



Carbon  
Neutral  
Cambridge



**Greater Cambridge Decarbonisation Report:**  
***Assessing progress 2015-2020***

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## About Carbon Neutral Cambridge

Carbon Neutral Cambridge is a not-for-profit community based organisation, helping create a zero carbon Greater Cambridge. Do join us.

<https://carbonneutralcambridge.org/>

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## Summary

The aim of this report is to assess the progress made in decarbonising Greater Cambridge and make recommendations for accelerating decarbonisation in our region.

Committee on Climate Changes targets imply that Greater Cambridge (ie Cambridge City, and South Cambridgeshire) should be decarbonising at 5-6% a year. A more ambitious target of halving territorial emissions by 2030 (i.e.7% a year) is widely recommended, as well as including consumption based emissions i.e. international travel, and consumption from outside the region.

It is encouraging that over the last five years 2015-2020, Cambridge has met this more ambitious territorial target, decarbonising at an average of 7% a year. South Cambridgeshire has been doing less well, decarbonising at 4% a year.

**Domestic Sector:** In the domestic sector, the emissions from electricity use have been falling significantly, although there was a slight rise in 2020 because of covid-19 lockdowns. However, there has been very little progress in households reducing their energy demand for heating or moving away from fossil fuel heating to electric heating and heat pumps.

**Transport Sector:** In Cambridge City, emissions from travel on A road and minor roads are both now falling steadily. This is encouraging and shows what can be done. However, there has been little progress in reducing transport emissions in South Cambs.

**Business Sector:** The commercial and industrial sectors appear to be doing better at decarbonising than households, probably because it makes commercial sense, and they have better access to finance and professional advice.

**Public Sector:** Emissions from electricity use in Education, Health, Care and Public Administration have fallen substantially, but emissions from gas have been increasing in South Cambs. However as the University of Cambridge, Addenbrookes hospital, Cambridge City and South Cambs, have announced major decarbonisation programmes, we would hope to see faster progress in future

We recommend the following actions by Councils, community groups, businesses and individuals

1. **Help householders decarbonise**, by providing advice and access to expert local contractors, to insulate and draught proof homes, switch from fossil fuels to heat pumps (for all but the smallest and most well insulated homes) and install PV solar and batteries
2. **Help businesses** respond to the forthcoming dramatic increases in energy prices, and increase their resilience to future energy price shocks, by providing access to expert advice on reducing their energy demand, decarbonising operations and installing renewables
3. **Help decarbonise travel**, especially in South Cambs. This includes reducing the need to travel, encouraging walking and cycling, including accelerating the introduction of the network of Greenway cycling routes , dramatically expanding bus services as part of the Sustainable Travel Zone, and encouraging the switch to eV's,
4. **Support Public Sector decarbonisation**, to help our schools, healthcare and councils decarbonise and save money, so they can continue to provide the services we all depend on.
5. **Improve our communities Resilience**. As climate change gathers pace, we can expect the impacts to be increasingly severe. We need to work together to get ready for floods, heatwaves and droughts, worse than any that we've seen before in Greater Cambridge.

## Introduction

The aim of this report is to assess the progress made in decarbonising Greater Cambridge over the last 5 years. It considers whether we're on track to meet the targets for reducing territorial emissions set by the Committee on Climate Change, and what we need to do to accelerate decarbonisation in our region to avoid catastrophic climate change and protect our community.

### **The Climate Emergency**

In 2015, 196 countries adopted The Paris Agreement: a legally binding international treaty on climate change. We all committed to reduce greenhouse gases, in order to limit global warming to well below 2C, and preferably to 1.5C.

In 2019, the UK committed to a legally binding target of reducing the UK's territorial emissions to Net Zero by 2050, although many scientists think it is dangerously complacent<sup>a</sup>. Shortly afterwards, Cambridge City Council and South Cambridgeshire District Council both declared Climate Emergencies and committed to achieve Net Zero by 2040.

It is becoming increasingly clear how important this is to avoid the catastrophic impacts of climate change, ranging from floods and droughts to wildfires and global food shortages.

### **This report**

It is based on data published annually by BEIS<sup>b</sup> on the territorial Greenhouse gas emissions from the Local Authority areas of Cambridge, and South Cambridgeshire.

The BEIS data categorises emissions into sectors: Industry, Commercial, Public Sector, Domestic, Transport. Since 2018 it has also included emissions from Agriculture, Waste and Land use, land use change and forestry (LUCUCF). These are of lesser importance in Greater Cambridge than the emissions from other sectors, so are not discussed fully in this report, although we hope to explore them in more detail in a later report on the Combined Authority region.

We compare these emissions to the sectoral reduction targets set by The Committee for Climate Change (CCC) for the UK as a whole to be on track for Net Zero by 2050<sup>c</sup>. The targets are:

- Industrial emissions to be reduced 63- 76% on 2019 levels by 2035
- Surface transport emissions to reduce by around 75% by 2035, relative to 2019
- Buildings emissions to fall by around 55% by 2035, relative to 2019
- Manufacturing and construction emissions to fall by around 70% by 2035, relative to 2019
- Waste sector emissions fall by around 44% by 2035
- Electricity supply to be 95% low carbon by 2030, on path to full decarbonisation by 2035
- Emissions from Land use and agriculture fall by around 34% by 2035, relative to 2019

