

East Midlands State of the Environment

Climate change

The earth's climate is complex and subject to many natural variations. However, the majority of climate research now supports the fact that human activity is influencing the earth's climate, causing it to warm. Man-made climate change is caused by the release of greenhouse gases (mainly through burning fossil fuels), deforestation and changes in land use. Even a small rise of a few degrees Celsius in average global temperatures could have devastating affects on society, habitats and species around the world.

The rate and severity of climate change will depend on many things, but reducing emissions of greenhouse gases is a priority. The UK has agreed to reduce emissions by at least 80 per cent by 2050 from 1990 levels. Between 1990 and 2008 the UK reduced emissions by 20 per cent so there is a long way to go.

The UK Climate Impacts Programme (UKCIP) is the UK's leading authority on climate change modelling. Although it is not possible to predict exactly how the East Midlands climate will change in the future, they have produced models which show that we should expect hotter drier summers and warmer wetter winters. Extreme weather events such as flooding and dry spells may also become more common.

No matter what we do in the short term, some climate change is thought to be inevitable due to the greenhouse gases that have already been released. Therefore helping people and wildlife adapt to climate change is one of the Environment Agency's priorities.

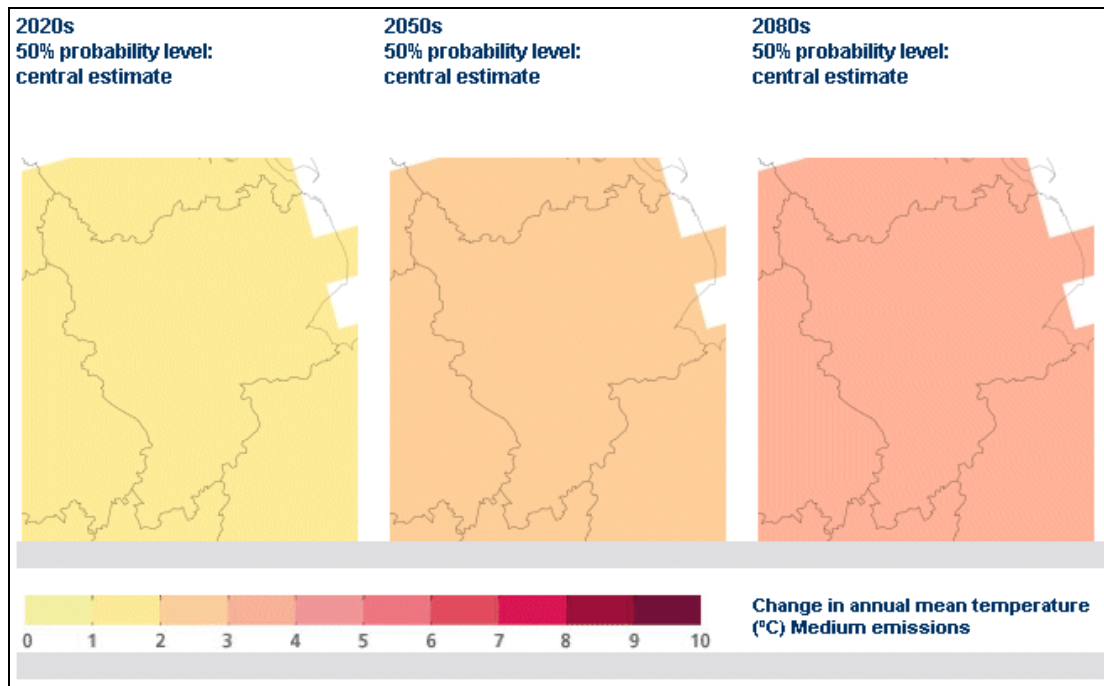
At a glance

- According to UKCIP, by 2050 the East Midlands could experience summer mean temperatures which are 2.5°C higher than today, summer rainfall could decrease by 16 per cent and winter rainfall could increase by 14 per cent. Sea levels on the East coast could rise by between 14cm and 22cm. These are the central estimates for a medium emissions scenario.
- By the 2050s eastern and central England could have irrigation needs similar to those currently seen in Central and Southern Europe. Mean monthly river flows could decrease by 50 to 80 per cent.
- In 2007, on average each person in the East Midlands was responsible for the emission of 8.9 tonnes of CO₂ (excluding emissions from air and marine transport, offshore emissions and direct emissions from waste). The UK average is 8.4 tonnes per capita and the East Midlands has the third highest figure of the English regions.
- In 2008, 947 Gigawatt Hours (GW h) of renewable energy were generated in the East Midlands out of the UK total of 21,578 GW h. The highest generation from an English region was East of England with 2,164 GW h.

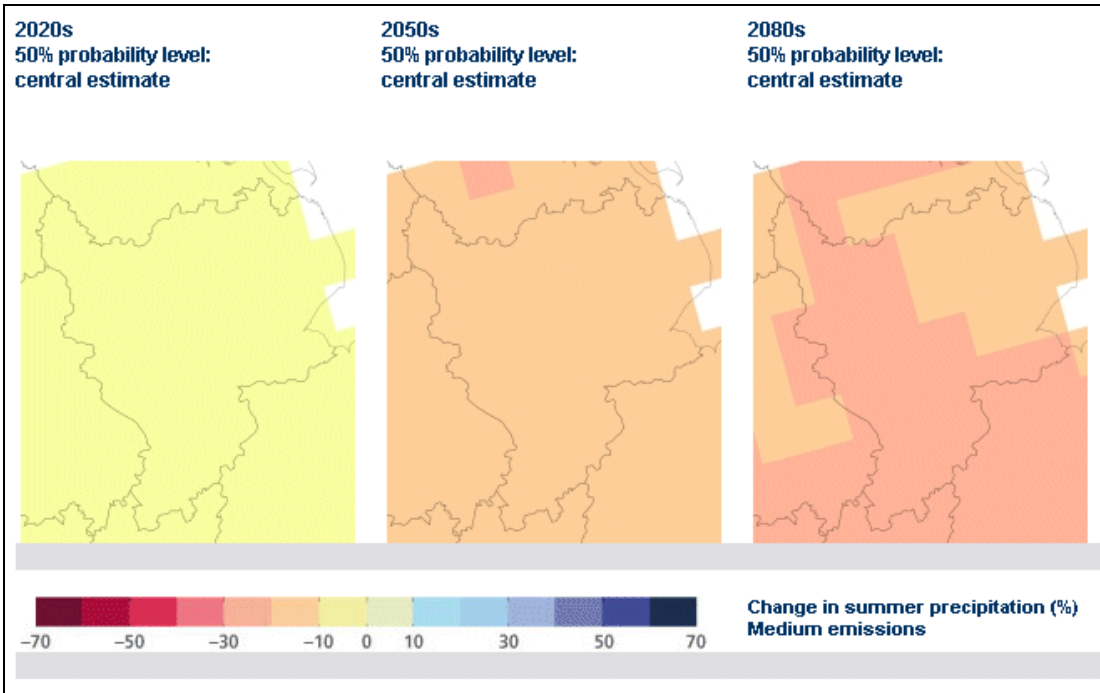
- Around 45,000 homes are at significant risk of flooding in the East Midlands (equivalent to a 1 in 75 year risk). This is based on the 2008 NaFRA dataset which looks at flooding from rivers and the sea and takes into account flood defences.

