Impact Tool – what it is and how it can be used

Megan Blyth, Centre for Sustainable Energy

About CSE

- We're a charity supporting people and organisations across the UK to tackle the climate emergency and end the suffering caused by cold homes
- Large Charity ~100 staff
- Running since 1979
- Approximately 100 projects running at any time

Supporting communities

- We support communities to take local action on the climate emergency and come together to make the energy system better
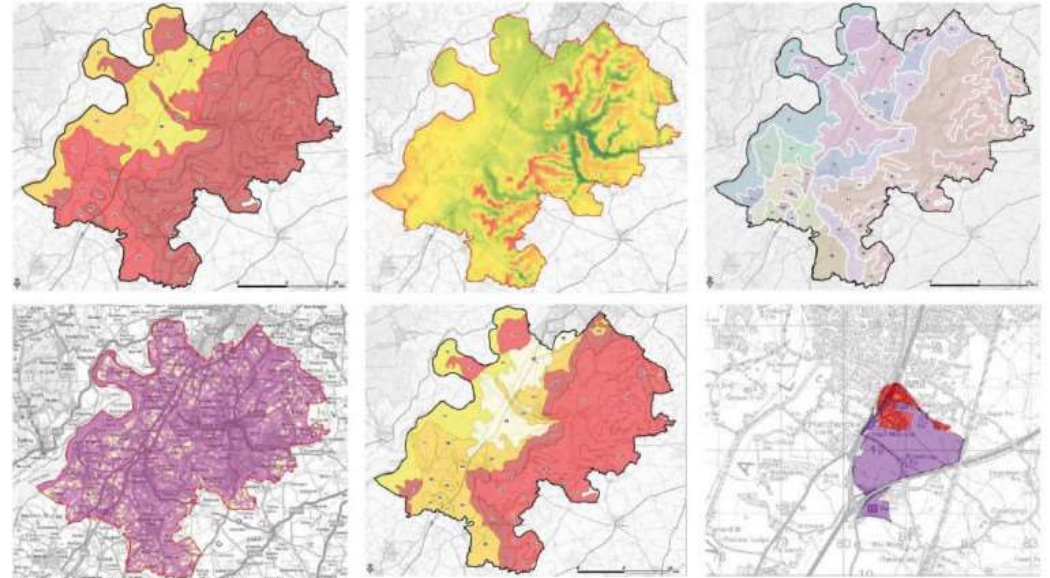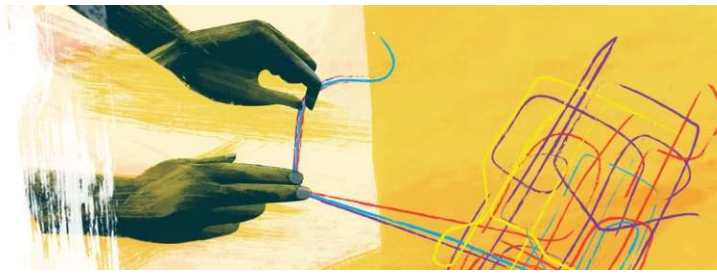
What is a carbon footprint?

A carbon footprint is the total amount of greenhouse gases (including carbon dioxide and methane) that are generated by our actions.

Includes emissions across sectors including: industry and agriculture, food and waste, transportation and energy.

As well as the emissions coming from the production of goods, it also includes emissions from our consumption of goods and services (even if produced elsewhere!)

Used at different scales – globally, nationally, regionally, locally and individually.
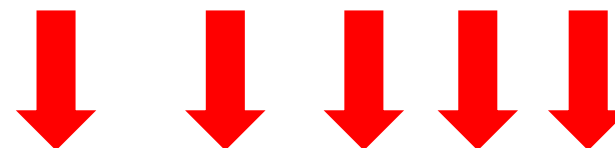
Why are they useful?

- To **compare** how nations and regions are doing against greenhouse gas emission reduction targets.

- To **prioritise actions** where there will be most impact in terms of emissions reduction.

- To **engage with people** on how they can reduce their individual footprints through behaviour change.

- To **underpin specific policies** for acting on the climate emergency.

IMPACT

- https://impact-tool.org.uk

- Part funded by CSE, BEIS and the UK Research Councils

- Project idea developed by CSE, as part of the Climate Emergency Support Programme, in response to requests from parish councils

- Co-developed with the University of Exeter – CSE working on consumption based footprinting, Exeter working on territorial based footprinting

- Developed in 2020, launched in 2021.

- Updated to include ward geographies, and data for Wales and Scotland

- Used by local authorities, parish and town councils and community groups

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IMPACT | Community carbon calculator

Using Impact   Calculate!   Analyse   Act   FAQs   Support us

Impact is a digital visualisation tool that helps you understand your community's carbon footprint. It works for parishes, wards and local authority areas.

It helps identify the areas where taking action to tackle climate change can make the biggest difference.

Before diving in, we recommend you read through our user guide:

Using Impact

Or if you know what you're doing, go ahead and calculate your footprint.

Two approaches to footprinting

Territorial

- Considers emissions arising within a given area. Includes emissions from industry, roads, agriculture.
- Based on activities occurring there, even if local people don't 'demand' these (e.g. motorway passing through, factory producing goods for export).
- Comparable to regional and national approaches.
- Less useful for targeting local action.
- Cuts national/regional datasets down to the local geography
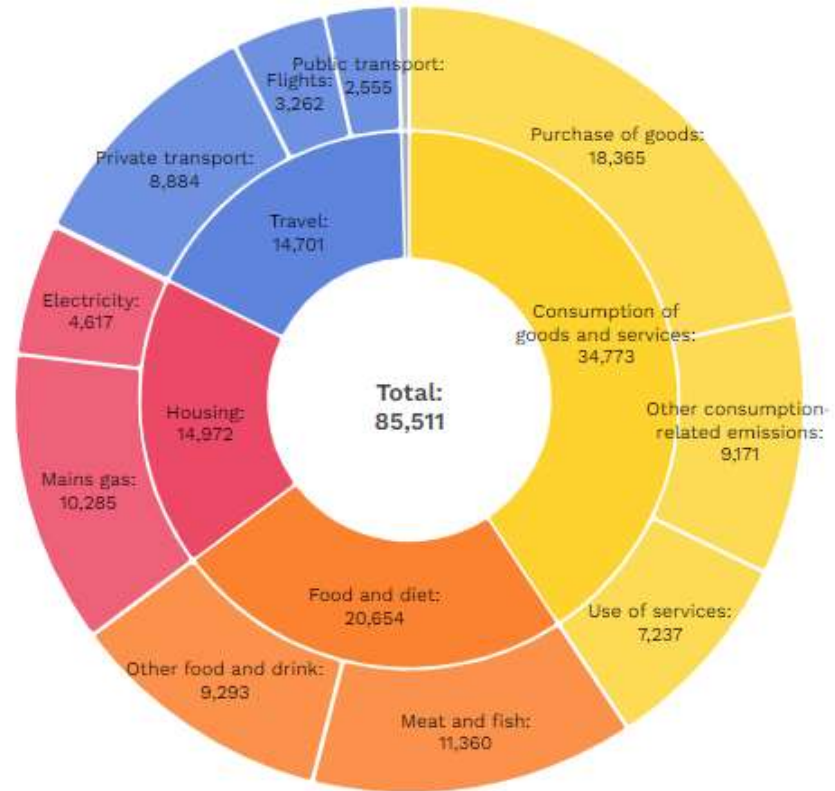
Consumption