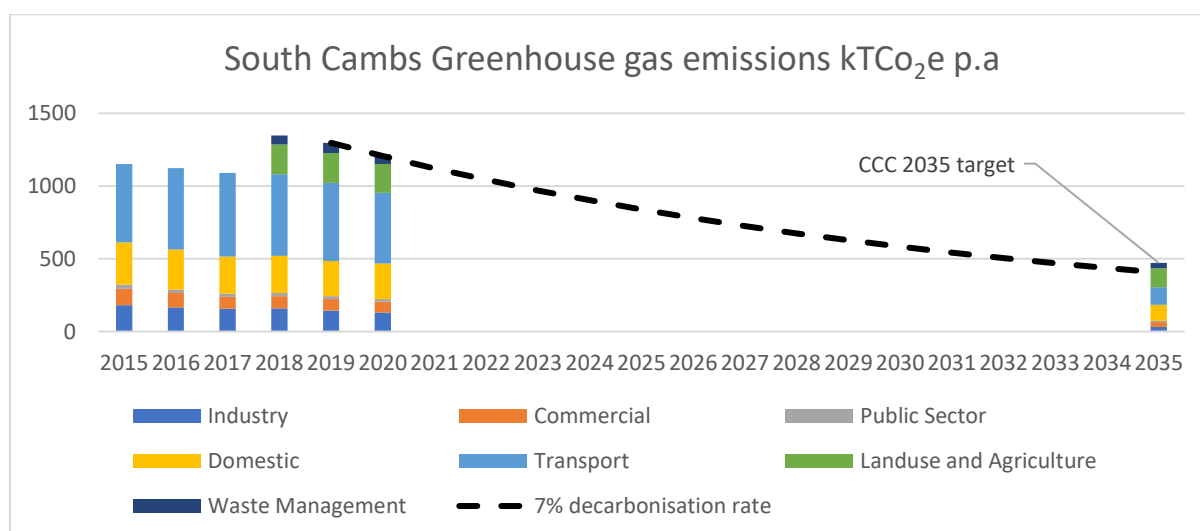
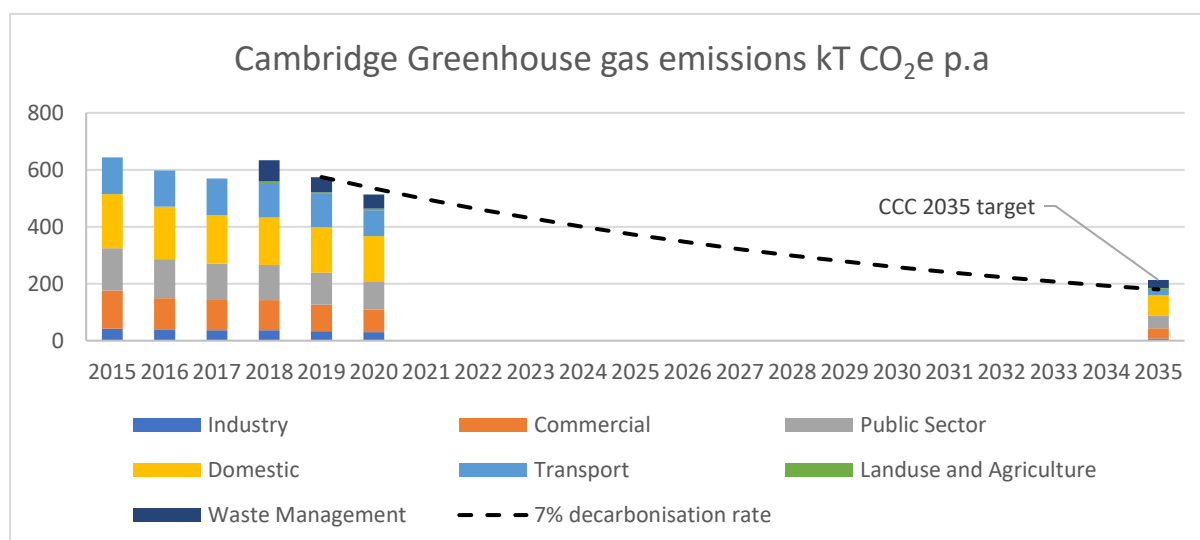
It is important to note that these "territorial" figures are based on the emissions created within the territory, whether from businesses, households or passing traffic, not just the emissions from the councils. However they ignore the emissions associated with making and transporting the things that we import (e.g. food, clothes, electronics, cars etc), and international travel. If these consumption based emissions are included, our emissions can easily double.

We, and many others,<sup>d e</sup> think we have a moral obligation to outperform the Committee on Climate Changes targets, aiming to halve territorial emissions by 2030 (equivalent to reducing by 7% a year)

## Greater Cambridge Overview

The BEIS data shows that over the five years 2015-2020 Cambridge has been reducing its territorial emissions at an average of 7% a year, while South Cambs has been decarbonising at 4% a year.

This is a promising start, because when the Committee on Climate Change (CCC) 2035 targets are applied to the mix of activities we have in Greater Cambridge, they imply that we should be reducing territorial emissions by 5-6% a year.



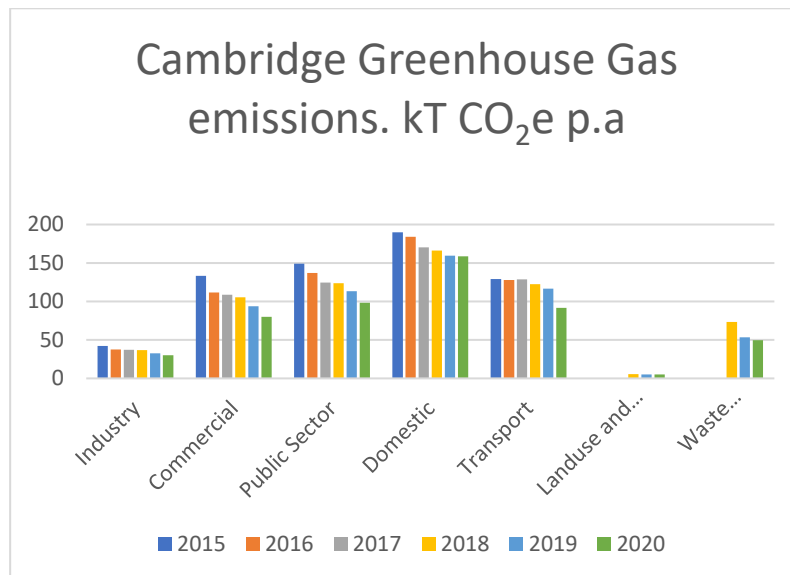
Cambridge City's performance is encouraging, although South Cambridgeshire needs to accelerate decarbonisation.

