

Haddenham Parish Climate Emergency

Year 1

Report 27/01/21

Haddenham Horticultural Society Meeting

Nota Bene

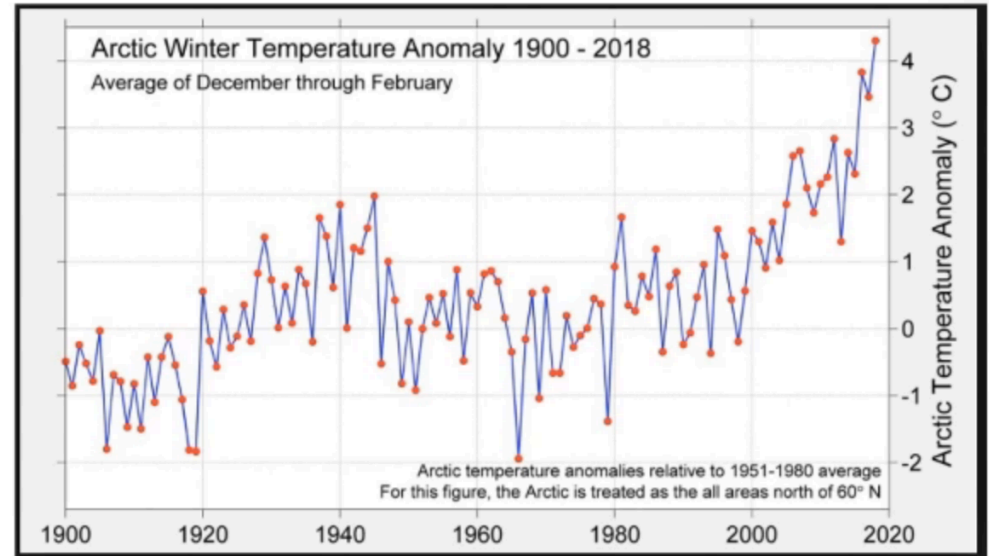
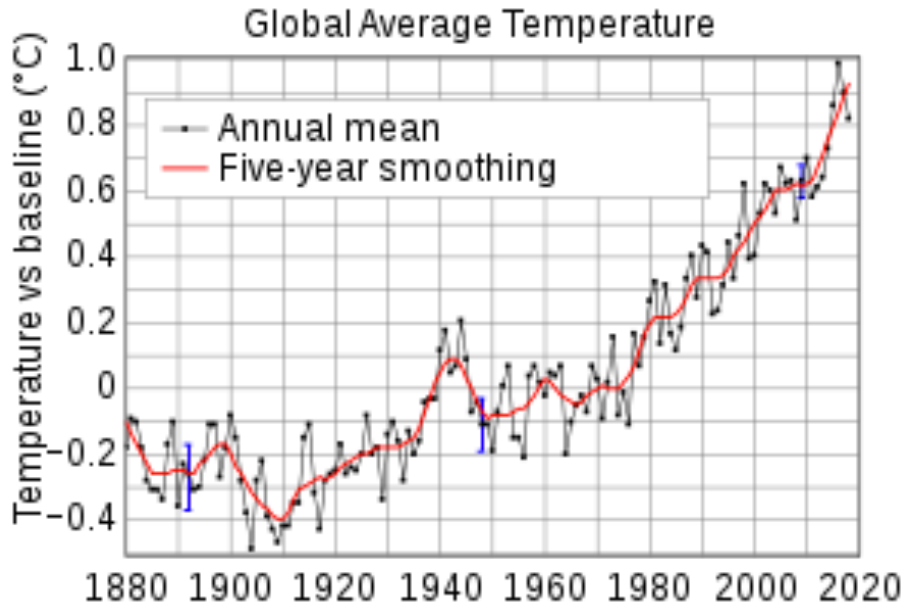
This is, and will always be, a work-in-progress. If you spot any errors, have better data and/or ideas and suggestions please alert both d.ohanlon@haddenham-bucks-pc.gov.uk & clerk@haddenham-bucks-pc.gov.uk

Updates and corrected versions will be issued

What's the rush?

Is this really an “emergency”?

The Arctic is Warming Faster Than The Global Average And The Ice Is Melting



These two graphs look the same – showing temperature rising in the last few decades. But the scales are different:

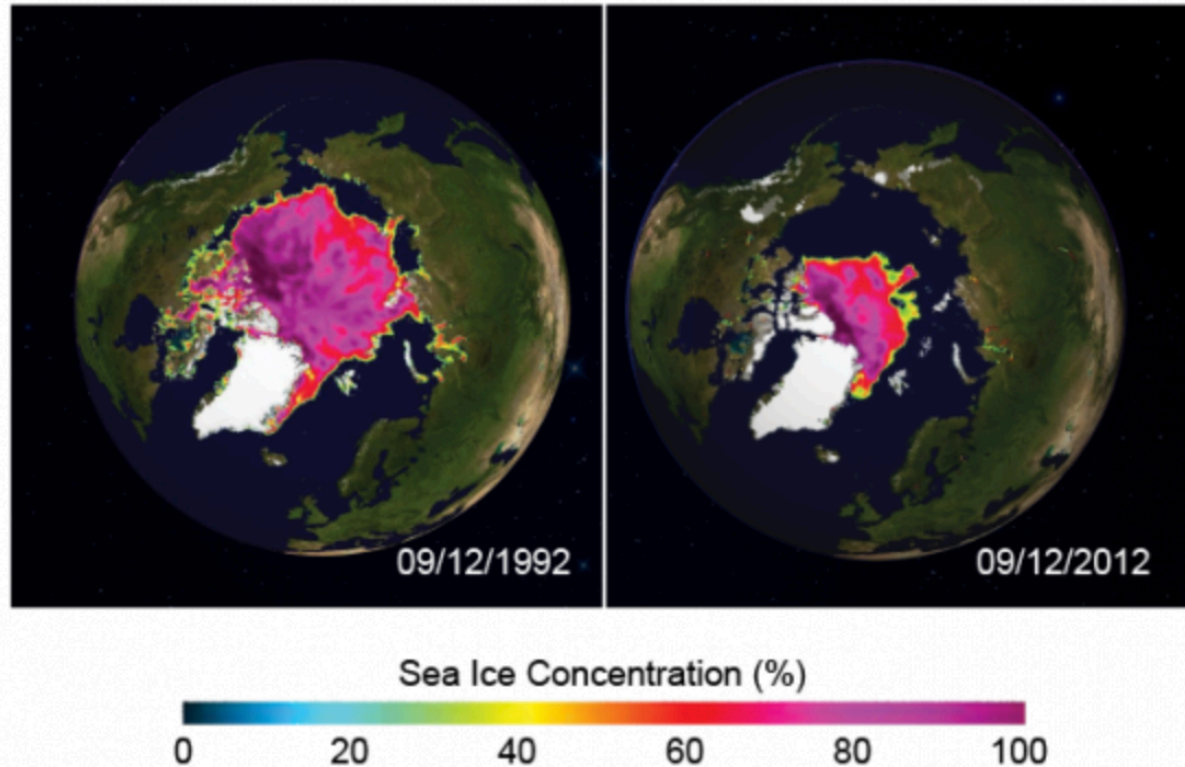
the global temperature on the left is from -0.5°C to + 1°C

the Arctic temperature on the right is from -2.5°C to +4.25°C

You'll notice the Arctic rise is all in the past 18 years

Sea Ice Decline Reduces Heat Reflection & Accelerates the Warming

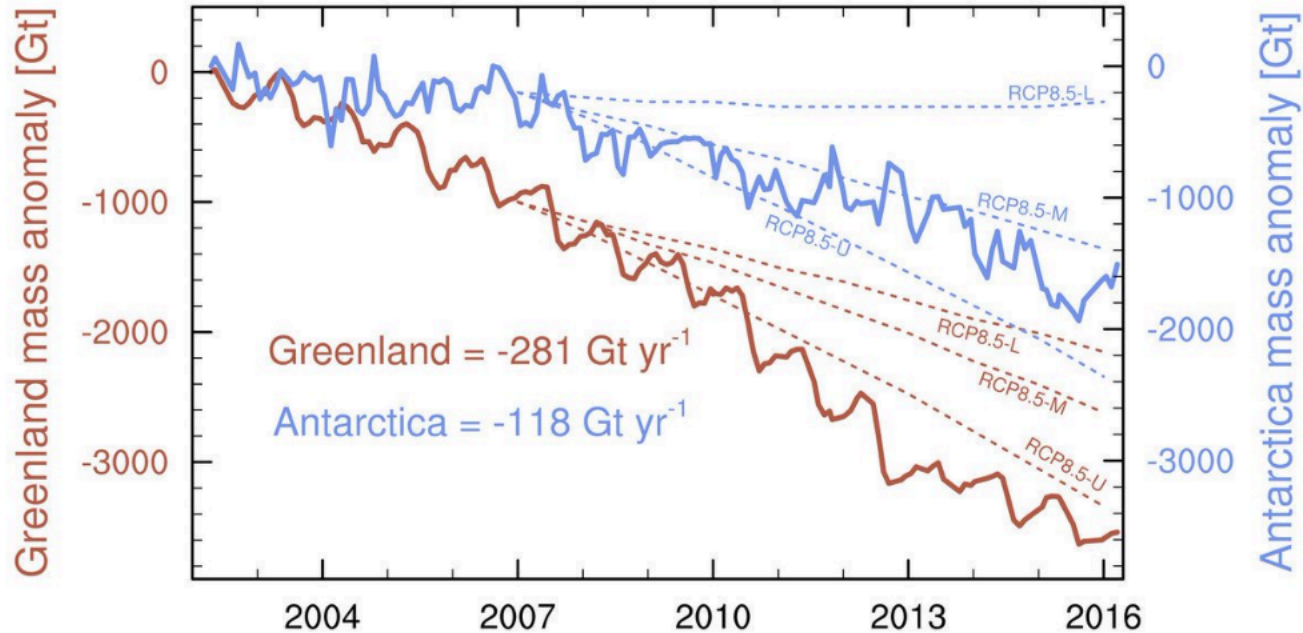
Arctic Sea Ice Decline



Ice reflects the sun's heat, while sea water absorbs it. This causes a vicious cycle

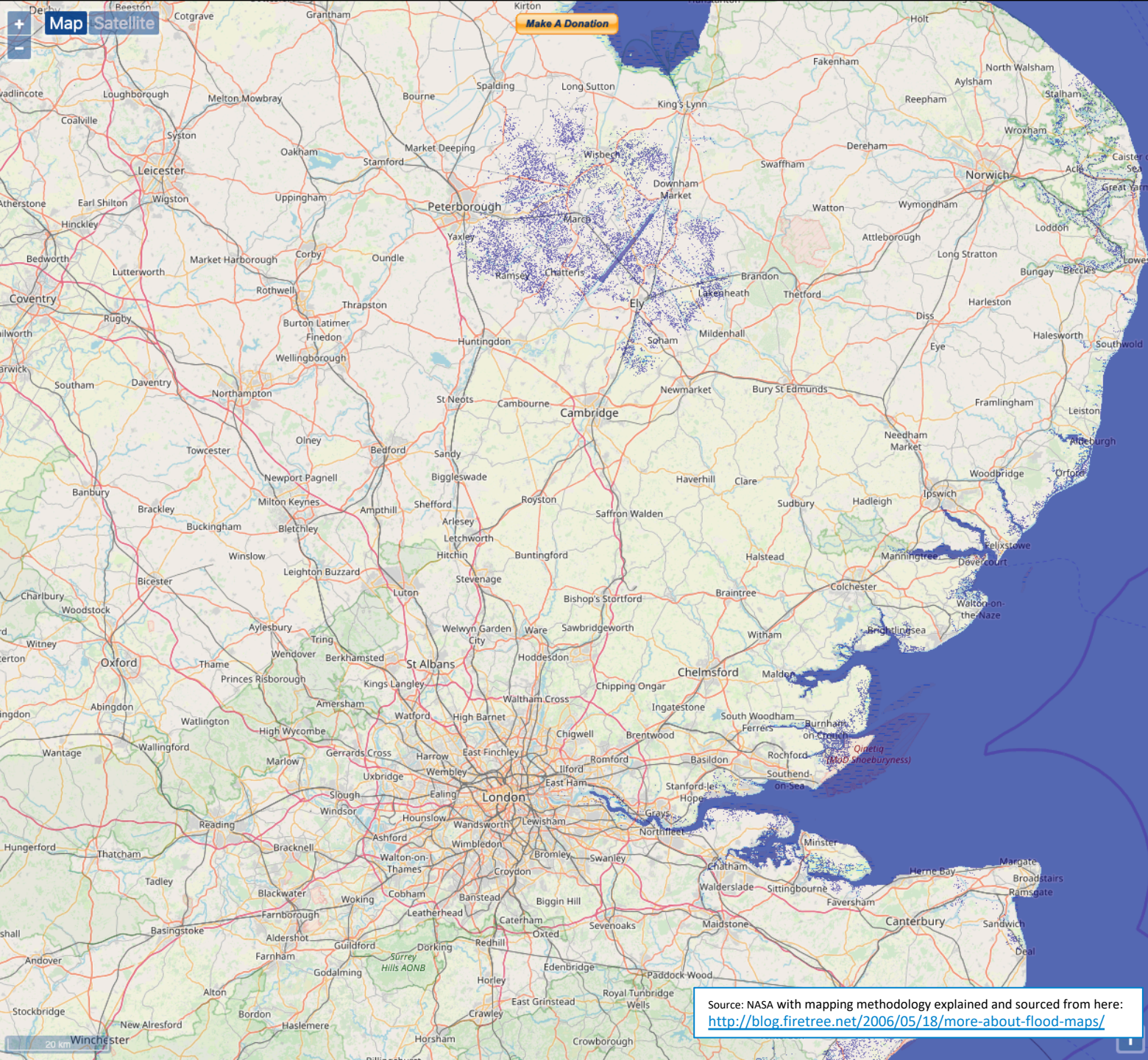
Sea Ice Decline Doesn't Raise Sea Levels But Greenland's Ice Melting Does

If all of Greenland's ice melts it will raise global sea levels by 7 metres (23 ft)



Graph shows ice loss of both Greenland & the Antarctic
Lines such as RCP8.5 show the modelled predictions from 2007 of the Lower [L], Medium [M] and Upper [U] amounts of ice expected to be lost
The actual loss has exceeded the worst-case prediction

Units are Giga [billions of] tonnes [Gt] of ice per annum [yr⁻¹]



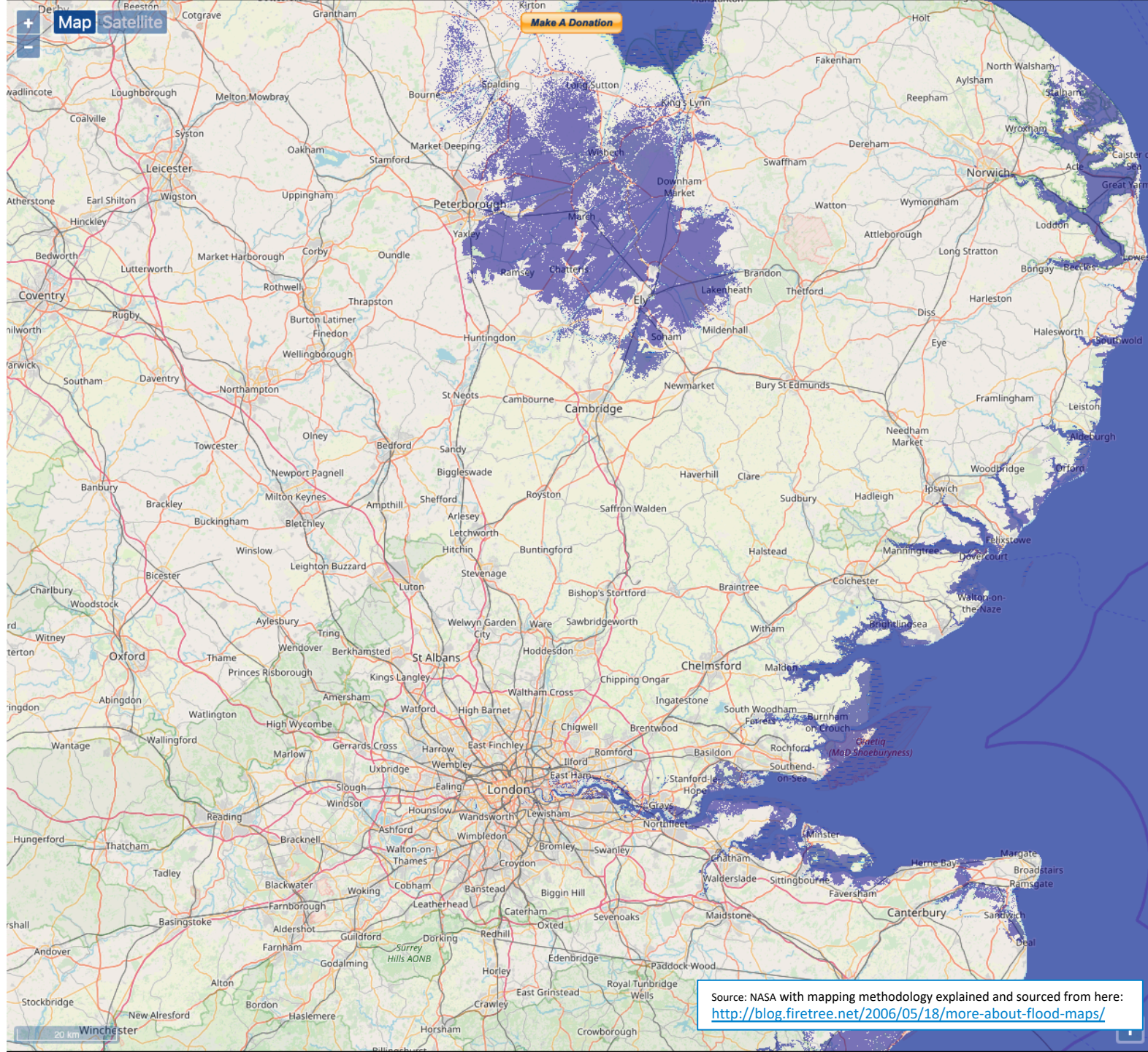
Map Satellite

Make A Donation

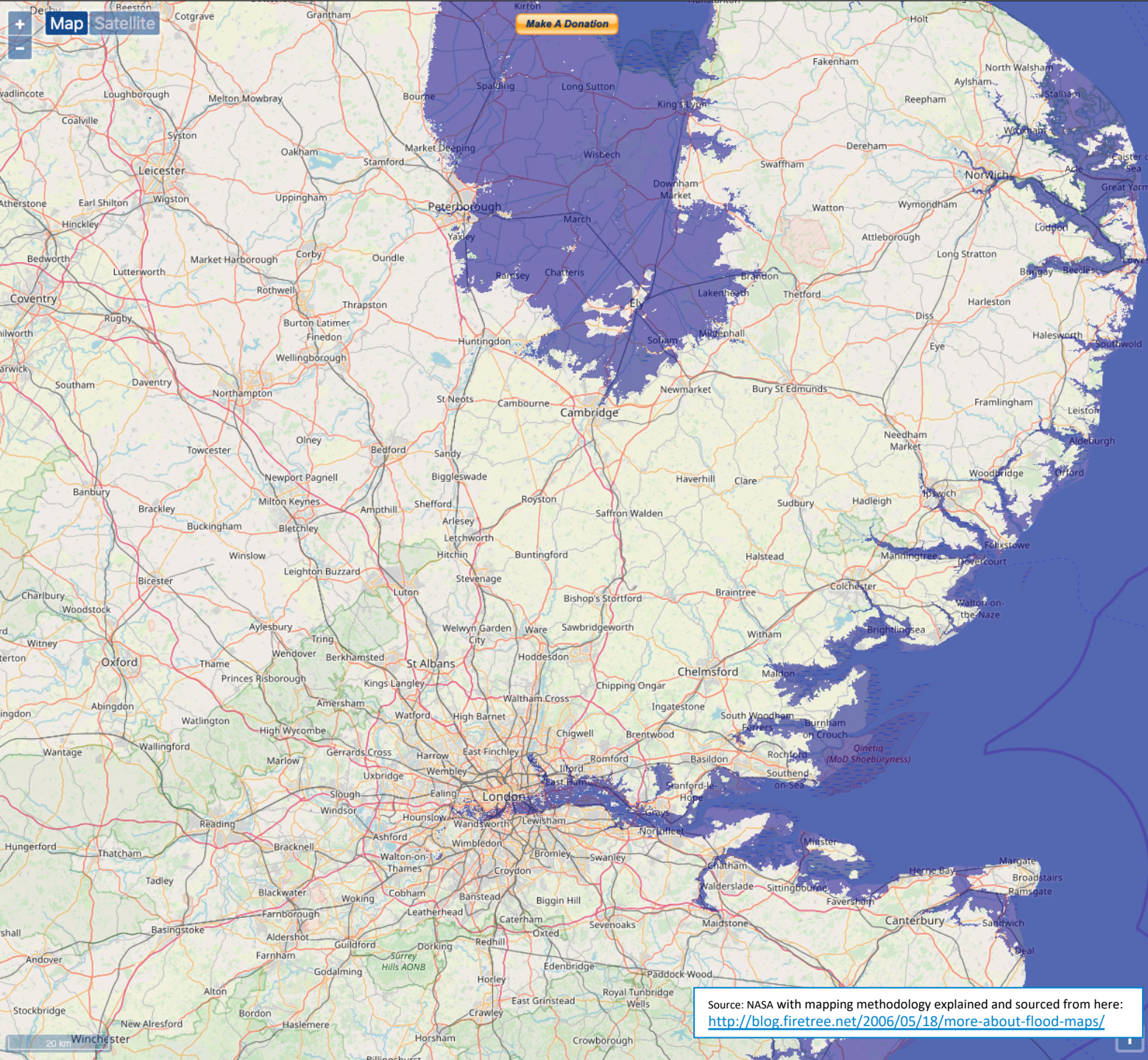
The UK today

Source: NASA with mapping methodology explained and sourced from here:
<http://blog.firetree.net/2006/05/18/more-about-flood-maps/>

The UK with a 2 metre rise in sea level



Source: NASA with mapping methodology explained and sourced from here:
<http://blog.firetree.net/2006/05/18/more-about-flood-maps/>



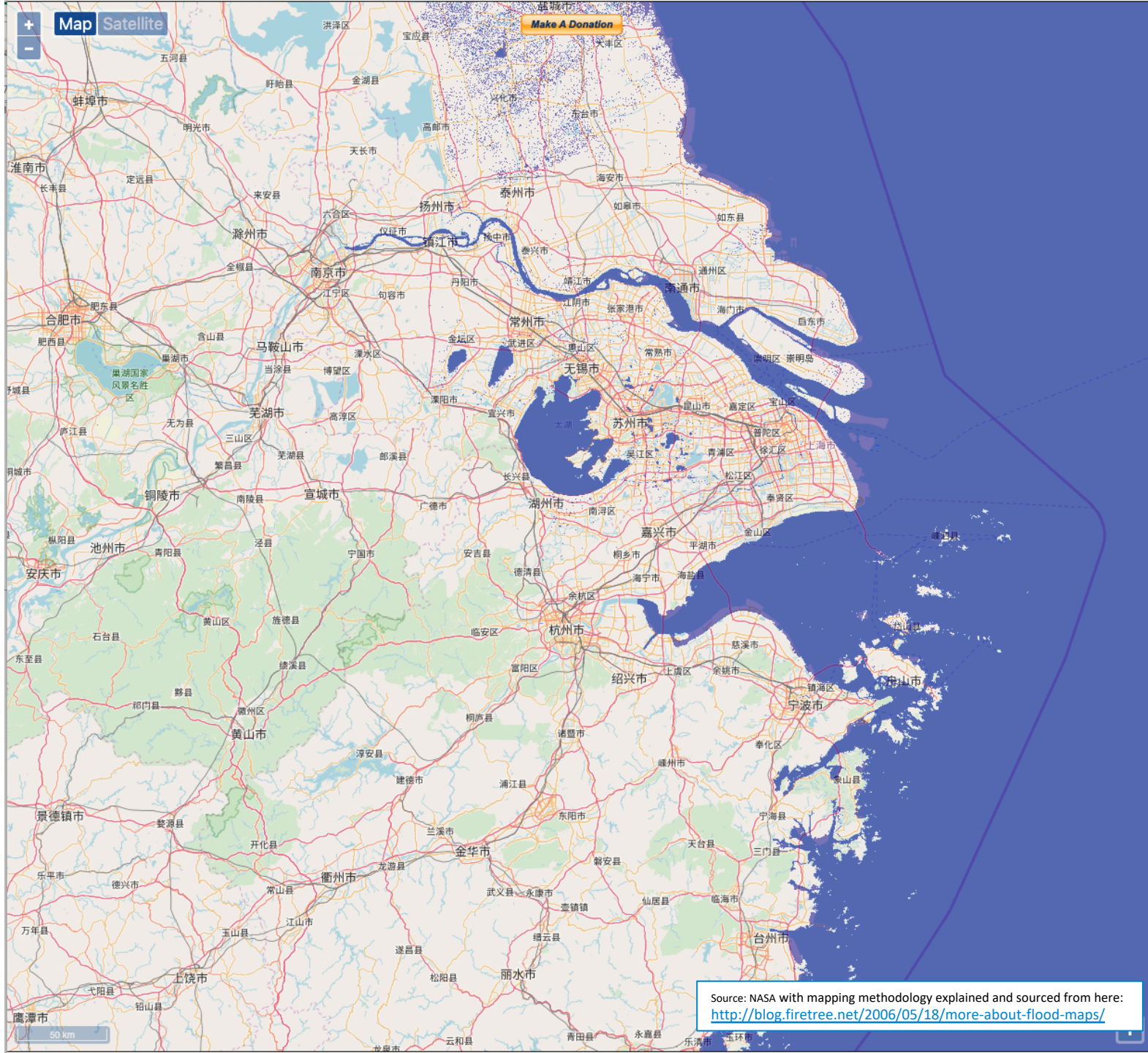
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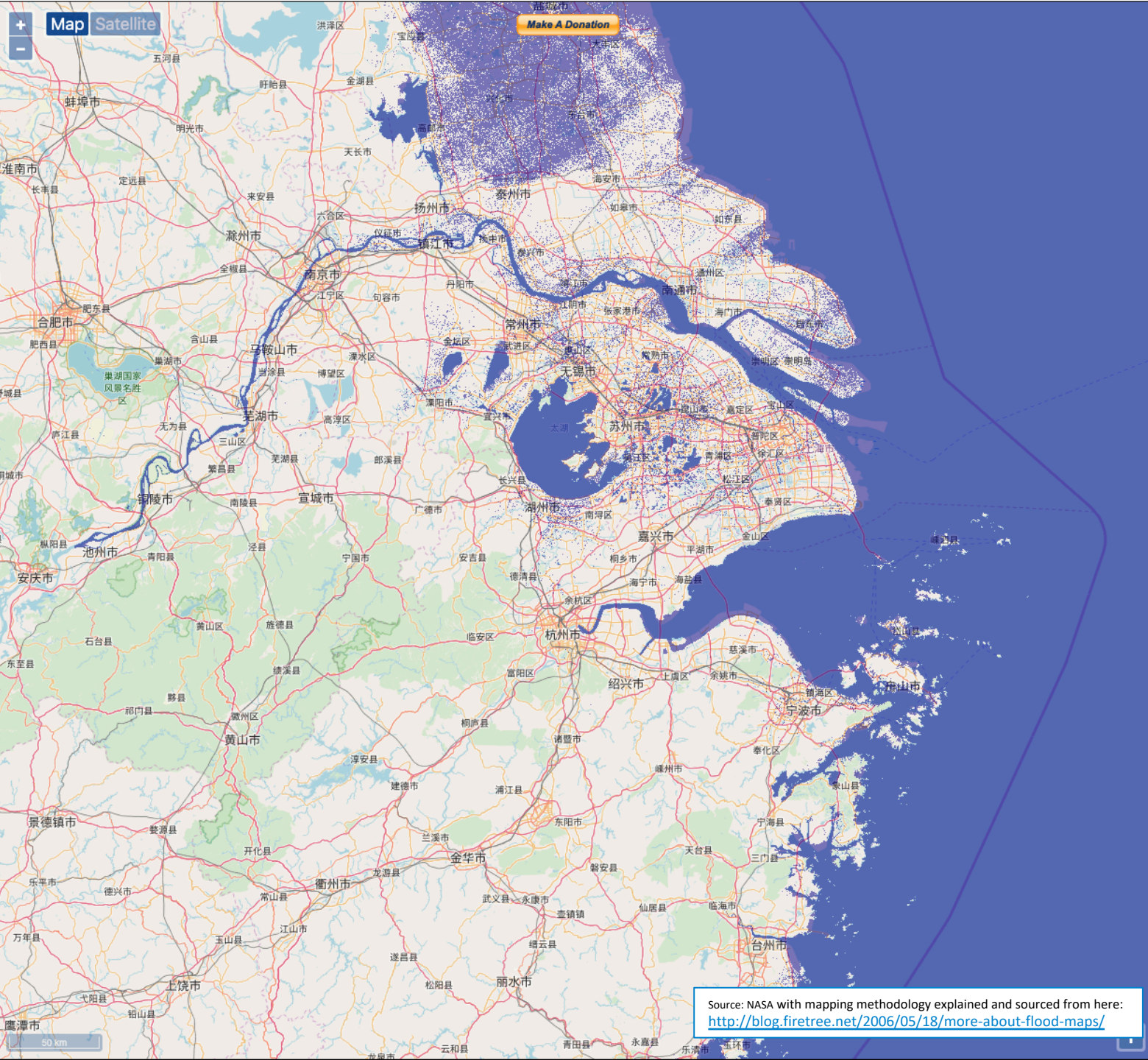
The UK with a
7 metre rise in
sea level

