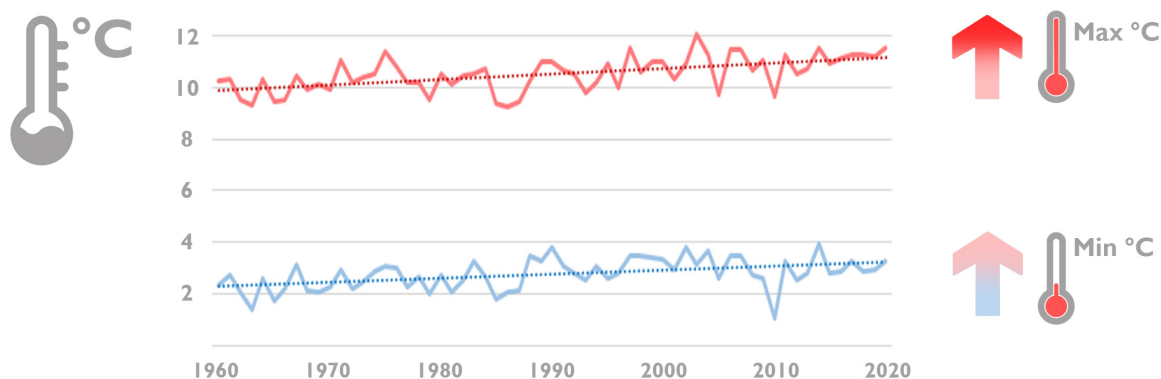


## Historic Climatic Trends

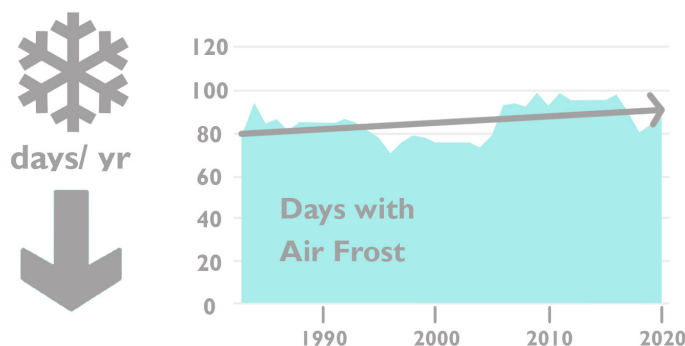
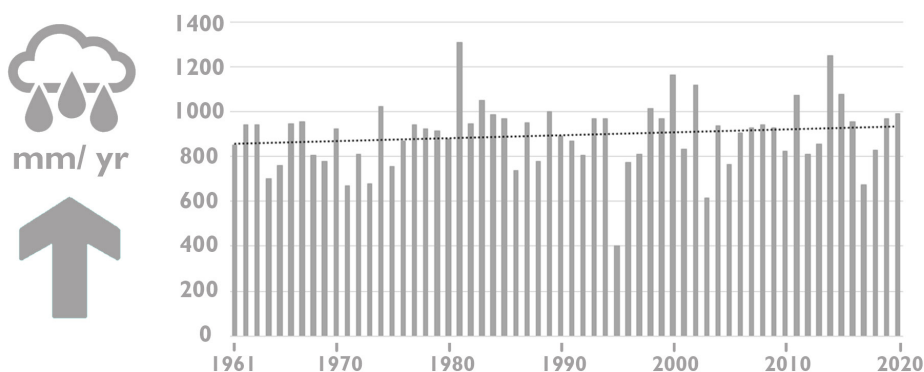
This data is provided by the Braemar and Aviemore weather stations.

### Braemar

Braemar weather station is a sufficient distance from main settlements to not be affected by urbanisation and therefore best reflects the nature of the climate within the National Park.



