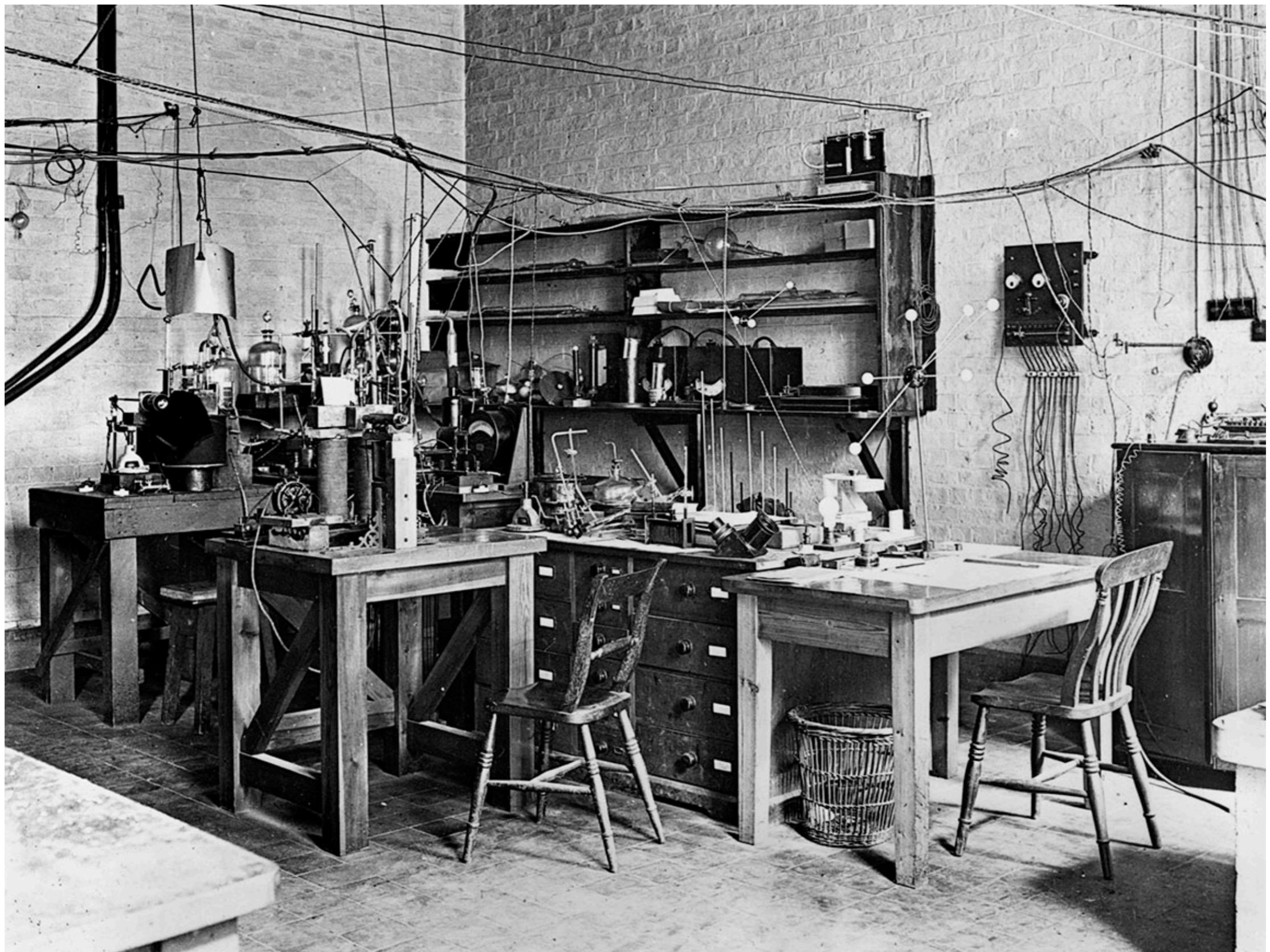


Scaling up the provision of open data to fight climate change

Government Data Science Conference
6 December 2019

