E

# Carbon Reduction Plan

## Thanet District Council

14 July 2022

# Carbon Reduction Plan

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# Executive Summary

### Introduction

This document summarises the activity and findings of the Zero Carbon Roadmap exercise carried out by LASER for Thanet District Council (TDC), with the key elements, findings and next steps summarised in the Executive Summary.

Following the initial project initiation meeting, LASER progressed through a number of steps in conjunction with TDC to quantify the Council's carbon footprint. This was to help TDC understand what measures could be taken to diminish these emissions, with the ultimate aim of achieving net zero by 2030. This report mirrors these steps and goes on to give additional explanation around areas, such as zero carbon electricity supply options and offsetting - which are extremely important considerations in this context. Finally, the report goes on to draw the findings together and identifies the most efficacious actions that the Council could take.

### Process & Key Points

The following stages were carried out for the project:

- Scoping
- Data collection
- Footprints & Business as Usual forecast
- Options appraisal workshop
- Carbon reduction modelling

Each stage is summarised below with key points and further details can be found in the main body of this report.

1. A scope was defined in order to frame the target. This was based on the operational control consolidation approach and the premise of including

outsourced contracts which would likely be provided by TDC if they had not been contracted out, for example the two leisure centres. Therefore, the following areas were included:

- Core Estate
- Waste collection and street cleaning
- Grounds maintenance
- Crematorium
- Ports and harbours
- Your Leisure (Ramsgate and Hartsdown Leisure Centres)
- Civica
- Kent Innovation Centre

2. For areas identified within the project scope data was collected, where available, for the below emission sources:

- Gas
- Fuel for stationary combustion
- Fuel for owned vehicles
- Fugitive emissions (F-Gas that has escaped to the atmosphere from air conditioning, refrigeration and other heat transfer systems)
- Electricity
- Grey fleet (employees using their own vehicles for business travel
- Water
- Waste

This data was quality assessed by LASER and were necessary, recommendations provided for actions to remedy any issues or concerns.

3. TDC's carbon footprint was calculated based on FY 2019/20 data and was 4,054 $tCO_2e$. It was shown to be dominated by the fuel use for TDC's owned vehicles, in particular the waste carriers and gas for the estates and two leisure centres.

4. Business As Usual forecast shows that emissions will continue to drop without further activity by TDC, mainly because of reducing electricity grid emissions, however this will plateau at around 71% of current emissions by 2050.

5. An option appraisal workshop was carried out with TDC Directors and Senior Officers from multiple departments. This was to help LASER understand which issues, subjects and concerns were of importance to the Council, and to help LASER align carbon reduction modelling with TDC's net zero journey.

6. A carbon reduction model was generated for TDC, assessing carbon emissions and high-level financial implications for chosen Carbon Reduction Options and assumptions.

   To be net zero by 2030 the Council will need to invest £9.640m and there will be savings of £4.070m resulting in a net position of -£5.570m. By 2050, investment will increase to £29.109m with savings of £20.811m and a net position of -£8.298m. (These figures are cumulative).

   The two areas with the largest investment costs were the introduction of electric vehicles into TDC's fleet (mainly the waste carrier vehicles) and the heat pumps. By 2030, the investment cost for EV replacements and heat pumps will be around 20% and 63% of the overall investment cost respectively. By 2050, the investment cost for EVs increases to 75% of the overall investment required.

   In 2030, there will be 1,347 $tCO_2e$ remaining from the carbon footprint of 4,054 $tCO_2e$ after the assumed Carbon Reduction Options have taken place. Carbon emissions will drop to 1,117 $tCO_2e$ by 2050, mainly due to the assumption that the crematorium would be electrified by 2036. According to the government's central forecast, the cost to offset the remaining $tCO_2e$ by 2030 is £0.109m and £3.978m

by 2050. Forecast costs to offset are variable, with the government providing a low and a high forecast – the below table shows the associated costs:

| | 2030 £m (Cumulative) | 2050 £m (Cumulative) |
|---|---|---|
| **Low Forecast** | -0.054 | -1.899 |
| **High Forecast** | -0.163 | -5.696 |

Table 1. Offsetting costs for 2030 and 2050 for low and high forecast

7. In order to align with science-based targets and contribute their fair share of emissions reductions determined under the Paris Agreement, a rapid reduction in TDC's emissions would be required, a cut of 46% by 2025. At current emission levels, TDC would use their entire carbon budget to 2100 by 2026.

**Key Findings**

- Substantial early action is needed to align with Paris Agreement pathway.
- In order to reach net zero as many vehicles as possible within the TDC fleet should be electrified.
- Firming up a strategy around estate rationalisation is vital to help TDC understand the extent of how this can contribute to meeting their net zero target, the associated financial benefits, and with planning of Carbon Reduction Options, such as LED and heat pump installation.
- Determining actions in retained buildings within an estate decarbonisation plan will be key for TDC in understanding how their net zero target can be reached, with steps taken to understand the feasibility of installing heat pumps in areas with a large gas consumption.

- Less significant emission sources should be addressed such as water and equipment.
- For electricity, a procurement strategy for green energy can help abate associated emissions.
- The carbon reduction model generated relied on some carbon offsetting to achieve net zero by 2030. There are inherent risks with this as the offsetting market is an evolving market and difficult to predict and it is important to highlight that there would be no financial returns or saving from offsetting.

**Next Steps**

Following the work carried out by LASER, the below next steps are recommended for consideration by TDC with further details provided on pages 50-51.

1. **Carry out electrification feasibility studies for car derived vans and waste carrier vehicles.**
2. **Determine estate future.**
3. **Complete a full estate decarbonisation plan for retained buildings and investigate the feasibility of heat pumps.**
4. **Address less significant emissions sources, for example from water and equipment.**
5. **Procure green energy for estate.**
6. **Investigate offsetting options.**
7. **Update carbon footprint.**

LASER would be happy to assist in either more detailed action planning or modelling of particular options and helping deliver activities via our public sector frameworks.

**Important points to note on interpreting this document**

- Analysis of financial impacts is based on energy costs only. For example, the savings stated from reducing the size of the estate only account for reductions in energy costs and does not take into account revenue from selling or leasing properties.
- Many of these actions are financially prohibited and TDC, where available, will need to source funding and assistance.
- This is an evolving strategy that can be refined, but allows TDC to understand their current position, the challenge and options to meet the challenge.
- There are not defined regulations or conventions at this time around reporting emissions from green energy, so decisions will need to be made based on the Council's preference or an interpretation of what it is felt would be favoured by the public.

# Background

In 2015, the EU and 196 nations signed on to the first truly global commitment to address climate change, namely the Paris Agreement. The aim of this was to limit global warming well below 2°C and in pursuit of 1.5°C compared to pre-industrial levels. On the 3rd of December 2020, the UK government unveiled its target to reduce emissions by 68% by 2030, compared to 1990 levels, and net zero by 2050. It released its Net Zero Strategy in October 2021.

At the time of this report around 80% of councils across the UK have declared a climate emergency*, with the majority of these setting target dates to be carbon neutral either for their own operations or across their area as a whole. Numerous other public bodies have also made declarations or are putting plans in place to begin this transition. The ambition of declarations varies significantly and also vary in scope, as public bodies begin to define exactly what they are committing to include, in terms of operations and emissions sources. Of those councils who have declared a climate emergency, approximately three quarters have stated a target, with dates ranging between 2025 and 2050, but the majority are 2030 in line with Thanet District Council.

The progress with planning and implementation is mixed. Some organisations are clearly taking large scale action towards developing new renewables, others have committed significant resource to planning yet many others have a clear target but little detail at this stage on how it will be achieved.

Regardless of current progress, these bodies have a mandate to take positive action to address the issue of climate change and will need to formulate detailed plans and take steps towards meeting these targets imminently. If action isn't taken now, the bodies could face substantial political pressure in the short term, and face not meeting their self-imposed targets in the longer term. In 2019, the environmental law firm ClientEarth threatened 100 councils with legal action if they did not provide adequate evidence of planning to meet for their carbon reduction targets.† At the beginning of

* Find a council – Climate Action Plan Explorer (climateemergency.uk)
† https://www.energylivenews.com/2019/09/03/environmental-lawyers-threaten-councils-with-legal-action-over-climate-inaction/

2022, action was also taken against the government by both ClientEarth and Friends of the Earth, with lawyers stating that their net zero climate strategy failed to include required policies to meet the emission reductions stated.‡ Although COP26, was seen to mark an important step in global efforts to address climate change, with key focus areas in the UK being that of strengthening NDCs and phasing out fossil fuel subsidiaries, it is apparent that action in every area and at every level is needed.

TDC's climate emergency declaration made on 11th July 2019 sets out a commitment for the Council's operations and services to be carbon neutral by 2030. LASER's expertise and frameworks means that we are well equipped to assist TDC on their journey to net zero. LASER can not only assist in the carbon footprint and planning stages but are also able to offer compliant procurement routes to support TDC through the implementation of emissions reduction projects and initiatives.

# Scoping

The first step towards measuring emissions and creating the carbon footprint for TDC was to carry out the scoping exercise. There are two stages to this process – the first is to review the organisational boundaries and the second is to review the operational boundaries. The below table provides details on why and how each stage is carried out.

| | Why the stage was carried out | How the stage was carried out |
|---|---|---|

‡ UK government sued over 'pie-in-the-sky' net-zero climate strategy | Climate crisis | The Guardian

| | | |
|---|---|---|
| **Stage 1**<br><br>**Organisational Boundary Setting** | To determine which organisations, entities and assets would be included in the scope<br><br>To determine boundaries between TDC's own operations, and third party / outsourced operations<br><br>To help classify emission sources into scopes 1,2,3 or scope 3 | Determine what organisation, entities and assets TDC influence or have control over<br><br>Application of an appropriate consolidation approach for less clear areas |
| **Stage 2**<br><br>**Operational Boundary Setting** | To determine which emission sources would be included and excluded in TDC's scope | Emission sources and data availability reviewed<br><br>Recommended that all scope 1 & 2 emissions were included for own operations, with scope 3 emissions for own operations as optional, and if data was available |

Table 3. The stages of scoping

## Stage 1: Organisational Boundary Setting

### Consolidation Approaches

The GHG Protocol Guidance provides three different consolidation approaches which are detailed below, to help determine what is influenced by an organisation. As highlighted in the above table, this also helps to determine which emissions sources are classified as the Council's scope 1, 2 & 3 emissions, and which emission sources are classified as scope 3 only. Further details of scopes 1, 2 and 3 are provided on page 11.

- **Operational Control**
    - The organisation has the full authority to introduce and implement its operating policies at the organisation, entity or asset.

- **Financial Control**
    - The organisation has the ability to direct the financial and operating policies of the organisation, entity or asset with a view to gaining economic benefits from its activities.
- **Equity Share**
    - The organisation accounts for GHG emissions from the entity according to your share of equity in the organisation, entity or asset.

It was decided by the Council that the operational control consolidation approach would be adopted, as it was felt to best tie in with the Council's setup, operations and objectives. Organisations, entities and assets that were included within the scope for TDC were also based on the premise that if the organisation was not outsourced to a third party, it would be an inhouse service provided by TDC. Based on this methodology the following areas and associated emissions were classified as scope 1, 2 and 3:

- Core estate (council offices, PCs, public areas, carparks, streetlighting, grey fleet – employees using own vehicles for company business)
- Waste collection and street cleaning
- Grounds maintenance
- Crematorium
- Ports & harbours

As the below areas fell outside of TDC's chosen consolidation approach, i.e., the buildings are owned by TDC but not operated by them, the associated emissions from these areas were classified as scope 3 only:

- Your Leisure (Ramsgate and Hartsdown leisure centres)

- Civica
- Kent Innovation Centre (TDC own and manage but the majority of offices are leased out).

TDC also have space utilised by EKS for server use, which was also recognised whilst carrying out the organisational boundary setting. However, due to complications with splitting out energy use, it was included under TDCs core estate.

**Stage Two: Operational Boundary Setting**

This stage involves determining which emission sources would be included for each area, and how they would be classified in relation to scopes 1, 2 and 3 as detailed in the GHG Protocol Guidance. Below, is a definition for each scope:

- Scope 1 – Direct GHG (Greenhouse Gas) Emissions, where the emission occurs directly from sources controlled or operated by the Council, for example the gases emitted from a boiler flue as a result of burning natural gas for heating, or emissions from diesel engines in vehicles.
- Scope 2 – Indirect GHG Emissions, where the consumption of a utility on site has a direct bearing on the emissions offsite. This predominantly relates to electrical consumption but can also include district heating and cooling.
- Scope 3 – Other indirect GHG Emissions, where emissions are a consequence of the activities of the Council such and emissions which also occur from sources not owned or controlled by them,

Scope 3 is a very wide category, as it includes all emissions sources which do not fall under scope 1 and 2, as well as all emissions associated with organisations, entities or assets that fall outside of the chosen consolidation approach.

For areas falling under TDC's chosen consolidation approach, it was determined that, the following emission sources would be included:

- Gas
- Fuel for owned vehicles
- Fuel for stationary combustion (such as standby generators)
- Fugitive
- Electricity
- Grey fleet (employees using their own vehicles for business travel)
- Water
- Waste

For areas which fell outside of the consolidation approach, a similar approach was taken, however it was understood that some of this data may not be as readily available for some of the areas and emission sources.

The scoping diagram is depicted in appendix 1, with appendixes 2 & 3 providing further details about scoping decisions.

**Upstream emissions**

A further category of two scope 3 emissions were included within the operational scope:

- Transmission and distribution losses: the energy losses that occur from supplying electricity from the power plant to TDCs areas, organisations and leased assets.
- Well-to-tank: emissions that occur from fuel extraction, refining and transportation prior to combustion by TDC or leased assets – this includes:
    - Gas
    - Fuels for stationary combustion

- Fuel used in both owned vehicles and grey fleet.

**Base Year**

TDC chose FY 2019-2020 as the base year which would be used for the Council's carbon footprint, as this represented a consistent period of time, with no major anomalies or variations from normal operations.

**Social Housing Emissions**

It was determined by the Council that emissions associated with social housing would be reported separately by TDC. These included emissions from electricity and gas use for both tenants and the landlords supply (stair wells, outside lighting), and emissions from the housing repair contract (Mears). These emissions were quantified by LASER and provided to TDC.

**Emissions evaluated outside of the project scope**

The below emissions were evaluated by LASER but not included within the project scope. It is prudent to note that even though a specific organisation, entity or area may be excluded from TDC's project scope, the Council can still act and look to reduce associated carbon emissions if wished.

- Purchased goods & services – this has been carried out as a separate study and reviews procurement spend to help understand associated carbon emissions in the supply chain. At time of report this has not yet been carried out due to data availability.
- Employee commuting – at time of report, due to data availability this has not been evaluated.

# Data Collection and Footprint

## Data Collection

LASER worked with TDC to collect available data for the areas and emission sources detailed in the previous section. Data not readily available was:

- Fugitive emissions for all areas, operations and assets
- Waste data – some data was received for Cecil Street offices, crematorium, and waste collection and street cleaning.

LASER worked closely with TDC to try and split out the server usage for EKS, however it was not possible to do so and therefore the total server usage for EKS is included within TDC's core estate area.

Recharges for Ramsgate Marina and the Newport area were also addressed based on recharging invoices and information received from the finance department at TDC.

Appendix 4 contains the carbon footprint data table.

## Data Quality

Consumption data was assessed by reviewing the quality of the data received, and its overall significance on the carbon footprint. This allowed LASER to identify any areas of risk and take the appropriate action to address. Data quality was assessed on a sliding scale, with 1 being the best quality (actuals from billings or reports), and 5 being the lowest quality (approximates and estimates). Table 2 demonstrates how data is scored, and table 3 advises of the priority impact and what actions should then be taken.

| Quality of Data | Significance | | | | |
|---|---|---|---|---|---|
| | <1%<br>1 | 1-5%<br>2 | 6-10%<br>3 | 10-20%<br>4 | >20%<br>5 |
| 1 (best quality) | 1 | 2 | 3 | 4 | 5 |
| 2 | 2 | 4 | 6 | 8 | 10 |
| 3 | 3 | 6 | 9 | 12 | 15 |
| 4 | 4 | 8 | 12 | 16 | 20 |
| 5 (lowest quality) | 5 | 10 | 15 | 20 | 25 |

Table 4 – scoring of data

| Priority | Overall Score & Description |
|---|---|
| 1 | 1 to 5 - no action required |
| 2 | 6 to 16 - to be reviewed next year |
| 3 | 17 to 25 - immediate action required |

Table 5 – Priority and actions to take

The majority of the data received by LASER fell under impact 1, and there was no data with an impact of 3.

## Data Quality Advisories

- KIC electricity consumption - priority 2: data was based on an average estimate from previous years consumption. The provision of actual data for the desired period will ensure a true reflection for this site.
- Although both the below sources fell within priority 1, as they did not contribute significantly to the overall footprint, reviewing and implementing sourcing and reporting methods will improve accuracy for these emissions sources:

- TDC own operations waste – data based on bin quantity and litre size and volumes of waste were unknown. Therefore, an assumption was made that bins were between 85% to 100% full at time of collection.
- Grounds maintenance fuel use for equipment – this was a yearly estimate.