## Sectors

### Overview

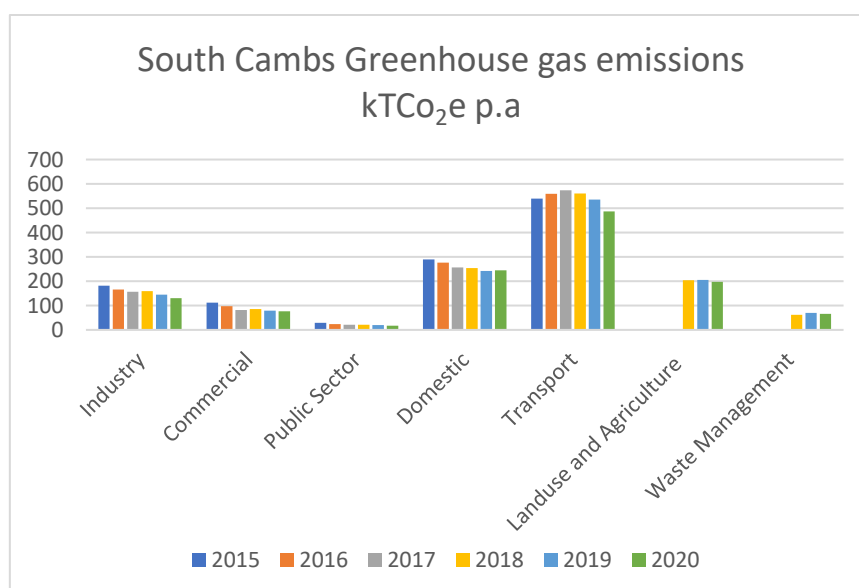
This section of the report explores the rate of progress in decarbonising, sector by sector

Overall, Cambridge has been doing quite well, steadily decarbonising in all of BEIS's sectors.



In South Cambs emissions are higher than in Cambridge, in part due to the higher population (161,000 vs Cambridge's 125,000) However, even on a per-person basis emissions are higher. This is primarily due to higher emissions from transport (particularly on major roads), more industry and larger homes.

South Cambs emissions have been declining more slowly than Cambridge, but at least are now falling in most sectors. Transport emissions continued rising until 2017, but are now starting to fall. The exceptions are Agriculture and Land-use.



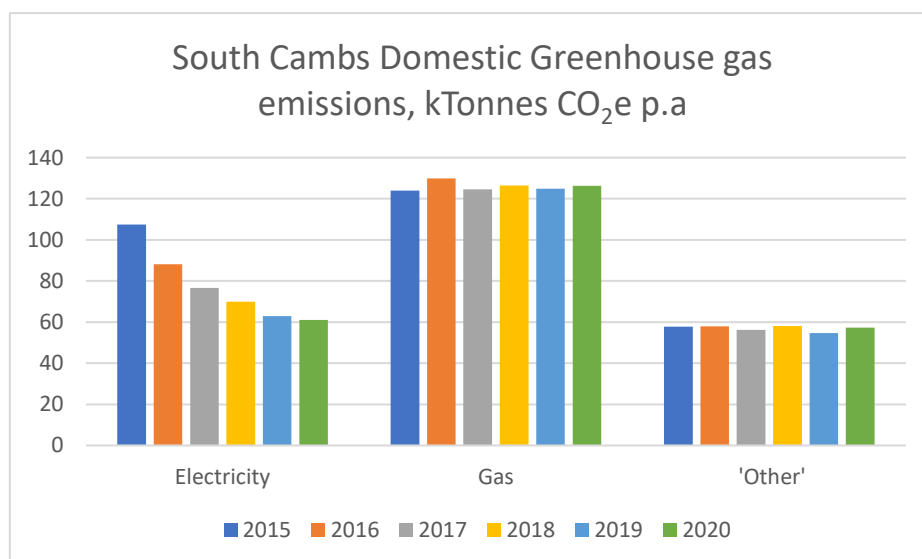
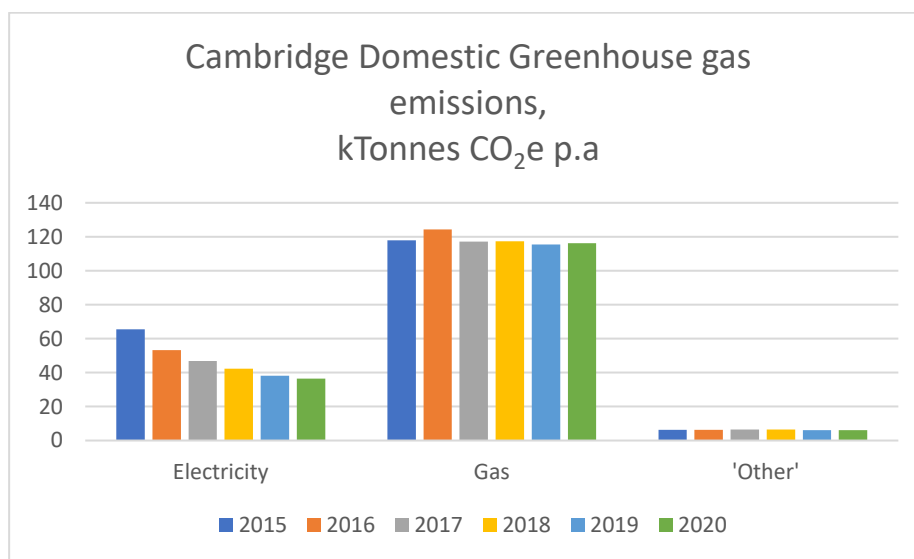
The following sections include the key Sectors for our region in more detail.

## Domestic Sector

The “Domestic” sector includes the estimated emissions from the energy used by households for heating, lighting and other domestic electricity use.

As the graphs below show, the emissions from electricity use have been falling significantly. This is primarily because of the decarbonisation of the UK electricity grid, but also because of energy efficiency measures, such as switching to energy efficient lighting & appliances and simply turning things off.