Data and Trends

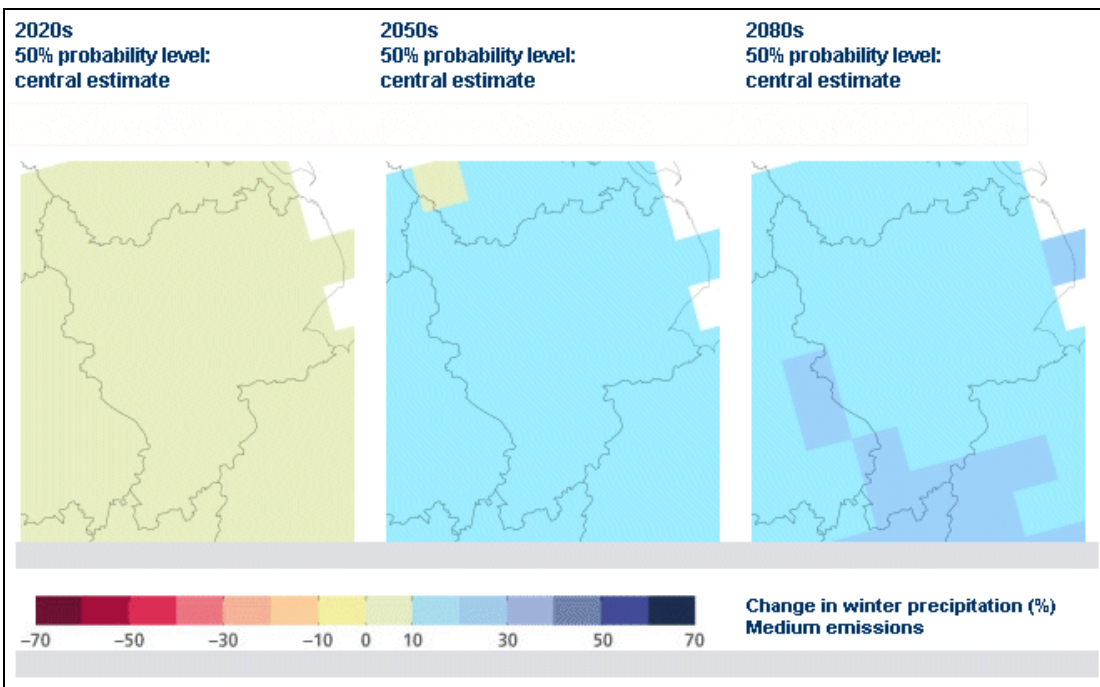
The maps below show the medium probability models predicting changes to the mean temperature, summer and winter rainfall for the East Midlands produced by the UKCIP. Models were based on a medium emissions scenario and give results projected to the 2020s, 2050s and 2080s.



