South Norfolk District Council Greenhouse Gas Report 2018/19

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Disclaimer

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1. Background to this Report

Local authorities in England have been requested by Government to measure and report annually upon the greenhouse gas (GHG) emissions arising from their own activities.[1] This Annual Greenhouse Gas Report follows HM Government *Environmental Reporting Guidelines* with emissions broken down into three scopes and reported in Carbon Dioxide Equivalent (CO_2e), calculated using the UK Government's 2018 carbon conversion factors. [2, 3]

South Norfolk District Council is a second tier Local Authority. Head Office is South Norfolk House, Cygnet Court, Long Stratton, Norwich, NR15 2XE. The report covers the annual period 1st April 2018 to 31st March 2019.

The production of this Annual Greenhouse Gas Report represents stage 1 of Groundwork Norfolk's proposal to provide support for the councils to achieve net zero carbon emissions. This report is the baseline carbon footprint for the year 2018-19. It is understood that this and future annual footprint reports will be written and published on the council website. These reports show emissions in a particular year for the council's estate. The production of these reports does not include site visits or make detailed recommendations of actions that would reduce emissions.

The next stage is a detailed decarbonisation plan that would look at buildings and vehicles in depth and make quantified recommendations for emissions reductions.

[1] Via a letter to Local Authorities https://www.gov.uk/guidance/sharing-information-on-greenhouse-gas-emissions-from-local-authority-own-estate-and-operations-previously-ni-185
[2] H.M. Government Environmental Reporting Guidelines https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/791529/Env-reporting-guidance_inc_SECR_31March.pdf
[3] https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2020

2. Methodology and Scope of Reporting

This 2018/19 Greenhouse Gas Report covers emissions from South Norfolk District Council's own estate and operations looking at electricity, gas, vehicle fleet fuel use and business travel. Appendix 1 details the properties included within this report.

Energy and fuel consumption data has been provided by South Norfolk District Council with GHG emissions calculations and analysis carried out by Groundwork Norfolk. In line with the *Environmental Reporting Guidelines* carbon emissions are broken down into direct and indirect emissions. These are categorised into Scope 1, Scope 2 and Scope 3 emissions according to which activity and fuel or energy use they arise from.

Scope 1: These are Direct Emissions which arise from the activities of an organisation and include fuel combustion on site such as gas boilers and fleet vehicles.

Scope 2: These are Indirect Emissions from electricity purchased and used by the organisation. Emissions are created during the production of the energy which is eventually used by the organisation.

Scope 3: These are all other Indirect Emissions from activities of the organisation, occurring from sources that they do not own or control. In this GHG report these cover emissions associated with business travel by employees and also those associated with the 'Transmission and Distribution' (T&D) of electricity purchased by the organisation. Scope 3 can include a wide range of indirect emission sources such as supply and demand chains and staff commuting emissions although at present the data is not available for this.

Inclusions

Buildings that are owned and operated by the councils have been included – where the council pays the energy bills. For South Norfolk Council's business centres energy use has only been included when there are empty units, these units are rented to tenants so the emissions form part of the tenants' footprints.

GHG emissions are expressed as tonnes of CO_2 equivalents (tCO_2e). This is a unit of measurement used to indicate the global warming potential of a greenhouse gas, expressed in terms of the global warming potential of one unit of carbon dioxide. The UK Government's 2018 Carbon Conversion Factors have been applied to the units of energy and fuel consumption to calculate the associated emissions.[4] For example CO_2 equivalent emissions from electricity consumption are calculated by multiplying the kWh use over a period by the conversion factor for electricity which gives a $kgCO_2e$ figure.

[4] https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2020

3. GHG Emissions Statement

South Norfolk District Council's total gross greenhouse gas emission statement for the year 2018/19 has been calculated to be 2,936.2 tCO_2e, as shown in Table 1.

