South Gloucestershire's

2023 Net Zero Dashboard

Local leadership on reducing carbon emissions to net zero has the potential to transform our energy system and at the same time build a local green economy, bringing in skilled jobs, investment, and resilience. This report aims to engage and inspire people and organisations in South Gloucestershire by setting out how the area is performing in the key net zero challenges of heat, power and transport: recognising what has been achieved and how far there is to go. Each year the Council reports on 3 overarching indicators covering renewable energy, area-wide carbon emissions and council-own carbon emissions.

Indicator 1 renewable energy

In 2021, renewable energy generation made up **23%** of ***electricity*** consumption

and **4%** of ***energy*** consumption.

There is **154 MW** of renewable capacity, of which **1.5 MW** was installed in the past year.

Indicator 2 area emissions

By 2020, carbon emissions (kt CO_2) from all sectors had decreased by **45%** compared to 1990 levels.

Between 2019 and 2020, emissions decreased by:

6.1%

Indicator 3 council own emissions

By 2021/22, council own emissions decreased by **73%** compared to 2009/10.

Between 2020/21 and 2021/22, emissions decreased by

5.6%

from **9,562** to **9,031** tCO_2e.

The graphics in this publication summarise the most recent publically available national datasets and were put together by Regen.

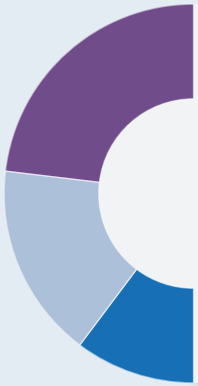
Full sources list and assumptions are available on page 7.

1 Energy use and carbon emissions

Significantly reducing the amount of energy we use for transport, heat and power is a key step on the path to net zero. This will reduce the amount of renewable and low carbon generation needed to achieve net zero.

South Gloucestershire Council

In **2020**, South Gloucestershire's energy use included:



2514 GWh transport fuel ≈ 353kt CO_2

1811 GWh gas ≈ 316kt CO_2

1114 GWh electricity ≈ 209kt CO_2

8.4 % of households in fuel poverty[1] in **2020**

The UK average was 12.6 %

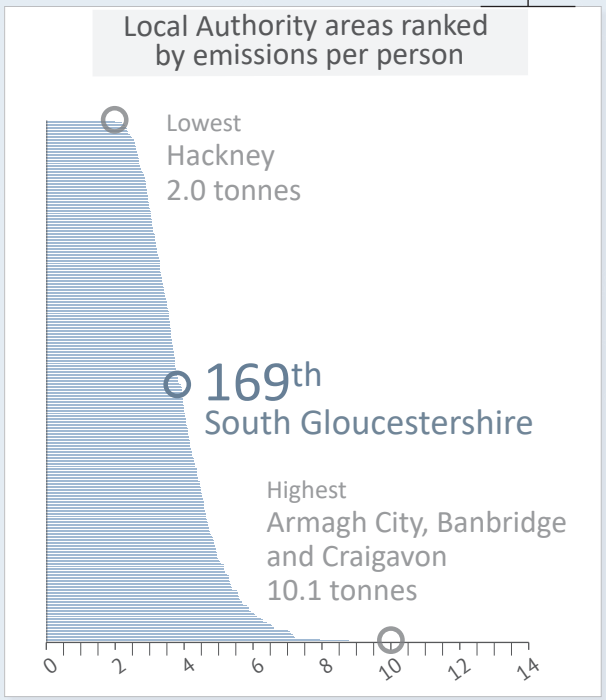
3.71 tonnes CO_2 per person

The UK average was 3.83 tonnes

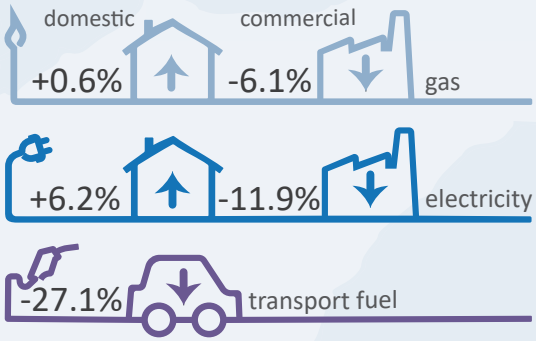
In **2020**, area emissions totalled:

1068 kt carbon emissions including other fuels and agriculture[2]

In the race to zero carbon, that places South Gloucestershire:



From **2019** to 2020, total energy use[3] changed by:



The reduction in transport and non-domestic emissions in this year should be considered in the context of the COVID-19 pandemic.