However, so far, there has been disappointingly little progress by households in reducing the amount of fossil fuel energy used for heating (This is largely gas, with some oil in South Cambs) There was a slight rise in 2020 because of increased working from home during covid-19.



**The priority is to improve the efficiency of heating homes, for example by improving insulation and draught proofing. Then, once the energy demand has been reduced, householders should switch from fossil fuels to heat pumps (for all but the smallest and most well insulated homes).**

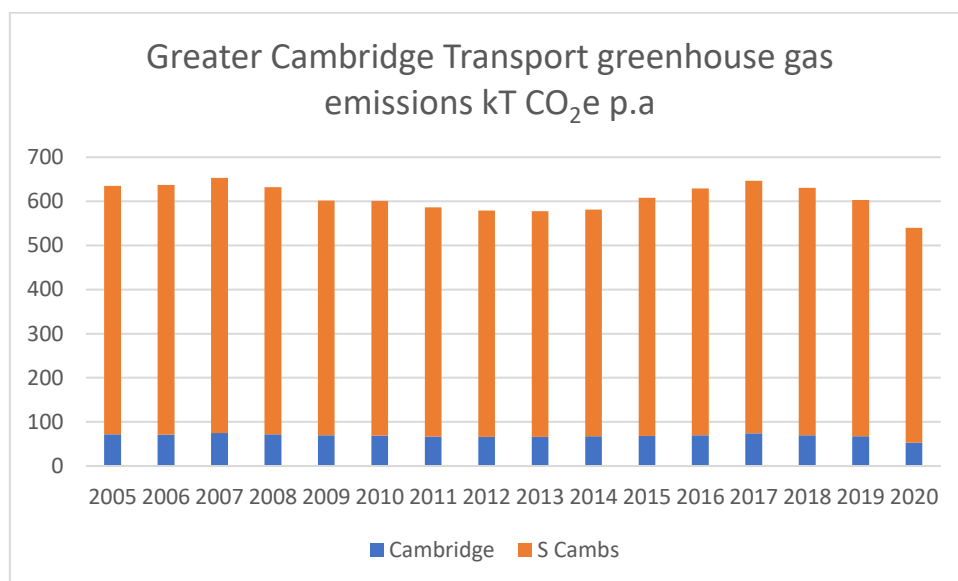
**Rooftop solar and batteries will also help decarbonisation and reduce householders' energy costs.**

## Transport Sector

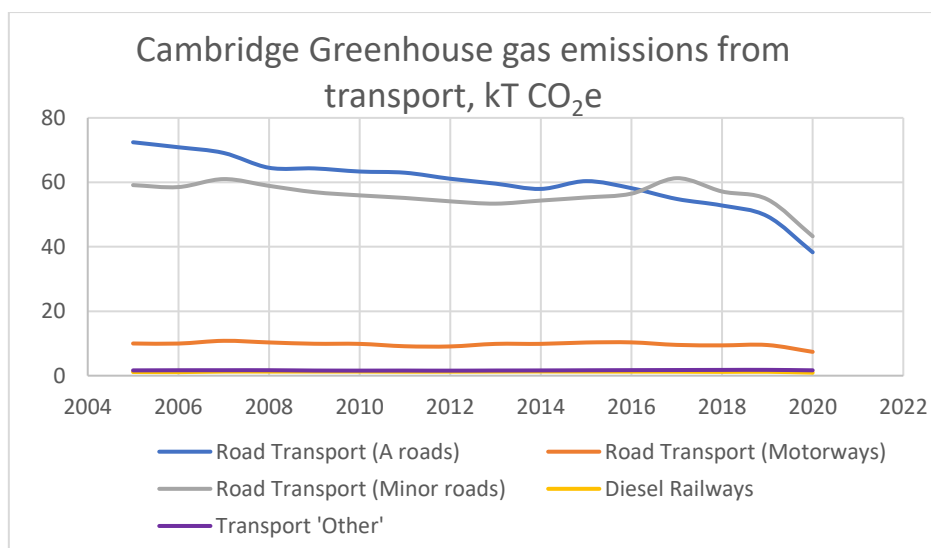
BEIS data on Transport emissions is based on traffic surveys on major roads, data on the national mix of vehicles and their fuel efficiency, assumed speed limits and modelling based on previous years. This raises questions about how well it will reflect rapid or local changes.

However, it's the best we've got and suggests that over the last 15 years, transport emissions from Greater Cambridge have remained largely static, although they fell after the 2008/9 recession and there are signs of a fall since 2017, probably due to the introduction of Euro6 diesel in 2015. There was a more dramatic fall in 2020, when Covid-19 lockdowns reduced private travel significantly (while possibly increasing journeys by delivery vans)

The national proportion of electric vehicles (eVs) was just ~3% in 2020 but is growing rapidly.



In Cambridge City, emissions from travel on A road and minor roads are both now falling steadily. This is probably due to a steady switch from private car use to public transport, car clubs, cycling and walking. Taxis within the city are increasingly switching to eVs. This is encouraging, and shows what can be done.

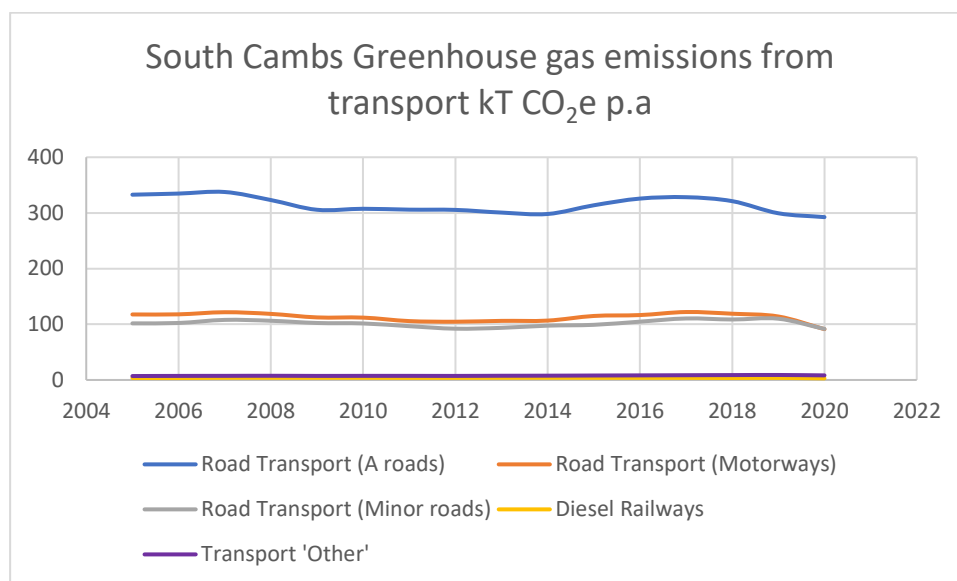




However, there has been less progress in reducing transport emissions in South Cambs.