Table 1: Emissions Statement (Estate and Operations) 2018/19

2018-19		GHG Emissions (tCO2e)
Scope 1	Natural Gas	818.4
	Oil	137.0
	Grounds, Waste and Street Scene Diesel	1341.9
Scope 2	Electricity	489.9
Scope 3	Water Supply and Sewerage	29.5
	Employee Business Travel	68.6
	T&D Emissions from Electricity	41.8
	Waste Disposal	9.2
		2936.2

Transmission and Distribution Losses (T&D) refers to the emissions associated with electricity which is lost from the system used for delivering the purchased electricity. These emissions are calculated by using a 'T&D loss' emission factor which is included in the 2018 Carbon Conversion Factors.

4. Intensity Measurement

In mid-2018 South Norfolk District Council served a population of 138,017.[5] An intensity ratio of 'kilogrammes of CO_2e per resident' has been calculated to be 21.27 $kgCO_2e$/resident for this period.

Previously local authorities were required to complete an annual greenhouse gas report. Since this requirement has ended not all local authorities have continued to report emissions.

Authorities differ significantly in size, geography and responsibilities so comparisons may be misleading, however, Table 2 below provides a snapshot of South Norfolk Council's carbon footprint in comparison to other local authorities.

Table 2: GHG Emissions Comparison with Other Published Authorities.

Local Authority	GHG Emissions	Population	$kgCO_2e$/resident/year
Broadland District Council	**1,297**	**129,464**	**10.02**
London Borough of Tower Hamlets (excludes schools but includes street lighting)	6,485	317,705	20.41
South Norfolk Council	**2,936**	**138,017**	**21.27**
Norwich City Council (inc business and **contractor travel**, and **contractor operated buildings** but not housing stock)	4,297	141,137	30.44
Kings Lynn (inc Transmission and distribution losses, water supply, water treatment, business travel and **contractor travel**)	4,632	151,811	30.51
Ipswich Borough Council (excluding housing stock)	4,757	136,913	34.74
Breckland (include contracted vehicle fleets, **commuting**, **procured goods and services,** and expensed travel)	5,084	139,968	36.32

5 https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland

Eastleigh Borough Council (includes staff travel)	7,727	129,966	59.45
Bradford Metropolitan District Council (**excludes staff travel** but includes schools and street lighting	37,662	500,000	75.32

The exact composition of services, scopes and ranges of emissions included in each report also vary so comparisons can be misleading.

5. Breakdown of GHG Emissions

Of the 2,936.2tCO_2e emissions for the period 2018/19, 46% is attributed to diesel consumption in the grounds maintenance, waste and street scene fleet at Ketteringham Depot (Figures 1 and 2). This fleet is understood to be owned and operated directly by South Norfolk Council so falls within the Scope 1 emissions.

The next largest emission sources are the natural gas consumption at 28%, electricity at 17% and heating oil at 5%. Employee travel is responsible for 2%, T&D and water for 1% each, and waste for less than1%.

