

# A greenhouse gas emissions assessment and target scenario for the Wye Valley Area of Outstanding Natural Beauty (AONB)

A report by Small World Consulting Ltd

## Executive summary

### Background

As the world wakes up to the climate and wider environmental emergency, rapid reduction of greenhouse gas emissions and sustainable land management are becoming increasingly central to the local, national and international policy agendas.

Together, the UK's 15 National Parks (NPs) and 46 Areas of Outstanding National Beauty (AONBs) are home to over 1.5 million residents, attract approximately 250 million visitors per year, and account for around 18% of the UK's land area. If these protected landscapes can become exemplars of low-carbon transition and environment-conscious land management, their national and international profiles could give them a level of influence that far outweighs the scale of their own emissions. The exciting and creative challenge for each protected landscape is to find a way to cut emissions in line with current science, and be leaders in land stewardship and planning authority while simultaneously creating better places for people to live, work and visit.

### This report

This report, for the Wye Valley Area of Outstanding Natural Beauty (AONB), is one of a series of methodologically compatible reports produced for each UK National Park and Welsh AONB, with the Cotswolds AONB and Cannock Chase AONB also joining. They are designed to provide a robust and consistent evidence basis for climate action, matched to the unique characteristics and circumstances of each protected landscape, as we enter an era in which climate mitigation and sustainable land management become ever more central to all our lives, our work and to all policy decisions.

This report contains a consumption-based assessment of the greenhouse gas emissions attributable to residents and visitors, including travel to and from the landscape (Figure 1), and a set of Paris-aligned target recommendations for transitioning to a low-carbon economy.

Consumption-based emissions reporting differs from more traditional production-based reporting, such as that used by the UK in setting its 2050 net zero target. A production-based assessment would cover all the emissions that are directly produced within the boundary of the landscape whether by people or businesses or from land, plus those arising from production of the electricity used within the landscape. However, the consumption-based approach adopted here covers, in addition, all indirect emissions that are embodied in the goods and services consumed by residents and visitors within the landscape. In doing so, it better reflects the full climate impact of people's lifestyles, and brings into focus for policymakers important areas of climate impact that a production-based assessment overlooks. The most important of these are the impact of food, of other purchased items (such as cars, clothes, IT equipment, household goods and furnishings), and of residents' and visitors' travel to and from the landscape, outside its boundaries.

Accounting for emissions from land use and management is also crucial for National Parks and AONBs. These landscapes are mostly rural, with comparatively small population and large parts of land under various forms of agricultural management, in addition to non-agricultural habitats such as woodlands, wildflower meadows, heathlands and peatlands. Land-based emissions originate predominantly from ruminants (methane), synthetic fertiliser use (nitrous oxide), and degrading peatlands (mostly CO<sub>2</sub>). These emissions are, to a degree, compensated by carbon sequestration in existing woodlands, meadows, hedgerows, and healthy peatlands, while agricultural soils could also sequester carbon under certain types of management. Reducing land-based emissions and scaling up land-based carbon sequestration efforts is going to be crucial for addressing the joint climate and ecological emergencies.

One feature of consumption-based reporting is that it does not include emissions from industry (except where an industry's goods and services are consumed by residents and visitors). Therefore, for perspective, this report also includes a simple estimate of emissions related to industries within the National Park or AONB, including their supply chains. It is important to note that there is some inevitable overlap between industry-related emissions and residents' and visitors' emissions, for example when people buy from local businesses within the area. Likewise, there is an overlap between emissions from agriculture as an industry sector and land-based emission within each landscape. Figure 1 illustrates the relationship between the main components of our central assessment and the industry emissions.