Dr Henry Partridge
Trafford Data Lab Manager



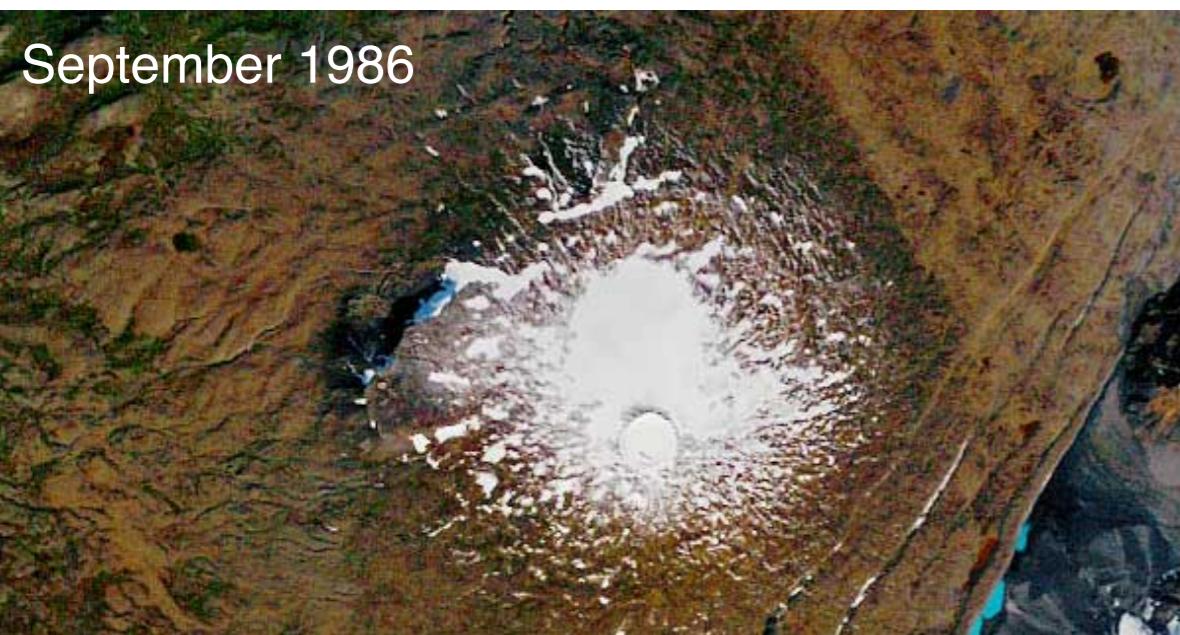


Climate Emergency

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.

