centre for sustainable energy

Carbon Footprint Report:

Kirton in Lindsey

Civil parish

4/27/2022

1. Your Footprint Report

Welcome to your carbon footprint report!

This report tells you about your community's carbon[1] footprint – both the scale of emissions and the main activities responsible for the emissions. This information comes from *Impact* – an online region-level carbon emissions estimator: https://impact-tool.org.uk/.

The tool was developed by the Centre for Sustainable Energy and the University of Exeter, initially to make carbon footprinting at parish level possible. Since its inception a number of improvements have been made, including the ability to look at larger geographical areas.

Your report shows both 'consumption based' and 'territorial' emissions, and also shows how your footprint compares with the district average and the national average.

It shows your 'territorial' *and* 'consumption' footprints.

There are two ways of viewing a community's carbon footprint: territorial-based, or consumption-based.

Territorial footprints consider the emissions produced within a geographical boundary – such as from heating buildings, transport, industry, and agriculture – regardless of whether the residents within the community are engaged in or demand those activities. For example, if a factory lies within the boundary of a local authority, then regardless of whether what is produced in the factory is consumed locally or exported to other parts of the country (or world), the factory's emissions would still be counted as part of that local authority's territorial footprint. A territorial footprint is largely created by taking national and local authority datasets and cutting these down to the local geography in as accurate a way as possible.

A consumption footprint captures all the emissions produced as a result of the activities that the area's residents engage in, regardless of where geographically they occur. For example, emissions resulting from the food they eat, the clothes and household items they buy, the leisure activities they engage in, their travel behaviours, and the heating of their homes. The consumption-based footprint is based on household and address-level data, which is then aggregated up to the community level (rather than cutting down from a higher geography as with the territorial approach).

[1] A 'carbon' footprint, includes carbon dioxide as well as other gases which impact the climate.

Apples and pears.

Showing both territorial and consumption footprints gives you useful information, but it is important to recognise that the two footprints cannot be directly compared as they look at the question of 'where do our emissions come from' in different ways, using different methods, and with different datasets.

Take your footprint as a guide, not as gospel.

The carbon footprints are modelled, drawing on data from more than 30 datasets (some of which are themselves made up of multiple further datasets!). As with all models, decisions have been taken in terms of what data is used, and how the data is 'cut' and analysed. The Impact footprints have been developed with the intention that they are as useful as possible, but remember to take them as a guide, not as gospel.

If you would like more detail about the method and datasets, please read the Impact methodology paper: https://impact-tool.org.uk/static/doc/Impact-methodology-paper-v1.7.pdf.

You can also download the raw data here: https://impact-tool.org.uk/download

How does knowing our carbon footprint help us tackle climate change?

Footprint information can guide us to where we should target our efforts to reduce emissions and have the greatest impact. To help you think about what to do next with your footprint information, in each section of this report there are change targets for reaching net zero, and some trigger questions to help you think about possible areas for action.

Note that these footprints are intended to raise awareness and improve understanding of the types of activities which contribute to emissions in any given area in order to stimulate individual and collective action. Local Authorities may well have carried out their own analysis and have made climate emergency declarations, drafted action plans, set out policies or be delivering schemes. We hope that the Impact tool can be used to complement this activity.

2. Your Community's Consumption Footprint

Your whole footprint

This figure shows the annual carbon emissions (measured in tonnes CO_2e[2]) emitted as a result of the different activities that residents within your parish's boundary engage in – from heating to eating.

