cenex

Environmental Report

Financial Year 2016/17

Report Date: September 2017

About Cenex

Cenex are an independent, not-for-profit consultancy, specialising in helping organisations to assess and implement low emission vehicle strategies and the supporting infrastructure. Cenex was established in 2005 with support from the Automotive Unit of the Department of Trade and Industry (now the Department of Business Innovation and Skills) and is based in Loughborough, with operational reach in Europe, Japan and the USA. Since its formation, Cenex has grown considerably and has now split into 3 departments: Transport, Energy Systems and Innovation Support. Cenex is known for its research into the market dynamics for low carbon transport as well as its analysis of real-world operation and user behaviour. Cenex annually organises “LCV”, the largest low carbon vehicle event in the UK.

Cenex also set up, and provides the secretariat for, The UK Electric Vehicle Supply Equipment (UK EVSE) Association and currently chairs the organisation. Cenex is a board member of the Advanced Propulsion Centre, the Automotive Council, the European Union’s Climate Knowledge and Innovation Community West Midlands Region, and the Drive Midlands Automotive Programme.

Ryan Johnson
Marketing and Business Support Officer
Innovation Support Team
ryan.johnson@cenex.co.uk

Company Details

Cenex
Advanced Technology Innovation Centre
5 Oakwood Drive
Loughborough
Leicestershire
LE11 3QF
Registered in England No. 5371158
VAT Registration No: 933 5969 83

Tel: 01509 635 750
Fax: 01509 635 751

Email: info@cenex.co.uk

Document Revisions

No.	*Details*	*Date*
1	Original Document	20.06.2017
2	Approved Version	04.10.2017

Prepared by:

Contents

1 Introduction

1.1 Rational

The rational of creating this environmental report is to demonstrate good practice and transparency as a non-profit organisation by revealing the extent of our environmental impact. By producing an annual environmental report Cenex hopes to identify areas for improvement and act upon them. The report shall cover the main impacts we have, how we are managing them, areas for improvement and suggestions on how to improve. As our first environmental report, this document will serve as a baseline for the future and should be referred to in subsequent reports.

1.2 Interpretation

Throughout the report, reference will be made to “activities”, “aspects” and “impacts”. To avoid confusion, it is best to define the terminology so this report is interpreted correctly.

- Activities – This is a task or action that the organisation does as part of their operations.
- Aspects – Aspects are the elements of an organisation’s activities that interact with the environment in either a positive or negative way.
- Impacts – Impacts are the resulting changes to the environment brought about from the aspects of the activity.

For example, if an activity of an organisation is to travel to a client, an aspect of this would be the release of emissions into the atmosphere and an impact would be the degradation of air quality.

This report will measure harmful emissions in carbon dioxide equivalent (CO_2e). CO_2e is a standard unit for measuring carbon footprints and is necessary as some emissions are more harmful than others. By converting all emissions to CO_2e the figures are comparable and give a more accurate representation of their harmfulness.

1.2.1 Boundaries

The report will assess the environmental performance of Cenex over the financial year of 2016/17 (April-March).

This report will focus solely on our building operations and the services we are providing and will exclude our LCV event which has a separate environmental analysis. The report will also be used to assess whether we are conforming to the objectives set out in our sustainability statement found in the appendices.

2 Summary of Activities

Over the course of the year, Cenex employed an average of 16 staff, 15 of which are based at our head office in Loughborough and one member of staff based from home in Redhill.

Cenex leases office space within the Advanced Technology Innovation Centre in Loughborough University's Holywell Park complex.

Due to the industry in which we operate, we often commute to meet clients and suppliers. These commutes are regular and include both short distance as well as long distance journeys which are predominantly made by car, aeroplane or train. Cenex has two pool cars, a Toyota Auris (Hybrid) and a Nissan Leaf (Battery Electric Vehicle) which are used for general business commutes. Additionally, four members of staff each have their own company car, these include; a Volkswagen Golf GTE (Plug-in Hybrid), a BMW i3 (Range Extended Electric Vehicle) and two Mitsubishi Outlanders (Plug-in Hybrid). Within Cenex, we have identified five activities that ultimately negatively impact the environment, these are: business travel, commuting to work, electricity used in the office, gas used in the office and finally, office waste.