Source: UKCP09

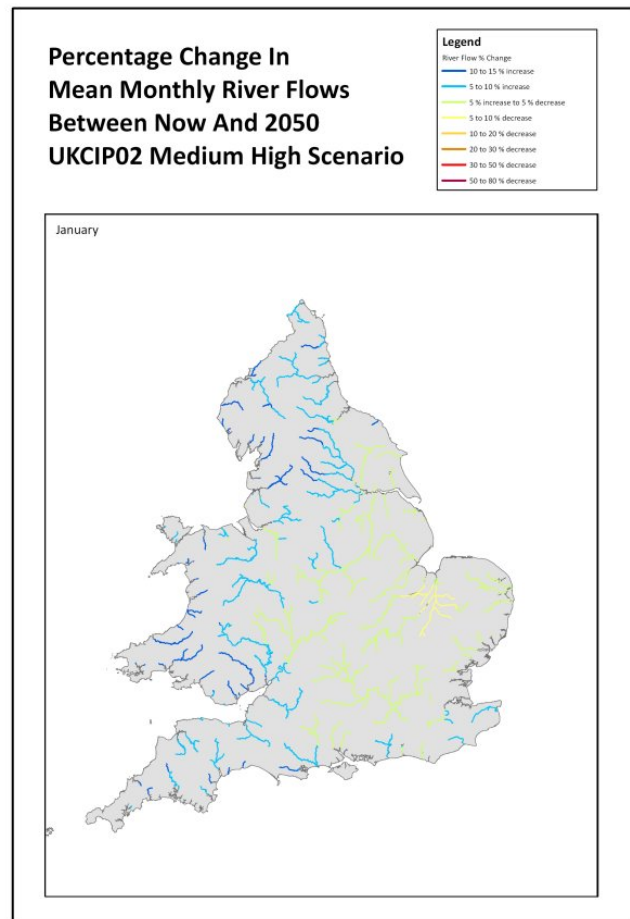
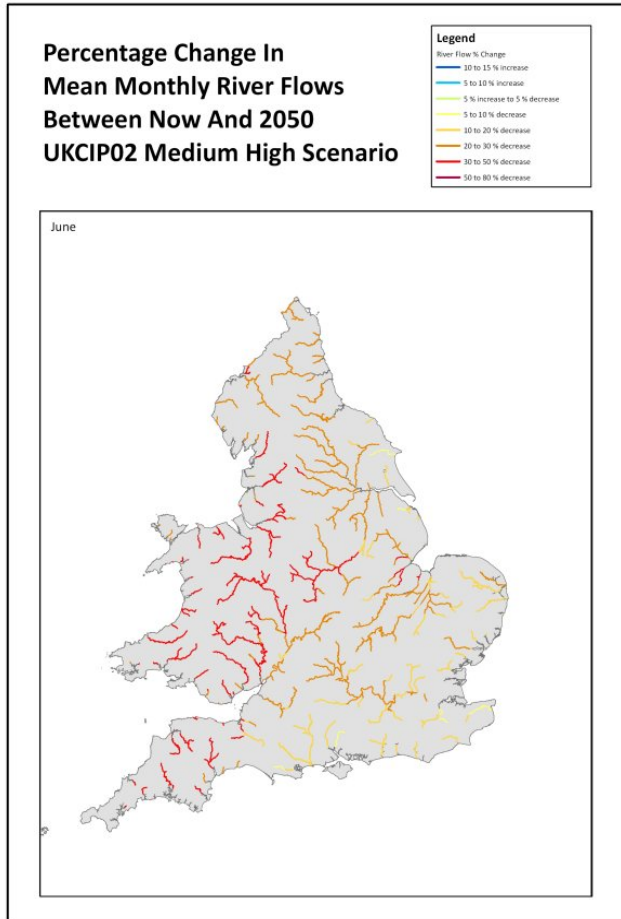


