as per above
Savings potential within the Server Room: The cooling units are old; the cooling temperature could be increased from 20°C to at least 22°C (modern servers = 28°C); Server room much larger than necessary & poorly insulated	Identification of opportunity to reduce equipment by 50% and whilst there are concerns over increasing server room temperature, there are plans to resize and insulate the room as part of activity in 2022
To maximise energy savings, it is advisable to undertake an updated assessment of the current levels of insulation within the thermal envelope of the building. Built in 1977 (although recently renovated)	Review conducted as part of low carbon skills fund independent assessment. Recent refurbishment upgrades insulation to better than 2010 building regulations, so further upgrades not economically prudent to pursue
Savings could be achieved from voltage reduction/optimisation equipment, which reduces the level of the voltage supply. A previous study at the council offices indicated a voltage supply of around 242 volts	Plans to implement once ASHP installed, as this, plus electric vehicle charge points significantly increase the benefit, and the additional load may impact the scope of solution. If PSDS3 successful this will be actioned in 2022/23
Following efficiency improvements increase the solar PV generation capacity	**Revised PSDS1 application approved for 230KW peak solar canopy under construction**
Whilst not directly returning energy savings, it would be advantageous to increase the level of sub-metering in place within the offices	New ASHP solution will have localised metering. Once in place next steps will be to assess more granular sub-metering potential

Summary of current status against energy saving recommendations at the PSC

In addition to the specific PSC building related plans shown above there have been additional accomplishments commenced which include:

Action	Status	Notes
Domestic Properties		
Surveys to assess condition and opportunities	Full home condition surveys, energy performance certificates and Zero Carbon Plans produced	Access to monthly/quarterly or annual consumption data required
Energy efficiency improvements	Insulation improvements retrofitted across most properties	To be completed across all properties
Low Carbon Heating Improvements	Assessments of potential for air source heat pumps and solar panels undertaken	Review of Gov. eligibility for heat pump grants required & business case for solar panels are priority next steps
Internal management systems: recording energy & emissions	Energy diaries produced for all buildings. Full recording of monthly consumption in place at PSC	Needs to be rolled out across all estate
Carbon Sequestration	Tree planting conducted at 8 sites has realised 85 trees planted	Plans to retain current available open land for future CN2030 & biodiversity net gains requirements
Carbon Literacy	Training sessions designed and planned for delivery early in year 3	Will be provided for staff and members alike
Climate Change Service Champions	Role definition outlined	Champions to be recruited following Literacy training delivered
Electric Vehicles	Owned Fleet expanded with additional electric vehicle	Renault Zoe
Salary Sacrifice	Opportunities for staff benefit being developed	Planned availability in year 3
EV charge points in car parks	Assessments being conducted, and partnership with Energy Savings Trust and Glos County Council emerging	Will achieve full costed design as minimum and expected implementation in year 3
Climate Leadership Gloucestershire	TBC leading on Waste Management element of the sustainability agenda	Exploring county wide partnership opportunities, but currently lagging behind own activity
Borough-wide carbon neutral strategy	At embryonic stage of development	Plans to arrange presentation to CCFMG from Stroud DC

There have been two staff recruited to increase resource in support of action plan implementation. A Facilities Officer joined the team in 2021, and from 22nd February 2022 a full time Carbon Reduction Officer took post. Content is being developed in readiness for production of a CN2030 aspect within our website.

SOLAR CANOPY CONSTRUCTION

The fruits of officer time and dedication spent on developing and revising the Public Sector Decarbonisation Scheme funding application to Salix over the last two years are now being realised and at the time of writing a 230KW solar canopy is under construction and at an advanced stage.

The agreed funding deadlines were extended to allow for planning and tendering exercises, but none the less delivery requirements have remained extremely tight. Despite this, close project management and good communication has kept the project on track.

The pre-construction work which included contractor site visits, further designs, survey work and trial holes was undertaken in April 2022. A G99 application was then submitted to the District Network Operator Western Power for connection to the electricity grid.