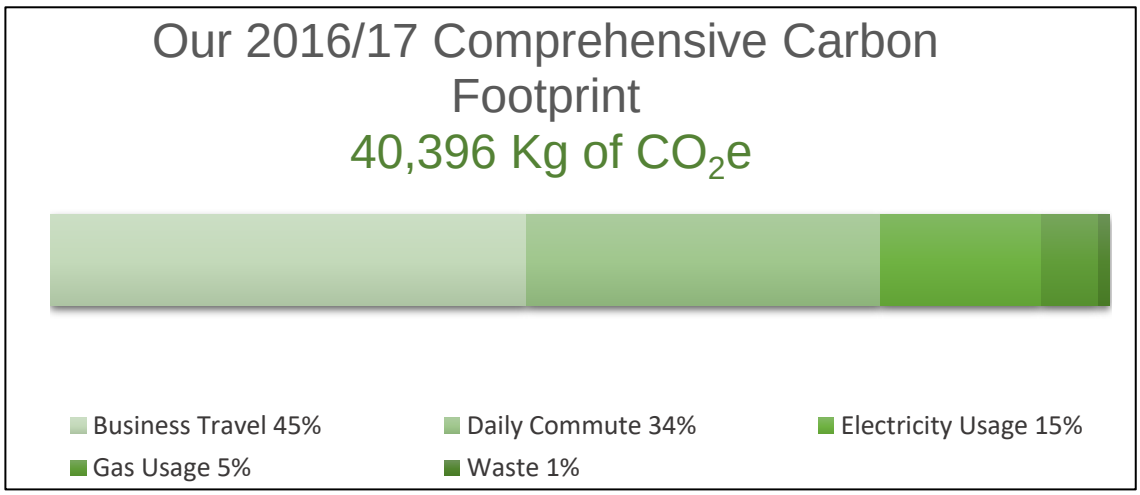


Figure 1: Cenex CO_2e Output Breakdown (Source: Employee travel data and data provided by ATIC building manager. DEFRA 2016 GHG conversion factors)

3 Analysis of Activities

This section of the report will investigate the activities undertaken by Cenex and calculate relative impact of that activity with regards to CO2e and equate it to the impact of a familiar activity.

Figure 2 shows the average carbon footprint of a Cenex employee, average CO_2e per employee has been used as a key figure as it can be compared to a smaller or larger organisation accurately. This figure will also serve as a baseline for future reports as the organisation grows.

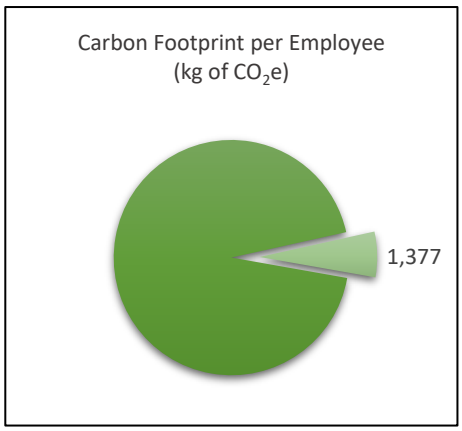


Figure 2: CO_2e Output per Employee (Source: Primary Data, DEFRA 2016 figures used for conversions. Average of 16 members of staff)

3.1 Building Activities

The Advanced Technology Innovation Centre is an ISO14001 accredited building meaning that we operate an environmental management system across the whole building, covering waste collection, recycling, water and electricity usage. By monitoring waste and consumption data, we hope to accurately report our environmental impact and improve year on year. The building has office space totalling 2,064m^2, however, only 1,785m^2 of this was utilised over period monitored, with Cenex occupying 92m^2. For the purpose of this report, Cenex's relative consumption will be calculated by proportioning it to the total utilised area in the building. Unoccupied space is assumed to have zero consumption.

3.1.1 Electricity

As shown in table 1, the Cenex annual electricity consumption is 12,781kWh. This is below the average for a business of this size which is projected by "uSwitch" to be in excess of 15,000 kWh. Electricity usage has been kept to a minimum through the use of natural light where possible, low energy bulbs where artificial lighting is necessary and the addition of a solar panel system on the roof. The 13kW solar panel system produces over 10,000 kWh of clean, renewable electricity every year (not included in the table in figure 3 & 5). This clean electricity is used to offset the electricity supplied by the national grid, which is usually around 35%.

Month	**kWh**	**£**	**Month**	**kWh**	**£**
April	17,131	-£462	October	21,389	£2,354
May	16,751	£1,786	November	23,471	£2,511
June	19,772	£2,015	December	22,548	£2,465
July	19,856	£2,073	January	24,175	£2,600
August	19,856	£2,061	February	21,032	£2,244
September	19,699	£2,084	March	22,290	£2,848
			Total	**247,970**	**£24,579**

Table 1: Electricity Consumption (Source: Consumption and costs monitored and provided by building manager)

As a result, the total CO_2e emitted as a biproduct of electricity consumption is 118,901.62 Kg for the whole building, with Cenex's relative usage being 6,128.20 Kg. A summary of our electricity usage can be seen in table 2 below.