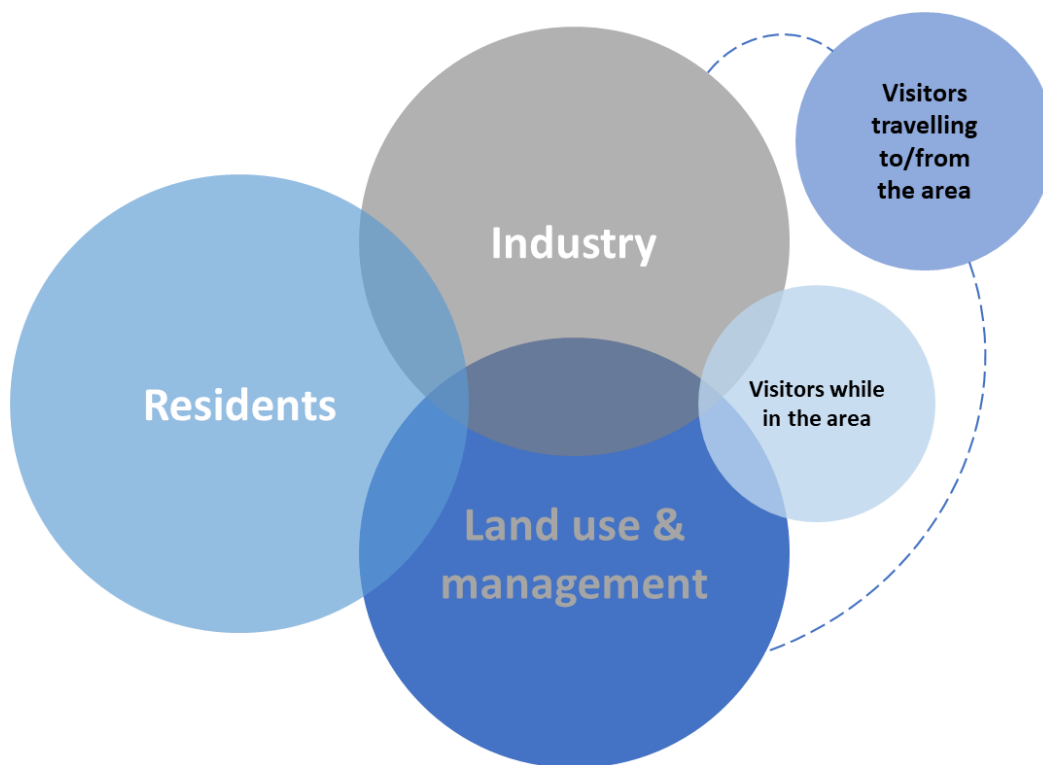


Figure 1: Boundaries of the greenhouse gas footprint assessment

This report also includes a scenario for Paris-aligned greenhouse gas emission targets across six key areas. These areas were selected for the original Lake District National Park assessment, and have

been chosen in order to find a “best fit” between competing desires: to cover everything of significance within the influence of local policymakers, to keep the boundary simple to describe, to avoid double-counting, and to make use of any data readily available for tracking progress. As a result, the scope for the target areas is slightly different from that of the overall emissions assessment. The six target areas are:

- Energy-only emissions by residents, visitors and industry
- Food and drink consumed by residents and visitors
- Other goods purchased by residents and visitors
- Visitor travel to and from the National Park or AONB
- LULUCF<sup>1</sup> Non-CO<sub>2</sub> component
- LULUCF CO<sub>2</sub> component

### Limitations and uncertainties

Due to the complexity of supply chains and the limitations of available data, consumption-based emissions estimates always contain a considerable degree of uncertainty. However, given current constraints on data availability, these estimates are sufficiently robust to provide an evidence basis for carbon management and target setting. The estimate of industry-related emissions is particularly crude, being based on comparatively simple revenue data and generic UK-wide emission factors.

### Results

| <b>Wye Valley Area of Outstanding Natural Beauty</b>       |   |
|--|---|
| Annual emissions from residents                            | <b>431,663 tCO<sub>2</sub>e</b> (14.8 tCO <sub>2</sub> e per person per year) |
| Annual emissions from visitors while in the AONB           | <b>47,456 tCO<sub>2</sub>e</b> (18.8 kgCO <sub>2</sub> e per visitor-day)     |
| Annual emissions from visitors travelling to/from the AONB | <b>60,819 tCO<sub>2</sub>e</b> (37.7 kgCO <sub>2</sub> e per visit)           |
| Annual industry emissions                                  | <b>242,500 tCO<sub>2</sub>e</b>   |

### Key highlights

The Wye Valley AONB is the only designated landscape overlapping with two of the UK’s nations, Wales and England. It has a comparatively high residential population and a relatively small number of visitors given its area. As a result, the total GHG footprint of the residents is estimated to be nearly four times higher than that of all visitors.

Wye Valley residents’ consumption is roughly 13% above the UK average (excl. public services), which is the average among all National Parks and AONBs on the programme. Demographic data points to a predominantly retired population, with health expenditure being particularly high.

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<sup>1</sup> LULUCF stands for Land Use, Land Use Change and Forestry. It is a commonly-used way to describe land-based emissions excluding fuel and electricity consumption by agricultural activities.