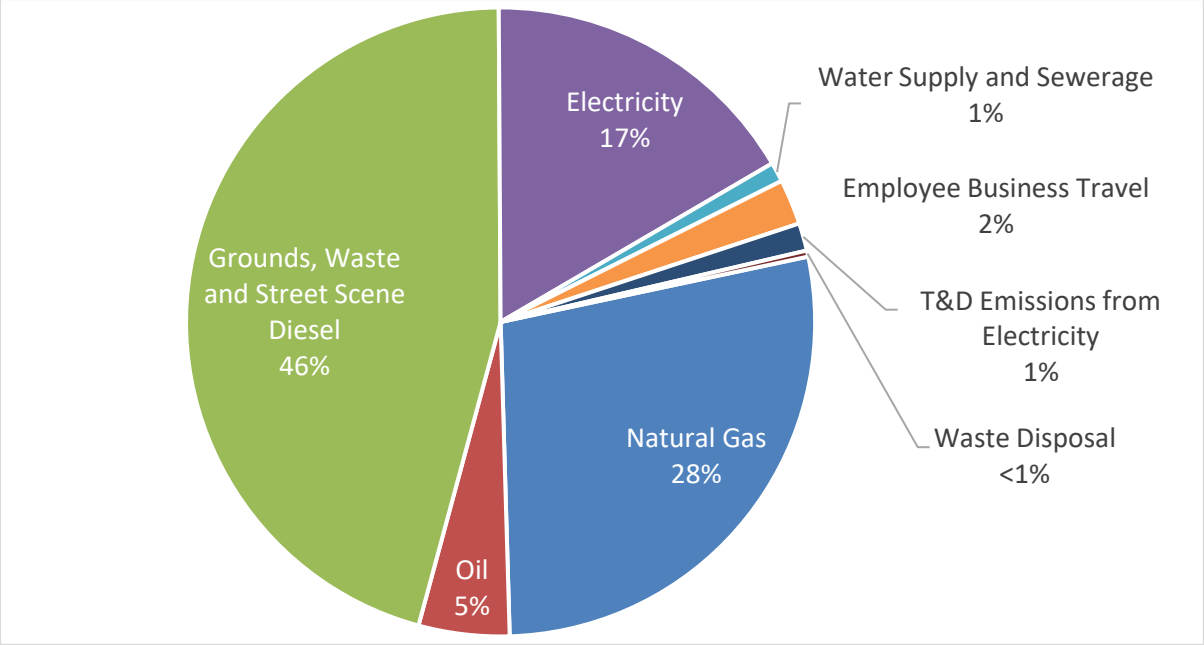

Figure 1: Breakdown of GHG Emissions by Source.

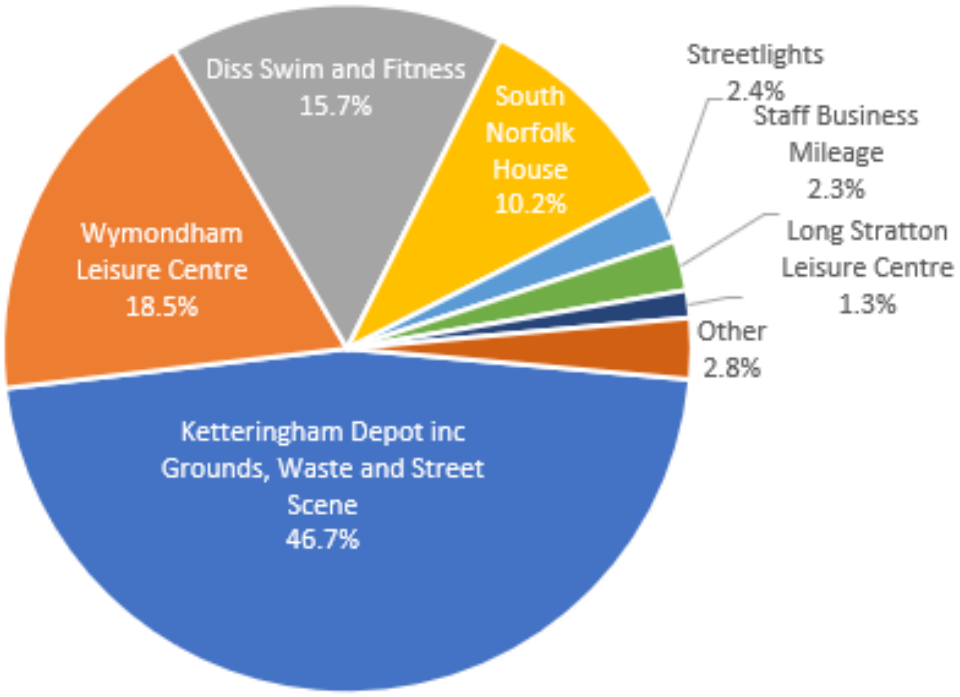

Figure 2: Breakdown of GHG Emissions by Location/Source.

The Ketteringham depot figure includes the grounds, waste and street scene fleet.

6. Electricity Generated from On-site Solar PV

There is understood to be no renewable energy generation within the South Norfolk Council portfolio at the time of this report.

7. Energy use in Buildings

Electricity, natural gas and heating oil consumption data was provided from meter readings and bills for the main South Norfolk Council buildings.