	Total Building	Cenex
Consumed from grid	247,970 kWh	12,781 kWh
Solar	10,100 kWh	521 kWh
Total CO^2e	118,901.62 Kg	6,128.20 Kg

Table 2: Electricity consumption summary (Source: CO_2e calculated using DEFRA 2016 conversion factors. Electricity generation mix from grid assumed at national average)

3.1.2 Waste

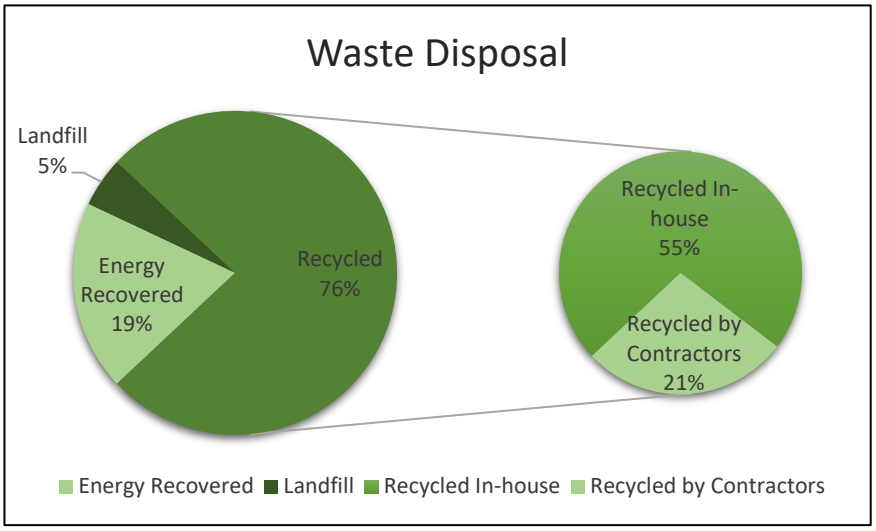


Figure 3: Building Waste by Category (Source: Data monitored and provided by building manager)

55% of the waste generated day to day is separated in-house into recycling and general waste bins. Of the remaining 45%, 21% is separated externally by contractors to be recycled, 19% goes through energy recovery processes resulting in only 5% of the building's 10.89 tonnes of waste ending up in landfill. In summary, 95% of waste generated at Cenex is recycled or used to generate electricity.

The Cenex share of this waste can be seen in Table 3. Using DEFRA 2016 GHG conversion factors, the relative carbon footprint of this waste has been calculated as follows; 421Kg of CO_2e emitted per tonne of municipal (general) waste disposed in landfill equating to 235.76Kg of CO^2e being released into the environment as a direct result of Cenex's landfill waste. Furthermore, an additional 21kg of CO_2e is produced per tonne of recycled and incinerated waste equating to 217.32Kg of CO_2e released as a byproduct of Cenex's recycled waste. Therefore, 427.82Kg of CO_2e was released into the atmosphere as a direct result of Cenex' waste disposal.

	Building	Cenex
Total Waste	10,890Kg	560Kg
Recycled	5,990Kg	310Kg
Landfill	540Kg	28Kg
CO^2e	4,445.23 Kg	427.82 Kg

Table 3: Building waste breakdown (Source: Data monitored and provided by building manager, CO_2e output calculated using DEFRA 2016 conversion factors.)

By recycling 76% of waste, Cenex is able to dramatically reduce the CO_2e output associated with waste. By minimising the amount of waste sent to landfill (5%), Cenex has managed to keep its waste emissions to a minimum. Additionally, as per our Sustainability Statement (found in Appendix A), our I.T department have changed the default settings on Cenex machines to print in black and white and double sided to reduce paper wastage. This makes up part of Cenex' 'think before you a print' policy which aims to eliminate unnecessary usage.

3.1.3 Gas

The total gas consumption for the ATIC building was 182,227kWh. The natural gas used by Cenex is controlled by the building manager and is only used for the boilers and central heating. Due to its purpose, the gas usage in the building fluctuates dramatically (see figure 4) as the weather changes with peak usage (28,691kWh) being in the coldest period and lowest usage being (4,408kWh) in the summertime. This extreme fluctuation shows why much emphasis is placed on insulation as even a modern building such as ours uses 6.5 times more gas in the winter than the summer.