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Shanghai today

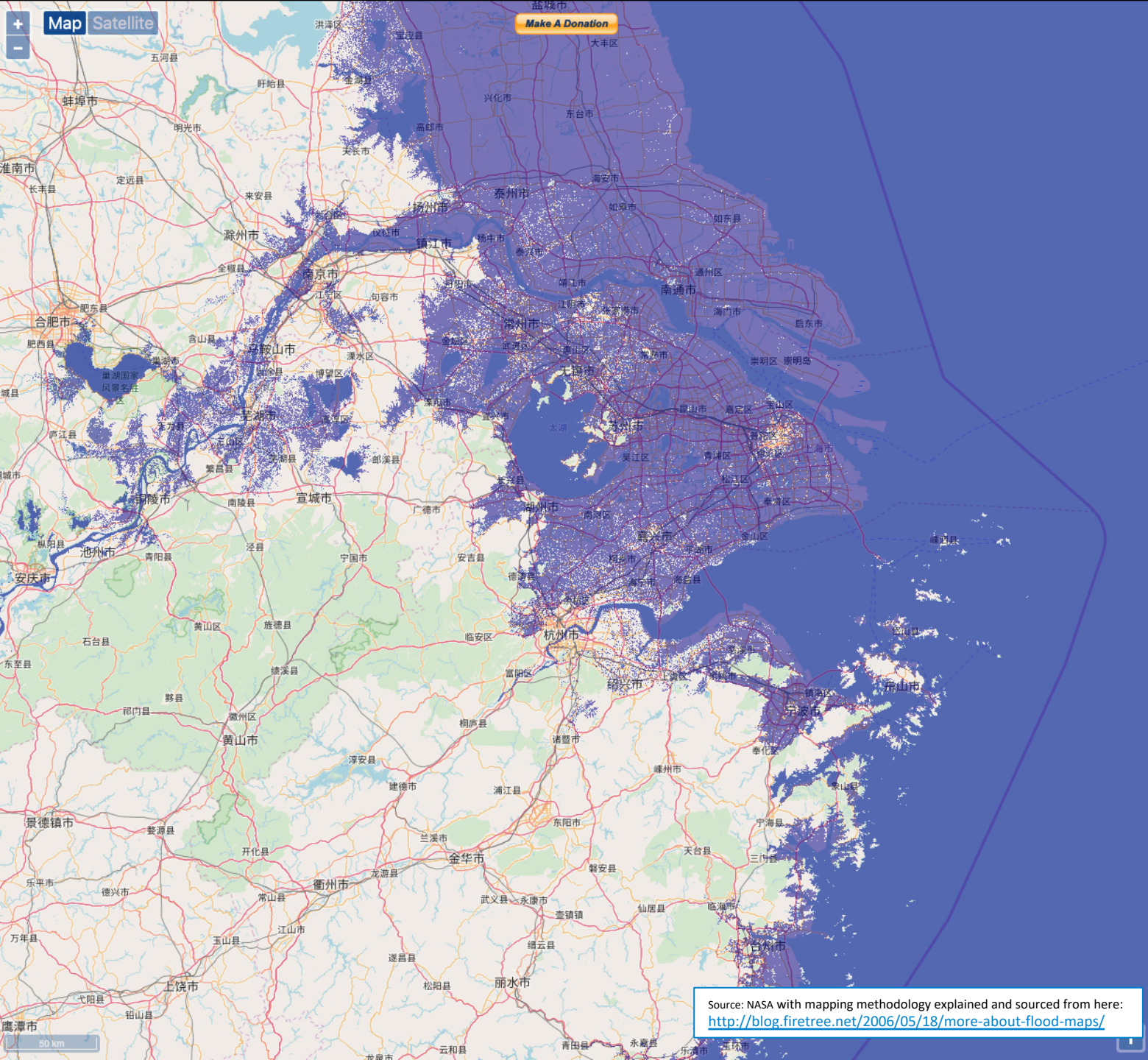


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Shanghai with
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in sea level

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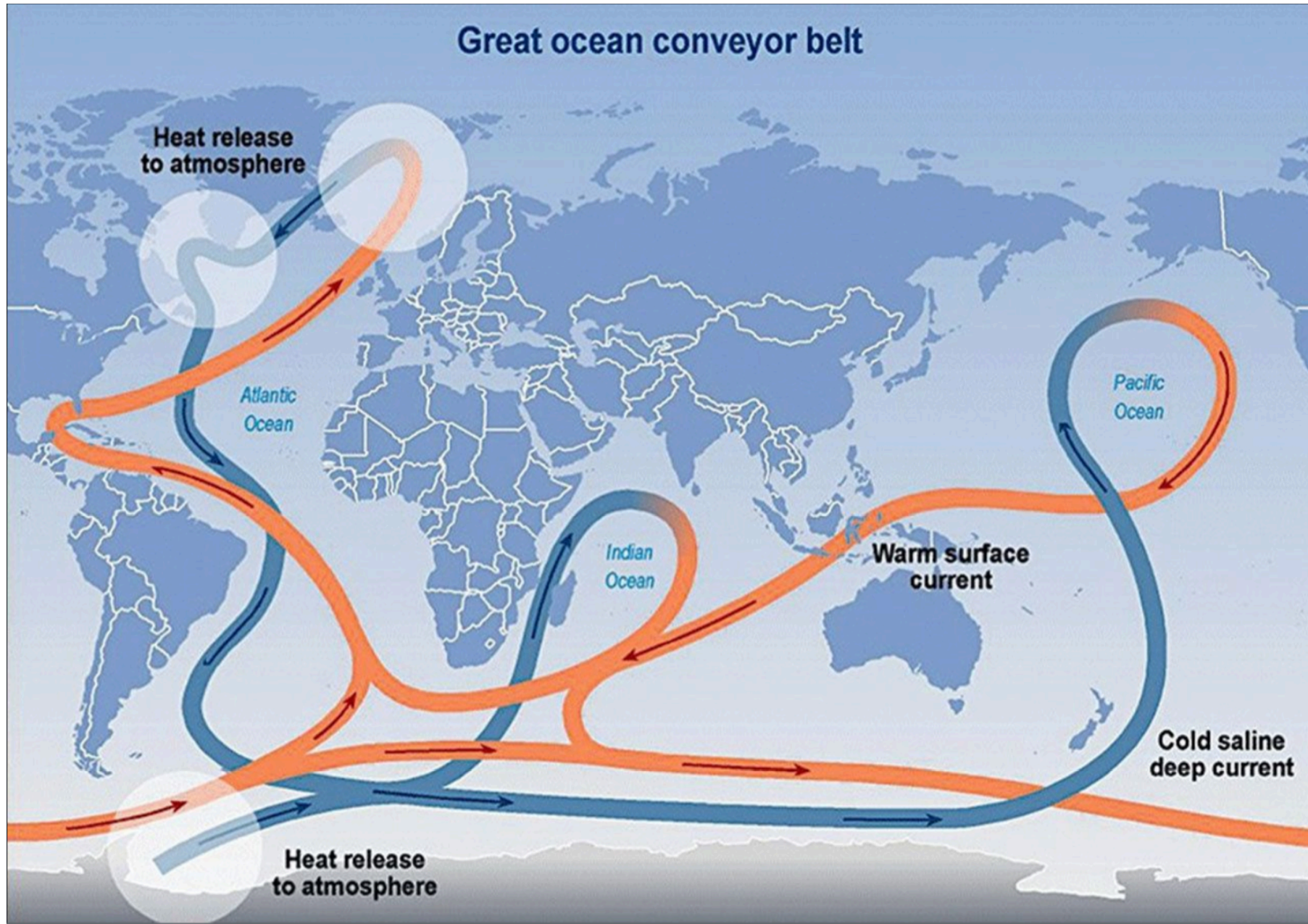
Shanghai with
a 7 metre rise
in sea level

Source: NASA with mapping methodology explained and sourced from here:
<http://blog.firetree.net/2006/05/18/more-about-flood-maps/>

Also, Greenland's glaciers melting is likely to "switch off" the Gulf Stream

This would leave the UK without its warming effect

The UK is at the same latitude as parts of Canada and Siberia that are quite cold



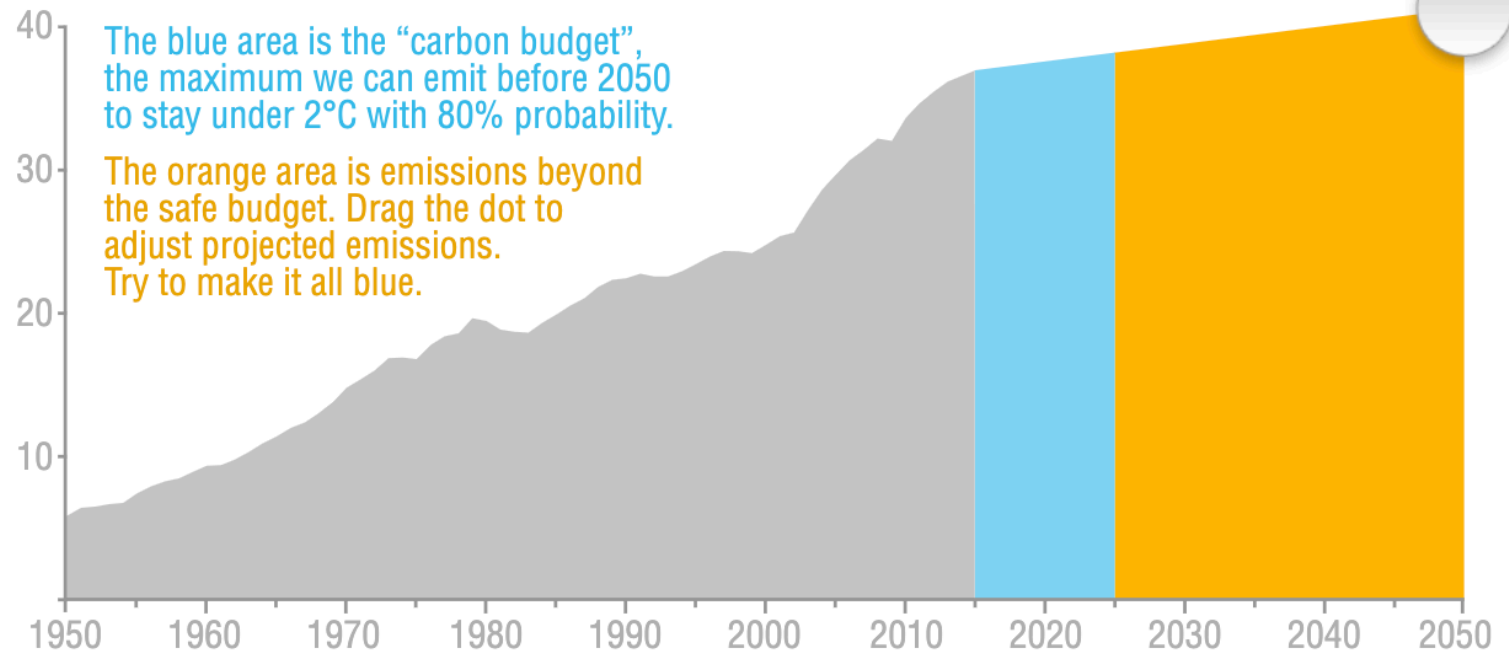
Why it's an emergency

We have models of what is needed to stop this happening.

This interactive (on its source webpage) shows how long we have

Business as usual would mean we get to a 2 degree rise by the mid 2020's

world carbon emissions (in GtCO₂/yr) and carbon budget (source)



Sources : All via <http://worrydream.com/ClimateChange/>
Carbon Brief "Analysis: Why the UK's CO₂ emissions have fallen 38% since 1990"
<https://www.carbonbrief.org/analysis-why-the-uks-co2-emissions-have-fallen-38-since-1990>
carbon emissions 1950-2013: <http://www.globalcarbonproject.org/carbonbudget/14/data.htm>
Global_Carbon_Budget_2014_v1.1.xlsx C. Le Quere, et al, Global Carbon Budget 2014. Earth System Science Data, doi:10.5194/essd-7-47-2015
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carbon budget 2000-2050:
<http://www.carbontracker.org/wp-content/uploads/2014/09/Unburnable-Carbon-Full-rev2-1.pdf>
Carbon Tracker Initiative, Unburnable Carbon (citing
<http://www.nature.com/nature/journal/v458/n7242/full/nature08017.html>)
"The Potsdam Climate Institute has calculated a global carbon budget for the world to stay below 2C of warming. This uses probabilistic climate change modelling to calculate the total volume of carbon dioxide (CO₂) emissions permitted in the first half of the 21st century to achieve the target. This revealed that to reduce the chance of exceeding 2 C warming to 20%, the global carbon budget for 2000-2050 is 886 GtCO₂."
carbon budget 2015-2050: From the 886 GtCO₂ budget for 2000-2050, I subtracted out the 440 GtCO₂ already spent 2000-2014, leaving 446 GtCO₂ remaining for 2015-2050.

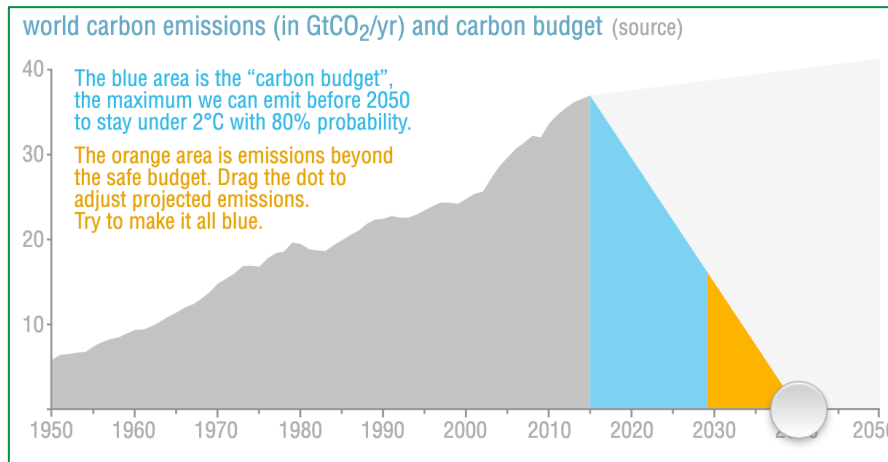
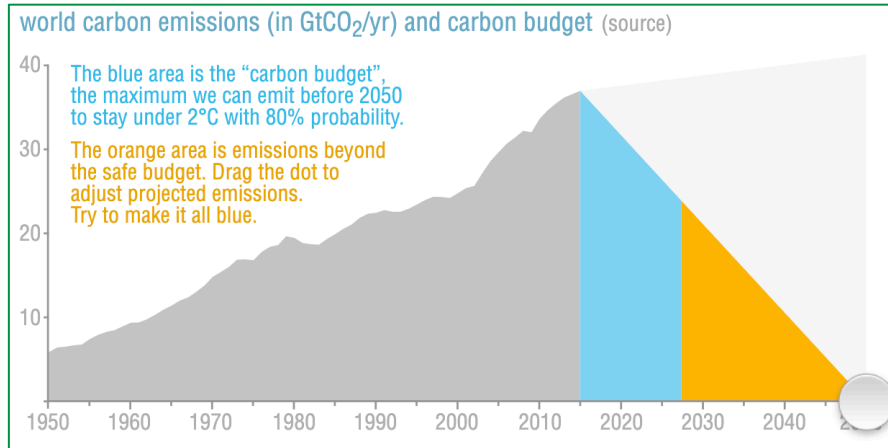
Why it's an emergency

The UK target of 2050 sounds ambitious.

Many say it's too ambitious.

But that rate of change will only delay crossing the 2 degree threshold by about 3 years

2040 is also not adequate as a target



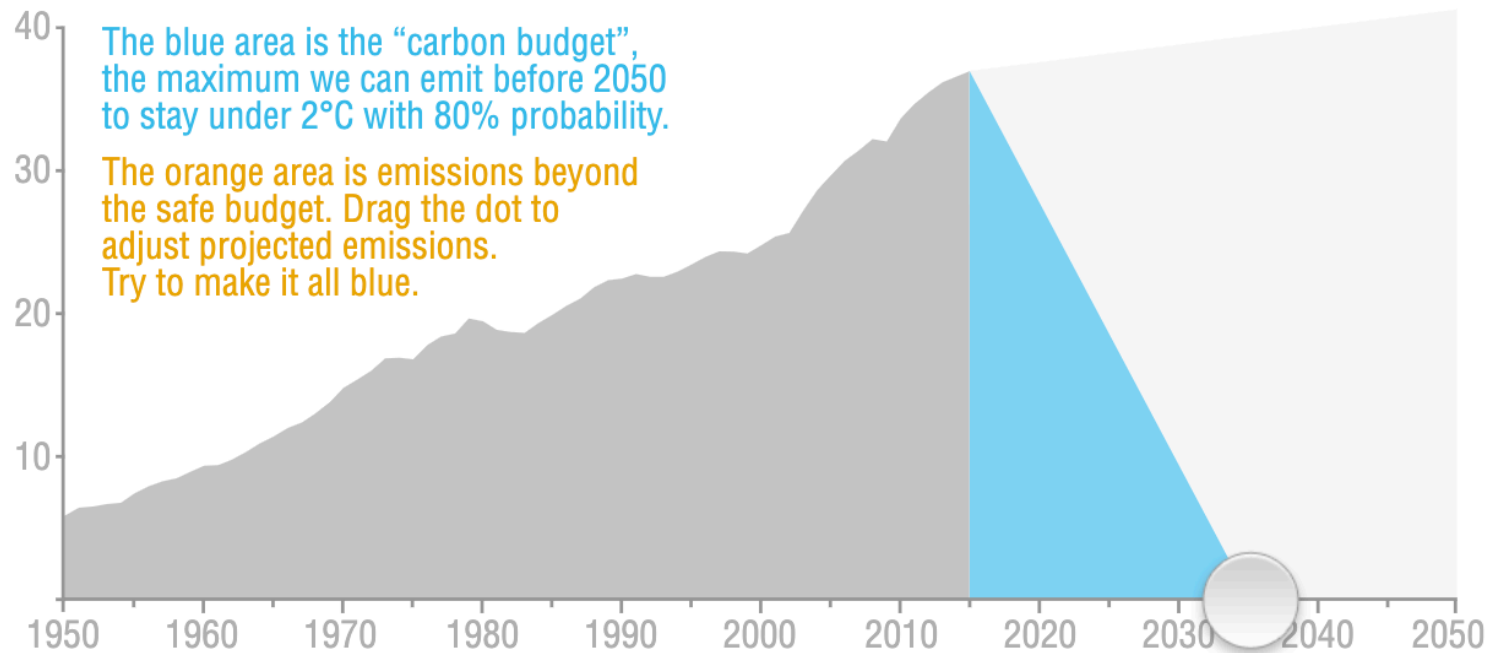
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 carbon budget 2015-2050: From the 886 GtCO2 budget for 2000-2050, I subtracted out the 440 GtCO2 already spent 2000-2014, leaving 446 GtCO2 remaining for 2015-2050.

Why it's an emergency

2035 is the latest we can get to zero carbon and not pass a point of no return to a climate that melts the ice and more generally will be hostile to human life

We are adopting 2030 because so far climate change has happened at a faster rate than the scientists' models have suggested

world carbon emissions (in GtCO₂/yr) and carbon budget (source)



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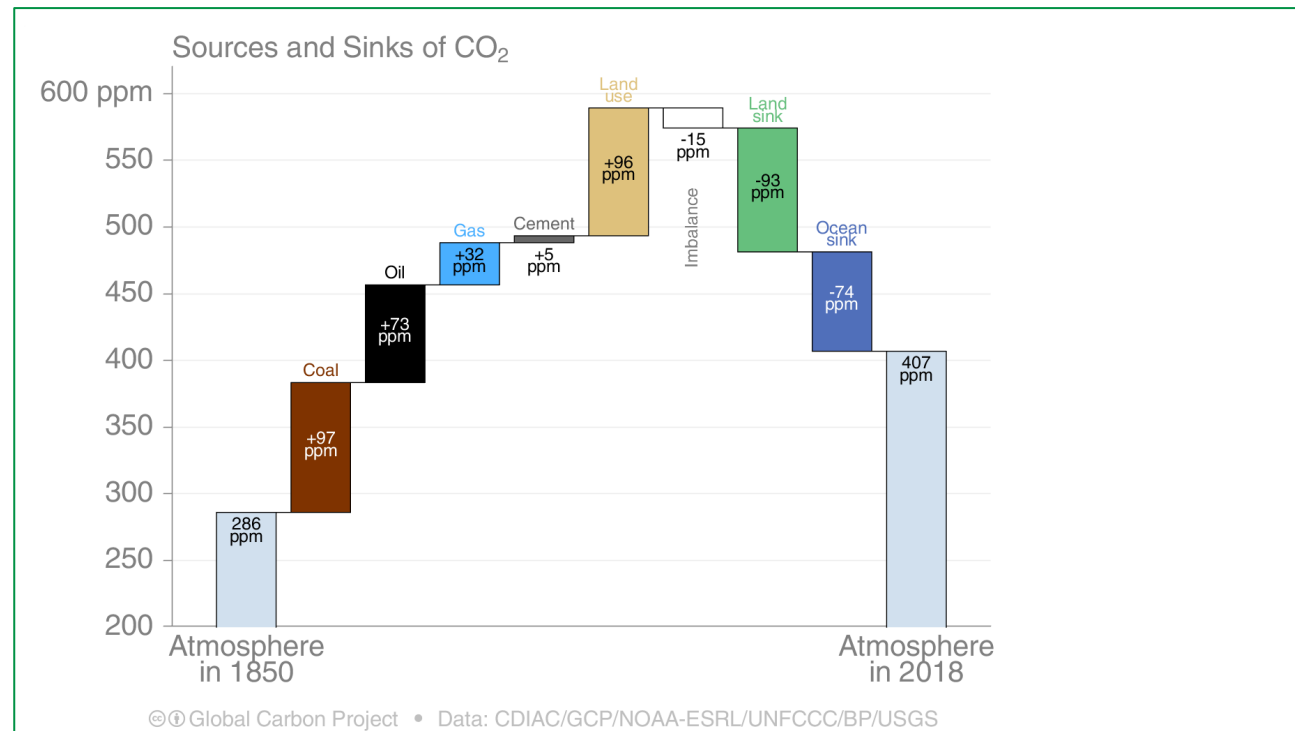
Zero carbon is actually not even enough

Getting to zero carbon only actually stops things getting worse.

Extreme weather, semi-melted ice caps already are in place.