Source: UKCP09

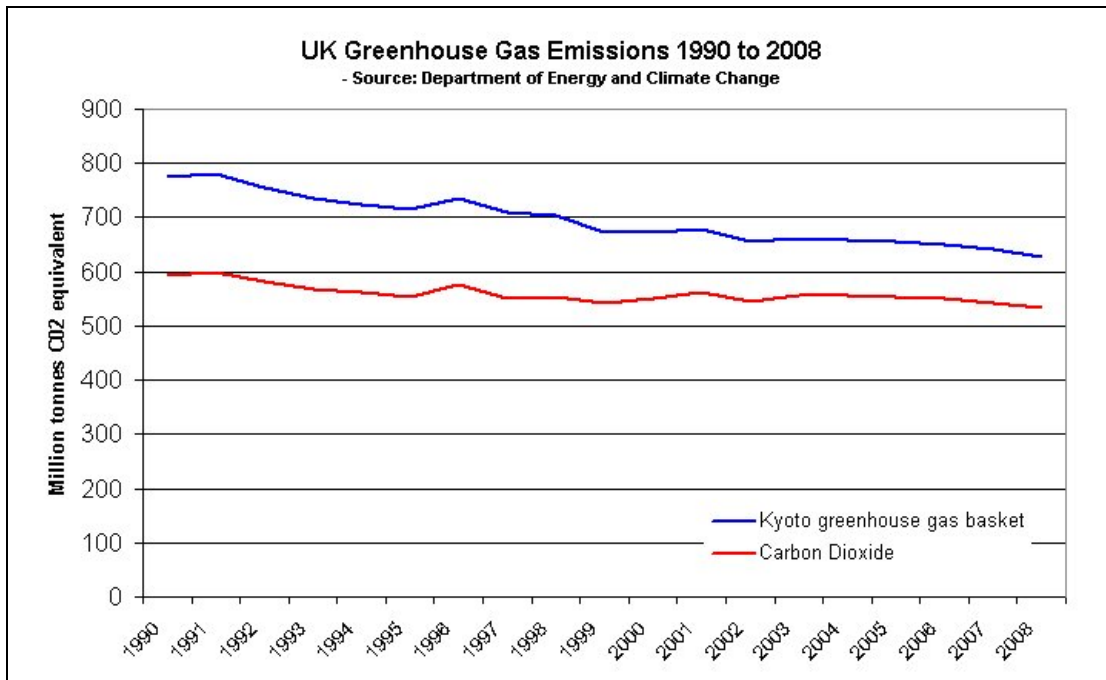


Source: UKCP09

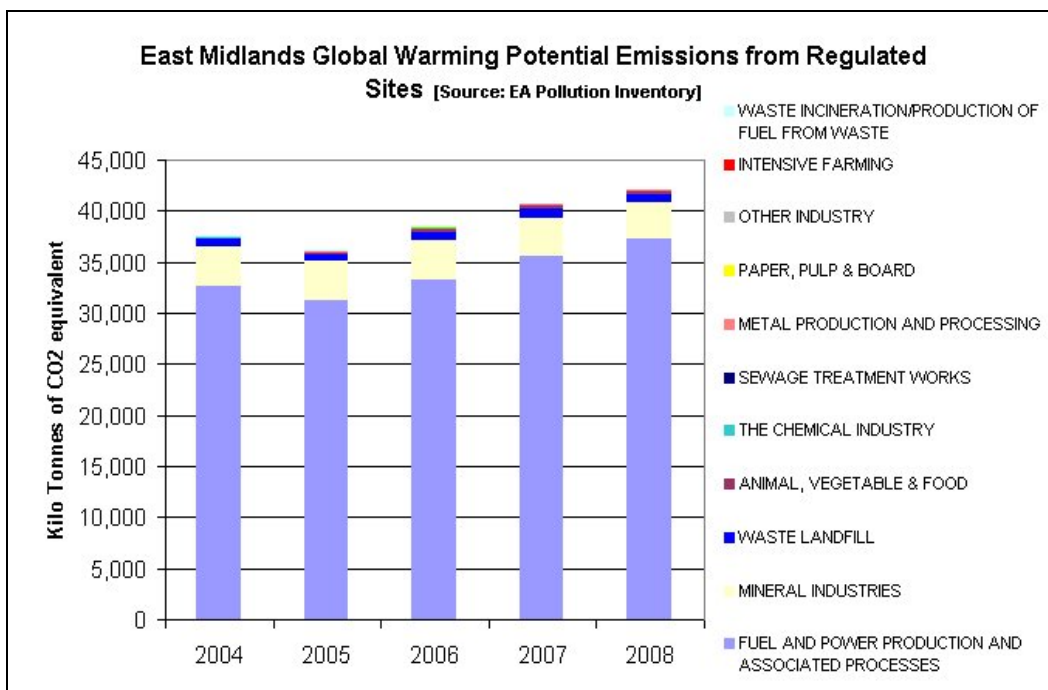
Predicted changes in average monthly river flows by the 2050s in a summer month and a winter month are shown in the two following maps. The full dataset for every month was produced by the Environment Agency in 2009 using the 2002 UKCIP data.