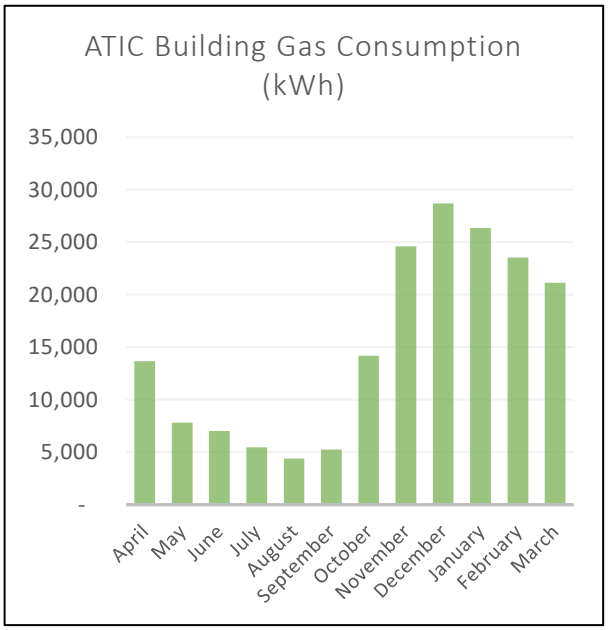


Figure 4: Building gas consumption by month (Source: Data monitored and provided by building manager)

Of the total 182,227kWh of gas expended, Cenex is responsible for 9,392kWh. To make this number relatable, according to OVO Energy, this is approximately the same usage as the average UK "small house/flat" shared by 2-4 people. The building minimises its gas consumption by utilising high quality insulative materials and eco-friendly boilers.

The relative CO_2e output of this usage is 42,320kg of CO_2e of which Cenex is responsible for 2,181kg as outlined in the table below.

	Building	Cenex
Total Consumption	182,227 kWh	9,391.98 kWh
Total CO2e	42,320.02 Kg	2,181.20 Kg

Table 4: Gas Consumption Breakdown (Source: Data monitored and provided by building manager)

3.1.4 Daily Commute

Figure 6 shows the total distance covered by each method of transport as well as its relative CO_2e output. The graph only represents one leg of the journey meaning that each day over 325 kilometres are covered by Cenex staff purely by traveling to and from the office. As a direct consequence, almost 60kg of CO_2e is released into the atmosphere each day.

It is worth noting that the graph shows the scope 3 ('well to wheel') emissions meaning that it considers the emissions produced as a bi-product of sourcing the fuel. For this reason, vehicles using electricity as a fuel still have a carbon footprint due to the way in which the electricity from the grid is generated – mostly nuclear, gas and some renewables.

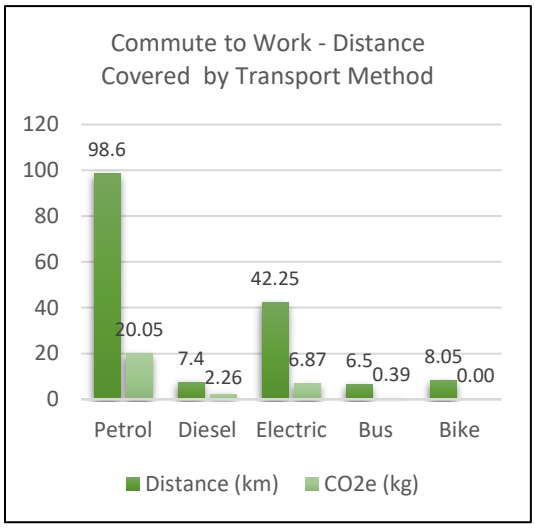


Figure 6: Distance by Transport Method - Commute to Work (Source: Primary data provided by employees)

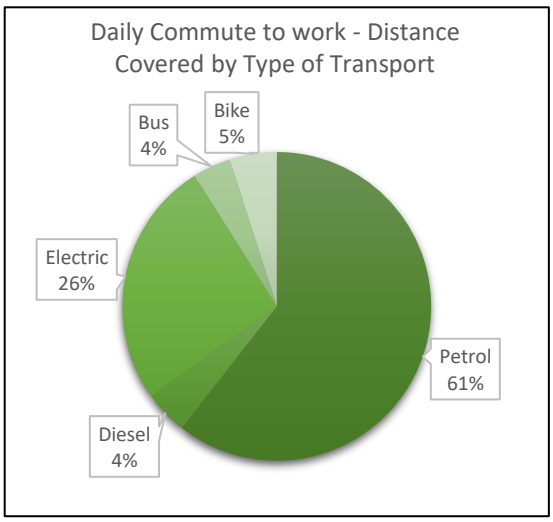


Figure 5: Commute to Work - Distance by Transport Method (Source: Primary data provided by employees. Distance is one way only)

As seen in figure 5, the majority of travel is made in petrol fuelled vehicles (61%) followed by electric vehicles (26%), Cycling (5%), Diesel vehicles (4%) and Buses (4%). As previously stated, public transport around this area is fairly limited in that there are only two bus routes that operate in the area therefore a high amount of commuting by car is to be expected.