- Largely based on household/address level data, aggregated up.
- Includes things people 'choose' to consume, such as imported goods, food, appliances.
- Transport looks at miles driven/flown, not presence of road in the area.
- Housing energy same as territorial.

Consumption categories

Housing
Emissions resulting from residents' use of energy in their homes.

Food and diet
Emissions resulting from the consumption of food and drink products by residents.

Travel
Emissions resulting from the transport choices & behaviours of residents.

Waste
Emissions resulting from the management of waste generated by residents.

Consumption of goods and services
Emissions resulting from the purchase of goods and the use of services by residents.

Public transport: 2,555
Flights: 3,262
Private transport: 8,884
Travel: 14,701
Electricity: 4,617
Housing: 14,972
Mains gas: 10,285
Other food and drink: 9,293
Food and diet: 20,654
Meat and fish: 11,360
Purchase of goods: 18,365
Consumption of goods and services: 34,773
Other consumption-related emissions: 9,171
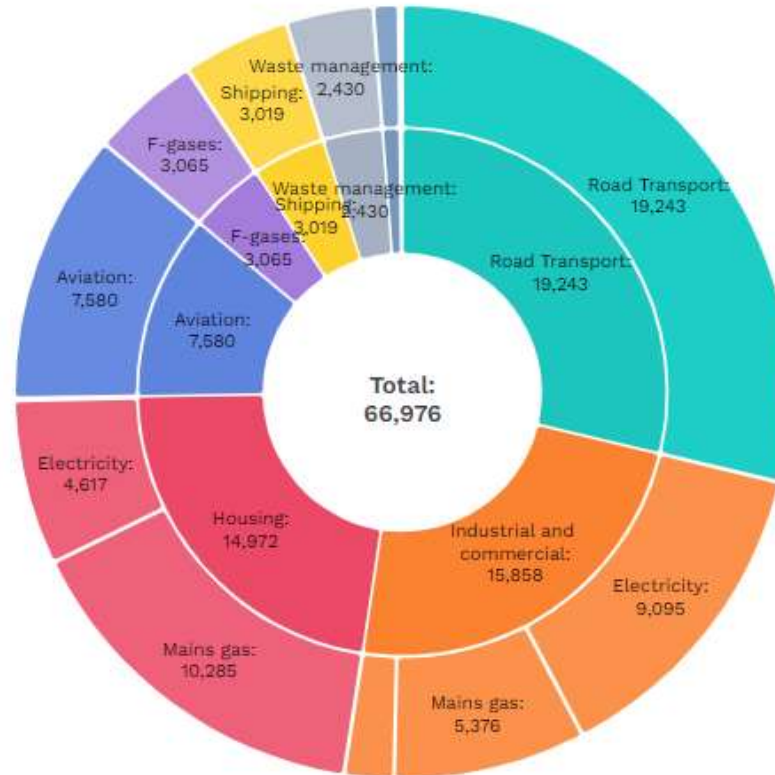Use of services: 7,237
Total: 85,511

Goods – all household goods (not food), including homeware, toiletries, medicines, furnishings, electronic goods, appliances, & large items such as cars.

Services – use of services, including the maintenance and repair of home, vehicles and other equipment, banking and insurance, medical services, treatments, education costs, communications (e.g. TV, internet and phone contracts), and other fees and subscriptions.

Other – leisure, entertainment, sporting or social activities.

Territorial categories

Road Transport
Emissions from road vehicles within your ward.

Housing
Emissions from domestic energy consumption.

Aviation

Industrial and commercial
Emissions from industrial processes and energy consumption.

Shipping
Emissions from international shipping.

F-gases
Release of 'f-gases' into the atmosphere.

Waste management

Diesel fuelled railways

Other Transport

Agriculture
Emissions from livestock, crops and agricultural vehicles and machinery.