In a given year, the residents' footprint is estimated to be around 20% higher than the UK average. Several fossil fuel-based sources of greenhouse gas emissions are particularly high, most notably for travel: residents' emissions from flying are estimated to be over 80% higher than for an average UK resident, while transport emissions (excl. driving) and driving emissions are around 33% and 26% above the UK average, respectively. The household electricity and fuel use (excl. vehicle fuel) footprints are around 26% and 13% higher than the respective UK averages. It must be noted that our estimates for emissions from household fuel and electricity use do not include renewable energy solutions such as solar panels and heat pumps, nor do they factor in the uptake of electric vehicles. As of 2019, the share of these technologies across households was comparatively low and no suitable data with sufficient geographical detail was available. The footprint from household fuel use (excluding driving) is particularly uncertain since more properties are off the gas grid in Wye Valley compared to the overlapping unitary Local Authorities, and because there is insufficient data for residual fuel use (oil, coal, biomass).

Wye Valley's share of visitors staying overnight (around 20%) and their average duration of stay (4 days) are in the middle of the range among all National Parks and AONBs on the programme. The visitors' footprint while in the AONB is dominated by food (46%), followed by driving (16%) and non-food shopping (11%). Estimated average mileage travelled on land to get to Wye Valley (around 90 miles) is on a lower side and is dominated by cars, while relatively few visitors come from overseas. The visitors' footprint while travelling to and from the AONB is dominated by driving (55%), and overall is around 30% higher than the footprint of travel within the AONB.

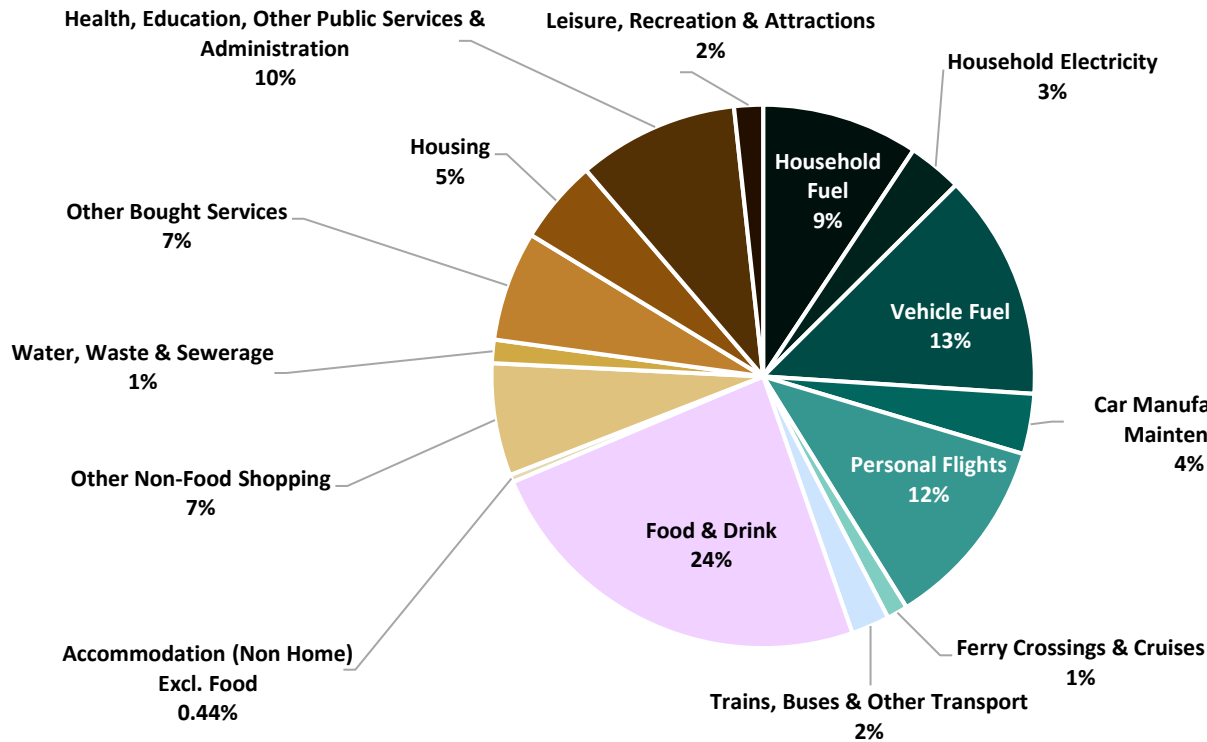
The industry footprint in the Wye Valley AONB is dominated by agriculture and fishing (45%) and production (26%).