The cleanest method of transport is of course cycling and walking which emit no significant harmful substances. Cenex actively offers all permanent staff the “Cycle to Work” scheme in an attempt to encourage cleaner transport and even offers showering facilities in the building to make cycling a comfortable option.

3.2 General business travel

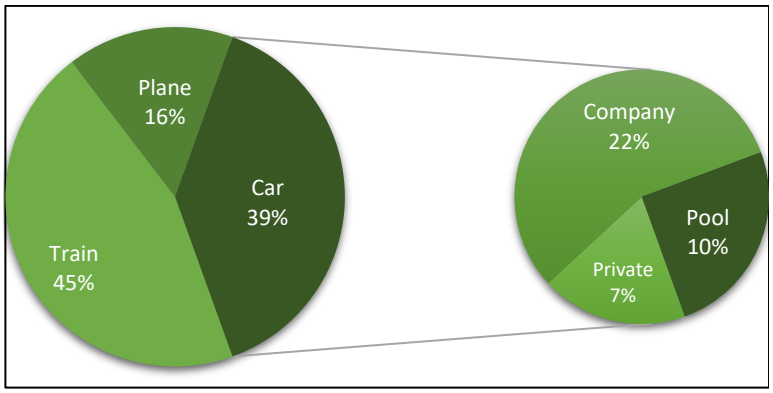
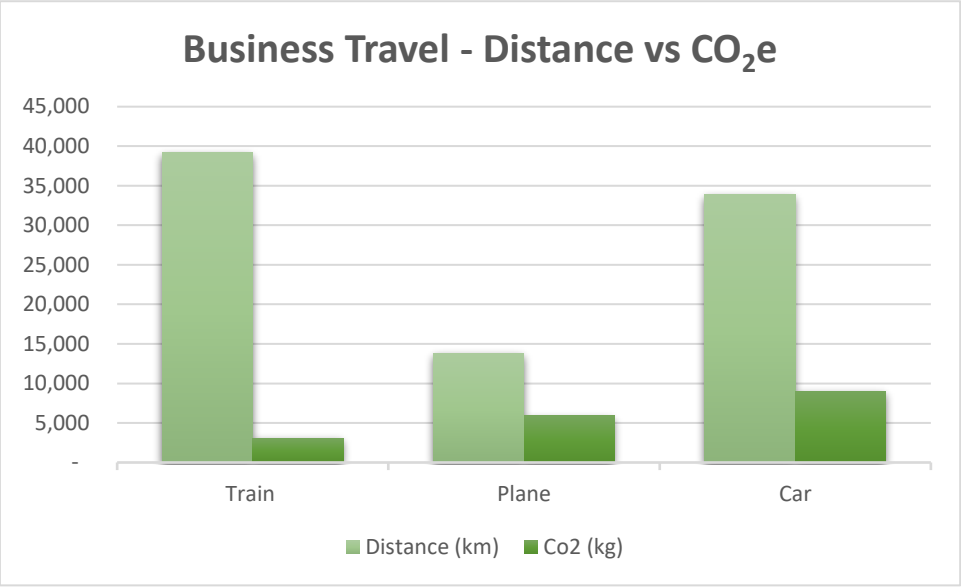


Figure 7: Business Travel by Category (Source: Data provided by employees and travel data from expenses).

For the purpose of this report, all work-related travel undertaken by Cenex staff has been categorised as “general business travel”. This could be travel for; client meetings, conferences, training or events etc. Figure 7 illustrates the breakdown of general business travel by categorising trips into different transport methods. The most common method of business travel was by train (45%) followed by car (39%) then finally by plane (16%). Where possible, staff with a company car tend to use their own vehicle to commute for work purposes with the remaining members of staff opting to take the train over long distances and one of our pool cars over short distances.



The ‘Car’ category has been further broken down as the relative emissions the three subcategories greatly differ. All of Cenex’s company cars are either PHEVs or REEVs meaning that they have a lower carbon footprint when used appropriately. This is important in assessing whether the impact of business travel can be decreased through policy change.