We will need to become carbon negative to get the CO₂ in the atmosphere back down to the levels that existed before we blundered into making them so high

The cumulative contributions to the global carbon budget from 1850
The carbon imbalance represents the gap in our current understanding of sources & sinks



Sources: The Global Carbon Project "GCP Carbon Budget 2019"
<https://www.globalcarbonproject.org/carbonbudget/19/presentation.htm> "CDIAC; NOAA-ESRL; Houghton and Nassikas 2017; Hansis et al 2015; Joos et al 2013; Khatiwala et al. 2013; DeVries 2014; Friedlingstein et al 2019; Global Carbon Budget 2019"

Achieving Zero-Carbon for Haddenham Parish by 2030

Strategy

Objective:

Haddenham Parish to be carbon neutral by 2030

Diagnosis:

The main obstacles are:

- Lack of knowledge regarding what action(s) will make most difference (& when to take them)
- The inertia of existing habits

Guiding Policy:

- Use an evidence-based approach to identify the fewest & highest-impact actions for residents to take to deliver the objective
- Package these as initiatives using a “pilot” structure and enroll early adopters via multiple existing social networks in the parish

Strategy

Specific Actions:

1. Identify main sources of emissions
2. Recognise which will be affected by other players / technological change / govt action, & when
3. Identify where behavioural change of residents, HPC and organisations within HPC's sphere of influence can have the most impact per £ spent and volunteer hour given
4. Create a decadal calendar of initiatives with a maximum of four at any one time (the four not including research or HPC lobbying government or other bodies)
5. For each pilot - Contact all existing social networks in Haddenham (real life & virtual). Engage with each & enroll only the genuine enthusiasts for that pilot
6. For each pilot - enable, measure, receive feedback, reflect & improve

Addressing Main Obstacle #1

Lack of knowledge regarding what action(s) will make most difference (& when to take them)

The basic maths

Carbon emissions are measured in tonnes (t), kilotonnes (kt) or megatonnes (Mt) of carbon dioxide (CO₂) per annum (y⁻¹)

With other greenhouse gases such as methane, emissions are measured as CO₂ equivalents, written CO₂e

On average emissions per capita in Haddenham are 8.2 tCO₂y⁻¹

Woodland & forests take in [sequester] CO₂ and release oxygen

One hectare (2.47 acres) takes in approx. 5.3 tCO₂y⁻¹

The task is to reduce the parish's CO₂ emissions as far as possible by 2030 and to plant enough trees to offset the residual emissions

By 2030 we will have approx. 3,300 dwellings (up from 2,200) in Haddenham which at UK average household size (2.40 ppl/hhld) means we will have a population just over 7,900

The table on the right shows the parish's total emission in 2030 depending on how much we can reduce per capita emissions from current levels and the hectares of woodland needed to offset them

The land area of the parish is around 1,300 hectares

Emissions in Haddenham in 2030 depending on reductions in CO₂ emissions achieved

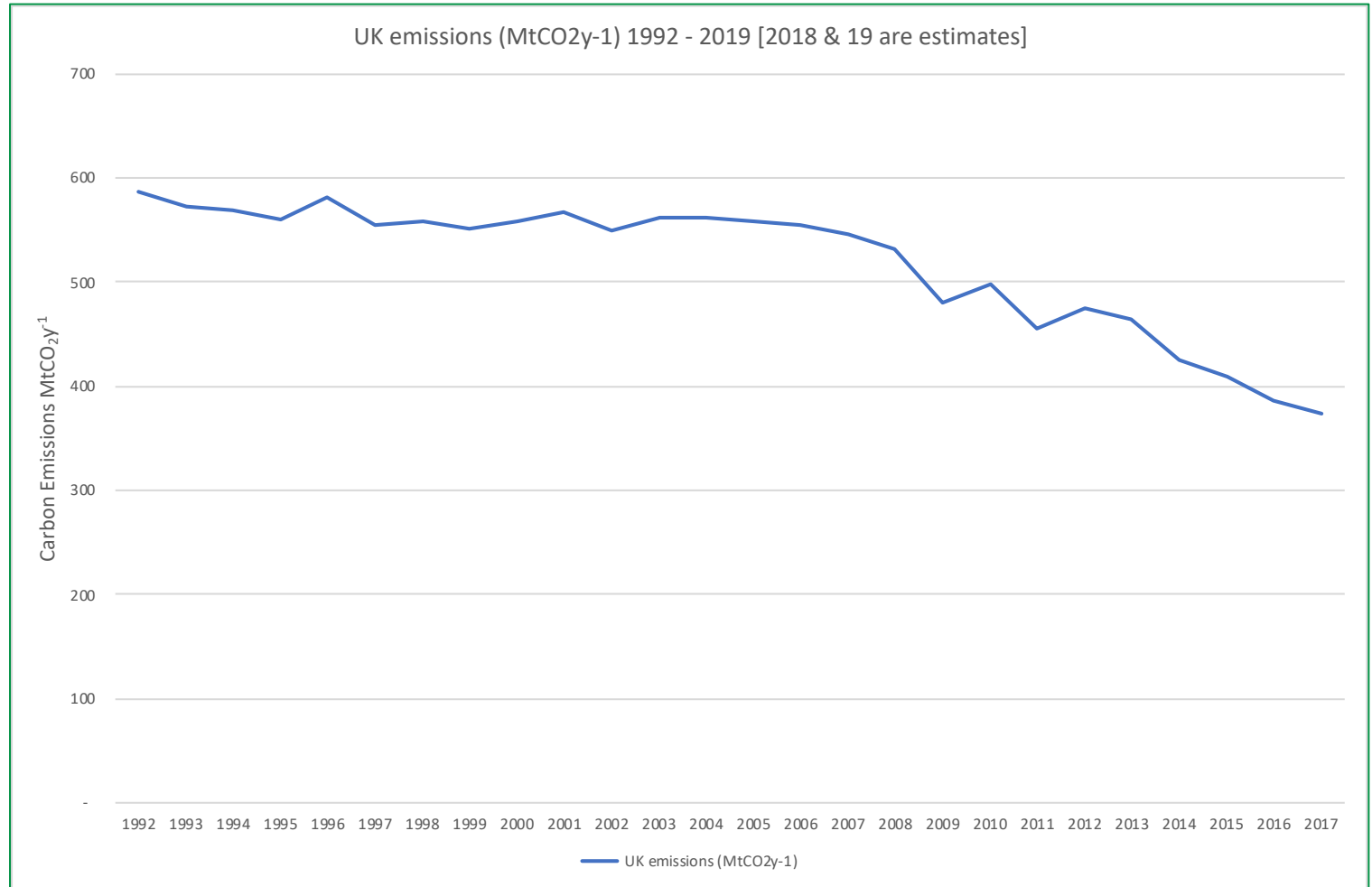
| % of 2020 emissions per cap | Emissions (tCO ₂ e-y-1) | Hectares of woodland required |
|-----------------------------|------------------------------------|-------------------------------|
| 100% | 64,900 | 12,180 |
| 95% | 61,700 | 11,580 |
| 90% | 58,400 | 10,960 |
| 85% | 55,200 | 10,360 |
| 80% | 52,000 | 9,760 |
| 75% | 48,700 | 9,140 |
| 70% | 45,500 | 8,540 |
| 60% | 39,000 | 7,320 |
| 55% | 35,700 | 6,700 |
| 50% | 32,500 | 6,100 |
| 45% | 29,200 | 5,480 |
| 40% | 26,000 | 4,880 |
| 35% | 22,700 | 4,260 |
| 30% | 19,500 | 3,660 |
| 25% | 16,200 | 3,040 |
| 20% | 13,000 | 2,440 |
| 15% | 9,700 | 1,820 |
| 10% | 6,500 | 1,220 |

UK CO₂ emissions

You've probably heard that the UK has been dramatically reducing its carbon emissions

This is true

But there's a "but"



There are three types of emissions

Greenhouse gas emissions are categorised into three groups or 'scopes' by the most widely-used international accounting tool, the Greenhouse Gas (GHG) Protocol. Scope 1 covers direct emissions from owned or controlled sources. Scope 2 covers indirect emissions from the generation of purchased electricity, steam, heating and cooling consumed by the reporting company. Scope 3 includes all other indirect emissions that occur in a company's value chain.

| Scope 1 | Scope 2 | Scope 3 |
|---|---------------------------------------|--|
| Fuel combustion Company vehicles Fugitive emissions | Purchased electricity, heat and steam | Purchased goods and services Business travel Employee commuting Waste disposal Use of sold products Transportation and distribution (up- and downstream) Investments Leased assets and franchises |

And much of the Scope 3 emissions - food, goods & services - we consume comes from outside the UK

Please note: These definitions, courtesy of the Carbon Trust, talk in terms of corporations but the definitions apply equally to individuals or organisations of any kind. "Fugitive emissions" in plain English means gas leaks.

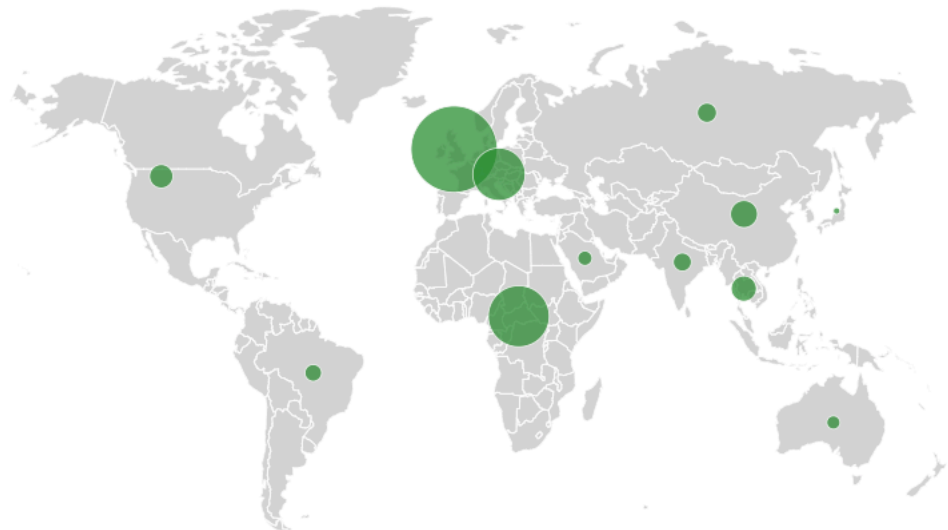
Sources of the UK's carbon footprint

▶ PLAY 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012

■ All Products ■ Food ■ Clothes ■ Transport
■ Power, Water & Waste ■ Manufactured Goods ■ Mining & Construction ■ Services

This map shows where the emissions occur in producing the goods and services that are consumed in the UK.

The circles show the UK's footprint for food products - the emissions associated with our demand for those products, across the full supply chain.



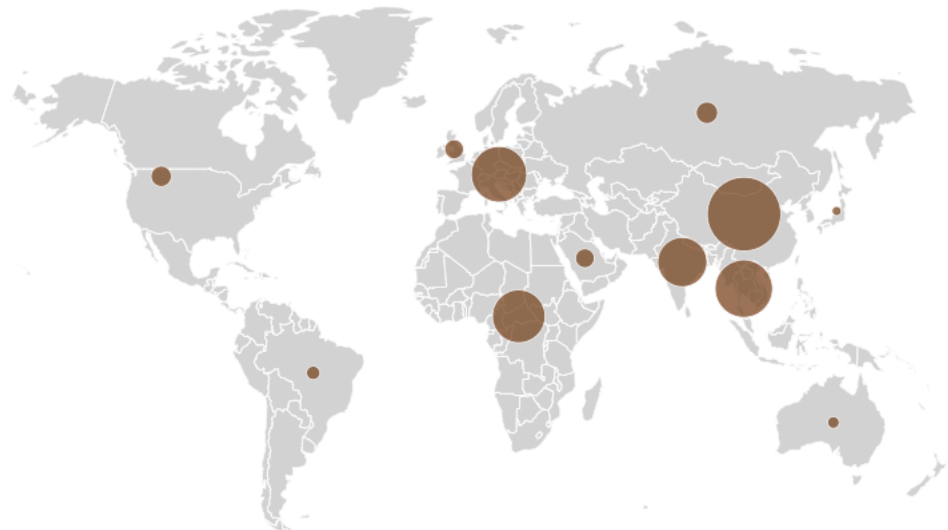
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■ All Products ■ Food ■ Clothes ■ Transport
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This map shows where the emissions occur in producing the goods and services that are consumed in the UK.

The circles show the UK's footprint for clothing products - the emissions associated with our demand for those products, across the full supply chain.



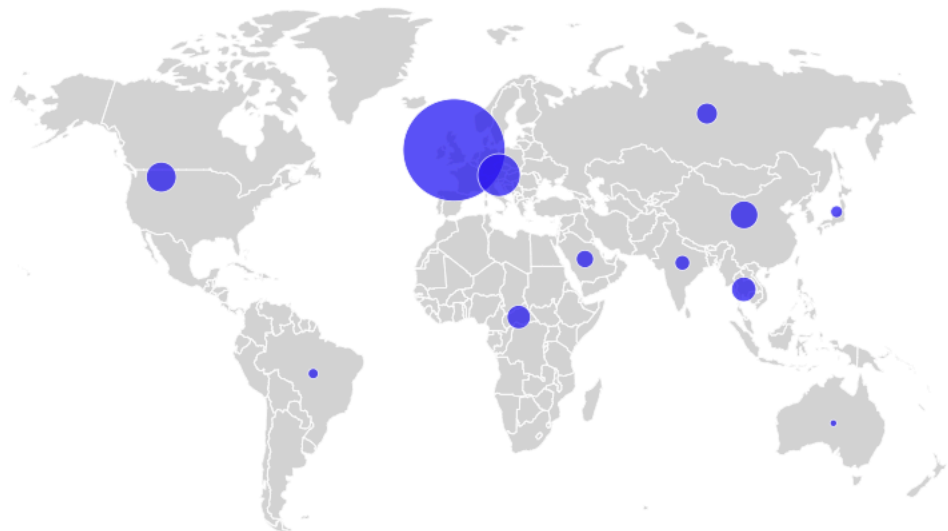
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■ All Products ■ Food ■ Clothes ■ Transport
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This map shows where the emissions occur in producing the goods and services that are consumed in the UK.

The circles show the UK's footprint for transport products - the emissions associated with our demand for those products, across the full supply chain.



Sources of the UK's carbon footprint

▶ PLAY 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012

■ All Products ■ Food ■ Clothes ■ Transport
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This map shows where the emissions occur in producing the goods and services that are consumed in the UK.

The circles show the UK's footprint for power, water & waste products - the emissions associated with our demand for those products, across the full supply chain.



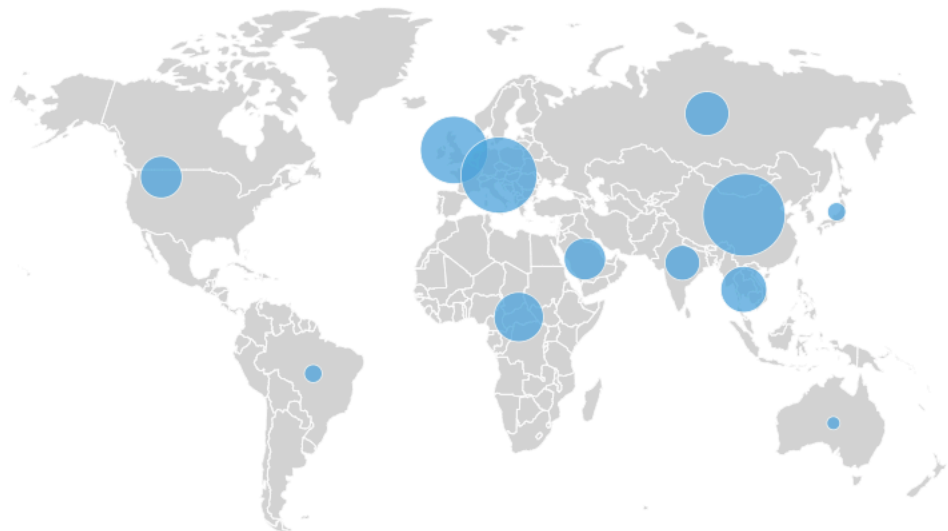
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■ All Products ■ Food ■ Clothes ■ Transport
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This map shows where the emissions occur in producing the goods and services that are consumed in the UK.

The circles show the UK's footprint for manufactured goods - the emissions associated with our demand for those products, across the full supply chain.



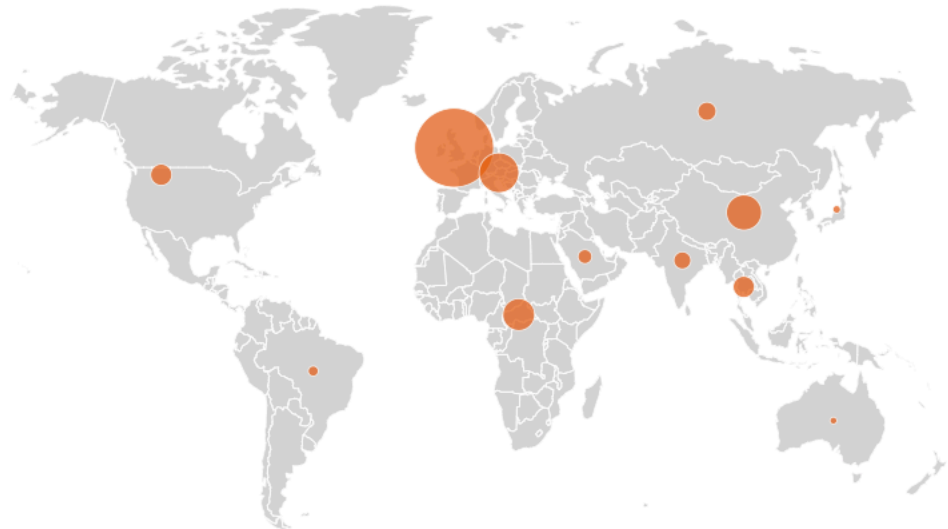
Sources of the UK's carbon footprint

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■ All Products ■ Food ■ Clothes ■ Transport
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This map shows where the emissions occur in producing the goods and services that are consumed in the UK.

The circles show the UK's footprint for mining and construction products - the emissions associated with our demand for those products, across the full supply chain.



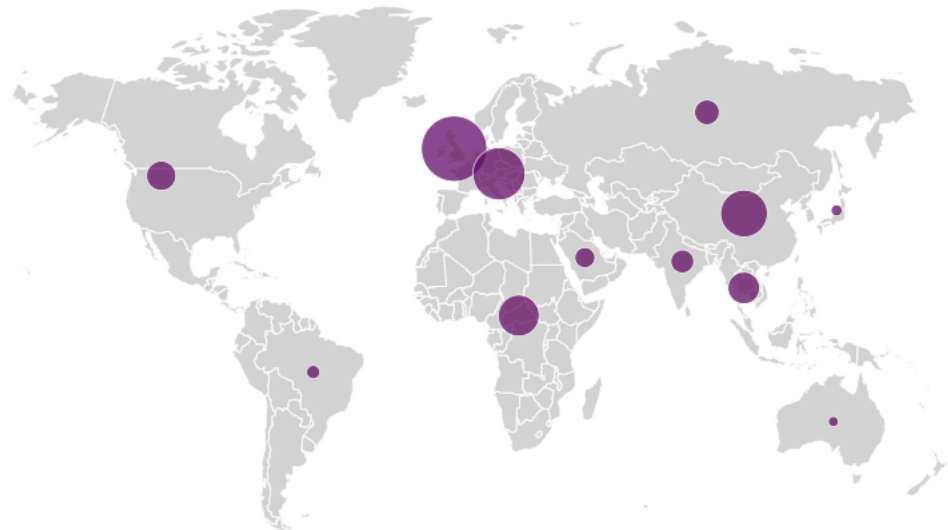
Sources of the UK's carbon footprint

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■ All Products ■ Food ■ Clothes ■ Transport
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This map shows where the emissions occur in producing the goods and services that are consumed in the UK.

The circles show the UK's footprint for services - the emissions associated with our demand for those products, across the full supply chain.



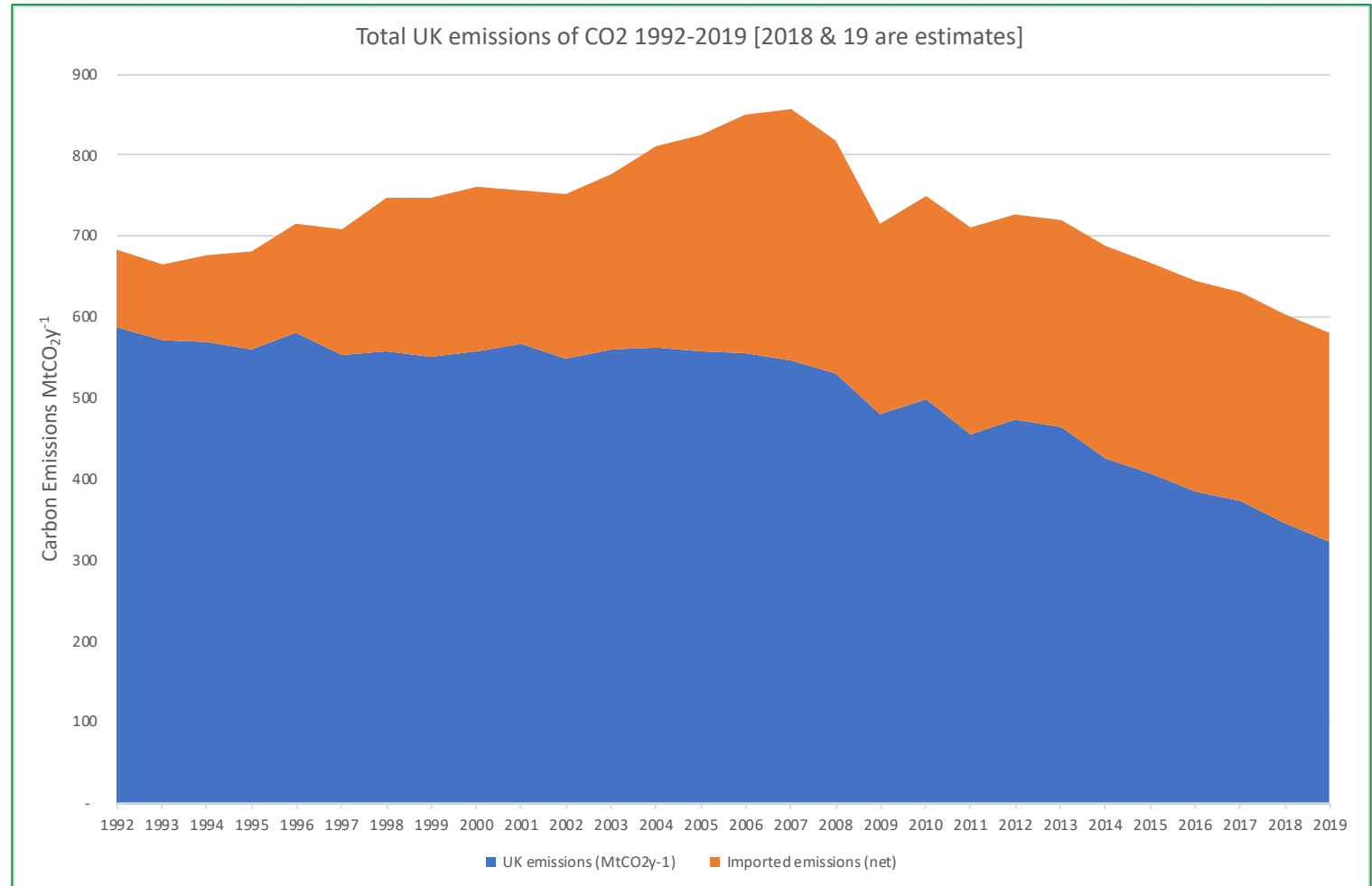
Total UK CO₂ emissions

So the emissions created by what we consume have to be included

(and what we produce, but people in other countries consume, of course are excluded)

It turns out that the UK is the second biggest importer of CO₂ emissions in the world

So UK emissions didn't peak in the 1980's but in 2007



Total UK CO₂ emissions

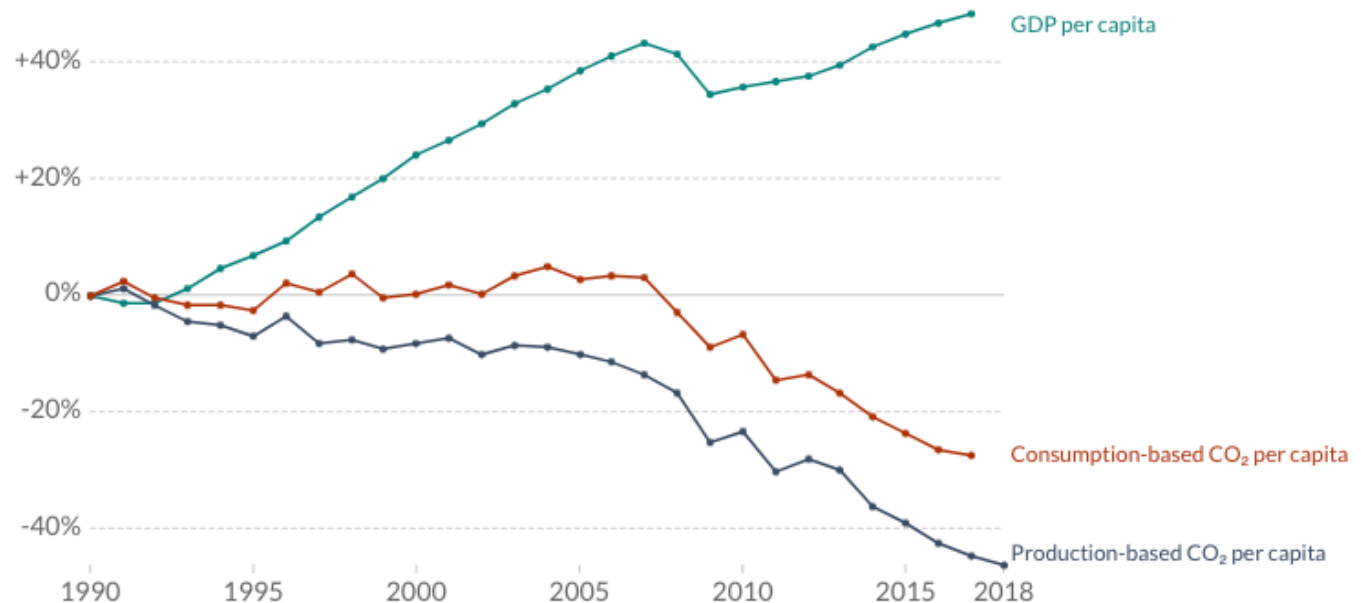
But CO₂ emissions have been significantly decoupled from growth in GDP

Change in per capita CO₂ emissions and GDP, United Kingdom

Our World in Data

Annual consumption-based emissions are domestic emissions adjusted for trade. If a country imports goods the CO₂ emissions needed to produce such goods are added to its domestic emissions; if it exports goods then this is subtracted.

Change country



Source: Global Carbon Project; World Bank

Note: GDP is measured in constant 2011 international-\$ which adjust for inflation and cross-country price differences.