The emissions associated with energy use (heat, light and power) show the biggest emitters to be Wymondham Leisure Centre, Diss Swim and Fitness, as would be expected, followed by South Norfolk House (Figure 3).

Long Stratton Leisure Centre has a relatively low electricity consumption understood to be attributable to the fact it is a dry leisure centre, now heated by air source heat pumps. The most recent DEC certificates gives the building a B rating.

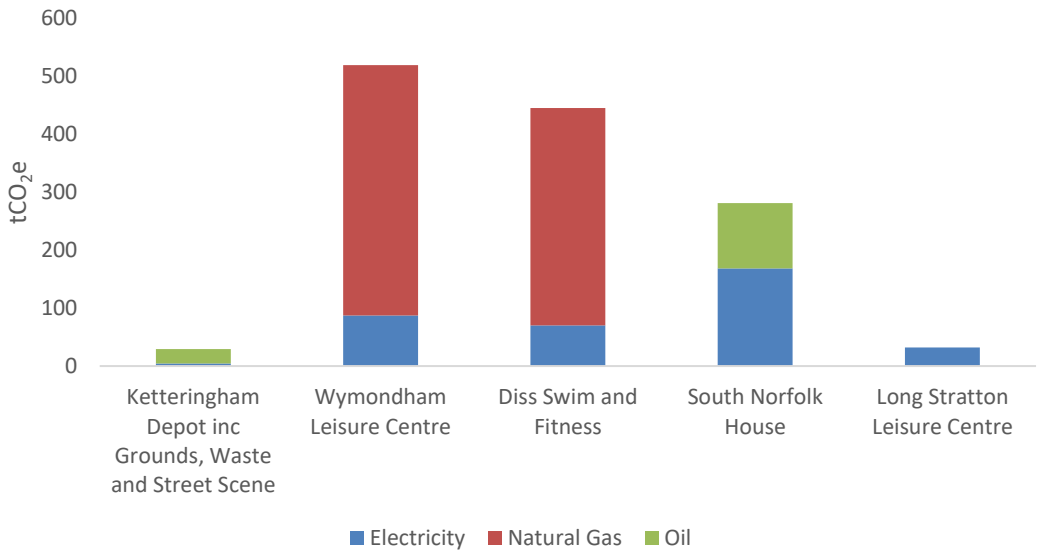

Figure 3: GHG Emissions Associated with Heat, Light and Power Energy Consumption.

All other properties emit less than 3% of the overall footprint each, and the building energy emissions at Ketteringham Depot are <3% of the sites overall footprint when including fleet diesel consumption (Figure 4).

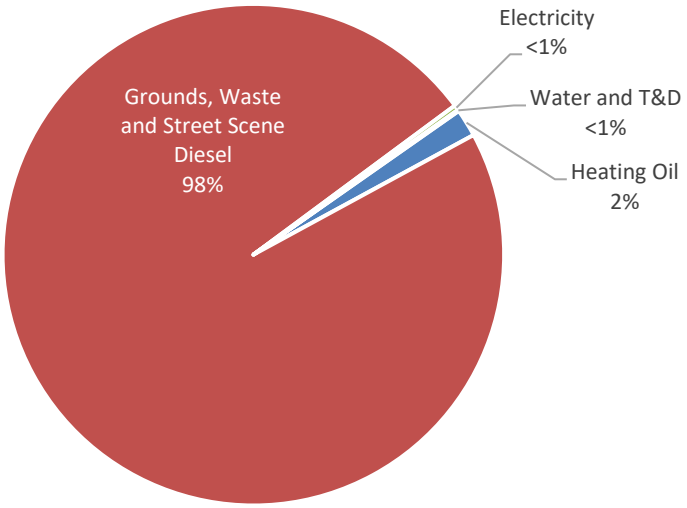

Figure 4: GHG Emissions Associated with Ketteringham Depot.

8. Transport Related Emissions

South Norfolk Council does not own any vehicles other than the grounds, waste and street scene fleet.