- Newport: proportioning consumption data from the main utilities data received from TDC was quite complex due to the nature of the area. All efforts have been made to ensure that a reasonable approximation has been used for Newport, including adjustments for recharges which have been taken from invoices. It is recommended that, if possible, a specific breakdown is understood for future consumption data – this will enable identification of building and areas which are operated by TDC and which are leased to external organisations.
- EKS: As consumption for this area could not be split and has therefore been included under TDC's Core Estate, it is recommended, if possible, that sub-metering is installed to identify a true reflection of usage associated with EKS.

Full details of the data quality assessment can be found in appendix 5.

## Emissions Factors

Once the data gathering had been completed, LASER utilised emissions factors gathered from various government sources and calculated factors where specific government factors were not available.

LASER have put significant time and resource into the compilation and generation of these figures, for both the footprint and the forecast, to ensure that as accurate a calculation of emissions as possible has been made for TDC.

## Carbon Footprint

**Total $tCO_2e$: 4,054**

The Council's carbon footprint was calculated and broken down in a variety of ways which allows for insight into the emissions and the significance of the different emissions sources. Chart 1 shows emissions represented as the three scopes detailed in the GHG Protocol Guidance. Scope 3 emissions make up approximately 43% of the carbon footprint, followed by scope 1 emissions at 40% and scope 2 emissions at 17%. It can be seen in Chart 2 that emissions associated with third party contractors and TDC's own transport make up the largest proportions of the carbon footprint, accounting mainly for the large scope 2 and 3 proportions seen in Chart 1.

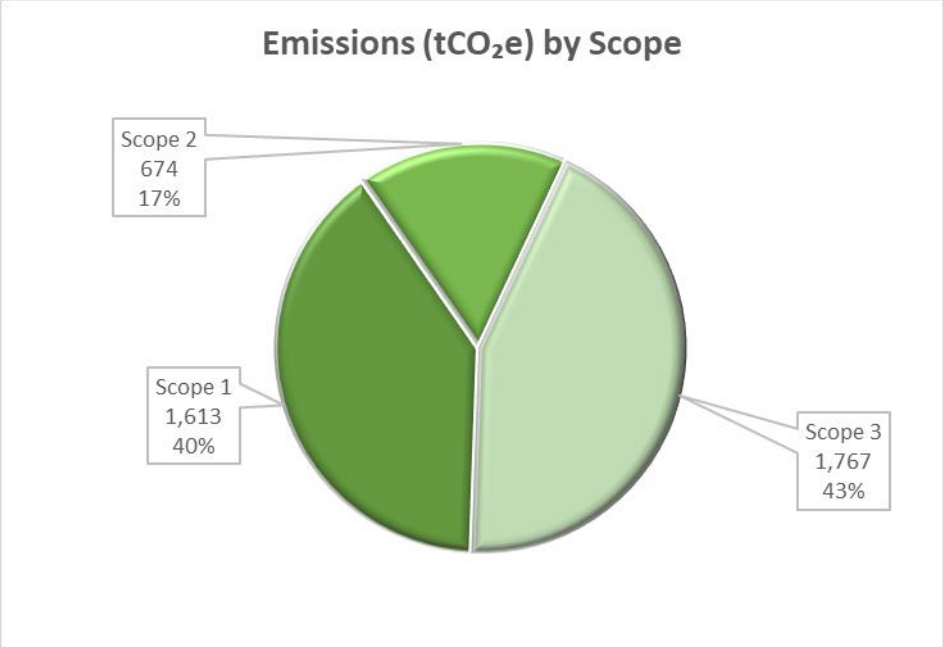



Chart 1 – TDC emissions by scope

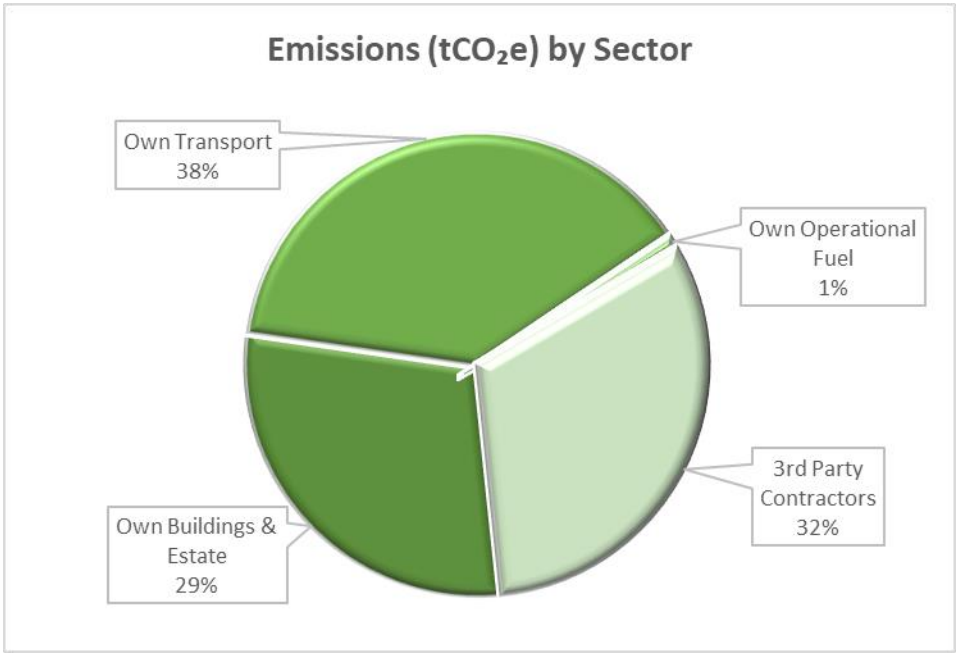
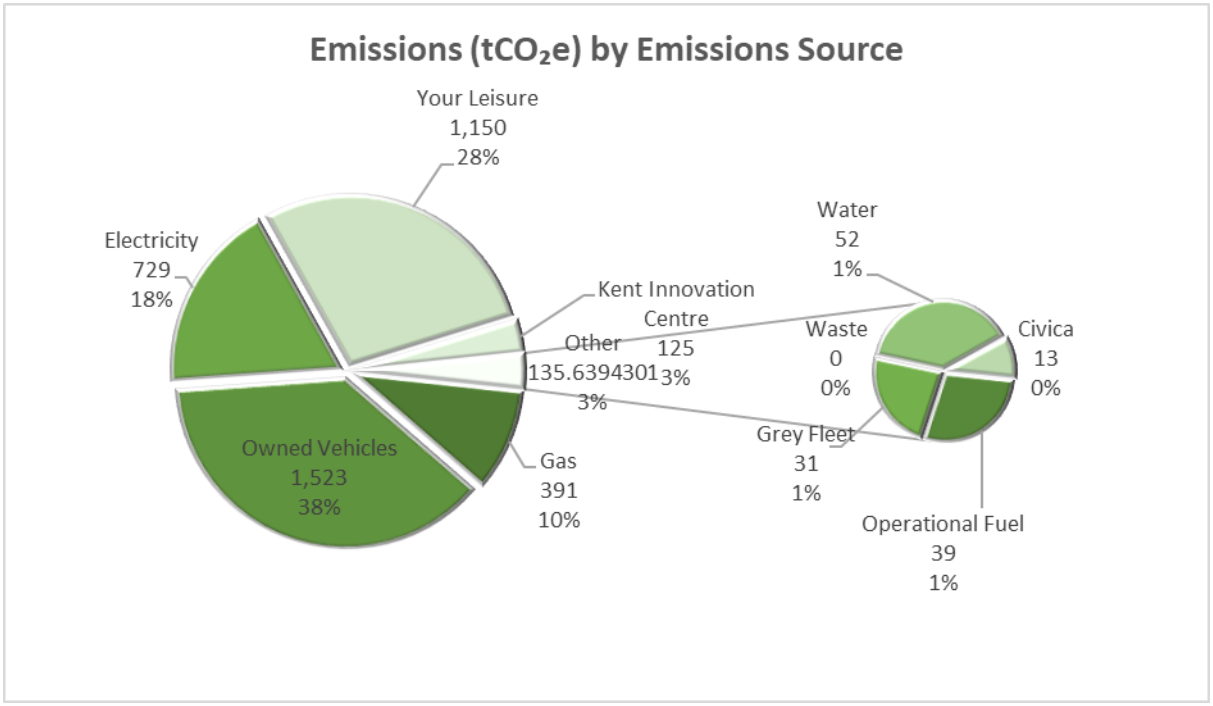



Chart 2 – TDC emissions by sector

The below chart further demonstrates the contribution of emissions from TDC's owned vehicles and the outsourced leisure contract and breaks down the footprint further.




Charts 3 – TDC emissions by source

In Chart 4, a breakdown of the different areas within the Council is shown and it is recognised that emissions for waste collection and street cleaning account for just over nearly a third of all emissions within the carbon footprint. A further breakdown of this specific area is shown in Chart 5, where it can be seen that 94% of these emissions are attributable to fuel use for owned vehicles.

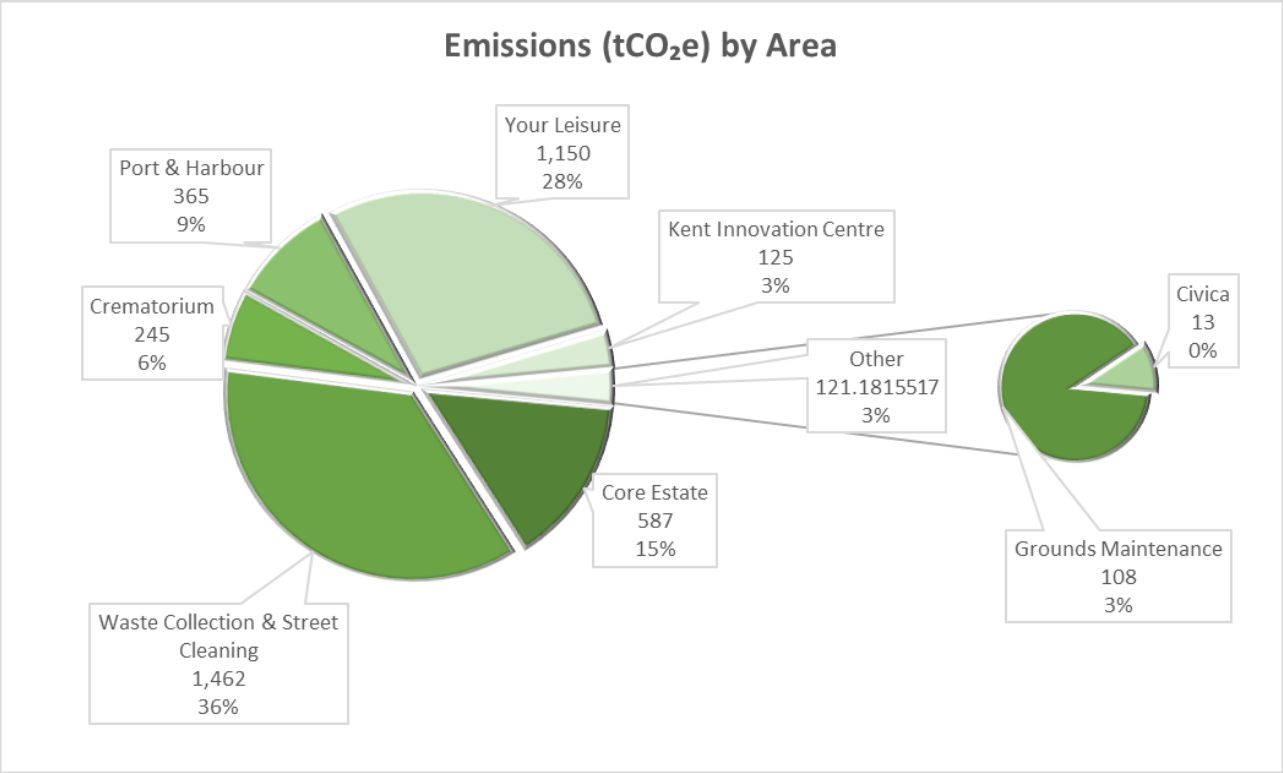



Chart 4 – TDC emissions by area

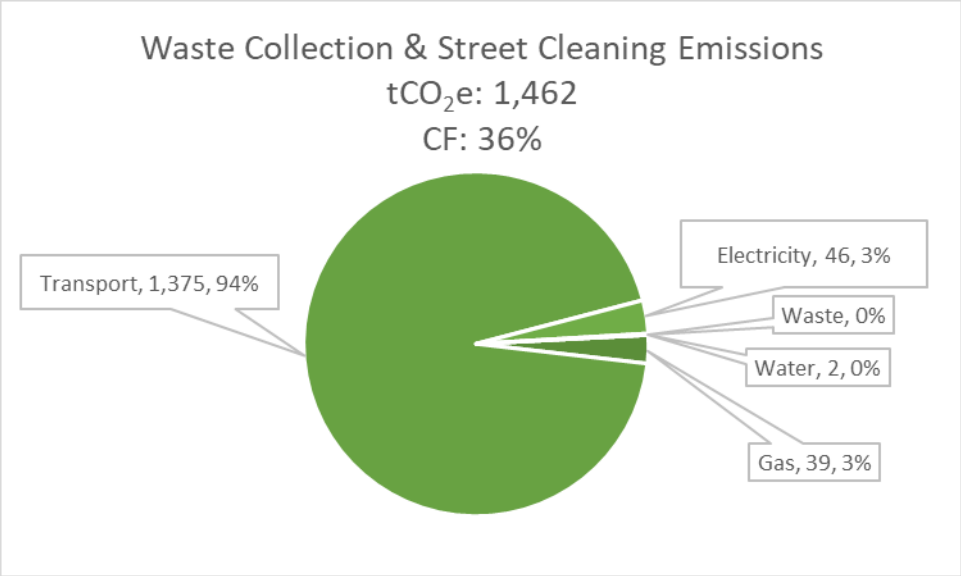



Chart 5 – TDC emissions: Waste Collection & Street Cleaning

In Appendix 6, emission breakdown charts can be found for the other areas within TDC, as well as the two leisure centres operated by Your Leisure.

**Own Vehicle Fuel Data**

Extensive work was carried out by LASER to quantify emissions associated with fuel use for TDC's owned vehicles. This work was used to help understand the following:

- Carbon emissions for each area (e.g., Core Estate, Waste & Street Cleaning)
- Vehicle category and tonnage
- Electricity required for EVs
- Approximate uplift costs for EVs (if available)

The below chart demonstrates that nearly half of the carbon emissions, approximately 750 $tCO_2e$, are associated with fuel use for the waste carriers.

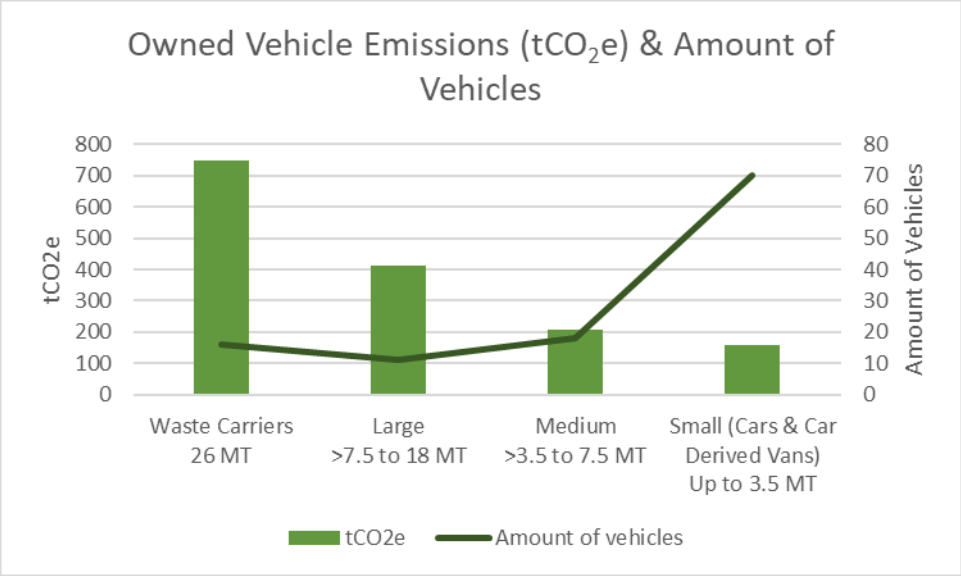



Chart 6 – TDC own vehicles

**Key Findings**

- The majority of emissions are scope 1 and 3, making up 83% of the total carbon footprint.
- Of the scope 3 emissions, the chief contributor is Your Leisure, specifically emissions associated with gas consumption.
- The vast majority of transport emissions shown are associated with TDC's owned vehicles, mainly from waste collection and street cleaning vehicles
- Emissions from waste collection and street cleaning and the leisure centres make up just over two thirds of total emissions.
- Other emissions from TDC owned and operated areas (crematorium, port and harbour, core estate and grounds maintenance) contribute to 33% of footprint, with Civica and the Kent Innovation making up the final 3%.