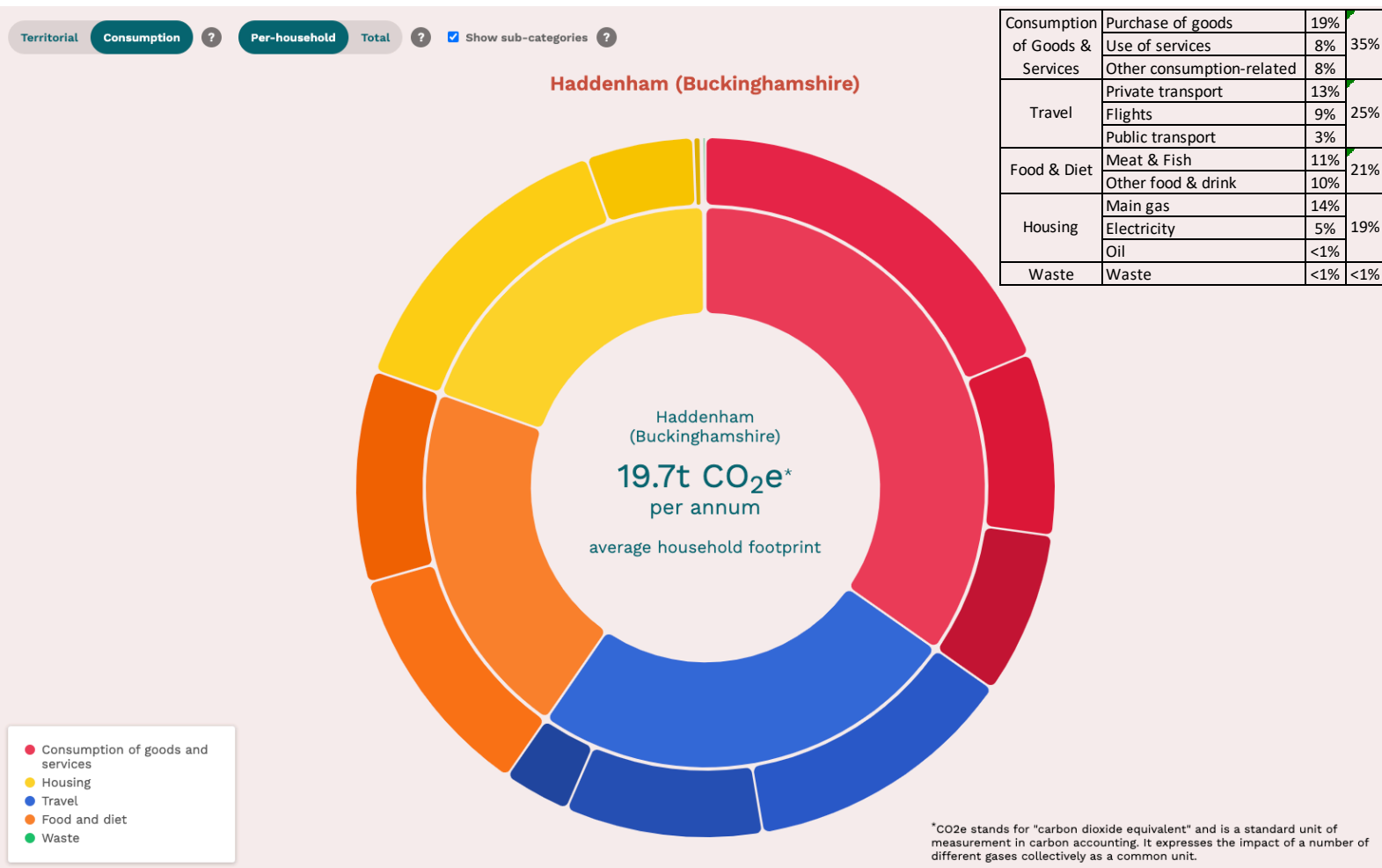
CC BY



How total Haddenham CO₂ emissions break down

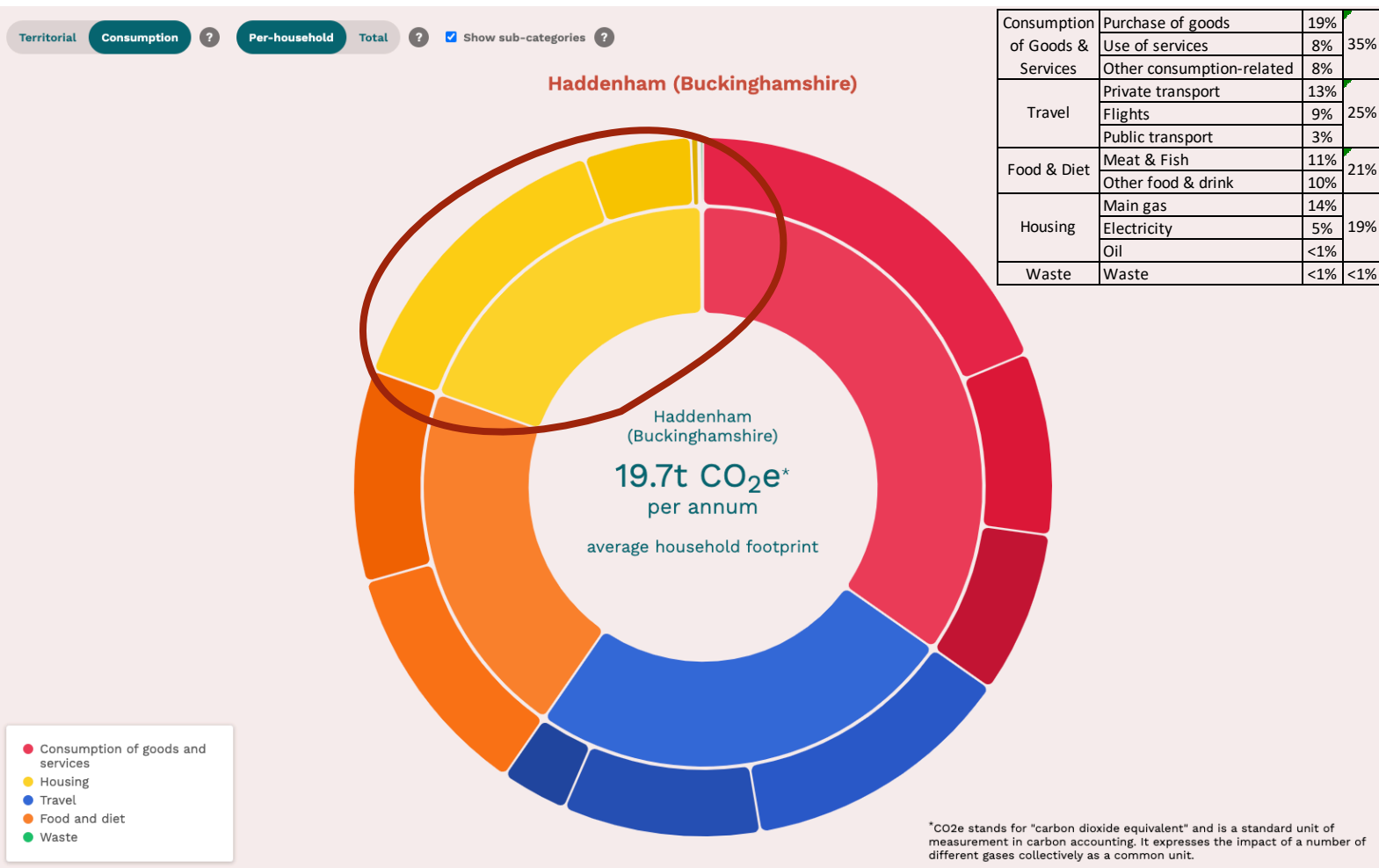
For the first year of this report we had to rely on applying the average consumption emissions of the UK to the parish

We have just recently received a more detailed breakdown which will improve the focus of our planning for emissions reduction



How total Haddenham CO₂ emissions break down

Let's begin with energy consumption in the home which account for 19% of parish emissions



Power, water & waste - Electricity

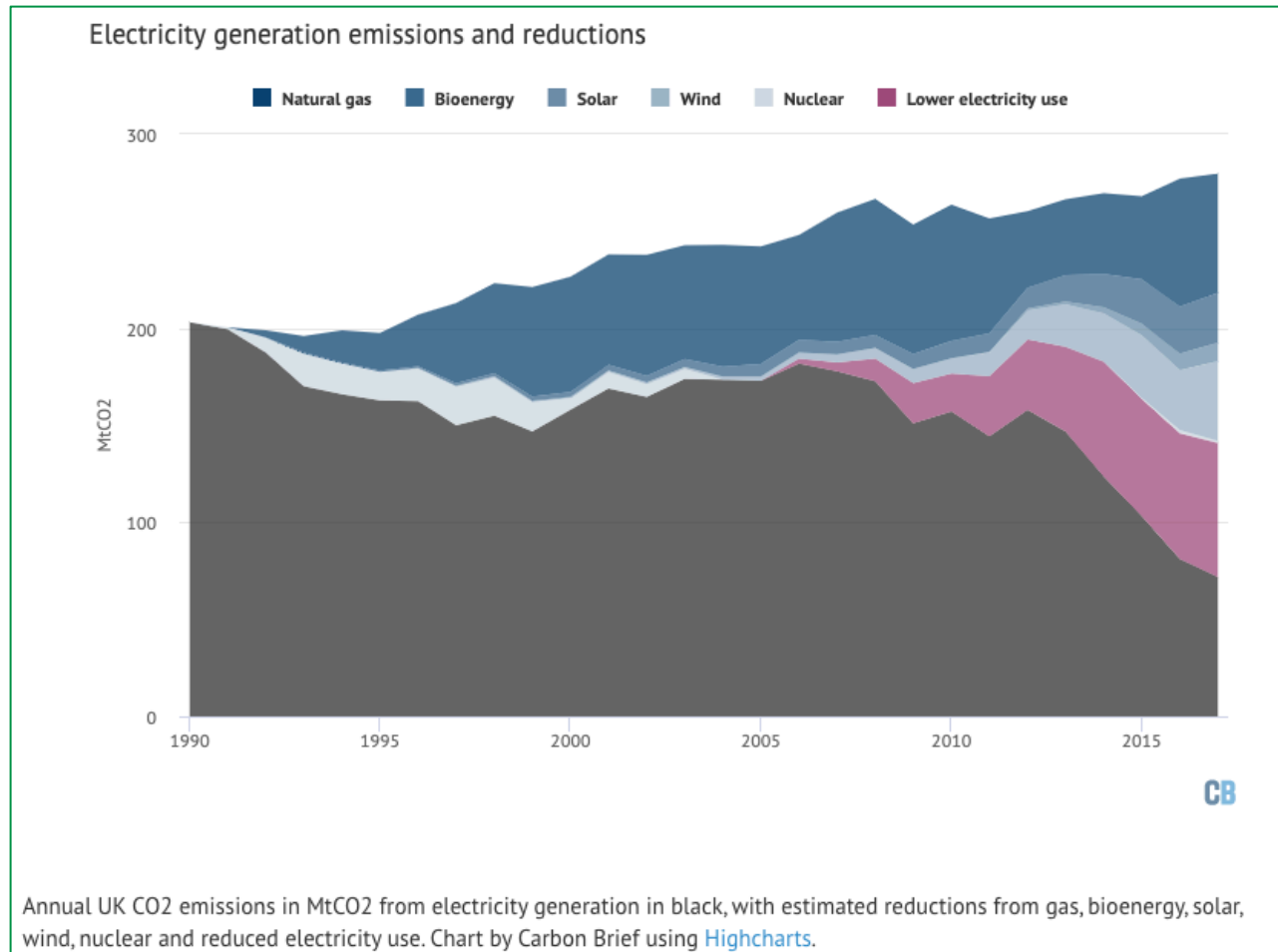
Heating & lighting homes used to be the biggest source of emissions

BUT!!....

The electricity side of the industry has reduced its emissions by 60% [that's the dark grey area – the other colours show sources of reduced compared with “business as usual”]

By 2030 90% of UK electricity will be carbon neutral

It's notable how much electricity-related emissions have reduced since 2012 – the date of the data on the previous slide. So Power, Water & Waste may no longer be the biggest source of emissions



Power, water & waste - Electricity

Given the reductions in electricity-related emission to -date and projected to 2030, it is gas where householder action will make a difference

Table 1: UK annual greenhouse gas emissions, 1990-2018, headline results

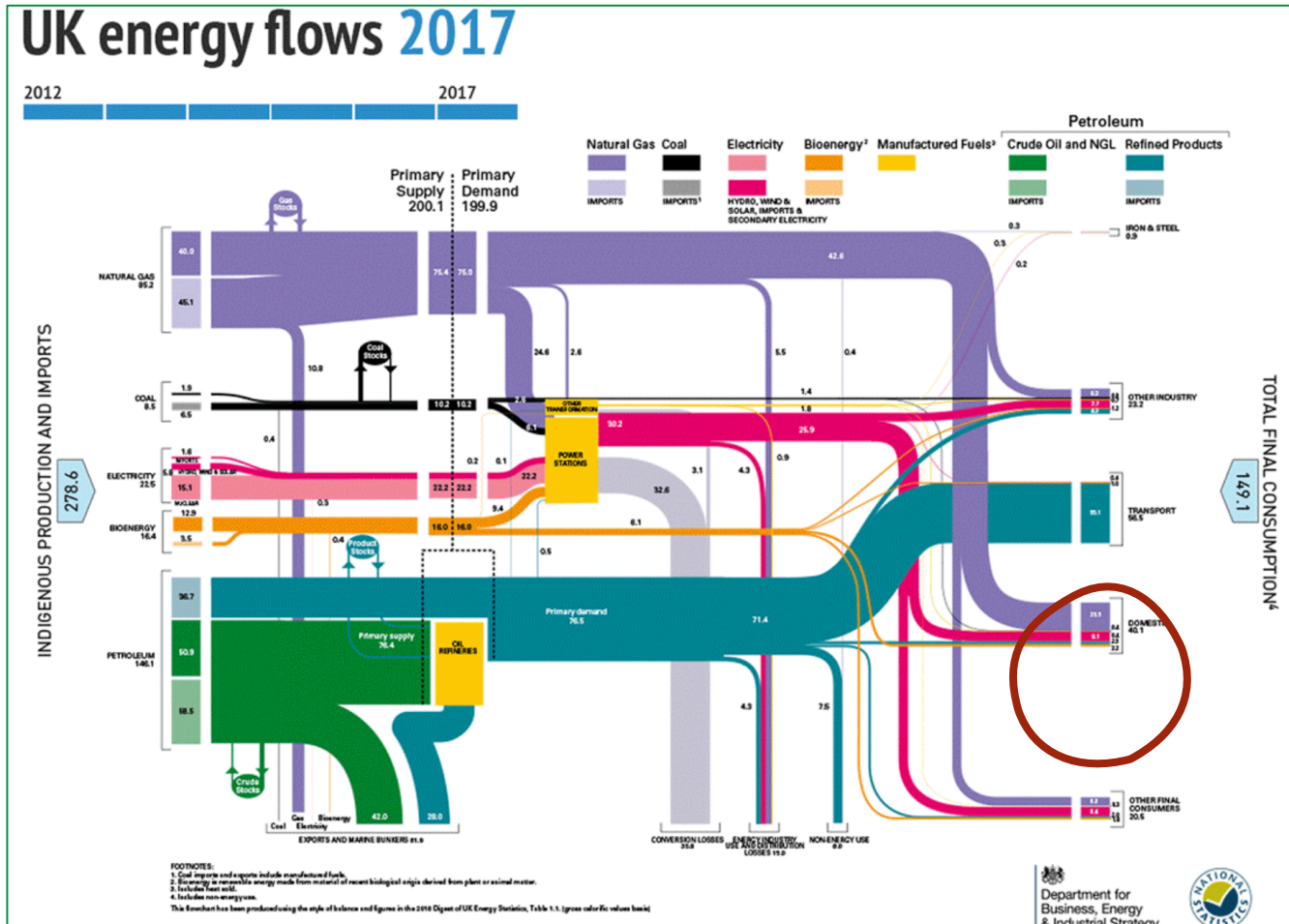
| | MtCO ₂ e | | | | | | | |
|-------------------------------|---------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2017 | 2018 (p) |
| Energy supply | 242.1 | 210.3 | 204.0 | 219.1 | 197.3 | 137.6 | 106.0 | 98.3 |
| <i>from power stations</i> | 203.0 | 163.0 | 158.7 | 173.1 | 157.3 | 104.1 | 72.4 | 65.2 |
| <i>other Energy supply</i> | 39.1 | 47.3 | 45.3 | 46.0 | 40.0 | 33.4 | 33.5 | 33.1 |
| Business | 111.9 | 108.9 | 108.7 | 96.9 | 78.2 | 69.5 | 66.1 | 65.9 |
| Transport | 125.4 | 126.8 | 131.0 | 134.3 | 123.4 | 122.2 | 124.6 | 121.4 |
| Public | 13.4 | 13.2 | 12.1 | 11.1 | 9.4 | 7.9 | 7.8 | 8.1 |
| Residential | 78.3 | 79.6 | 85.6 | 82.5 | 84.5 | 64.5 | 64.1 | 65.9 |
| Agriculture | 6.5 | 6.5 | 5.5 | 6.1 | 5.4 | 5.5 | 5.6 | 5.6 |
| Industrial process | 19.4 | 17.7 | 16.9 | 16.3 | 10.6 | 12.1 | 10.2 | 10.0 |
| Waste management | 1.3 | 1.0 | 0.5 | 0.4 | 0.3 | 0.2 | 0.3 | 0.3 |
| LULUCF | -2.0 | -3.9 | -6.0 | -8.9 | -10.7 | -11.2 | -11.3 | -11.3 |
| Total CO₂ | 596.3 | 560.1 | 558.3 | 557.9 | 498.3 | 408.3 | 373.2 | 364.1 |
| Other greenhouse gases | 198.0 | 185.4 | 149.2 | 125.8 | 102.5 | 89.6 | 87.0 | 84.4 |
| Total greenhouse gases | 794.4 | 745.6 | 707.5 | 683.7 | 600.9 | 498.0 | 460.2 | 448.5 |

Power, water & waste - Gas

HOWEVER the technology & policy to fund & enable the switch from gas boilers to electric heat pumps at scale will not be ready until circa 2023

So this project will wait until then unless govt / technology enables mass action sooner

Action: There will be a project to enable and encourage the switch from gas boilers to electric heat pumps, probably from 2023 onwards



NB The chart shows the sources of energy in the UK, where it is ultimately consumed, and the flows in-between. It's generally for information for those interested but it shows the predominance of gas in domestic consumption

What about Green Energy Tarriffs?

We are **NOT** asking people to switch to green energy tariffs

Why?

Because while they used to result in higher investment in renewable generation capacity, they now make **NO DIFFERENCE** to what is generated.

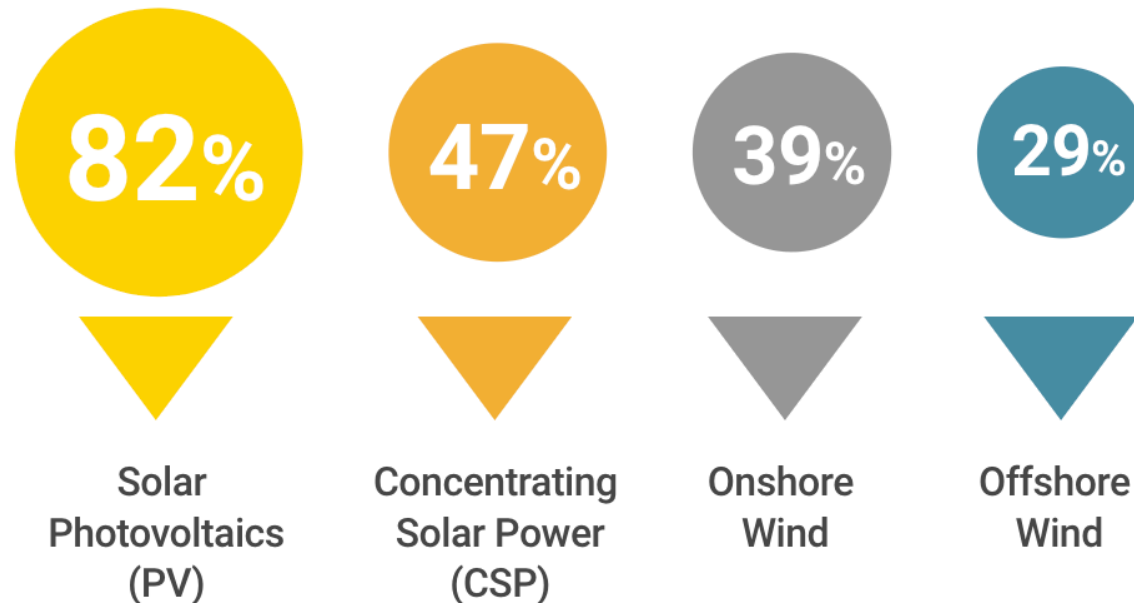
Why?

Because renewables are cheaper to generate than fossil fuels so pure commercial economics is driving all investment into increased renewable generation

So while your energy consumption will all be renewables the UK's electricity pool will not be affected. Someone else will receive the fossil energy you previously received

FALLING POWER GENERATION COSTS

Renewable energy costs declined rapidly over the last 10 years (2010-2019)

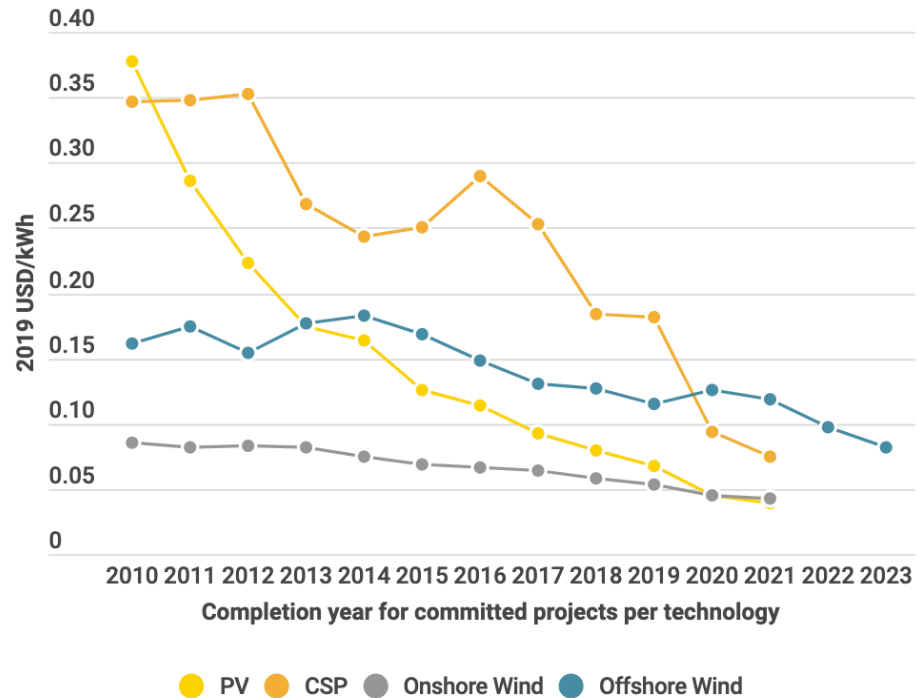


What about Green Energy Tarriffs

In fact for the mathematicians among you, if this had been put on a log scale graph you'd be able to see that the rate of decline in costs is actually increasing

POWER GENERATION COSTS IN 2019

Costs continued to fall in 2019 for solar and wind power technologies

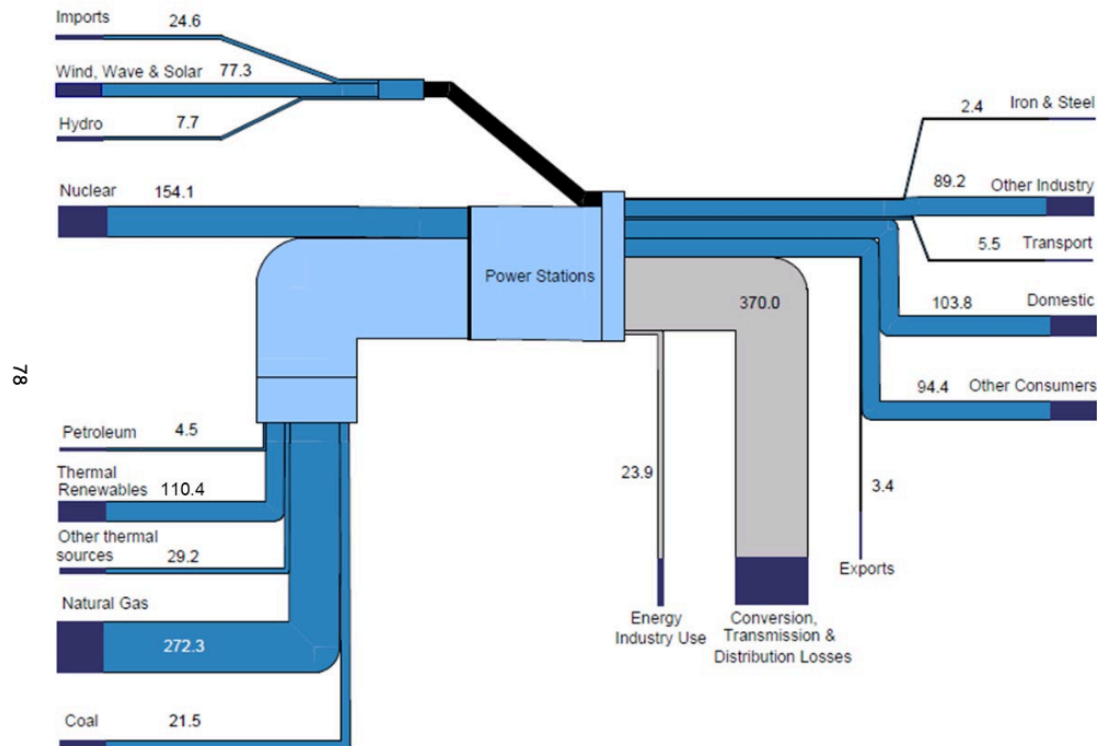


What about Green Energy Tarriffs?

If we zoom into the electricity power station part of the complicated diagram from two slides ago, it used to be the case that being on a green tariff subsidized and expanded the inputs from Wind, Wave & Solar.