Work started on site during May with site mobilisation, set-up and the groundworks for the Solar Canopy structure. The foundations for the 13 columns which will support the solar PV roof were completed together with the first of the two soft trenching channels for cables.

An archaeological watching brief was necessary as the site is on the location of a 12th century castle.

The steel purlins and rafters of the roof structure have followed on and will be completed allowing for the Solar Panels to be mounted.

The Electrical Connections (external and internal), install of Inverters and further soft trenching will be completed by the end of June, with commissioning to follow.

The Benefits

The final design for the Solar Canopy will provide a 230kW peak system, which is greater than initially envisaged and will provide increased carbon savings.

Calculations show that the solar canopy could generate up to 260,000kWh of energy to be consumed directly by the Council offices with the balance being 'exported' to the Leisure Centre. As a result, carbon emissions are expected to reduce by 76 tonnes per annum, which represents over 7% of our total emissions documents for 2021.

The solar canopy would also deliver significant ongoing financial savings and provide a visible demonstration of the Council's commitment towards it 2030 carbon neutral objective.

The estimate of energy production in the order of 260,000kWh has been substantiated with the production of a detailed study which also mapped energy production against energy consumption for the latest full year period available. This highlighted that for the subject year, the council would be able to consume 202,000kWh for its own needs leaving approximately 58,000kWh of excess generation available for other purposes. These figures mean that approximately 44% of the Council's energy needs could be met through the new car park canopy.

Bringing together three key elements – the solar canopy, the export of excess energy to the leisure centre and an expected reduction in the baseload of 15% - will result in a significant reduction in energy consumption and an income from the sale of excess energy. To quantify this in financial terms, the current cost of electricity has been used and results in an annual saving/income of £45,222. Should energy costs continue to rise, this annual return will increase.

DATA – CONSUMPTION, EMISSIONS & CONVERSION FACTORS

Data has been collated for three overarching categories: Buildings; Transport &; Waste. This data covers the calendar year 2021. Improvements to internal management systems has significantly aided the data collection process, specifically with regard to energy consumption from most buildings and for PSC office waste. Transport data has always been and continues to be readily available. Therefore this end of year 2 emissions reporting is the most comprehensive dataset to date, and illustrates the value of robust internal data management, both from an efficiency perspective in terms of accessibility and from an analysis position. This will also enable provision of evidence to show the impact of measures implemented as well as informing future management decisions.

The following section will provide:

1. Commentary on the variations in data collection in 2021 against that from the baseline year
2. A breakdown of 2021 consumption & CO_2e emissions by both use (buildings, transport and waste) and Greenhouse Gas protocol Scope
3. The 2021 consumption & CO_2e emissions position, and a comparison (subject to aforementioned caveats) against the 2019 baseline position
4. A narrative offering a rationale that explains the changes between 2021 and baseline year emission levels
5. A brief review of changes to Government published conversion factors between 2019 and 2021 and their impact on our 2021 emissions position

DATA CONSIDERATIONS: Changes against 2019 Baseline

There are four main changes that have impacted on the data that directly compromise the ability to make a direct comparison between the emission levels of 2021 and the 2019 baseline. These are:

1. Government published conversion factors that enable consumption to be converted from energy, mileage or waste are updated annually as infrastructural improvements lower the factor or conversely the need to import more resources from overseas will increase the factor

2. The addition of consumption/emissions from 5 further buildings of the council's estate: Bishops Cleeve Cemetery; Lower Lode Depot; Deerhurst & Tirely Pump Houses; Wheatpieces Community Centre
3. The addition of emissions from PSC office waste is included in 2021 data that was not available for inclusion in 2019 baseline
4. The electricity consumption in 2021 for Roses Theatre suggests the baseline data provided was inaccurate. Data provided was in the form of a single line email for both years, however the consumption in 2021 is over 7 times higher than that provided for baseline. At present the Theatre is not utilising provided energy diaries, which if adopted would enable consumption to be easily validated

ANALYSIS

The analysis of the data focused on two primary aspects, Use and Scope. Showing the level of emissions by 'use', meaning those derived from energy consumed in **Buildings**, fuel used in **Transport** and that from processing office **Waste** provides a simple and digestible breakdown of the council's emissions, whereas emissions by 'Scope' are provided for the purpose of future formal reporting requirements where emissions are broken down into 1 of 3 scopes determined by a combination of the primary energy source, its production refinement and transportation, or more generally the categories of activity from which emissions are produced (water use, office waste etc.). This is illustrated in the two sections below.