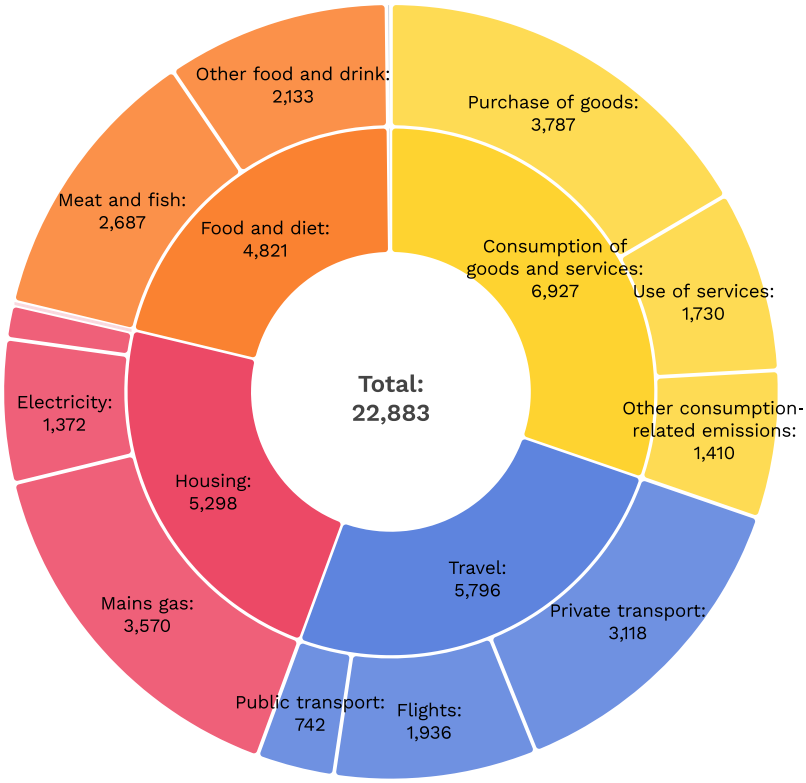
Housing
Emissions resulting from residents' use of energy in their homes.

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.



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.

A breakdown of the numbers

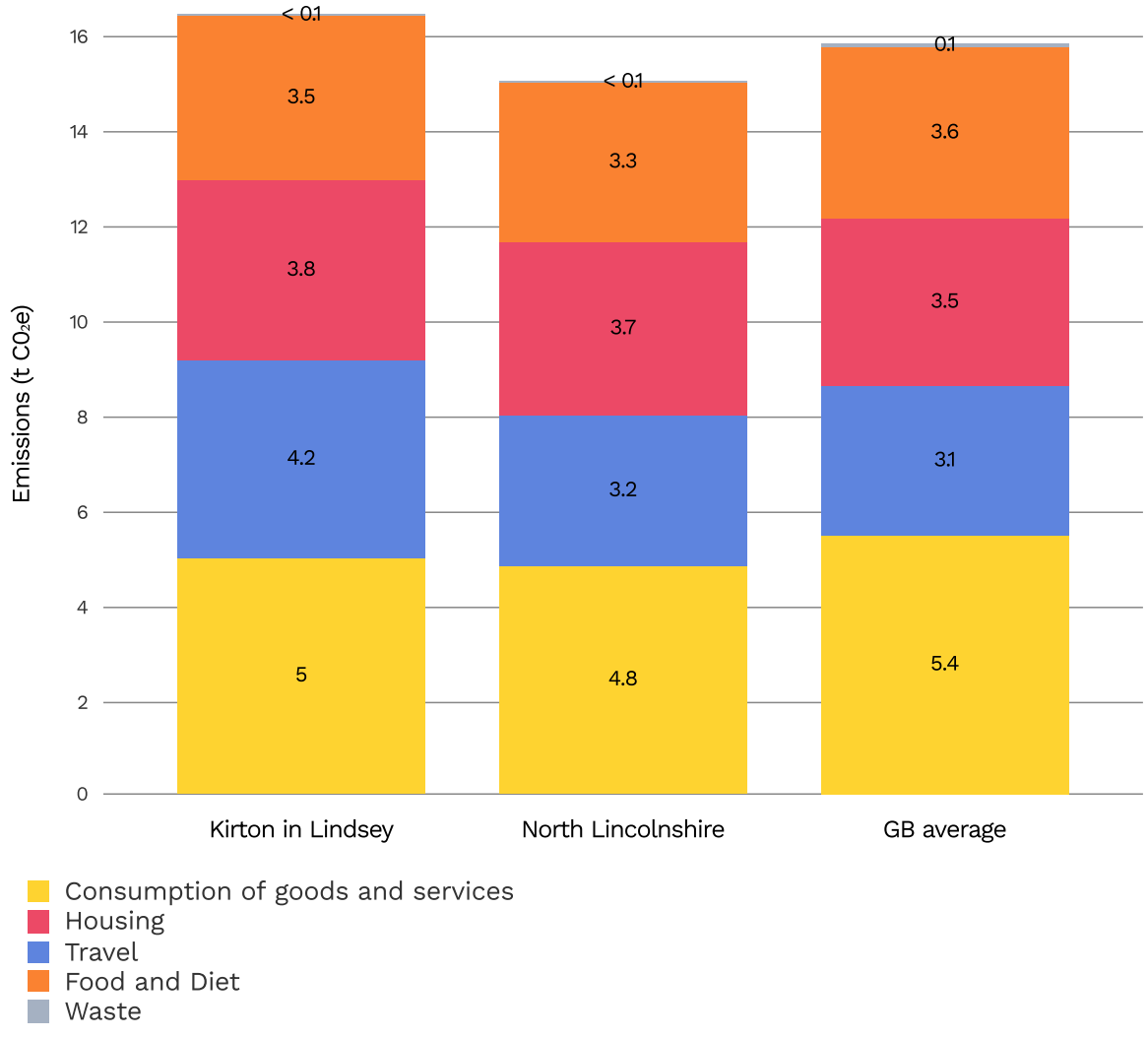
The table below shows your area's consumption footprint – total estimated emissions and per-household averages – so that you can see a breakdown of the numbers.