In part this is because of traffic on the M11, A14, A11 and A428 which is not really under our control (except in so far as, by reducing our consumption, we also reduce Heavy Goods Vehicle traffic on the A14 and other major roads)

However, traffic on minor roads is presumably mostly local, and the emissions from this are also largely unchanged, except for a slight covid-lockdown induced fall in 2020. This is very disappointing.



**Increased remote working will reduce the need to travel, and this should be encouraged**

**However we all need to do a lot more to help South Cambs residents switch lower carbon means of getting about, such as enabling more cycling/ e-bikes, public transport, eVs, car sharing and shared delivery services.**

**Reducing speed limits<sup>f</sup>, for example introducing and expanding 20mph zones will help make roads safer and hence will reduce emissions by encouraging walking and cycling.**

**The proposed Greenways will help.**

**We support the plans for a dramatically improved rural public transport service, as part of the proposed Sustainable Travel Zone**

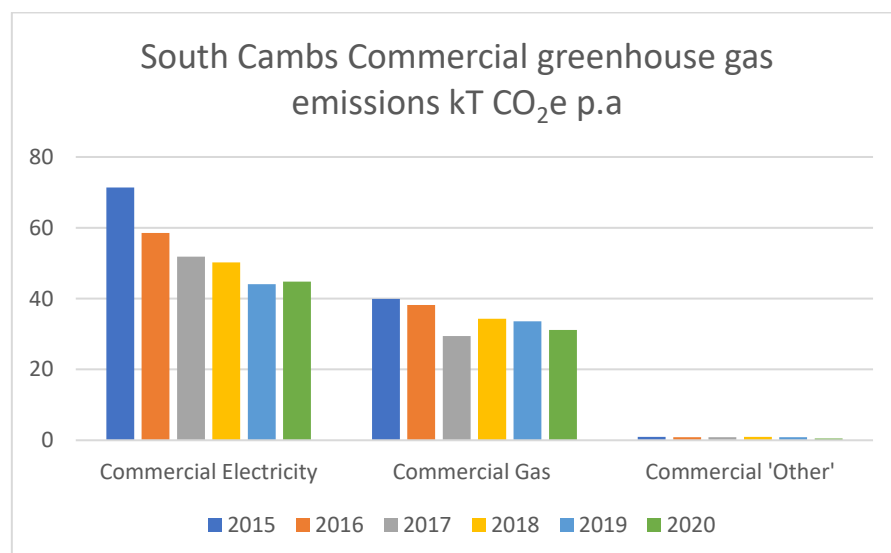
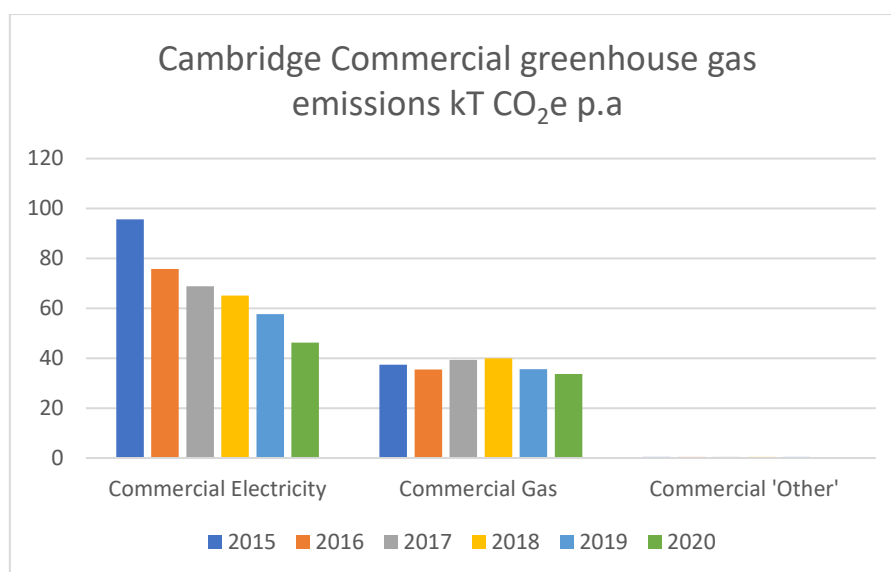
## Commercial

The Commercial Sector is an important one in Greater Cambridge, as it includes Retail, Tourism, Accommodation, Scientific research, Consultancy, Financial and Legal Services.

Businesses appear to be doing better at decarbonising than households, probably because it makes commercial sense, and they have better access to finance and professional advice to help.

Emissions from the use of electricity have been falling, primarily due to decarbonisation of the power grid, but probably also due to efficiency measures such as lighting, and better controls

There has also been a slight fall in the use of gas for heating, probably due to a combination of energy efficiency measures and businesses becoming more efficient in their use of heating. There may be some evidence of a shift from gas to electricity in South Cambs in 2020.