Waste management: 2,430
Shipping: 3,019
F-gases: 3,065
Waste management: 2,430
Shipping: 3,019
F-gases: 3,065
Road Transport: 19,243
Road Transport: 19,243
Aviation: 7,580
Aviation: 7,580
Electricity: 4,617
Housing: 14,972
Total: 66,976
Industrial and commercial: 15,858
Electricity: 9,095
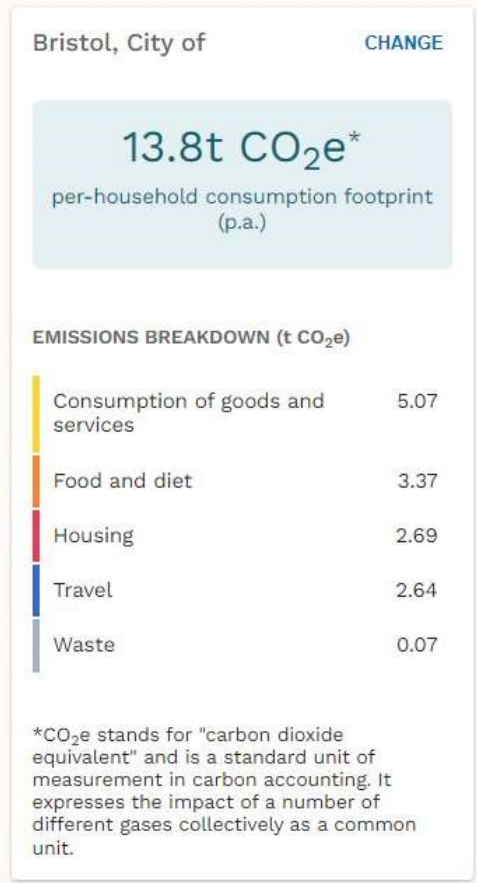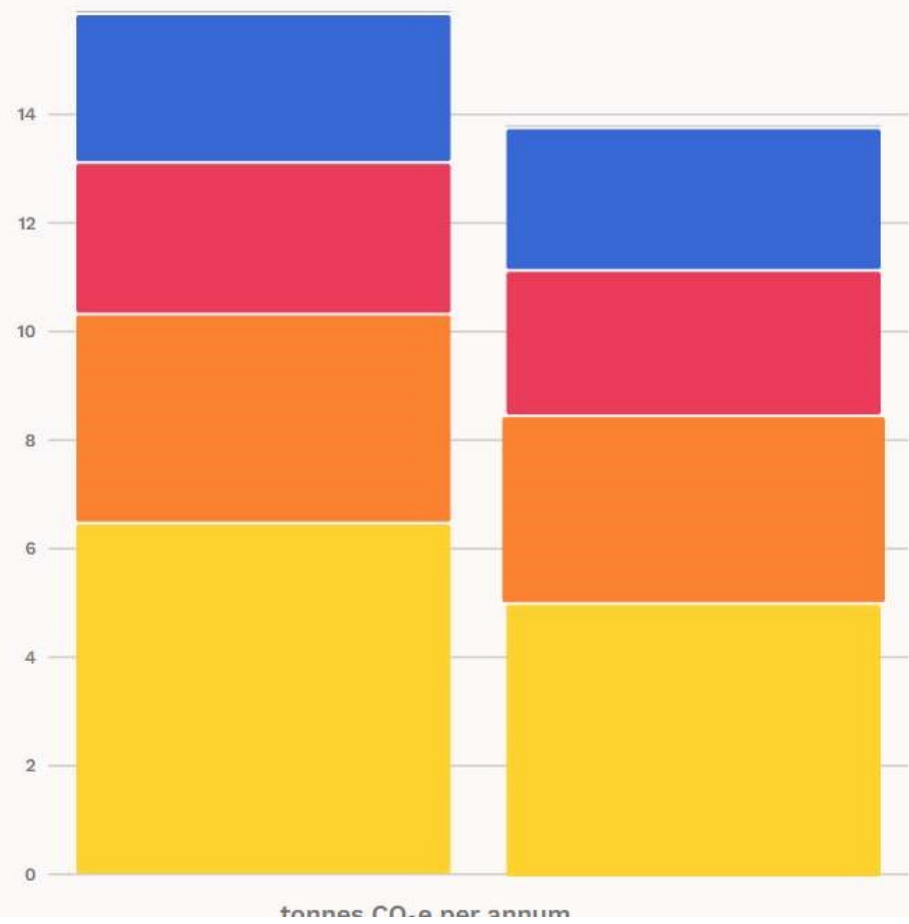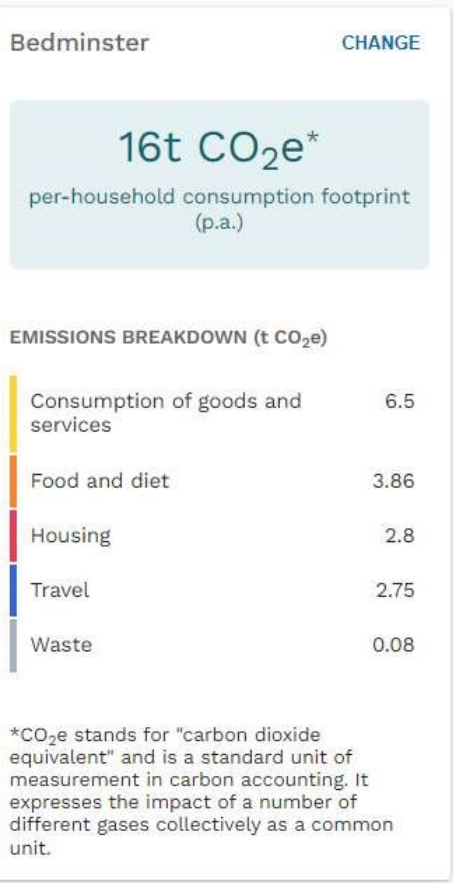Mains gas: 10,285
Mains gas: 5,376

Which footprint is more useful?

- Territorial footprints at the small community level largely tell you who you need to lobby

- Consumption footprints at the small community level are more likely to show you the changes you can make personally, and in individual households

- Both actions are needed!

Can be used comparatively

Bedminster — CHANGE

16t CO_2e*
per-household consumption footprint (p.a.)

EMISSIONS BREAKDOWN (t CO_2e)

Consumption of goods and services	6.5
Food and diet	3.86
Housing	2.8
Travel	2.75
Waste	0.08

*CO_2e stands for "carbon dioxide equivalent" and is a standard unit of measurement in carbon accounting. It expresses the impact of a number of different gases collectively as a common unit.

Bristol, City of — CHANGE

13.8t CO_2e*
per-household consumption footprint (p.a.)

EMISSIONS BREAKDOWN (t CO_2e)

Consumption of goods and services	5.07
Food and diet	3.37
Housing	2.69
Travel	2.64
Waste	0.07

*CO_2e stands for "carbon dioxide equivalent" and is a standard unit of measurement in carbon accounting. It expresses the impact of a number of different gases collectively as a common unit.

tonnes CO_2e per annum

16t CO$_2$e*

per-household consumption footprint (p.a.)

EMISSIONS BREAKDOWN (t CO$_2$e)

Consumption of goods and services	6.5
Food and diet	3.86
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Travel	2.75
Waste	0.08

PDF Report 🖹

*CO$_2$e stands for "carbon dioxide equivalent" and is a standard unit of measurement in carbon accounting to assess the impact of a number of different gases collectively as a common unit.