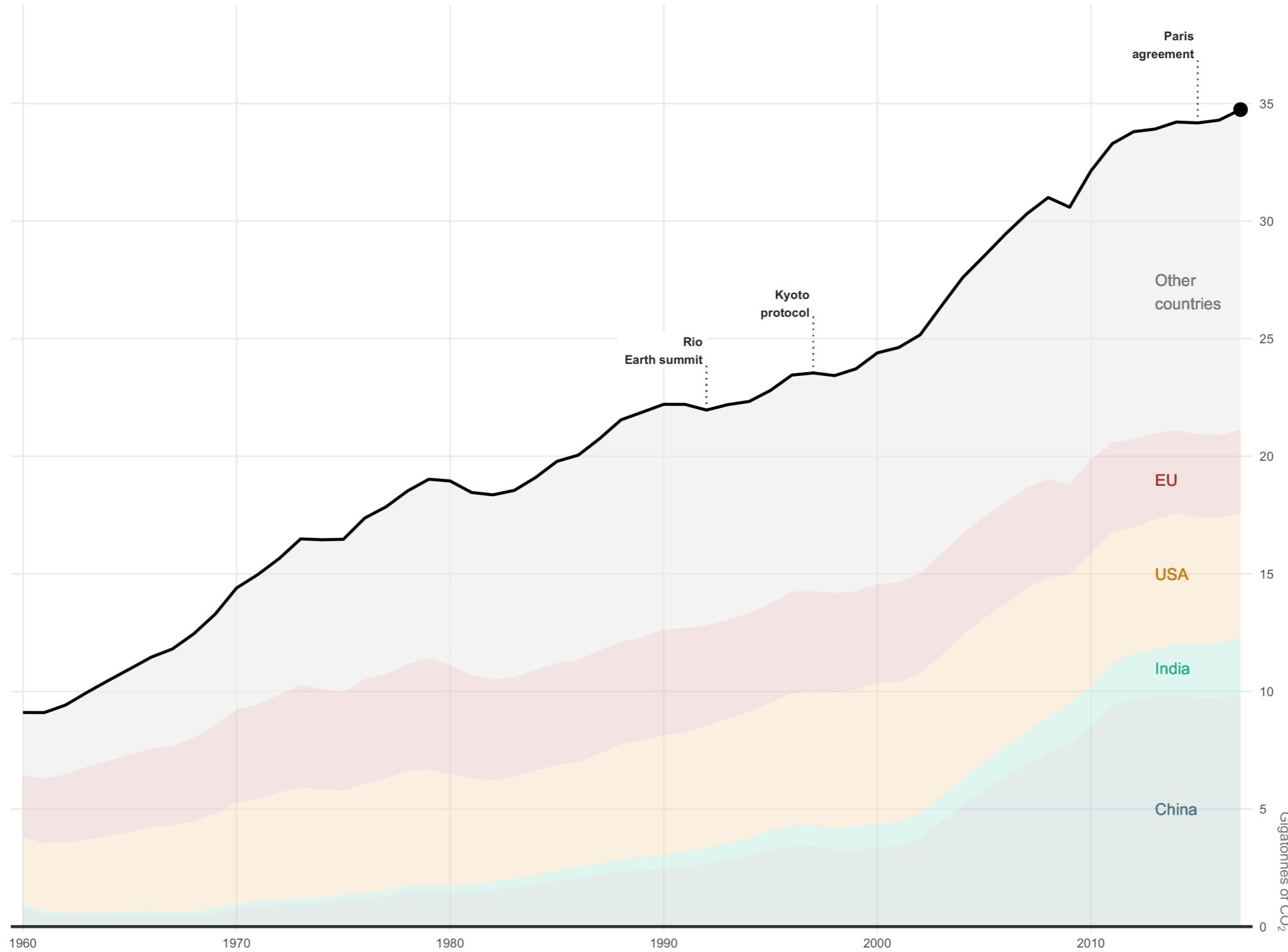
A letter to the future

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 CO₂



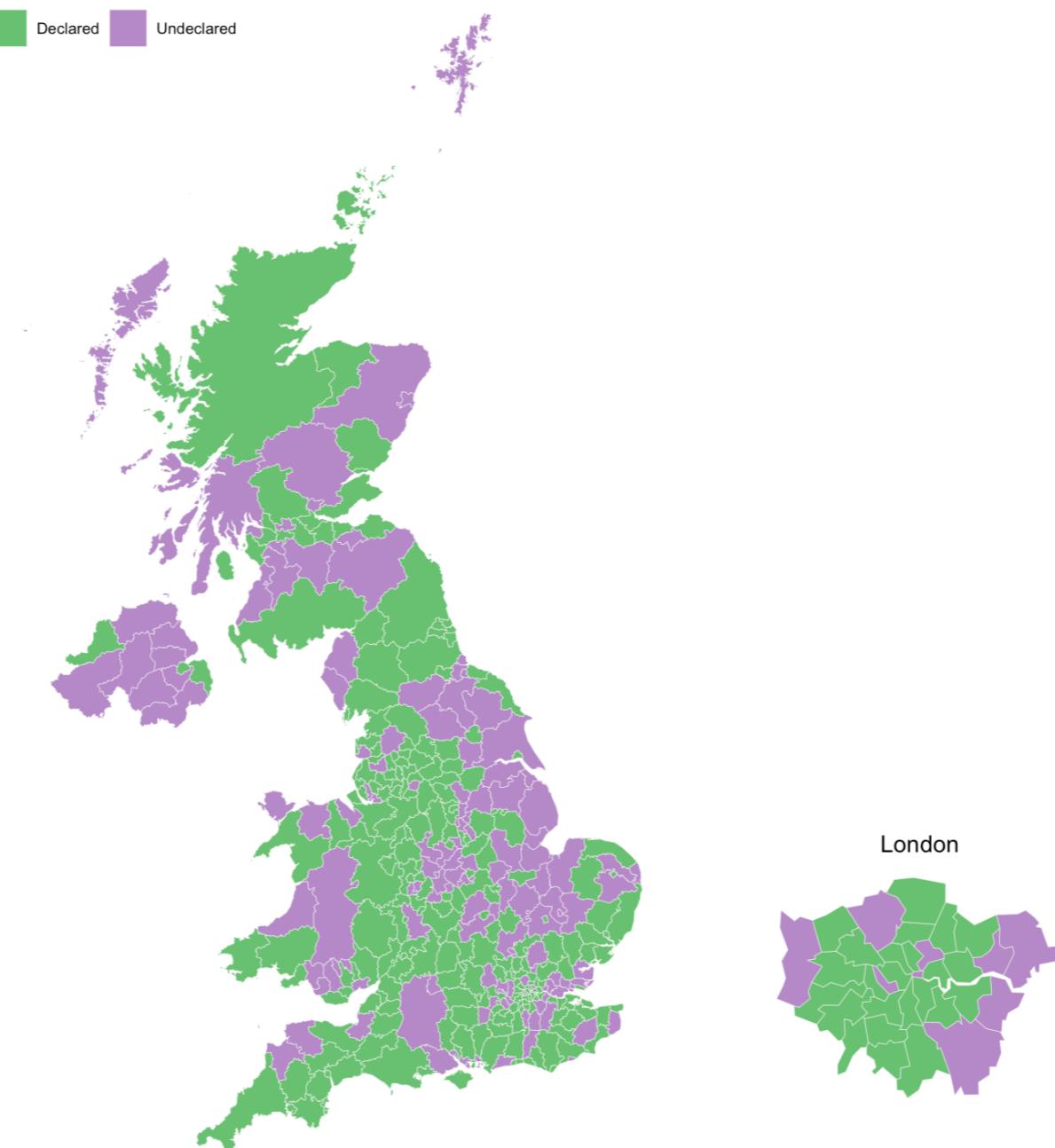
Global carbon emissions



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). The windows are arranged vertically from top to bottom:

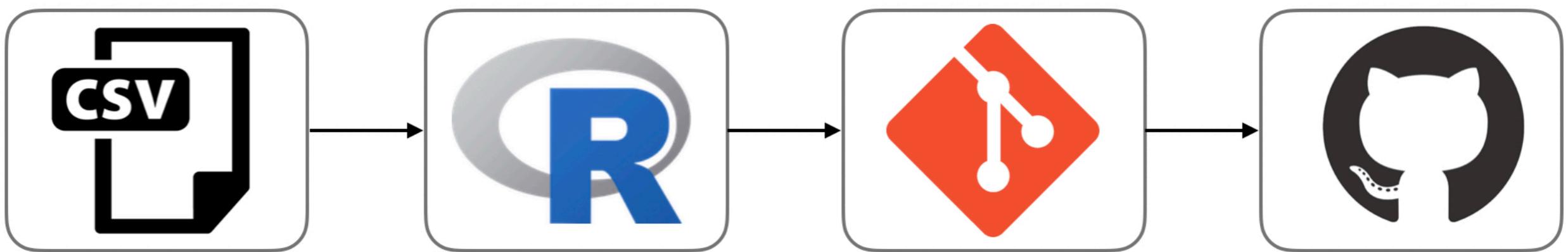
- Top Window:** Shows the main GOV.UK header with a search bar.
- Second Window:** Shows a link to "Statistical data" and a large heading "Total final and local".
- Third Window:** Shows a link to "Home" and a section titled "Sub-region".
- Bottom Window:** Shows a link to "Home" and a section titled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



Carbon dioxide emissions

Total carbon dioxide emissions are broken down by different domestic, industrial & commercial, and transport sectors. Carbon dioxide emissions are also available per capita (ktCO₂/capita) in the source dataset.