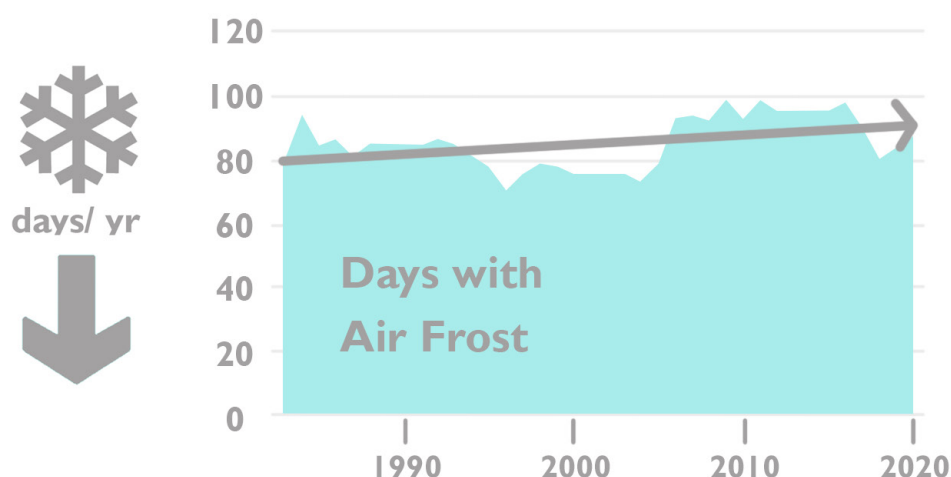
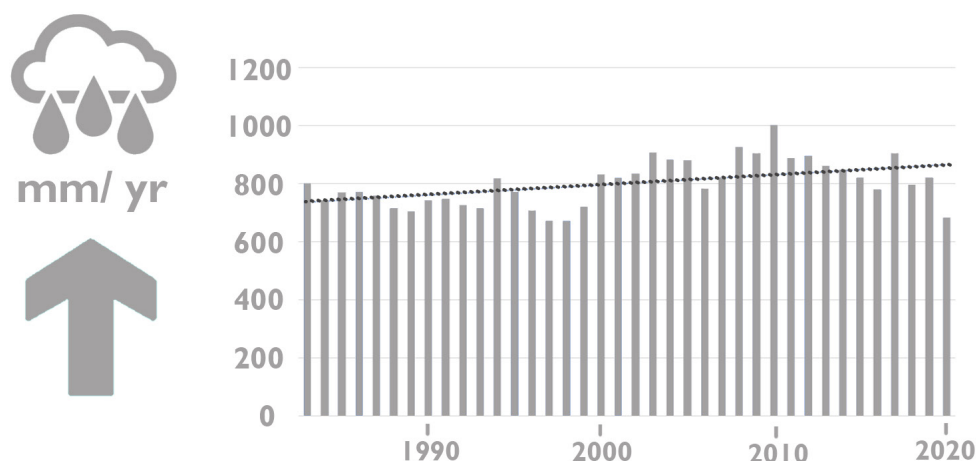
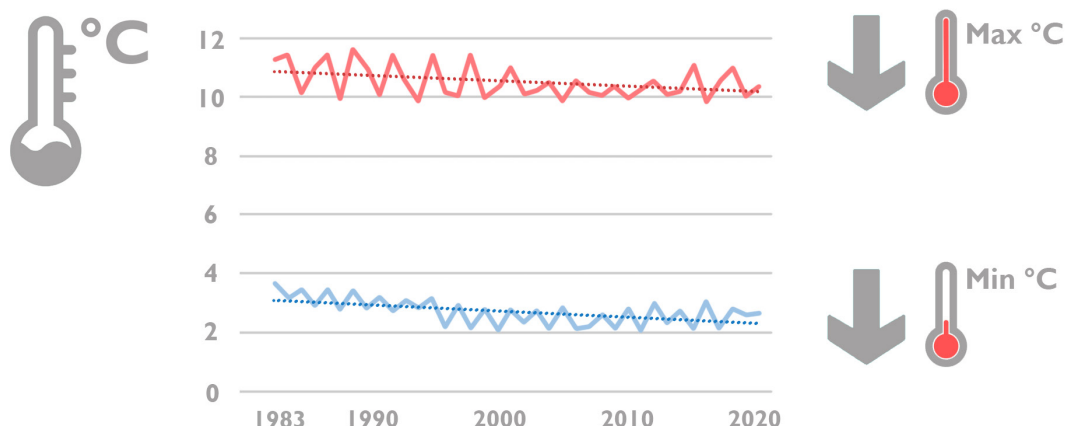
The findings are consistent with broader trends across Scotland, where temperatures have risen by around 0.8 degrees since 1980, with increased heavy precipitation events contributing to an increase in winter rainfall versus decreases in summer rainfall.



Records from the weather station indicate that this area of the National Park is experiencing a decrease in the number of days of air frost and an increase in annual rainfall.

## Aviemore

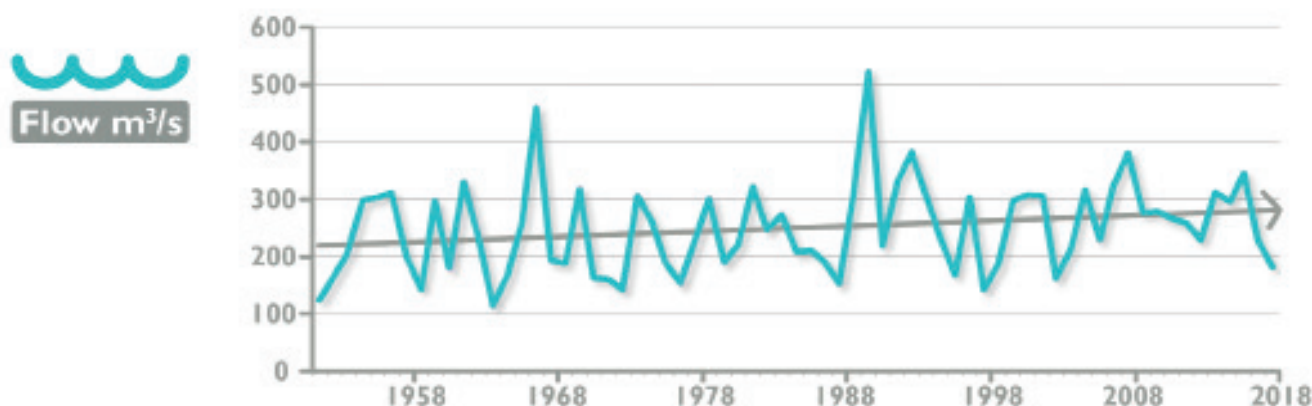
The trend is for both Aviemore and Braemar to become wetter. However, in contrast to Braemar, the temperature trend for temperature in Aviemore is colder, and with more days air frost. Indicating an east/west divide, potentially caused by the intervening mountains. The difference between Aviemore and Braemar is also to be expected as the effects of climate change will not be even across all areas.