But now they are cheaper sources than coal, gas & petroleum your choice of tariff makes no difference whatsoever to the national picture

Electricity flow chart 2019 (TWh)



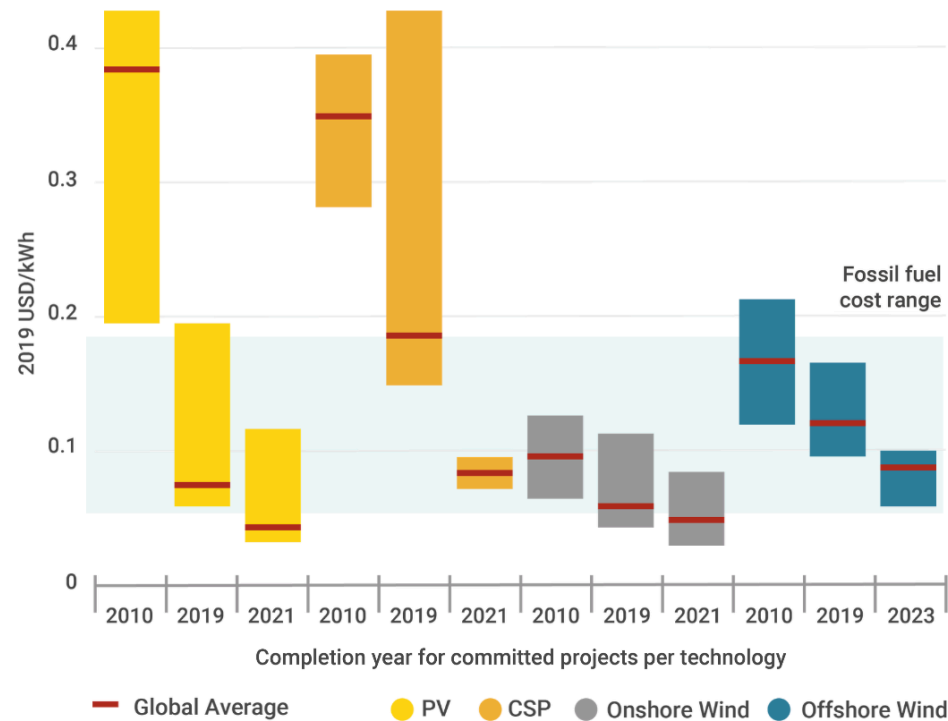
What about Green Energy Tarriffs

And it is vitally important for the Parish Council & this project to not advocate action that has no impact on emissions

Why?

1. If people take the time & trouble to switch to a “green tariff” they can easily feel they’ve now “done their bit” & therefore have done enough so they don’t then do the things that will make a difference. This is a risk that is easily avoided!
2. We lose credibility & would rightly be accused of virtue signaling or not knowing what we are talking about.

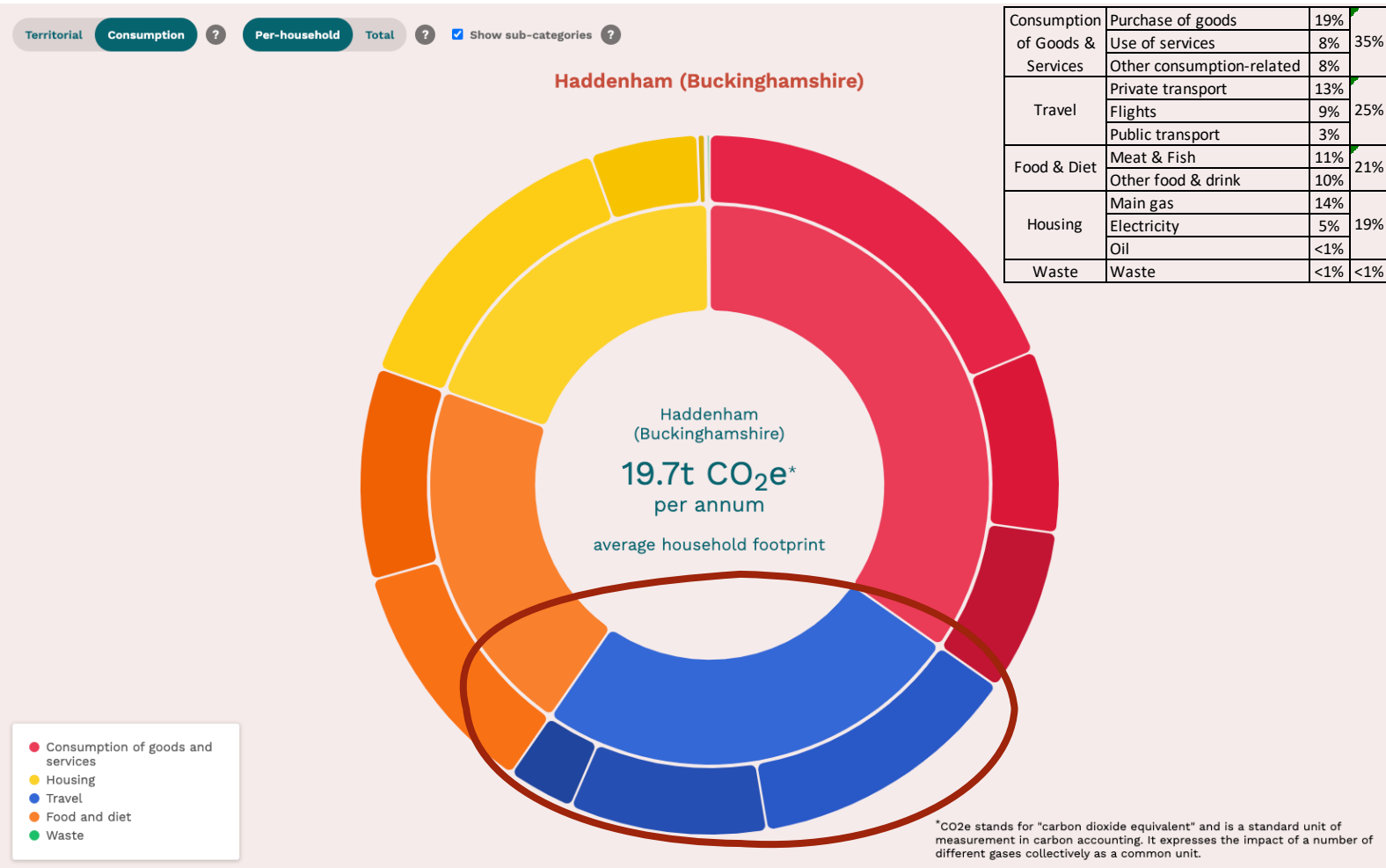
Recent auctions results and record low auction prices underpin the downward trend in costs



Transport

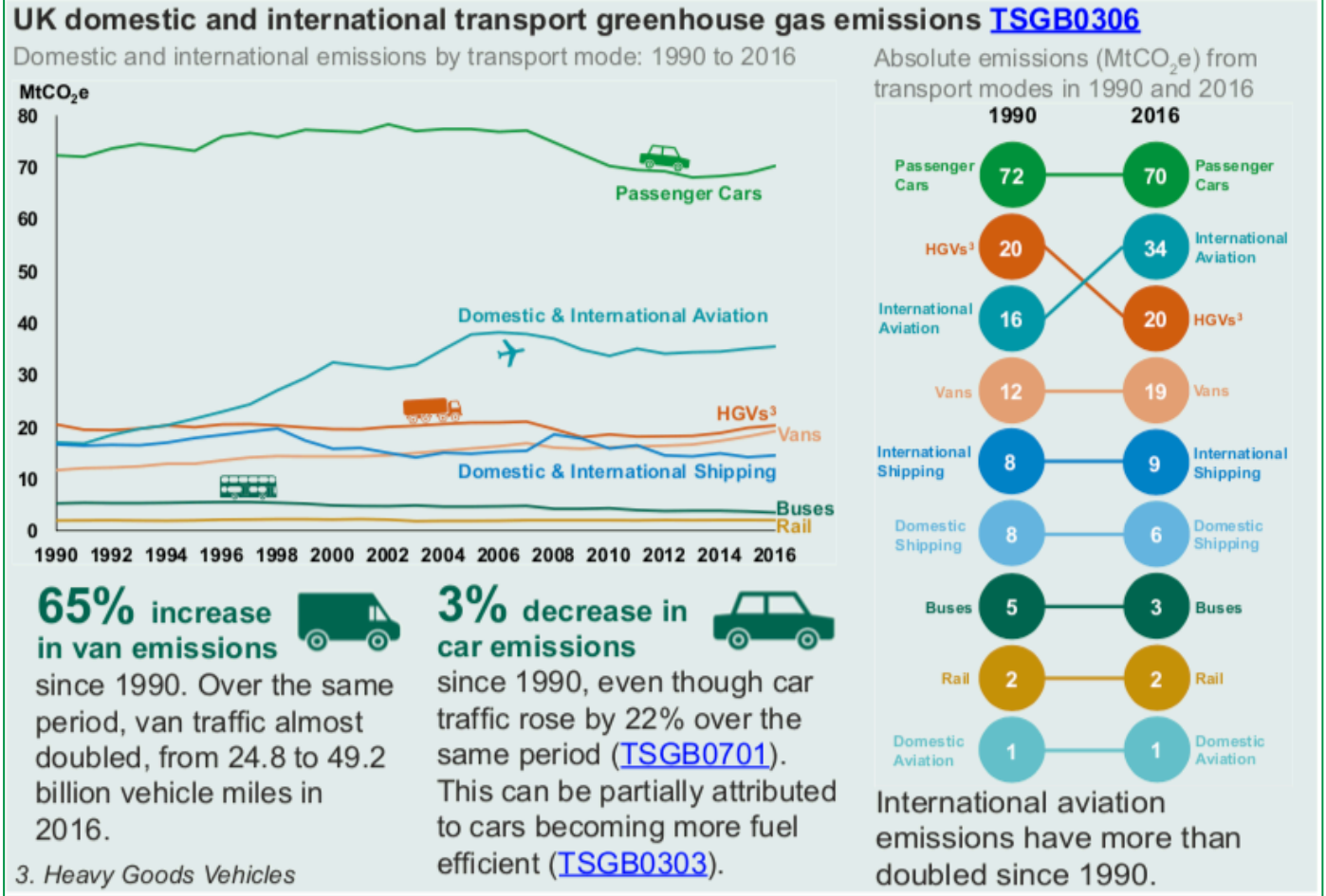
Transport is the second highest single source of emissions

But how does it break down in detail?



Transport – by mode

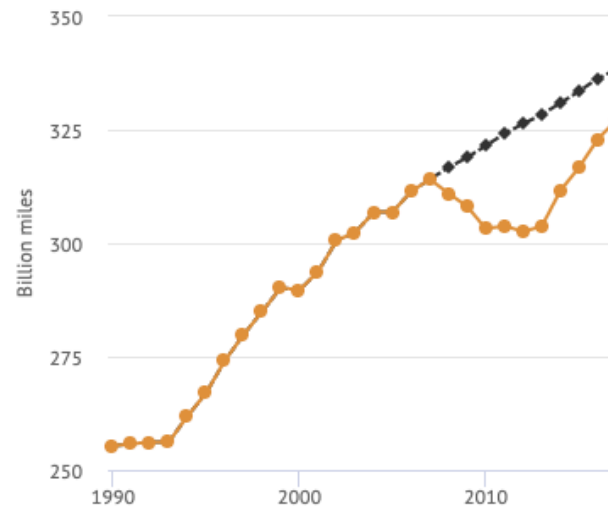
Cars and aviation are the main items



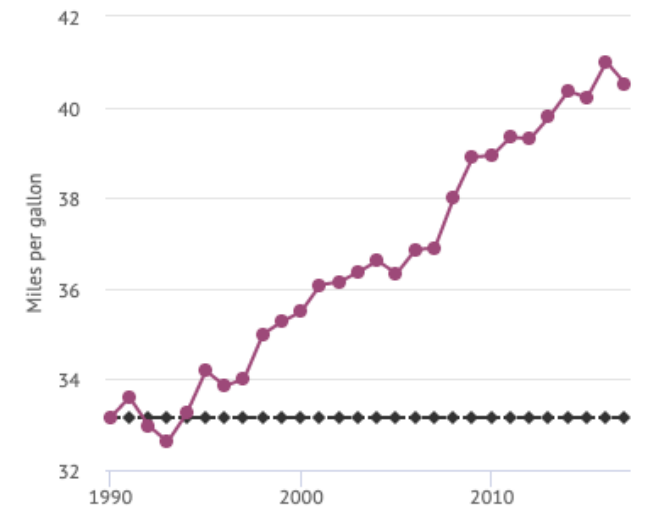
Transport – Cars

Car emissions are unchanged over 25 years as increased usage has offset improved fuel efficiency

Vehicle miles travelled



Vehicle fuel economy



Annual miles travelled and vehicle fuel economy (in miles per gallon). Black lines in each plot represent the business as usual scenario: 1990 fuel economy levels and fixed per-capita miles traveled after 2007. Note the truncated y-axes. Data from the UK [Department for Transport](#); chart by Carbon Brief using [Highcharts](#).

Vehicle Emissions – by speed

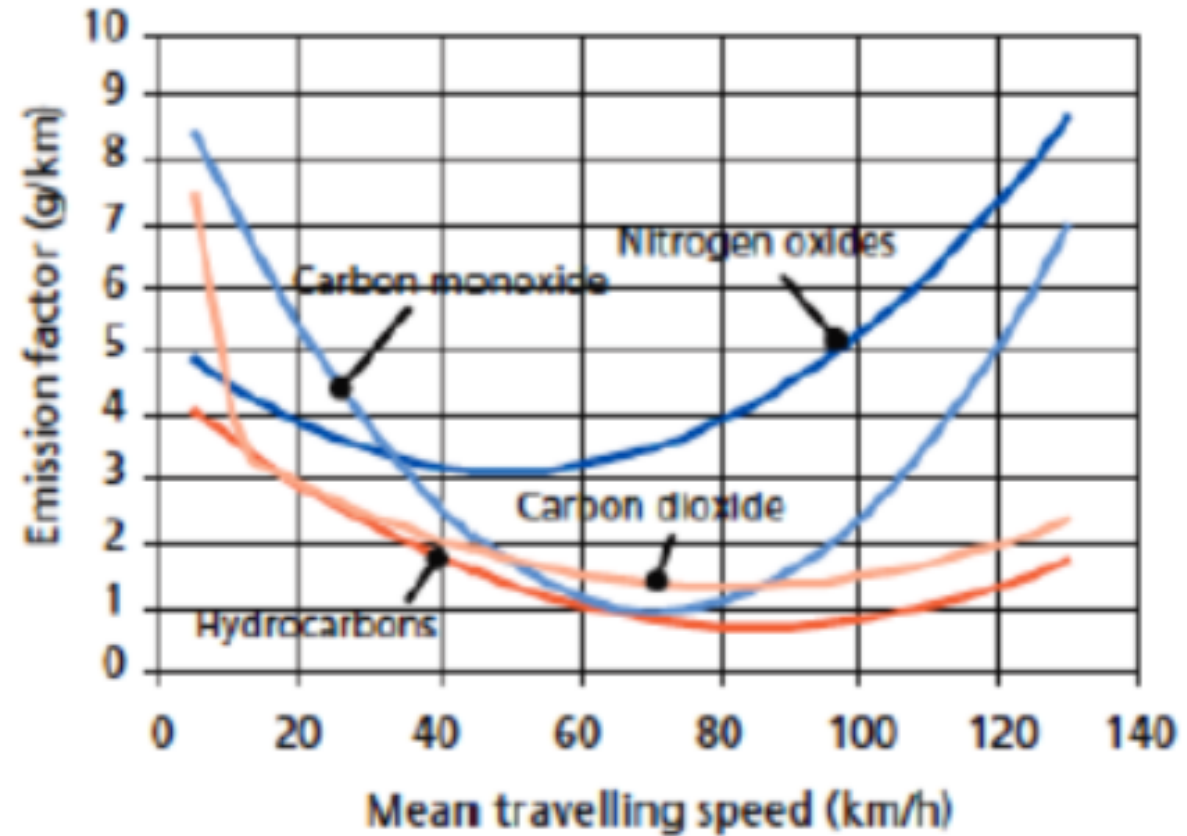
Some people think that in addition to the other benefits of reducing speed limits to 20mph that the push for zero carbon will augment their case

Sadly not

Cars are optimised for emissions at 56mph (90km/h)

Driving faster or slower progressively increases emissions per mile

Figure 9-1 Relationship between vehicle emissions and vehicle speed



Walking & cycling have a trivial impact on emissions in rural areas

It's vital we only engage in activities that have the potential to reduce total parish emissions by a least 1% (that is to say the total emissions of 55 people each year at current levels)

| Village trips to be walking or cycling only | Changeable assumptions | Comments |
|---|------------------------|---|
| <u>Estimate of emissions from village-only trips</u> | | |
| Village is 1 mile across so average intra-village trip there & back = 1 mile | 1.00 | 1 |
| Also assume average distance there & back when leaving the village = 1 mile | 1.00 | 1 |
| Average number of car trips per annum for residents of a rural village | | 554 |
| Average distance travelled per car per annum (UK) | | 7,600 |
| Rural car distance as a percentage of national average | | 177% |
| Average distance travelled per car per annum (Haddenham resident) | | 13,468 |
| Percentage of mileage within the village | | 4.1% |
| Which as a percentage of all emissions is $4.1\% \times 177\% \times 68 / (68+76+271+358+(68 \times 77\%))$ | | 0.60% which is below the 1% threshold |
| And assuming intra-village trips are 25% of all car journeys | 25% | 0.15% which is a factor of 7 times below the 1% threshold |
| Compliance with initiative - 25% | 25% | 0.04% which is a factor of 27 times below the 1% threshold |
| Number of residents' annual emissions eliminated | 5,500 | 2.06 |
| | | |
| Support Electric Vehicle Adoption | | |
| Target of 90% using EVs rather than cars by 2030 | 90% | 90% |
| Assume National Grid meets target of 90% decarbonised electricity supply by 2030 | 90% | 90% |
| Percentage of emissions accounted for by cars (rural) $177\% \times 68 / (68+76+271+358+(68 \times 77\%))$ | | 14.60% |
| Which as a percentage of all emissions is $15.57\% \times 90\% \times 90\% =$ | | 11.82% |
| Number of residents' annual emissions eliminated | 5,500 | 650 |
| | | |
| But why not do both? | | |
| <u>Impact of eliminating intra-village trips if 90% EV</u> | | |
| As a percentage of all current emissions $(0.04 \times (1-0.9) + 0.04 \times 0.9 \times (1-0.9)) =$ | | 0.01% |
| Number of residents' annual emissions eliminated | 5,500 | 0 |
| | | |
| <u>Impact of 90% EV if intra-village trips eliminated</u> | | |
| As a percentage of all current emissions $(12.62 \times (1-0.25 \times 0.25 \times 4.1\%)) =$ | | 11.79% |
| Number of residents' annual emissions eliminated | 5,500 | 649 |

Sources: DEFRA: 2018 UK Greenhouse Gas Emissions, Final figures
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/862887/2018_Final_greenhouse_gas_emissions_statistical_release.pdf
 Department of Transport "Transport Statistics Great Britain 2018 Energy and Environment"
<https://www.gov.uk/government/statistics/transport-statistics-great-britain-2018>
 RAC Foundation "Car Ownership in Great Britain" 2018
<https://www.racfoundation.org/wp-content/uploads/2017/11/car-ownership-in-great-britain-leibling-171008-report.pdf>



Further Sources: RAC Foundation [https://www.racfoundation.org/motoring-fags/mobility#:~:text=Back%20to%20top-Q25\)%20What%20is%20the%20average%20annual%20mileage%20per%20car%20in,to%207%2C600%20miles%20in%202018.](https://www.racfoundation.org/motoring-fags/mobility#:~:text=Back%20to%20top-Q25)%20What%20is%20the%20average%20annual%20mileage%20per%20car%20in,to%207%2C600%20miles%20in%202018.)
 National Transport Survey Datasets NTS 9903 & 9904 <https://www.gov.uk/government/statistical-data-sets/nts99-travel-by-region-and-area-type-of-residence>
 Building the Net Zero Energy Workforce Report <https://www.nationalgrid.com/stories/journey-to-net-zero/net-zero-energy-workforce>

Walking & cycling have a trivial impact on emissions in rural areas

I've been asked to consider how this would change if we considered Thame as being a linked settlement

The issues here are achievability prior to most/all cars being EV & the percentage of journeys to be substituted

There are many reasons to support a cycleway to Thame but reducing CO2 emissions is not among them

Village trips to be walking or cycling only

Estimate of emissions from village-only trips

Village is 1 mile across so average intra-village trip there & back = 1 mile
Also assume average distance there & back when leaving the village = 1 mile
Thame is 3.3 miles from the Village hall so a round trip is 6.6 miles

Average number of car trips per annum for residents of a rural village
Average distance travelled per car per annum (UK)
Rural car distance as a percentage of national average
Average distance travelled per car per annum (Haddenham resident)
Percentage of mileage within the village

Which as a percentage of all emissions is $4.1\% \times 177\% \times 68 / (68 + 76 + 271 + 358 + (68 \times 77\%))$
And assuming intra-village trips are 25% of all car journeys

Compliance with initiative - 25%

Percentage of mileage within the Haddenham Thame bubble but excluding intra-Haddenham

And assuming trips to Thame are 25% of all car journeys

Compliance with initiative - 5%

Number of residents' annual emissions eliminated

Support Electric Vehicle Adoption

Target of 90% using EVs rather than cars by 2030
Assume National Grid meets target of 90% decarbonised electricity supply by 2030
Percentage of emissions accounted for by cars (rural) $177\% \times 68 / (68 + 76 + 271 + 358 + (68 \times 77\%))$
Which as a percentage of all emissions is $15.57\% \times 90\% \times 90\% =$
Number of residents' annual emissions eliminated

But why not do both?

Impact of eliminating intra-village trips if 90% EV

As a percentage of all current emissions $(0.04 \times (1 - 0.9) + 0.04 \times 0.9 \times (1 - 0.9)) =$

Number of residents' annual emissions eliminated

Impact of 90% EV if intra-village trips eliminated

As a percentage of all current emissions $(12.62 \times (1 - 0.25 \times 0.25 \times 4.1\%)) =$

Number of residents' annual emissions eliminated

| Changeable assumptions | Comments |
|------------------------|--|
| 1.00 | 1 |
| 1.00 | 1 |
| 6.60 | 7 |
| | 554 |
| | 7,600 |
| | 177% |
| | 13,468 |
| | 4.1% |
| | 0.60% which is below the 1% threshold |
| 25% | 0.15% which is a factor of 7 times below the 1% threshold |
| 25% | 0.04% which is a factor of 27 times below the 1% threshold |
| 25% | 6.79% |
| 5% | 0.34% which is a factor of 3 times below the 1% threshold |
| 5,500 | 20.73 |
| 90% | 90% |
| 90% | 90% |
| | 14.60% |
| | 11.82% |
| 5,500 | 650 |
| | |
| | 0.01% |
| 5,500 | 0 |
| | |
| | 11.79% |
| 5,500 | 649 |

Sources: DEFRA: 2018 UK Greenhouse Gas Emissions, Final figures
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/862887/2018_Final_greenhouse_gas_emissions_statistical_release.pdf
Department of Transport "Transport Statistics Great Britain 2018 Energy and Environment"
<https://www.gov.uk/government/statistics/transport-statistics-great-britain-2018>
RAC Foundation "Car Ownership in Great Britain" 2018
<https://www.racfoundation.org/wp-content/uploads/2017/11/car-ownership-in-great-britain-leibling-171008-report.pdf>



Further Sources: RAC Foundation [https://www.racfoundation.org/motoring-faqs/mobility#:~:text=Back%20to%20top-Q25\)%20What%20is%20the%20average%20annual%20mileage%20per%20car%20in,to%207%2C600%20miles%20in%202018.](https://www.racfoundation.org/motoring-faqs/mobility#:~:text=Back%20to%20top-Q25)%20What%20is%20the%20average%20annual%20mileage%20per%20car%20in,to%207%2C600%20miles%20in%202018.)
National Transport Survey Datasets NTS 9903 & 9904 <https://www.gov.uk/government/statistical-data-sets/nts99-travel-by-region-and-area-type-of-residence>
Building the Net Zero Energy Workforce Report <https://www.nationalgrid.com/stories/journey-to-net-zero/net-zero-energy-workforce>

For walking & cycling to have an impact we first would need to change our diets

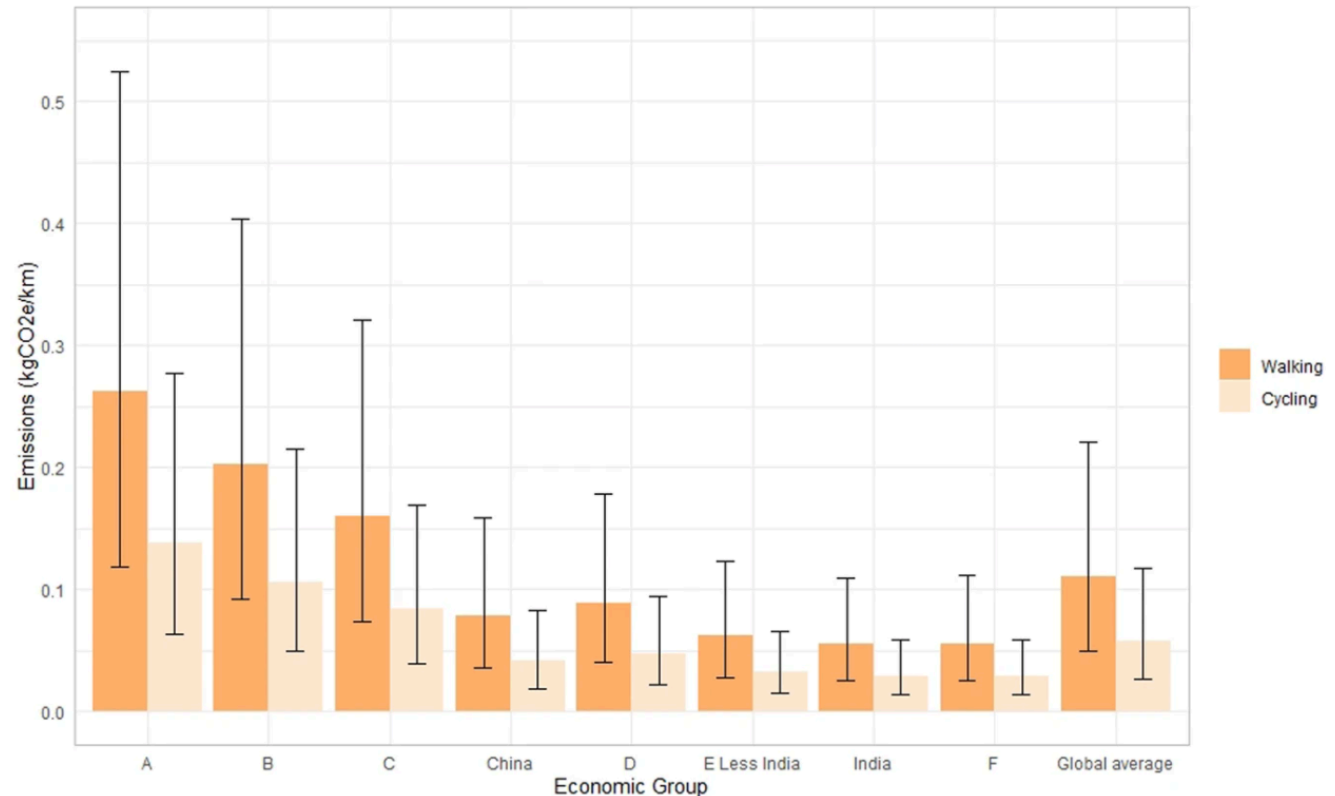
A June 2020 article in Nature concluded...