Which equates to a carbon savings of:

CO_2 **135** kt

1. Uses the Low Income Low Energy Efficiency (LILEE) metric of fuel poverty
2. Subset CO_2 dataset (excludes large industrial sites, railways, motorways and land-use)
3. Total energy use excludes non-road transport and residual fuels

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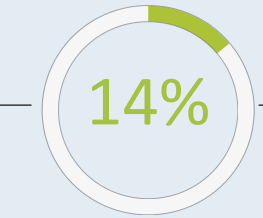
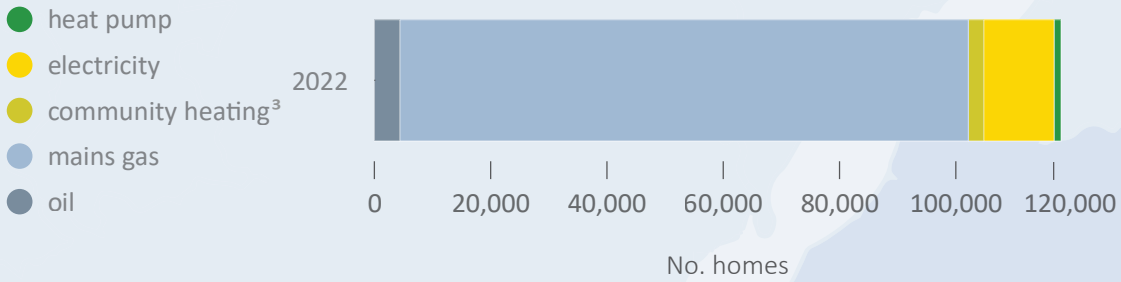
2 Homes and other buildings

Achieving net zero will require upgrades to nearly every home and business: to keep heat in, to keep energy use low and to switch to low carbon heat sources. It is one of the greatest challenges of net zero, but also one of the greatest opportunities for green jobs.

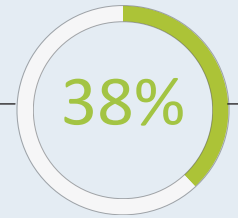
South Gloucestershire Council

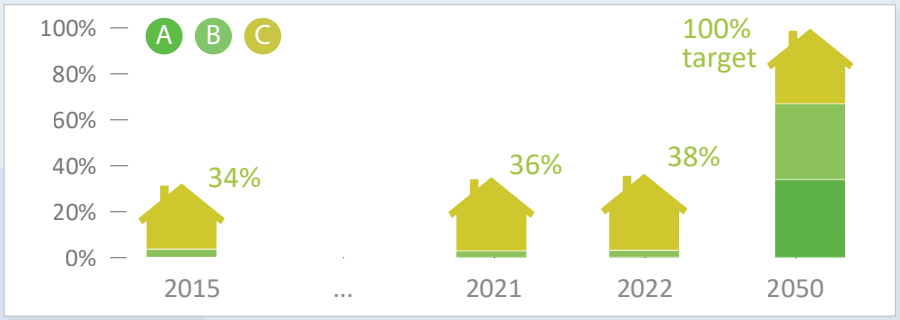
By **2022**, the estimated number of homes using low carbon heating[1] in South Gloucestershire was:





The estimated percentage of existing homes[2] with an energy efficiency rating of A, B or C made up:

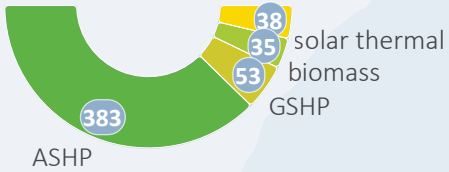




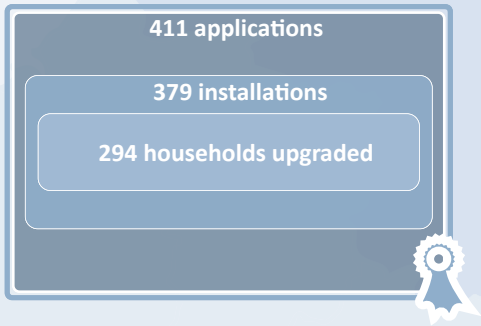
The number of Renewable Heat Incentive (RHI) installations since 2014 is:

509

RHI installations

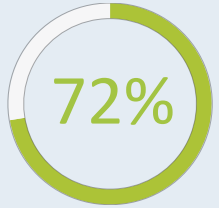


Of homes eligible for Green Homes Grant Vouchers, there have been:



Energy inefficient homes (D, E, F, G) use on average around 1.5 times the energy of energy efficient homes (A, B, C), which gives rise to higher bills and carbon emissions. Any EPC rating may still be heated by gas.