# Business As Usual Forecast

LASER used the carbon footprint data and the emissions factors touched on above, to generate a forecast of TDC's emissions to 2050. This is designed to act as a representation of emissions levels if TDC took no action to reduce them.

The chart below shows that total emissions at the baseline equate to 4,054 $tCO_2e$. The foremost emission sources below are gas (blue), electricity (light green), and fuel use for owned vehicles (dark green). Each source includes emissions from all of TDC areas, as well as outsourced contracts and leased assets. Further detail and breakdown of the forecast data can be seen in Appendix 7.

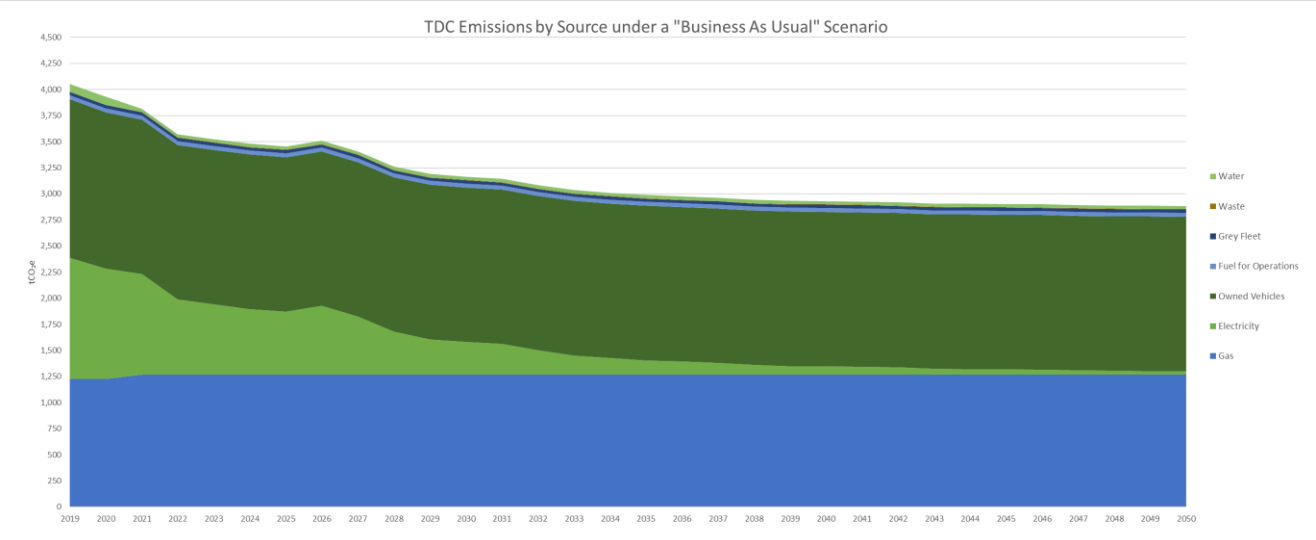



Chart 7 – TDC emissions to 2050 under a "BAU" Scenario

It can be seen that emissions reduce at a noticeable rate during the initial few years of the forecast. This is primarily due to a reduction in emissions associated with electricity consumption, as renewable generation is forecast to make up a larger proportion of the grid supply. As biofuel content continues to increase in the short term, the forecast also shows a slight reduction in emissions associated with fuel consumption. It can be

seen that emissions associated with gas remain largely static throughout and make up an increasing proportion of the total.

In the medium and longer term, emissions associated with this level of use would reduce to:

- 3,164 $tCO_2e$ in 2030
- 2,884 $tCO_2e$ in 2050

These figures are based on government forecasts so, while they are long term forecasts and liable to change, they are as realistic estimates as possible at this point in time.

## Carbon Budget & Pathway

As part of an ongoing project for TDC, LASER were commissioned to provide a science-based carbon budget in line with the Paris Agreement. Aligning efforts with international agreements and recognised scientific research will give TDC's planning and actions more credibility both socially and politically.

The report was produced separately at the end of 2021, however since this time amendments have been made to the original baseline used to generate the budgets and pathway. These amendments are in relation to electricity recharges associated with the Marina Harbour and Newport area and exclusion of the landlord's electricity supply for social housing.

To allow TDC to understand how their net zero pathway is aligning with the Paris Agreement, this pathway has been included within the carbon reduction modelling and has been revised accordingly to take into account the above mentioned adjustments. Further analysis will be provided under the section 'Zero Carbon Modelling, Outputs & Strategy'.

# Options Appraisal

Having established the Council's current position and quantified the scale of the task and reductions required, the next step was to devise a strategy which supported TDC's journey to net zero. In order to update and gain input from TDC Directors and Senior Officers, an options appraisal workshop was run. The aim of this was to ensure that LASER had a good understanding of which issues, subjects and concerns were of importance to the Council, and which were of less importance.

Particular areas of focus were electrification of TDC's owned vehicles, including the possible charging infrastructure required at Manston Road, and heat decarbonisation for TDC's own estate as well as the leisure centres operated by Your Leisure.

# Zero Carbon Electricity Supply Options

There are various zero or low carbon green electricity products available and emerging onto the market. Selecting the products and a procurement strategy which provides the best fit for the Council's situation and objectives is an important challenge. LASER offer three different products; Green Tariff, Green Basket and Public Energy Power Purchase Agreement (PEPPPA). Each product varies with the key features, considerations and advantages offered.

More details can be found in Appendix 8.

# Zero Carbon Modelling, Outputs & Strategy

Following on from the creation of the business as usual emissions forecast, taking into account the feedback from the options appraisal workshop and from the strategy already formulated by TDC, LASER worked with TDC to identify a number of Carbon

Reduction Options and assumptions that the Council would like to assess in order to produce a carbon reduction model.

The Carbon Reduction Options were based around:

- Increasing energy and water use efficiency in estates
- Decarbonising the KIC and one of the two leisure centres
- Electrification of the car derived vehicles and the waste carrier vehicles
- Electrification of equipment
- Reduction in business travel mileage
- 100% green electricity

In order to understand the impact of the Carbon Reduction Options and associated assumptions, the BAU forecast has been used as a baseline, and the impact of each assumption for various Carbon Reduction Options have been built in to assess the net impact on emissions within the scenario.

Due to the emissions associated with TDC's owned vehicles and outsourced contracts having such a large impact on the Council's footprint, the Carbon Reduction Options and assumptions have been split into three tables:

- Table 8. Carbon Reduction Options for TDC owned vehicles (including grey fleet)
- Table 9. Carbon Reduction Options for outsourced contracts and leased buildings (Your Leisure & KIC)
- Table 10. Carbon Reduction Options for TDC estates (offices, depots, crematorium, port and harbour) and core activities (excluding transport)

**Table 8. Carbon Reduction Options: TDC Owned Vehicles (including grey fleet)**

The below table includes emissions from TDC fleet and emissions from staff using their own vehicles for business travel. It assumes that:

- By 2030 all cars and car derived vans will have shifted to an electric alternative.

- By 2028 TDC will have purchased electric waste carrier vehicles. It is understood that this is a very complex action and will require external funding and redesign of the Manston Road depot.
- Those who travel for business will reduce their mileage by 25% by 2025, and that 5% of those who do use their personal vehicle will switch to electric vehicles by 2030. This could be underestimated.

Further details can be found in the Owned Vehicles section on page 43.

| | Core Estate | Waste & Street Cleaning | Grounds Maintenance | Crematorium | Port & Harbour |
|---|---|---|---|---|---|
| **EV Shift Owned Vehicles** | **100%**<br>Small & car derived vans<br>By 2030 | **100%**<br>Small & car derived vans<br>By 2030<br>**100%**<br>26 T Waste Carrier<br>2028 - 2028 | **100%**<br>Small & car derived vans<br>By 2030 | **100%**<br>Small & car derived vans<br>By 2030 | **100%**<br>Small & car derived vans<br>2023 - 2030 |
| **Mileage Reduction Grey Fleet** | **25%**<br>By 2025 | - | - | - | - |
| **EV Shift Grey Fleet** | **5%**<br>By 2030 | - | - | - | - |

**Table 9. Carbon Reduction Options: TDC Outsourced Contracts & Leased Buildings**

Table 9 describes the assumptions within the Kent Innovation Centre and in the two leisure centres that are run by Your Leisure. It assumes that:

- the KIC will have full LED lighting by 2024 and heat pumps by 2030.
- energy efficiency (electricity and gas) will improve by 5% and water efficiency will improve by 10% by 2025.
- the leisure centres will have 100% LED lighting by 2030 and that one of the two will have its heating supply decarbonised by the installation of heat pumps.
- energy efficiency (electric and gas) and water use efficiency will increase by 25% by 2025 in both of the leisure centres.

| | Kent Innovation Centre | Leisure Centres |
|---|---|---|
| **Estate Rationalisation** | - | - |
| **LED Installation** | **100%**<br>2022 - 2024 | **100%**<br>2022-2030 |
| **Heat Pump Installation** | **100%**<br>2023 - 2030 | **50%**<br>2023 -2030 |
| **Energy Efficiencies (electricity and gas)**<br>**(kWh reduction)** | **5%**<br>By 2025 | **25%**<br>By 2025 |
| **Water Efficiencies**<br>**(cbm reduction)** | **10%**<br>2023 – 2025 | **25%**<br>2022 – 2025 |
| **Green Energy**<br>**Buildings (B)** | B<br>By 2030 | B<br>By 2030 |

**Table 10. Carbon Reduction Options: TDC own estate and operations (non-transport)**

The below table includes the following assumptions:

- Estates rationalisation: less office space will be needed going forward, therefore from 2023 it is projected that the consumption associated with Cecil Street Office will reduce by 50%.
- There will be 100% LED lighting across the offices, depots, crematorium and port and harbour by 2030.
- Equipment in the Open Spaces team will be electric by 2030.
- Energy efficiency (electricity and gas) will mean a reduction of 25% in the offices and 10% in depots, crematorium and port and harbour by 2025 by behaviour change, with installation of motion sensors for lighting.
- Water use efficiency will increase by 10% in the offices and 20% in depots, crematorium and port and harbour by 2025.
- Electricity will be sourced from renewable sources by 2030 e.g., PEPPPA

Based on information provided by TDC, it is assumed that in 2036 gas usage for the crematorium will be replaced with electricity. At present, as the consumption of an electric crematorium is unknown, the electricity required for operation has been based on the gas usage.

The modelling includes a solar pv array of 25kWp (not included within the assumption tables).

High-level details were provided to TDC in relation to a potential solar park, however, this has not been included within the Carbon reduction model seen below as it has not yet been determined if this option would be viable.

| | Core Estate | Waste & Street Cleaning | Grounds Maintenance | Crematorium | Port & Harbour |
|---|---|---|---|---|---|
| **Estate Rationalisation** | **Office Space to be reduced by 50%**<br>2023 – 2025 | - | - | - | - |
| **LED Installation** | **100%**<br>2022 - 2030 | **100%**<br>2022 - 2030 | **100%**<br>2022 - 2030 | **100%**<br>2022-2030 | **100%**<br>2022-2030 |
| **Heat Pump Installation** | - | - | - | - | - |
| **Equipment Switch** | - | - | **100%**<br>2025 - 2030 | **100%**<br>2036 | - |
| **Energy Efficiencies (electricity and gas)**<br>**kWh reduction** | **25%**<br>2023 – 2025 | **10%**<br>2023 – 2025 | **10%**<br>2023 – 2025 | **10%**<br>2023 – 2025 | **10%**<br>2023 – 2025 |
| **Water Efficiencies**<br>**(cbm reduction)** | **10%**<br>2023 – 2025 | **20%**<br>2023 – 2025 | **20%**<br>2023 – 2025 | **20%**<br>2023 – 2025 | **20%**<br>2023 – 2025 |
| **Green Energy**<br>**Buildings (B) Vehicles (V)** | **B & V**<br>By 2030 | **B & V**<br>By 2030 | **B & V**<br>By 2030 | **B & V**<br>By 2030 | **B & V**<br>By 2030 |

**Carbon Reduction Model**

The carbon reduction model generated for TDC includes four charts. The first chart details how carbon emissions will reduce with the application of TDC's chosen Carbon Reduction Options and assumptions, whilst the other three charts review the associated costs.

The below unit costs have been used in the model for the financial profile:

- Electricity for buildings and EVs: 20p/kWh
- Gas: 7p/kWh
- Diesel: £1.80/litre
- Water supply: £1.00/cbm / Water treatment - £1.10 cbm

Chart 8 below shows the total carbon emissions from 2019 to 2050 for each area as stacked columns made up from data in chart 4, page 22. Each part of the stacked column is made up of the emissions associated within that specific area.

Starting from the top of the bar and working down, the core estates bar is light blue and includes emissions from the offices. The waste collection and street cleansing bar (dark blue) is the largest bar because it includes the emissions from most of the fleet including the waste carrier vehicles.

The ground maintenance bar is small (dark brown), and the port and harbours bar (yellow) is larger as there are high levels of electricity used here. The crematorium emissions are shown as the grey bar (slightly smaller than port and harbour), and the emissions from the KIC are shown in the small purple bar. The second largest bar at the bottom shows emissions from both leisure centres (Hartsdown and Ramsgate).

The pink columns below the x-axis show the amount of carbon offsetting required by the Council.

The business as usual line in red demonstrates how TDC's emissions would look if no actions were taken by the Council and if consumption was to remain the same. The net emission line in green shows the impact of the Carbon Reduction Options that were

detailed in tables 8, 9 and 10. Based on TDC's carbon footprint for 2019, the blue line demonstrates the Paris Agreement pathway.

In order to meet the Paris Agreement, the Council will need to address the following:

- Emissions from the waste carrier vehicles are address
- Decarbonisation of the estates.

(It is likely that the Council will need to source external funding for these large projects).

In order to reduce emissions fully, it is recommended that heat pumps be installed at the Hartsdown Leisure Centre. However, it understood by LASER that there is a question of longevity of the current building, and a percentage of the building may not be suitable for heat pumps. Based on this, the installation of heat pumps at Hartsdown has therefore has not been included within the modelling.

If a future study shows that Hartsdown leisure centre is suitable for heat pumps, it will reduce the carbon footprint by approximately 387 $tCO_2e$ and the installation of heat pumps would be estimated at a cost of £1.2m (based on previous TDC project).

It can be seen that carbon offsetting reduces in 2036 and this is in relation to the electrification of the crematorium.

The model does not address the emissions from the medium and large vehicles as currently there are no electric alternatives available on the market, so these emissions will need to be offset at 2030 to reach net zero.