As detailed in the previous sections, the Ketteringham depot accounts for 47% of the council's overall emissions and, within that, the grounds, waste and street scene fleet diesel consumption accounts for 98% of those emissions.

Staff business travel accounts for 2% of the overall council emissions.

9. Water Emissions

Limited water meter data was available for the South Norfolk Council properties. Carbon emissions from staff and public welfare facilities water consumption can be insignificant however the wider environmental impacts of water consumption and waste water disposal may be considered in future environmental reports so should be part of the monitoring systems.

10. South Norfolk House

This report was a desktop exercise, it has not been necessary to visit buildings at this stage.

The information on the buildings has been taken from published DECs and EPCs and details on improvements to the buildings has been provided by building managers.

Detailed audits of buildings to make specific recommendations would form part of a decarbonisation plan which is the next step.

According to the currently valid Display Energy Certificate, South Norfolk House has a total useful floor area of 4761 and has mechanical ventilation.

The DEC Certificate, valid till Sept 2022, gives an operational rating of D, scoring 87.

Benchmark emissions data is usually based on the treated floor area (heated and lit) which, without more detailed data, can be estimated at 75% of the total floor area, 3571m^2. So on that basis the heat, light and power data supplied for this report suggests an emission for South Norfolk House of 0.079tCO_2e/m^2. The CIBSE Energy Consumption Guide 19 (ECON 19 Guide) suggests a benchmark for a *good* air conditioned standard office building of 0.087tCO_2e/m^2 suggesting the building is reasonable efficient for its type and age.[6]

Measures understood to have already been completed at the House include:

- Waterless urinals
- Power Factor Correction equipment installed
- LED lighting installation ongoing
- External floodlighting disabled

[6] David H. Clark. What Colour is Your Building? Measuring and reducing the energy and carbon footprint of buildings. 2013, London.

- External perimeter lighting disabled (other than emergency lights)
- BMS system installed
- Ventilation modified to provide 'free cooling' when possible
- Chillers/main air conditioning only operated in extreme temperatures (reliance on natural ventilation)
- Heating only operated when conditions dictate
- One calorifier used (two installed)

11. Wymondham Leisure Centre

According to the currently valid Display Energy Certificate, Wymondham Leisure Centre has a total useful floor area of 3971m^2 and has mechanical ventilation.

The DEC Certificate, expired August 2021, gives an operational rating of C, scoring 64.

Benchmark emissions data is usually based on the treated floor area (heated and lit) which, without more detailed data, can be estimated at 75% of the total floor area, 2,978m^2. So on that basis the heat, light and power data supplied for this report suggests an emission for the leisure centre of 0.174tCO_2e/m^2.

The CIBSE Energy Benchmark (TM46:2008) Guide suggests a benchmark of 0.373tCO2e/m^2 suggesting the building is efficient for its type and age.

The building is understood to now have a combined heat and power (CHP) system installed and operational.

Improvements suggested in past DEC reports that could pay for themselves in three years include:

- Survey heating systems
- Improve heat losses
- Survey A/C systems
- Upgrade ventilation motors

Longer term suggestions include:

- Solar PV and thermal water heating

Solar PV Illustration

Subject to engineer surveys the roof would appear to have potential for solar PV arrays to offset the annual 308,000kWh of imported electricity (Figure 5).

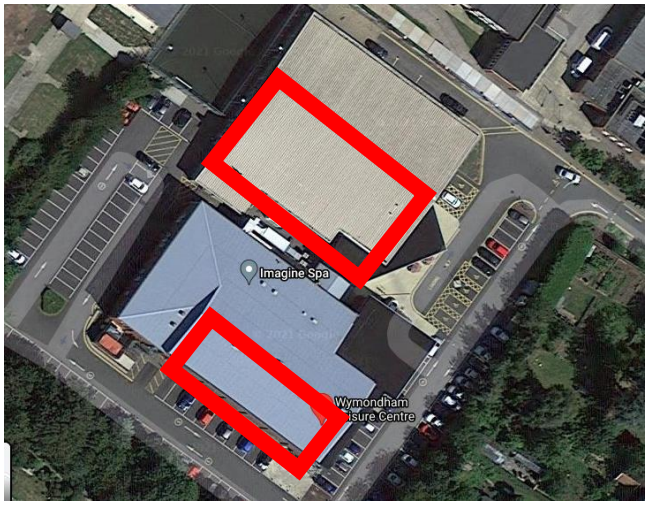

Figure 5: The roof space at Wymondham Leisure Centre that may be suitable for solar PV array installations.