That people walking are not carbon neutral and may well, in economies with an energy-intensive food supply chain such as ours, be on a par with cars, while bike riding produces around a 50% reduction in emissions

That from an emissions point of view car clubs could have a bigger positive emissions impact than increasing walking, and

That from an emissions point of view more walking needs to be partnered with low carbon diets for lower emissions to be one of the benefits.

From: [Fuelling walking and cycling: human powered locomotion is associated with non-negligible greenhouse gas emissions](#)



Emissions associated with travelling a kilometre, by walking, and cycling, assuming full energy compensation for countries grouped by level of economic development (from most economically developed (A) to least economically developed (F)).

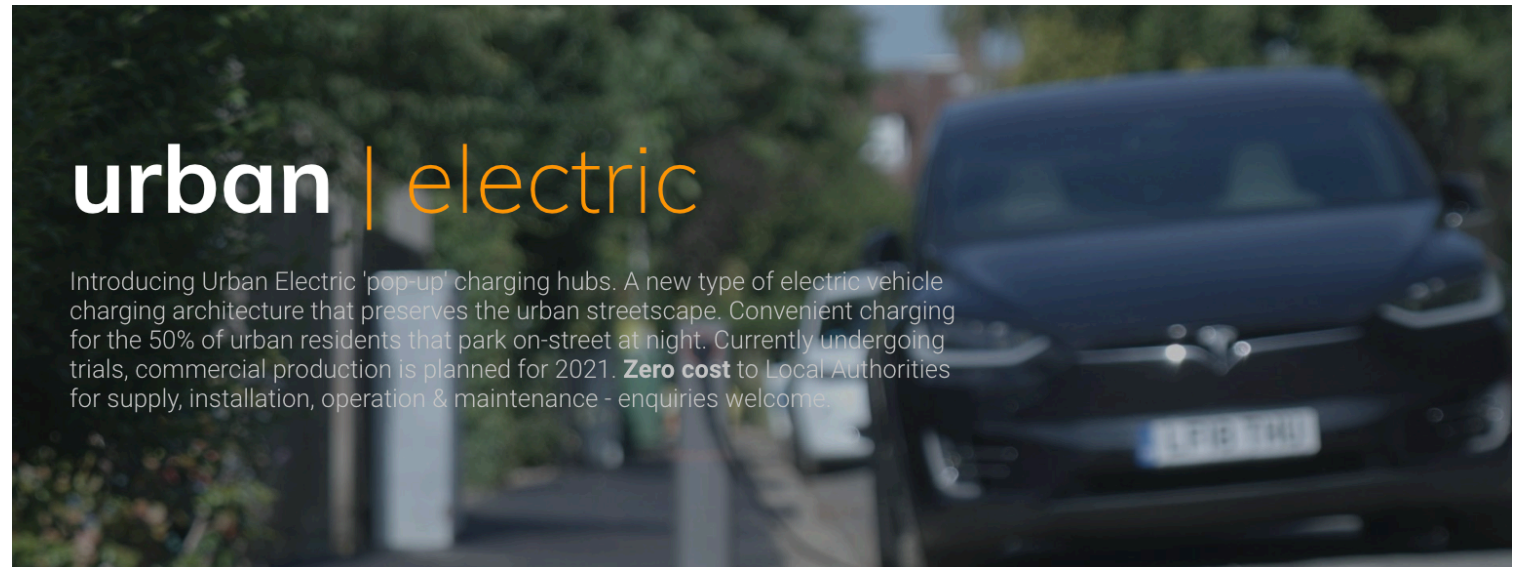
Transport – Electric cars

Given electricity will be from 90% carbon zero sources by 2030, and that the average car is scrapped after 16 years and has 4 owners, there is the potential to cut emissions from cars to single figure MtCO₂e by 2030, or about 90%

Actions:

Ensure there are no planning obstacles to off-street home charging stations

Provide on-street rapid charging for those without off-street parking



We also will be working with Thame on EVs and EV car clubs

Thame's Green Living Plan opens the opportunity for us to work together to make the adoption of Electric Vehicles easier and much cheaper for Haddenham residents

Let's talk about ...Transport (4.4)



This year's new registrations of EVs and Hybrids up from 1.7% in 2017 to 24% in 2020

2nd Hand EV is growing significantly

EVs remain 'upwardly compatible' with newer chargers

£400m investment nationally in street Charge Points and new Super Hubs

15

We also will be working with Thame on EVs and EV car clubs

Thame's Green Living Plan opens the opportunity for us to work together to make the adoption of Electric Vehicles easier and much cheaper for Haddenham residents

Thame Electric Vehicle Charging Points (4.4/4.5)



**In fuel alone, for over 10,000 miles driven,
an EV saves £380 over a diesel car and £609 for petrol cars**

16

We also will be working with Thame on EVs and EV car clubs

Thame's Green Living Plan opens the opportunity for us to work together to make the adoption of Electric Vehicles easier and much cheaper for Haddenham residents

Thame EV Car Club/Shared Transport (4.5)



Access transport only when you need it

Peer to Peer club (Hyacar)

Operating under license from a National Operator (CoWheels)

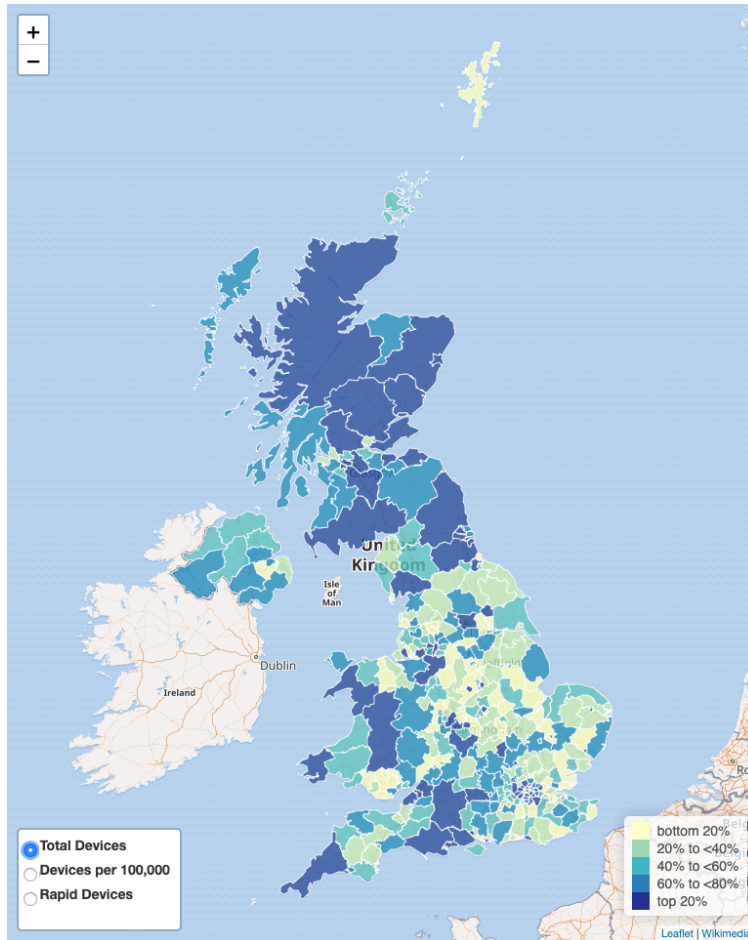
An independent car club

Greener, no capital outlay, reduces parking requirements 17

Transport – Public charging points

Action:

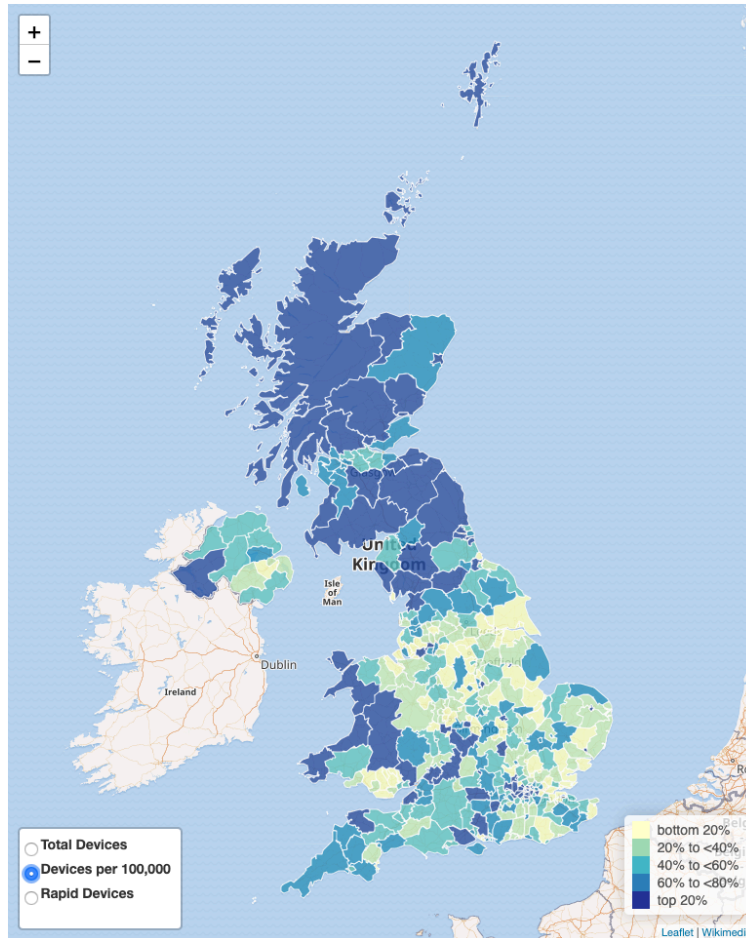
We should also pressure Buckinghamshire Council (BC) to roll out public charging points.



Transport – Public charging points

Action:

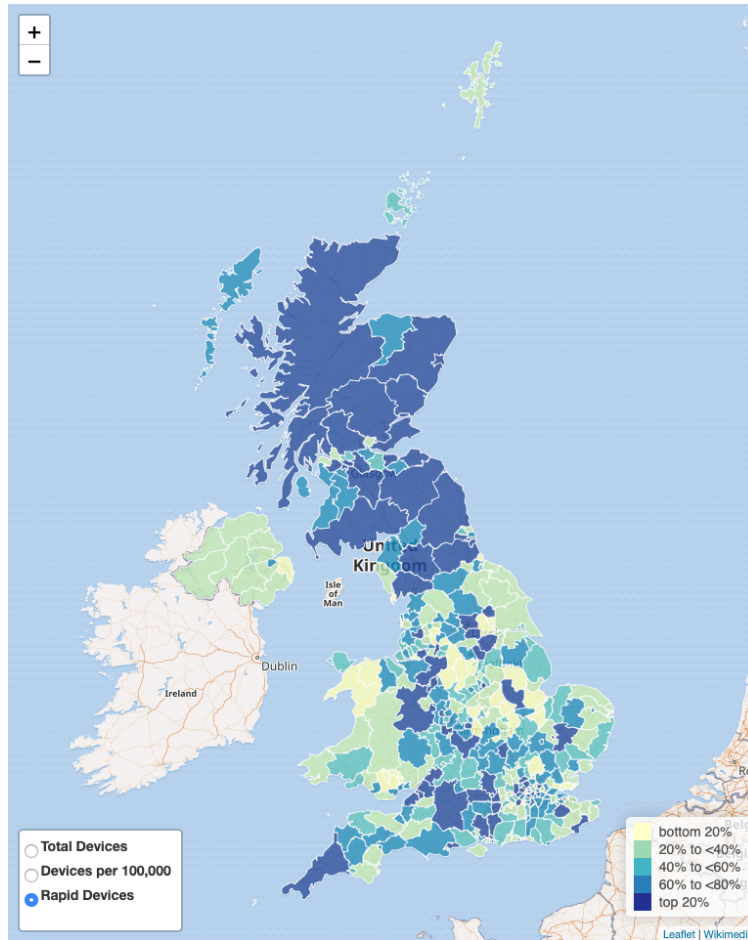
We should also pressure Buckinghamshire Council (BC) to roll out public charging points.



Transport – Public charging points

Action:

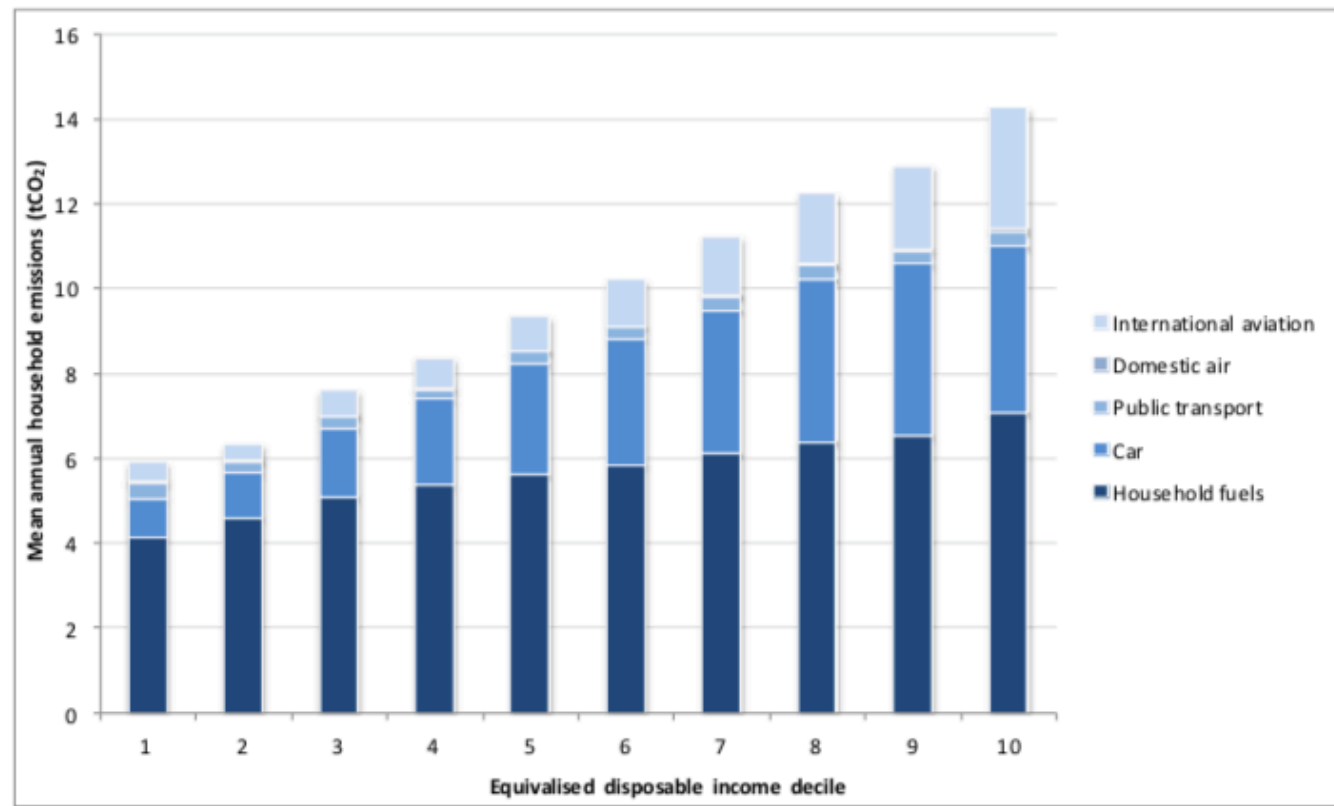
We should also pressure Buckinghamshire Council (BC) to roll out public charging points.



Aviation emissions vary considerably by circumstances

By income

Figure 3: Mean annual CO₂ emissions from all sources by equivalised household disposable income decile



Aviation emissions vary considerably by circumstances

By family structure, and so on

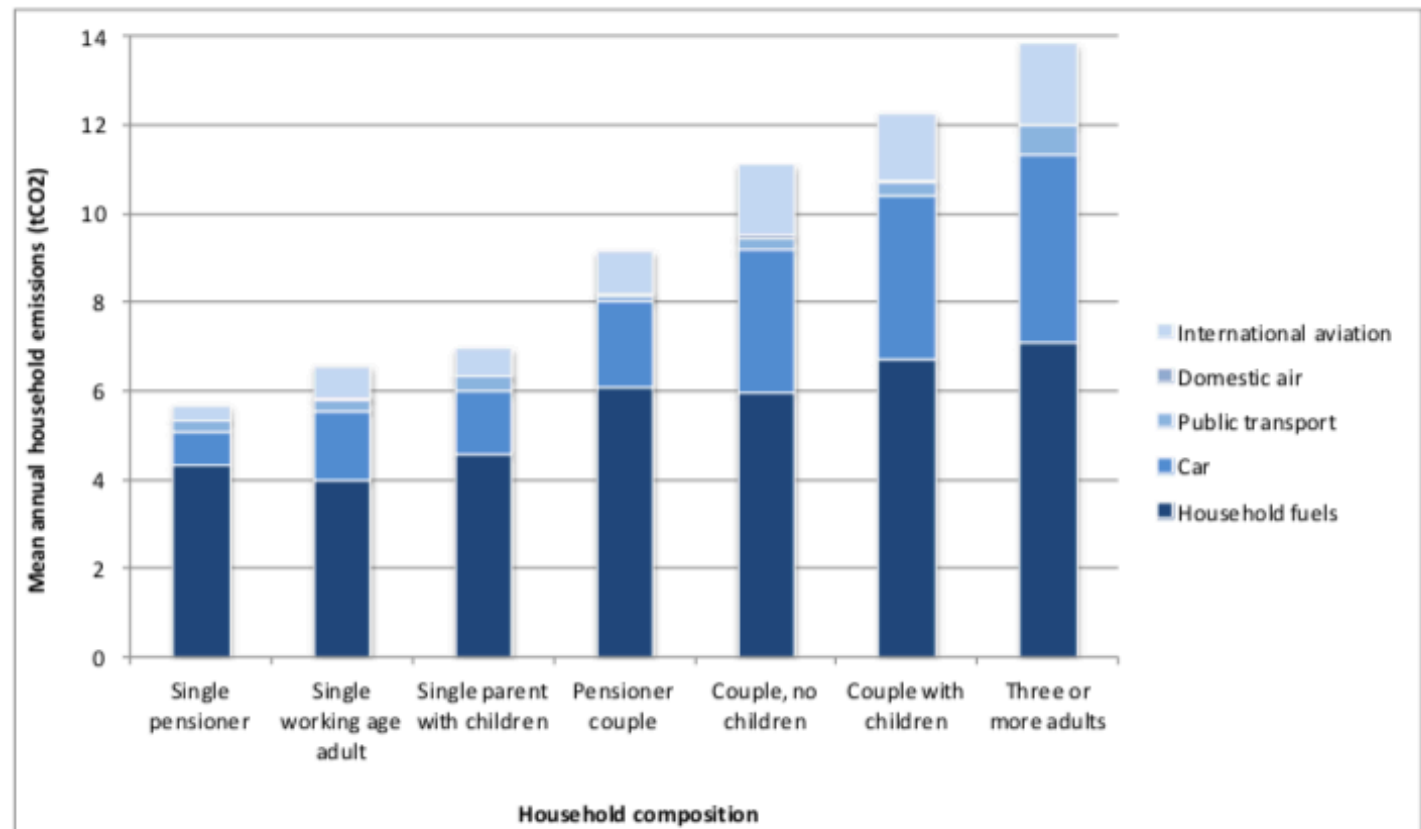
Ideally this topic will be tackled by national / industry sector actions.

However, in the absence of these thus far...

Action: Conduct focus groups /depth interviews / informal research among residents who use international aviation in order to better diagnose the issues

Action: Seek expertise from elsewhere and/or through desk research to elicit insights

Figure 8: Mean annual CO₂ emissions by source and household type

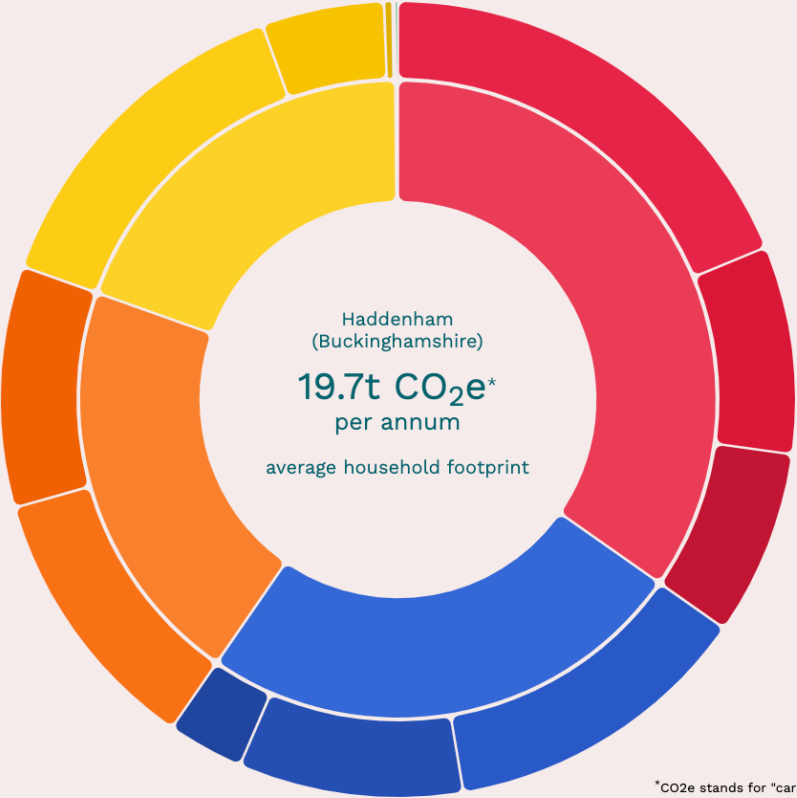


Food

Food is the second largest homogenous source of emissions – there may be significant "hotspots" in manufactured goods and services, and more work will be done to establish if so, and what

Territorial Consumption Per-household Total Show sub-categories

Haddenham (Buckinghamshire)



- Consumption of goods and services
- Housing
- Travel
- Food and diet
- Waste

*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.

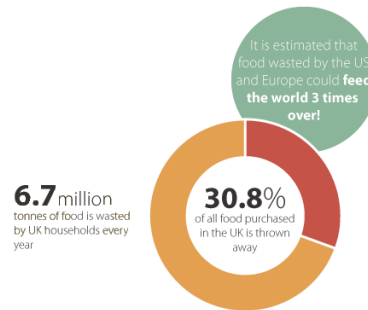
Food waste

Food is the third largest homogenous source of emissions¹

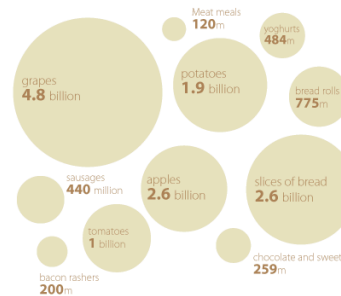
Action:

Create pilot in Q1 (calendar) 2020 to eradicate food waste in Haddenham and at the shops & farms where Haddenham residents buy their food.

food waste in the UK



how much do we waste?



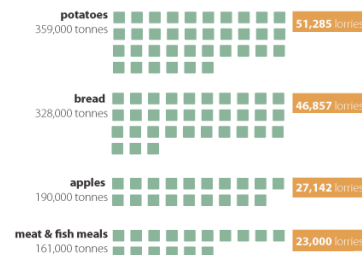
how much is it costing the UK?

The UK pays for but does not eat up to **€11.3 billion** of good food each year

That is twice the amount the government spends on **foreign economic aid**



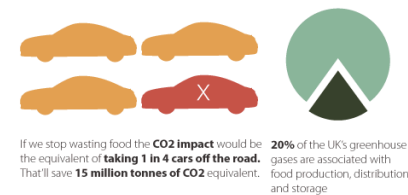
the most common foods we waste and their equivalent weights



unopened food... how much does it cost UK households?



the environmental impact of wasting food



Food waste & Covid

Covid 19 has delayed the start of the food waste pilot, changed what is safe and practical for residents to do, but has also created new habits to make eliminating food waste easier

Figure 3 – In home food management behaviours

Q. In the past month would you say you are doing the following things *more often*, *less often* or the *same as always*? If you never do any of them, please select NA/don't do

Base: 4,197 UK adults aged 18+ with responsibility for food shopping and/or preparation in the home. April 2020



Food waste – pilot to find apps that help people

Foodsavvy.org.uk is a Norfolk- and Suffolk-based campaign working with environmental charity Hubbub to help households cut food waste inline with the United Nation's Sustainable Development Goals.

We will be using a lot of their tools and resources in the pilot

Food shopping doesn't have to be a series of mental checklists and post it notes. Get techy with a little bit of help from our favourite food waste apps. With **nearly £14 billion** worth of food going to waste in the UK every year, get #FoodSavvy with the touch of a button.

OLIO

Get involved in your community with this popular food sharing app. Have too much food on the go? Just pop it on **Olio** and someone from your local area will be happy to pick it up. Free, easy and full of community spirit.

KITCHE

Kitche It, Don't Ditch It by uploading your shopping receipts and receiving automated reminders to help you bin food waste for good. Flummoxed by the random bits and bobs in your fridge? Kitche is also packed with smart recipes to help you use up every last bite.

COZZO

Manage your pantry like a pro. **CozZo** creates a digital inventory of your kitchen cupboards, makes sure you know when food will go off, and creates shopping lists to streamline your supermarket trips. Never find a mouldy potato at the back of the fridge again.



TOO GOOD TO GO AND KARMA

Sometimes we just don't have time to make that midweek meal, which is where **Too Good To Go** and **Karma** come in. Connecting you to local businesses, these apps sell food at discounted prices, so it doesn't just get thrown away. Cheap, delicious and beneficial for everyone!

GIKI

Make your food choices count. Simply scan the barcode on a product and **Giki** will tell you everything from additives to the company's sustainability policy. It will give you info on animal welfare, carbon footprint and palm oil content, arming you with everything you need to make an informed choice.

EATBY APP

This **EatBy** barcode scanner keeps track of the food you have in your kitchen and reminds you to eat it before it goes past its use by date. The sharing function makes it easy to share your shopping list or let your family know what's for dinner.