Download your PDF report
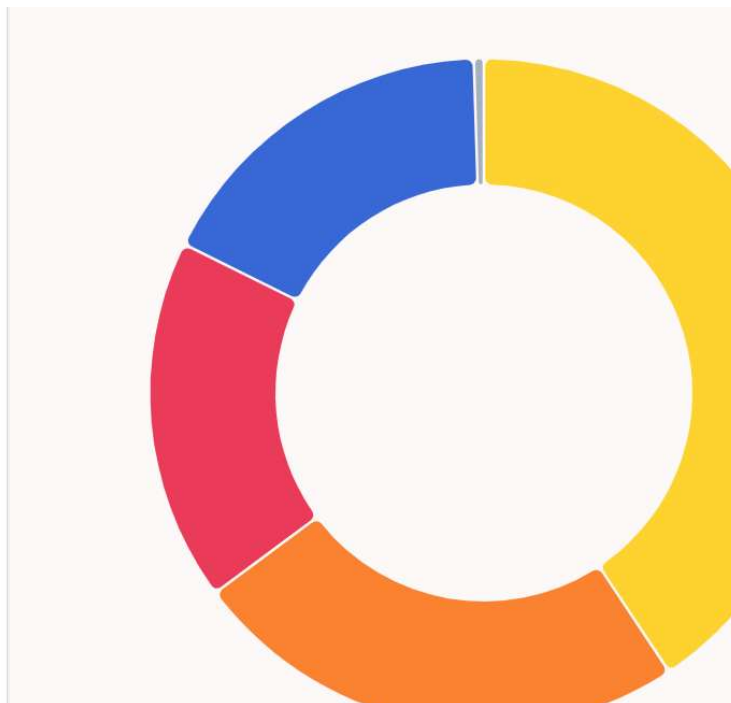
Housing

Change targets:

- Hugely reduced energy demand from buildings, including heritage assets
- Smarter & more flexible management of energy demand, including storage
- Decarbonised heat delivery
- New buildings and developments that achieve net zero emissions, (including associated new transport)

Your community's residents' use of energy in their homes results in annual carbon emissions per household of 2.8 t CO$_2$e. This compares with 2.7 t CO$_2$e at the district level and 3.5 t CO$_2$e at the national level. In the average UK home, 64% of energy is used for space heating, 17% for heating water, 16% for lighting and appliances, and 3% for cooking[3]. As such a large proportion of household energy is used for heating, the type of heating system (i.e. is it low carbon?), and how well the home retains heat, are critical factors shaping the scale of a home's emissions. How well a home retains heat depends on a number of factors, including: when and how it was built; how much insulation has been installed; how draughty the home is; the efficiency of the windows; and the behaviour of the residents.

Carbon footprints covering a large geographical area will encompass a range of smaller communities with different housing types and demographics. This will influence the types of activities which are most likely to be successful and have the greatest impact in terms of reducing emissions from housing.

Below are some trigger questions to help you to start to think about the implications of your community's household footprint information.

- How does your community's household energy use compare with the the district and national averages? What might the reasons be for the differences?
- What type of housing is there in your community? And what is the main heating fuel (oil, gas, electricity, etc.)?
- Is the housing easily retrofitted to improve how well it retains heat and install low carbon heating? Do you know if residents are doing this? Are there already initiatives to increase demand and encourage and support residents to take action?

[3] Energy facts from: Energy consumption in the UK, BEIS (January 2021)

Take your footprint as a guide, not as gospel

"All models are wrong, but some are useful"

- We have tried hard to make this as useful for you as possible but please bear in mind:

- This is a **model** and therefore decisions have been taken in terms of what data is used, and how it is cut and analysed.

- If you'd like to understand the datasets and methods used: https://impact-tool.org.uk/static/doc/Impact-methodology-paper-v1.7.pdf

- If you'd like to download the raw data and do your own analysis: https://impact-tool.org.uk/download

Context is key

- The data only shows one aspect of the picture

- It's a starting point to kickstart discussions

- You need to analyse your carbon footprint within the context of your area

- Think about <u>why </u>it may be showing what it shows – what can you do about this?

Not all footprints are equal!

Comparison of emissions from bottom and top income deciles covering the poorest and the wealthiest households respectively - all UK households (emissions in t.CO2/yr)
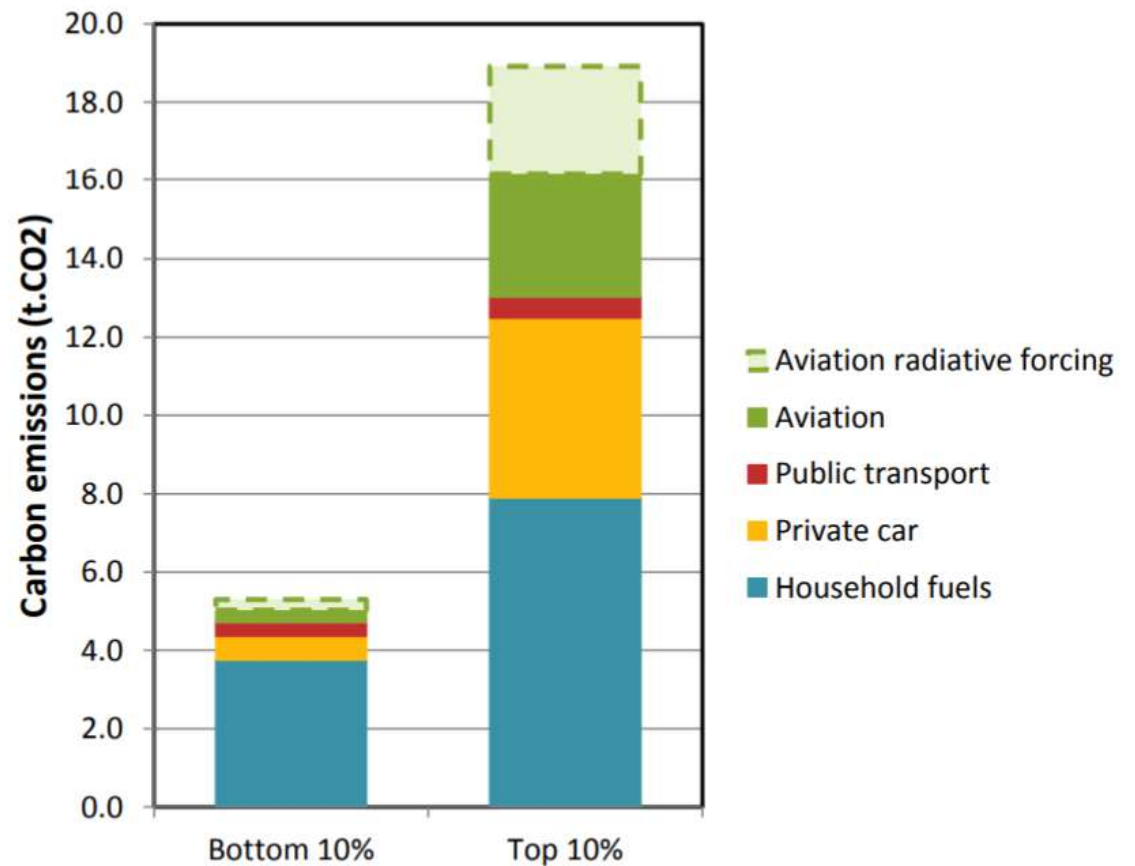
A tale of two towns

