



# Dacorum Borough Council

## Consultancy support – Establishing the Council's Carbon Footprint Trajectory to 2030

Report

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Draft Vs 1



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# DACORUM BOROUGH COUNCIL

## CONSULTANCY REPORT – ESTABLISHING THE COUNCIL'S CARBON FOOTPRINT TRAJECTORY TO 2030

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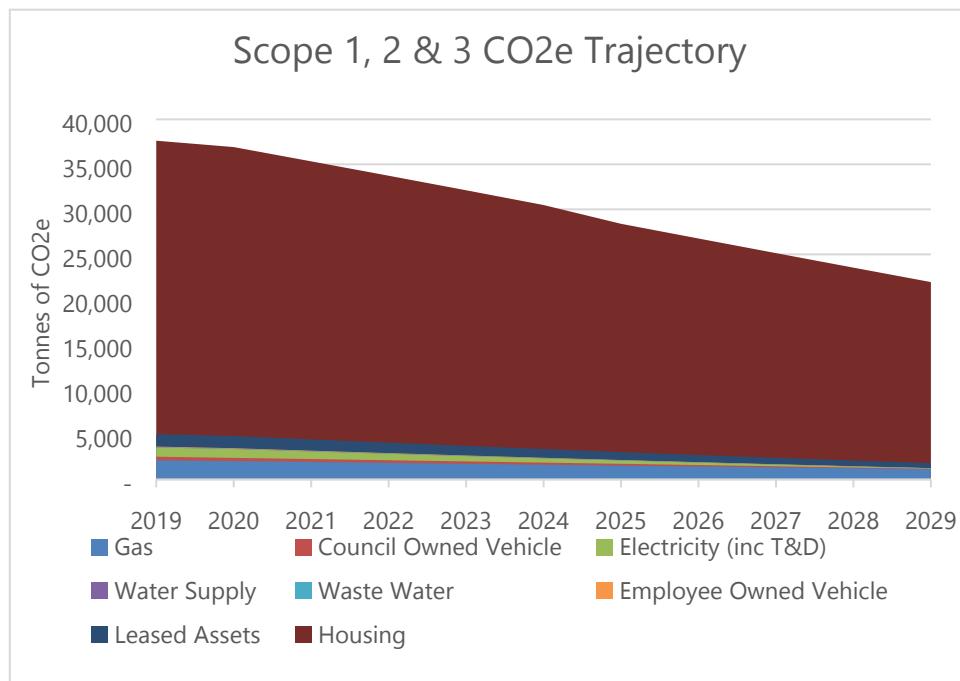
## Executive Summary

The 2019 baseline carbon emissions from Scope 1, 2 and 3 emissions within Dacorum Borough Council's own operations are 37,625 tCO<sub>2</sub>e.

It is estimated that a financial budget of £13.9 million is required to reach net zero carbon for Scope 1 and 2 emissions (as currently calculated) by being more energy efficient in buildings, generating power and moving towards electric vehicles. It is estimated that these initiatives will financially benefit the Council by £788.5k annually by 2030.

It is estimated that there will be 21,919 tCO<sub>2</sub>e from hard to reduce sources from Scope 1, 2 and 3 emissions that will be unavoidable by 2030 that will need to be offset.

**Chart 1. Chart showing projection of carbon emissions of the Councils Scope 1, 2 and 3 emissions**



However, it should be noted that this does not account for all emissions released through Council operations as issues arose with the collection of data. As an example, data was not available to calculate emissions from sectors such as waste and purchased goods in the supply chain. This is not surprising, as no local authorities have been required to collect and keep this extent of data previously. However the Council should aspire to collect as much data as it can on the principle that 'what is measured, can be managed.' The Council has indicated that it will focus on data moving forwards and so the picture will become more

comprehensive and it is also expected that total emissions will increase as access to this data improves.

It is important to understand that this exercise is based on data which may not be comprehensive and so will have an impact on the results. It is to be expected that there will be a margin of error in the calculations. The appendices provide a significant amount of information about the Council's entire estate. Detailed feasibility studies will highlight actual emissions reductions and savings which can be made and we suggest this is part of the Council's ongoing approach.

## 1 Introduction

This report provides the results of the carbon footprint calculations for Dacorum Borough Council which can be used to record the baseline emissions and a trajectory of future emissions in order to become net zero carbon by 2030. The carbon footprint calculations have been undertaken in accordance with best practise guidance by the Greenhouse Gas Protocol and carbon conversion factors published by the Department for Business, Energy & Industrial Strategy (BEIS).

The reporting baseline year is nominated as the calendar year of 2019. The carbon footprint is categorised into scopes, which cover:

**Scope 1 (direct)** emissions are from activities owned or controlled by the Council. Examples of Scope 1 emissions include emissions from combustion in council owned or controlled boilers, furnaces and vehicles.

**Scope 2 (indirect)** emissions are associated with purchased electricity, heat, steam and cooling. These indirect emissions are a consequence of the Council's energy use, but occur at sources that the Council does not own or control. Examples include grid supplied electricity and heat provided through a heat network.

**Scope 3 (other indirect)** emissions are a consequence of the Council's actions that occur at sources the Council does not own or control and are not classed as Scope 2 emissions. Examples of Scope 3 emissions include business travel by means not owned or controlled by the Council (grey fleet), leased assets, disposing of the Council's own waste and purchased goods in the supply chain, etc.

The carbon footprint has been calculated based on data provided by Dacorum Borough Council. Emissions included within Scope 1 and 2 essentially cover assets where the Council are responsible for paying the fuel bills. Based on the property addresses, it is assumed that this includes the electricity usage for the lighting in several landlord areas in housing blocks and some communal heating areas, but excludes individual dwellings. The Council owned housing stock is categorised under Scope 3, as the Council own the asset but do not occupy it or pay the energy bills.