## Water

SEPA monitor water levels at 20 sites within the National Park, as well as at a number of locations just outside the National Park boundary. The trends can be used as an indicator of climate change or as an identifier of potential risks such as flooding.

### SEPA annual maximum (AMAX) flow and trend for the River Spey from the Granttown-on-Spey monitoring station (8010) between 1951 and 2018



### SEPA annual maximum (AMAX) flow and trend for the River Dee at Polhollick, near Ballater (monitoring station 12003) between 1951 and 2018



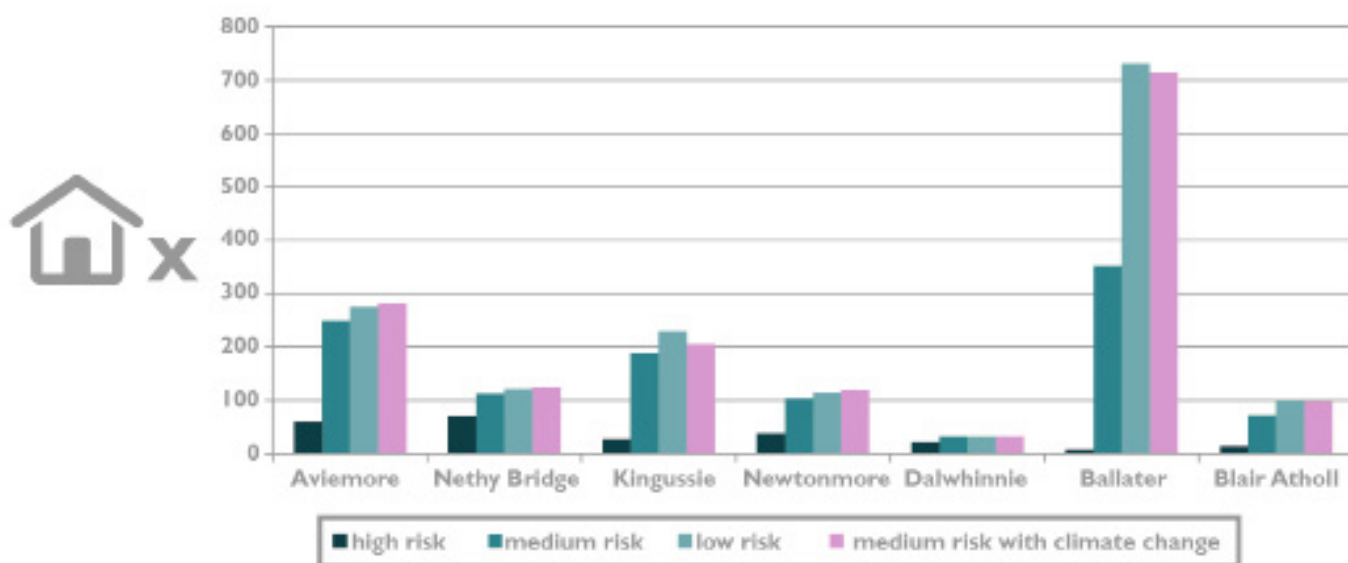
The data from both stations shows a general trend for higher annual maximums during the monitoring period.

## Flooding

All of the rivers and watercourses in the National Park have the potential to flood to some degree. When the main rivers break their banks, they often cause damage to land, building and infrastructure, resulting in economic cost.

The River Spey and its tributaries continue to flood regularly. These floods have damaged properties in Newtonmore, Aviemore and Carr-Bridge on a number of occasions. A significant number of properties remain at risk of future flooding in these and other settlements identified as Potentially Vulnerable Areas (PVAs) in the National Park.