Assuming the areas in red are suitable, a 170kWp array could be installed, generating over 100,000kWh pa, offsetting perhaps 30% of the 2018/19 electricity consumption and thereby saving over 30tCO_2e.

12. Diss Swim and Fitness

According to the currently valid Display Energy Certificate, Diss Swim and Fitness centre has a total useful floor area of 1112m^2 and has mechanical ventilation.

The DEC Certificate, expiring December 2021, gives an operational rating of B, scoring 44.

Benchmark emissions data is usually based on the treated floor area which, without more detailed data, can be estimated at 75% of the total floor area, 834m^2. So on that basis the heat, light and power data supplied for this report suggests an emission for the leisure centre of 0.533tCO_2e/m^2.

The CIBSE Energy Benchmark (TM46:2008) Guide suggests a benchmark of 0.373tCO_2e/m^2 suggesting the building is less efficient than it could be, contrary to the DEC report.

Improvements suggested in past DEC reports that could pay for themselves in three years include:

- Upgrade ventilation motors to variable speed

Longer term suggestions include:

- Heat recovery systems
- Solar PV
- Solar thermal water heating

Solar PV Illustration

Subject to engineer surveys the roof would appear to have potential for solar PV arrays to offset the annual 247,000kWh of imported electricity (Figure 6).

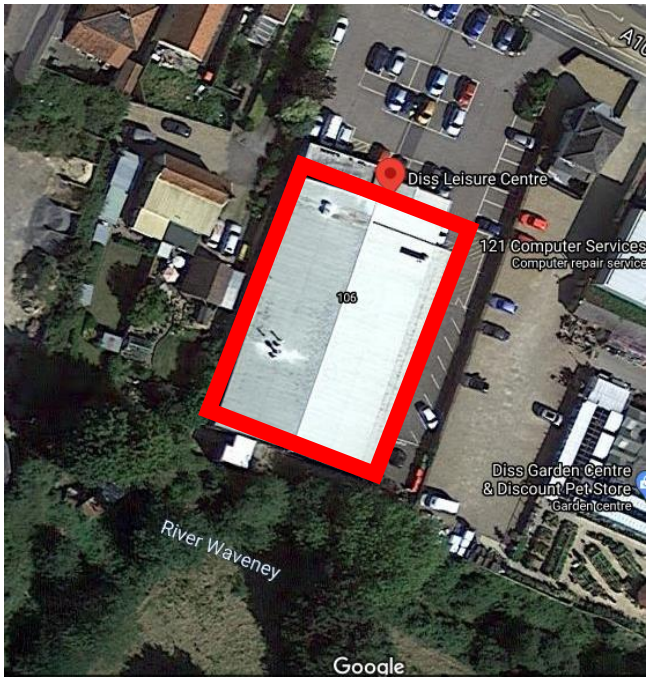

Figure 6 : The roof space at Diss Swim and Fitness Centre that may be suitable for solar PV array installations.

Assuming the areas in red are suitable, a 140kWp array could be installed, generating over 62,000kWh pa, offsetting perhaps 25% of the 2018/19 electricity consumption and potentially saving 22tCO_2e emissions pa.