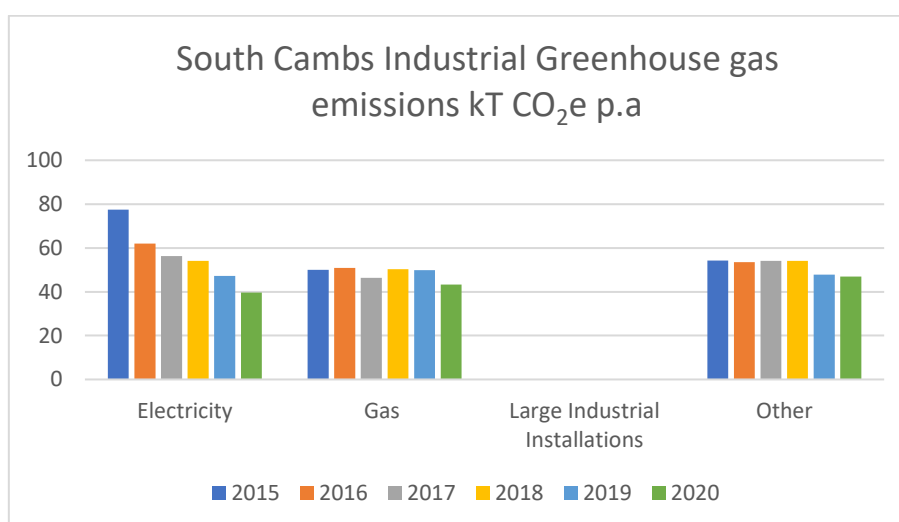
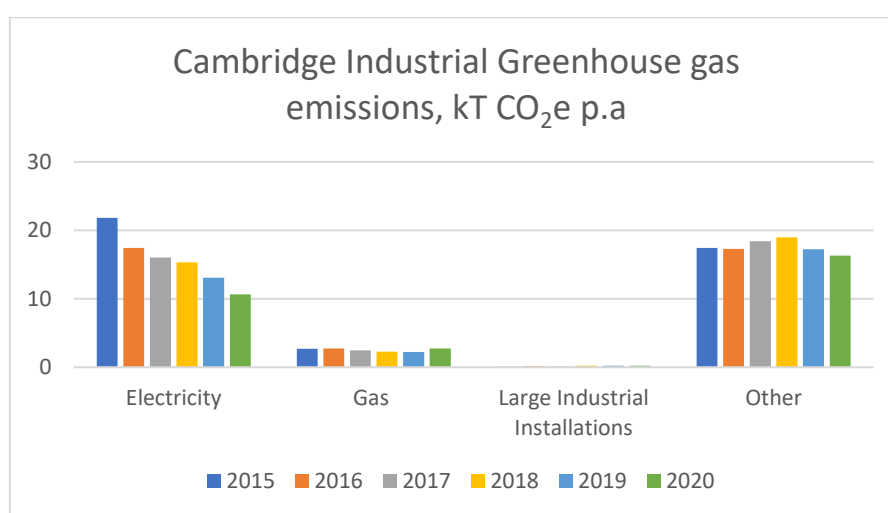
**In future, we'd expect to see significant changes, as businesses respond to the challenges of the dramatic increases in energy prices, inflation and staff shortages. For some this will be very difficult but for others it will offer opportunities to decarbonise while improving resilience. Access to expert advice about energy use and decarbonisation may be very useful.**

## Industry

The “Industry” sector includes Manufacturing, Water treatment (but not sewerage), waste collection and printing. The emissions are mostly from relatively small sites, but other BEIS data<sup>6</sup> suggests that the Addenbrookes Incinerator is by far the largest single emitter, producing 2kT of CO<sub>2</sub>e emissions p.a. This burns both clinical waste and gas to provide heat to the hospital.

The largest emitters in South Cambs are Histon Sweet Spreads, Hexel Composites (in Duxford) and The National Grid’s Gas Compressor station (near Hinxton). It is worth noting that up until its closure in 2008, Barrington Cement works emitted was the largest source, emitting about 0.3KT p.a.

As in other sectors, most of the progress is due to the decarbonisation of the electricity grid, but there are signs of reductions in emissions from other greenhouse gases too, particularly in South Cambs.

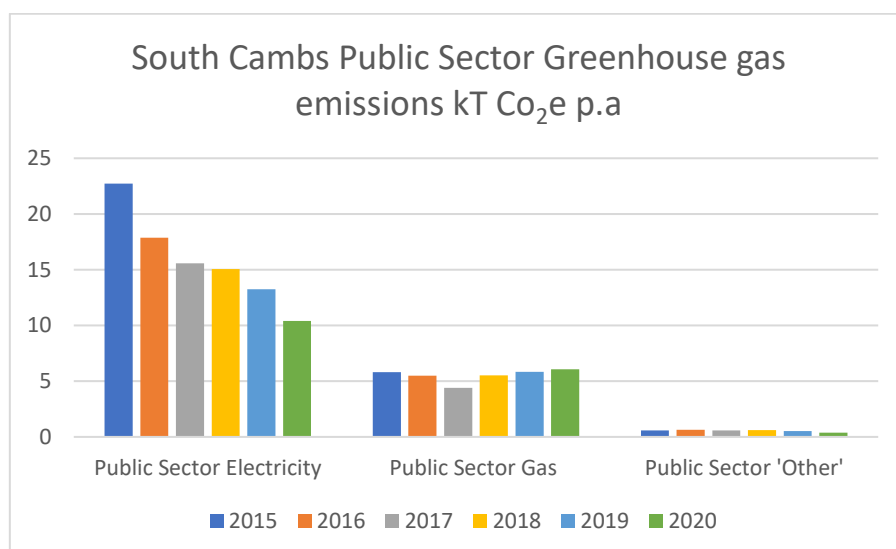
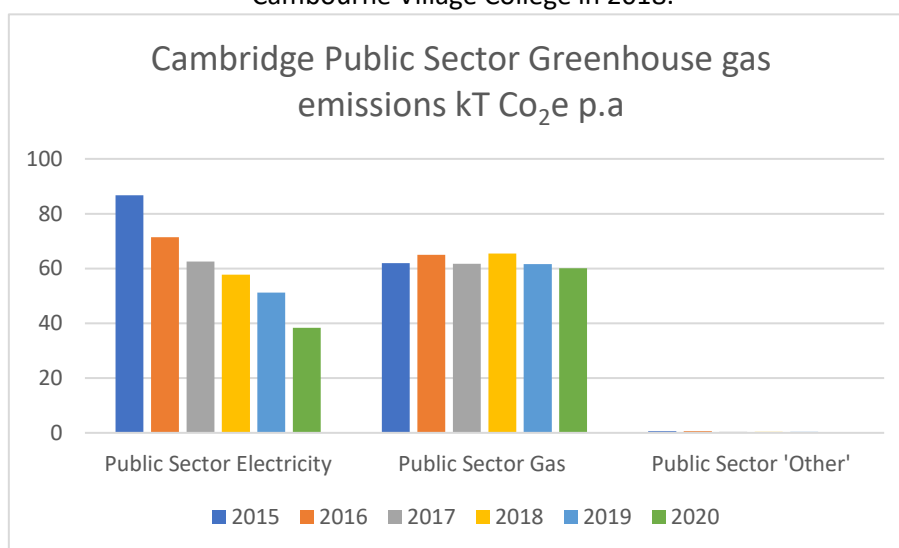