Figure 8 compares the amount of CO_2e produced per kilometre by Train, Plane and Car. These figures were calculated using Cenex actual travel data and are specific to our travel patterns therefore may not reflect general emission figures.

4 Summary

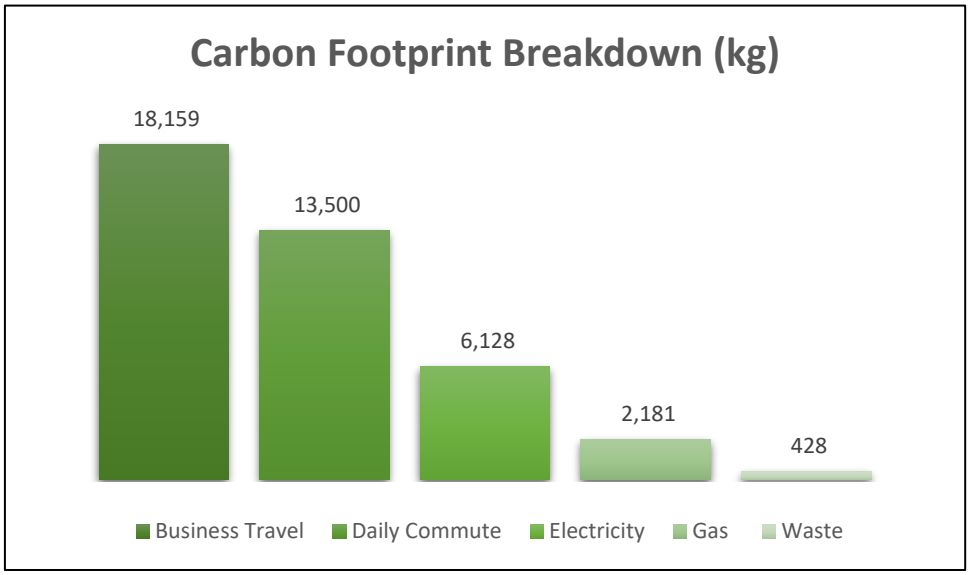


Figure 8: Carbon Footprint by Category (Source: Employee travel data and data provided by ATIC building manager. DEFRA 2016 GHG conversion factors)

Above is a comprehensive summary of Cenex's CO_2e output for the year (in kg). The graph highlights areas where the business has performed well such as waste and gas. The graph also shows the areas of higher negative impact such as general business travel and the daily commute to work. These two are the areas that have the highest potential for improvement and therefore should be made the priority when considering areas of improvement.

4.1 Areas of improvement

4.1.1 General Business Travel

General business travel is accountable for over 45% of Cenex total CO_2e output making it the least sustainable element of the business and the area with the greatest potential for improvement. At the current rate, it would require 835 mature trees to offset the 18,159 Kg of CO_2e produced by Cenex through general business travel alone. Possible ways of improving our performance in this area include;

- **Taking the train instead of car or aeroplane where appropriate** – Figure 9 shows the carbon footprint comparison per mile of traveling by train car and aeroplane, the train has been by far the most efficient means of travel producing 3 times less CO_2e than traveling by car and over 5 times less CO_2e than the same distance by plane.

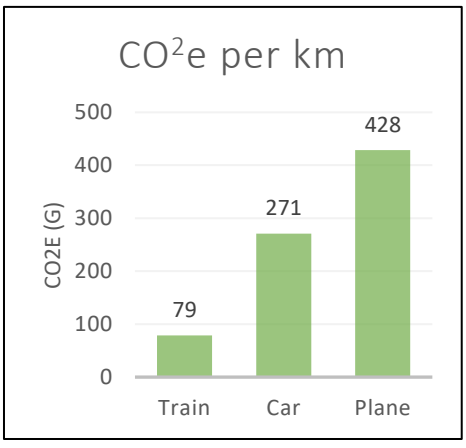


Figure 9: CO_2e per km by Transport Method (Source: Figures are calculated based on Cenex' specific travel data. DEFRA 2016 conversion factors used for calculations)

- **Use the Nissan Leaf instead of Auris where possible** - The Leaf is a fully electric vehicle with a real-world all-electric range of approximately 85 miles (136km) tested using our telemetry devices. The Auris on the other hand is a hybrid which mainly uses the petrol engine with the occasional help of an electric motor. Journeys that can be made in under 85 miles should always be made using the Leaf, longer distance commutes need more consideration and may need to be made in the Auris due to range restriction, however, the Leaf should still be considered.
- **Assess the best travel option, not just the easiest** – On many occasions, staff took a flight to areas that were just as accessible by train or car. Figure 9 in the previous section shows that, on average, traveling by plane produces over 5 times more CO_2e per km. Although, for some short haul and domestic (UK to UK) journeys this figure is much higher. Table 5 shows the environmental benefits of traveling by train to five destinations that were all made by Cenex staff within the period examined. However, looking at tables 6&7 you can see that the most environmentally friendly option is not always the fastest or most economical option. Before traveling, it is important to consider all three tables (5,6&7) to fully understand which the best option is. Note that the total travel time in Table 7 includes travelling to the nearest airport, allowing 3 hours for check-in and boarding, and travelling from the airport to the city centre.