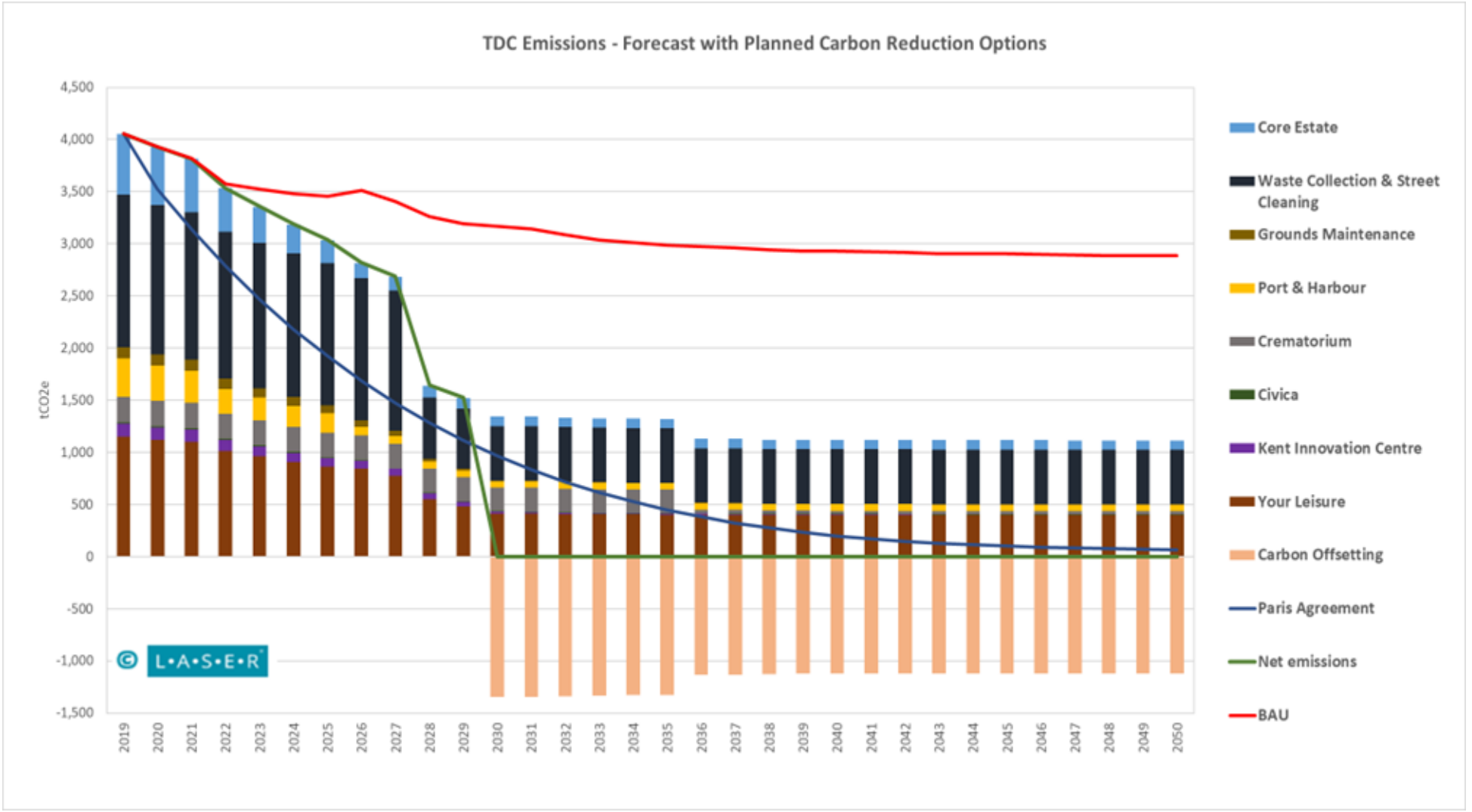



Chart 8 – TDC emissions forecast with carbon reduction options

The financial chart overleaf takes into consideration the overall cashflow position for both the capital investment and annual costs and savings. Carbon Reduction Options generating a savings are shown above the x-axis and those generating an additional cost are shown below the x-axis, with the net position represented by the dark green line.

| Key Points | 2030 | 2050 |
|---|---|---|
| **Cumulative Investment (£m)** | -9.640 | -29.109 |
| **Cumulative Net Financial Benefit (£m)** | 4.070 | 20.811 |
| **Net Position (£m)** | -5.570 | -8.298 |

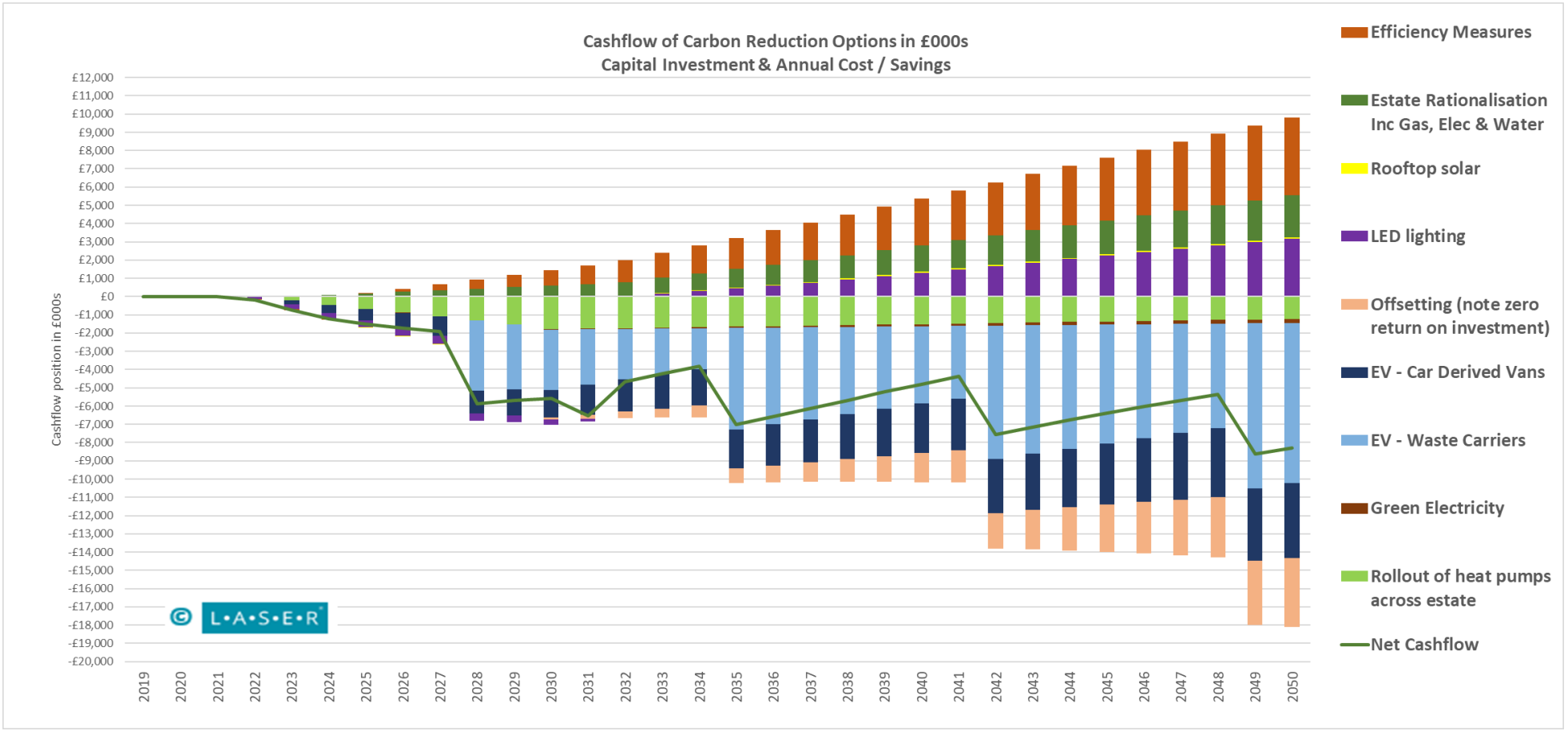



Chart 9 – TDC cashflow for capital investment and annual costs / savings

As shown in the key points table above, in order to reach net zero by 2030 the cumulative cost to the Council is £9.640m. By 2050 cumulative costs, including offsetting costs, will have risen to £29.109m. The increase in cost is mainly due to the purchase of new electric waste carrier vehicles every 7 years.

Investment is required for:

- Solar PV
- LED
- Heat pump installation EV waste carrier vehicle
- Car derived vehicles
- Cost of offsetting

Savings are associated with:

- Energy efficiency measures
- Estate rationalisation
- Roof top solar (export of energy to the grid)
- LED installation

Therefore, the net position by 2030 is -£5.570m and -£8.298m by 2050.

Chart 10 demonstrates the cumulative capital investment required only. It should be noted that the chart does not include investment for electrification of the crematorium.

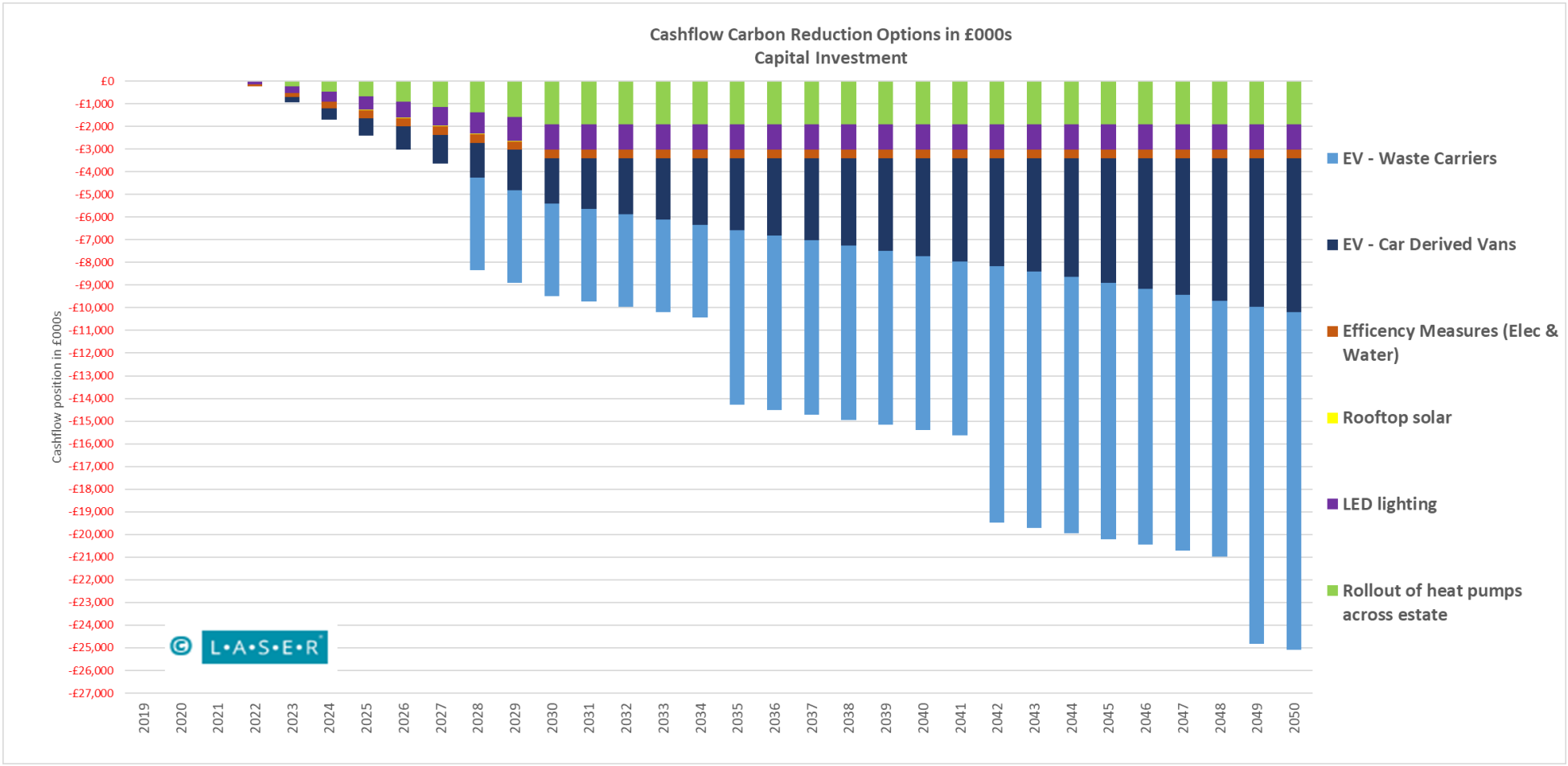



Chart 10 – TDC capital investment

Capital investment needed as per the bullet points above.

Below are approximate capital costs received from TDC for the full decarbonisation of

- Kent Innovation Centre: £1.35m (heat pump installation cost approximately 700k, including new radiators)
- Ramsgate Leisure Centre: £1.2m (based on the Stour Leisure Centre project, with heat pump installation costs of approximately this value)

Chart 11 demonstrates the cumulative annual costs and savings associated with each Carbon Reduction Option but does not include capital investment. The green line shows the overall net position for all Carbon Reduction Options for each year.

Overall savings are recognised by the Council for:

- EV shift for both the car and car derived vans and the waste carriers - the cost to run these EVs is less than a diesel vehicle.
- Heat pumps – the cost to operate with electricity is less than a conventional gas boiler.

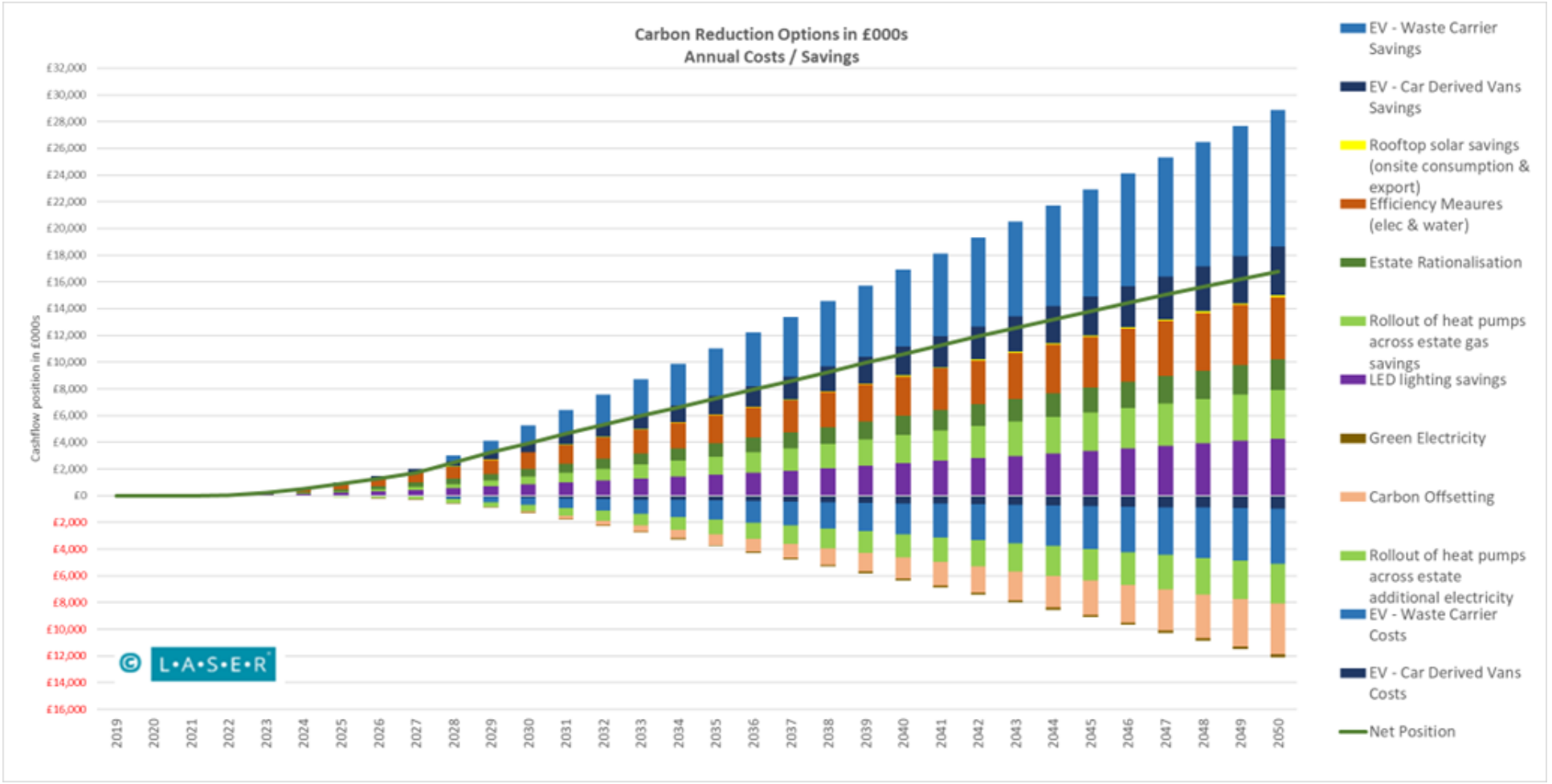



Chart 11 – TDC annual costs and savings

Table 10 provides a breakdown of the cumulative capital investment and cumulative annual costs / savings associated with each Carbon Reduction Option. It details these figures for two specific milestone years - 2030 and 2050. The net position figure at the bottom of the table takes into account both the capital investment and annual savings / costs, and corresponds with the green net position line shown in Chart 9 for these specific years.

There is scope to recognise greater savings for all the Carbon Reduction Options (except carbon offsetting and green energy), if implementation is carried out before the start dates detailed in tables 7, 8 and 9.

| | 2030 | | 2050 | |
|---|---|---|---|---|
| | Capital Investment £m (Cumulative) | Annual Costs / Savings £m (Cumulative) | Capital Investment £m (Cumulative) | Annual Costs / Savings £m (Cumulative) |
| **Efficiency Measures (Elec & Water)** | -0.370 | 1.225 | -0.370 | 4.650 |
| **Solar PV** | -0.023 | 0.032 | -0.023 | 0.122 |
| **Estate Rationalisation** | - | 0.593 | - | 2.286 |
| **EV – Cars & Car Derived Vans** | -2.002 | 0.486 | -6.797 | 2.708 |
| **EV – Waste Carriers** | -4.090 | 0.796 | -14.893 | 6.099 |
| **Heat Pumps** | -1.9 | 0.108 | -1.9 | 0.670 |
| **LED** | -1.117 | 0.830 | -1.117 | 4.275 |
| **Carbon Offsetting** | - | -0.109 | - | -3.798 |
| **Green Electricity** | | -0.029 | - | -0.211 |
| **Total** | -9.501 | 3.932 | -25.100 | 16.802 |
| **Net Position** | **-5.570** | | **-8.298** | |

Table 10 – Costs for 2030 and 2050

### Owned Vehicles

Due to the nature of the vehicle types found within the medium and large categories, these vehicles have not been included at present within the EV shift. The Mercedes hooklift which falls under the small category classification has also been excluded.

