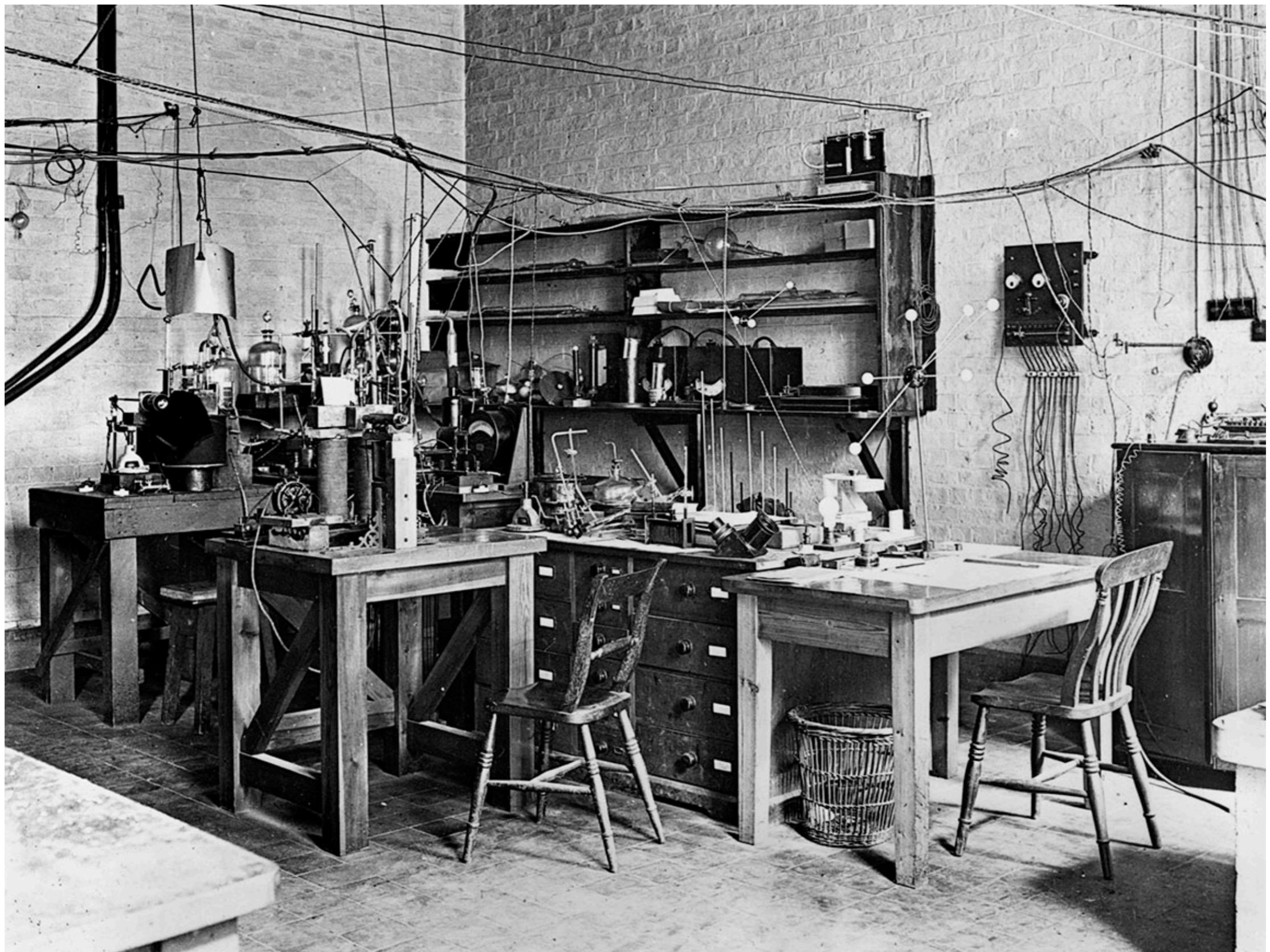


# Scaling up the provision of open data to fight climate change

**Government Data Science Conference**  
**6 December 2019**

Dr Henry Partridge  
Trafford Data Lab Manager



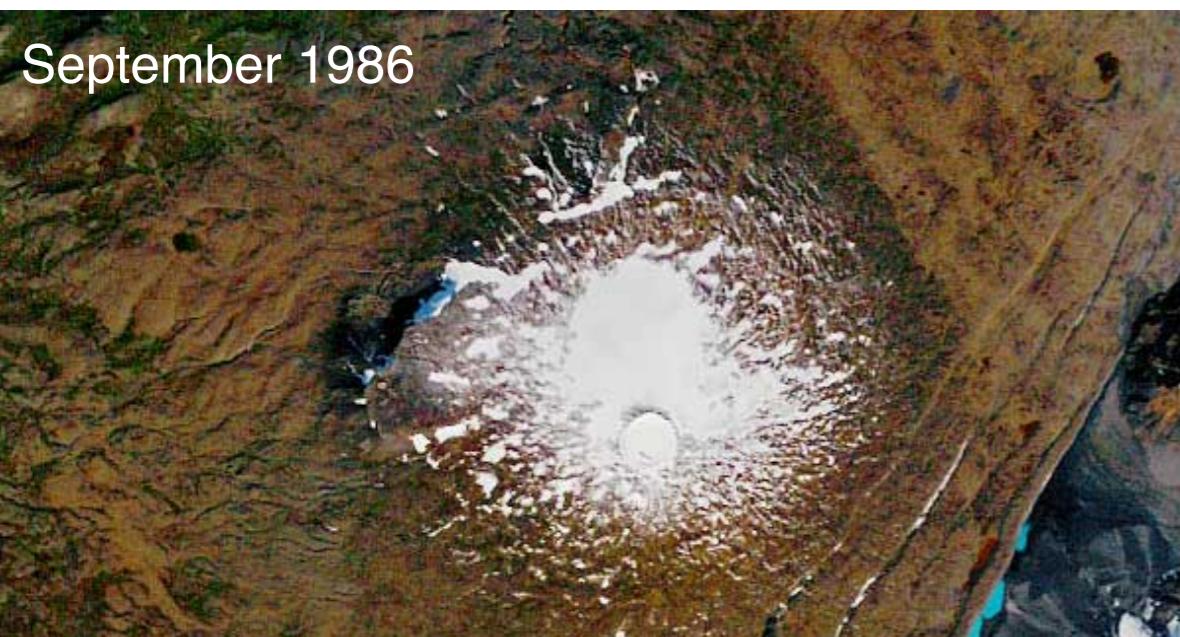


# Climate Emergency

The 2018 special report of the Intergovernmental Panel on Climate Change (IPCC) warned that we have only 12 years to limit global temperature rises to 1.5°C above pre-industrial levels or risk extreme heat, drought, flooding and poverty.

# Okjökull

September 1986



August 2019



## Bréf til framtíðarinnar

Ok er fyrsti nafnkunni jökullinn til að missa titil sinn.  
Á næstu 200 árum er talið að allir jöklar landsins fari sömu leið.  
Þetta minnismerki er til vitnis um að við vitum  
hvað er að gerast og hvað þarf að gera.  
Aðeins þú veist hvort við gerðum eitthvað.