Emissions (Kg of CO2e One way)				
Destination	*Plane*	*Train*	*Differrence*	*% Diff.*
Paris	89.97	7.73	82.24	91.40
Edinburgh	71.97	6.02	65.95	91.63
Brussels	82.77	6.75	76.02	91.85
Amsterdam	82.41	9.32	73.09	88.69
Dublin	57.04	6.15	50.89	89.22

Table 5: Plane vs Train emissions comparison (Source: Calculated based on traveling from Loughborough train station to centre of destination. Flights are calculated from Birmingham International Airport and figures include journey to the airport (via train) and to the City centre from the airport (also via train). Dublin journey includes a ferry trip from Holyhead to Dublin port, the rest of the journey is made by train.

Plane vs Train Costs				
	Flight		*Train*	
Destination	*9AM*	*Cheapest*	*9AM*	*Cheapest*
Paris	£119.00	£40.00	£84.00	£56.00
Edinburgh	£51.00	£35.00	£41.00	£41.00
Brussels	£203.00	£203.00	£44.00	£44.00
Amsterdam	£63.00	£42.00	£121.00	£55.00
Dublin	£15.00	£15.00	£100.00	£100.00

Travel time			
Destination	*Plane*	*Train*	*Differrence*
Paris	06:21	04:38	01:43
Edinburgh	06:10	05:06	01:04
Brussels	05:55	05:01	00:54
Amsterdam	05:57	07:26	01:29
Dublin	06:05	08:38	02:33

Table 6&7: Plane vs Train Cost & Duration Comparison (Source: Costs based on traveling on a Monday at the closest departure time to 9AM and also the cheapest departure time.)

4.1.2 Daily Commute

As the second-worst performer accounting for over 33% of the company's CO_2e output, the daily commute is another major development area for the company. However, decreasing this may be more difficult as the company can only advise alternatives and not enforce them. Supplying certain staff with eco-friendly company cars has helped lower the daily emissions by converting mileage from fossil fuels to electric – which now accounts for 26% of the daily commute. The ATIC building has 10 charge points that are all available free of charge to Cenex staff in order to promote the uptake of ultra low emission vehicles.

- **Promote the cycle to work scheme** - As stated, Cenex participates in the cycle to work scheme, however, over the period examined only two members of staff chose to cycle. To decrease the negative impacts of the daily commute, Cenex should consider advertising or incentivising cycling to work. Over the period examined, all but 5 members of staff travelled less than 5 miles to work, a distance that would take 15-20 minutes to cycle. By publicising the benefits of cycling, Cenex may be able to encourage those living nearby to cycle instead of driving.
- **Encourage car sharing within the company** – Due to the number of employees living locally, it is likely that some will live within a suitable distance for car sharing.
- **Look into feasibility of staff working from home** – Working from home would remove the need to commute to the office which, for some, can be a 130 mile-round journey thus considerably reducing the carbon footprint associated with daily commutes to work.
- **Publish the nearby public transport routes** – By doing so, those who live locally can assess the possibility of using alternative methods of transport.
- **Supplying charge points with 100% renewable electricity** – This will almost fully eliminate the carbon footprint of the electric vehicles charged at the office resulting in a decrease of 6.87Kg of CO_2e each day.

Environmental Report Appendices

APPENDIX A: ENVIRONMENTAL POLICY

1. PURPOSE

We recognise that as an organisation our impact upon the local and global environment arises as a result of our own operations and consultancy services. We endeavour to achieve a truly sustainable future by ensuring our actions and advice are based on informed technical analysis and sound business cases.

2. SCOPE

We continually assess our activities against potential environmental impacts in the areas of vehicle fuel, electricity use, paper consumption, waste to landfill and waste recycled. The importance of environmental sustainability is embedded throughout our organisation, from the Board to every staff member, and is apparent in everything from purchasing fairtrade tea and coffee, printers set to double sided printing and using recycled paper to making optimum use of video and telephone conference facilities in order to reduce our overall environmental impact.