Indicator	Period	Geography	Source	Updated	Licence	Data
Carbon dioxide emissions	2005-2017	Local authority	BEIS	2019-06-27	OGL v3.0	view

Carbon dioxide emissions by main sector
Trafford, 2005-2017

Source: BEIS

The chart displays the total CO₂ emissions for Trafford from 2005 to 2017, broken down into three sectors: Transport (dark purple), Industry and commercial (teal), and Domestic (yellow). The Y-axis represents emissions in ktCO₂, ranging from 0 to 2,000. The X-axis shows the years 2005, 2010, and 2015. The total emissions show a general downward trend over the period, starting around 2,100 ktCO₂ in 2005 and ending around 1,600 ktCO₂ in 2017. The Domestic sector consistently contributes the largest share of emissions, followed by Industry and commercial, and then Transport.

Year	Transport	Industry and commercial	Domestic	Total
2005	420	1150	530	2100
2006	410	1140	550	2090
2007	400	1130	570	2090
2008	390	1120	580	2080
2009	380	1110	590	2070
2010	370	1100	600	2060
2011	360	1090	610	2050
2012	350	1080	620	2040
2013	340	1070	630	2030
2014	330	1060	640	2020
2015	320	1050	650	2010
2016	310	1040	660	2000
2017	300	1030	670	1990

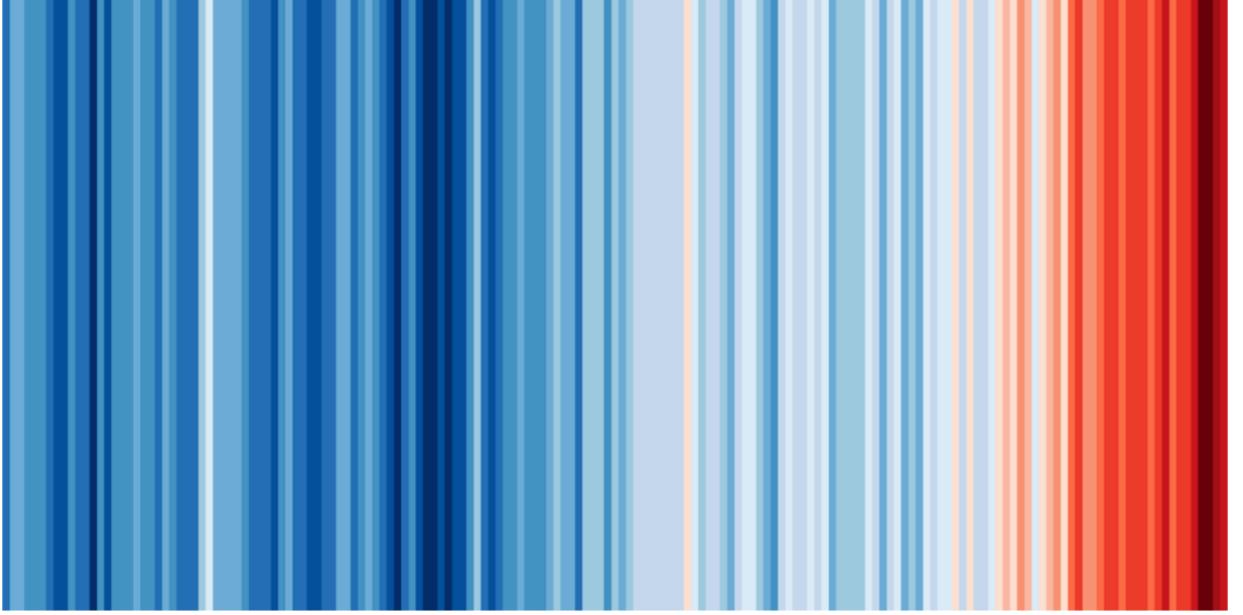
Additional resources
The [National Atmospheric Emissions Inventory](#) (NAEI) website has an [interactive map](#) that allows you to explore CO₂ emissions by local authority area and sector.