Town A

- Town on an estuary
- Population: ~10,000
- Entirely connected to gas (no oil heating)
- Mid-income to affluent area
- Services largely 'walkable'
- No significant roads, agriculture or industry

Town B

- Small village
- Population: 1,200
- Large A-road running through parish
- Agriculture is key 'industry'
- ¼ homes are off gas network
- Mid-income to affluent area
- A lot of car usage to drive to services
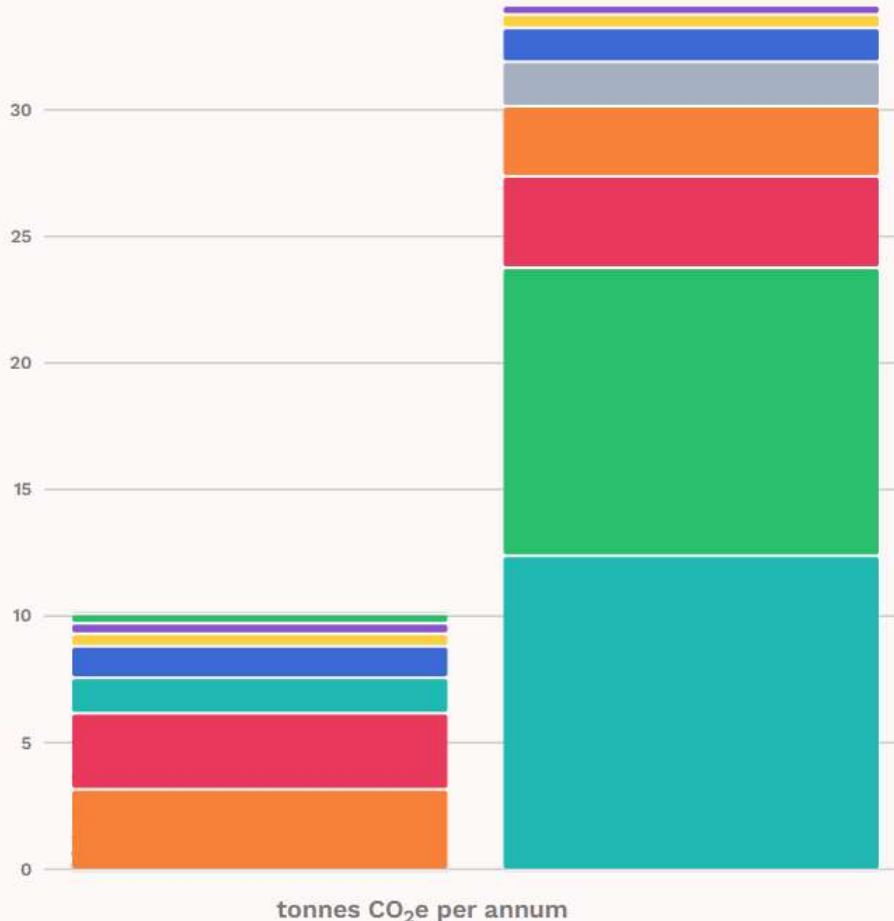
Town A or Town B?

CHANGE

10.4t CO₂e*

per-household territorial footprint (p.a.)

EMISSIONS BREAKDOWN (t CO₂e)

Industrial and commercial	3.22
Housing	3.04
Road Transport	1.42
Aviation	1.26
Shipping	0.5
F-gases	0.42
Agriculture	0.37
Waste management	0.14
Diesel fuelled railways	0.03
Other Transport	0

*CO₂e stands for "carbon dioxide equivalent" and is a standard unit of measurement in carbon accounting. It expresses the impact of a number of different gases collectively as a common unit.

CHANGE

34.4t CO₂e*

per-household territorial footprint (p.a.)

EMISSIONS BREAKDOWN (t CO₂e)

Road Transport	12.45
Agriculture	11.42
Housing	3.62
Industrial and commercial	2.78
Waste management	1.76
Aviation	1.34
Shipping	0.53
F-gases	0.36
Other Transport	0.09
Diesel fuelled railways	0.03

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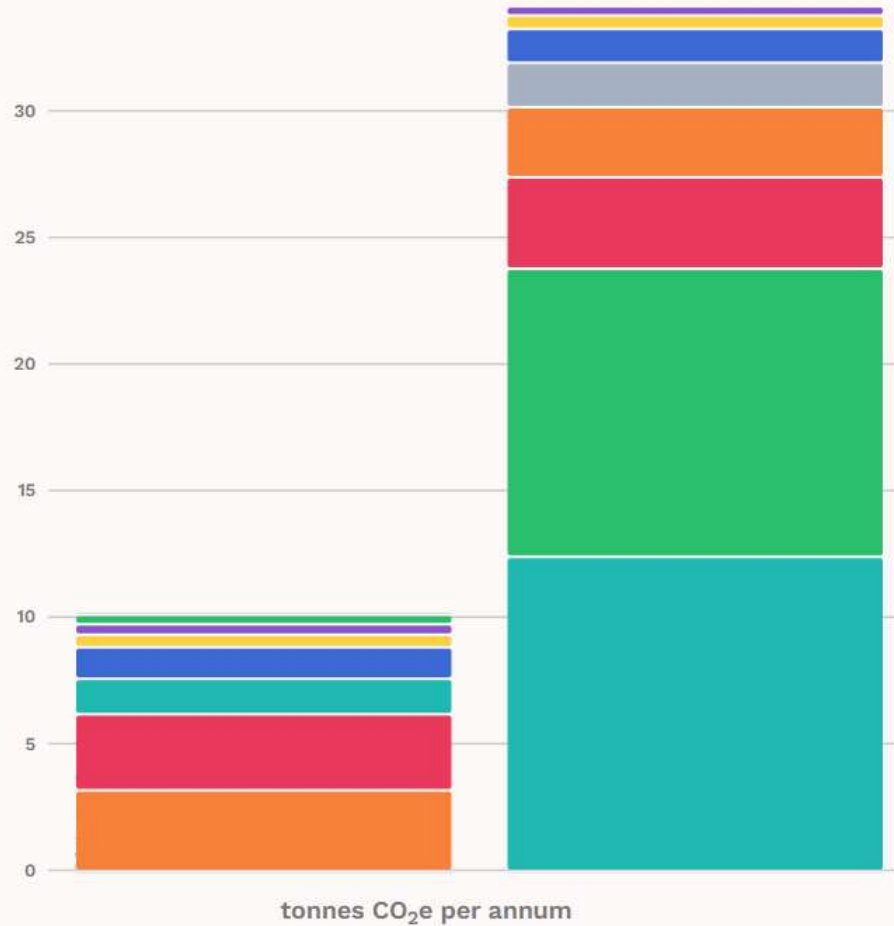
tonnes CO₂e per annum

