
Climate economics: The data

BofE student technology competition

By Alasdair Hopwood



The story of climate change

Data is the key to telling the story of climate change, since it is only when something is measured that it can be combatted, since the outcomes of policies and action must be visible to ensure efficacy and effectiveness. Data also gives insight into the true impact of climate change, and can help uncover hidden trends and those who will gain/suffer from the effects.

Causes

- » Greenhouse gas (GHG) emissions
 - Most recognisable is CO₂, although others such as methane are much more potent as a GHG – weighted data takes into account the relative potency
- » Key activities that have led to increased emissions:
 - Industrialisation
 - Deforestation
 - Transport

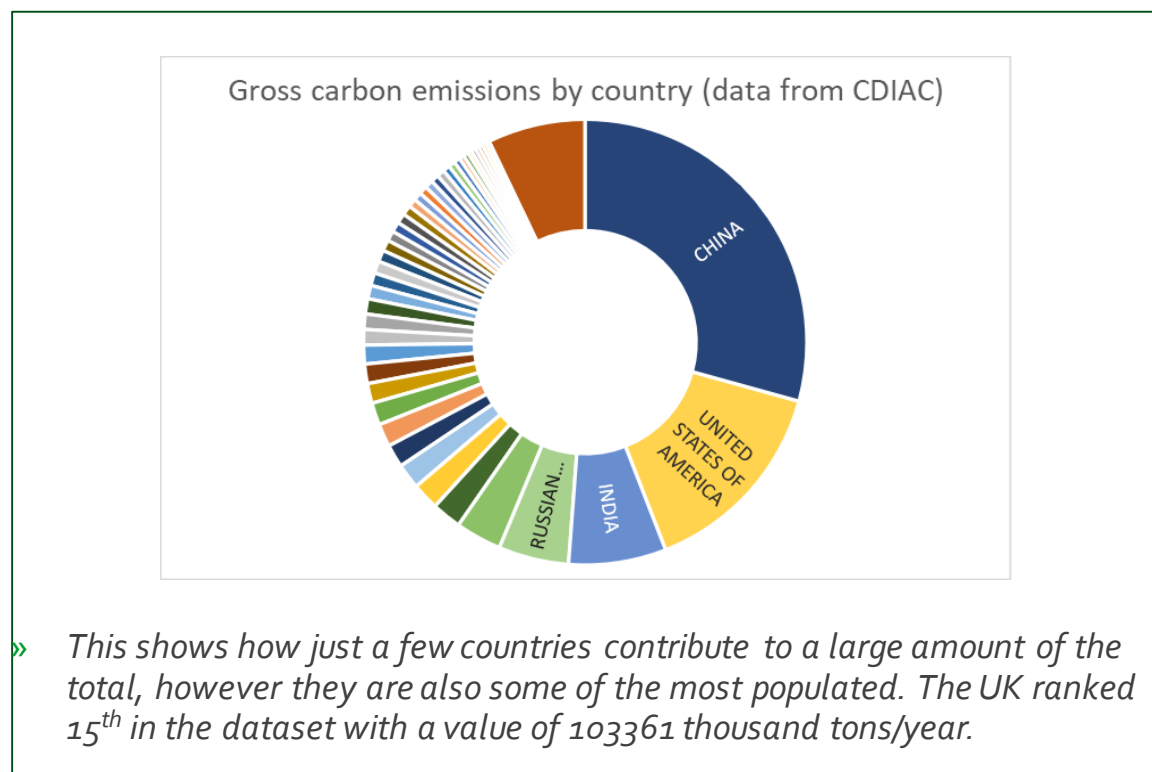
Effects

- » Global warming
 - This was the term used to describe climate change for many years, although now the effects are understood to be more nuanced than general warming, with some regions experiencing change in the form of cooling
- » Increased frequency of natural disasters
 - There have been clear statistical trends showing the severity and frequency of natural disasters has increased
- » Impacts on lifestyle as globally humanity has to adjust to a new way of living to mitigate climate change