Of the **453** non-domestic buildings assessed in **2022**, the number with an energy efficiency rating of A, B or C made up:



1. Heat pumps, electricity and community heating

2. Excluding new build properties

3. combined heat and power or renewable

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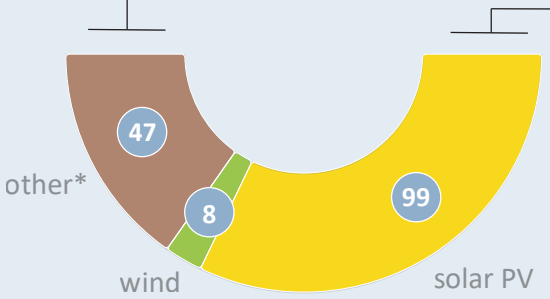
3 Renewable energy produced

According to the Committee on Climate Change, a UK net zero energy system will require at least 5.8 times more renewable generation than today. New renewable energy projects need to be installed across the UK, from rooftop solar to offshore wind.

South Gloucestershire Council

In **2022**, the local energy capacity in South Gloucestershire included:

154 MW renewable energy capacity

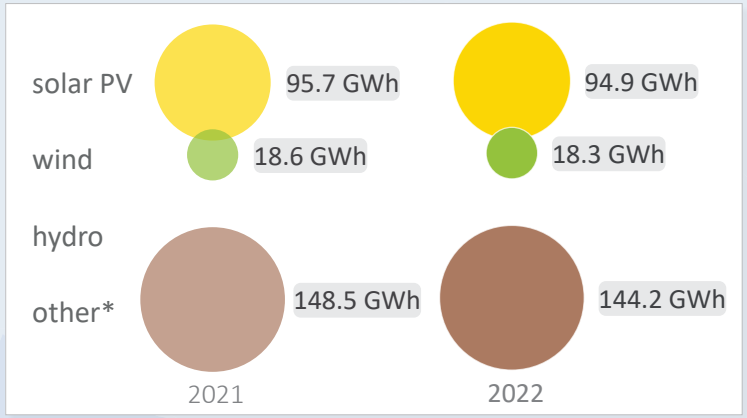


+

73 MW fossil fuel[1] capacity still online

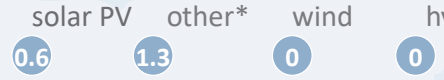
In **2022**, South Gloucestershire's local renewable sites generated:

257 GWh renewable generation



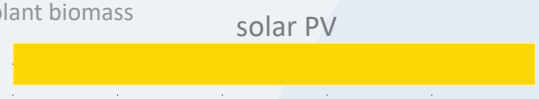
In **2022**, new renewable capacity installed in South Gloucestershire totalled:

1.9 MW



and in the pipeline[3], there are:

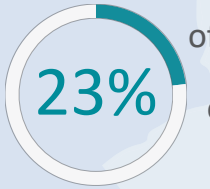
landfill gas, municipal solid waste, plant biomass



504 MW

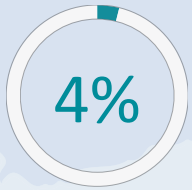
+ **1,122** MW battery storage

Renewable energy generated in South Gloucestershire is equivalent to:



of South Gloucestershire's average annual **electricity consumption**

and



of South Gloucestershire's average annual **energy consumption**[2] from heat, electricity and transport.

22.6 MWh of energy consumption per person in **2022**

Energy consumption may vary year on year due to external factors such as population growth, change in demand habits, etc.

Electricity consumption is expected to increase along with electrification of vehicles and heating over time.

1. CHP, diesel, OCGT and EfW
2. Excluding non-road transport and residual fuels
3. In planning or with grid connection enquiries

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4 Transport and mobility

A shift to electric vehicles is inevitable in the next decade, with the 2030 ban on new fossil fuel cars and market growth. We must also shift private vehicle use, to active travel and public transport to reduce energy use, tackle congestion and improve air quality and health.