### No. of properties at risk of flooding (selected settlements in Park)

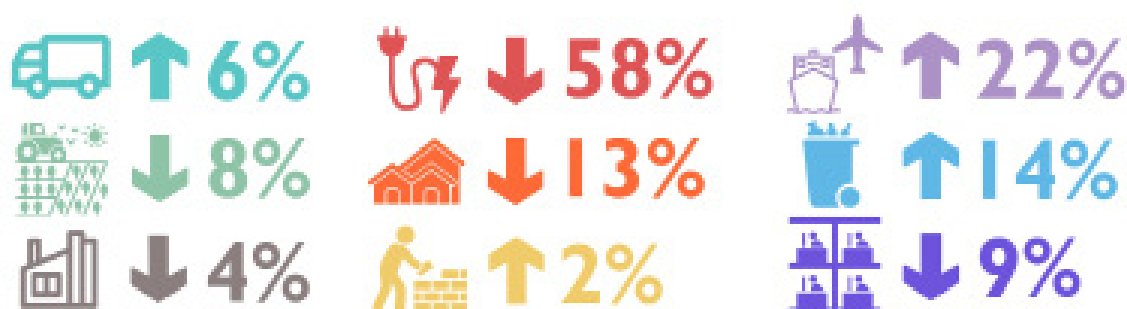
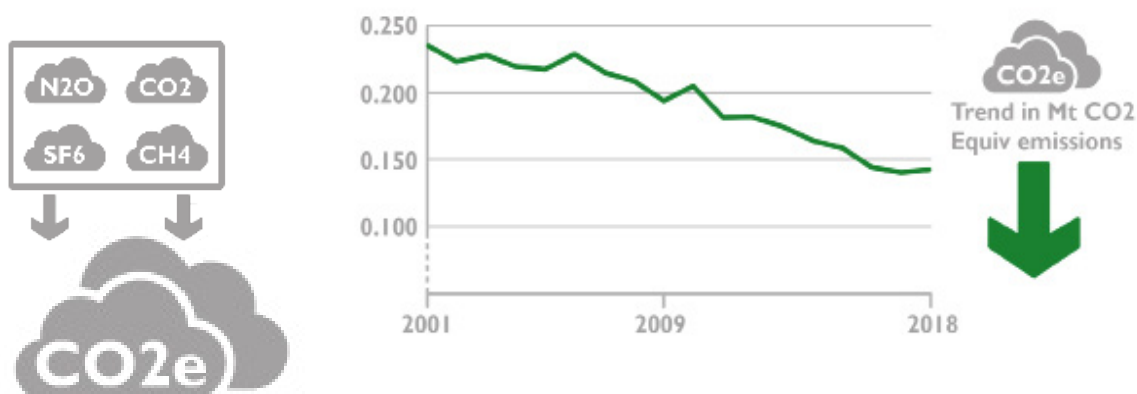


The Dee suffers from flooding related to heavy rain and melting snows. In 2014 the caravan park and a number of roads were closed due to flooding, and in December 2015 / January 2016, the Dee experienced widespread flooding, which caused significant damage to property and transport infrastructure. Ballater has a significant number of properties at risk of flooding.

The Tay catchment contains one PVA that falls across the National Park boundary at Blair Atholl. A number of historical river floods have been recorded in this area, including July 1916 and June 1931 when the railway was affected and evacuation was required as River Garry flooded near Blair Atholl. There continues to be a risk of flooding at Blair Atholl from the Garry Burn and from surface water.

## Greenhouse Gas Emissions

The trend in CO<sub>2</sub> equivalent emissions in the Park is encouraging with a marked decline since 2001 overall. However this is not represented equally among all sectors. For example, in recent years there are estimated to have been slight increases from Transport, Waste and Development emissions within the National Park.



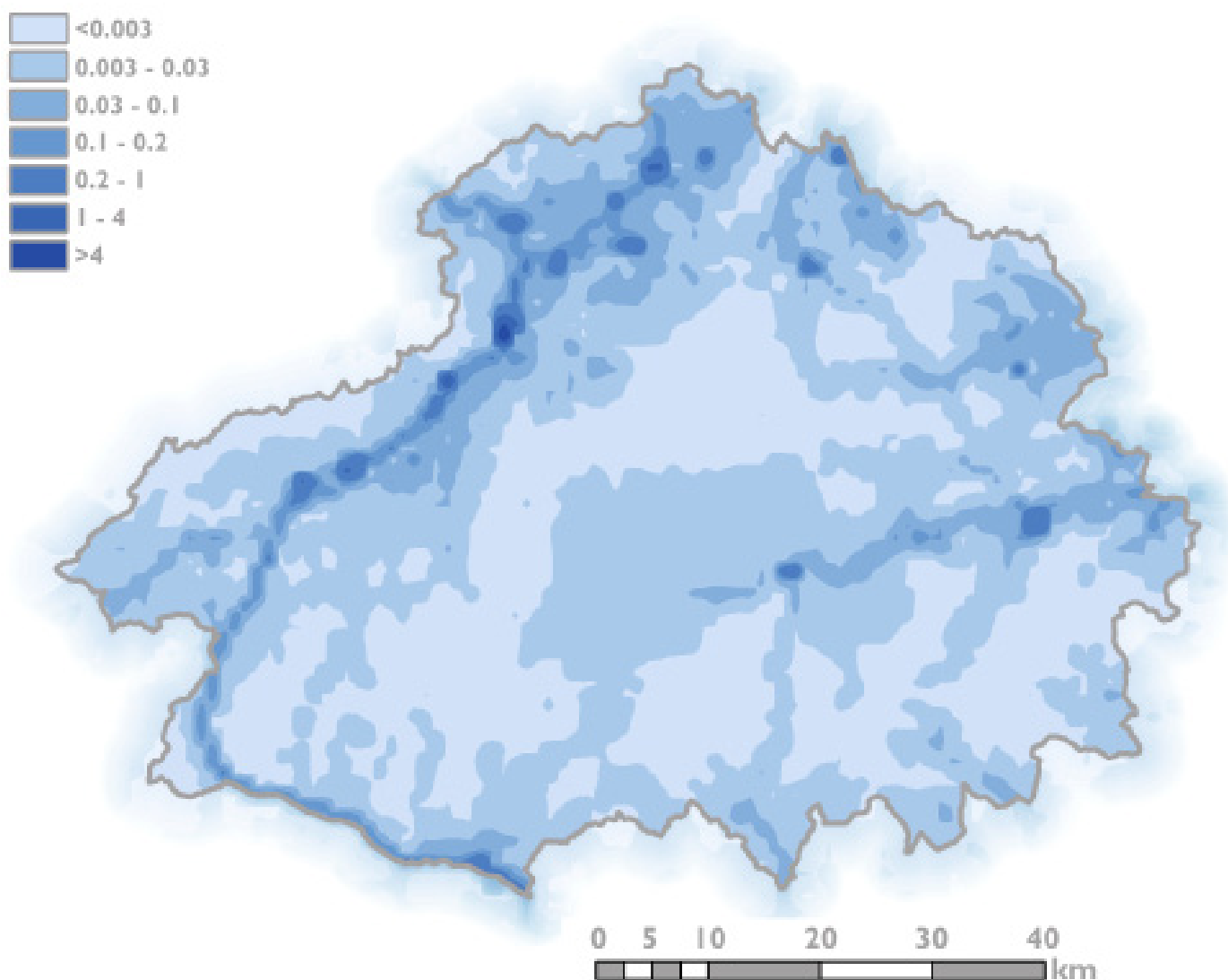
% Change 2013 - 2018 | Data obtained from <https://statistics.gov.scot>