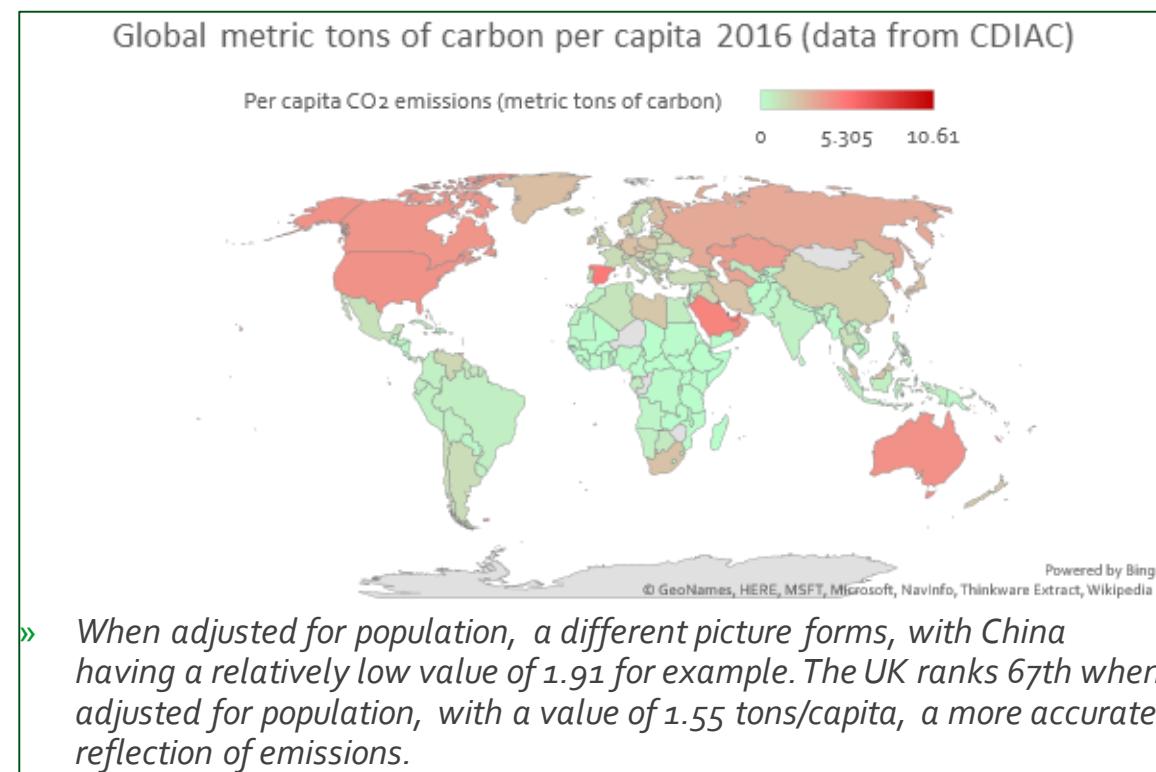
The UK within the global context

Whilst CO₂ is not the most potent of the GHG's, it provides an indicator of the relative emissions of countries within a global context. Additionally the CDIAC provides open data facilitating clear visualisations – I took the raw CSV files and cleaned it to plot the visualisations with Excel's map chart tool and sunburst tool. All data from 2016.

CO₂ National output (gross)