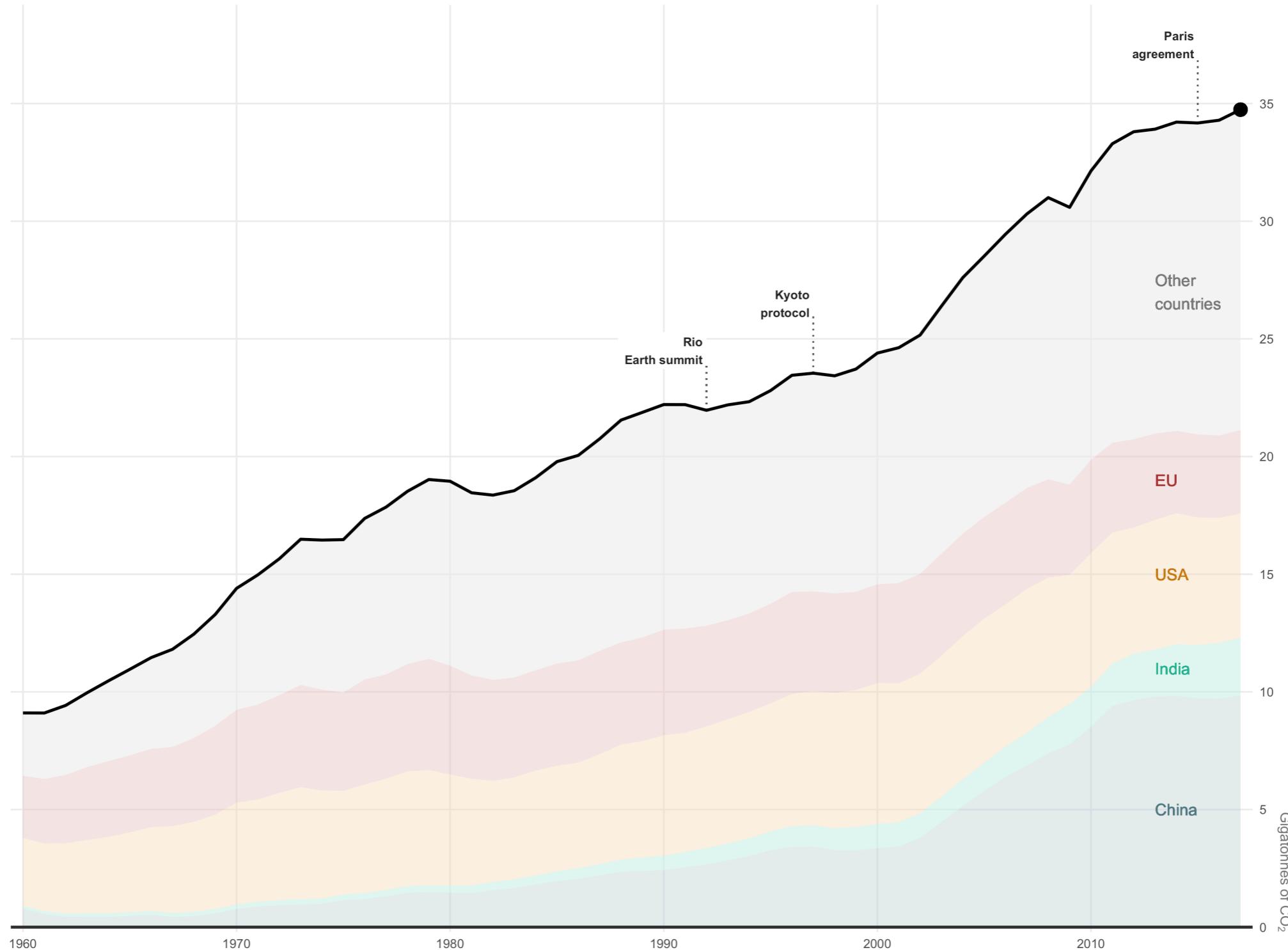
## A letter to the future

Ok is the first Icelandic glacier to lose its status as a glacier.  
In the next 200 years all our glaciers are expected to follow the same path.  
This monument is to acknowledge that we know  
what is happening and what needs to be done.  
Only you know if we did it.