## Greenhouse Gas Emissions: Carbon Dioxide

The UK National Atmospheric Emissions Inventory maps greenhouse gas emissions. In the Park (map below) the most significant carbon dioxide emissions are associated with road transport corridors and settlements.

Other emission sources include those associated with agricultural practices and the Granish landfill site near Aviemore. Due to topography and climate, the Park has limited land suitable for the lowland agricultural practices compared to upland land uses, meaning that emissions from agriculture are limited. The degraded peatlands in the mountain areas are also emitting carbon dioxide, adding to the emissions in the National Park. However peatland restoration projects are underway to bring peatland habitats back to functioning carbon sinks.

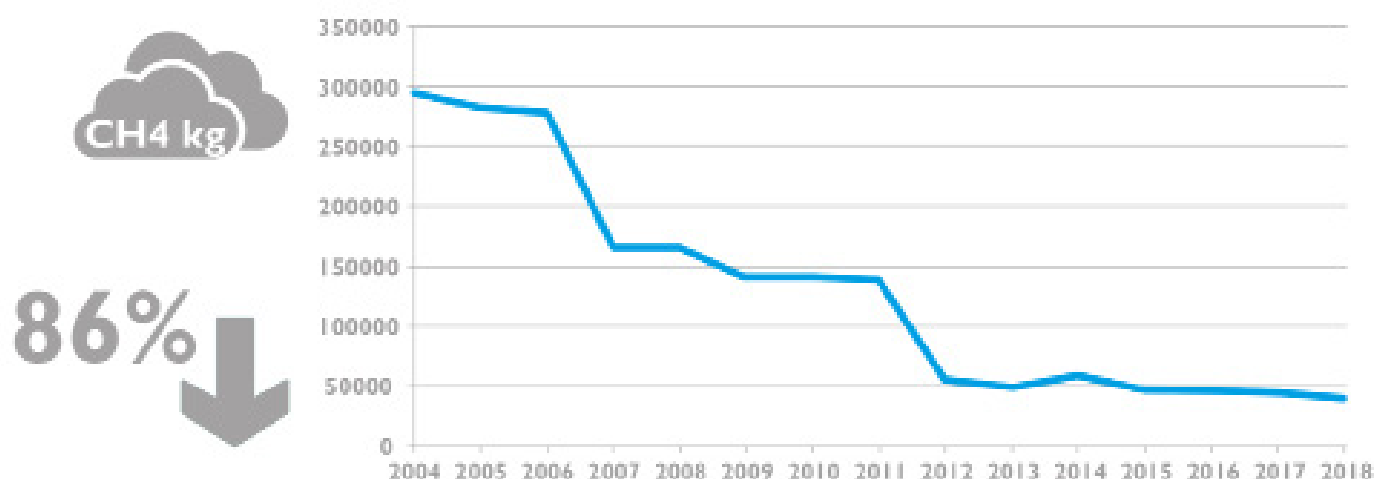
### Carbon Dioxide (as carbon) emissions (t) for the Park, 2017 (km<sup>2</sup> data)