Where possible comparisons are made between the 2021 and 2019 baseline data however there are factors to be mindful of that prevent a complete direct comparison as outlined in the above section.

CONVERSION FACTOR IMPACTS

The following table shows the carbon content in a unit of energy, this is measured in kilograms of carbon dioxide equivalent (kg/CO_2e/kWh), which is applied to the relevant year's consumption in order to determine emissions levels. There has been an expectation that whilst the carbon content of gas and oil will remain largely constant (which it has, with only a 3.15% increase between 2019 and 2021) there would be significant annual reductions in that of electricity. This, due to Government projections that the electricity would be almost free of carbon before 2030 as a result of increasing renewable energy generation replacing fossil fuel generation. It is therefore interesting to note the increase in the electricity carbon factor in 2021 against 2020, and whilst relatively small (1.09%), is worthy of attention and explanation.

	2019		2020		2021	
	Electricity	Gas	Electricity	Gas	Electricity	Gas
Conversion Factor	0.31598	0.20776	0.28813	0.20778	0.2913	0.2145
Annual % Change	-	-	-9.67%	0.01%	1.09%	3.14%
2021 % Change v 2019 Baseline	-	-	-	-	**-8.47%**	**3.15%**

Table: Carbon Factor (KG/CO_2e/kWh) changes in 2020, 2021 against 2019 Baseline (BEIS: .Gov.uk)

National statistics released by the Department for Business, Energy & Industrial Strategy (BEIS) in the December 2021 issue of Energy Trends[2] point to two main reasons for this increase. Firstly, weather conditions during periods of 2021 were less conducive for production of energy through renewable sources than in 2020 (this relates to the period July to September '21 compared to the same period in '20), and as such the total UK generation fell. It should be noted that whilst actual generation fell by 17% against the same period of the previous year, the actual capacity for renewable energy generation had risen by 3%, this highlights the need for diverse renewable energy generation solutions that will help mitigate meteorological vagrancies. It was wind generation that was mainly affected, seeing a 30% reduction in generation as a result of the lowest recorded wind speeds this century. In addition, during the same period, demand for energy rose by around 6.5%, necessitating an increase in imported energy. The increase in the carbon factor is directly as a result of electricity production from overseas, and the associated additional transportation and distribution.

Considering this in terms of what it means more locally and the recommendations that can be taken, it really does serve to reinforce our planned CN2030 roadmap and strategic approach. By reducing the level of demand for energy as a result of further increasing energy efficiency activity (technical, managerial and behavioural), combined with increasing on-site renewable energy generation we will not only reduce demand for imported energy from the national grid, but also mitigate the risk of increasing energy costs and increase resilience or self-sufficiency.

CONSUMPTION AND EMISSIONS BY USE

BUILDINGS

Data has been collated and analysed and is attached to this report[3] for more detailed review. The table below shows the total building energy consumption for relevant estate buildings (those considered to be used for the provision of core council services).