South Gloucestershire Council

2020 fuel consumption in South Gloucestershire compared to the UK:

Fuel from cars, light goods, and heavy goods vehicles[1] account for **44%** of South Gloucestershire's total emissions.

cars
0.47 tonnes per person
UK average: 0.29 tonnes

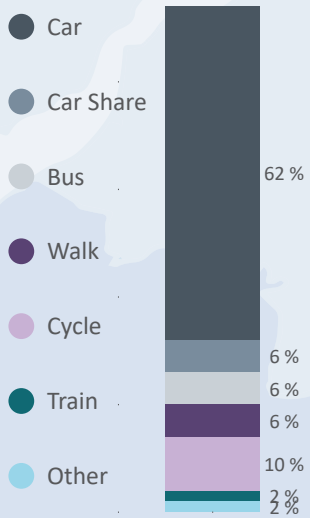
light goods
0.14 tonnes per person
UK average: 0.09 tonnes

heavy goods
0.23 tonnes per person
UK average: 0.1 tonnes

As a result, compared to the rest of the UK:

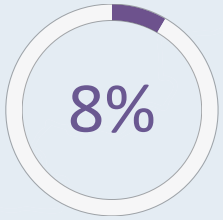
transport emissions are **lower** per person than the UK average

In 2022 mode of travel to work was:



And 6% worked from home

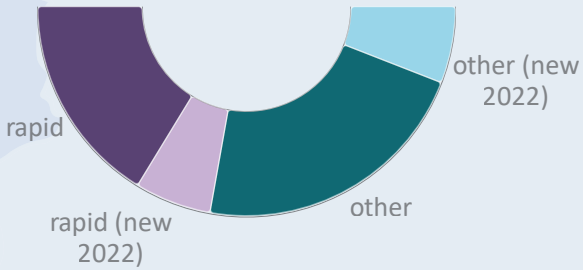
Of South Gloucestershire's vehicles, electric vehicles make up:



of total vehicles

In 2022, the number of electric vehicle chargers totaled:

169 electric vehicle chargers



Which, when comparing chargers per person to other council areas, South Gloucestershire ranks:

43 nd out of 374 UK councils

1. Excluding motorways

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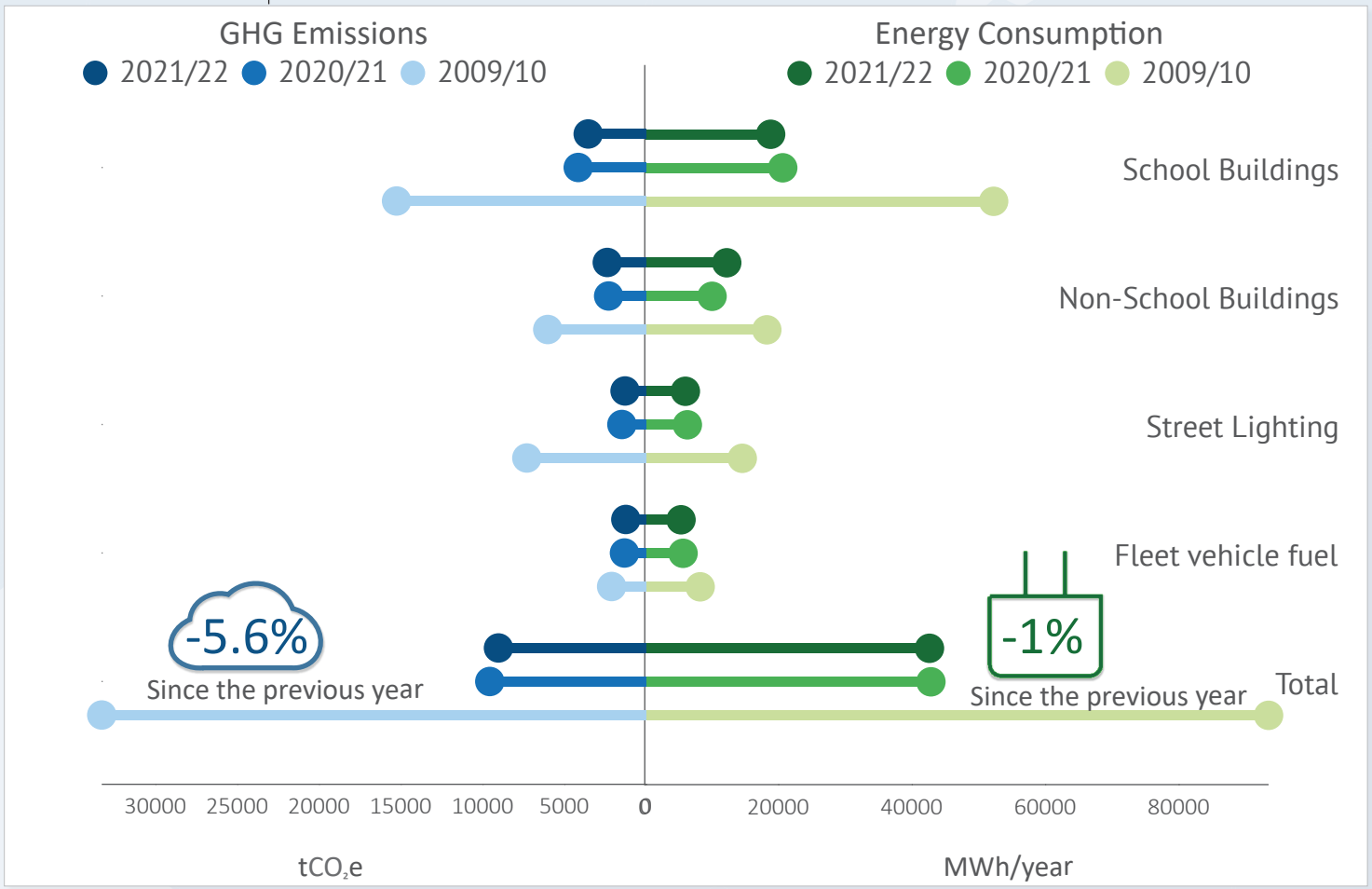
5