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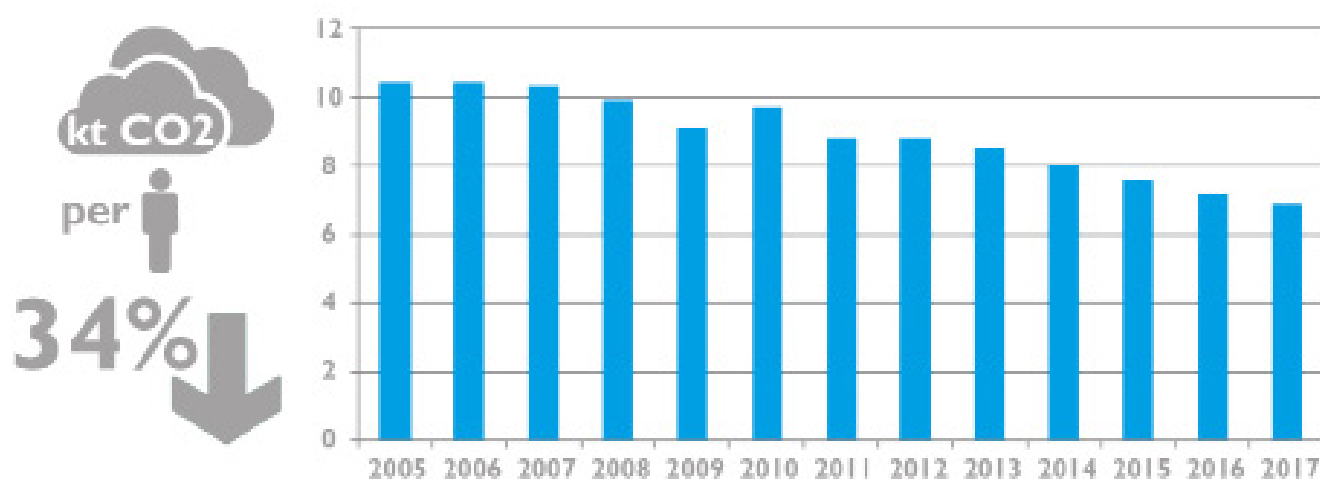
## Greenhouse Gas Emissions: Granish Landfill Site

With regard to methane ( $\text{CH}_4$ ), another greenhouse gas, the only facility within the Park that contributes towards the Scottish Pollutant Release Inventory is Granish landfill site, which is operated by the Highland Council. Estimates of the methane emissions for the site indicate a trend for sudden significant reductions in emissions which then plateau.



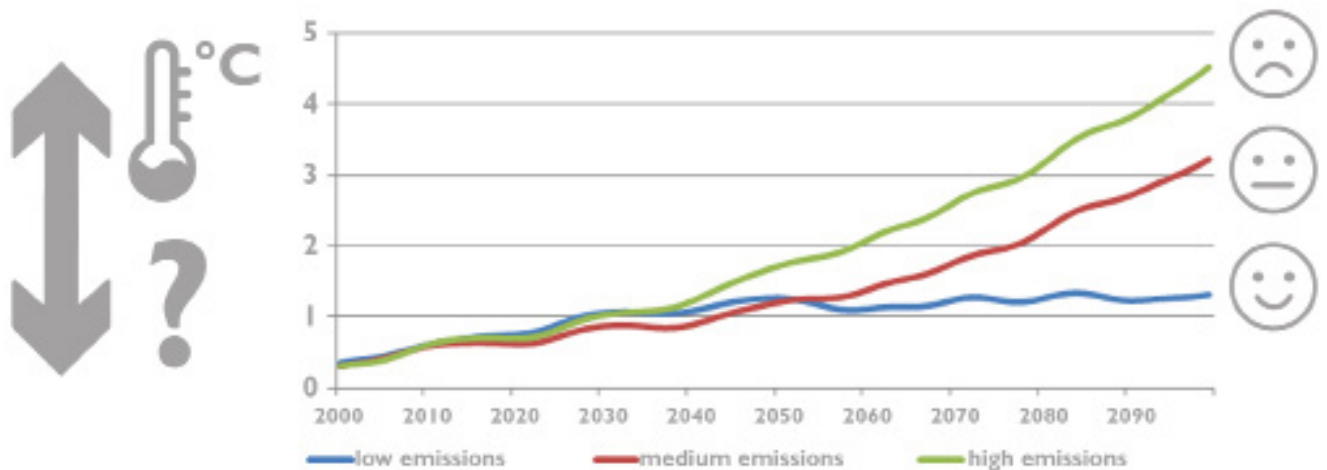
## Greenhouse Gas Emissions per person

Annualised data for National Parks is not available. To get an approximation of the contribution of the Park, further analysis of data from the 2019 Department of Business, Energy and Industry Strategy (<https://ukclimateprojections-ui.metoffice.gov.uk/>) has been required. Mid-year population estimates have been used as a proxy for proportionally attributing the emissions of the residents within the Park. The overall trend has been for a combined reduction in emissions per person in the Park between 2005 - 2017.



## Future Climatic Projections

Probable projections available from the UK Climate Projections (UKCPI8) website (<https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/index>) are available for high, medium and low emission scenarios, with the latest projections down to a local resolution of 2.2 km<sup>2</sup>. However the degree of uncertainty changes with the scale of resolution, so the data used for the baseline is for the 25km<sup>2</sup> area including Braemar.