The table below shows the amount of vehicles owned and the uplift cost for the different types of vehicles. The financial uplift for cars and car derived vans has been based on an average cost which takes into consideration small, medium and large electric vans (up to 3.5t) currently available on the UK market. TDC also own four 4x4 trucks and this uplift is a substantial increase. Based on information and an Energy Saving Trust Fleet Review report (carried for Manchester City Council) provided by TDC, an uplift cost of £225,000 has been used for the 26t waste carriers.

| | Tonnage | Amount of Vehicles | EV Uplift £ |
|---|---|---|---|
| **Cars & Car Derived Vans (Small)** | Up to 3.5 | 65 | £22,177 |
| **Cars & Car Derived Vans – 4x4s (Small)** | Up to 3.5 | 4 | £52,658 |
| **Mercedes Hook lift (Small)** | Up to 3.5 | 1 | EV not available |
| **Medium** | >3.5 up to 7.5 | 18 | EVs not available |
| **Large** | >7.5 up to 18 | 10 | EVs not available |
| **Waste Carriers** | 26 | 16 | £225,000 |

Table 11 – Owned vehicles and uplift costs

### Cars and Car Derived Vans

The total additional cost of changing the 69 cars and car derived vans to electric alternatives over the next 7 years is estimated to be £0.536m.

It takes into consideration the capital investment, as well as the cost of infrastructure which has been estimated at approximately 6% of the total EV cost (as per details

received from TDC finance department). Loan interest is 2.5% (also received from TDC finance department).

A full annual usage of 204,322 kWh as from 2029 has been used, as this reflects a 100% fleet shift to EVS. (This kWh annual usage is based on the diesel consumption, and an average kWh/mile, which takes into consideration battery size and mile range for small, medium and large vans currently available on the market).

EV maintenance and repair costs are based on details from Link Group and a previous case study held by LASER. The EV maintenance and repair costs are on average 43% of diesel vehicles maintenance and repair costs.

| | Cost Type | Diesel | Electric | Additional Costs / Savings |
|---|---|---|---|---|
| **Vehicle (£m)** | Capital | -1.481 | -3.051 | -1.570 |
| **Infrastructure (6% of vehicle cost)** | Capital | 0 | -0.183 | -0.183 |
| **Loan Interest (2.5%)** | Capital | -0.033 | -0.073 | -0.039 |
| **Vehicle Exercise Duty (VED) £m** | Operational | -0.145 | 0 | 0.145 |
| **Fuel / Energy £m** | Operational | -0.972 | -0.357 | 0.615 |
| **Maintenance & Repairs £m** | Operational | -0.869 | -0.374 | 0.496 |
| **Total over 7 years £m** | Capital & Operational | **-3.500** | **-4.038** | **-0.538** |

Table 12 – Cost breakdown for car derived vans over a 7 year period

It can be seen that EVs allow savings in three areas: VED, fuel, and maintenance and repairs. The fuel / energy cost comparison recognises the largest savings, equating to £0.615m over the 7 year period. The additional cost each year of switching to EVs is £0.076m, meaning that in this case, the Council does not see a break even position.

**Waste Carrier Vehicles**

Based on 16 vehicles, the below table shows costs over 7 years and assumes all vehicles are replaced in the first year when the contract is up for renewal in 2028.

The following assumptions have been based on the Energy Saving Trust 'Fleet Review' report carried out for Manchester City Council:

- Annual electricity usage for fleet: 895,226 kWh
- AdBlue: £0.36 per litre
- Maintenance and repair costs: 34% compared to ICEs

For each waste carrier, the end-of-life electric battery resale has been assumed to be £5,000 and is based on a figure obtained from a report by Eunomia[§]. The Energy Saving Trust 'Fleet Review' report carried out for Manchester City Council detailed a figure of £36,000 for each battery, however it was determined that the lower value would be used for TDC's modelling.

There have been no savings included for the resale of diesel waste carriers as it was advised that this was minimal, and in some instances could actually be an oncost to TDC.

| | Cost Type | Diesel | Electric | Additional Costs / Savings |
|---|---|---|---|---|
| **Vehicle (£m)** | Capital | -2.440 | -6.04 | -3.600 |
| **Infrastructure ( approx. 6% of vehicle cost)** | Capital | 0 | -0.400 | -0.400 |
| **Loan Interest (2.5%)** | Capital | -0.054 | -0.144 | -0.090 |
| **Electric Battery Resale** | Capital | 0 | 0.080 | 0.080 |
| **Vehicle Exercise Duty (VED) £m** | Operational | -0.034 | 0 | 0.034 |
| **Road User Levy (RUL) £m** | Operational | -0.035 | 0 | 0.035 |

§ Ditching Diesel - A Cost-Benefit Analysis of Electric RCVs (eunomia.co.uk)

| | | | | |
|---|---|---|---|---|
| **Fuel / Energy £m** | Operational | -2.93 | -1.253 | 1.677 |
| **Ad Blue (5l for every 100l)** | Operational | -0.029 | 0 | 0.029 |
| **Maintenance & Repairs £m** | Operational | -0.735 | -0.560 | 0.175 |
| **Total over 7 years £m** | Capital & Operational | **-6.257** | **-8.317** | **-2.06** |

Table 13 – Cost breakdown for vehicles over 7 years for 2030 and 2050

There are six areas where savings are made when replacing with EV waste carriers. The most significant savings are seen in the fuel / energy comparison, where the financial benefit is £1.677m over the 7 year period. However, due to the large investment required for the vehicles themselves, approximately £3.6m, there is still an additional oncost of £2.22m to the Council overall.

**NB: The replacement of infrastructure for both cars and car derived vans and waste carriers has assumed to be every 21 years based on a report from Eunomia.**

**Medium and Large Vehicles (and x1 Hooklift)**

These have not been addressed in the carbon reduction model as electric alternatives are not currently available. An interim option could be to use biodiesel instead of conventional diesel until the market offers electric options for these types of vehicles. At time of report, biodiesel is approximately 15% more expensive than conventional diesel. Although there are specific bodies and schemes (such as the ISCC) which ensure production is sustainable, there are concerns by some around the sustainability of this option, and that it may put pressure on land which could be used for food.

The below table indicates a yearly additional cost, and cumulative costs by 2030 and 2050 if moving these vehicles to HVO by 2023.

| Additional Yearly Cost<br><br>£m | Cumulative Cost 2030<br><br>£m | Cumulative Cost 2050<br><br>£m |
|---|---|---|
| -0.043 | -0.354 | -1.204 |

Table 14 – Additional costs for HVO

In the longer-term future, another area of exploration that could be considered by TDC is hydrogen.

# Carbon Offsetting

The carbon offsetting costs (£/t$CO_2$e) used in this analysis are based on government forecast figures from their central forecast and by 2030 are £0.109m and £3.978m by 2050.

There is a reliance on carbon offsetting to achieve TDC's net zero target in the carbon reduction model presented. This is a drawback from an environmental perspective as conventionally only emissions that can't be abated by other means should be offset. The Council have begun to explore the possibility of using owned land for sequestration, which could help to reduce the reliance of purchasing carbon offsets from the market in the longer-term future. This would also reduce the amount of risk the Council is exposed to from the market. Carbon offsetting can also be seen by some as 'greenwashing', so needs careful management to ensure emissions saving are real.

Although these are the best possible representation at this time, carbon offsetting is an evolving market and as such, more difficult to predict. Therefore, there is a risk that the cost of carbon offsetting could be substantially higher by 2030, especially as demand is likely to drastically increase at that point and over the intervening period.

The below two charts demonstrate the yearly and cumulative offsetting costs up to 2050 for the three offsetting forecasts available from the government: low, central and

high.

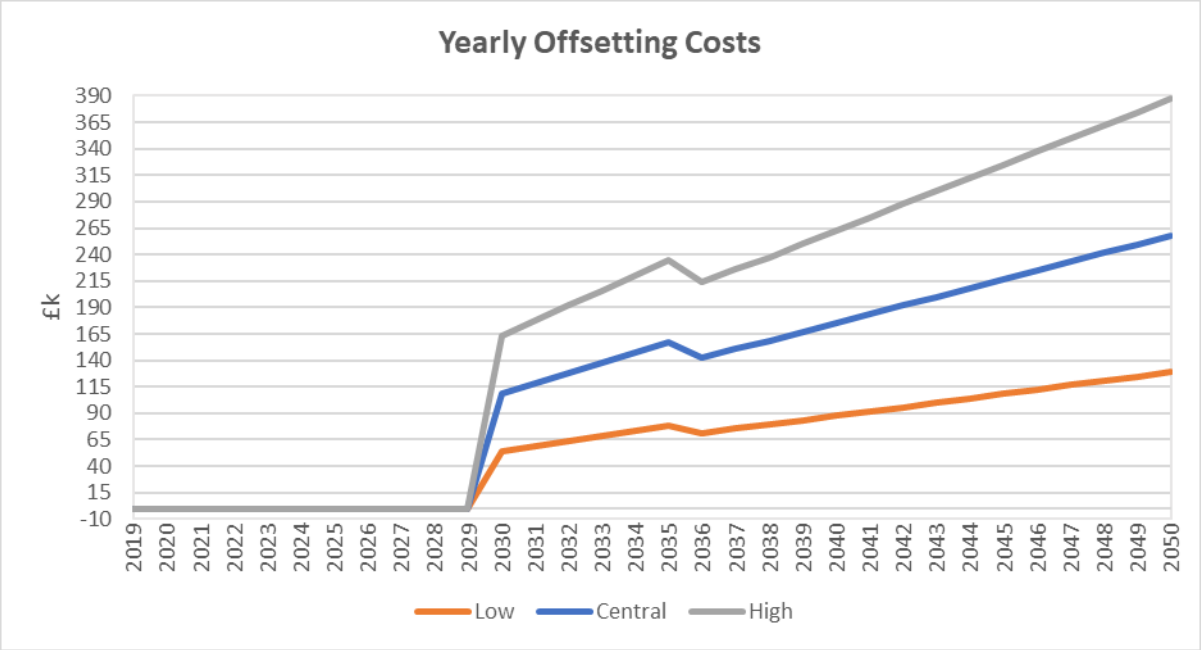



Chart 12 – Yearly offsetting costs

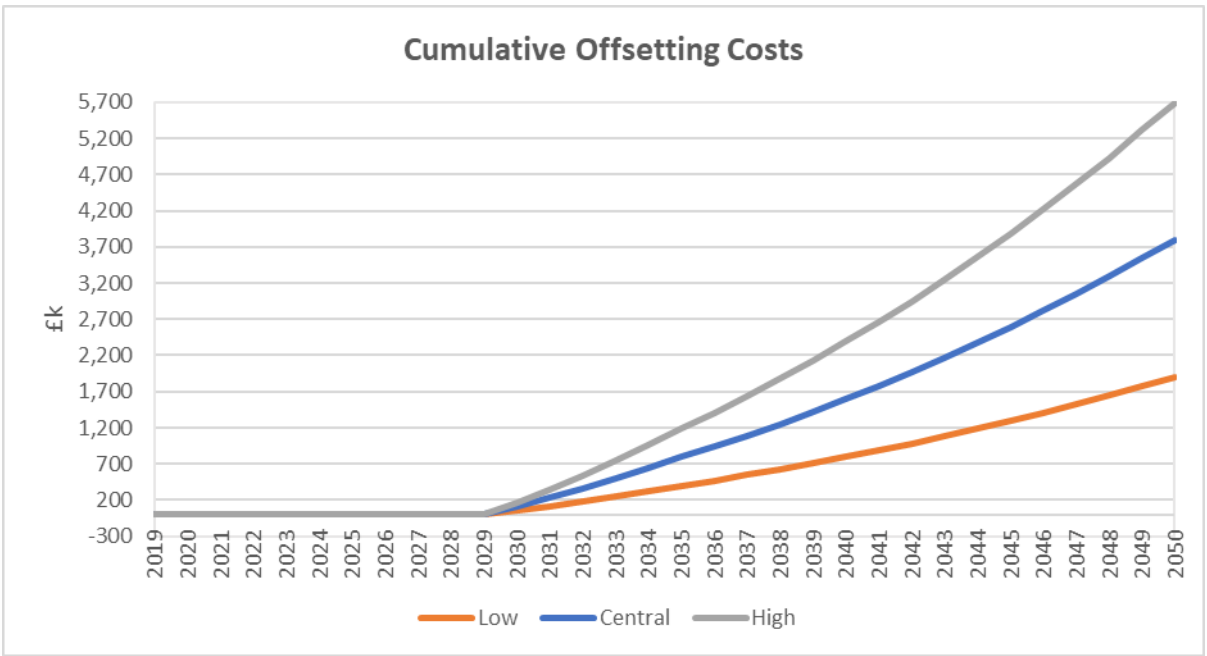



Chart 13 – Cumulative offsetting costs

# Conclusion

In order to align with the Paris Agreement pathway, it is evident that substantial early action will need to be taken to reduce emissions.

With a significant proportion of TDC's emissions associated with fuel use for owned vehicles and gas consumption for heating, in particular the leisure centres, these are two major areas of focus, which have been recognised by TDC - and as such require substantial action by TDC in order to reach their net zero target. Currently, the market does not offer alternative EVs for all of TDC's owned vehicles so an alternative strategy for the short to medium term future will be required to abate these emissions.

The assumptions included for estate rationalisation have a significant impact on the reduction of carbon emissions. Further understanding and confirmation of the direction TDC wish to take with their own estate will help to firm up these assumptions and allow the Council to fully understand what Carbon Reduction Options can be implemented to mitigate any emissions that reside. It will also provide certainty around the development of a green energy purchasing strategy.

Many of these actions are financially prohibited and TDC will need to look to source funding and assistance.

**Evolution of Strategy and Model**

At this stage the modelling gives a view of potential possibilities and can be a useful tool in monitoring progress as well as for planning and decision making.

It is likely that opportunities for further emissions reductions will come to light in the medium term that are not included in the model. This may be through new technologies, reductions in costs of current technologies or government policies.

**Key Points**

- TDC can achieve net zero carbon by their target date however, some carbon offsetting will be required, as well as substantial external funding.
- Substantial early action is needed to align with Paris Agreement pathway.
- The majority of TDC's carbon footprint is attributable to fuel use for owned vehicles, mainly the waste carrier vehicles and the outsourced contract associated with the leisure centres.
- Clear long-term policy on estate will help with planning of energy efficiency measures and procurement of green electricity.
- Reliance on carbon offsetting to achieve targets comes with significant risks and importantly no financial returns on any investment.
- The offsetting market is expected to change and develop hugely over the next decade.
- Modelling is designed to help inform decision making and is based on current factors and state of the market technologies. Technologies and economics may change significantly over time and government funding and policy will also influence these issues. Regular review of the model as the technology landscape changes, particularly in relation to transport, will place TDC in the best position to meet their net zero targets.

# Next Steps

**1. Electrification of Owned Vehicles**

As mentioned, alternative EVs are not currently available for all of TDCs owned vehicles. It is recommended that where alternatives are available feasibility studies are undertaken to review all aspects associated with the introduction of EVs.

**2. Determine estate future**

Establishing a firm and clear direction for the estate is vital and will help TDC with plans to reduce emissions.

**3. Estate Decarbonisation Plan**

Heat pumps should be explored as a viable alternative to conventional gas heating for estates that are to be kept, as well as other Carbon Reduction Options such as LED and energy efficiencies.

**4. Address less significant emissions sources**

The Council can pursue established initiatives in other areas such as reducing water use and switching equipment to electric alternatives.

**5. Procure green energy for estate**

Although influenced by steps 1, 2 & 3, TDC can establish a proposed procurement strategy for electricity and implement this once a clear direction is obtained.

**6. Investigate Offsetting Options**

For remaining emissions, it is recommended that options for offsetting are explored by the Council.

**7. Update carbon footprint**

Data for 2020-21 can be built into the model to demonstrate the changes to the carbon footprint to date and pertinently, the impact of COVID-19 on the Council's emissions.

# LASER Background

LASER Energy Buying Group was formed in 1989 by Kent County Council (KCC) with the aim of assisting Local Authorities and other public bodies to benefit from lower energy prices through deregulated gas and electricity markets and to offer management services that focus on reducing energy spend, saving time and hassle for our customers.

LASER has grown to become one of the leading energy procurement and energy management service providers in the UK. Today our mission is to deliver unique end-to-end solutions to our customers helping reduce energy costs, manage market risk and provide compliance in an increasingly volatile market.

LASER's success and reputation has helped it to grow organically to its current position serving 200 public sector customers and buying in excess of £500m of energy per annum. We work with a large number of public sector bodies including NHS Trusts, Universities & colleges, Local Authorities and Housing Associations.