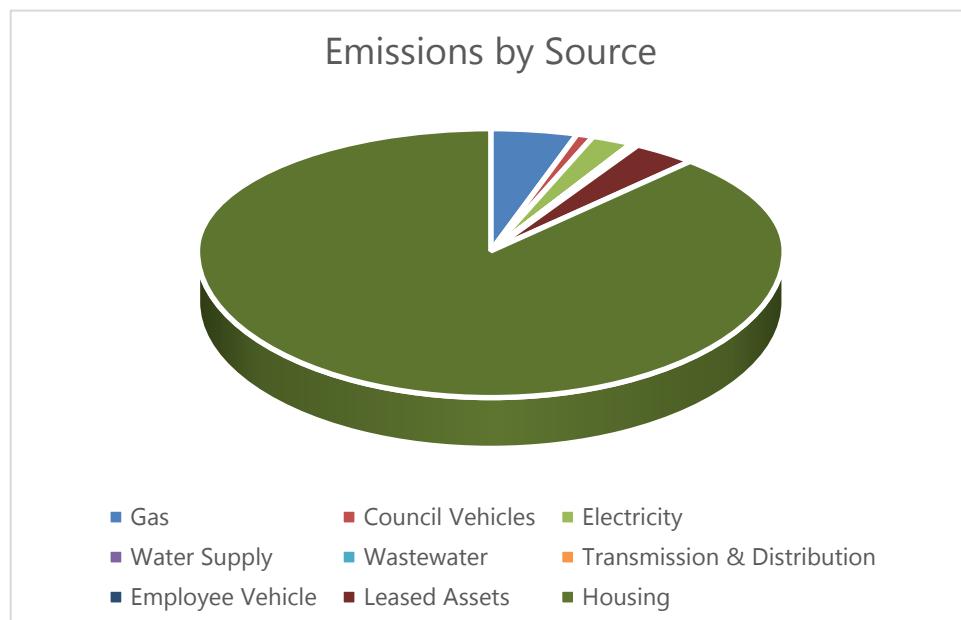
## 2 Carbon Footprint

The carbon footprint has been calculated using the best data that was available to the Council during the reporting year. Section 6 provides further detail of what information is required to report on all emissions going forward.

**Table 1. Carbon emissions by source for 2019**

Emissions Source	Scope	% Split	TonnesCO <sub>2</sub> e
Gas	1	5.6%	2,123
Council Vehicles	1	1.1%	398
Electricity	2	2.5%	950
Water Supply	3	0.03%	12
Wastewater	3	0.07%	27
Transmission & Distribution	3	0.2%	68
Employee Vehicle	3	0.2%	65
Leased Assets	3	3.7%	1,381
Housing	3	86.6%	32,602
<b>Total</b>	-	<b>100%</b>	<b>37,625</b>

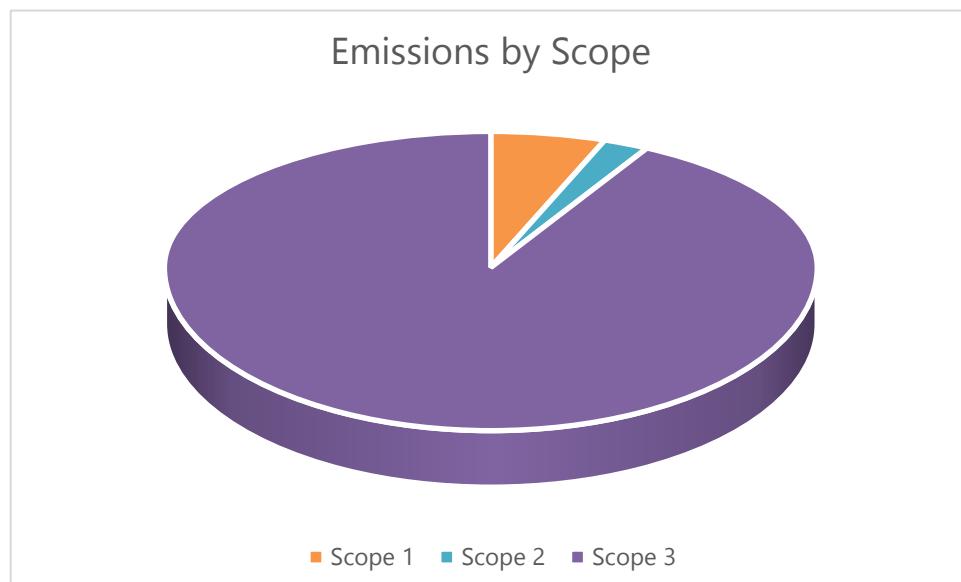
**Chart 2. Carbon emissions by source for 2019**



**Table 2. Carbon emissions by scope**

Emissions Source	% Split	TonnesCO <sub>2</sub> e
Scope 1	6.7%	2,521
Scope 2	2.5%	950
Scope 3	90.8%	34,154
<b>Total</b>	<b>100%</b>	<b>37,625</b>

**Chart 3. Carbon emissions by scope**



The data shows that the Council owned housing stock of 10,127 properties accounts for 86.6% of the Council's total emissions.

### 3 Notes and Observations on Calculating Emissions

Appendix A is an Excel spreadsheet that shows a breakdown of the emissions by source. This can be used to develop a carbon strategy by identifying and approaching sources with the highest emissions.

At the time of reporting, data was not available from the gas supplier for December 2019, so the reporting period is 01/12/18 to 30/11/19.

Usage has been prorated for periods that do not cover a full calendar year, e.g. a supply period covering 380 days has been adjusted to 365 days. A separate column has been provided in Appendix A which shows the 'Adjusted' usage.

Appendix A highlights sites which are under the Housing Revenue Account (HRA) and reported under Scope 1 and 2. All sites included under Scope 1 and 2 are buildings where the Council pay for the energy, as being responsible for paying the bills effectively denotes ownership of emissions. Most of the electricity use in HRA sites is assumed to be from landlord lighting in communal areas and gas consumption is assumed to be from district heating for communal areas (not tenanted properties).

Emissions data has been calculated based on recorded usage during the reporting year except for the Council owned housing stock which has been estimated based on calculation (explained further in Section 4).

The recorded usage provided for the water supply and wastewater is the same. The return to sewer (wastewater) is typically calculated based on 95% of the supply usage, i.e. it is assumed that 5% is consumed and 95% of the water that is supplied to a premises is returned to the sewer (RTS). The RTS could be far less if it is for a premises that returns less than 95% to the sewer, for example, water that is evaporated by cooling towers as part of a building's air conditioning.

At the time of issuing this report, an investigation was underway to identify a suspected issue with the electricity meter at The Forum. The carbon emissions for The Forum's electricity usage has been calculated based on the Building Regulation UK Part L report (BRUKL Report) which shows the calculated energy usage for the building which was determined during the design stage. This is the standard calculation method used in the UK for commercial buildings and gives an accurate representation of what the energy usage of a new build premises should be. It is not exactly the same as the actual usage as assumptions are made based on internal equipment and building usage patterns.

Actual mileage for all vehicles should be recorded during the reporting period. The Scope 1 vehicle data provided was calculated by averaging the total mileage to date and dividing by the age of the vehicle. This does not reflect the actual distance travelled in the reporting year.

The Council should record the gross vehicle weight of Council owned vehicles. The gross vehicle weight value is the maximum operating weight of the vehicle including passengers, cargo and any additional body work (for example, tail lift or box section). This excludes the weight of any additional trailers. As this information has not been provided, all heavy vehicles have been classed as 'Average' and all light vehicles have been categorised as 'Class I (up to 1.305 tonnes)'.

A sense check should be made on the data. A refuse vehicle has been recorded as travelling 108,142 miles in one year which is much higher than average.

## 4 Emissions from Council Owned Housing

The Council owned housing stock comprises of 10,127 properties and is reported under Scope 3 as the Council do not pay the energy bills. However it does own and maintain the properties. Consumption data from domestic properties is required to accurately calculate the emissions however, it will not be possible to obtain consumption data from the tenant energy bills so an alternative methodology is required to calculate the emissions from housing.