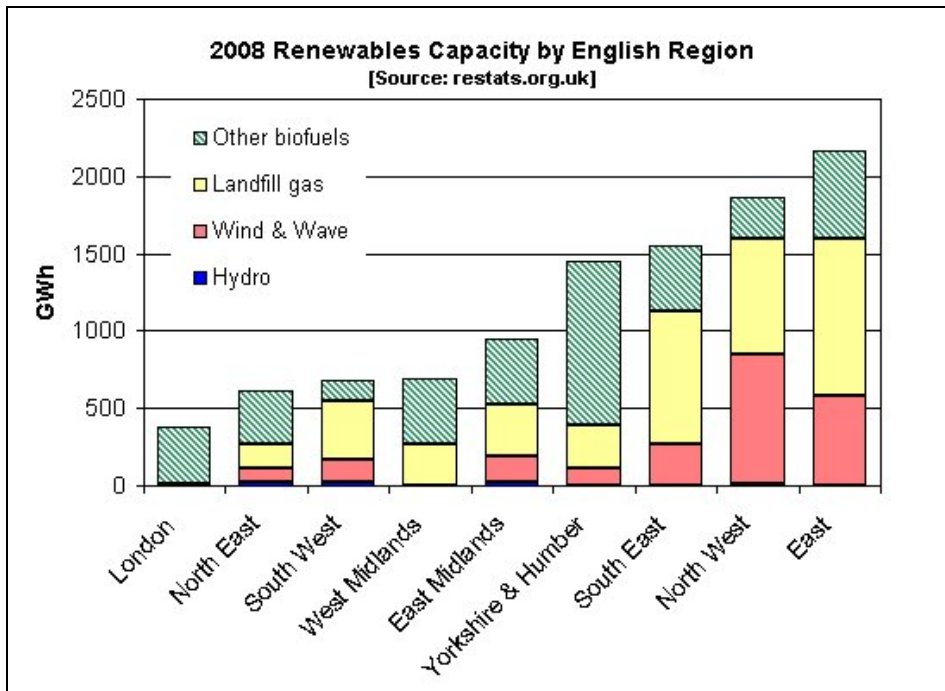
The Department of Energy and Climate Change (DECC) collate UK greenhouse gas emissions data and the most recent published figures are shown below. The graph shows a slight downward trend in overall greenhouse gases and carbon dioxide emissions since 1990.



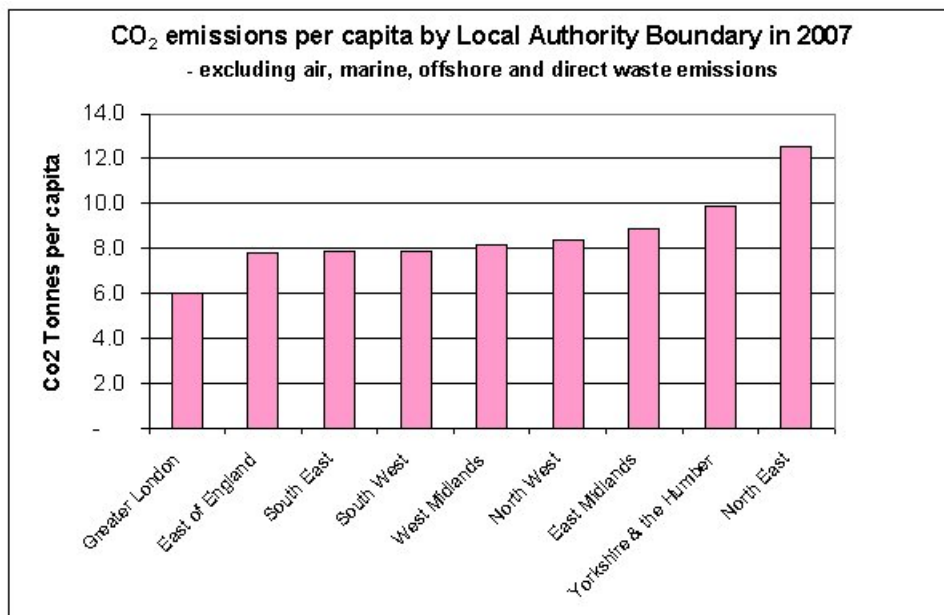
The Environment Agency receives emissions data from eligible regulated industrial sites. The Global Warming Potential (GWP) of the basket of six Kyoto greenhouse gases is calculated from this emissions data to give a kilogrammes of carbon dioxide equivalent figure. The chart below shows overall emissions since 2004 showing an increase from 37,500 in 2004 to over 42,000 kilo tonnes of CO2 equivalent in 2008.