Food labelling

Labelling food to show its carbon footprint has been discussed at least since 2010 by UK governments

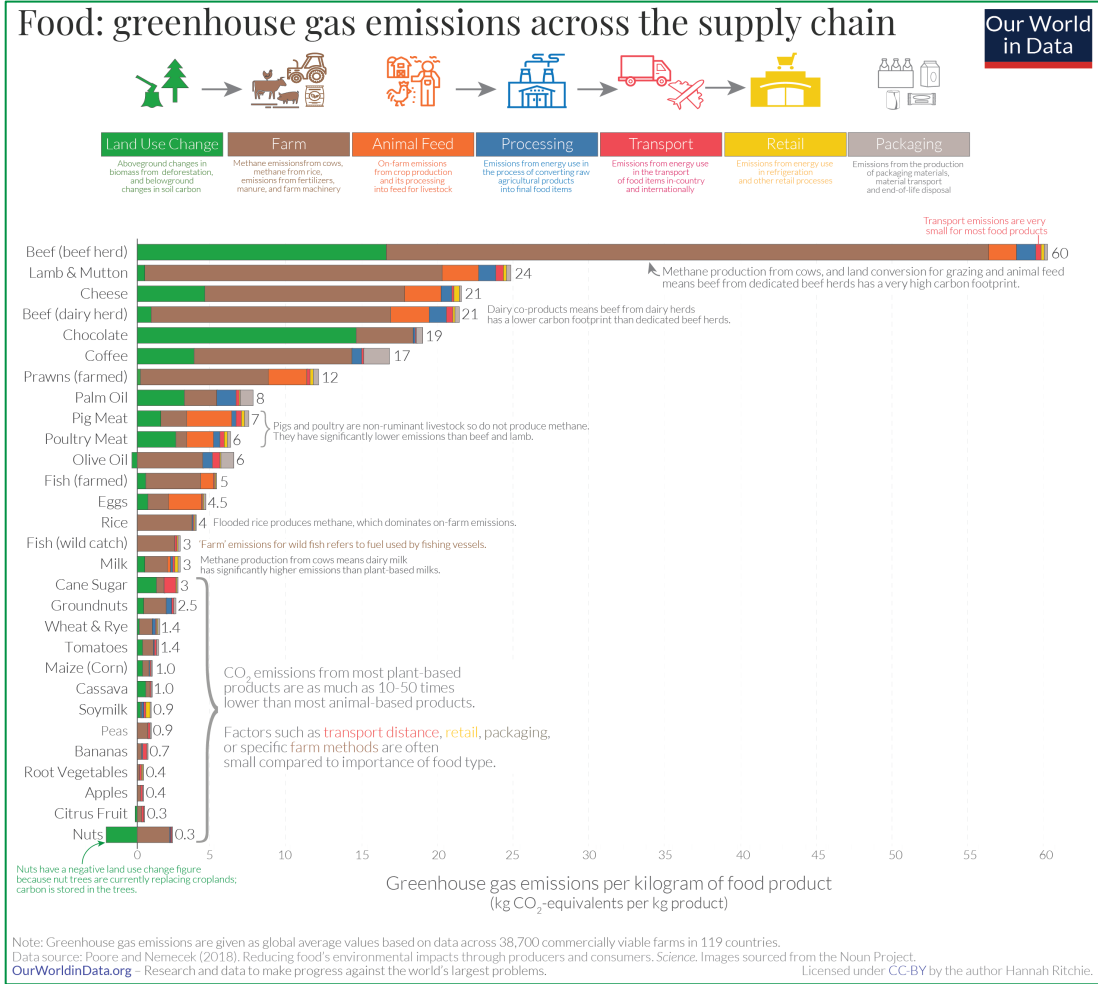
Simple rules of thumb such as food miles are known to be poor guides as often it is better in emissions terms to buy food grown overseas in season than to buy polytunnel-produced food grown here or in nearby countries such as The Netherlands

Action: Run a pilot to optimise response to carbon labelling of food when introduced circa 2023. This will be a complement to national action and timing will be dictated by when legislation comes into force



Food miles only matter for air-shipped perishables like asparagus and green beans

Food miles often crops up as something to focus on, but the less welcome news is that it is the impact on land use and especially the methane from cows that drive the emissions from food



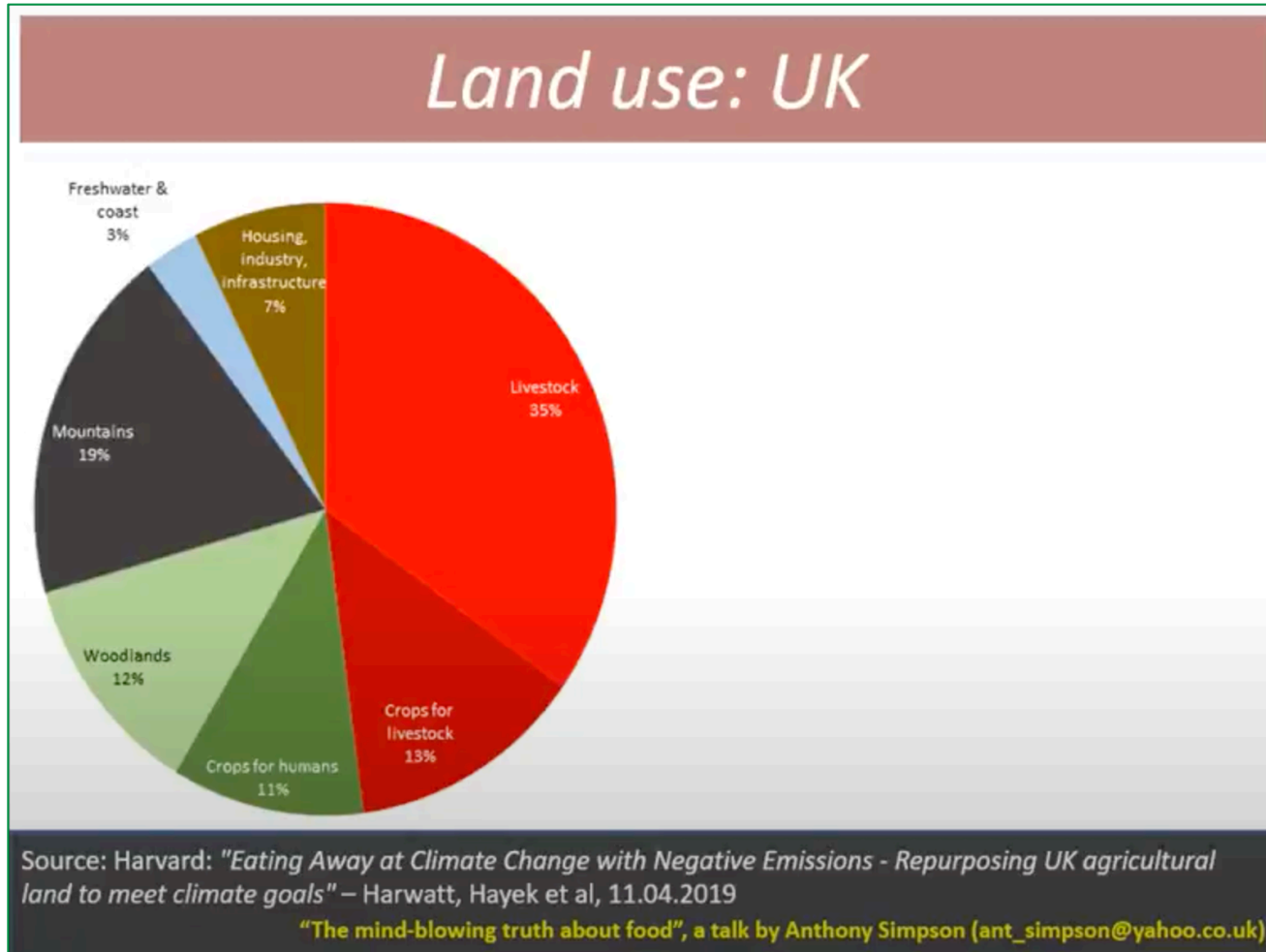
Land for livestock and the crops for food to feed them covers 48% of the UK

The UK has one of the highest levels of forest depletion in the world

For example, in Germany roughly 33% of the land is still forest

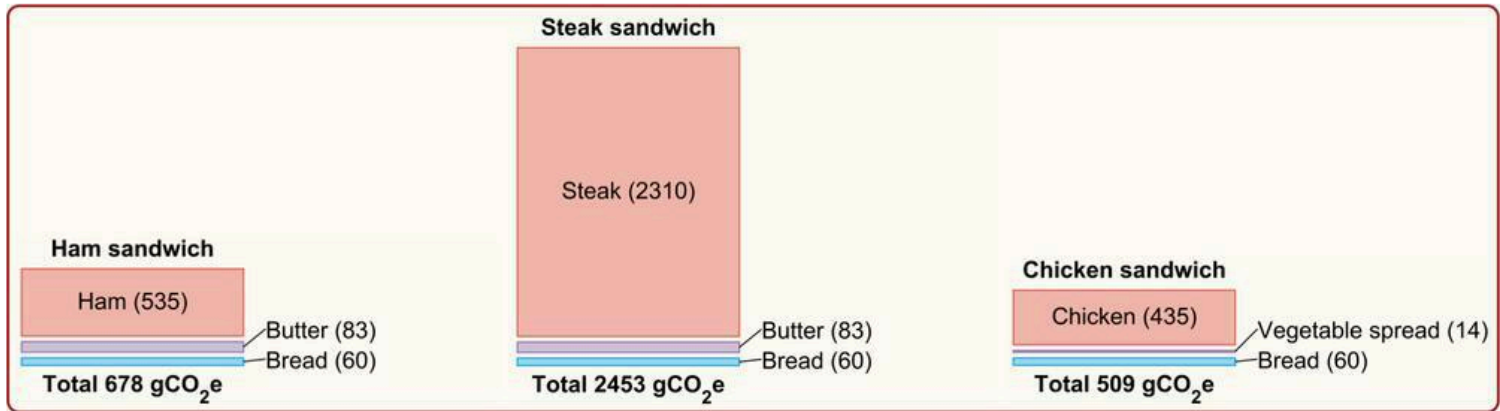
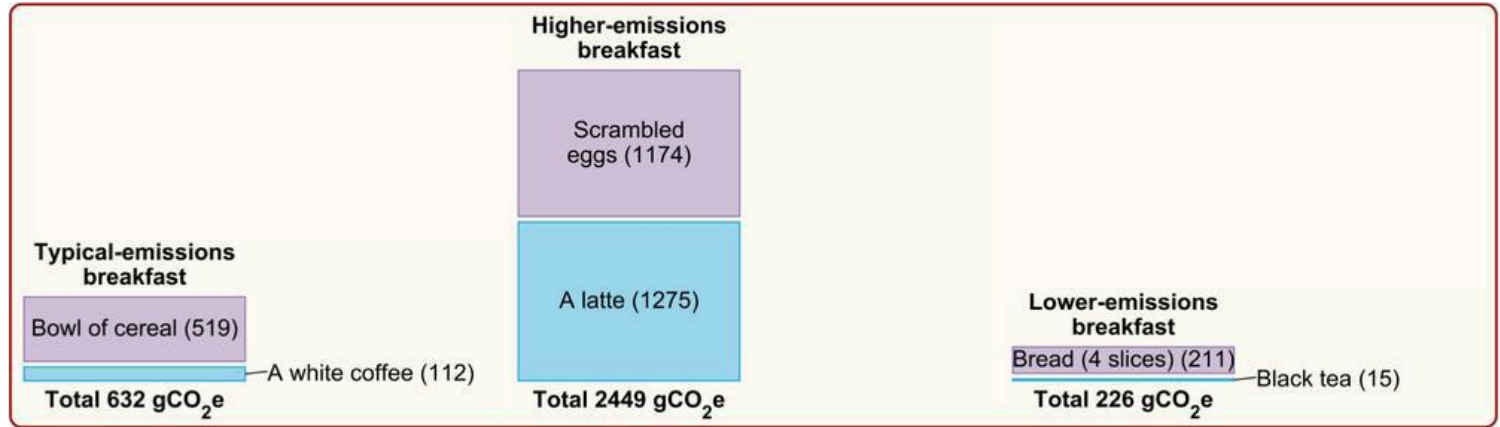
If the land used for livestock were re-forested then our net emissions from the food we eat would drop to zero

If we grew crops for humans on the land we now grow crops for animals then we would be self-sufficient in food whereas now we also need a land mass 50% of the UK overseas to feed ourselves



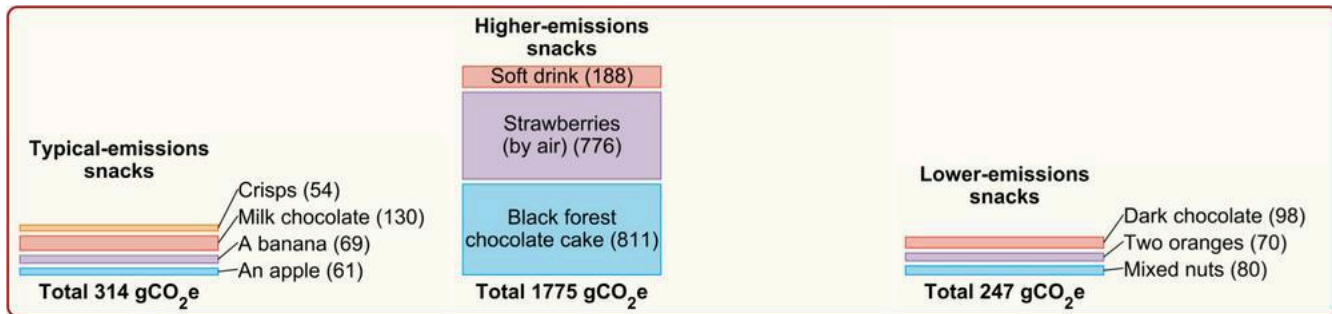
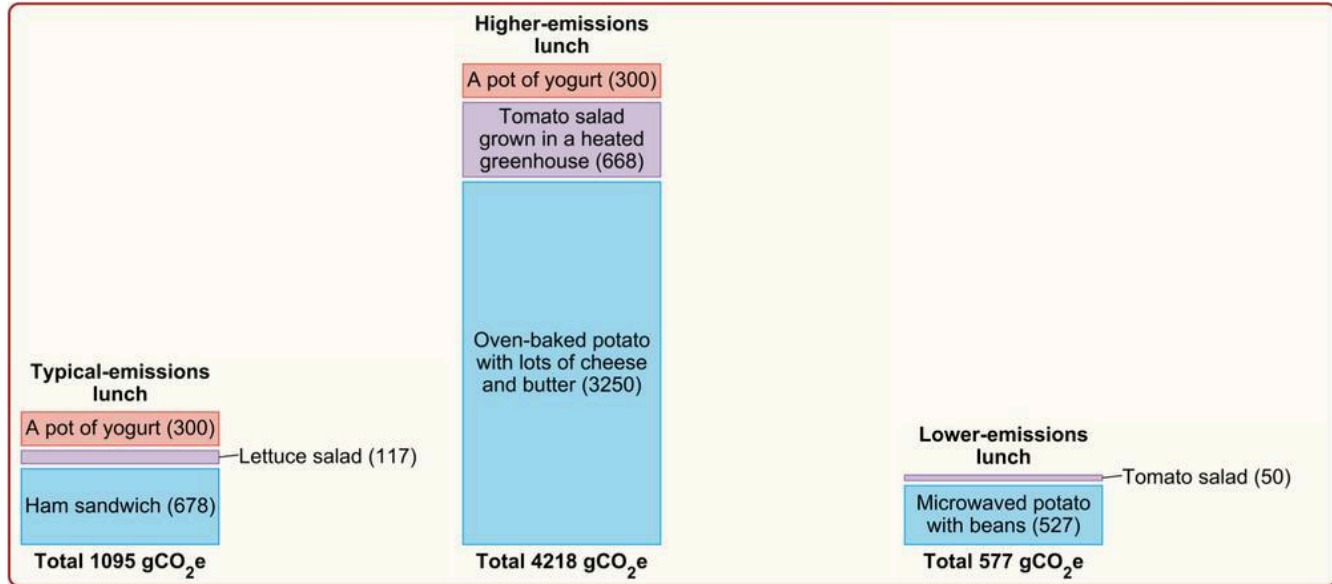
Some examples of high and low carbon meals – ahead of food labelling

In general the less red meat, the less dairy and the less air-freighting



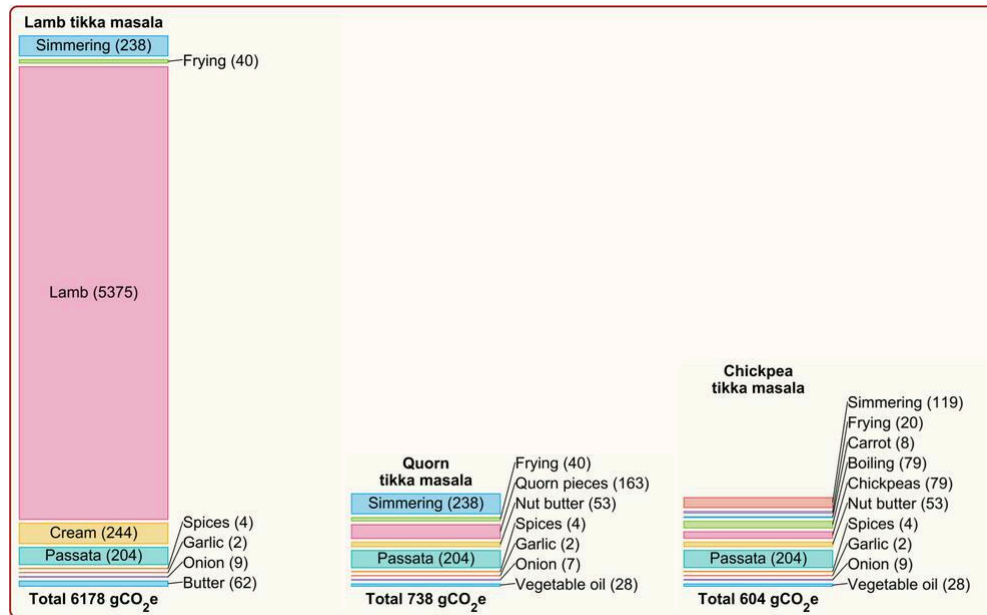
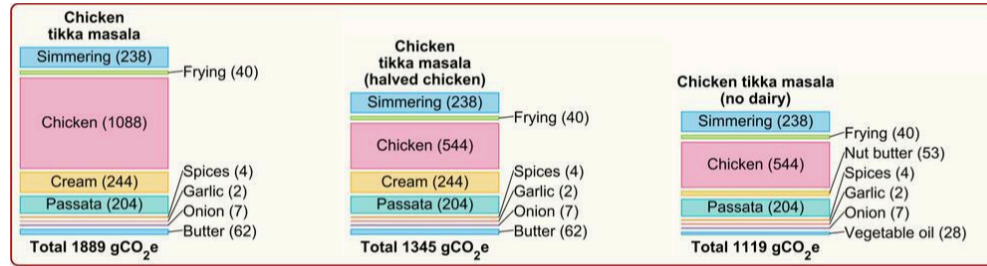
Some examples of high and low carbon meals – ahead of food labelling

In general the less red meat, the less dairy and the less air-freighting



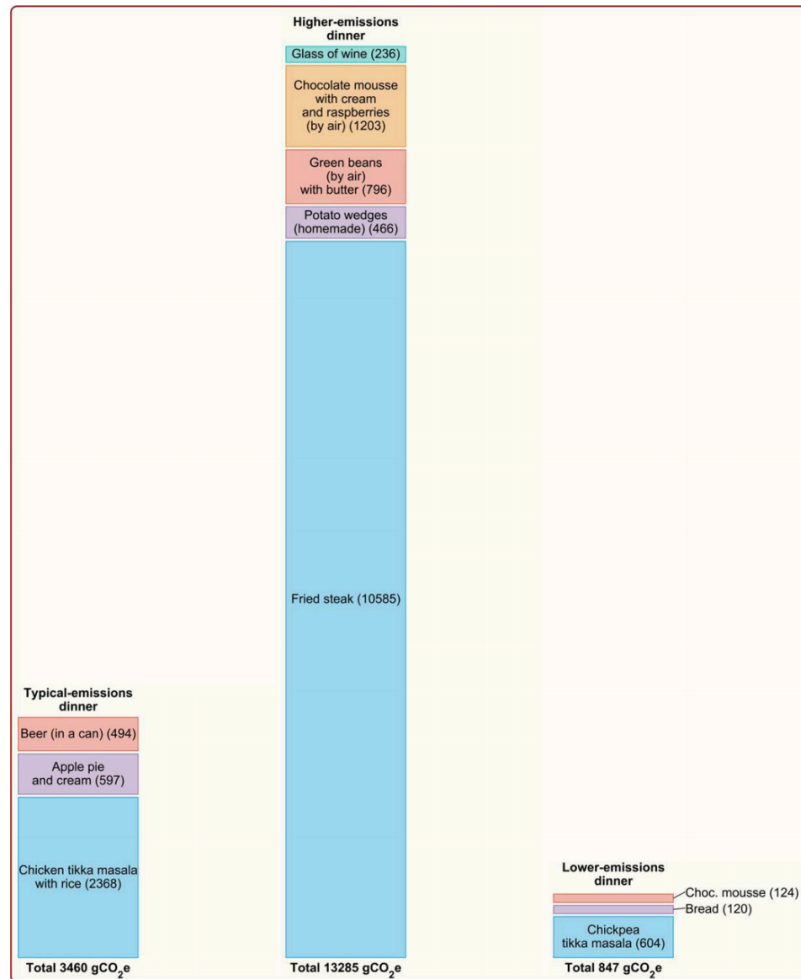
Some examples of high and low carbon meals – ahead of food labelling

In general the less red meat, the less dairy and the less air-freighting



Some examples of high and low carbon meals – ahead of food labelling

In general the less red meat, the less dairy and the less air-freighting



Summary of Proposed Actions & Estimated Impacts **So Far**

HDM Food waste initiative

Eradicating 73% of food waste would be a 23% reduction in food-related emissions and halving meat emissions by reducing beef & lamb for other options

Enabling EVs via charging point provision & removal of obstacles – 90% take-up by 90% who change vehicle reduces transport-related emissions by 47%

De-carbonisation of electricity generation by market forces & govt reduces power emissions by 54%

Switching 80% of hhlids who have gas boilers to electric heat pumps reduces power emissions by 26% with half attributable to local enabling action

| | | | | Per cap | Per hhld | HDM now | HDM 2030 BAU | Reduction w/o HDM action | Reduction from currently-proposed HDM action | HDM 2030 so far |
|---------------------------------|---------------------------|-----|-----|---------|----------|---------|--------------|--------------------------|--|-----------------|
| Consumption of Goods & Services | Purchase of goods | 35% | 19% | 1.56 | 6.54 | 9,000 | 12,300 | | | 12,300 |
| | Use of services | | 8% | 0.66 | 2.76 | 3,800 | 5,200 | | | 5,200 |
| | Other consumption-related | | 8% | 0.66 | 2.76 | 3,800 | 5,200 | | | 5,200 |
| Travel | Private transport | 25% | 13% | 1.07 | 4.48 | 6,200 | 8,400 | | -81% | 1,600 |
| | Flights | | 9% | 0.74 | 3.10 | 4,300 | 5,800 | | | 5,800 |
| | Public transport | | 3% | 0.25 | 1.03 | 1,400 | 1,900 | | | 1,900 |
| Food & Diet | Meat & Fish | 21% | 11% | 0.90 | 3.79 | 5,200 | 7,100 | | -62% | 2,700 |
| | Other food & drink | | 10% | 0.82 | 3.44 | 4,800 | 6,500 | | -23% | 5,000 |
| Housing | Main gas | 19% | 14% | 1.15 | 4.82 | 6,700 | 9,100 | -50% | -30% | 1,800 |
| | Electricity | | 5% | 0.41 | 1.72 | 2,400 | 3,200 | -80% | | 600 |
| | Oil | | <1% | | | | | | | |
| Waste | Waste | <1% | <1% | | | | | | | |
| | | | | 8.2 | 34.44 | 47,600 | 64,900 | | | 42,100 |

| % of 2020 emissions per cap | Emissions (tCO ₂ e ^y -1) | Hectares of woodland required |
|-----------------------------|--|-------------------------------|
| 100% | 64,900 | 12,180 |
| 95% | 61,700 | 11,580 |
| 90% | 58,400 | 10,960 |
| 85% | 55,200 | 10,360 |
| 80% | 52,000 | 9,760 |
| 75% | 48,700 | 9,140 |
| 70% | 45,500 | 8,540 |
| 65% | 42,100 | 7,900 |
| 60% | 39,000 | 7,320 |
| 55% | 35,700 | 6,700 |
| 50% | 32,500 | 6,100 |
| 45% | 29,200 | 5,480 |
| 40% | 26,000 | 4,880 |
| 35% | 22,700 | 4,260 |
| 30% | 19,500 | 3,660 |
| 25% | 16,200 | 3,040 |
| 20% | 13,000 | 2,440 |
| 15% | 9,700 | 1,820 |
| 10% | 6,500 | 1,220 |

Residual emissions of 46,600 MtCO₂y⁻¹ require 8,740ha of woodland to offset

Woodland offset

Quantification of the carbon sequestration offered by woodland is sparse with a range of figures being proposed

This report uses verified numbers from The Forestry Commission Woodland Carbon Code Project which implies 5.3 tCO₂y⁻¹ per hectare but figures as high as 10 tCO₂y⁻¹ or as low as 2.5 can be found

Clearly much depends on the soil, aspect, type of tree and we will need to acquire expertise so we can make wise decisions

Forestry Statistics 2018

Table 4.3a Woodland Carbon Code projects¹ in the UK

| | Verified | Validated only | Awaiting validation | Total |
|--|----------|----------------|---------------------|--------|
| Number of projects | | | | |
| March 2012 | 0 | 11 | 46 | 57 |
| March 2013 | 0 | 36 | 69 | 105 |
| March 2014 | 0 | 67 | 135 | 202 |
| March 2015 | 0 | 100 | 99 | 199 |
| March 2016 | 1 | 121 | 108 | 230 |
| March 2017 | 3 | 140 | 107 | 250 |
| March 2018 | 37 | 119 | 83 | 239 |
| Area of woodland (hectares) | | | | |
| March 2012 | 0 | 795 | 1 972 | 2 767 |
| March 2013 | 0 | 1 488 | 2 073 | 3 561 |
| March 2014 | 0 | 2 824 | 12 576 | 15 401 |
| March 2015 | 0 | 3 322 | 12 063 | 15 385 |
| March 2016 | 5 | 4 749 | 11 087 | 15 841 |
| March 2017 | 148 | 4 993 | 11 028 | 16 170 |
| March 2018 | 1 578 | 3 680 | 10 868 | 16 125 |
| Projected carbon sequestration² (thousand tonnes of carbon dioxide equivalent) | | | | |
| March 2012 | 0 | 354 | 930 | 1 283 |
| March 2013 | 0 | 655 | 1 137 | 1 792 |
| March 2014 | 0 | 1 323 | 4 364 | 5 687 |
| March 2015 | 0 | 1 588 | 4 091 | 5 679 |
| March 2016 | 2 | 2 278 | 3 519 | 5 799 |
| March 2017 | 79 | 2 385 | 3 476 | 5 940 |
| March 2018 | 713 | 1 790 | 3 285 | 5 788 |


Source: Forestry Commission

Woodland offset – Carbon Credits

Woodlands have long been a form of investment and the need for carbon offset and government encouragement of new planting has added to this

However a business case for both the Parish and for landowners is still to be developed and the Forestry Commission is likely to be an early port of call for advice





Research Note

Assessing the investment returns from timber and carbon in woodland creation projects

Richard Haw August 2017

Financial returns from woodland creation have traditionally been generated from sales of timber. In recent years, the voluntary carbon market has established and grown in the UK and landowners can now generate additional revenue from the sale of carbon. The sale of carbon 'credits' allows landowners to increase their financial returns by creating woodlands for both timber and non-timber objectives. Even at conservative yield classes and low carbon prices, woodlands can generate £400–£1300 of extra income per hectare when carbon credits are included, and much more for higher yield classes or carbon prices. The costs and benefits of woodland creation projects can vary significantly. However, this Research Note shows that, based on conservative assumptions for the five woodland types analysed here, the net present value for woodland creation increased by around 40–70% for some projects and enabled other projects to produce positive returns from the inclusion of carbon revenue. The analysis also shows that financial returns from commercial rotations can be increased by selecting a longer rotation length that will sequester more carbon. Even at low carbon prices, the extra carbon revenue generated from increasing the rotation length by five years outweighs the reduction in timber value from delayed harvesting. At higher carbon prices a further increase in rotation length could also be substantiated.