Appendix 1:

South Norfolk District Council Sites Included in this Report

Associated Council	Property name	Full Address	Postcode	Type of building	Electricity kWhpa	Natural Gas kWhpa	Oil (l tbc)	Water (m3)	Incinerated General Mixed Waste (kgs)	Recycled Waste (kgs)	Composted (kgs)	Sanitary (Kgs)
South Norfolk	South Norfolk House (inc Lodge and Store)	South Norfolk House, Cygnet Court, Swan Lane, Long Stratton	NR15 2XE	open plan office	595,420		44,290	1,489	42900	88280		
South Norfolk	Long Stratton Leisure Centre	Swan Lane, Long Stratton, Norwich	NR15 2UY	dry leisure centre	112,848			1,238	42900	42900		
South Norfolk	Diss swim and fitness	106 Victoria Road, Diss, Norfolk	IP22 4JG	wet leisure centre	247,382	2,036,633		8,458	42900	28600		
South Norfolk	Wymondham Leisure centre	Norwich Road, Wymondham, Norfolk,	NR18 0NT	wet leisure centre	308,867	2,345,031		13,698	100100	42900		
South Norfolk	Ketts Park	Harts Farm Road, Wymondham	NR18 0UR	dry leisure centre	74,722			290				
South Norfolk	Ketteringham Depot	Ketteringham Depot, Station Lane, Hethersett	NR9 3AZ	workshop/depot	16,373			723				
South Norfolk	Crafton House	Rosebery Business Park, Shotesham Rd, Poringland, Norwich	NR14 7XP	business centre	847							
South Norfolk	Diss business centre and the old barn annexe	Dark Ln, Scole, Diss	IP21 4HD	business centre	7,765							
South Norfolk	Trumpeter House			business centre	33,190							
South Norfolk	Loddon business centre	Business Centre, 2b High St, Loddon, Norwich	NR14 6AH	business centre	-							
South Norfolk	Diss tourist information centre	10 St Nicholas St, Diss	IP22 4LB	small shop	648							
South Norfolk	Car park ticket machine	Wymondham		car park machine	130							
South Norfolk	Car park ticket machine	Diss		car park machine	16,560							

South Norfolk				temporary accommodation	1,726							
South Norfolk				temporary accommodation	10,684							
South Norfolk				temporary accommodation	-	-						
South Norfolk				temporary accommodation	25,607	67,040						
South Norfolk				temporary accommodation	37,140							
South Norfolk	Harleston toilets	Bullock Fair Car Park, Harleston	IP20 9AT	toilets	2,404			147				
South Norfolk	Loddon toilets	Public Convenience Church Plain LODDON Norwich	NR14 6EX	toilets	26							
South Norfolk	Long Stratton toilets	Public Conveniences Swan Lane LONG STRATTON Norwich	NR15 2XN	toilets	2,191			1,209				
South Norfolk	Hingham toilets	Public Conveniences Market Place Hingham	NR9 4AF	toilets	966			222				
South Norfolk	Wymondham toilets	Public conveniences, Market Street, Wymomdham	NR18 0UQ	toilets				835				
South Norfolk	Diss toilets	Public Convens Mere Street Diss	IP22 3AG	toilets	3,215			1,792				
South Norfolk	South Norfolk Area			streetlights	7,225							
South Norfolk	Wymondham 1			streetlights	124,044							
South Norfolk	Wymondham 2			streetlights	749							
South Norfolk	Wymondham 3			streetlights	4,691							
South Norfolk	Wymondham 4			streetlights	-							
South Norfolk	Diss 1			streetlights	684							
South Norfolk	Diss 2			streetlights	91,957							
South Norfolk	Diss 3			streetlights	2,440							

Council	Type/person/Fleet/department	Number of Vehicles	Fuel type	Mileage pa
South Norfolk	Staff	sample of vehicles checked and percentages extrapolated over total mileage declared	Diesel	140275
South Norfolk	Staff	sample of vehicles checked and percentages extrapolated over total mileage declared	Petrol	1420
South Norfolk	Staff	sample of vehicles checked and percentages extrapolated over total mileage declared	Hybrid	75208
South Norfolk	Councillors	sample of vehicles checked and percentages extrapolated over total mileage declared	Diesel	12242
South Norfolk	Councillors	sample of vehicles checked and percentages extrapolated over total mileage declared	Petrol	124
South Norfolk	Councillors	sample of vehicles checked and percentages extrapolated over total mileage declared	Hybrid	6563