Town A

CHANGE

10.4t CO_2e*

per-household territorial footprint
(p.a.)

EMISSIONS BREAKDOWN (t CO_2e)

Industrial and commercial	3.22
Housing	3.04
Road Transport	1.42
Aviation	1.26
Shipping	0.5
F-gases	0.42
Agriculture	0.37
Waste management	0.14
Diesel fuelled railways	0.03
Other Transport	0

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Town B

CHANGE

34.4t CO_2e*

per-household territorial footprint
(p.a.)

EMISSIONS BREAKDOWN (t CO_2e)

Road Transport	12.45
Agriculture	11.42
Housing	3.62
Industrial and commercial	2.78
Waste management	1.76
Aviation	1.34
Shipping	0.53
F-gases	0.36
Other Transport	0.09
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tonnes CO_2e per annum

Town A

ANGE

16.8t CO$_2$e*

per-household consumption footprint (p.a.)

EMISSIONS BREAKDOWN (t CO$_2$e)

Consumption of goods and services	5.91
Travel	4.03
Food and diet	3.69
Housing	3.04
Waste	0.08

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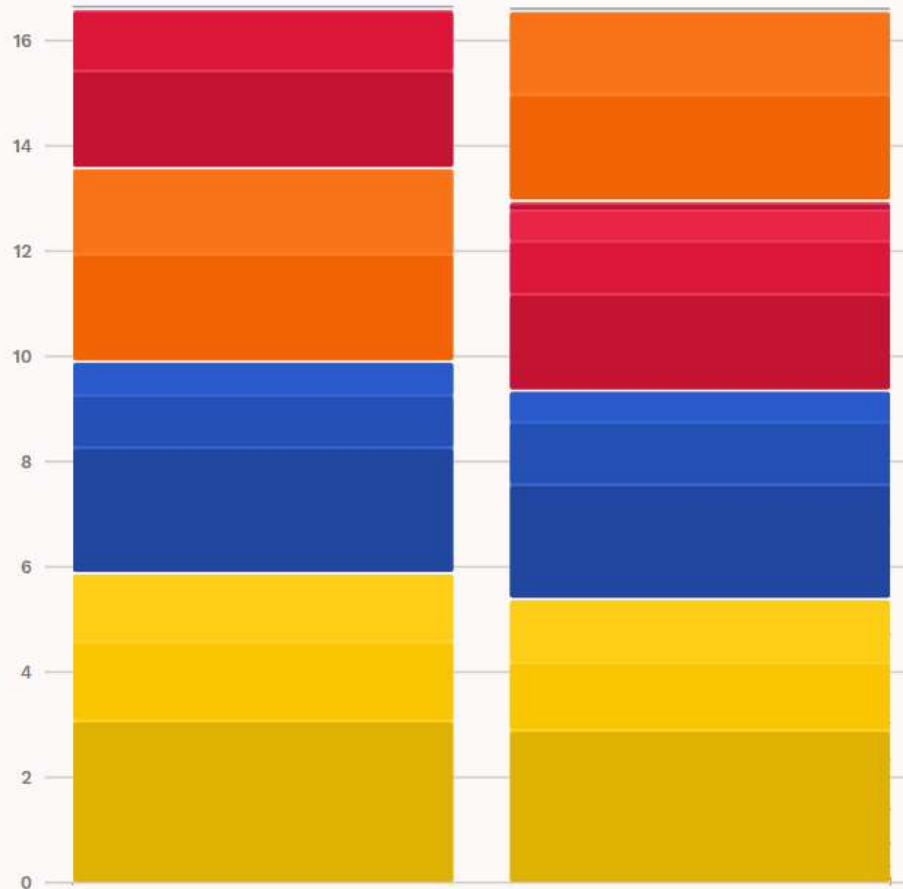
Town B

HANGE

16.7t CO$_2$e*

per-household consumption footprint (p.a.)

EMISSIONS BREAKDOWN (t CO$_2$e)