Wye Valley AONB is estimated to have a considerable traffic footprint from the major A roads (particularly A40), which amounts to around 20% compared to the total footprint of the residents. Through traffic is estimated to account for as much as 85% of the emissions from the major A roads.

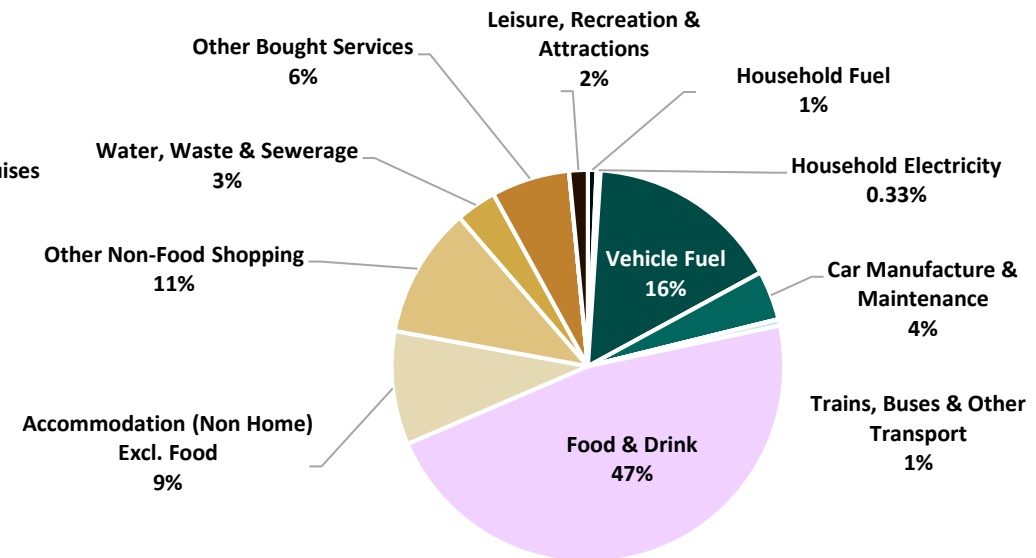
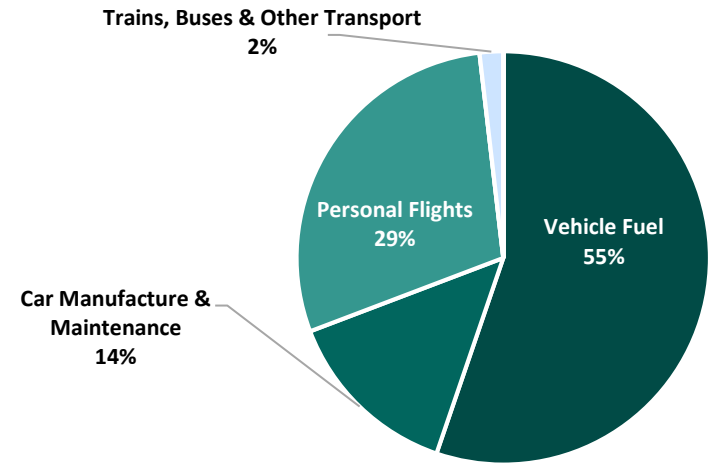
### Targets scenario

A minimum Paris-aligned target trajectory has been constructed for each of the six elements of the targets, as illustrated in *Figure 6*. When combined, they result in a net zero date of 2038 for the Wye Valley AONB. We note that the net zero date reflects the unique characteristics of the landscape, including the land use types and their respective areas, the number of residents and visitors and their consumption patterns, and the level and type of industrial activity (see Section **Error! Reference source not found.** for the target figures). It also assumes the recommended decarbonisation and carbon sequestration efforts, including land use change, ratchet up to the required levels immediately in the base year of the assessment. In reality, the high levels of ambition for different sectors explored in this report are likely going to take several years to achieve, given that post-COVID emissions have largely rebounded, and that decarbonisation trends to date have been relatively small in magnitude compared to what we know is required for keeping global warming below the safer 1.5°C limit from the Paris Agreement. These factors are expected to push the projected net zero year back by several years. The net zero date should therefore not be taken in isolation as a level of ambition.