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

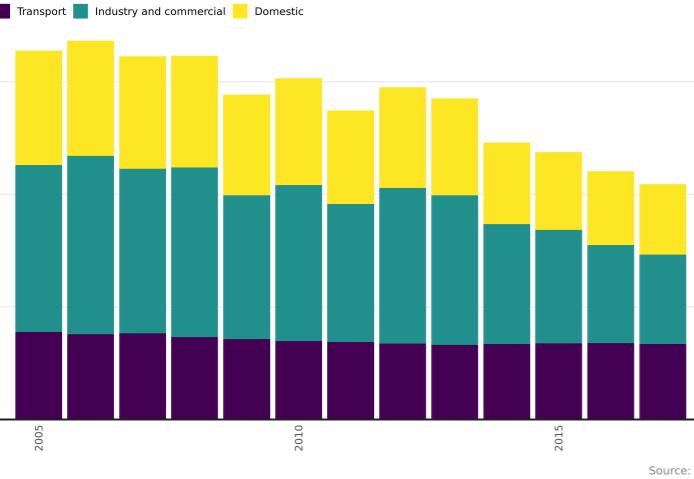
 **Build slides**

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



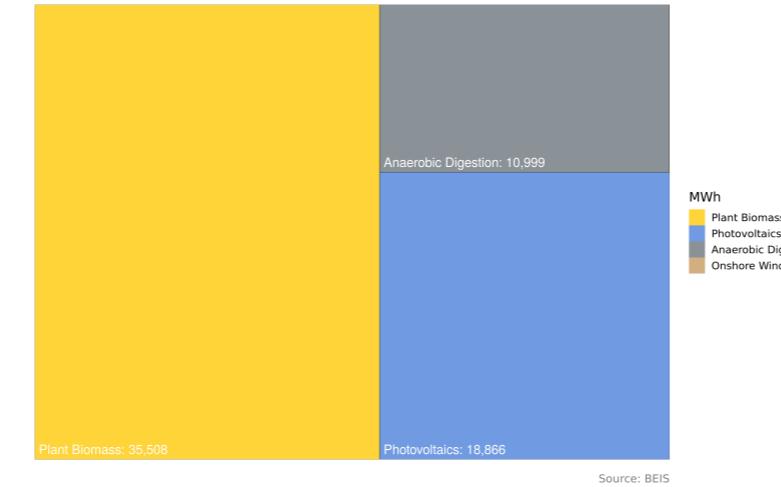
Carbon dioxide emissions by main sector

Manchester, 2005-2017



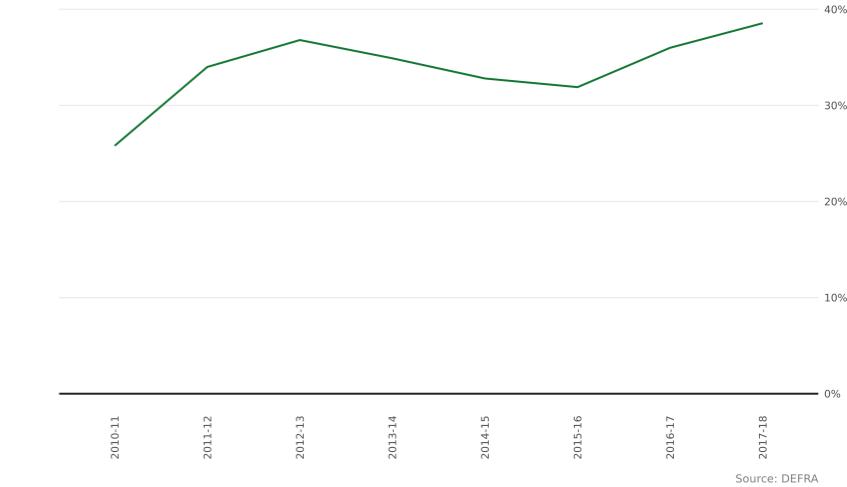
Renewable electricity generation by source