**We expect that the recent dramatic rises in energy costs will be stimulating industrial businesses to invest in energy efficiency measures. These will both reduce costs and improve their resilience against future price shocks. This should be encouraged and enabled wherever possible.**

## Public sector

The public sector includes Education, Human health, Residential care and public administration, and is a particularly important sector for Cambridge City. In 2020, The University of Cambridge emitted<sup>h</sup> 50 kT CO<sub>2</sub>e (down 25% from 2015), Cambridge University Hospitals 21 kT CO<sub>2</sub>e (down 32%)<sup>i</sup> Cambridge City Council 4.4 kT CO<sub>2</sub>e<sup>ik</sup> (down 40%) and South Cambs 1.7kT CO<sub>2</sub>e<sup>l</sup>

Emissions from electricity use have fallen substantially during the period, in part due to Power Purchase Agreements (PPA)<sup>m</sup>. Disappointingly, emissions from gas are static in Cambridge, and have been increasing in South Cambs. Some of this may be due to the opening of new facilities, such as Cambourne Village College in 2018.



**As South Cambs Council<sup>n</sup>, Cambridge City Council, The University of Cambridge<sup>op</sup>, and Cambridge University NHS Foundation Hospital Trusts<sup>q</sup> have all announced significant decarbonisation plans we would hope and expect to see significantly faster progress over the next 5 years.**

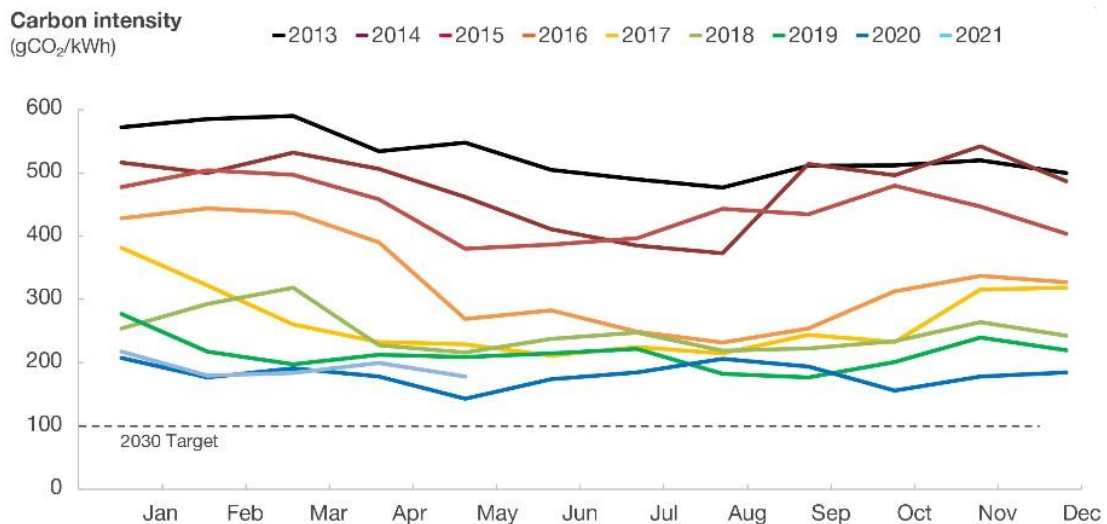
**For example, in 2020 South Cambs District council, started a programme to reduce emissions from South Cambridgeshire Hall (currently 0.5kT pa) by 75% by 2022. In 2022 Addenbrookes announced a programme to reduce emissions by 10% a year.**

## Decarbonisation of UK Electricity

The biggest national success in decarbonisation during the period 2015-20 has been the decarbonisation of the UK electricity grid.

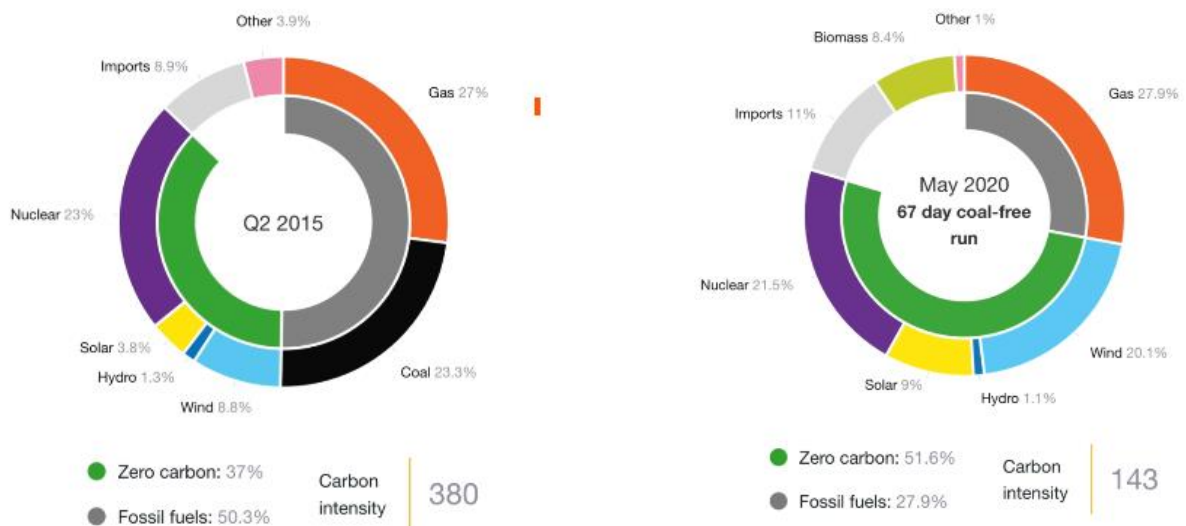
This has driven by the removal of coal from UK power generation, and the rise of renewables. This has decreased the carbon emissions from each kWh of electricity by 60% in just 5 years.