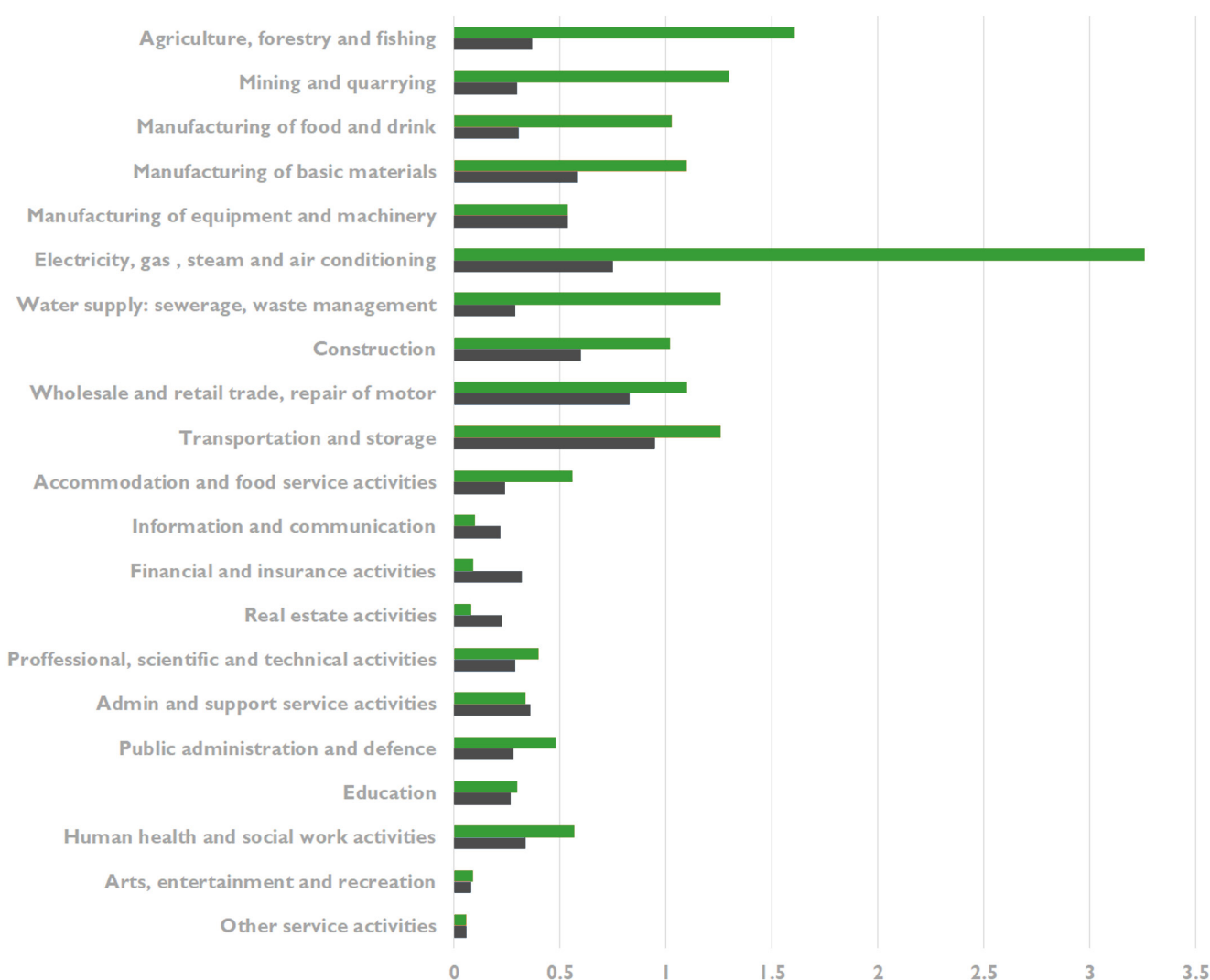
This is helpful as it increases the reliability of the projections and includes the Braemar weather station used to record the actual climatic changes shown since the 1960s, allowing comparisons to be made.

Although the overall trend in greenhouse gas emissions is downward in the National Park, it is likely that substantial further decreases will be required to meet the emissions targets of the Climate Change (Emissions Reduction Targets) (Scotland) Bill 2019.



## Cairngorms National Park industry GHG emissions compared with UK national average

The graph below shows the early estimates for per capita GHG emissions in the National Park. They indicate that total CO<sub>2</sub> emissions per capita (excluding auxiliary fuels and electricity) are over twice that of the UK national average (see figures below graph). This reflects the industries prominent in the National Park attributing to the higher GHG emission in an area with lower (rural) population. This data is draft and due to be updated in the near future.