# Key People

| Name | Description |
|---|---|
| **Steve Marks**<br>**Head of Carbon Advisory** | Steve has a strong background in energy and carbon management having worked in the industry for over a decade after graduating from Loughborough University with a degree in Business, Economics & Finance. He has worked as an Energy Engineer for Schneider Electric and as a Carbon & Compliance Manager for ENGIE. Throughout this time Steve conducted energy surveys across a wide range of sectors and has also dealt with numerous environmental schemes including CCAs, EUETS, GQCHP, CDP, CRC and ESOS. Steve is a CIBSE Low Carbon Consultant and remains an accredited DEC Assessor and ESOS Lead Assessor.<br><br>Steve managed LASER's team of Energy Surveyors and has led LASER's response to assist the public sector in addressing the climate emergency declarations and carbon net zero targets enacted by many authorities. |

| | |
|---|---|
| **Helen Cartledge**<br>**Zero Carbon Consultant** | Helen has over 10 years of experience within the energy industry, having worked in the marine, timber, gas and electricity sectors. Helen procured fuel for the fleet at P&O Ferries and researched alternative fuel types and technologies to help reduce carbon emissions.<br>Helen has also worked for a national timber company and in energy procurement and undertaken a carbon reduction project for a local charity, identifying financially advantageous sustainable power alternatives. |
| **Kane Stockwell**<br>**Net Zero Energy Supply Lead** | Kane has been with LASER since 2009 and sits within the Procurement team. He specialises in energy trading, contract structures and public sector procurement compliance, and played a key role in putting in place numerous compliant routes-to-market including LASER's £250 million per annum energy supply frameworks.<br>More recently Kane has led LASER's creation of contractual structures for the procurement of green electricity. With regards to Power Purchase Agreements, he has put in place LASER's PPA Dynamic Purchasing System, has played a key role in investment decisions for building renewable assets, has structured the ability to sleeve and sell electricity from renewable assets, as well as becoming an expert in handling the ongoing management of PPAs. |
| **Andy Morgan**<br>**Assistant Director Carbon & Energy Management** | Andy has over 25 years' experience in energy efficiency and procurement since graduating as an Energy Engineer. He has previously worked for Matthew Hall, procuring energy and operating EPCs for large clients, and the City of London Corporation, taking responsibility for saving and procuring energy for the city portfolio. Now Andy manages LASER's Bureau Services, LED Lighting Services and other energy management and water services.<br>As a CMVP, Andy is expert in handling and analysing data and also specialises in energy efficiency, renewable energy, energy supply markets, energy industry infrastructure and Government energy policy and schemes. |

# Legal Information

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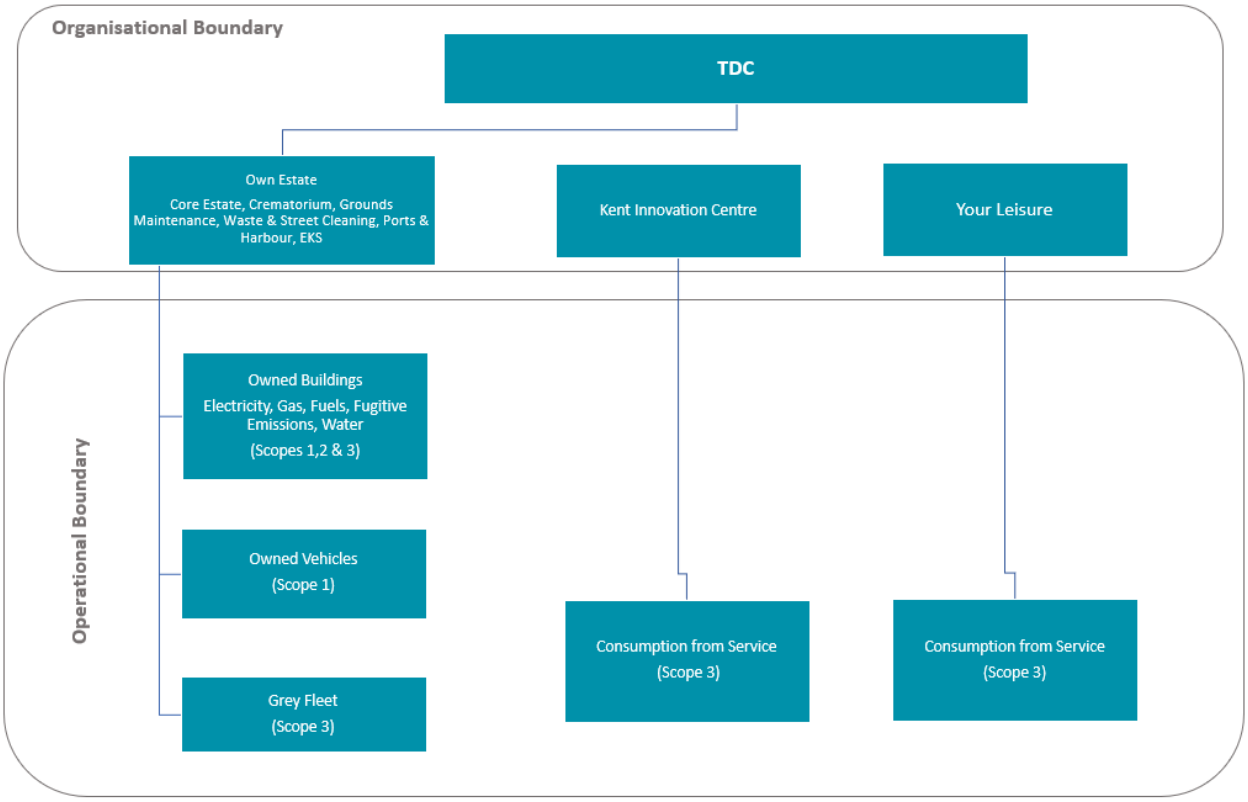
# Appendix 1 – Scoping Chart



# Appendix 2 – Scoping Table

| Scope | In scope (practical for immediate inclusion) | Evaluate | Consider longer term / Outside of scope |
|---|---|---|---|
| Carbon Negative | Gas | | |
| | Oil | | |
| | Other Fuels | | |
| | Fugitive Emissions (if data available) | | |
| | Owned Vechicles | | |
| | Electricity | | |
| | Grey Fleet | | |
| | Water | Homeworking (if data available) | |
| | Waste (if data available) | Social Housing – Tenants Energy Use | Employee Commuting |
| | Contracted Services | Purchased Goods & Services (Additional Study) | Employee Business Travel (air, rail, taxi etc) |
| Carbon Positive | Renewable Generation | | |
| | Additional Tree Planting | | |

# Appendix 3 – Scope Details

| Area / Organisation | Details | Inc in Scope |
|---|---|---|
| **Core Estate** | Made up of council offices, PCs, public areas, carparks, streetlighting.<br><br>TDC to provide consumption data for electricity, gas, water, waste, owned vehicles, stationary combustion, fugitive emissions | Y |
| **Grounds Maintenance** | Inhouse.<br><br>TDC to provide consumption data for electricity, gas, water, waste, owned vehicles, stationary combustion, fugitive emissions | Y |
| **Waste Collection & Street Cleaning** | Inhouse.<br><br>TDC to provide consumption data for electricity, gas, water, waste, owned vehicles, stationary combustion, fugitive emissions | Y |
| **Crematorium** | Inhouse.<br><br>TDC to provide consumption data for electricity, gas, water, waste, owned vehicles, stationary combustion, fugitive emissions | Y |
| **Port & Harbour** | TDC pay invoices for one of the buildings and recharges to the tenants (Newport)<br><br>TDC to provide data and additional information so that the associated recharges can be accounted for appropriately. | Y |

| | | |
|---|---|---|
| | TDC to provide consumption data for electricity, gas, water, waste, owned vehicles, stationary combustion, fugitive emissions | |
| **TDC**<br><br>**Business Travel** | Covers the use of public transport for employee business travel, as well as grey fleet (employees utilising own vehicles for business travel), in relation to TDC's own estate, (grounds maintenance, waste collection and street cleaning, crematorium, port and harbour).<br><br>TDC to provide expenses data for TDC's grey fleet. (breakdown of fuel type, vehicle type, engine size if available).<br><br>If TDC wish to include emissions associated with public transport, LASER would require this data in passenger/km format. | Y |
| **Leisure Centres** | Centres are TDC assets and leased to Your Leisure who operate and pay invoices associated with operations.<br><br>Your Leisure to provide consumption data for electricity, gas, water, waste, stationary combustion, fugitive emissions | Y |
| **Social Housing / EKH**<br><br>**Communal & Landlord Supply** | Housing stock is owned by TDC who are responsible for paying communal / landlord supply and improving building fabric and heating systems. Tenants pay their own energy bills - please see further details and proposed handling for tenants under 'Social Housing – Tenants'.<br><br>Day to day running was brought back inhouse in October 2020.<br><br>TDC to provide consumption data for electricity, gas | Y |

| | | |
|---|---|---|
| **Mears**<br><br>**Housing Repairs** | Outsourced contract (could potentially come back inhouse).<br><br>Confirmation required if TDC own any buildings used to serve this contract, or if Mears utilise their own sites specifically to serve this contract.<br><br>Excluded from scope as contract is associated with Social Housing maintenance. | N |
| **Civica**<br><br>**Revenue & Benefits Service** | Strategic partnership with Civica, shared with Canterbury and Dover. Civica utilise space at Thanet council offices as well as at other authorities.<br><br>It is understood that each authority accounts for energy use within their own estate and LASER propose the same handling of Civica for TDC. | Y |
| **EKS** | Shared service. HR coming back inhouse as of Sept 21. IT under review & Payroll to be left with EKS. Service uses separate building at Canterbury for IT which includes servers. Dover house some servers (c20%) / TDC house servers (c80%).<br><br>LASER propose to include energy use associated with Thanet buildings and address the server imbalance between TDC and DDC. Please can TDC confirm they are happy with this approach. Alternatively, TDC could include all energy used on site, although this would be an over estimation.<br><br>LASER would require further information / sub meter data for Thanet Servers if wishing to address the imbalance. | Y |

| Area | Details & Data Required | Inc in Scope |
|---|---|---|
| **Homeworking** | Energy use associated with homeworking.<br><br>TDC to provide data | N |
| **Social Housing - Tenants** | Energy use for gas and electricity. The preference would be for this data to be in kWh.<br><br>TDC to provide data | N |
| **Goods and Services** | LASER will carry out an assessment of emissions associated with procurement spend with top 15 suppliers without additional charge. This will enable TDC to assess significance of emissions and analyse emission intensity.<br><br>TDC to provide spend details of top 15 suppliers for FY 19-20. | N |

# Appendix 4 – Carbon Footprint Data

| Operation | Sector | Scope | Emissions Category | Individual Emissions Source | Fuel Type & Units | Units | 2019-2020 | 2019 Emissions Factor | 2,019 $tCO_2e$ |
|---|---|---|---|---|---|---|---|---|---|
| Core Estate | Buildings & Estate | Scope 1 | Gas | Gas | Natural Gas/kWh | kWh | 531,602.00 | 0.184 | 97.74 |
| Core Estate | Buildings & Estate | Scope 3 | Gas | Gas WTT | Natural Gas/kWh | kWh | 531,602.00 | 0.024 | 12.71 |
| Core Estate | Transport | Scope 1 | Owned Vehicles | Diesel - Small, Cars & Car Derived Vans | Diesel/Litres | litres | 19,328.80 | 2.594 | 50.14 |
| Core Estate | Transport | Scope 1 | Owned Vehicles | Diesel - Medium | Diesel/Litres | litres | 0.00 | 2.594 | 0.00 |
| Core Estate | Transport | Scope 3 | Owned Vehicles | Diesel - WTT | Diesel/Litres | litres | 19,328.80 | 0.617 | 11.93 |
| Core Estate | Buildings & Estate | Scope 2 | Electricity | Electricity Building Use | Electricity/Generation/kWh | kWh | 1,089,288.10 | 0.256 | 278.42 |
| Core Estate | Buildings & Estate | Scope 2 | Electricity | Electricity Street Lighting UMS | Electricity/Generation/kWh | kWh | 125,460.00 | 0.256 | 32.07 |
| Core Estate | Buildings & Estate | Scope 2 | Electricity | Electricity UMS | Electricity/Generation/kWh | kWh | 62,664.00 | 0.256 | 16.02 |
| Core Estate | Buildings & Estate | Scope 3 | Electricity | All Electricity T&D | Electricity T&D | kWh | 1,277,412.10 | 0.022 | 27.72 |
| Core Estate | Transport | Scope 3 | Grey Fleet | Grey Fleet Passenger / Delivery Non EV Petrol | Diesel Small | miles | 15,327.00 | 0.229 | 3.50 |
| Core Estate | Transport | Scope 3 | Grey Fleet | Grey Fleet Passenger / Delivery Non EV Petrol | Diesel Medium | miles | 15,369.00 | 0.275 | 4.22 |
| Core Estate | Transport | Scope 3 | Grey Fleet | Grey Fleet Passenger / Delivery Non EV Petrol | Diesel Large | miles | 5,797.00 | 0.337 | 1.95 |
| Core Estate | Transport | Scope 3 | Grey Fleet | Grey Fleet Passenger / Delivery Non EV Petrol | Petrol Small | miles | 38,915.00 | 0.247 | 9.63 |
| Core Estate | Transport | Scope 3 | Grey Fleet | Grey Fleet Passenger / Delivery Non EV Petrol | Petrol Medium | miles | 17,872.00 | 0.309 | 5.53 |
| Core Estate | Transport | Scope 3 | Grey Fleet | Grey Fleet Passenger / Delivery Non EV Petrol | Petrol Large | miles | 72.00 | 0.455 | 0.03 |
| Core Estate | Transport | Scope 3 | Grey Fleet | Grey Fleet Passenger - WTT | Combined | tonnes | 6.62717688 | 1.000 | 6.63 |
| Core Estate | Buildings & Estate | Scope 3 | Waste | Waste | Mixed waste | tCO2e | 0.013899609 | 1.000 | 0.01 |
| Core Estate | Buildings & Estate | Scope 3 | Water | Water Supply | Water Supply/cbm | cbm | 36,416.00 | 0.344 | 12.53 |
| Core Estate | Buildings & Estate | Scope 3 | Water | Water Sewerage | Water Treatment/cbm | cbm | 22,617.96 | 0.708 | 16.01 |
| Waste Collection & Street Cleaning | Buildings & Estate | Scope 1 | Gas | Gas | Natural Gas/kWh | kWh | 187316 | 0.184 | 34.44 |
| Waste Collection & Street Cleaning | Buildings & Estate | Scope 3 | Gas | Gas - WTT | Natural Gas/kWh | kWh | 187316 | 0.024 | 4.48 |
| Waste Collection & Street Cleaning | Transport | Scope 1 | Owned Vehicles | Diesel - Small, Cars & Car Derived Vans | Diesel/Litres | litres | 40,783.29 | 2.594 | 105.80 |
| Waste Collection & Street Cleaning | Transport | Scope 1 | Owned Vehicles | Diesel - Medium | Diesel/Litres | litres | 65,266.60 | 2.594 | 169.31 |
| Waste Collection & Street Cleaning | Transport | Scope 1 | Owned Vehicles | Diesel - Large | Diesel/Litres | litres | 89,775.80 | 2.594 | 232.89 |
| Waste Collection & Street Cleaning | Transport | Scope 1 | Owned Vehicles | Diesel - Waste Carriers | Diesel/Litres | litres | 232,419.34 | 2.594 | 602.92 |
| Waste Collection & Street Cleaning | Transport | Scope 3 | Owned Vehicles | All Diesel - WTT | Diesel/Litres | litres | 428245.03 | 0.617 | 264.27 |
| Waste Collection & Street Cleaning | Buildings & Estate | Scope 2 | Electricity | Electricity | Electricity/Generation/kWh | kWh | 164,343.00 | 0.256 | 42.01 |
| Waste Collection & Street Cleaning | Buildings & Estate | Scope 3 | Electricity | Electricity T&D | Electricity/Generation/kWh | kWh | 164,343.00 | 0.022 | 3.57 |
| Waste Collection & Street Cleaning | Buildings & Estate | Scope 3 | Waste | Waste | Mixed waste | tCO2e | 0.00200 | 1.000 | 0.0019985 |
| Waste Collection & Street Cleaning | Buildings & Estate | Scope 3 | Water | Water Supply | Water Supply/cbm | cbm | 1,921.00 | 0.344 | 0.66 |
| Waste Collection & Street Cleaning | Buildings & Estate | Scope 3 | Water | Water Sewerage | Water Treatment/cbm | cbm | 1,824.95 | 0.708 | 1.29 |