Restats.org.uk publish annual figures for renewable capacity and generation in the UK regions. The chart below shows that the East Midlands the mid-ranking region compared to the English regions in 2008.



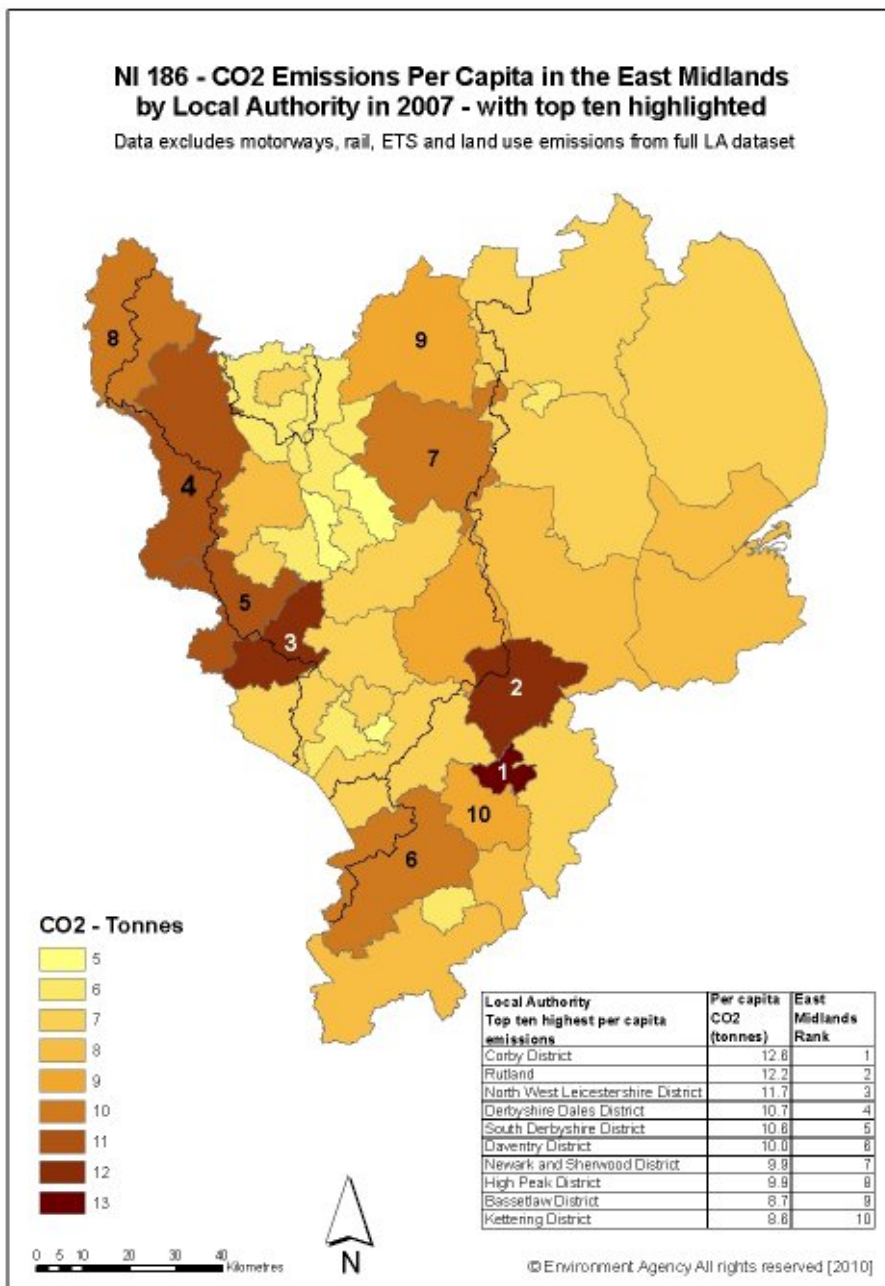
Each year, DECC releases many datasets. One is the full dataset of CO2 emissions by local authority area. This includes all emissions with the following exclusions: air and marine transport, offshore emissions from imported goods and direct waste emissions. The following chart shows the 2007 dataset.