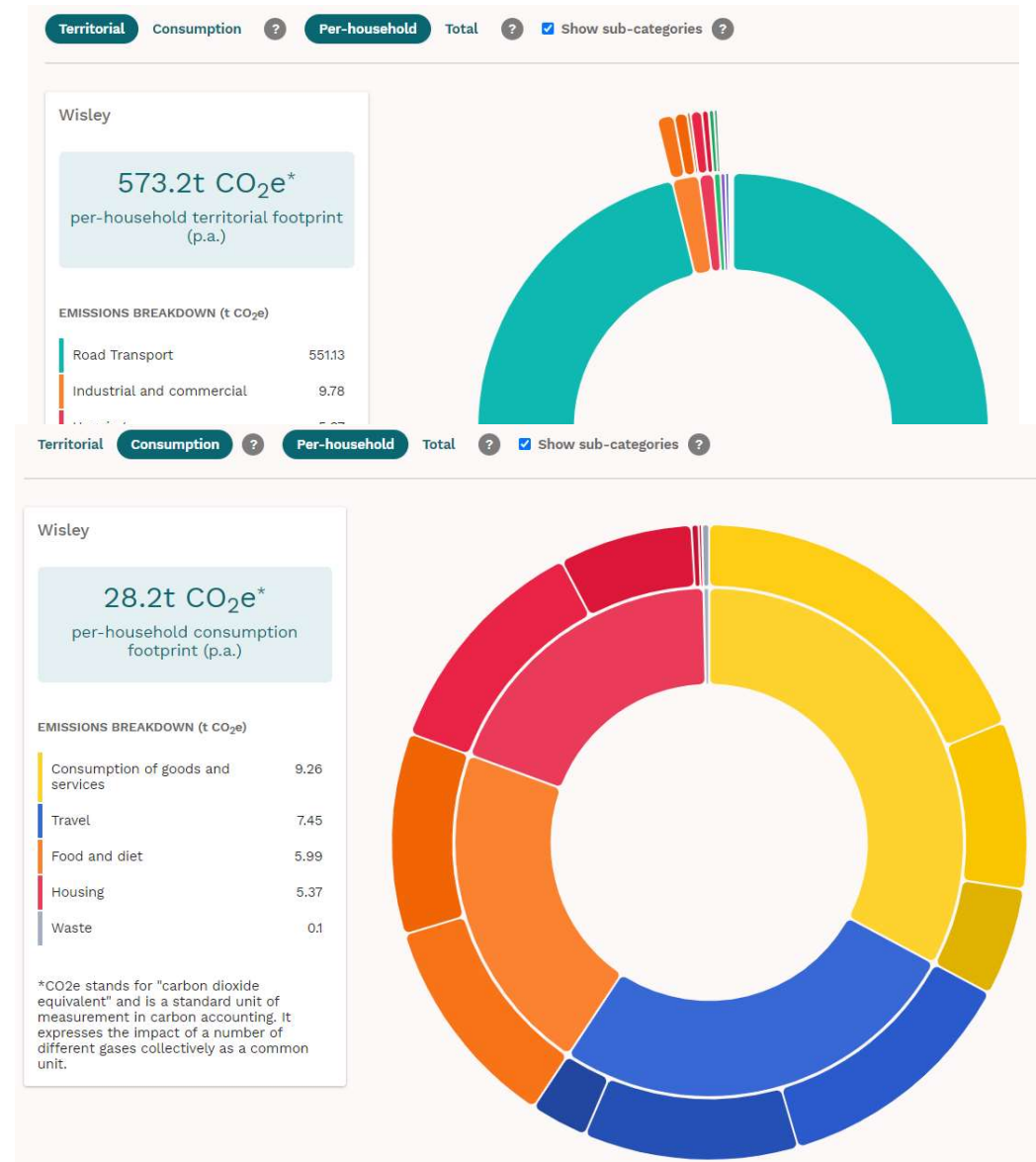|	
Consumption of goods and services	5.42
Travel	3.97
Housing	3.62
Food and diet	3.62
Waste	0.09

*CO2e stands for "carbon dioxide equivalent" and is a standard unit of measurement in carbon accounting. It expresses the impact of a number of different gases collectively as a common unit.

tonnes CO$_2$e per annum

An extreme example…

Town C
- Parish in a semi-rural area
- Lots of commuters
- Large A road and motorway running through it
- Very affluent

Territorial Consumption ? Per-household Total ? ☑ Show sub-categories ?

Wisley

573.2t CO₂e*
per-household territorial footprint (p.a.)

EMISSIONS BREAKDOWN (t CO₂e)

Road Transport	551.13
Industrial and commercial	9.78

Territorial Consumption ? Per-household Total ? ☑ Show sub-categories ?

Wisley

28.2t CO₂e*
per-household consumption footprint (p.a.)

EMISSIONS BREAKDOWN (t CO₂e)

Consumption of goods and services	9.26
Travel	7.45
Food and diet	5.99
Housing	5.37
Waste	0.1

*CO2e stands for "carbon dioxide equivalent" and is a standard unit of measurement in carbon accounting. It expresses the impact of a number of different gases collectively as a common unit.
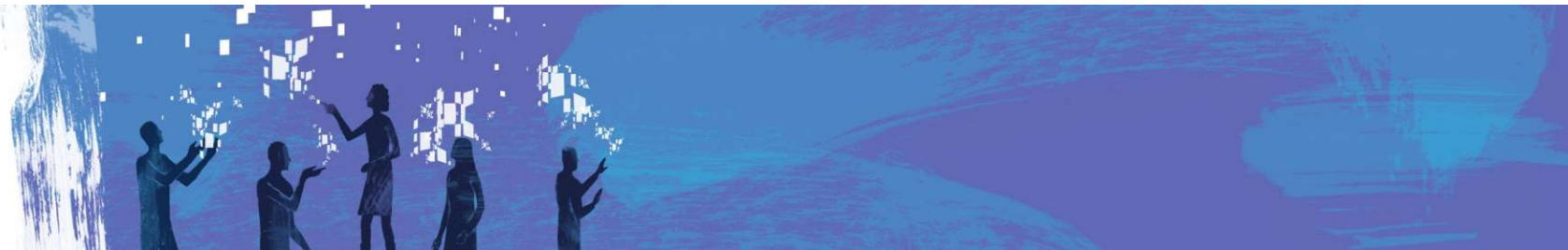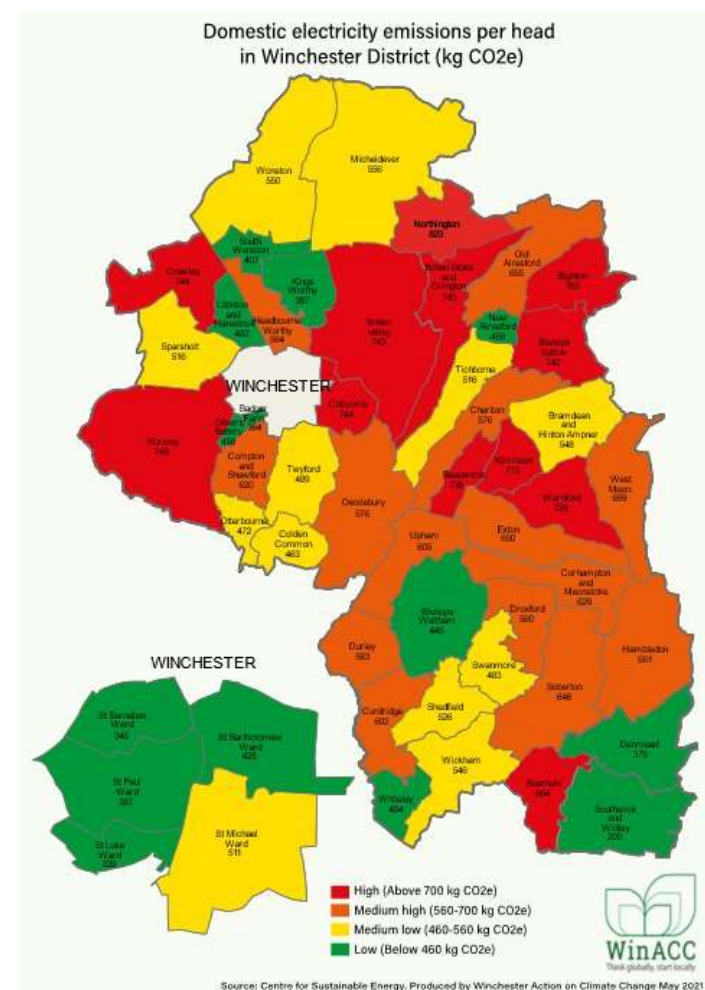
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Use cases