### **Energy Performance Certificates**

Energy Performance Certificates (EPC) determine the carbon emissions based on a site survey and using software which calculates a rating so that a comparison of the energy efficiency can be made with other dwellings. The EPC's are given a rating from A to G and a SAP rating of 1 to 100, with G/1 being the least energy efficient and A/100 being the most efficient.

The Council's asset register contains the EPC rating for 5,158 dwellings but the EPC rating alone is not enough to calculate CO<sub>2</sub> emissions.

The average rating across these EPC's is 65.9 with the vast majority of dwellings being +/-5 either side of this average.

The average domestic EPC rating in England in 2016 was 62 ([source](#)), which shows that the rating of the Council housing stock is just above average.

### **BEIS Local Authority Emissions Data**

BEIS publish annual carbon emissions data for local authorities within the UK. The most recent data published is from 2017 and it covers the electricity, gas and 'other fuels' (oil) of domestic properties. The consumption data is taken from the Digest of UK Energy Statistics (DUKES) which contains data of actual energy usage for each building within the Dacorum local authority post code and is based on usage data taken from the electricity and gas suppliers. This is converted into CO<sub>2</sub> emissions and a correction factor is applied to the gas data so that it is adjusted to average weather conditions. It is a reliable source of data and it covers all dwellings in the Dacorum local authority area.

### **Establishing the Council Owned Housing CO<sub>2</sub> Benchmark**

It was agreed with Council officers to include benchmark emissions for housing and acknowledge that the methodology and data gathering process will need to be improved in subsequent years. An explanation of the methodology to calculate the benchmark is included below so that this can be referenced in future reporting.

The table below shows the apportioned emissions from Council owned housing within the local authority area.

**Table 3. Apportioned emissions from Council owned stock 2017**

A Fuel	B Dacorum 2017 LA Emissions (tCO <sub>2</sub> )	C Council Owned Housing Apportioned Emissions (tCO <sub>2</sub> )	D Council Owned Housing Emissions Adjusted (tCO <sub>2</sub> )
Electricity	65,743	10,132	<b><u>9,532</u></b>
Gas	159,105	24,520	<b><u>23,069</u></b>
<b>Total</b>	<b>224,848</b>	<b>34,652</b>	<b><u>32,602</u></b>

### Explanation of Calculations

- Column B – The total CO<sub>2</sub> emissions of all dwellings within the Dacorum local authority area for 2017 published by BEIS
- Column C – Apportioning emissions based on the total number of dwellings. Council owned dwellings account for 15.4% of the regions total based on:
  - Estimated number of dwellings in Dacorum LA post code = 65,711 (taken from SCATTER)
  - Estimated number of Council owned dwellings = 10,127
- Column D – An adjustment factor is applied to adjust the emissions based on the Council's average EPC rating calculated as:

$$\frac{\text{National EPC average}}{\text{DBC EPC average}} = \frac{62}{65.9} = 5.9\% \text{ uplift}$$

By apportioning the data available it is calculated that the total carbon emissions for the Council owned housing stock is **32,602tCO<sub>2</sub>**.

The adjustment factor could be increased as EPC data is updated and recorded following an efficiency improvement in a dwelling.



## 5 Achieving Net Zero Target

### 5.1.1 Energy Efficiency

Appendix B shows generic actions that could be taken to reduce energy usage from the baseline for Scope 1, 2 and 3 emissions. This is a desktop assessment based on the consumption data and typical saving initiatives and is not based on site specific information. Estimated energy savings and forecast capital costs shown are for representative purposes to give an illustrative outcome and should not be used for budgeting purposes. Please note that further work is required to take forward the initiatives demonstrated.

It is recommended that a detailed audit and feasibility study is carried out for all assets to determine their specific and bespoke initiatives. This will provide an indication of the realistic interventions that could be provided and the likely cost savings, capital cost and carbon savings.

The following assumptions have been made which can be updated when more information is available:

- Future CO<sub>2</sub> emissions and tariff rates have been taken from the Treasury Green Book supplementary appraisal guidance on valuing energy use and greenhouse gas (GHG) emissions published by BEIS. These emissions factors include transmission and distribution losses, including significant losses due to power station inefficiency meaning that the emissions factors differ slightly to those calculated in Section 2.
- The energy costs are calculated using the retail fuel price which includes the Climate Change Levy but excludes standing charges that are not directly impacted by consumption fluctuations.
- The intervention capital cost is calculated by multiplying the typical payback of the intervention by the annual energy cost savings.
- An average energy tariff over 5 years (2020 to 2025) has been used as 5 years is the assessment period used by Salix to repay loans.
- Interventions that have been applied to each site are assumed to be applicable based on the site address only and not all interventions are applicable to each site, for example:
  - Replacement lighting is the only intervention that will be applicable to landlord lighting areas;

- The Forum opened in 2017 and is rated as BREEAM Excellent and it assumed that the opportunity to reduce emissions through replacing services will be limited.

**Table 4. Generic interventions for heating (gas usage) include:**

Intervention	Saving on Heat Demand	Payback in Years	Detail
More efficient plant	20%	8	May include new CHP or boilers
Controls	15%	5	May include a new or optimised BMS for larger sites and controllers and TRVs for smaller sites
Insulation	15%	5	May include building fabric insulation, draught proofing, pool cover and pipework insulation
Other	15%	5	May include more efficient heat emitters, heat recovery and distribution improvements

Savings from these interventions have been calculated concurrently rather than independently, i.e. each intervention reduces the heat demand following on from the previous intervention, for example:-

- 100kWh less 20% saving from more efficient plant = 80kWh >;
- 80kWh less 15% saving from controls = 68kWh >;
- 68kWh less 15% saving from insulation = 58kWh >;
- 58kWh less 15% saving from 'other' = 49kWh;
- Total reduction = 51%.

Using heat pumps is a good initiative for heating systems because the carbon factor of electricity will reduce as the grid is decarbonised and due to their efficiency and Coefficient of Performance (COP). For a heat pump, a COP value of 4 means that 1kW of electric energy is needed to generate 4kW of heat.

It is assumed that heat pumps by themselves will not be financially viable for the larger buildings based on current technology. This is because the existing boilers distribute heat at around 80°C and heat pumps distribute heat at around 50°C. It is assumed that the cost to retrofit a leisure centre

with a heat pump and the associated infrastructure would be disproportionate compared to the benefits.

The total carbon emissions from gas (heat) below for 2030 does not include any heat pump systems. Heat pumps may be suitable in selected buildings or hybrid systems could be feasible where there is a combination of heat sources, however this cannot be determined from a desktop investigation at this stage.