UK



NATIONAL PARK

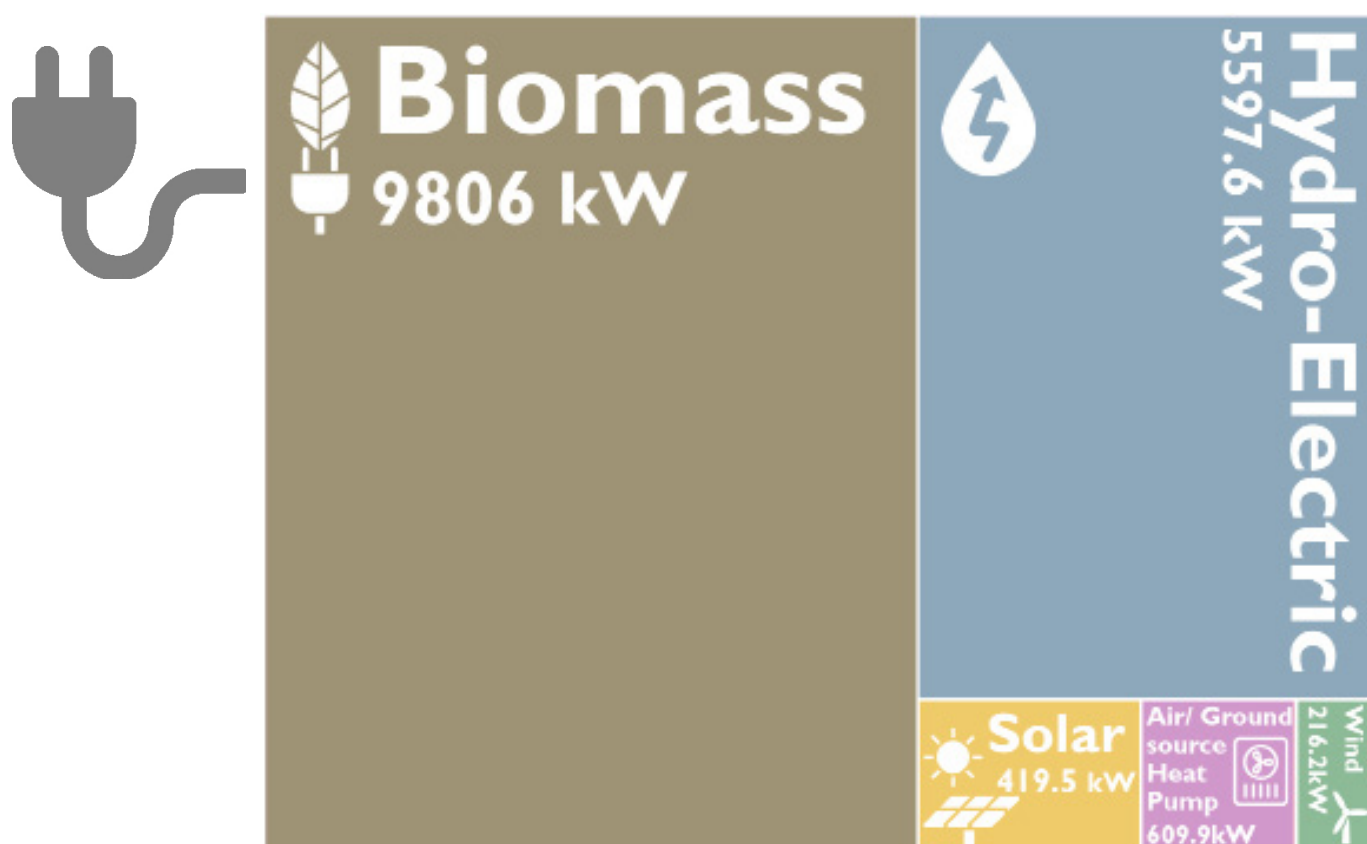
**Total Cairngorms NP = 16.6 tCO<sub>2</sub>e per capita**  
(excluding auxiliary fuels and electricity 9.2 tCO<sub>2</sub>e)

**Total UK average = 8.2 tCO<sub>2</sub>e per capita**

## Energy Generation

In order to safeguard the special landscape qualities of the National Park, the Park Authority has historically implemented relatively restrictive policies on large scale renewable energy development in the National Park. As a result, developments of energy generating infrastructure have been relatively minor in scale and number. It should be noted that this may not reflect the amount actually generated, due to some permissions not being implemented and also variations in predicted and actual generation once built.

### kW of installed renewable energy generation granted planning permission in the Park, 2005 - 2021



Installing certain renewable energy technologies, such as solar panels and biomass boilers, is within the permitted development rights of householders and businesses provided certain conditions are met. This means that no data is available on energy generation installed under permitted development rights as it is not recorded officially. Therefore, the graphic above does not offer a comprehensive indication of the amount of energy generated within the National Park - the figures are likely to be higher.

## Further Information

### Climate Change in the National Park:

<https://cairngorms.co.uk/working-together/the-climate-emergency/>

### Snow Cover and Climate Change on Cairngorm Mountain:

<https://cairngorms.co.uk/working-together/publications/publication/490/>

### Cairngorms National Park Authority Greening Policy and Emissions Report:

<https://cairngorms.co.uk/working-together/publications/publication/448/>

### Scottish Government Climate Change Plan:

<https://www.gov.scot/publications/securing-green-recovery-path-net-zero-update-climate-change-plan-20182032/>

### Climate Change Impacts in Scotland (NatureScot):

<https://www.nature.scot/climate-change/climate-change-impacts-scotland>

### ClimateXchange:

<https://www.climateexchange.org.uk/>

### UK Climate Impacts Programme:

<https://www.ukcip.org.uk/>