Manchester, 2017



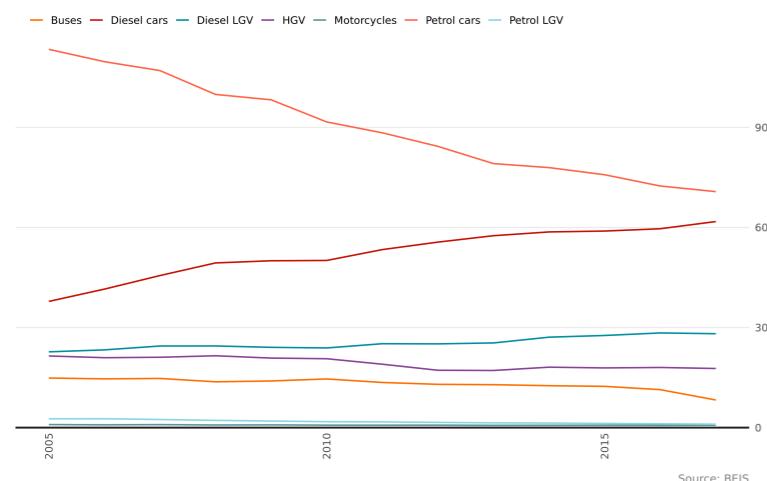
Reuse, recycling or composting of household waste

Manchester, 2010/11 - 2017/18



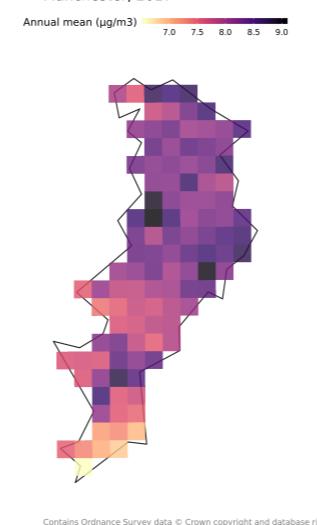
Fuel use by vehicle type

Manchester, 2005-2017



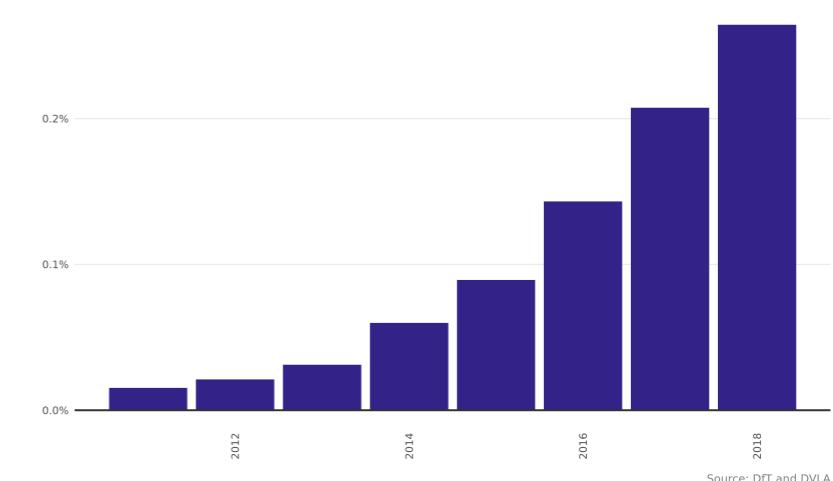
Modelled background PM_{2.5} concentrations