Council-own energy use and emissions

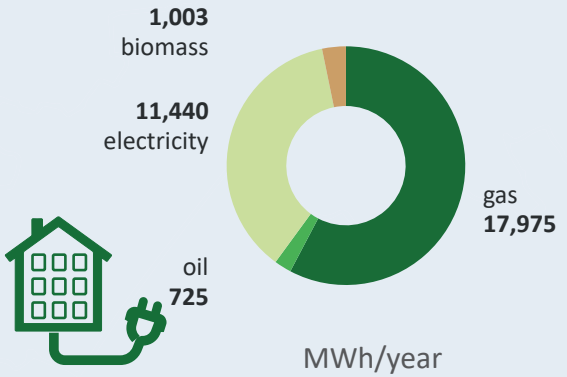
South Gloucestershire Council has set an ambition to become carbon neutral across all council functions by 2030, and joined many councils across the UK by declaring a Climate Emergency in 2019. Tracking council emissions and energy use is a crucial step towards meeting this target.

South Gloucestershire Council

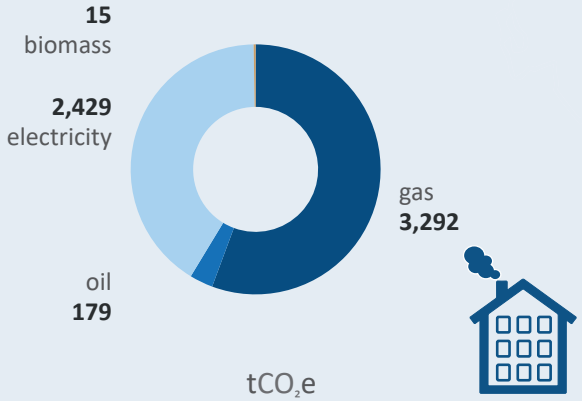
South Gloucestershire Council emissions from energy use in **2021/22**, **2020/21** and **2009/10** were:



In **2021/22**, energy consumption from council buildings by fuel type was:



In the same year, resultant emissions from council buildings by fuel type were:



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Warm and Well installations

The Warm and Well Scheme has been offering energy efficiency advice since 2001, and has seen the installation of over 60,000 measures since its creation. Home installation projects through the scheme include: wall insulation, boilers, heating systems and solar PVs.