FCRN031 1

Box 2 Planting and establishment costs

Operations included in each of the five woodland types were drainage, fencing, insurance, plan preparation costs, beating up, plants and planting costs, general maintenance, ground preparation, establishment phase maintenance costs and weeding. The three broadleaved sites also contained costs for marking out, stakes, tubing and spiral guards. The two commercial (conifer) sites also contained costs for roading. The table below summarises the undiscounted costs for the planting and establishment phase (15 years) and the total lifetime of the whole woodland, as well as per hectare for broad comparisons.

| Woodland type | Whole woodland | | Per hectare | |
|---|----------------------|----------------------------------|----------------------|----------------------------------|
| | Total lifetime costs | Planting and establishment costs | Total lifetime costs | Planting and establishment costs |
| Farm woodland: managed for mixed objectives | £41 600 | £23 100 | £13 900 | £7 700 |
| Broadleaved woodland: managed for game and biodiversity | £49 300 | £20 000 | £9 900 | £4 000 |
| Broadleaved woodland: managed for timber | £66 900 | £35 600 | £13 400 | £7 100 |
| Upland conifer: managed for timber | £342 600 | £170 900 | £6 900 | £3 400 |
| Lowland conifer: managed for timber | £96 600 | £51 700 | £9 700 | £5 200 |

grant rates (based on information from the Forestry Commission Grants and Licensing team). Maintenance payments of £200/ha for 10 years have also been included. In Scotland 80% of establishment and maintenance costs have been applied. In addition, landowners can usually retain farming subsidies, such as the basic payment, for a number of years following woodland creation. These have not been included.

Timber prices

Box 3 shows the size–price curves applied for typical softwood (conifer) and hardwood (broadleaved) harvests. A further set of prices is also included for 'quality hardwoods' as the price of hardwood timber can vary significantly depending on the end-product quality as a result of the management regime.

Carbon prices

The analysis is based on carbon prices of £3, £6 and £9/tCO₂e paid up front to the landowners, via a project developer, for woodland creation. These prices broadly reflect a range of prices paid at present (2017). The Department for Business, Energy & Industrial Strategy publishes annually updated figures (previously produced by DECC) that reflect the cost of reducing emissions in order to meet UK climate change targets. A price of £60/tCO₂e has also been included to indicate this wider value of carbon sequestration to society. In reality, market prices are significantly short of this level but it does indicate the scale of benefit that investment in woodland creation provides to society.

Additional revenue sources

There are a number of other potential financial benefits for landowners creating woodlands. There may be additional benefits to farms from scaling back on activity no longer required and from shelter provided by woodlands. The presence of woodlands on farms has been shown to add to overall property values and many woodland owners also derive income from game shooting (John Clegg Consulting, 1993). Planting woodlands near rivers could also improve local water qualities and/or reduce water flows and risks of flooding, which can attract further grant funding and in some cases payments from water utility companies. None of these sources of income have been included in this analysis.

Carbon value of the woodland types

Table 2 shows the amount of claimable carbon sequestered by the different woodland types, based on the yield classes shown in Box 1, and its value at selected carbon prices. Even at low carbon prices it is possible to generate a significant amount of additional income from sales of voluntary carbon credits. The carbon sequestration that can be claimed for commercial woodlands is generally lower. Not all of the carbon sequestered can be claimed

| Woodland type | Area ha | Claimable tCO ₂ e sequestered per ha | total | Carbon value of woodland/ha | | | |
|----------------------------|---------|---|-------|-----------------------------|--------|--------|---------|
| | | | | £3 | £6 | £9 | £60 |
| Farm woodland | 3 | 450 | 1 300 | £1 300 | £2 700 | £4 000 | £26 900 |
| Broadleaved woodland (G/B) | 5 | 330 | 1 700 | £1 000 | £2 000 | £3 000 | £20 000 |
| Broadleaved woodland (T) | 5 | 200 | 1 000 | £600 | £1 200 | £1 800 | £12 300 |
| Upland conifer | 50 | 130 | 6 300 | £400 | £800 | £1 100 | £7 600 |
| Lowland conifer | 10 | 240 | 2 400 | £700 | £1 400 | £2 200 | £14 400 |

Note: rounding has been applied to the tCO₂e and carbon value figures.



Woodland offset in the Parish

Approx 150 hectares (370 acres) of land in the parish is at our borders and is in Flood Zones 2 or 3.

It is likely therefore that a business case can be made to the landowners for these areas of land to be planted as woodland

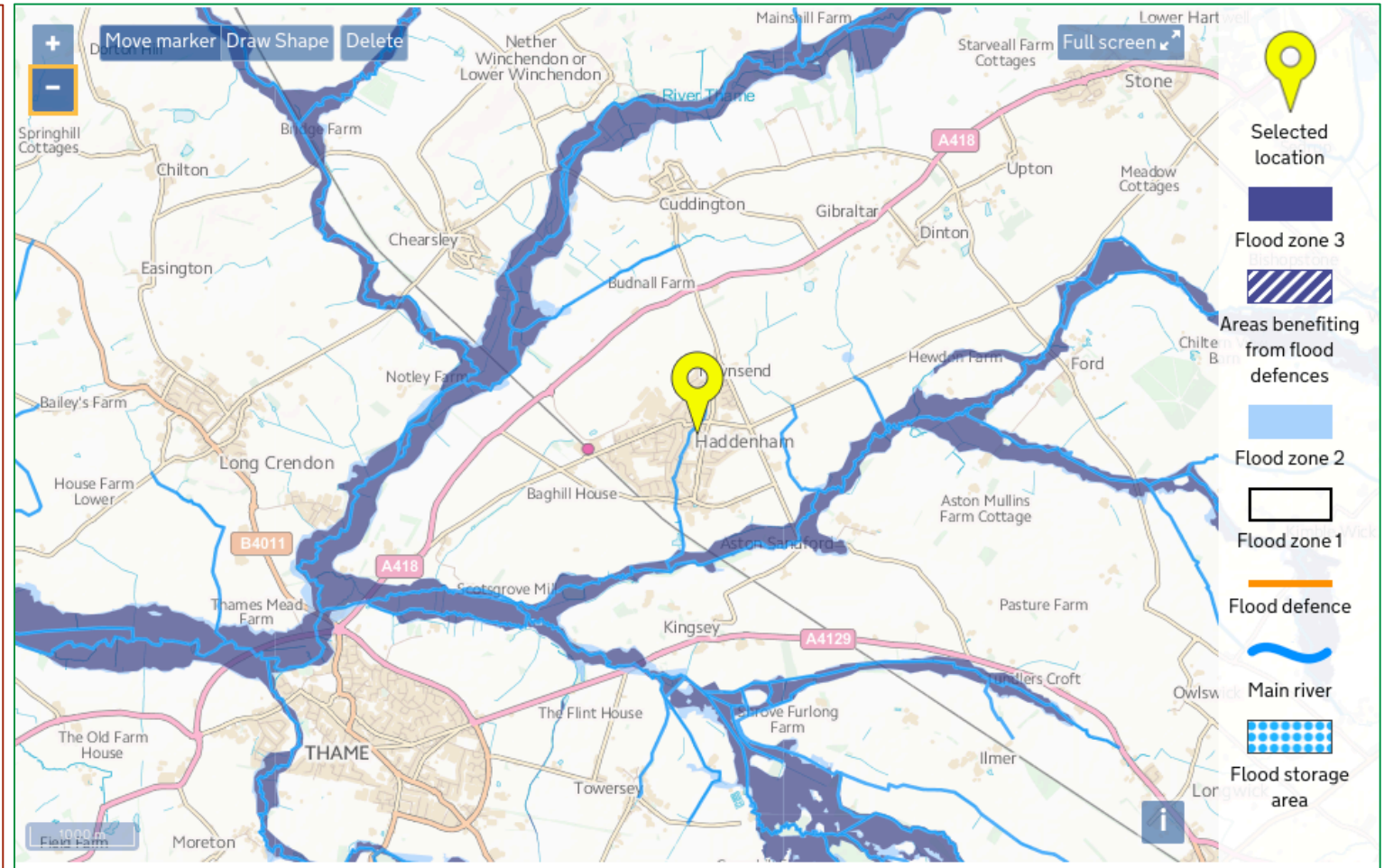


Key

-  Flood plain outside the Parish of Haddenham
-  Flood plain within the Parish of Haddenham

Woodland offset adjacent to the Parish

If landowner reaction is positive and experts deem it feasible, it may be possible to also extend the programme to the flood plains across the parish borders in Aston Sandford, Kingsey, Thame, Long Crendon, Chearsley & Cuddington



Woodland offset – ReLeaf

ReLeaf is a local group already working with the Parish Council on planting trees as an offset for carbon emissions.

The group has expertise in this area and has already identified sources of advice, resources and funding for starting and scaling up the planting requirement within the parish boundary and beyond

More details about woodland offset can be found in its live proposal document in the URL on this page



Releaf - Proposal for a tree planting programme in Haddenham

Why plant trees?

Planting billions of trees across the world is by far the biggest and cheapest way to tackle the climate crisis, according to scientists. "This new quantitative evaluation shows [forest] restoration isn't just one of our climate change solutions, it is overwhelmingly the top one," according to Prof Tom Crowther at the Swiss university ETH Zürich, who led the research. "What blows my mind is the scale. I thought restoration would be in the top 10, but it is overwhelmingly more powerful than all of the other climate change solutions proposed."

Tree planting is "a climate change solution that doesn't require President Trump to immediately start believing in climate change, or scientists to come up with technological solutions to draw carbon dioxide out of the atmosphere", Crowther said. "It is available now, it is the cheapest one possible and every one of us can get involved." The study was published on 05/07/19 in the journal Science - you can read the abstract here <https://science.sciencemag.org/content/365/6448/76> You can read some further discussion of the study here <https://www.theguardian.com/environment/2019/jul/04/planting-billions-trees-best-tackle-climate-crisis-scientists-canopy-emissions>

Wood is 50% carbon, so trees are a great carbon store. Their respiration also converts CO2 into oxygen. Trees are one of the few things that can actually take carbon out of the atmosphere and store it for the long term (carbon sequestration). Trees also build soil, stabilise local climates, mitigate flood water, help wildlife, provide food and wood. There are other benefits such as beauty and local amenity use, so wherever we can find space we should plant a native or fruit bearing tree. Better still, plant many. And then care for them.

Many organisations are starting tree planting campaigns, for example water companies have announced plans to plant 11 million new trees in England by 2030 to help the industry's effort to become carbon neutral. <https://www.independent.co.uk/environment/trees-planted-england-water-companies-a9061296.html>

Ethiopia is in the middle of a campaign to plant 4 billion trees between May and October, they planted more than 350 million trees in a single day! <https://www.independent.co.uk/news/world/africa/ethiopia-trees-plant-world-record-abiy-ahmed-a9025896.html>

Woodland offset – Village Wood Proposal

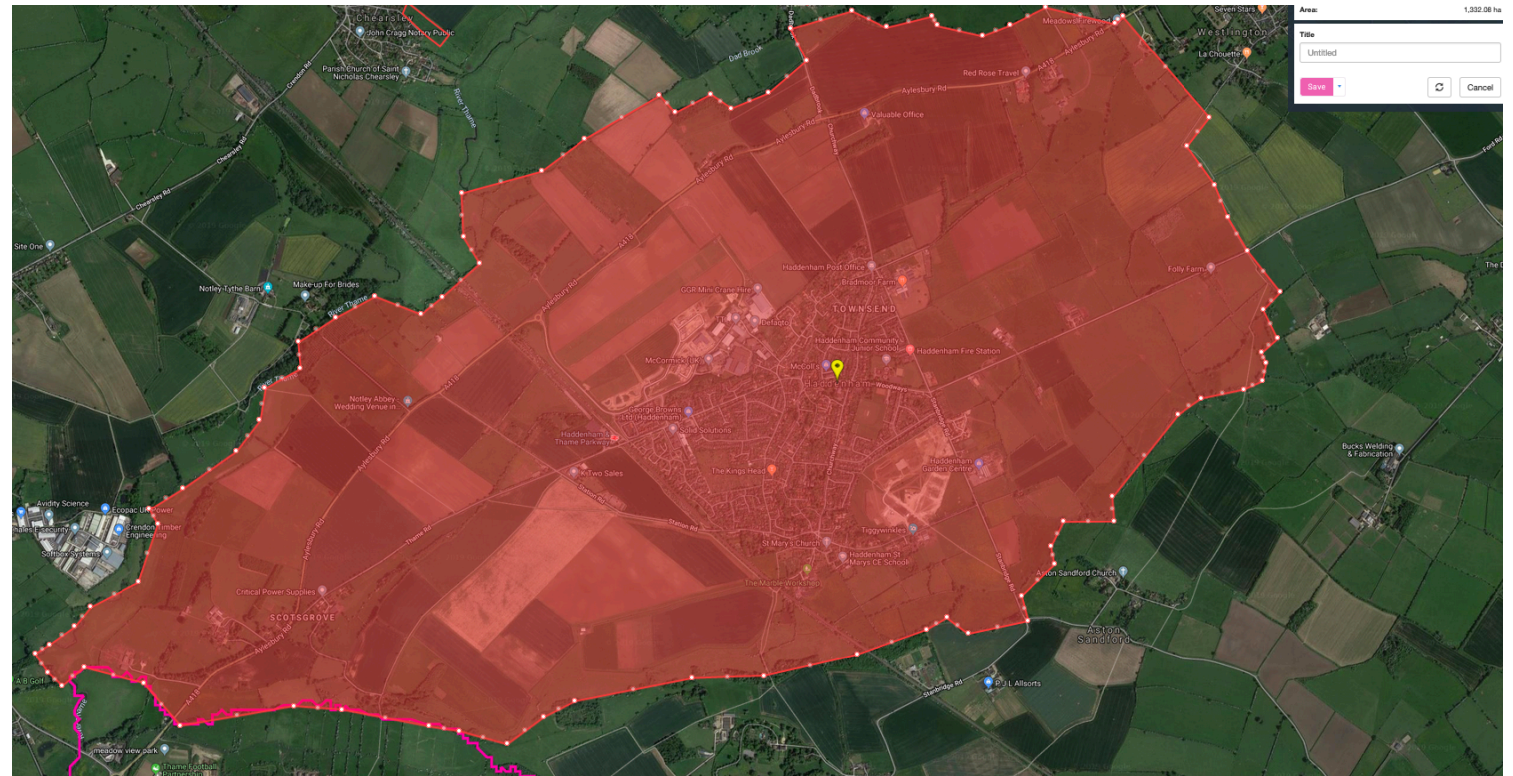
Brian Bowman has convinced Land Improvements to use approx. 2.7 ha of their land between the railway and Pegasus Way as a Village Wood.

This adds a further 1.8% to the land identified and will offset 1.66 residents' emissions per annum at current levels



Land use in the Parish

The parish covers an area of approx. 1,330 hectares (3,285 acres)



Land use in the Parish

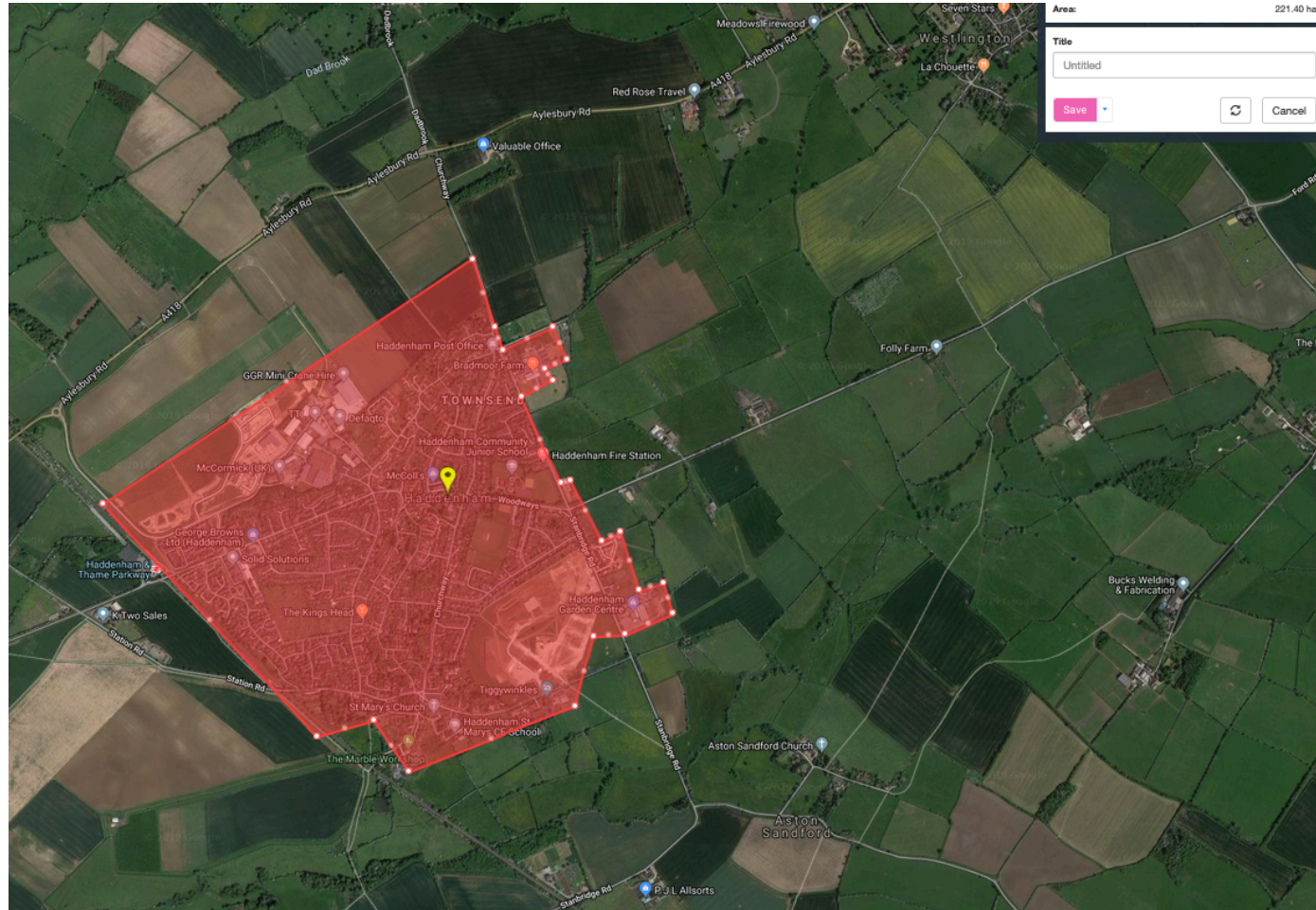
The built-up area, including the new developments, accounts for circa 220 hectares (544 acres)

This means there is approx. 960 hectares (2,370 acres) that is neither built-up nor in the flood plain

Grassland does have the potential to contribute as a carbon sink but agricultural land is usually a net emitter, especially if cattle or sheep are farmed

Work to assess the impact of this land, and its potential is still to be done

Action: To the extent woodland is needed in excess of what can be planted in the parish, the emissions will have to be offset elsewhere and a business plan for doing so will be needed



Addressing Main Obstacle #2

The inertia of existing habits

A pilot of enthusiasts for each initiative

We will use a pilot structure for generating behavioural change in the village

We will NOT seek to persuade, cajole or shame anyone into action as these approaches are respectively very difficult to pull off, annoying and counter-productive

Piloting involves finding people who have an immediate personal enthusiasm for participating in the specific initiative

Consequently their mindset is to help, report things that don't work in a constructive fashion with ideas for solving the problem, and they are likely to talk with enthusiasm about what they are doing to their friends and neighbours

It is more than likely that the participants on each pilot will be different people

Some people will not want to be involved at all. Ever. This is fine and no energy should be expended worrying about this nor on trying to specifically change their behaviour



Recruit only enthusiasts for each pilot across as many existing social networks as possible

One of the many benefits of a "pilot" structure is that the activity becomes the communication about the activity.

Rather than broadcast "one-to-many", the communication is "many-to-many" as participants are dispersed across the village's many existing social networks, and given they have joined the pilot because they are enthusiastic about it, not because they've had their arm twisted, the communication is positive and the mere fact of it nudges others into being more likely to join in

The main driver of most people's behavior is other people's behavior. Especially other people with whom they have things in common

Clubs & Interest Groups
Home » Organisations » Clubs & Interest Groups

Search... All categories >

| Adults | Adults (cont) | Adults (cont) |
|--|--|---|
| No Fear Bridge Club | Monday Club | WI - Haddenham & Witchert WI |
| Autism Mentor | Mummers | Yoga |
| Badminton - Ladies | Museum | Zumba with Olivia |
| Bell Ringers | Music - Handbell Ringers | Babies & Toddlers |
| Bowls Club (Short Mat) | Music - Informal Music Group | Baby & Toddler Groups |
| Bridge Club | Music - Princes Risborough Music Society | Children |
| Calligraphy Classes | Music - Sing in the Vale | Autism Mentor |
| Camcorder Enthusiasts - Aylesbury (A.C.E.) | Music - Thame Chamber Choir | Children's Church: 'Activate' (St Mary's) |
| CAMRA - Campaign for Real Ale | Music - Thame Choral Society | Cycle Training |
| Crickets Club | Music - Ukulele Musos | Dance - Louise Austin School of Dance |
| Cycling - Haddenham Cycle Training | Music - Witchert Chorale | Dance - School of Disco Dancing |
| Cycling - Safe Walking & Cycling Group | Music - Witchert Warblers | Dance - Tanya's School of Dancing |
| Dancing - Haddenham Hoofers | Nature Reserve - Snakemoor | Drama Group - Haddenham Youth Theatre |
| Dancing - Ponderosa Line Dancers | Pop Choir | Guiding |
| Dancing - Tea Dances | Rotary - Haddenham & District | Haddenham Youth FC |
| Dancing - Towersey Morris | Rugby - Chinnor RFC | Music - Thame Children's Choir: TCC2 |
| Drama Group - Haddenham Players | Running - Haddenham Runners | Play Scheme |
| Drama Group - Thame Players | Slimming World | Rollers - Roller Skating |
| Films - 'Haddenham Screen' | Speakers Club, Thame | Scout & Guide Association |
| Films - Thame Cinema 4 All | Sports & Social Club | Scouting |
| Fishing - Licence for Pony | Stitchers | Tennis Club |

| | | |
|---|--|---------------------------------------|
| Freemasons - Haddenham Lodge 8944 | Table Tennis Club | Youth |
| Genealogical Society, Buckinghamshire | Tai Chi Classes | Crickets Club |
| Handbell Ringers | Tennis Club | Dance - Louise Austin School of Dance |
| Historical Farm Machinery Club, Risborough & District | The Vibe Acoustic Cafe | Dance - School of Disco Dancing |
| Horticultural Society | Tyrefighters Weightloss Group | Dance - Tanya's School of Dancing |
| HUFC - Football Club | U3A - University of the Third Age | Drama Group - Haddenham Youth Theatre |
| Jan Baker Yoga | Village Fete | Guiding |
| Jane's DanceFit | Village Society | Haddenham Youth FC |
| Jazzercise | Walking - Aylesbury Ramblers | Karate |
| Kaleidoscope Women's Group | Walking - Safe Walking & Cycling Group | Ladies' Football |
| Karate | Walking - Simply Walk | Music - Thame Children's Choir: TCC2 |
| Meditation Group | Walking Football | Scouting |
| Methodist Fellowship | WEA: Workers' Education Association | Tennis Club |
| | Weight Watchers | Youth Club - Cafe in a Box |

Decadal Calendar

Decadal Calendar

| Topic | Action | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|-------------------------------|--|------|------|------|------|------|------|------|------|------|------|------|
| Food | Eradicate food waste | | | | | | | | | | | |
| | Change food mix | | | | | | | | | | | |
| | Carbon labelling | | | | | | | | | | | |
| Home Fuel | Gas Boiler / Heat Pump switch | | | | | | | | | | | |
| | Lobby UBC & MHCLG re CLT | | | | | | | | | | | |
| | Home insulation? | | | | | | | | | | | |
| Transport | Lobby UBC & MHCLG re any planning impediments to EVs | | | | | | | | | | | |
| | Lobby UBC re charging infrastructure | | | | | | | | | | | |
| | Install network ourselves with commercial partner | | | | | | | | | | | |
| | Aviation Use - Resident Research | | | | | | | | | | | |
| | EV car club | | | | | | | | | | | |
| Manufactured Goods | | | | | | | | | | | | |
| Services | | | | | | | | | | | | |
| Carbon sinks | Woodland Offset | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Behavioural change initiative | | | | | | | | | | | | |
| Other initiatives | | | | | | | | | | | | |

What can I do?

We're looking for people who are **KEEN** to be part of

The Food Waste pilot

The Electric Vehicle Car Club pilot

Please email assistantclerk@haddenham-bucks-pc.gov.uk if that's you