Ágúst 2019  
415ppm CO<sub>2</sub>



# Global carbon emissions

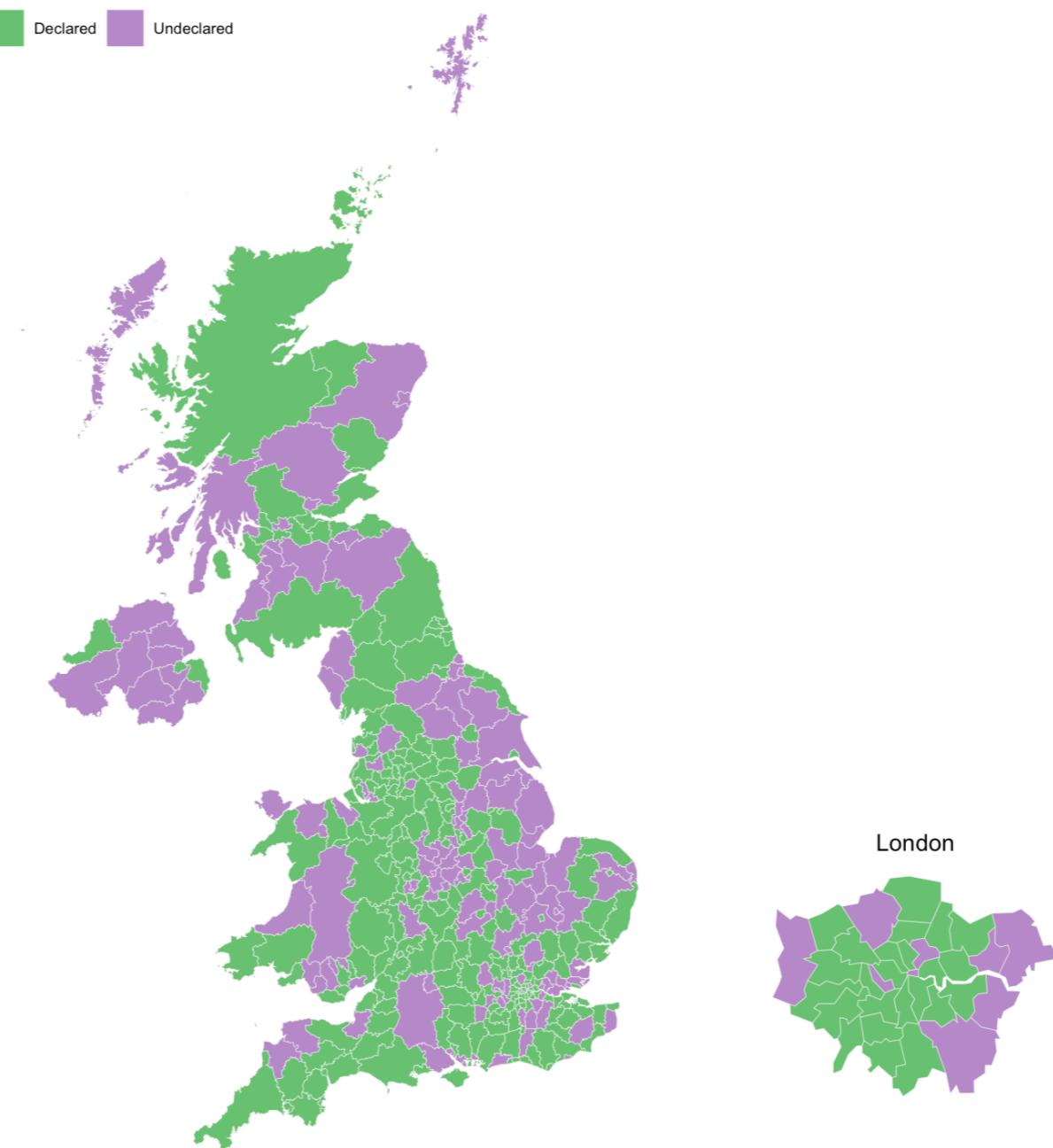


Source: Global Carbon Project | @traffordDataLab



In November 2018, Bristol City Council became the first local authority to declare a **climate emergency**. Since then over half of the UK's councils have committed themselves to taking urgent action to reduce local carbon emissions.

# Councils declaring climate emergency



Source: climateemergency.uk | @traffordDataLab  
Contains Ordnance Survey data © Crown copyright and database right 2019

# Open data

The image shows a Mac desktop with four overlapping browser windows, all displaying the GOV.UK website ([www.gov.uk](http://www.gov.uk)). The windows are arranged vertically from top to bottom:

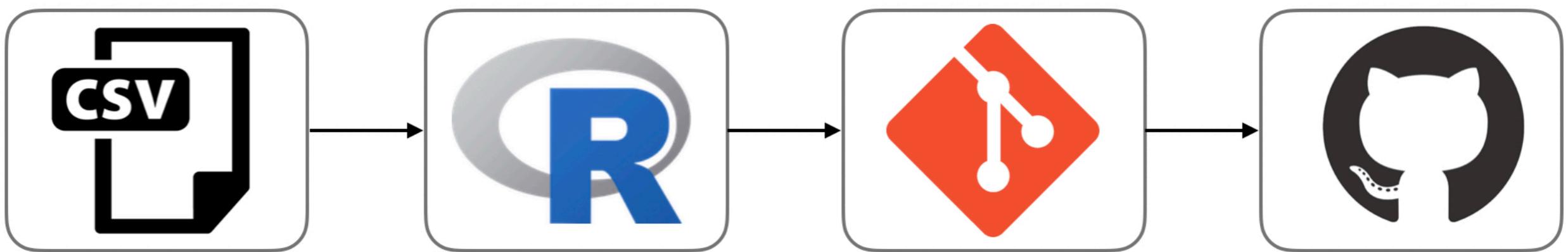
- Top Window:** Shows the main GOV.UK header with a search bar.
- Second Window:** Shows a link to "Statistical data" and a large heading "Total final and local".
- Third Window:** Shows a link to "Home" and a section titled "Sub-region".
- Bottom Window:** Shows a link to "Home" and a section titled "Regional".