Warm & Well – a fitter home for a healthy future

FREE energy advice line
Monday – Friday 9am to 5pm
0800 500 3076

South Gloucestershire Council

In 2021/22, the Warm and Well Scheme has resulted in:

189 insulation projects

73 heating replacements

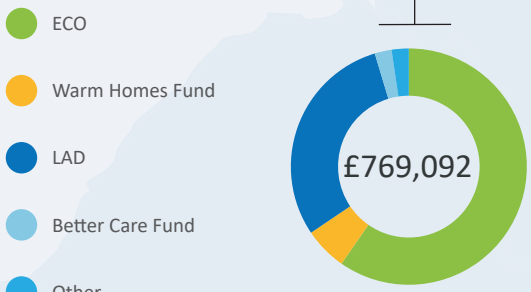
CO_2 ≈ 176 tonnes saved annually

CO_2 ≈ 5,291 tonnes saved over lifetime

Which is the equivalent of making...

1,507 ...households carbon neutral for a year.

The Warm and Well Scheme administers grant funding on behalf of local authorities. In 2021/22, additional funding accessed came from:



So far in 2022/23, there have been:

insulation projects: 13

heating replacements: 3

equalling:

CO_2 ≈ 18 tonnes saved annually

CO_2 ≈ 445 tonnes saved over lifetime

Which is the equivalent of: 126 net zero households.

Over the past five years there have been:

664 insulation projects

184 heating replacements

equalling:

CO_2 ≈ 301 tonnes saved annually

CO_2 ≈ 3,660 tonnes saved over lifetime

1,042

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Data sources and assumptions

The graphics on each page represent the following datasets, each of which have limitations and have not been validated by Regen. Please refer to the methodology documentation of each source. We welcome questions about the data, its uses and applications, as well as discussions around your data analysis

About Regen

Regen is a not-for-profit centre of energy expertise and market insight whose mission is to transform the world's energy systems for a zero carbon future.

We believe that;

- the UK will not achieve its net zero ambition without the active engagement of the people and organisations living and working in each of the UK's nations, cities and regions.
- clever uses of data can provide solutions that will help us achieve net zero and support the green recovery in our local areas.

For more about local energy data innovation click here and for more about the role of local leadership in the energy transformation click here.

This report was produced as part of Regen member-ship. For more information on membership click here.

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1

BEIS 2021, Subnational electricity consumption, Great Britain, 2005 - 2020
BEIS 2021, Subnational gas consumption, Great Britain, 2005 - 2020
BEIS 2021, Sub-national road transport fuel consumption in the United Kingdom, 2005 to 2019
BEIS 2021, UK local authority and regional carbon dioxide emissions national statistics: 2005-2019

2

Open Data Communities 2022, Energy Performance of Buildings Data: England and Wales
MoH 2022, Live tables on EPCs (non-domestic) 2008-2020
Assume EPCs recorded in quoted year are representative of region. The data is in reality weighted towards rental properties since they are more regularily assessed and new builds.
National Energy Efficiency Data-Framework, 2018, Tables 27 and 28
Comparison of EPC ratings' consumption takes the average of electricity and gas
BEIS 2022, Non-Domestic and Domestic Renewable Heat Incentive (RHI) monthly deployment data (Great Britain): December 2021
BEIS 2022, Green Homes Grant Vouchers (GHGV) Statistics

3

Sixth Carbon Budget, Committee on Climate Change, Figure 3.4.a.
Embedded Capacity Registers database, Jan 2021
Only includes distribution connected generation. Note that the dataset is known to have missing data.
Weighted averages were taken for per capita CO_2 emissions estimates
Ofgem 2021, FIT Installation report June 2021
Ofgem 2020, Microgeneration Certification Scheme 2019
attained exceptionally via Freedom of Informatino request, and valid up to 2019
Ofgem 2020, RHI installation database
attained exceptionally via Freedom of Informatino request, and valid up to 2019
ONS 2021, National Statistics Postcode Lookup Feb 2021
Capacity could only by included from Capacity Register where data entry provided a postcode.
Ofgem, Renewables Obligation Register

Methodology Explanatory Notes

The methodology behind the calculations on each page are detailed and justified below. The calculation of certain figures and combination of data sources may be altered based upon bespoke requests. Please get in touch with Regen for any further details or data queries, or email tlonsdalesmith@regen.co.uk