All Buildings 2019				
Fuel	kWh	T/CO_2 (Scope 1/2)	T/CO_2 (Scope 3)	T/CO_2 Total
Electric	734,087	188	44	232
Heat	2,231,920	410	53	464
Water			5	5
Total	2,966,008	598	103	**701**

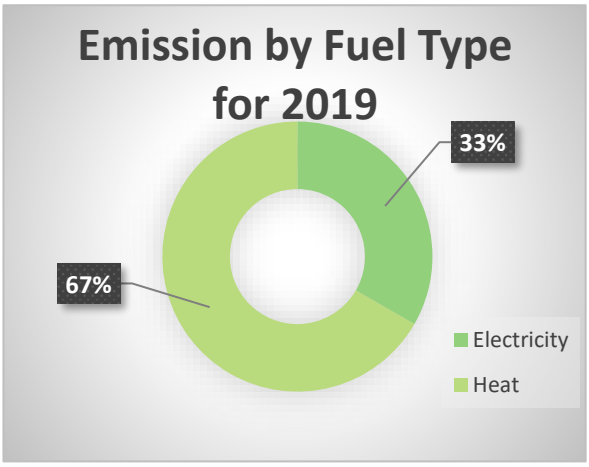
All Buildings 2021				
Fuel	kWh	T/CO_2 (Scope 1/2)	T/CO_2 (Scope 3)	T/CO_2 Total
Electric	641,980	154	54	209
Heat	1,753,227	321	55	376
Water			2	2
Total	2,395,208	476	111	**587**

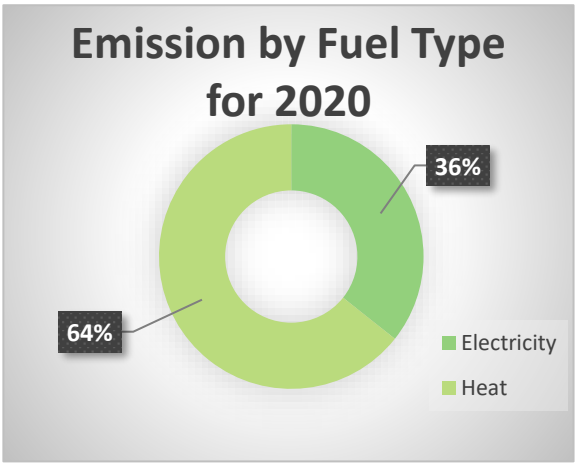
[2] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1043311/Energy_Trends_December_2021.pdf

[3] "CN2030_Emissions_2019_v_21_Data – Excel" workbook

The headline results show that in **2021 there was a 16.28% reduction in total building emissions** against the 2019 baseline, with total energy consumption reducing by 19.24% between the same periods. The majority of the reduction in consumption is from energy used to heat buildings (including swimming pool heating in the case of the Leisure Centre).

It is important to note that currently Natural Gas consumption accounts for the vast majority of building energy consumption (75.25% in 2019 and 73.19% in 2021), and similar proportions for emissions derived from electricity and gas (33% & 67% in 2019 and 36% & 64% in 2021 respectively), and with the conversion factors changing by +3.15% for gas and -8.47% for electricity since 2019, it confirms that from a carbon neutral aspirational perspective changing the source of heating from gas to electricity will have an ongoing greater impact on emission reductions. This should remain a priority focus of attention in relation to carbon reductions from buildings.





More granular analysis (building by building) of energy consumption from the largest consuming buildings (Leisure Centre and the Public Service Centre) show contrasting patterns in consumption by fuel type both of which actually support the same conclusion. From the graphic below it can be seen that the Leisure Centre's gas consumption has reduced significantly in '21 against baseline, whereas it is electricity consumption at the PSC (council office) that reduced during the same period.

PSC	2019			
Fuel	kWh	Tonnes CO_2 (Scope 1/2)	Tonnes CO_2 (Scope 3)	Tones CO_2 Total
Electricity	267,828	68.46	16.17	84.63
Heat (Gas)	282,424	51.92	6.75	58.68
Water (m^3)	980	0.00	1.03	1.03
Total	**550,253**	120	24	**144**

PSC	2021			
Fuel	kWh	Tonnes CO_2 (Scope 1/2)	Tonnes CO_2 (Scope 3)	Tones CO_2 Total
Electricity	225,356	47.85	17.80	65.65
Heat (Gas)	294,824	54.00	9.24	63.24
Water (m^3)	1,964	0.00	0.83	0.83
Total	**520,181**	102	28	**130**