The "Regional" window is the most prominent, containing the following content:

- Section Header:** "UK local authority and regional carbon dioxide emissions national statistics"
- Description:** "UK local authority and regional estimates of carbon dioxide emissions from 2005."

# Reproducible workflow

**Open data**      **Programming**      **Version control**      **Sharing**



```
# CO2 emissions #

# Source: Department for Business, Energy & Industrial Strategy
# URL: https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2017
# Licence: Open Government Licence v3.0

library(tidyverse) ; library(httr) ; library(readxl) ; library(lubridate)

url <- "https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/812142/2005-17_UK_local_and_regional_CO2_emissions_tables.xlsx"
GET(url, write_disk(tmp <- tempfile(fileext = ".xlsx")))

df <- read_excel(tmp, sheet = 2, skip = 1) %>%
  filter(LAD14NM == "Trafford") %>%
```

# Scale

```
# CO2 emissions #

# Source: Department for Business, Energy & Industrial Strategy
# URL: https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2017
# Licence: Open Government Licence v3.0

library(tidyverse) ; library(httr) ; library(readxl) ; library(lubridate)

lookup <- read_csv("../data/geospatial/local_authority_codes.csv") %>%
  pull(area_code)

url <- "https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/812142/2005-17_UK_local_andRegional_CO2_emissions_tables.xlsx"
GET(url, write_disk(tmp <- tempfile(fileext = ".xlsx")))

df <- read_excel(tmp, sheet = 2, skip = 1) %>%
  filter(LAD14CD %in% lookup | LAD14NM == "National Total") %>%
```



A screenshot of a web browser displaying a data dashboard. The title is "Carbon dioxide emissions". A text block below the title states: "Total carbon dioxide emissions are broken down by different domestic, industrial & commercial, and transport sectors. Carbon dioxide emissions are also available per capita (ktCO<sub>2</sub>/capita) in the source dataset." Below this is a table with details about the data source:

Indicator	Period	Geography	Source	Updated	Licence	Data
Carbon dioxide emissions	2005-2017	Local authority	<a href="#">BEIS</a>	2019-06-27	<a href="#">OGL v3.0</a>	<a href="#">view</a>

### Carbon dioxide emissions by main sector

Trafford, 2005-2017

Source: BEIS

A stacked bar chart titled "Carbon dioxide emissions by main sector" for Trafford, 2005-2017. The Y-axis represents emissions in ktCO<sub>2</sub>, ranging from 0 to 2,000. The X-axis shows years from 2005 to 2017. The chart is stacked with three sectors: Transport (dark purple), Industry and commercial (teal), and Domestic (yellow). The total emissions show a general downward trend over the period.

Year	Transport (ktCO <sub>2</sub> )	Industry and commercial (ktCO <sub>2</sub> )	Domestic (ktCO <sub>2</sub> )	Total (ktCO <sub>2</sub> )
2005	420	1150	630	2100
2006	420	1150	630	2100
2007	420	1150	630	2100
2008	420	1150	630	2100
2009	420	1150	630	2100
2010	420	1150	630	2100
2011	380	1100	620	1900
2012	380	1100	620	1900
2013	380	1100	620	1900
2014	380	1100	620	1900
2015	380	850	470	1600
2016	380	850	470	1600
2017	380	850	470	1600