1 **Energy use** was derived from local electricity, gas and road transport consumption datasets published by BEIS, excluding residual fuels. This was then compared to the energy use for each dataset in the previous year to calculate the energy use change from the previous year in both domestic and commercial residences. The Latest available data for transport consumption is 2019 compared to 2020 for gas and electricity datasets, and so the year 2019 is taken for all three to allow for comparison. Residual fuels were excluded, as these refer largely to non-road transport and industrial applications that are less likely to be under the sphere of local authority influence.
Local Authority Emissions were taken from the subset CO_2 dataset, rather than the full dataset, to exclude emissions deemed to be outside the sphere of local authority influence, such as large industrial sites, railways motorways and land-use. These do not correspond perfectly to the energy use dataset, as some energy consuming activities may not have been included in the CO_2 subset data. Furthermore, the total CO_2 emissions figure will not always total the corresponding energy figures, as the total includes some non-energy related emissions sources, such as agriculture. Per capita CO_2 emissions were also derived from the subset dataset, with large outliers removed. It should be noted that areas have been ranked together regardless of type, urban/rural split, etc.

2 **Domestic Heat Sources and EPC Ratings** were derived through analysis of EPC data. Duplicate EPC certificates were removed, keeping only the most recent EPC assessment for any given property. For the A, B and C rated homes, certificates issued to new build properties were removed from the analysis to shift the focus to decarbonisation of existing building stock.
Non-domestic EPC Ratings were derived from the MoH subnational dataset, and include new build as well as existing building stock.
RHI and Green Homes Grant Vouchers were lifted from the respective subnational datasets published by BEIS.

3 **Renewable Energy Capacity** was calculated based on the previous methodology used for the *South Gloucestershire Renewable Energy Progress Report 2019-20*. This methodology combines capacity data for small-scale installations (thermal and electric) from multiple sources such as the RHI installations report, Microgeneration Certification Scheme (MCS), and the FiT Installations reports. Due to the nature of combining datasets, there may be small variation based on revisions of the datasets and identification of duplicates on a year-by-year basis. Access to RHI and MCS installation data is subject to GDPR restrictions and not guaranteed for future iterations of this report. Large-scale capacity data is retrieved from DFES data, REPD data, and Embedded Capacity Registers, as well as desk research. This is then compared to and checked against the BEIS Subnational renewable electricity dataset.
Renewable Energy Generation is derived from the renewable energy capacity totals based on annual average capacity factors for each technology type. Capacity factors are updated annually from BEIS and DUKES. This information is then compared to the average annual energy and electricity consumption respectively for the past three years of available data.

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4 Local Authority Population Estimates 2021, ONS
Road transport fuel consumption 2005-2019, DfT
Conversions factors 2020, BEIS
Vehicle emissions 2020 conversion factor: 3179.6 tonnes (Average of diesel and petrol)
Ultra Low Emissions Vehicles Table VEH0132b 2020, DfT
Licensed vehicles by body type and local authority Table VEH0105 2020, DfT, Driver and Vehicle Licensing Agency
Hybrid vehicles discluded. 'New' is the increase in registered vehicles, thereby including decomissioning.
Electric vehicle charging device statistics January 2021, DfT
Travelwest 2021, Travel to Work Survey: South Gloucestershire Council

5 South Gloucestershire Council 2021, South Gloucestershire Council: Local Greenhouse Gas Report (2020/2021)

6 Severn Wye Energy Agency Ltd 2022, Warm and Well Scheme quarterly statistics
data provided by South Gloucestershire Council

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4 **Tonnes of vehicle fuel consumption per capita** figures were sourced from the road transport fuel consumption dataset from BEIS, coupled with mid-year population estimates from ONS to estimate the amount of emissions per person.
Road transport emissions as a percent of total emissions are derived from the CO_2 subset dataset, and exclude motorways and non-road transport.
Average transport emissions were calculated based on the BEIS CO2 subset dataset, and compared against the local authority average to determine if local authority emissions are higher or lower than the UK average.
Electric vehicle statistics as a proportion of vehicles were derived by taking the number of total EVs as a percentage of total cars licenced in the local authority.
Business travel mileage and **mode of travel to work** data was provided to Regen by South Gloucestershire Council.
EV charge point data from DfT was ranked and analysed to determine the split of rapid and non-rapid devices at the end of the last quarter of the previous year. The proportion of new chargers was also calculated and visualised to give an idea of recent uptake levels compared to historic EV charger capacity. Authorities were then ranked from highest to lowest.

5 **South Gloucestershire Council** emissions and consumption data can be retrieved from the *South Gloucestershire Council: Local Greenhouse Gas Report (2020/2021)* report.

6 **Warm and Well** data provided to Regen by South Gloucestershire Council.