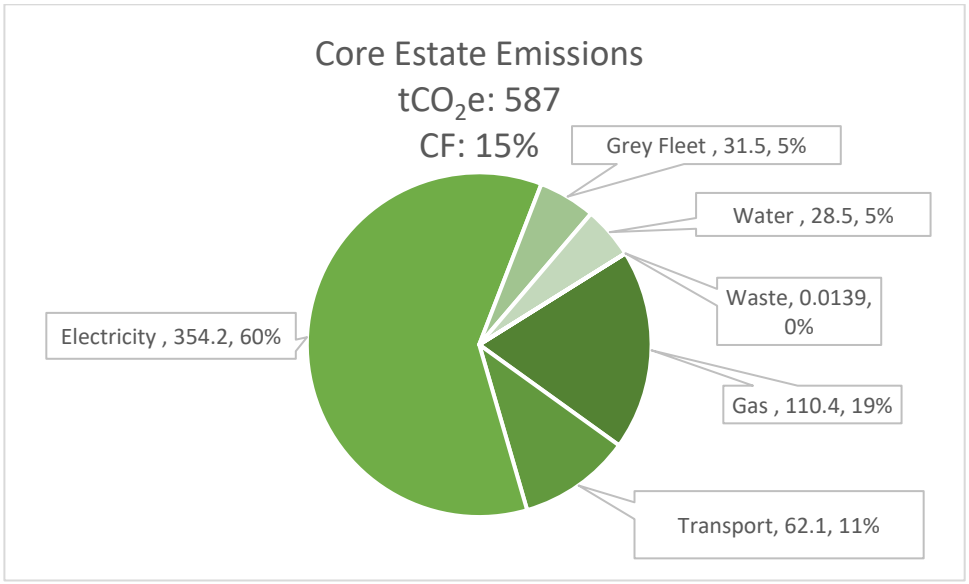
| Operation | Sector | Scope | Emissions Category | Individual Emissions Source | Fuel Type & Units | Units | 2019-2020 | 2019 Emissions Factor | 2,019 $tCO_2e$ |
|---|---|---|---|---|---|---|---|---|---|
| Grounds Maintenance | Operations | Scope 1 | Fuel for Operations | Diesel | Diesel/Litres | litres | 12,000.00 | 2.594 | 31.13 |
| Grounds Maintenance | Operations | Scope 3 | Fuel for Operations | Diesel - WTT | Diesel/Litres | litres | 12,000.00 | 0.617 | 7.41 |
| Grounds Maintenance | Transport | Scope 1 | Owned Vehicles | Diesel - Small, Cars & Car Derived Vans | Diesel/Litres | litres | 15,678.55 | 2.594 | 40.67 |
| Grounds Maintenance | Transport | Scope 1 | Owned Vehicles | Diesel - Medium | Diesel/Litres | litres | 0.00 | 2.594 | 0.00 |
| Grounds Maintenance | Transport | Scope 3 | Owned Vehicles | All Diesel - WTT | Diesel/Litres | litres | 15,678.55 | 0.617 | 9.68 |
| Grounds Maintenance | Buildings & Estate | Scope 2 | Electricity | Electricity | Electricity/Generation/kWh | kWh | 65,786.00 | 0.256 | 16.81 |
| Grounds Maintenance | Buildings & Estate | Scope 3 | Electricity | Electricity - T&D | Electricity/Generation/kWh | kWh | 65,786.00 | 0.022 | 1.43 |
| Grounds Maintenance | Buildings & Estate | Scope 3 | Waste | Waste | Mixed waste | tCO2e | 0.00 | 1.000 | 0.00 |
| Grounds Maintenance | Buildings & Estate | Scope 3 | Water | Water Supply | Water Supply/cbm | cbm | 1,366.00 | 0.344 | 0.47 |
| Grounds Maintenance | Buildings & Estate | Scope 3 | Water | Water Sewerage | Water Treatment/cbm | cbm | 479.85 | 0.708 | 0.34 |
| Crematorium | Buildings & Estate | Scope 1 | Gas | Gas | Natural Gas/kWh | kWh | 895480 | 0.184 | 164.63 |
| Crematorium | Buildings & Estate | Scope 3 | Gas | Gas - WTT | Natural Gas/kWh | kWh | 895480 | 0.024 | 21.41 |
| Crematorium | Transport | Scope 1 | Owned Vehicles | Diesel - Small, Cars & Car Derived Vans | Diesel/Litres | litres | 155.26 | 2.594 | 0.40 |
| Crematorium | Transport | Scope 1 | Owned Vehicles | Diesel - Medium | Diesel/Litres | litres | 9540.43 | 2.594 | 24.75 |
| Crematorium | Transport | Scope 1 | Owned Vehicles | All Diesel - WTT | Diesel/Litres | litres | 9695.69 | 0.617 | 5.98 |
| Crematorium | Buildings & Estate | Scope 2 | Electricity | Electricity | Electricity/Generation/kWh | kWh | 94,593.00 | 0.256 | 24.18 |
| Crematorium | Buildings & Estate | Scope 2 | Electricity | Electricity T&D | Electricity/Generation/kWh | kWh | 94,593.00 | 0.022 | 2.05 |
| Crematorium | Buildings & Estate | Scope 3 | Waste | Waste | Mixed waste | tCO2e | 0.0125 | 1.000 | 0.01 |
| Crematorium | Buildings & Estate | Scope 3 | Water | Water Supply | Water Supply/cbm | cbm | 1,349.00 | 0.344 | 0.46 |
| Crematorium | Buildings & Estate | Scope 3 | Water | Water Sewerage | Water Treatment/cbm | cbm | 1,079.20 | 0.708 | 0.76 |
| Civica | Buildings & Estate | Scope 3 | Gas | Gas | Natural Gas/kWh | kWh | 26,220.00 | 0.184 | 4.82 |
| Civica | Buildings & Estate | Scope 3 | Gas | Gas - WTT | Natural Gas/kWh | kWh | 26,220.00 | 0.024 | 0.63 |
| Civica | Buildings & Estate | Scope 3 | Electricity | Electricity | Electricity/Generation/kWh | kWh | 26,881.67 | 0.256 | 6.87 |
| Civica | Buildings & Estate | Scope 3 | Electricity | Electricity - T&D | Electricity/Generation/kWh | kWh | 26,881.67 | 0.022 | 0.58 |
| Civica | Buildings & Estate | Scope 3 | Water | Water Supply | Water Supply/cbm | cbm | 341.00 | 0.344 | 0.12 |
| Civica | Buildings & Estate | Scope 3 | Water | Water Sewerage | Water Treatment/cbm | cbm | 323.50 | 0.708 | 0.23 |

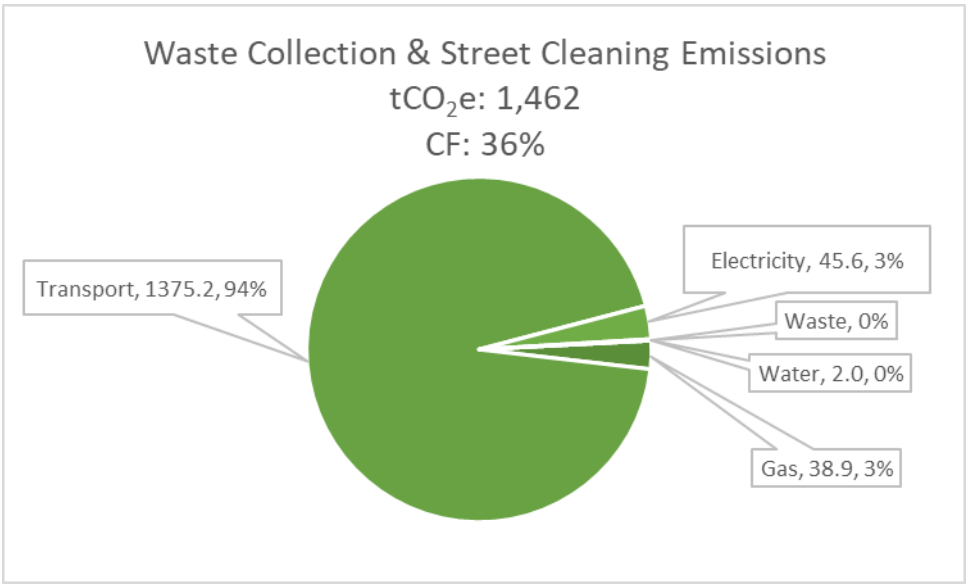
| Operation | Sector | Scope | Emissions Category | Individual Emissions Source | Fuel Type & Units | Units | 2019-2020 | 2019 Emissions Factor | 2,019 $tCO_2e$ |
|---|---|---|---|---|---|---|---|---|---|
| Port & Harbour | Buildings & Estate | Scope 1 | Gas | Gas | Natural Gas/kWh | kWh | 269,585.00 | 0.184 | 49.56 |
| Port & Harbour | Buildings & Estate | Scope 3 | Gas | Gas | Natural Gas/kWh | kWh | 269,585.00 | 0.024 | 6.45 |
| Port & Harbour | Transport | Scope 1 | Owned Vehicles | Diesel - Small, Cars & Car Derived Vans | Diesel/Litres | litres | 1,185.40 | 2.594 | 3.08 |
| Port & Harbour | Transport | Scope 1 | Owned Vehicles | Diesel - Medium | Diesel/Litres | litres | 0.00 | 2.594 | 0.00 |
| Port & Harbour | Transport | Scope 3 | Owned Vehicles | All Diesel - WTT | Diesel/Litres | litres | 1,185.40 | 0.617 | 0.73 |
| Port & Harbour | Buildings & Estate | Scope 2 | Electricity | Electricity | Electricity/Generation/kWh | kWh | 1,028,320.49 | 0.256 | 262.84 |
| Port & Harbour | Buildings & Estate | Scope 3 | Electricity | Electricity - T&D | Electricity/Generation/kWh | kWh | 1,028,320.49 | 0.022 | 22.31 |
| Port & Harbour | Buildings & Estate | Scope 3 | Water | Water Supply | Water Supply/cbm | cbm | 39,102.00 | 0.344 | 13.45 |
| Port & Harbour | Buildings & Estate | Scope 3 | Water | Water Sewerage | Water Treatment/cbm | cbm | 8,969.27 | 0.708 | 6.35 |
| Your Leisure | Buildings | Scope 3 | Gas | Gas | Natural Gas/kWh | kWh | 3612421 | 0.184 | 664.14 |
| Your Leisure | Buildings | Scope 3 | Gas | Gas - WTT | Natural Gas/kWh | kWh | 3612421 | 0.024 | 86.37 |
| Your Leisure | Buildings | Scope 3 | Electricity | Electricity | Electricity/Generation/kWh | kWh | 1359976 | 0.256 | 347.61 |
| Your Leisure | Buildings | Scope 3 | Electricity | Electricity - T&D | Electricity/Generation/kWh | kWh | 1359976 | 0.022 | 29.51 |
| Your Leisure | Buildings | Scope 3 | Water | Water Supply | Water Supply/cbm | cbm | 21163 | 0.344 | 7.28 |
| Your Leisure | Buildings | Scope 3 | Water | Water Sewerage | Water Treatment/cbm | cbm | 20,104.85 | 0.708 | 14.23 |
| Your Leisure | Buildings | Scope 3 | Waste | All Waste | | t | 1.16 | 1.000 | 1.16 |
| Mears | Transport | Scope 3 | External Organisation Fuel | Diesel | Diesel/miles | miles | 0.00 | 0.241 | 0.00 |
| Mears | Transport | Scope 3 | External Organisation Fuel | Diesel - WTT | Diesel/miles | miles | 0.00 | 0.057 | 0.00 |
| Mears | Buildings | Scope 3 | Electricity | Electricity | Electricity/Generation/kWh | kWh | 0 | 0.256 | 0.00 |
| Mears | Buildings | Scope 3 | Electricity | Electricity - T&D | Electricity/Generation/kWh | kWh | 0 | 0.022 | 0.00 |
| Mears | Buildings | Scope 3 | Waste | Waste DMR | | tCO2e | 0 | 1.000 | 0.00 |
| Kent Innovation Centre | Buildings | Scope 3 | Gas | Gas | Natural Gas/kWh | kWh | 381,524.00 | 0.184 | 70.14 |
| Kent Innovation Centre | Buildings | Scope 3 | Gas | Gas - WTT | Natural Gas/kWh | kWh | 381,524.00 | 0.024 | 9.12 |
| Kent Innovation Centre | Buildings | Scope 3 | Electricity | Electricity | Electricity/Generation/kWh | kWh | 160000 | 0.256 | 40.90 |
| Kent Innovation Centre | Buildings | Scope 3 | Electricity | Electricity - T&D | Electricity/Generation/kWh | kWh | 160000 | 0.022 | 3.47 |
| Kent Innovation Centre | Buildings | Scope 3 | Water | Water Supply | Water Supply/cbm | cbm | 1711.00 | 0.344 | 0.59 |
| Kent Innovation Centre | Buildings | Scope 3 | Water | Water Sewerage | Water Treatment/cbm | cbm | 1625.45 | 0.708 | 1.15 |