For reference purposes, if all gas heating systems were replaced with heat pumps with a COP of 4, the carbon emissions in 2030 would change from **1,043 tCO<sub>2</sub>e for gas plant to 180 tCO<sub>2</sub>e for electric heat pumps.**

**Table 5. Generic interventions for electricity include:**

Intervention	Saving on Electricity Usage	Payback in Years	Proportion of building services	Apportioned saving across whole building	Detail
LED Lighting and Control	60%	5	33%	20%	Replace existing luminaires with LED and automatic control
Controls and HVAC	15%	5	41%	6%	Controlling building services with a BMS
Office Equipment	15%	5	15%	2%	Replacing aging equipment with more efficient equipment
Other	15%	5	11%	2%	Could include variable speed drives, motors, hand dryers

Savings from these interventions have been calculated independently from the total electricity usage and their estimated proportion to building services, e.g. lighting is assumed to account for 33% of all electricity usage in a building and a potential saving of 60% could be achieved from installing LED lighting and automatic control which leads to an apportioned whole building saving of 20%.

## 5.1.2 Power Generation

It is assumed that solar PV could be placed on selected buildings with a generation capacity of approximately 500kWp comprising of approximately 1600 panels generating 480,000kWh per year of electricity that could feed directly into Council buildings, with no units exported to the grid.

The combined systems would have a capital cost of approximately £300,000.

### 5.1.3 Council Owned Vehicles

A detailed feasibility study is required to determine a more accurate projection for replacing the vehicle fleet with electric vehicles.

It is assumed that 10% of the current fleet will be replaced with electric vehicles every year up to 2030, and the cost of diesel increases by 3% annually.

The kWh/mile of electric vehicles and their cost to purchase have been categorised as below:

Vehicle	kWh/mile	Cost to purchase
Small Van (based on Nissan e-NV200)	0.42	£20,000
Medium Van (based on Volkswagen e-Crafter Electric Van)	0.48	£57,000
Refuse lorry (based on Cambridge City Council data)	0.48 (actual kWh/mile is unknown and likely to be higher)	£375,000

Savings in emissions do not consider vehicle efficiency improvements between 2019 to 2030 nor the likely reduction in cost to purchase electric vehicles. A more detailed analysis is required to assess this.

### 5.1.4 Employee Owned Vehicles

The trajectory assumes that staff vehicle usage will reduce by 10% per year compared to the baseline. It is unrealistic to expect all staff to replace their own vehicle with an EV, so a combination of interventions would be required such as providing EV pool cars, bicycles and encouraging staff use of public transport.

### 5.1.5 Water Supply and Wastewater

Water supply and wastewater combined account for 0.1% of the total emissions and 39tCO<sub>2</sub>e. However, simple measures can be taken to reduce water usage and cost such as installing low flow appliances and fixing leaks.

It has been assumed that emissions from water supply and wastewater will reduce by 5% annually.

### 5.1.6 Transmissions and Distribution

This has not been accounted for separately as the forecast carbon conversion factors provided by BEIS include losses from transmission and distribution.

### 5.1.7 Leased Assets

The methodology for calculating the trajectory for leased assets (leisure centres) is the same as the methodology for forecasting emissions from Scope 1 and 2 emissions.

### 5.1.8 Council Owned Housing

The methodology for the emission trajectory for the housing stock was taken from SCATTER which provides details of initiatives that could be adopted to reduce emissions within the district. The reduction in emissions have been taken from the SCATTER projections for Dacorum and apportioned out to the Council's own housing stock up to 2030. Interventions include:

Dacorum Borough Council assumed interventions in housing
Local solar capacity grows to equivalent of 2,500kWh per household in 2030
By 2050, domestic lighting and appliance total energy demand has dropped to 27% of current levels (apportioned to 2030).
Small reductions in efficiency of domestic cooking. Proportion of cooking which is electric increases to 100% in 2050 (apportioned to 2030).
Hot water demand per household reduces by 8% every 5 years
From 2021, 30% of all new houses per year are built to 2013 building regulations; 40% to AECB standard; 30% to passivhaus standard.

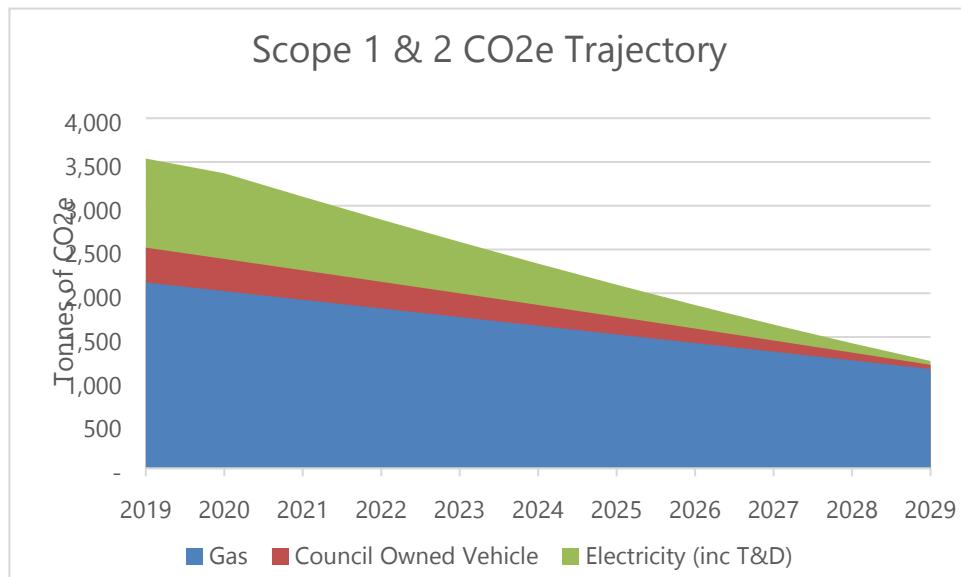
By 2050, 10% of current stock is retrofitted to a medium level; 80% deep retrofit (apportioned to 2030).
By 2050, 7% resistive heating; 60% air-source heat pumps and 30% ground-source heat pumps; 3% district heating (apportioned to 2030).

## 5.2 Scope 1 and 2 Trajectory to 2030

The impact from the abovementioned interventions are linear and are inclusive of 2020 and 2029, e.g. the savings from energy efficiency are equal ( $1/10^{\text{th}}$ ) in all years up to 2030. It is likely that the carbon savings will not be linear through the term and this will need to be modelled following a detailed feasibility study.

A breakdown of the carbon savings can be found in Appendix B.

**Chart 4. Carbon Emissions Trajectory 2019 to 2030**



The trajectory shows that there are 1,226 tCO<sub>2</sub> of unavoidable emissions up to 2030. This is the amount of carbon that will need to be offset to balance the emissions that cannot be directly removed based on current technology and within a reasonable budget.

### 5.2.1 Scope 1 and 2 Offsetting

A carbon offset is a reduction in emissions of CO<sub>2</sub>e made in order to compensate for emissions made elsewhere. There are several ways of offsetting carbon emissions such as carbon capture and storage, however this is not deemed financially or technically feasible to the Council. More typical options available to the Council to directly offset emissions include renewable energy generation projects and tree planting. However, the effectiveness of tree planting to quickly offset emissions can be questioned as it can take many decades for trees to reach maturity.