3. RESPONSIBILITIES

a. It is the responsibility of the directors of CENEX to ensure compliance with the procedure and policy detailed here.
b. It is the responsibility of the directors of CENEX to
    i. Maintain the version of this document
    ii. Audit compliance to this policy/procedure

4. PROCEDURE

a. Wholly support and comply with or exceed the requirements of current environmental legislation and codes of practice.
b. Minimise our waste and then reuse or recycle as much of it as possible.
c. Minimise and monitor our energy and water usage in our office.
d. To encourage the use of public transport, walking and cycling and to utilise ultra-low carbon vehicles in our fleet and as company cars.
e. As far as possible purchase products and services that do the least damage to the environment and encourage others to do the same.
f. Assess the environmental impact of any new service or products we intend to introduce as part of the approval procedures.
g. To monitor and report annually on our environmental performance including our carbon footprint.

APPENDIX B: SUSTAINABILITY STATEMENT

5. POLICY REVIEW

Cenex is currently undergoing a review phase of all policies and procedures, including our sustainability and environmental policy. Our new policy will contain a detailed programme of work that will focus on:

- Reducing our office energy emissions;
- Engaging our staff on sustainability issues;
- Reducing our water consumption;
- Reducing our impact from waste;
- Improving resilience to climate change;
- Enabling active travel and;
- Encouraging local procurement.

6. SUSTAINABILITY ACTIVITIES

Printing | The Cenex IT department have set the default printing on Cenex machines to black and white, and always double sided to reduce paper wastage. The printer will also only print one copy of a document, even when multiple copies are sent. This has greatly reduced excess copies from human error. We operate a 'think before you a print' policy, and use laptops to share documents and information during meetings. These new activities will be evaluated at the end of the financial year to assess the savings we have made.

Fleet | Cenex utilise ultra-low carbon vehicles in our fleet, and employees are expected to choose a ULEV as a company car. Our new office includes 10 charging points, and the fleet includes; Golf GTE (39g/km), BMW i3 (0g/km), 2 x Mitsubishi Outlanders (42g/km), 2 x Nissan Leaf (0g/km), 1 x Toyota Auris Hybrid (89g/km), and the new Mercedes on order. Our fleet manager has begun to monitor the MPG performance of the vehicles to reduce fuel use, and to consider the impact of our business travels.

Travel | Cenex encourages the use of public transport for all business travel, especially the train as Loughborough is very well connected. Car sharing is encouraged where possible for business trips, as this represents both cost and environmental savings. Employees are actively discouraged from using personal cars for business travel, and are expected to use a company low carbon fleet vehicle instead. Cenex operates and offers it's employees the 'Cycle to Work Scheme' funding, and two employees of the 16 have taken this up. Walking to work is also encouraged, as is lift sharing.

Purchases | Cenex procurement activities include an environmental consideration and, where possible, the most environmentally friendly option is chosen for instance recycled paper, recycled toner cartridges and recycled business cards.

Meetings | Cenex has recently purchased a GoToMeeting corporate account to greatly increase the quantity of digital meetings to reduce our travel impacts.

Computers | Cenex operates a "shutdown, not log off" policy to ensure evenings and weekends do not drain unnecessary electricity. There is a 'last person out' routine that includes the checking and switching off of all lights, technology and computers. Our servers are new and energy efficient, and lights on telephones and the office automatically turn off at 6pm.

Health and Wellbeing | In December 2015 as part of Cenex's commitment to its staff and general wellbeing, employees were asked to complete a survey with an external company related to their stress and health opinions at work. The results culminated in a presentation from an external body and the team collectively agreed on initiatives to encourage healthy living in the office environment, including a communal fruit bowl, identification of a workplace health champion, "thick-to-thin Thursday's" and team sports opportunities. Involvement is totally voluntary, and is aimed to help improve everyone's general health.

7. CENEX OFFICE

Due to employee growth, Cenex recently moved to a new business facility built using ERDF grant funding. As part of its criteria Cenex wanted to move to a more environmentally friendly facility. The Advanced Technology Innovation Centre (ATIC) in Loughborough was chosen. The building was built to Building Research Establishment Environmental Assessment Methodology (BREEAM) standard of Very Good. Also included are solar panels on the roof and full smart LED lighting throughout.

8. REPORTING

As part of the policy refresh, Cenex will be implementing a monitoring process and reporting annually on our environmental performance including our carbon footprint. Cenex will be engaging with the Business Development and Growth Unit at Loughborough University to see what support is offered to implement a method of best practice for reporting.