CO₂ National output per capita

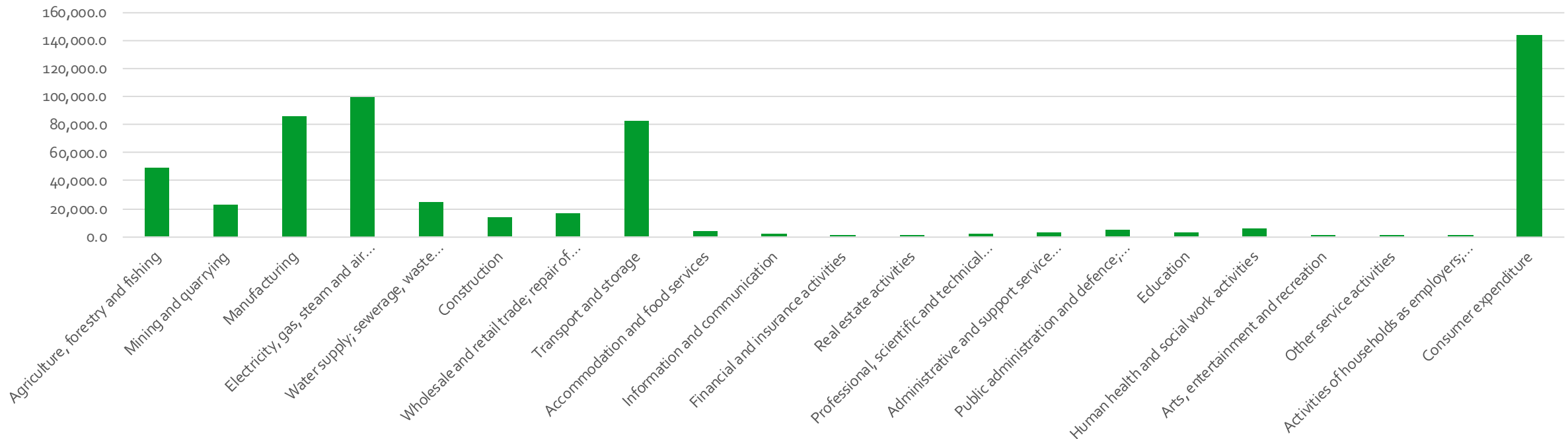


Data citation: Boden, T.A., G. Marland, and R.J. Andres. 2018. Global, Regional, and National Fossil-Fuel CO₂ Emissions. Carbon Dioxide Information Analysis Center at Appalachian State University, Boone North Carolina, <https://energy.appstate.edu/CDIAC>

UK emissions by sector

- » I produced this to show that the majority of emissions come from just a few sectors, mainly primary and secondary sectors –
- » The UK's shift towards a service driven economy will continue to decrease the emissions, although this has led to structural unemployment and hysteresis in towns reliant upon industry and mining whereby the skills are not transferrable to the changed labour environment – the transition comes at an economic and social cost.

Greenhouse gas emissions by industry section and group in 2017 in thousand tonnes of CO₂ equivalent (data from ONS)



Citation: Office for National Statistics licensed under the Open Government Licence v.3.0

<https://www.ons.gov.uk/economy/environmentalaccounts/datasets/ukenvironmentalaccountsatmosphericemissionsgreenhousegasemissionsbyeconomicsectorandinasunitedkingdom>

Key Stakeholders in climate change - UK



Public

Loss of livelihood,
change in lifestyle



Companies

Trade and business
effects, opportunities in
green industries



Financial system

Potential for negative
shocks to system,
volatility and decreased
confidence



Insurance

An increase in disasters
and magnitude of
payouts could lead to
instabilities



Energy Industry

Shift in operating model
towards renewables,
provides opportunities
but also disruption