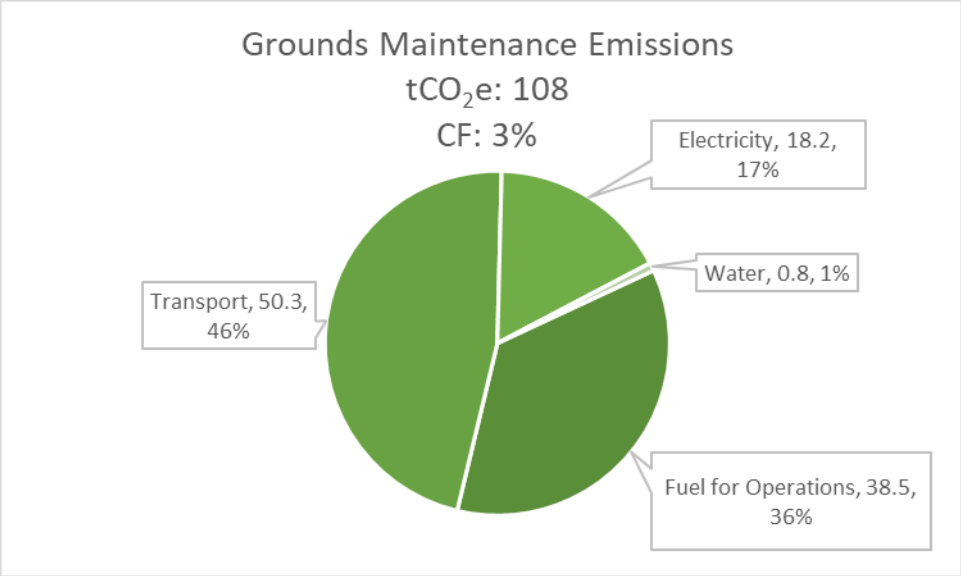
# Appendix 5 – Carbon Footprint Data QA

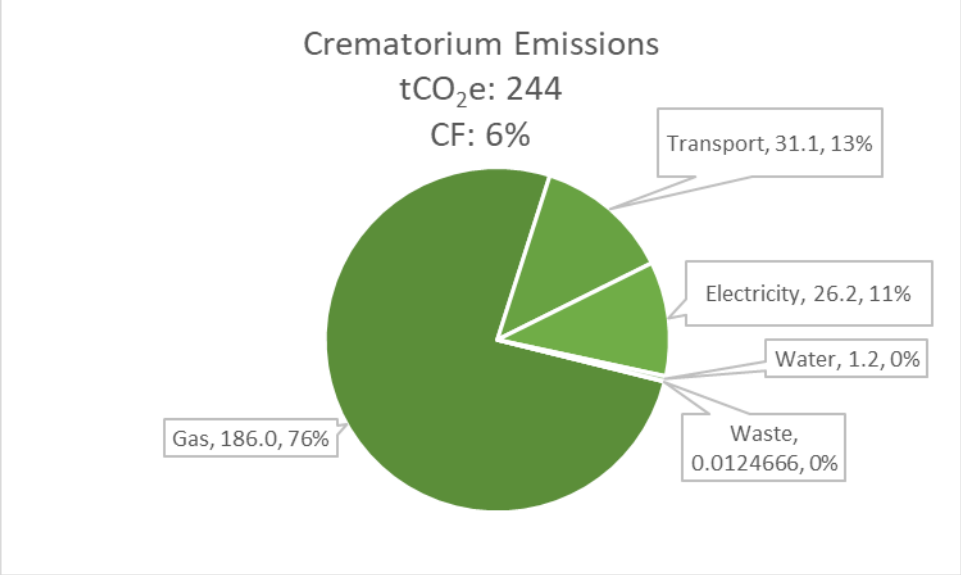
| Name | | | | | | | Thanet District Council | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Period Covered | | | | | | | FY 19-20 | | | | | | | | | | | | | | | |
| Organisational Boundary | | | | | | | Own Building and Estate | | | | | | Leisure Centres | | | | | | KIC | | | |
| | | | | | | | Operational Boundary | | | | | | | | | | | | | | | |
| Scope | Emissions Source | Source | Fuel Type | Additional Information | Units (kWh, l, etc.) | Emissions Factor | Σ Units | tCO2e | % | Quality | Significance | Impact | Σ Units | tCO2e | % | Quality | Significance | Impact | Σ Units | tCO2e | % | Quality | Significance | Impact |
| 1 Direct Emissions | Gas | | Natural Gas | Own Buildings & Estate covers: core estate, grounds maintenance, waste collection, crematorium, port & harbours, Civica, EKS | kWh | 0.20800 | 1910203 | 397.322 | 0.097994443 | 1 | 3 | 3 | 3612421 | 751.384 | 0.185319143 | 1 | 4 | 4 | 381524 | 79.357 | 0.019572387 | 1 | 2 | 2 |
| | Other | Fuel for equipment | Diesel | | litres | 3.211 | 12000 | 38.532 | 0.0095 | 5 | 1 | 5 | | | | | | | | | | | | |
| | Owned Vehicles (non EV) | | | Own Buildings & Estate covers: core estate, grounds maintenance, waste collection, crematorium, port & harbour | litres | 3.211 | 474123.54 | 1522.41 | 0.375483116 | 1 | 5 | 5 | | | | | | | | | | | | |
| 2 Energy Indirect Emissions | Electricity | Electricity Building Use | Electricity | Own Buildings & Estate covers: core estate, grounds maintenance, waste collection, crematorium, port & harbours, Civica, EKS | kWh | 0.277 | 2469212 | 683.972 | 0.168692874 | 1 | 4 | 4 | 1359976 | 376.713 | 0.092911528 | 1 | 3 | 3 | 160000 | 44.32 | 0.010930961 | 3 | 2 | 6 |
| | | Electricity | Electricity | | kWh | 0.277 | 125460 | 34.7524 | 0.00857124 | 1 | 1 | 1 | | | | | | | | | | | | |
| | | Electricity UMS | Electricity | | kWh | 0.277 | 62664 | 17.3579 | 0.004281111 | 1 | 1 | 1 | | | | | | | | | | | | |
| 3 Other Indirect Emissions | Grey Fleet | Passenger / | | | tonnes | 1 | 31.33 | 31.33 | 0.007727144 | 1 | 1 | 1 | | | | | | | | | | | | |
| | Own Waste | Waste | All waste | | tCO2e | 1 | 0.02836 | 2.8E-05 | 6.99463E-09 | 5 | 1 | 5 | 1.15567 | 1.15567 | 0.000285032 | 1 | 1 | 1 | | | | | | |
| | Water | Supply | Water Supply | Own Buildings & Estate covers: core estate, grounds maintenance, waste collection, crematorium, port & harbours, Civica, EKS | cbm | 0.344 | 80495 | 27.6903 | 0.006829453 | 1 | 1 | 1 | 21163 | 7.28007 | 0.001795537 | 1 | 1 | 1 | 1711 | 0.58858 | 0.000145167 | 1 | 1 | 1 |
| | | Sewerage | Water Treatment | | cbm | 0.708 | 35294.73 | 24.9887 | 0.006163135 | 1 | 1 | 1 | 20104 | 14.2336 | 0.003510543 | 3 | 1 | 3 | 1625 | 1.1505 | 0.000283756 | 1 | 1 | 1 |

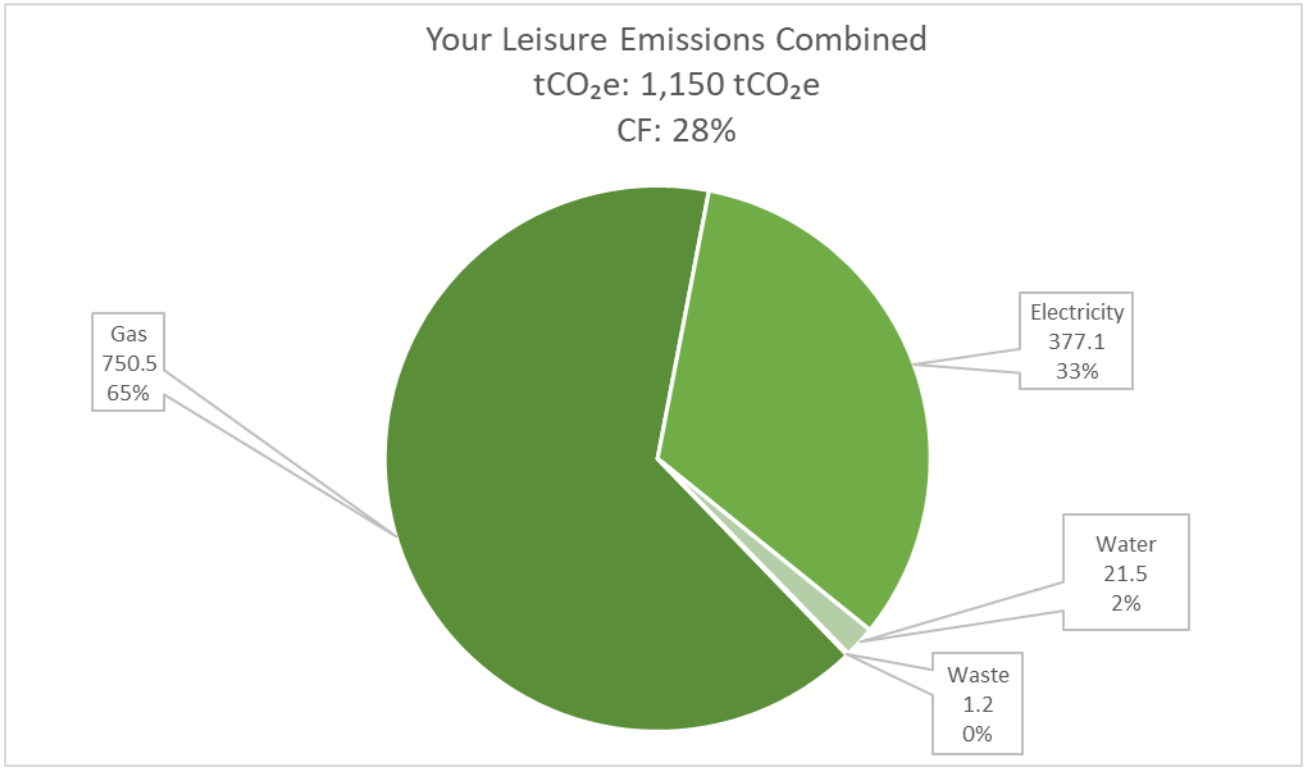
# Appendix 6 – Footprints – Area Breakdown

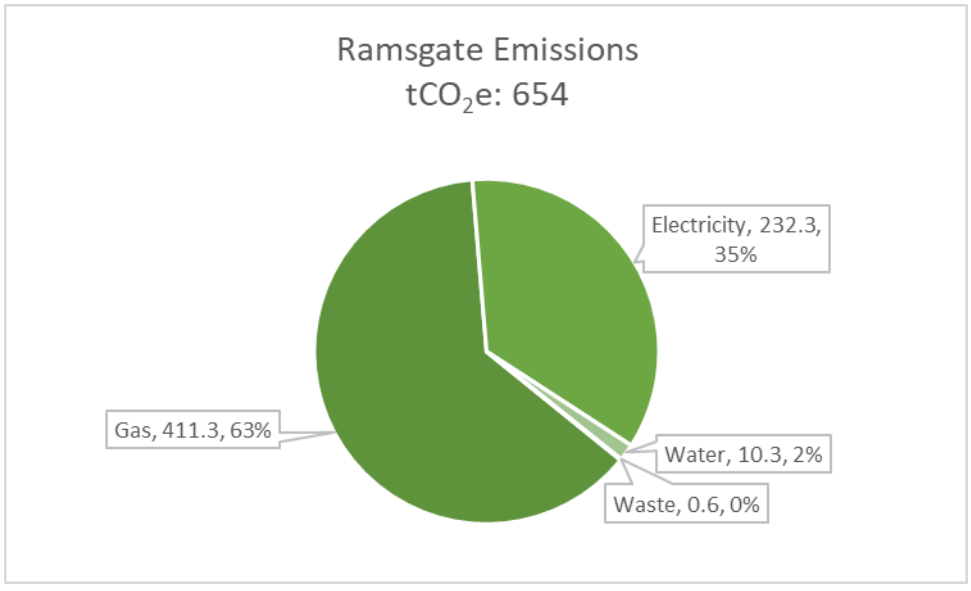


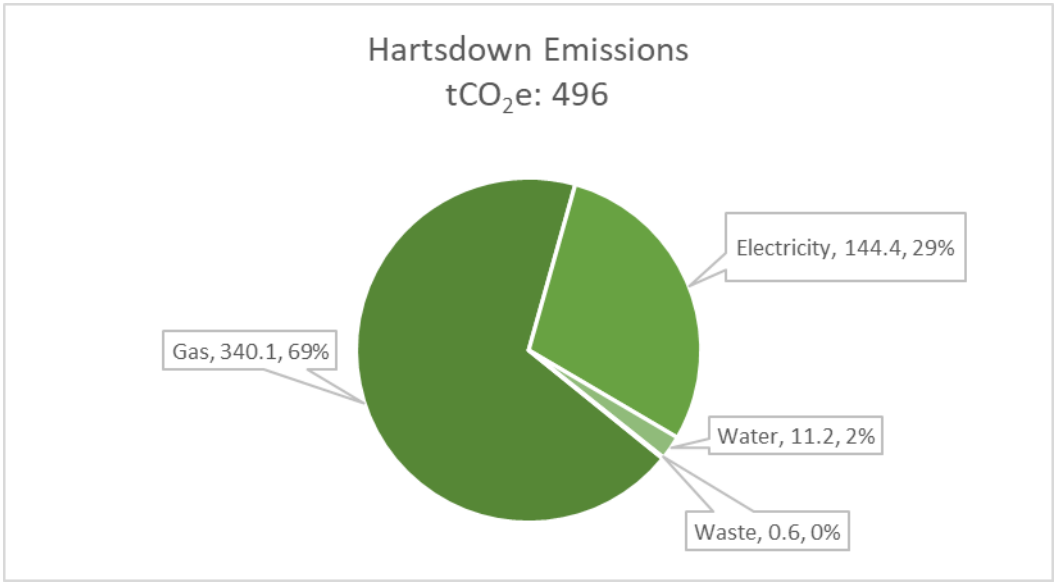




Grounds Maintenance Emissions
tCO2e: 108
CF: 3%
Electricity, 18.2, 17%
Water, 0.8, 1%
Transport, 50.3, 46%
Fuel for Operations, 38.5, 36%

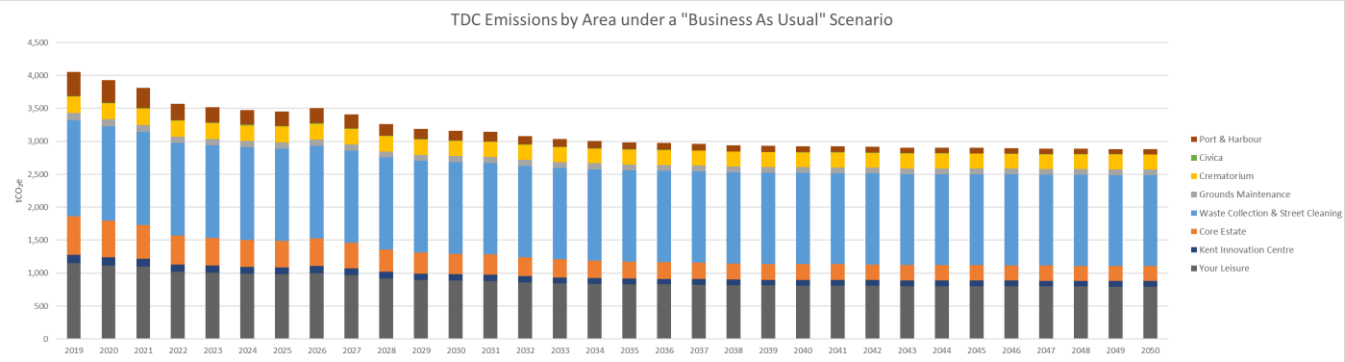

Crematorium Emissions
tCO2e: 244
CF: 6%
Transport, 31.1, 13%
Electricity, 26.2, 11%
Water, 1.2, 0%
Waste, 0.0124666, 0%
Gas, 186.0, 76%

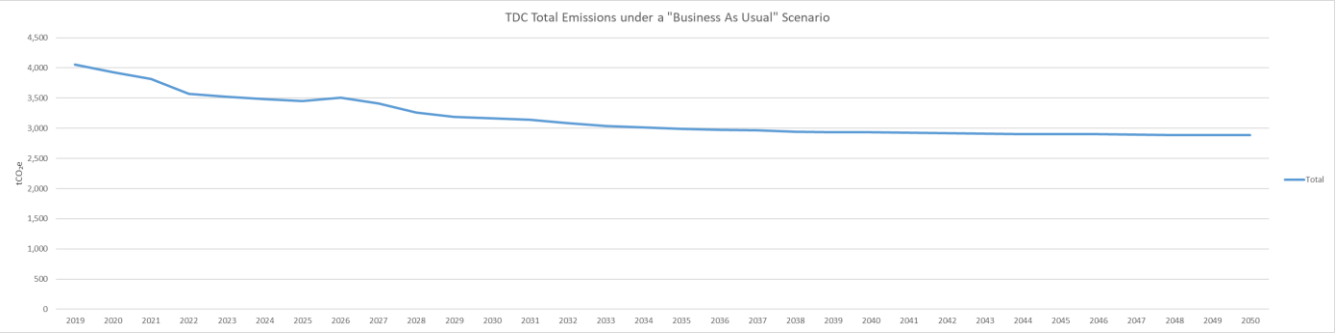

Your Leisure Emissions Combined
tCO2e: 1,150 tCO2e
CF: 28%
Gas
750.5
65%
Electricity
377.1
33%
Water
21.5
2%
Waste
1.2
0%


Ramsgate Emissions
tCO2e: 654
Electricity, 232.3,
35%
Gas, 411.3, 63%
Water, 10.3, 2%
Waste, 0.6, 0%


Hartsdown Emissions
tCO2e: 496
Electricity, 144.4, 29%
Gas, 340.1, 69%
Water, 11.2, 2%
Waste, 0.6, 0%

# Appendix 7 – BAU Forecasts



# Appendix 8 – Zero Carbon Green Electricity Supply Options

LASER's support is not confined to these 3 options, and we are in a position to assist with investigating investment in renewable assets through other models, for example directly or through other PPA structures.

It is important to note that some certainty around long term energy requirements is vital when planning in this area.

| Important factors to consider to your organisation | OPTION 1 Green Tariff | OPTION 2 Green Basket | OPTION 3 PEPPPA |
|---|---|---|---|
| Volume Commitment | Annual | 2-4 years | 10< years |
| REGOs | Yes | Yes | Yes |
| Direct Funding of Renewables | Minimal | Yes | Yes |
| Traceability | No | Yes | Yes |
| Additionality | No | Unlikely | Yes |
| Lead time to delivery | Within a year | Within a year | Up to 36 months |
| Ease of Procurement | Very High | Very High | High |

**REGOs (Renewable Electricity Guarantee of Origin)**

REGO certificates are the most widely recognised certification of environmental credentials for energy generation across Europe. They are well administered and the provision of a REGO with each MWh of electricity should guarantee that the energy was

generated from “renewable” sources. The largest problem with REGOs from a zero-carbon perspective is that their definition of “renewable” is not confined to zero carbon technologies but can also include technologies such as gas-fired CHP generation. There is also the possibility of ‘greenwashing’, as suppliers can buy REGO certificates on the open market without having purchased any power from renewable generators. In August 2021, there was a press release from the government to review electricity green tariffs to address concerns regarding this practice.**

As a consumer, generation cannot necessarily be traced back to a specific asset so it can be unclear as to whether the electricity is zero carbon or not. REGO backed supply can be reported as zero emissions but the validity of this is open to debate.

Therefore, REGO backed supplies are definitely “greener” than grid average electricity supplies, but generation cannot be traced to a specific asset, and they are not categorically zero carbon

**Traceability**

As touched on above, it is considered important in environmental fields to be able to trace generation to particular assets to provide assurance of renewable origin and add credibility.

**Additionality**

Additionality is a term that has arisen in recent years and has come to define a very important factor when considering investment in renewable assets or supply contracts - namely that the investment has a genuine impact which would not have been realised otherwise. In this case, ‘additionality’ can be seen as the investment resulting in the construction of a new generation asset - such as a solar array or wind farm - rather than the consumer receiving energy from an existing renewable asset which would be generating regardless of the consumer’s investment.

** Government to tighten rules to stop 'greenwashing' of electricity tariffs - GOV.UK (www.gov.uk)

**Power Purchase Agreements (PPAs)**

PPAs are essentially contractual agreements between off takers (consumers) and suppliers or generators, where an agreement is made to buy and sell an amount of energy generated from a renewable asset for a set term - usually between 10 and 20 years. These agreements allow generators to invest in assets with certainty and guarantees long term green energy supply to the consumer.

Due to the nature of PPAs they tend to be long-term, large volume contracts which can preclude some consumers from entering the market. In order to provide a solution, LASER has created a model where multiple public sector bodies are aggregated in order to increase buying power and are calling this the Public Energy Partnership Power Purchase Agreement (PEPPPA).

To find out more about **LASER's Zero Carbon Future** please contact us or visit **www.laserenergy.org.uk**

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