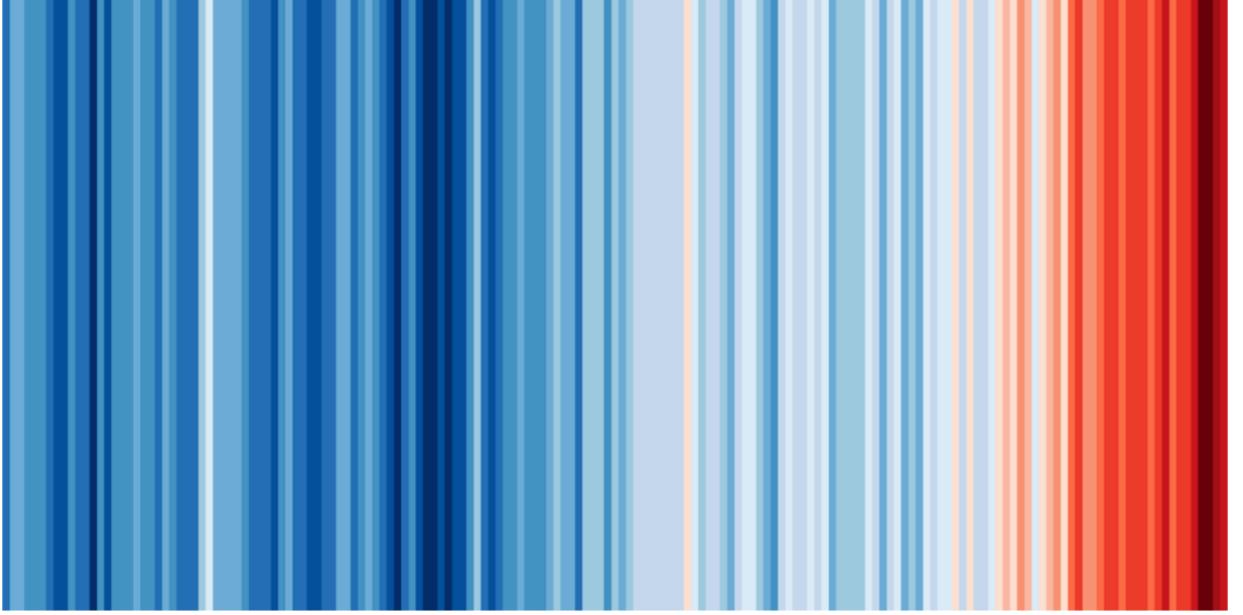
**Additional resources**  
The [National Atmospheric Emissions Inventory](#) (NAEI) website has an [interactive map](#) that allows you to explore CO<sub>2</sub> emissions by local authority area and sector.



# Parameterise

 **Climate emergency slide pack**

Last updated: 25 October 2019



*Annual average global temperatures (1850-2018). Source: [showyourstripes.info](#)*

More than half of UK councils have declared a 'climate emergency'. This tool is designed to support local councils by visualising open data relating to climate change. Just select your local authority and hit the 'Build slides' button to create a slide pack of visualisations.

Please note that this app is an alpha release so there may be some bugs. Also, local government reorganisation in some areas means that historical data are unavailable and visualisations will not render.

Choose a local authority district:

Trafford

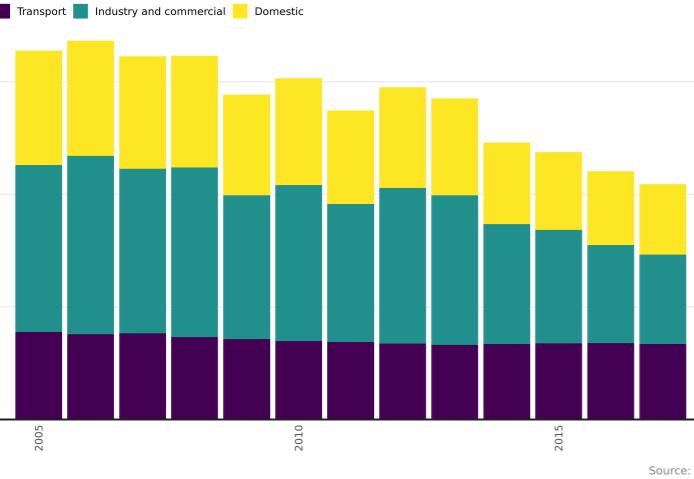
 **Build slides**

Developed in R by the [Trafford Data Lab](#) under the [MIT](#) licence



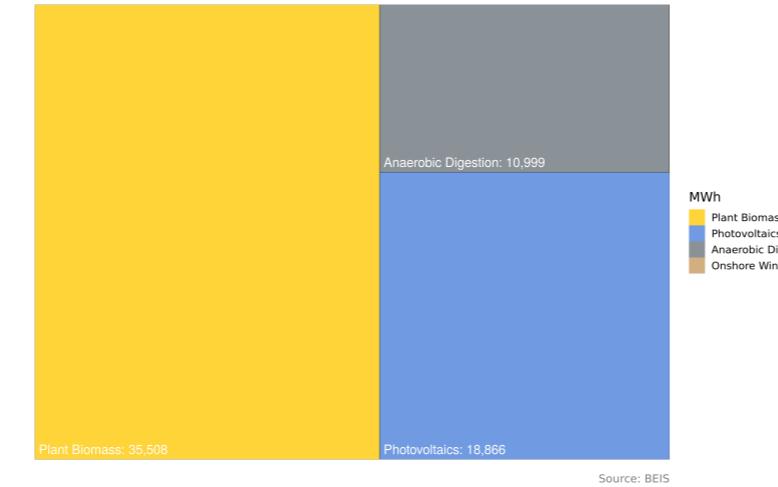
### Carbon dioxide emissions by main sector