It is assumed that solar PV could be placed on Council land with a generation capacity of approximately 5MW generating 4,800,000kWh of electricity that feeds directly into the electricity grid. This could include open land space and car parks, etc.

A 5MW system would have a capital cost of approximately £3million and would offset 710tCO<sub>2</sub>e if installed by 2030.

The installation of 5MW of solar PV would leave 516tCO<sub>2</sub>e of unavoidable emissions by 2030 that will need to be offset. The Woodland Trust states that it costs £25 to offset 1 tonne of CO<sub>2</sub> in British woodlands which would

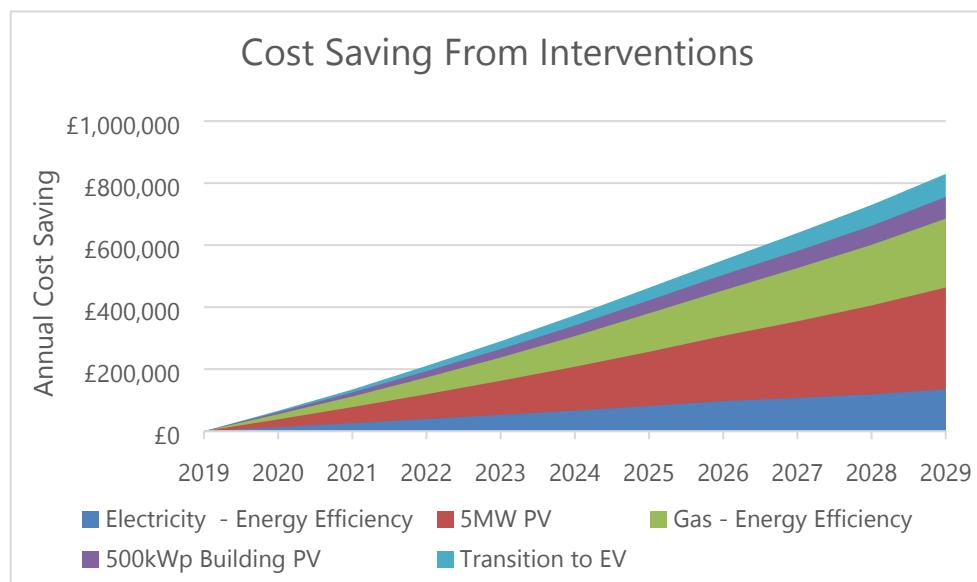
result in a cost of £12,902 to offset the remaining emissions from Scope 1 and 2 activities.

## 5.2.2 Forecast Capital Cost

Investing in efficiency projects and power generation will, in most cases, have a positive financial benefit with a good return on investment. The Council should set its own guidelines on a cap for ROI to measure the viability of projects.

Grid supplied electricity and gas rates are taken from BEIS modelling. The future grid export rate and diesel costs are based on the current price and increased by 3% annually.

**Chart 5. Cost savings from interventions between 2019 to 2030**



**Table 5. Forecast capital cost and financial savings from initiatives**

Intervention	Cost of all interventions	Accumulative saving up to 2030	Total annual saving of all interventions by 2030
Electricity - Energy Efficiency	£546,259	£612,691	£112,616
5MW Land PV	£3,000,000	£1,656,079	£328,177
Gas - Energy Efficiency	£1,036,533	£1,043,001	£203,421
500kWp Building PV	£300,000	£379,554	£69,764
Transition to EV	£8,972,000	£377,392	£74,498
Tree Planting	£12,902	N/A	N/A
<b>Total</b>	<b>£13,867,693</b>	<b>£4,068,717</b>	<b>£788,477</b>

The table above assumes that the delivery of interventions are linear and are inclusive of 2020 and 2029, e.g. the savings from energy efficiency are equal (1/10<sup>th</sup>) in all years up to 2030.

This shows that the forecast capital cost to achieve net carbon zero for Scope 1 & 2 emissions is £13.9million and the total annual savings achieved by 2030 would be the equivalent of £788k per year.

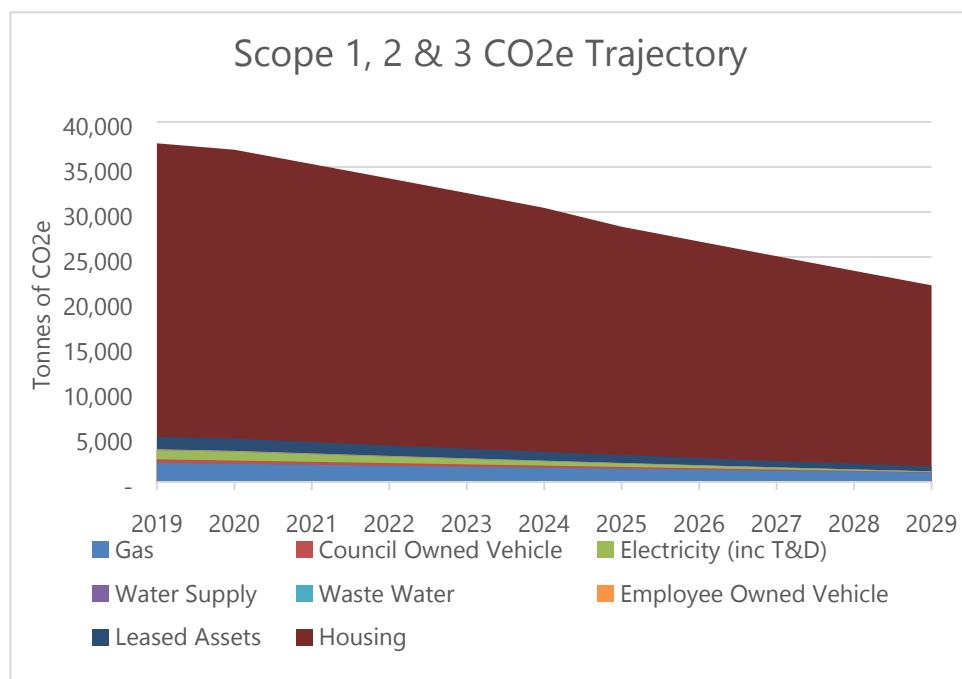
63% of the forecast capital cost is from replacing traditional vehicles with electric vehicles and £5.7million of this cost is attributed towards replacing 16no. refuse vehicles costing £375k each.

A detailed feasibility study is required to determine an accurate forecast for the financials involved in being net zero carbon for Scope 1 and 2 emissions.