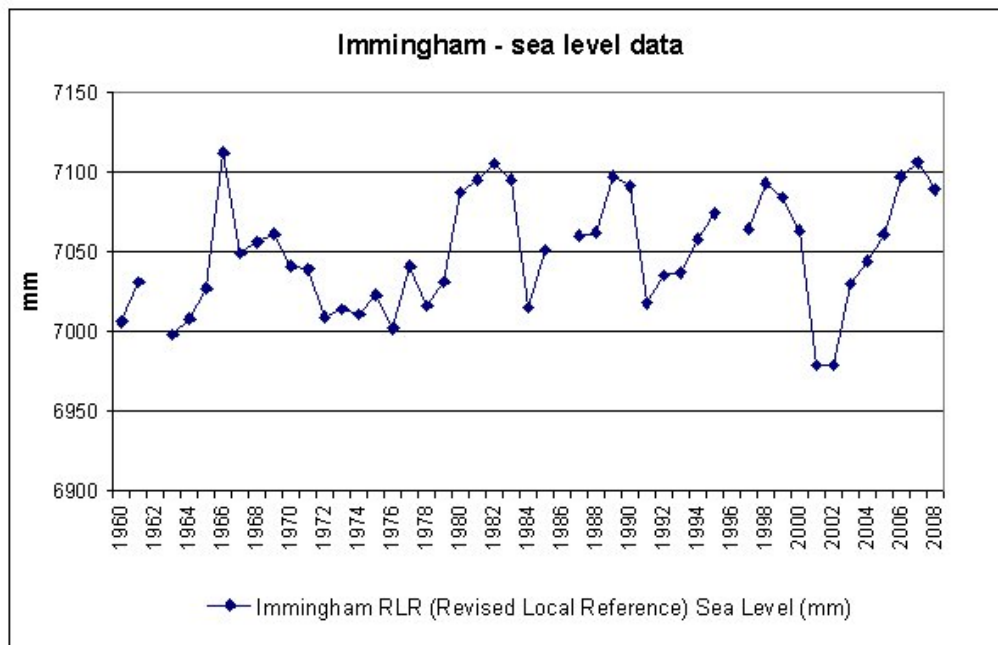
Another dataset which DECC releases is called the 'National Indicator 186' dataset. This is used by government to track 'per capita reductions in CO2 emissions in each local authority area'.

This uses a subset of the dataset described above. Emissions from some additional sources are excluded because they are considered to be beyond a local authority's control for example motorways, rail, Emissions Trading Scheme (ETS) emission and land use. The map below shows the 2007 National Indicator 186 dataset highlighting local authorities with the top ten highest per capita emissions in the East Midlands.

Corby and Rutland both fell in the top ten local authorities for per capita NI 186 emissions of all UK local authorities.



Long term sea level data is held by the Proudman Oceanographic Laboratory in Liverpool. The chart below shows annual data for Immingham over the last 50 years.



Our role

We have a key role to play in avoiding and responding to climate change. By 2015 we will regulate around half the greenhouse gas emissions in England and Wales. We are also an influential advisor to businesses and communities on the causes and consequences of climate change. We will also continue to reduce the emissions of our own operations.

In the coming years we will ensure that:

- Methane and carbon dioxide emissions from landfill sites are reduced.
- More energy in the East Midlands is produced from renewable sources.
- Organisations reduce their carbon impacts and increase their climate change resilience.
- Carbon storage in soils and standing biomass is increased.
- We are leaders in responding to the causes and consequences of climate change in the East Midlands.
- We reduce our environmental impact, comply with regulations and manage procurement in a sustainable and ethical manner.

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