Examples of Winners and Losers in the UK due to climate change

Winners

Sustainable technology
companies

Renewable energy
sector

Areas that benefit from
increased temperatures
e.g. Wine production in
S.England

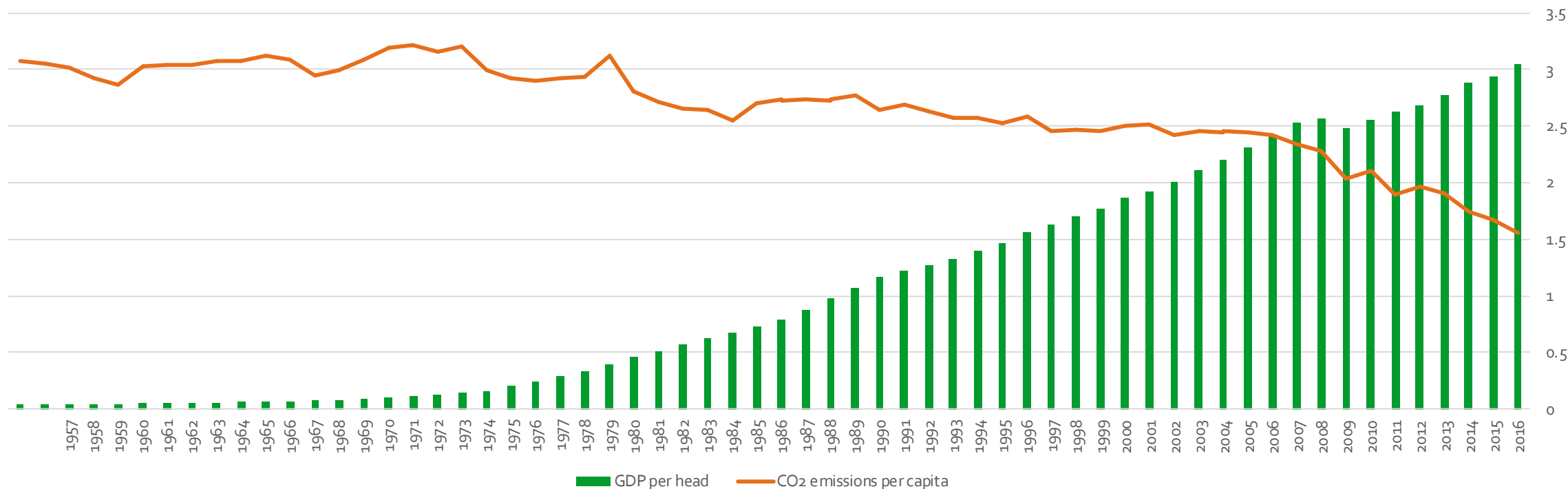
Losers

Fossil fuel
sector,
especially coal

Flood hit
areas

Coastal
regions

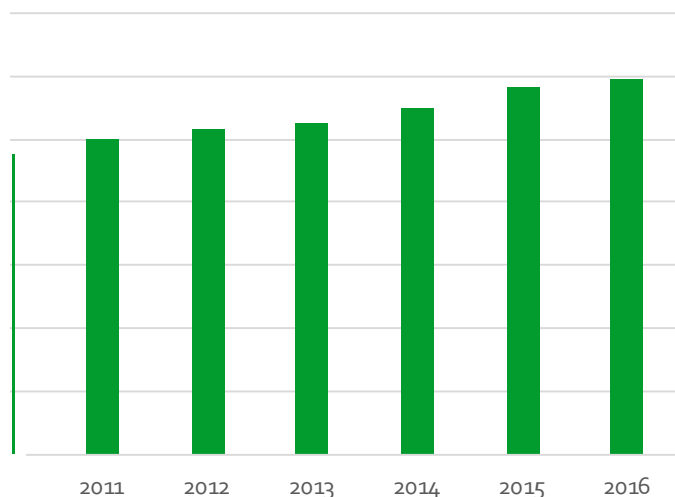
Decarbonisation impact on economy



Economic growth and decarbonisation are not mutually exclusive concepts, indeed the UK has halved its per capita carbon emissions since 1990, while maintaining constant, 15-fold economic growth over the past 60 years. The data was sourced from the various sources, formatted and cleaned it in excel to ensure only relevant data was used, then created a custom plot of

Growth of UK green industries

of overall industry (in thousand million pounds)