Manchester, 2017



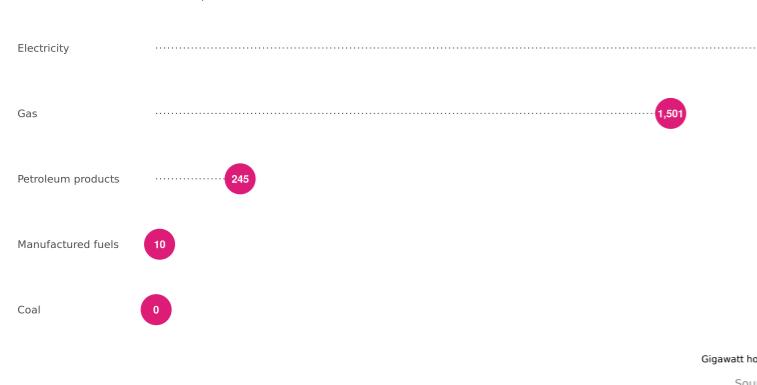
Licensed electric cars and vans as a proportion of all licensed cars and vans

Manchester, 2011-2018



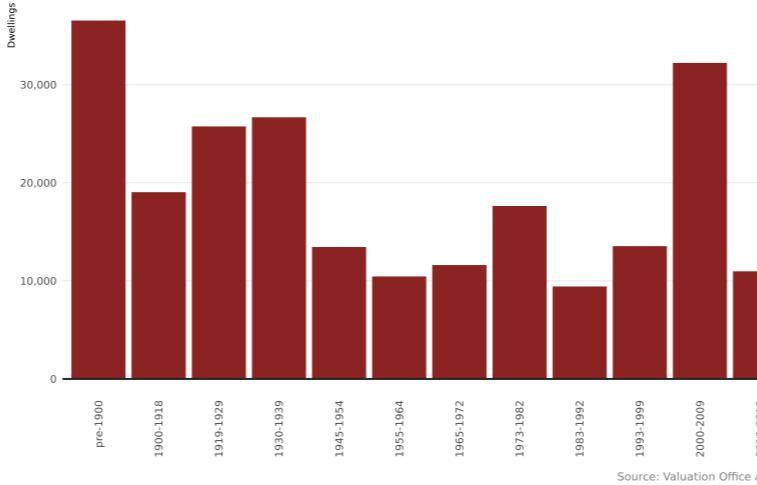
Industrial and commercial fuel use

Manchester, 2016



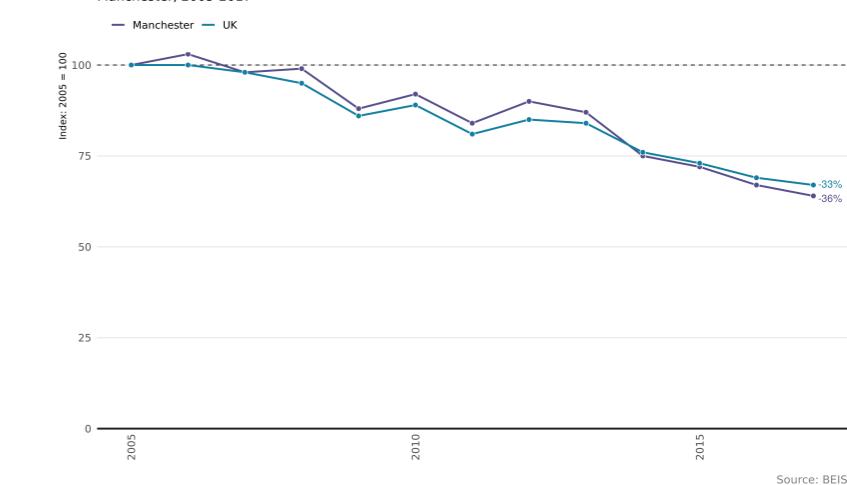
Build period of domestic dwellings

Manchester, 2018



Change in total CO₂ emissions

Manchester, 2005-2017



Thank you!

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-  trafforddatalab.io