TLC	2019			
Fuel	kWh	Tonnes CO_2 (Scope 1/2)	Tonnes CO_2 (Scope 3)	Tones CO_2 Total
Electricity	406,630	103.93	24.55	128.49
Heat (Gas)	1,632,377	300.11	39.03	339.14
Water (m^3)	4,026	0.00	4.24	4.24
Total	**2,039,007**	404	68	**472**

TLC	2021			
Fuel	kWh	CO_2 (Scope 1/2)	CO_2 (Scope 3)	CO_2 Total
Electricity	325,689	69.15	25.72	94.87
Heat (Gas)	1,092,538	200.11	34.25	234.36
Water (m^3)	3,226	0.00	1.36	1.36
Total	**1,418,227**	269	61	**331**

As a result of each buildings use, the suggestion is that the reason for this relates to the impacts of COVID. As such it is likely that gas consumption at the leisure centre will return to pre-COVID levels,

and this is an important factor to consider when looking at the overarching annual emission figures. This said the reduction in electricity use at the PSC, whilst also due to COVID is unlikely to return to pre-COVID levels because of the introduction of hybrid working. Interestingly, the reason there was no reduction in heating consumption at the PSC was as a result of very limited controllability of the existing heating system. This further impresses the need for a low carbon heating upgrade to be implemented when possible.

Finally, there are new metrics being introduced across public sector organisations, particularly academia at the current time that is looking at annual emission intensity ratio against annual employee numbers. This has been calculated as part of the Tewkesbury CN2030 reporting process for this year. There is no current benchmark or best practice level available, however the aim is to see the ratio decrease year on year.

Emission Intensity Ratio: CO_2e against Annual Employee Numbers (Public Service Centre)		
Year	2019	2021
Employee Number	207	220
CO_2e Emissions (Tonnes)	701	587
Emission Intensity Ratio	0.70	0.59

TRANSPORT

There have been no changes to the areas of business that form council transport emissions, and the tables below show the mileage and emissions associated with each aspect.

2019 Fleet, Ubico & Grey Fleet: Mileage & Emissions

Type	Mileage	Scope1	Scope 3	Total
Pool Fleet	55,819	13.13	3.53	16.66
Ubico	605,903	705.71	169.40	875.11
Grey Fleet (Staff	17,837	0.00	7.02	7.02
Grey Fleet (Councillors)	14,337	0.00	5.64	5.64
Total	**693,897**	**718.84**	**185.59**	**904.43**

2021 Fleet, Ubico & Grey Fleet: Mileage & Emissions

Type	Mileage	Scope1	Scope 3	Total
Pool Fleet	24,794	3.94	1.10	5.04
Ubico	389,484	374.09	94.75	468.84
Grey Fleet (Staff)	13,790	0.00	5.34	5.34
Grey Fleet (Councillors)	2,546	0.00	0.99	0.99
Total	**430,614**	**378.03**	**102.18**	**480.20**

As can be seen there have been reductions across every category of transportation, most notably from collection of domestic waste provided by UBICO. At the time of writing, the council is exploring with UBICO the reasons behind the substantial reduction in mileage, and any important findings from this will be reported separately. It is thought that any errors will relate to the 2019 data, and not the 2021 data, meaning that 2021 emission figures provided are accurate.

Further points of note are that the councils Pool Fleet has added a new electric vehicle and also focused on the reduction in usage of its petrol fuelled vehicles, which alongside the reduction in miles travelled have led to a reduction in emissions of around two-thirds. Additionally mileage recorded from Councillors has reduced by over 80%, which is reflected in emissions from this aspect of transport emissions. It should be noted however that not all Councillors claim reimbursement for expenses incurred. As such the total mileage and by association, emissions will most likely be higher than that documented. It is advised that all business related mileage is documented and provided to the council, if only for the purpose of increasing the accuracy of operational emissions for which the council is responsible for eliminating as part of the CN2030 programme.

The table below brings together data from the two transport tables above, showing the decrease (across the board) in mileage and associated emissions as well as the % reductions realised in 2021 against the 2019 baseline.