### 5.3.1 Scope 1, 2 & 3 Emissions

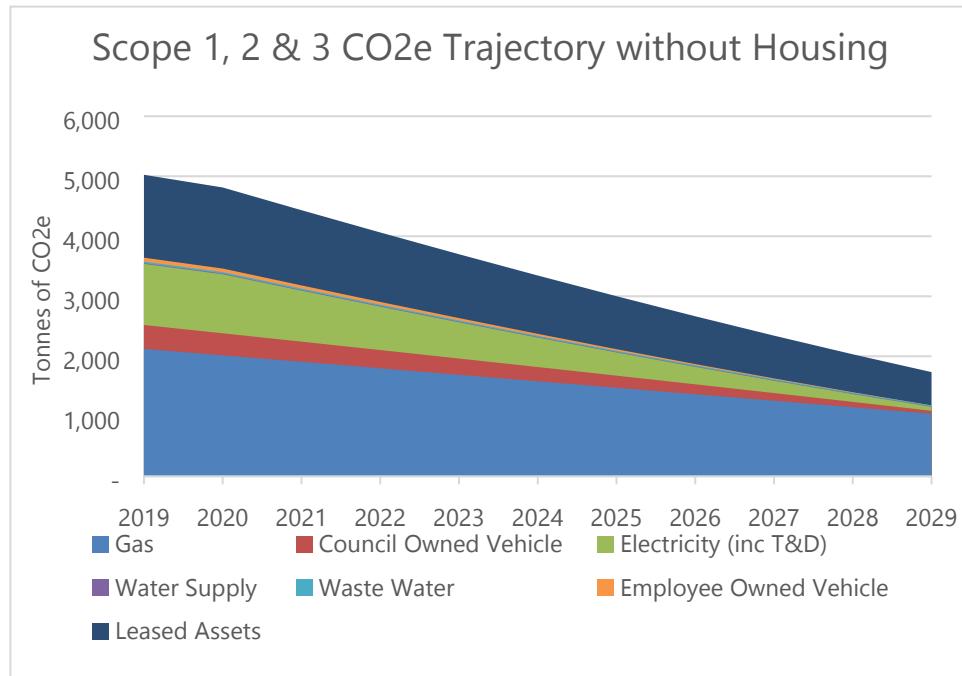
The chart below shows the CO<sub>2</sub>e trajectory to 2030 for Scope 1, 2 and 3 emissions. A breakdown is shown in Appendix B.

**Chart 6. Scope 1, 2 & 3 CO<sub>2</sub>e Trajectory**



The chart above shows that most of the emissions come from housing. The chart below shows the Scope 1, 2 and 3 trajectories with housing removed to provide a clearer visual of non-housing emissions.

## Chart 7. Scope 1, 2 & 3 CO<sub>2</sub>e Trajectory without Housing



A forecast for the finances required to reduce Scope 3 emissions has not been included. This is because the Council do not have direct control of Scope 3 emissions and in many cases will not directly benefit financially from reducing emissions.

A detailed feasibility study is required to determine the financials around Scope 3 emissions.

### 5.3.2 Scope 1, 2 & 3 Offsetting

Scope 1, 2 and 3 emissions are forecast to be 21,919tCO<sub>2</sub>e by 2030 after the interventions have been implemented.

Based on the Woodland Trust statement that it costs £25 to offset 1 tonne of CO<sub>2</sub> in British woodlands, it would cost £530,230 to offset the remaining emissions.

There are other schemes that provide carbon offsetting through international planting schemes such as [One Carbon World](#) which contributes funding towards large scale forestry schemes for as much as £1.20/tCO<sub>2</sub>e. There is some concern over the viability of such schemes.

A detailed feasibility study is required to determine an accurate forecast for the requirement of planting to offset emissions.

## 6 Recommendations for Gathering Data Going Forward

### 6.1 Scope 1 and 2 Emissions

The Council should develop a procedure for gathering and storing data as it is made available. The benefit of this is that the carbon reporting process is streamlined and progress towards targets can be tracked.

APSE Energy can support by gathering data on behalf of the Council and storing it on energy management software. The Council will be provided with password protected access to the cloud-based database so it can access the data and generate cost and carbon reports. APSE Energy can use this data to provide streamlined reporting to the Council in subsequent years.

### 6.2.1 Scope 3 Emissions

Based on the data provided, Scope 3 emissions account for 91% of the Council's total carbon footprint.

Appendix C shows the 15 different categories of Scope 3 emissions and what data should be gathered to report on emissions in future years. Where applicable, the Council should develop policies/procedures to gather the data from third parties. This should be incorporated into the procurement process and contracts with suppliers.

It is discretionary for an organisation to report on Scope 3 emissions. It should be explained and documented in subsequent carbon reports if the Council is unable to obtain data for any of the items in Appendix C as it is deemed financially impractical or not significant. The reporting principles should be based on:

- Relevance;
- Completeness;
- Consistency;
- Transparency;
- Accuracy.

Emissions data that should be included in subsequent years includes waste. Policies should be put in place to start recording waste data. This could be through contractual changes, i.e. waste contractor weighing and recording waste type or the Council can measure its own waste. There are tracking sheets from WRAP to monitor waste streams and these could be used in the short term until the waste contractor can record it.

Purchased goods and services could also be included under Scope 3 as this will represent a high level of emissions down the supply chain. However, obtaining this data from third parties may prove difficult and the Council should assess what relevant goods and services could be recorded in subsequent years.

### **6.2.2 Scope 3 - Council Owned Housing**

All data from the domestic EPC's (SAP rating, floor area, no. of bedrooms, saving initiatives, etc.) should be added to the asset register so that summary reports can be quickly exported. This should include details of efficiency measures that have been undertaken on all properties and an updated EPC should be provided every time a new efficiency measure is introduced so that the improved rating is shown on the certificate.

A spot check of certificates showed that many EPC's dated back to 2010. A rolling programme should be introduced to update EPCs for all properties where improvements have been made.

## 7 Conclusion and Recommendations

- Use carbon footprint data and Appendix A to develop a strategy to become net zero carbon. APSE Energy have provided a proposal to provide consultancy services to Dacorum Borough Council. The scope has not been finalised and the cost of this can vary widely depending on the level of work required. The scope might include:-
  - a review of existing policies and strategies;
  - workshops for officers, councillors and partners;
  - interviews with policy officers, service managers, senior officers and councillors;
  - compilation of data;
  - writing draft document;
  - design of strategy for publication.

As a guide, the cost for a zero carbon strategy would be in the region of £5,000 - £8,000;

- Provide a detailed feasibility study to determine the interventions required to be net zero carbon by 2030, which includes a forecast of the capital cost required, funding options, cost savings and trajectories;
- Calculate the carbon footprint of the whole Local Authority area and provide an action plan for the whole district to be zero carbon;
- Contact the water supplier and negotiate the Return to Sewer rate;
- Data provided by the electricity supplier, Npower, shows that the Council is responsible for 719 electricity meters. A review should be carried out for each asset to determine if the Council is responsible for paying the electricity usage and taking ownership for the associated carbon emissions. It is not uncommon for assets to be sold, leased or decommissioned yet the Council continue to pay for the utilities. APSE Energy can support the Council with this work;
- Adjust baseline calculations once the electricity usage for The Forum is known;
- Check that mileage data for vehicles is accurate;
- Develop policies and processes for capturing data going forward (see comment in section 6);
- Specifically arrange a procedure to collect waste data. There is no current access to this data within the Council, but it is available from BEIS;

- Develop policies and processes to request emissions data from suppliers.