[2] 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.

	Total emissions (t CO_2e)	Per-household emissions (t CO_2e)	%
Total emissions	**22,883**	**16**	**100**
Consumption of goods and services	6,927	5	30
Travel	5,796	4.2	25
Housing	5,298	3.8	23
Food and diet	4,821	3.5	21
Waste	42	< 0.1	< 1

How does your area compare?

Here is what the average consumption footprint for your area looks like per household, and how this compares with the district average and the national average. Note that these per household footprints are averages. Within a larger (e.g. local authority) area you may have neighbourhoods with very different per household consumption footprints and it will be worth looking at more granular data if you are planning area-specific initiatives or messaging.



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 3.8 t CO_2e. This compares with 3.7 t CO_2e at the district level and 3.5 t CO_2e 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 anumber 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)

- What opportunities are there to retrofit community buildings?
- Many homes, public and commercial buildings have an Energy Performance Certificate (EPC) which measures the energy efficiency of the property. You can look at the EPCs of the buildings in your community here: https://epc.opendatacommunities.org
- Could you identify homes and buildings where the residents / owners have already made improvements, and showcase these – for example with an event?
- Have you explored local potential for renewable energy generation schemes, such as a solar farm, rooftop solar, or wind? Could a community owned (or jointly owned) initiative be possible?
- Are there opportunities to shift households, community buildings and businesses in your area onto green energy tariffs, where energy is generated from renewable sources?

Transport

Change targets:

- Reduced private car travel and a comparable increase in active and public transport
- A complete shift to electric vehicles (and an end to petrol & diesel cars & vans)
- Massively reduced air travel, particularly among frequent flyers

Car use: Residents' car use results in annual carbon emissions per household of 2.2 t CO_2e. This compares with 1.7 t CO_2e at the district level and 1.6 t CO_2e at the national level.

Air travel: Residents' air travel results in annual carbon emissions per household of 1.4 t CO_2e. This compares with 1 t CO_2e at the district level and 1.1 t CO_2e at the national level.

Public transport: Residents' use of public transport results in annual carbon emissions per household of 0.5 t CO_2e. This compares with 0.5 t CO_2e at the district level and 0.5 t CO_2e at the national level.

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

- How do your community's car use-related emissions compare to public transport emissions? And how do these both compare with the district and national averages? What might the reasons be for the differences?
- Could existing or new community schemes help residents shift their transport behaviours to using public transport (if this is a choice) or more active travel options (e.g. electric bike hire or subsidised purchase schemes)? How could the impact of local initiatives be increased?
- Is there scope more strategically to influence provision of public transport (e.g. routes, frequency, fares, subsidies, low carbon fleets)?
- What is the provision of walking and cycling routes like? How accessible are local service centres and facilities to residents in different neighbourhoods? Is it possible for most households to access what they need without needing to use a car?
- What do you think are the key reasons for air travel in your community? Are there likely to be differences between residents of different neighbourhoods? It is worth noting that about 10% of England's population take more than half of all international flights – so trying to address 'frequent flying' is a good way to target any activities or communications campaign.

Food & diet

Change targets:

- Altered dietary patterns & reduced food waste
- Widely adopted agricultural practices that reduce emissions & increase soil carbon

Meat and fish: Residents' consumption of meat and fish results in annual carbon emissions per household of 1.9 t CO_2e. This compares with 1.9 t CO_2e at the district level and 2 t CO_2e at the national level.

Other food and drink items: Residents' consumption of other food and drink items results in annual carbon emissions per household of 1.5 t CO_2e. This compares with 1.5 t CO_2e at the district level and 1.6 t CO_2e at the national level.

So, where do the emissions from our food actually come from? Without understanding this it can be difficult to know what we can do to change the carbon footprint of what we eat and drink.