Manchester, 2005-2017



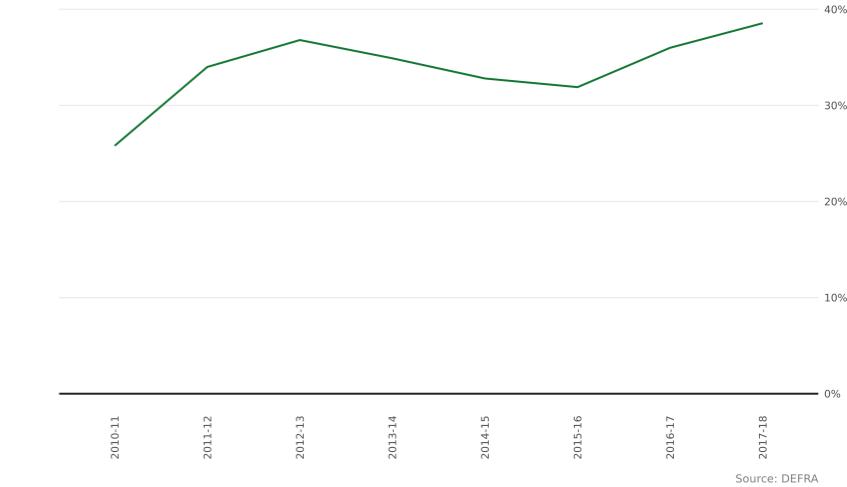
### Renewable electricity generation by source

Manchester, 2017



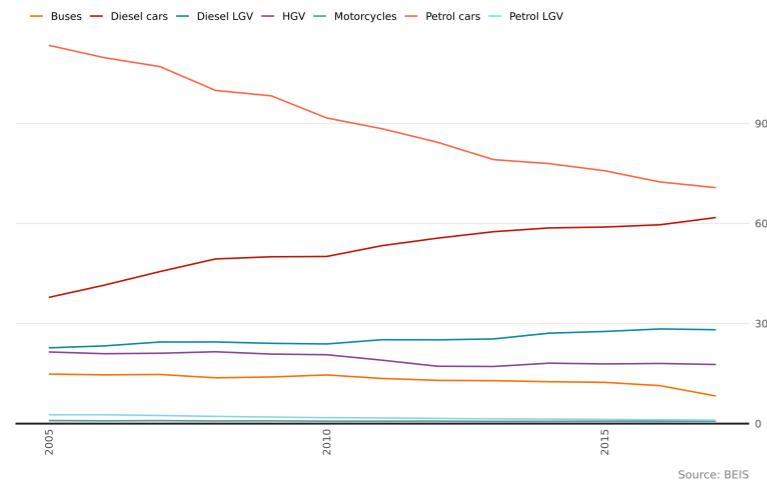
### Reuse, recycling or composting of household waste

Manchester, 2010/11 - 2017/18



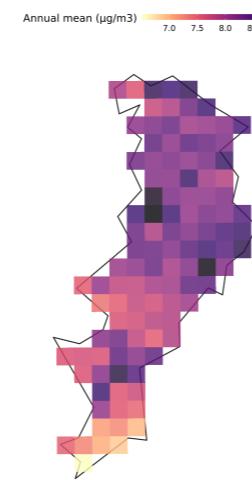
### Fuel use by vehicle type

Manchester, 2005-2017



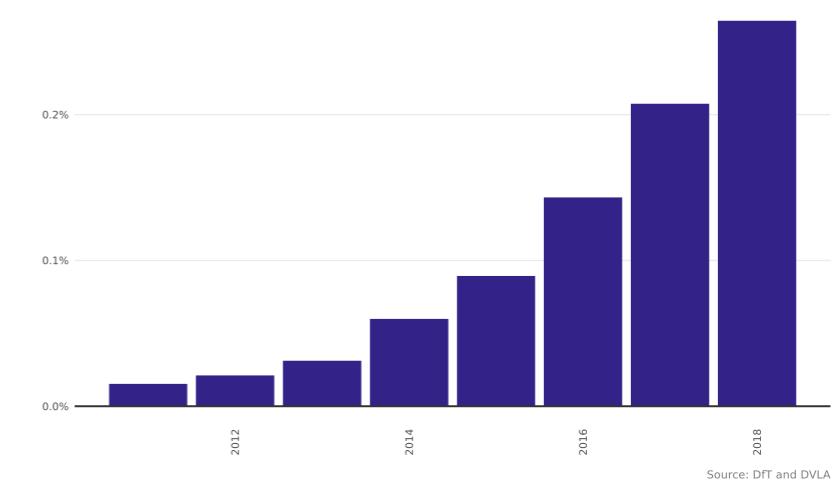
### Modelled background PM<sub>2.5</sub> concentrations