Mileage, Emission and % change 2021 against 2019 Baseline				
Type	**Mileage +/-**	**% Mileage +/-**	**Emission +/-**	**% Emission +/-**
Pool Fleet	-31,025	-55.58%	-12	-69.76%
UBICO	-216,419	-35.72%	-406	-46.42%
Grey Fleet - Staff	-4,047	-22.69%	-2	-23.95%
Grey Fleet - Cllrs	-11,791	-82.24%	-5	-82.53%
Total	**-263,283**	**-37.94%**	**-424**	**-46.91%**

It is important to note the caveat regarding mileage from UBICO in 2021 being under review, but on the basis that 2021 mileage figures are found to be accurate then the level of emission reductions is substantial. If however it was to be assumed that the mileage from UBICO was the same in 2021 as in 2019, then the overall reduction in emissions reduces to less than 5%.

WASTE

It is positive to note that office waste data is now being recorded. Whilst currently this is only in terms of recycled and non-recycled waste, this does not affect the accuracy of the associated emissions. The emission conversion factors associated with waste are predominantly affected by the nature of its disposal, with the worst method unsurprisingly being landfill, and the optimal method being anaerobic digestion or composting. Presently no waste is disposed of by any of these methods. The graphic below provides the headline figures for 2021. The current impact of office waste on total emissions is negligible.

Total Waste (kg)	**13,301.33**
% Recycled	**98.86%**
T/CO2e Emissions	**0.28**

COMBINED EMISSIONS RESULTS

The graphic below clearly shows the status of emissions in 2021 against the 2019 baseline position. There is a high degree of confidence in the 2021 data, but uncertainty over elements of the 2019 baseline transport data, which needs further investigation.

Category	2019 Emissions (T/CO2e)	2021 Emissions (T/CO2e)	Emissions Variance (-/+)	% Emissions Change (-/+)
Buildings	701	587	-114	-16.28%
Transport	904.43	480.20	-424	-46.91%
Waste	0	0.28	0	
Total	**1,605**	**1,067.37**	**-538.07**	**-33.52%**

It is important to take into consideration the impacts of COVID-19 in 2020 and 2021, and more detailed analysis of 2020 annual data (not currently available in totality) should be undertaken in order to help better contextualise this impact. One of the main reasons that underline the importance of this is because internal CN2030 efforts over the past 18-24 month have focused on internal management systems, securing external funding opportunities and increasing the level of staff resource allocated to CN2030 activity as opposed to the implementation of costly measures that would achieve the highest levels of emission reductions.

EMISSIONS BY SCOPE

The table below shows a direct illustration of emissions by scope based on formal greenhouse gas protocol reporting structure.

TBC 2021 CO2 Emissions by Scope & Element				2019 Figures	
Scope	**Element**	**Emissions (T/CO2e)**	**% of Total**	**Emissions (T/CO2e)**	**% of Total**
Scope 1	Gas Consumed	321.12	30.09%	405.95	25.37%
	Owned Transport	378.03	35.42%	718.84	44.93%
Scope 2	Electricity Consumed	154.42	14.47%	185.68	11.61%
Scope 3	Extraction, refinement & transportation of Scope 1 Gas	54.96	5.15%	52.79	3.30%
	Extraction, refinement & transportation of Scope 1 Transport Fuel	95.85	8.98%	172.93	10.81%
	Extraction, refinement & transportation of Scope 2 Electricity	54.17	5.07%	43.86	2.74%
	Water	2.21	0.21%	7.21	0.45%
	Business Travel (unowned vehicles)	6.32	0.59%	12.66	0.79%
	Waste	0.28	0.03%	N/A	0
TOTAL		**1,067.37**	**100%**	**1,599.96**	**100%**

YEAR 3 ACTION PLAN

The 2022/23 (year 3) Action Plan has been informed by activities undertaken during the last 2 years particularly given recent energy price increases against which the Council are keen to mitigate before the end of current energy contracts in 18-24 months' time.