Research shows us that changing ***what*** we eat will have a greater impact on carbon emissions than changing ***where*** our food has travelled from – although, of course, eating locally-produced food brings multiple other benefits such as supporting local economies, having more control over mandating more ethical and environmentally-beneficial growing practices, and creating opportunities for people to better understand where the food they eat comes from and how it's grown or made.

Whilst the emissions from a food item can really vary depending on how it is grown or reared, it is clear that animal products, and most significantly beef and lamb, account for the largest proportion of food-related emissions. Explore the BBC's Climate Change Food Calculator to better understand how food and drink items compare: https://www.bbc.com/future/bespoke/follow-the-food/calculate-the-environmental-footprint-of-your-food.html[3].

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

- How do your community's food and diet-related emissions compare with the district and national averages?
- Could you establish or support a behavioural change campaign to encourage people to reduce the amount of meat and dairy they consume? (It is critical that any community-based activity or communications campaigns around dietary changes is sensitive to concerns about farmers' livelihoods and people's cultural and traditional links to meat-eating).
- The amount of food wasted 'post-farm-gate' in the UK is equivalent to 22% of food purchased. What initiatives could raise awareness about food waste and encourage unwanted food to be redistributed (e.g. through a 'community fridge')?

Goods & services

Change targets:

- Hugely altered consumption patterns, buying less and re-using/repairing more
- Decarbonised power generation

Goods & services: Residents' consumption of goods and use of services results in annual carbon emissions per household of 5 t CO_2e. This compares with 4.8 t CO_2e at the district level and 5.4 t CO_2e at the national level.

[4] For further information, you can also read this Our World in Data (Oxford University) study: https://ourworldindata.org/food-choice-vs-eating-local

All goods that we buy will have had carbon emitted in their making (including the sourcing of raw materials), packaging, shipping and sale. Without clear carbon labelling, it is difficult to know the scale of emissions resulting from each item, but it is clear that with every new product made, more carbon is emitted (and more resources are extracted and sourced – which itself can have huge environmental and social impacts). Reducing how many *new* goods we buy in the first place is the best place to start in terms of reducing goods-related emissions; and then of course re-using and repairing items where goods are needed.

Carbon emissions from the services we use will relate to the energy used by that service provider (e.g. heating in a leisure centre, pub or hospital), as well as the carbon emitted as a result of goods they buy and use (e.g. gym equipment, vehicle repair machinery).

Here are some trigger questions to help you to consider ways to reduce emissions attributable to goods and services:

- How do your community's goods and services-related emissions compare with the district and national average? What might the reasons be for the differences?
- Are there opportunities to: grow the second-hand market; enable residents to upcycle and repair household items; share larger/more expensive/rarely used items, such as power tools?
- Are there opportunities to encourage businesses to switch to green energy tariffs (where energy is generated from renewable sources), or to support local businesses who want to reduce their emissions (e.g. with cargo bike deliveries to replace vans; energy efficiency improvements to buildings to reduce heat demand; low carbon procurement policies; local sourcing and carbon-conscious materials?

Waste

Change targets:

- Greatly increased recycling rates to achieve a circular economy model, taking plastics out of the waste stream
- Widespread, actively managed and planned carbon storage strategies

Waste: The management of residents' waste results in annual carbon emissions per household of 0.03 t CO_2e. (Emissions associated with waste management are distributed out evenly across the population.)

The waste ‘wedge’ in your carbon footprint may look small, but remember that emissions from the *management* of waste only represent a small fraction of the total emissions associated with every item that ends up in our bins or recycling boxes. So reducing waste in the first place is critical.

> - What sort of messaging could be effective in helping to reduce the amount of waste being generated (e.g. avoiding plastic packaging, water bottle refills, home composting)?
> - What initiatives are likely to be popular (e.g. local food boxes, repair cafes, swap shops)?

3. Territorial Footprint

Your whole footprint

This figure shows the annual carbon emissions (measured in tonnes) emitted as a result of activities taking place within your parish's boundary.

While these figures should give you a reasonable indication of the major sources of emissions within your parish's boundary, they should be taken with a small pinch of salt, as some sectors are difficult to apportion territorially. For example, emissions from international shipping are calculated for the whole country and apportioned to each parish based on its population. For more information, see the Impact methodology paper.

Road Transport
Emissions from road vehicles within your parish.

Housing
Emissions from domestic energy consumption.

Aviation

Industrial and commercial
Emissions from industrial processes and energy consumption.

Shipping
Emissions from international shipping.