## 8 Glossary

Term	Definition
Carbon dioxide equivalent (CO <sub>2</sub> e)	The carbon dioxide equivalent (CO <sub>2</sub> e) allows the different greenhouse gases to be compared on a like-for-like basis relative to one unit of CO <sub>2</sub> and includes the six greenhouse gases with the greatest global warming potential (GWP).
Carbon footprint	A carbon footprint measures the total greenhouse gas emissions caused directly and indirectly by a person, organisation, event or product. A carbon footprint is measured in tonnes of carbon dioxide equivalent (tCO <sub>2</sub> e).
Council Vehicles	Vehicles that are owned or controlled by the Council. This does not include employee-owned vehicles that are used for business purposes.
Electricity	Electricity used at sites owned/controlled by the Council. This is reported as a Scope 2, indirect emission. The conversion factors used are for the electricity supplied to the grid that the Council purchase - they do not include the emissions associated with the transmission and distribution of electricity.
Employee Vehicles	Travel for business purposes in assets not owned or directly operated by the Council. This includes mileage for business purposes in cars owned by employees, public transport, hire cars etc.
Gas	Primary fuel sources combusted at a site or in an asset owned or controlled by the Council.
MPAN & MPR	The MPAN (Meter Point Administration Number) and MPRN (Meter Point Reference Number) are unique numbers assigned to the electricity and gas supplies. This information has been provided as a reference and can be used to identify each meter.
tCO <sub>2</sub>	Tonnes of CO <sub>2</sub>
Transmission and Distribution	Transmission and distribution (T&D) factors are used to report Scope 3 emissions associated with grid losses (the energy loss that occurs in getting the electricity from the power plant to the premises).

SAP rating	The Standard Assessment Procedure (SAP) is the methodology used by the Government to assess and compare the energy and environmental performance rating of dwellings. Its purpose is to provide accurate and reliable assessments of dwelling energy performances that are needed to underpin energy and environmental policy initiatives.
SCATTER	Setting City Area Targets and Trajectories for Emissions Reduction is a tool dedicated to calculating the GHG emissions of LA's and follows the Global Protocol for City-wide Greenhouse Gas emissions. In addition, it provides details of initiatives that could be adopted to reduce emissions within the district.
Wastewater	Water returned into the sewage system through mains drains.
Water Supply	Water delivered through the mains supply network.

## Appendix A – Carbon Calculations

## Appendix B – Asset Reduction Plan

The above appendices are provided separately as spreadsheets.

## Appendix C – Data that should be gathered to report on Scope 3 emissions

### **Data that should be gathered to report on Scope 3 emissions**

Item	Category	Details Required
1	Purchased goods and services	<p>This category includes all upstream (i.e. cradle-to-gate) emissions from the production of products purchased or acquired by the Council in the reporting year. Products include both goods (tangible products) and services (intangible products).</p> <p>This category includes emissions from all purchased goods and services not otherwise included in the other categories of upstream scope 3 emissions (i.e. category 2 through category 8 below).</p> <p>Cradle-to-gate emissions include all emissions that occur in the life cycle of purchased products, up to the point of receipt by the Council. Cradle-to-gate emissions may include:</p> <ul style="list-style-type: none"><li>• Extraction of raw materials</li><li>• Agricultural activities</li><li>• Manufacturing, production, and processing</li><li>• Generation of electricity consumed by upstream activities</li><li>• Disposal/treatment of waste generated by upstream activities</li><li>• Land use and land-use change</li><li>• Transportation of materials and products between suppliers</li><li>• Any other activities prior to acquisition by the reporting company</li></ul>

		<p>Relevant purchases to the Council may include capital goods, such as office supplies, office furniture, computers, telephones, travel services, IT support, outsourced administrative functions, consulting services, janitorial, landscaping services, maintenance, repairs and operations.</p> <p>For accurate carbon reporting emissions, the Council should request cradle-to-gate emission factors for materials used by suppliers to produce purchased goods such as Environmental Product Declarations (EPDs). It is likely that many suppliers will not be able to provide all the emission data.</p> <p>If an EPD cannot be provided, supplementary information required includes the volume of product (kg) and the carbon emission factor (kg CO<sub>2</sub>e).</p> <p>A policy should be developed so that suppliers in the supply chain are required to provide this data as part of the contract.</p>
2	Capital goods	<p>Capital goods are final products that have an extended life and are used by the Council to manufacture a product, provide a service, or sell, store, and deliver merchandise. Capital goods are treated as fixed assets or as plant, property, and equipment (PP&amp;E). Examples of capital goods include equipment, machinery, buildings, facilities, and vehicles.</p> <p>The required information is the same as Category 1 above.</p> <p>A policy should be developed so that suppliers in the supply chain are required to provide this data as part of the contract.</p>
3	Fuel- and energy related activities (not included in Scope 1 or Scope 2)	Transmission and distribution (T&D) losses have been included and calculated from the data provided in Scope 2.

4	Upstream transportation and distribution	<p>Category 4 includes emissions from:</p> <ul style="list-style-type: none"> <li>• Transportation and distribution of products purchased in the reporting year, between suppliers and its own operations in vehicles not owned or operated by the Council.</li> <li>• Third-party transportation and distribution services purchased by the Council in the reporting year (either directly or through an intermediary), including inbound logistics, outbound logistics (e.g. of sold products), and third-party transportation and distribution between the Council's own facilities.</li> </ul> <p>The Council requires data on:</p> <ul style="list-style-type: none"> <li>• Quantities of fuel (e.g., diesel, petrol, jet fuel, biofuels) consumed</li> <li>• Amount spent on fuels</li> <li>• Distance travelled</li> <li>• Vehicle type</li> </ul> <p>This may include managed assets - Vehicles that are used by the Council but are not owned by the organisation and generally do not appear on the organisation's balance sheet, for example, maintenance contractor vehicles, outsourced refuse and recycling trucks, road sweepers, grounds maintenance mowers etc.</p> <p>A policy should be developed so that suppliers using their own vehicles are required to provide this data as part of the contract.</p>
5	Waste generated in operations	<p>This includes emissions from third-party disposal and treatment of waste generated in the Council's owned or controlled operations in the reporting year. This category includes emissions from disposal of both solid waste and wastewater.</p> <p>The Council should request volume and emissions data from the waste treatment company applicable to <b>its own waste stream</b>. If this cannot be provided, the emissions</p>