As a result of prudent management and good timing Tewkesbury Borough Council benefits from highly attractive energy tariffs, which are contractually committed for the short to medium term. This presents an opportunity through the CN2030 programme to take stock of the potential impacts of the recent substantial increases in energy costs for many and work to mitigate accordingly. As such there will be a prioritisation of demand reduction activities, and where possible power decarbonisation through continued expansion of on-site renewable energy generation.

The main CN2030 focus areas at the PSC for 2022 / 2023 include:

- Addressing energy waste resulting from the server room. This will involve: a reconfiguration of the server room in order to reduce its size by up to 75% in order that substantially less area requires conditioned cooling (subject to viability, free cooling options will be explored to further minimise energy requirements); super-insulating the reconfigured server room so as to prevent cooling losses which will have a duality impact of firstly retaining the conditioned air within the space for longer, thus reducing the amount of conditioned air required, and secondly as a result of reduced cooling losses, the adjacent areas will require less heating that would otherwise be needed to overcome the impact of cooled air permeating into occupied office spaces that may require heating beyond the temperature of the conditioned air.
- Assessing the impact of time control on the point of use Domestic Hot Water units throughout the building, and further consideration of the benefits of implementing time control on other equipment such as water coolers, printers, photocopiers etc.
- Based on the impact of the two aspects above, detailed, out of hours, energy surveys will be conducted to identify explicit areas of night time energy waste. As explained earlier in the report, achieving a 15% reduction against current baseload levels are likely to enable the building to achieve energy based Net Zero Carbon, and as such this is a main priority
- Should another Salix Heat decarbonisation funding window open in the Autumn the previously approved application that was not funded due to full allocation of the grant fund by the time our application was assessed will be resubmitted
- Voltage optimisation has been previously explored, and based on historic electricity demand levels the benefits were not sufficient to justify the investment costs. As a result of the significant increase in electricity demand resulting from converting from gas fired to electricity powered heating, alongside the four 22KW Electric Vehicle Change Points (which will undoubtedly have to grow in number in years to come) it is expected that the business case for voltage optimisation will become viable. Therefore, and subject to confirmation of funding to support the low carbon heating plans, it is expected that an updated voltage optimisation feasibility study will be commissioned during 2022/23 and based on findings, implemented during 2023/24.
- Looking beyond utility consumption there are plans to initiate staff engagement campaigns

Carbon literacy training will be provided for staff and members, providing subject knowledge around climate change which is fundamental to ensuring that both key strategic and daily operational decisions and actions are undertaken that minimise impact on the environment.

“Carbon Literate citizens understand how climate change will affect them – both geographically and sectorally – and have acquired the knowledge and skills to lower their carbon footprint, with typical realised carbon savings of 5-15% per person” (Jacobs 2018). The training is then a natural progression to another objective within the Carbon Reduction Programme, such as Climate Change (service) Champions.

The champions will lead on developing and reporting improvements within their work area, and help further develop the programme strategy.

An Electric Vehicle Infrastructure strategy will be developed to understand the need with in Tewkesbury Borough and shape charge point delivery within the Council’s Public Car Park’s and

working together with Gloucestershire County Council's programme to deliver on street charge points across the County.

Further Strategies will be required to consider how to reduce emissions from Waste Collection Vehicles and also looking more outward how to support Borough-wide Decarbonisation. Internally we are further improving how we report on waste management and improving the Council's website to highlight programme activities, carbon performance, and support for residents and linking to relevant strategies and partners.

We will continue to contribute to countywide partnership working around tree planting, energy efficiency housing retrofit and other related climate change initiatives, including:

- Waste management initiatives
- Consideration of additional sub-metering to further improve management decision making and provide better evidence of the impact of energy reduction measures implemented
- Analysis to further expand the components of the Greenhouse Gas Protocol's Scope 3 to potentially include features like the carbon impacts (both upstream and downstream) of: products and services; Procurement; Working with 'In-contract' suppliers to maximise the work they do in relation to emissions reductions be it through reducing packaging, identifying carbon free production opportunities, emission free transportation and distribution etc.
- Assessment and options appraisal for enabling commencement of a Borough wide carbon neutrality declaration

In conclusion, there has been robust and tangible progress made since August 2020 when the Council started on its Carbon Neutral journey, and as a result of this the opportunities to push both ourselves, our partners and our residents further and harder are presenting themselves. We are committed to doing all we can to achieve positive change on this crucial agenda in the short, medium and long term.