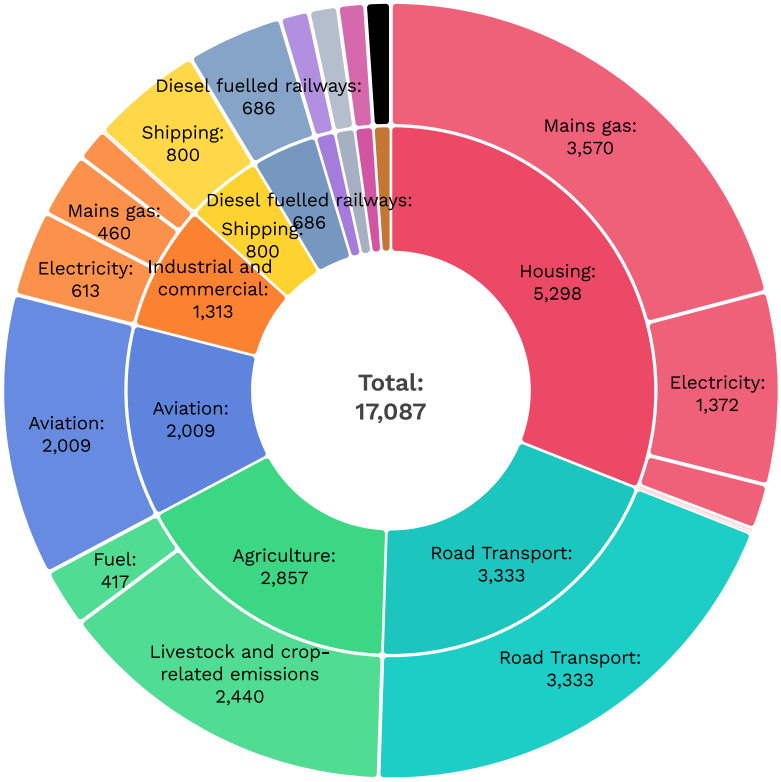
F-gases
Release of 'f-gases' into the atmosphere.

Waste management

Diesel fuelled railways

Other Transport

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



A breakdown of the numbers

The table below shows your parish's territorial footprint – total and per-household averages – so that you can see a breakdown of the numbers.

	Total emissions (t CO_2e)	Per-household emissions (t CO_2e)	%
Total emissions	**17,087**	**12**	**100**
Housing	5,298	3.8	31
Mains gas	3,570	2.6	21
Electricity	1,372	1	8
Oil	321	0.2	2
LPG	13	< 0.1	< 1
Biomass	12	< 0.1	< 1
Coal	10	< 0.1	< 1
Road Transport	3,333	2.4	20
Agriculture	2,857	2	17
Livestock and crop-related emissions	2,440	1.7	14
Fuel	417	0.3	2
Aviation	2,009	1.4	12
Industrial and commercial	1,313	0.9	8
Electricity	613	0.4	4
Mains gas	460	0.3	3
Other Fuels	238	0.2	1
Large industrial consumers	3	< 0.1	< 1
Shipping	800	0.6	5
Diesel fuelled railways	686	0.5	4
F-gases	208	0.1	1
Waste management	206	0.1	1
Other Transport	194	0.1	1
Land use, land-use change, and forestry	182	0.1	1

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

- Are there particular sectors which account for a high proportion of the territorial emissions in your community?
- Based on your knowledge, are these sectors surprising or are they what you would expect?
- Who are the key stakeholders you would need to engage with to address the emissions from the highest emitting sectors?
- For example – for agricultural emissions can you engage with local land owners, or the NFU/other farmer groups to understand what is happening in your area to reduce emissions from agriculture? For industrial and commercial emissions, are there ways that businesses could be supported with reducing their emissions? For road transport what changes would be needed to improve public and active travel links?

4. Sources of information

There are lots of sources of support and information on how to reduce carbon footprints – too many to list here! Here is an introductory range of resources that we hope will help you take your next steps now that you know your carbon footprint. Most of these contain many other links relevant to the topic under discussion:

- Developing a climate emergency action plan for your community (.xlsx)
- Communicating climate change (pdf)
- Energy efficient buildings (pdf)
- Funding and grants for community responses to the climate emergency (pdf)
- Making your community EV ready (pdf)
- Planting trees, and better land management (pdf)
- Further resources and useful links compendium (pdf)
- The National Association for Local Councils has also produced a list of case studies of local councils doing work on the climate emergency (link)
- The National Farmers Union has recently published guidance on how local government can engage with the farming community on climate change (link)