### Carbon Intensity of electricity generation in Great Britain<sup>1</sup>.



The transformation has been remarkable.

### Britain's Changing Electricity Generation Mix<sup>5</sup>.



The Committee on Climate Change has set the target for electricity supply to be 95% low carbon by 2030, and on path to full decarbonisation by 2035. To benefit from this, it is important that as much energy demand as possible (eg for heating and transport) is switched from fossil fuels to low carbon electricity. This will increase the demand for electricity so we also need to continue expanding renewable electricity generation (especially wind and solar), and energy storage (for flexibility)

## Recommendations

We need to maintain the pace of decarbonisation in Cambridge, and increase it in South Cambridge, ideally reducing our territorial emissions by at least 7% a year. In addition, we should be reducing our consumption based emissions (i.e. international travel and imports) by a similar amount.

This will help avoid catastrophic impacts of climate change, and will also result in a healthier, fairer and more prosperous community.

We recommend the following urgent five actions by local Councils, community groups, businesses and individuals

1. **Help householders decarbonise**, by providing advice and access to expert local contractors.
  - a. To insulate and draught proof homes, in order to reduce energy demand, particularly for heating.
  - b. Help householders switch from fossil fuels to heat pumps (for all but the smallest and most well insulated homes).
  - c. Install rooftop PV solar (wherever suitable) and batteries (where justified)
2. **Help businesses** respond to the forthcoming dramatic increases in energy prices, and increase their resilience to future energy price shocks, by providing access to expert advice on how they can reduce their energy demand, decarbonise operations and install their own renewables (e.g with rooftop solar)
3. **Help decarbonise travel**, especially in South Cambs. This includes
  - d. encourage and enable remote working (thus reducing the need to travel)
  - e. reduce speed limits, thus making roads safer for walking and cycling
  - f. accelerate the introduction of the network of Greenway cycling routes
  - g. dramatically expand bus services, as part of the Sustainable Travel Zone
  - h. encourage the switch to eV's, by providing charging points
4. **Support Public Sector decarbonisation**, to help our schools, healthcare and councils decarbonise and reduce their energy costs, so they can continue to provide the services we all depend on.
5. **Improve our community's resilience**. As climate change gathers pace, we can expect the impacts to be increasingly severe. We need to work together to get ready for floods, heatwaves and droughts, worse than any that we've seen before in Greater Cambridge.

This would be much easier if we had supportive government policy. However Committee on Climate Change concluded, in their 2022 progress report<sup>5</sup>, that “the national the policy framework is not yet fully in place to drive the large programme of delivery required within this decade”.

Nevertheless, as David Attenborough said<sup>6</sup>, where “there are things that we can do, we must”.

## References

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- <sup>a</sup> <https://twitter.com/kevinclimate/status/1489282785449857029>
- <sup>b</sup> <https://www.gov.uk/government/statistics/uk-local-authority-and-regional-greenhouse-gas-emissions-national-statistics-2005-to-2020>
- <sup>c</sup> <https://www.theccc.org.uk/publication/2022-progress-report-to-parliament/>
- <sup>d</sup> <https://www.carbontrust.com/resources/the-journey-to-net-zero-for-smes>
- <sup>e</sup> <https://smeclimatehub.org/uk/>
- <sup>f</sup> <https://roadsafetygb.org.uk/news/scottish-government-to-consider-default-20mph-limit/>
- <sup>g</sup> <https://naei.beis.gov.uk/laco2app/>
- <sup>h</sup> These are their direct “energy related” emissions, referred to as “Scope 1 and 2”
- <sup>i</sup> As some of these emissions will be due to “research” rather than “education” , BEIS’s data may split them between the “Public Sector” and “Commercial Sector”
- <sup>j</sup> <https://www.cambridge.gov.uk/carbon-management-plan>
- <sup>k</sup> Cambridge City Council’s emissions are higher than South Cambs, because it runs leisure facilities such as Kelsey Kerridge Swimming pool, and Abbey pool. These are important for the community’s health, but use a lot of energy.  
<https://scambs.moderngov.co.uk/documents/s122743/Appendix%20A%20GHG%20Emissions%20Account%202020-21.%20FINAL.pdf>
- <sup>m</sup> A PPA is when an organisation contracts to buy power direct from a low carbon source such as a wind or solar farm.
- <sup>n</sup> <https://www.local.gov.uk/case-studies/south-cambridgeshire-district-council-greening-south-cambridgeshire-hall>
- <sup>o</sup> <https://www.environment.admin.cam.ac.uk/crf>
- <sup>p</sup> <https://www.environment.admin.cam.ac.uk/Annual-Report>
- <sup>q</sup> <https://www.cuh.nhs.uk/about-us/climate-emergency/our-action-50-green-plan/>
- <sup>r</sup> <https://www.nationalgrideso.com/future-energy/our-progress/road-zero-carbon/report>
- <sup>s</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1064923/2021-provisional-emissions-statistics-report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1064923/2021-provisional-emissions-statistics-report.pdf)
- <sup>t</sup> <https://www.theccc.org.uk/publication/2022-progress-report-to-parliament/>
- <sup>u</sup> Concluding remarks in Frozen Planet II