The table overleaf summarises Year 3 planned activity:

	Action	Success Criteria	Timetable
-	**Communications & Engagement**		
1	**CN2030 Branding and web presence**	TBC Web pages created reporting on programme activities, carbon performance, support for residents and linked to relevant strategies and partners	30/09/2022
2	**Staff Training – carbon literacy**	Minimum 3 courses delivered to 45-60 staff / members. 15% of council staff certified as carbon literate and progress toward accreditation. Impacts of training carried forward into work activities.	31/07/2023
3	**Climate Change (Service) Champions**	At least 1 CC Champion 'recruited' in each council service area and first meeting undertaken.	31/03/2023
4	**Further Low Carbon & Sustainability Support for Staff**	Monthly article in News4U, and programme of support in place working with the carbon champions	31/07/2023
5	**Publicise, Celebrate and seek recognition for solar canopy and other CN2030 achievements**	Production of case study, press release and award	31/12/2022
-	**Technical Implementation**		
6	**PSC Low carbon heating**	New application submitted to Salix when funding opens for PSC heating system.	31/07/2023

7	**Ensure Solar Arrays are fully optimised**	Solar Generation as per plan	31/12/2022
8	**Further PSC Energy Efficiency improvements, including reduced out of hour's consumption.**	Additional measures implemented and a reduction in Electricity & Gas consumption	31/03/2023
9	**Installation and utilisation of Electric Vehicle Charge Points in TBC owned public car parks and on street locations**	Charge points installed in public Car Park and Gloucestershire County Council installed charge points on street.	31/07/2023
10	**Conversion of remaining car fleet to electric**	Conversion cost defined, business case approved and date agreed	31/07/2023
11	**Agree Action Plans & Commencement of Domestic property decarbonisation**	Action Plan agreed for domestic properties with quotes for works.	31/07/2023
12	**Increase internal recycling rates and reduce overall waste**	Reduced overall waste and increased recycling rates	31/07/2023
	Scoping Studies and Policies & Schemes		
13	**Electric Vehicle Charge Point Strategy**	Interim Scoping study to consider demand determine sites, system size, cost & charges for use produced	30/09/2022
14	**Detailed feasibility studies in support of Roses Theatre decarbonisation plans (as applicable)**	Completed feas studies as req'd to enable installations to commence	31/03/2023
15	**Commence planning and scoping study for Borough wide decarbonisation.**	A Carbon Neutral Tewkesbury Borough high level planning exercise commenced	31/07/2023

16	**Develop Waste Collection Vehicle - Low Emission and Alternative Fuel Strategy**	Low Emission / Alternative Fuel Strategy work commenced, with time framework for procurement	31/07/2023
	Budgets, External Funding & Reporting		
17	**Research and applications to wider funding streams (as applicable/available)**	External funding opportunities identified and secured.	31/07/2023
18	**Maintain and Improve Carbon Reporting**	Continuous Reporting Improvements demonstrated in year 3 report and at flood and climate risk quarterly meetings. Further Scope 3 consideration.	31/07/2023
	Partnerships & Wider Activity		
19	**Actively support partnerships such as the Innovate to Renovate Programme, and create links with areas such as Climate Change Adaption and Low Carbon Business advice.**	Contributing to project development and signposting services to potential customers / beneficiaries.	31/07/2023
20	**Support Tree Planting, Tree Protection and Bio-Diversity**	Help GCC recruit minimum 1 new tree warden in Tewkesbury Borough and 100 new trees planted on TBC owned land.	31/07/2023