	<p>can be calculated by requesting the volume of waste, type and disposal method:</p> <p>Example of data required:</p> <p>Total weight (kg) of waste type and disposal method e.g.</p> <ul style="list-style-type: none"> <li>• 5,000kg municipal waste to landfill</li> <li>• 500kg organic garden waste to composting</li> <li>• 1,000kg metal recycled</li> <li>• 1,000kg plastic recycled</li> <li>• 1,000kg paper recycled</li> </ul> <p>Data is required for the volume of supply and wastewater in cubic metres (<math>m^3</math>) from water bills.</p> <p>Local authorities have an important role in waste prevention and sustainable waste management through awareness-raising campaigns, providing separate collection for recycling and food waste, and implementing waste-to-energy schemes. It is therefore voluntary on whether the Council choose to include the emissions from waste associated with the whole borough, or just the Council's own operation.</p> <p>Only waste treatment in facilities owned or operated by third parties is included in scope 3. Waste treatment at facilities owned or controlled by the reporting company is accounted for in scope 1 and scope 2.</p> <p>Waste generated by DBC is considered as Scope 3 as the treatment facility is owned by Hertfordshire County Council or by a third party contractor.</p> <p>The Council could choose to include all waste collected by DBC within the borough, but it is recommended to focus on its own operational waste initially. The Council would choose at a later date to gather data for all waste collected within the borough for a borough wide carbon footprint.</p>
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6	Business travel	<p>Travel for assets not owned or directly operated by the Council. This includes mileage for business purposes in cars owned by employees, public transport, hire cars etc.</p> <p>Require details for:</p> <p><u>Vehicle</u></p> <p>Fuel type, size of vehicle and distance for:</p> <ul style="list-style-type: none"> <li>• Car</li> <li>• Motorbike</li> <li>• Taxis</li> <li>• Bus</li> <li>• Rail</li> </ul> <p><u>Flights</u></p> <ul style="list-style-type: none"> <li>• Airport travelled to/from</li> <li>• Number of passengers</li> <li>• Class type</li> <li>• Distance</li> </ul> <p><u>Ferry</u></p> <ul style="list-style-type: none"> <li>• Foot or car passenger</li> <li>• Distance</li> </ul>
7	Employee commuting	<p>This category includes emissions from the transportation of employees between their homes and their worksites.</p> <p>Emissions from employee commuting may arise from:</p> <ul style="list-style-type: none"> <li>• Car</li> <li>• Bus</li> <li>• Rail</li> <li>• Other modes of transportation</li> </ul> <p>Staff would be required to provide method of transport and distance travelled. It may be difficult and time consuming to collect accurate data.</p>

8	Upstream leased assets	<p>This category is applicable from the operation of assets that are leased by the Council.</p> <p>If the Council procures the energy then this should be considered as Scope 1 and 2.</p> <p>If the landlord is responsible for the Scope 1 and 2 emissions, the Council should include the reporting under Scope 3. An example may include an office that the Council lease from a private landlord. All energy bills may be included as part of the lease and the energy contract is under the name of the landlord. The Council should therefore request the energy data from the landlord and include this under Scope 3.</p> <p>Data required include the Scope 1 and 2 data from the leased asset.</p>
9	Downstream transportation and distribution	<p>This category includes emissions that occur in the reporting year from transportation and distribution of sold products in vehicles and facilities not owned or controlled by the Council in the reporting year.</p> <p>It is assumed that this category is not applicable to the Council as it does not manufacture and sell products.</p>
10	Processing of sold products	<p>It is assumed that this category is not applicable to the Council as it does not manufacture and sell products.</p>
11	Use of sold products	<p>It is assumed that this category is not applicable to the Council as it does not manufacture and sell products.</p>
12	End-of-life treatment of sold products	<p>It is assumed that this category is not applicable to the Council as it does not manufacture and sell products.</p>

13	Downstream leased assets	<p>This category is applicable where the Council is the landlord to a lessee.</p> <p>If the Council procures the energy on behalf of a lessee then this should be considered as Scope 1 and 2. An example of this is where the Council may lease a premises to a lessee and include all energy costs as part of the lease. The energy contract is under the name of the Council and is therefore reported under Scope 1 and 2.</p> <p>If the lessee is responsible for the Scope 1 and 2 emissions, the council should include the reporting under Scope 3. An example of this is a shop that the Council own and the occupant pays for the energy bills and the contract is under their name. The Council should request the energy data from the shop occupier and report this under Scope 3.</p> <p>Data required include the Scope 1 and 2 data from the leased asset.</p> <p>Dacorum Borough Council have stated that they are not able to provide this information. The commercial properties are let out on leases with exclusive possession and entitlement to quiet enjoyment.</p> <p>This means:</p> <ul style="list-style-type: none"> <li>a) tenants are responsible for their utility payments and the Council do not have access to that information.</li> <li>b) Tenants are under no legal obligation to provide invoicing details or usage data even if requested. There are in excess of a thousand commercial tenancies and it is not feasible to try and obtain this information.</li> <li>c) The Council have no control over the utility use of these leaseholders/tenants and therefore have no ability to manage or control use.</li> </ul> <p>If the Council determines that this is something it wants to collect going forward then it would ideally need to change</p>
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		<p>the T&amp;C's and this would require a project on its own and resources to do this work.</p> <p>Emissions from the Council housing stock comes under this section, but it is recommended for housing to be separated from other leased properties.</p>
14	Franchises	<p>It is assumed that this category is not applicable to the Council as it does not operate any franchises.</p>
15	Investments	<p>This category includes scope 3 emissions associated with the Council's investments in the reporting year, not already included in scope 1 or scope 2. This category is applicable to investors (i.e. organisations that make an investment with the objective of making a profit) and organisations that provide financial services. This category also applies to investors that are not profit driven (e.g. multilateral development banks). Investments are categorised as a downstream scope 3 category because providing capital or financing is a service provided by the organisation.</p> <p>Category 15 is designed primarily for private financial institutions (e.g., commercial banks), but is also relevant to public financial institutions (e.g., multilateral development banks, export credit agencies) and other entities with investments not included in scope 1 and scope 2.</p> <p>The Council's scope 3 emissions from investments are the scope 1 and scope 2 emissions of investees.</p> <p>For purposes of greenhouse gas accounting, this standard divides financial investments into four types:</p> <ul style="list-style-type: none"> <li>• Equity investments</li> <li>• Debt investments</li> <li>• Project finance</li> <li>• Managed investments and client services</li> </ul> <p>Dacorum Borough Council have identified that current investments are in place with banks, building societies, other Local Authorities, market funds and pension funds.</p>

		<p>An example of the information required is the Scope 1 and 2 emissions from the bank where an investment is in place. This is based on the Council's proportional share of investment in the investee. If the Council has £1million invested in the bank and the banks total investments amount to £100million, the Council should report on 1% of the banks Scope 1 and 2 emissions.</p> <p>It is assumed that this information will be difficult to collate from third parties and that the total emissions will be proportionally small compared to other emission sources and these emissions could be excluded from the reporting.</p>
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## NEW MUNICIPALISM

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