Visualising Impact data

- Community group: Winchester Action on the Climate Crisis

- Mapped the domestic household energy consumption data across each area

- Eye-catching way to engage residents and parish councils

- Packaged information up with online reports for each parish or ward – accessible online.

"The maps have been used as a springboard for communities to take relevant action, reducing energy consumption in their homes"

Domestic electricity emissions per head in Winchester District (kg CO2e)

Legend:
- High (Above 700 kg CO2e)
- Medium high (560-700 kg CO2e)
- Medium low (460-560 kg CO2e)
- Low (Below 460 kg CO2e)

Source: Centre for Sustainable Energy. Produced by Winchester Action on Climate Change May 2021

Sharing Impact information with residents

Itchen Valley Parish Council

- Published summary of local carbon footprint report in monthly magazine

- Following issues included more in-depth articles explaining the topic in more details

- Council used the report to develop household carbon reduction plans which were hand delivered to 600 houses

- Plans included suggestions for behaviour changes

"We know Itchen Valley's 'problem' areas and this knowledge has spurred us to create messages to educate our community, make each person feel included in the effort and motivate them to do their bit." – Steve Percy, chair of Environmental Committee

to be seen in a completely new way. If you are interested in the relationship between art and nature, this is a great place to visit. Afternoon is the better time to be in the garden we were advised, as the light is beautiful then and plays onto the sculptures giving yet another dimension to the effect. You need to book tickets in advance which does mean that the garden will never be overcrowded. Paths can be slippery, even in the summer, so it is best to wear "sensible" shoes! Our visit was definitely worth the wait.

Catherine Hann

The Valley's Carbon Footprint

Many of us hope that the climate crisis will be largely tackled by new technology, such as the expansion of wind and solar energy generation and the introduction of electric vehicles. However, we also know that drastically reducing our carbon emissions will require us all to make significant lifestyle changes. Many have already embraced significant changes whilst others are worried and some resistant. The scale of the challenge for us in the Itchen Valley is powerfully illustrated by data produced recently by the Centre for Sustainable Energy, (CSE). The CSE has calculated carbon footprints by parish using modelling that draws on information from more than 30 data sets, some of which themselves are made up of multiple data sets. We have been provided with a CSE Carbon Footprint Report for the Itchen Valley and it makes for a sobering read. Total estimated emissions in the Itchen Valley by household are shown below with comparative figures for the wider Winchester area and the UK overall, in

13

Using Impact to address local housing emissions

Tatham Parish Council

- Set up a "Carbon committee" of councillors and community members to focus projects and discuss ideas.

- Impact tool showed housing emissions made up 44% of total emissions (mainly off-gas)

- Sparked them to look at EPC ratings of homes in parish

- Energy survey and thermal imaging for households

- Larger programme for retrofitting being developed by the committee

- Set up "Energy Action" public meeting with speakers to engage the community

Common questions

- **When does it get updated?**

We aim to update the underlying data at least once a year, although this is dependent on the availability of funding.

Common questions

- **Why might these figures differ from those presented in reports produced by others?**

The outputs of a carbon footprint calculation are dependent on the scope of the assessment and the methods used, and these can vary considerably from study to study. Our tool presents a territorial and a consumption-based approach to footprinting, whereas other calculation methods may use a combination of the two. The underlying data used might also differ, for example where we have used address-level Experian MOSAIC household classification data to estimate the consumption-based footprint, others might use locally-collected survey data to do the same thing.

Common questions

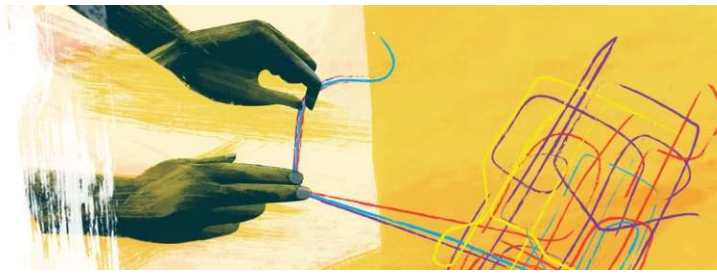- **The data for my area doesn't look right**

Often there is a logical explanation for this

If territorial emissions look high:

1. Think about characteristics of your area (using a map can be helpful)

2. There may be a lack of data

3. Linked to local authority as a whole (there may be a single large emitter skewing the data for all parishes in the local authority)
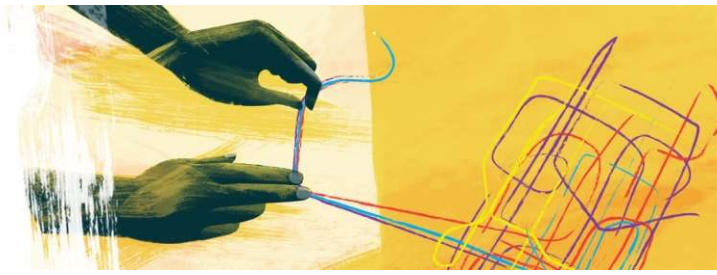
If consumption emissions look high:

1. Reflect on character of your area – think about affluence, property type, diet and public transport provision.

Further support

- Climate Action Planning events for local councils

- SLCC webinars

- General advice from our communities team:
  communities@cse.org.uk

- CSE's e-news:
  https://www.cse.org.uk/contact/enews-sign-up

SLCC webinars

- Energy Advice and Fuel Poverty Awareness for cost-of-living crisis

- Tackling the Climate Emergency at Local Level

- How to engage your community on the climate emergency

- Community Energy and Transport projects

Sign up: https://www.slcc.co.uk/events/webinar/

Questions?

Thank you

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www.cse.org.uk | @HelloCSE