Manchester, 2017



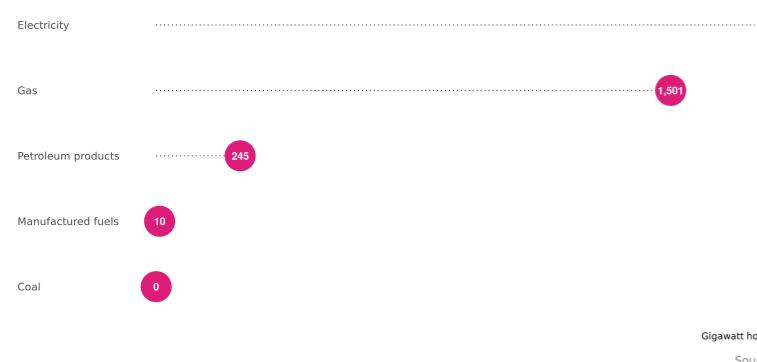
### Licensed electric cars and vans as a proportion of all licensed cars and vans

Manchester, 2011-2018



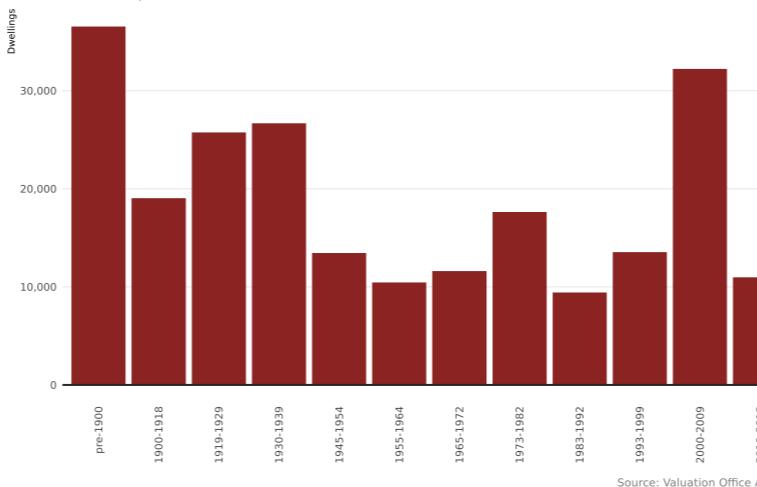
### Industrial and commercial fuel use

Manchester, 2016



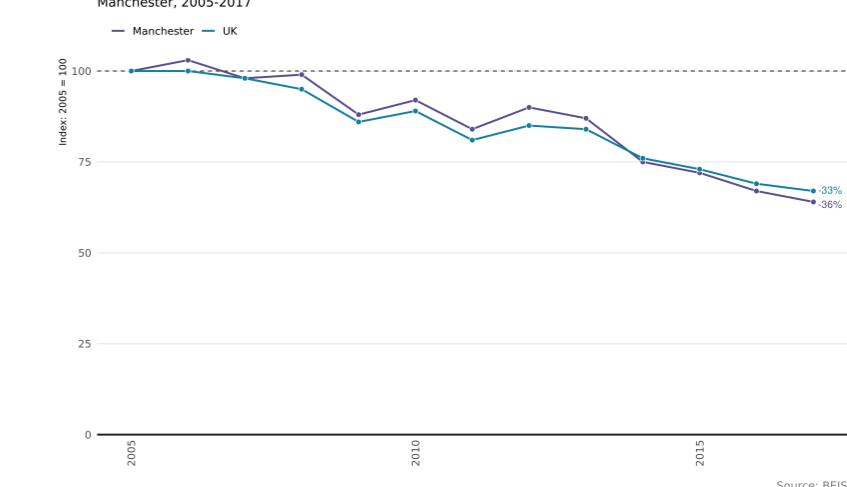
### Build period of domestic dwellings

Manchester, 2018



### Change in total CO<sub>2</sub> emissions

Manchester, 2005-2017



# Thank you!

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 trafforddatalab.io