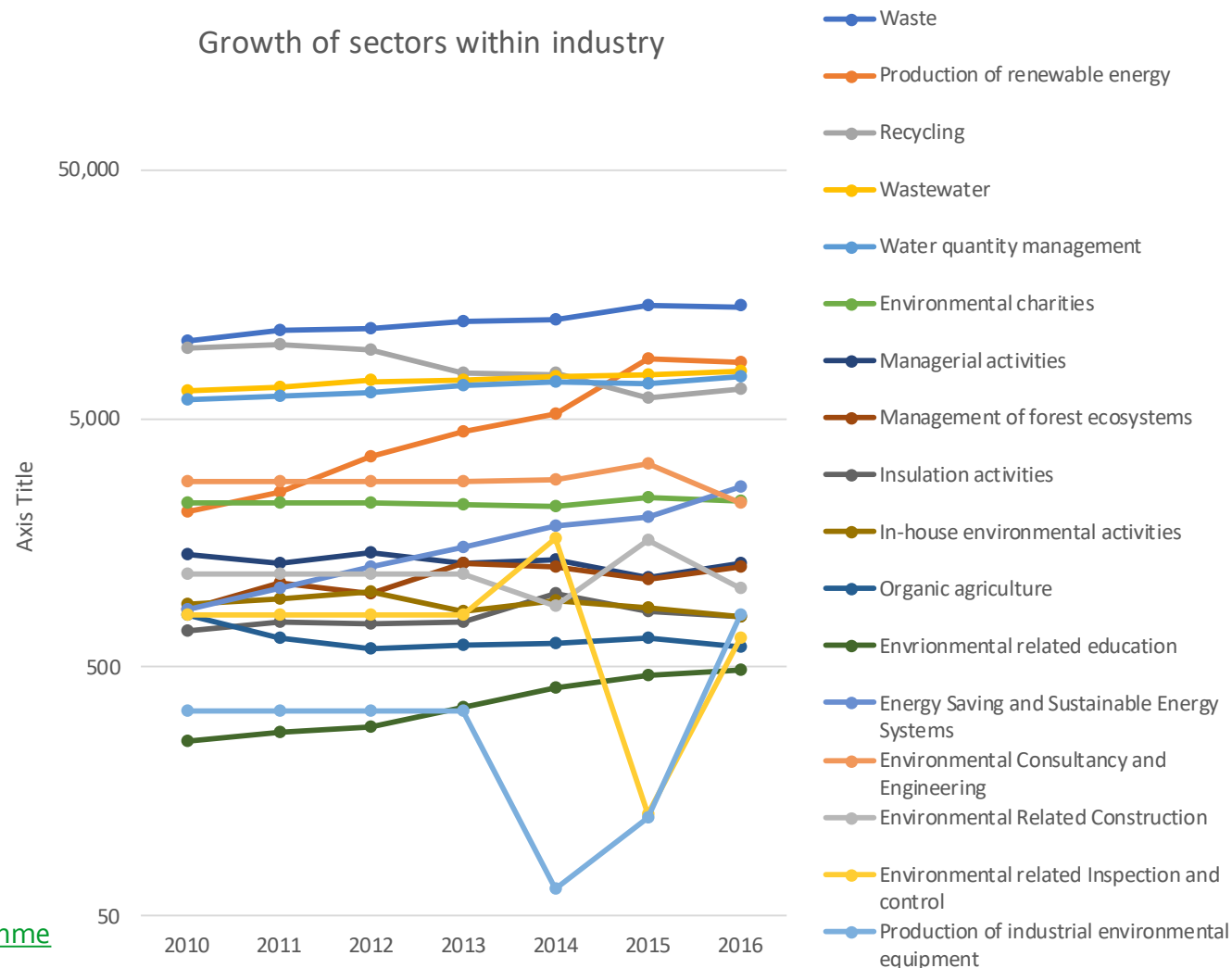


wards a greener economy presents
ities for sustainability focused
es, as shown by recent growth

for National Statistics licensed under the Open
3.0

[economy/environmentalaccounts/datasets/ukenvironmentalaccounts/estimates](https://economy.environmentalaccounts/datasets/ukenvironmentalaccounts/estimates)

Growth of sectors within industry



Effects on UK financial sector