**Residents: 431,663 tCO<sub>2</sub>e**



**Visitors travelling to and from the AONB: 60,819 tCO<sub>2</sub>e**



**Visitors while in the AONB: 47,456 tCO<sub>2</sub>e**

Figure 2: (left) Residents' GHG emissions in the Wye Valley AONB, by percentage

Figure 3: (top right) Visitors' GHG emissions from travel to and from the Wye Valley AONB, by percentage

Figure 4: (bottom right) Visitors' GHG emissions while in the Wye Valley AONB

# Industry: 242,500 tCO2e

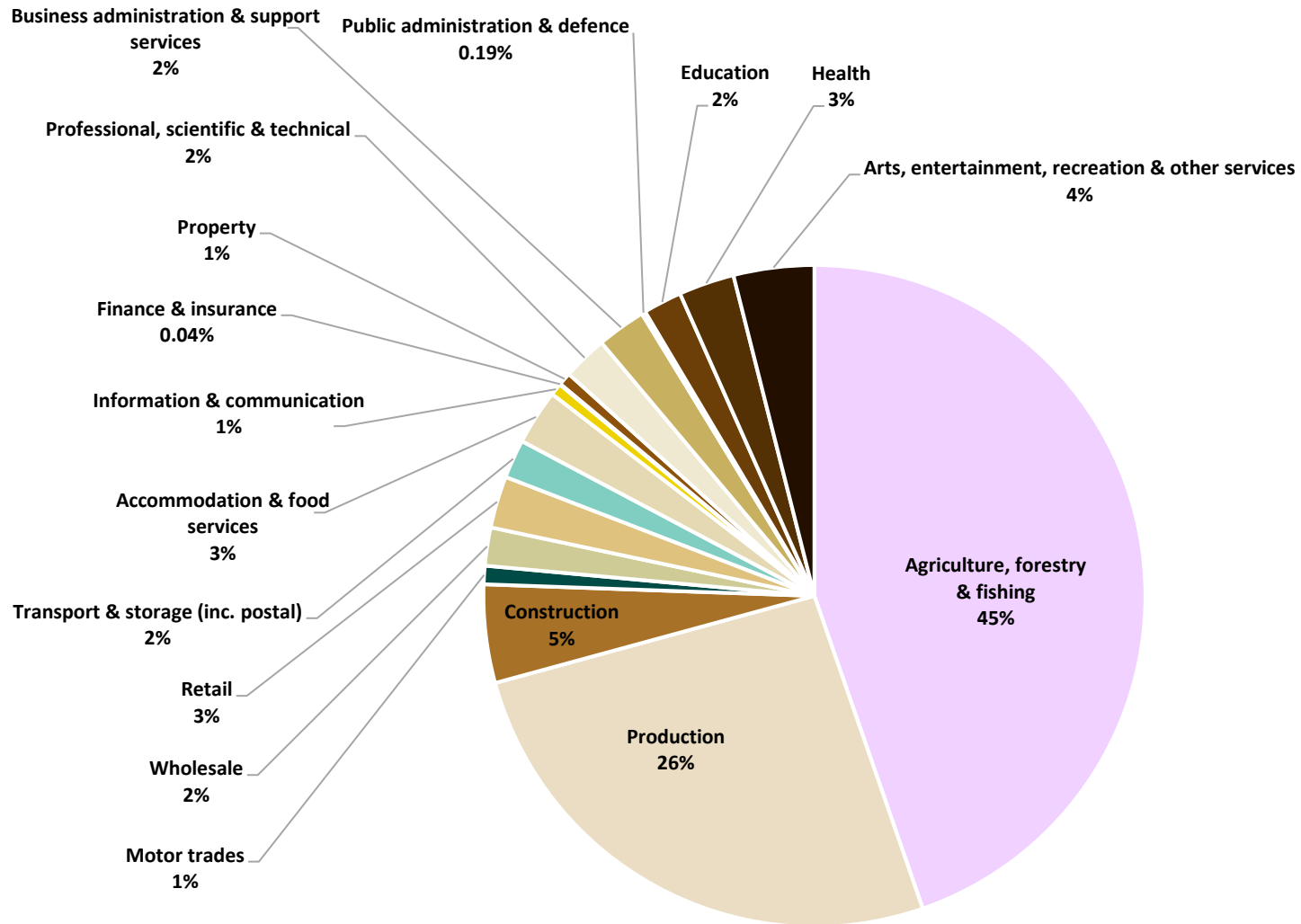


Figure 5: A estimate of emissions from industries within the AONB and their supply chains (scopes 1, 2 and upstream scope 3)

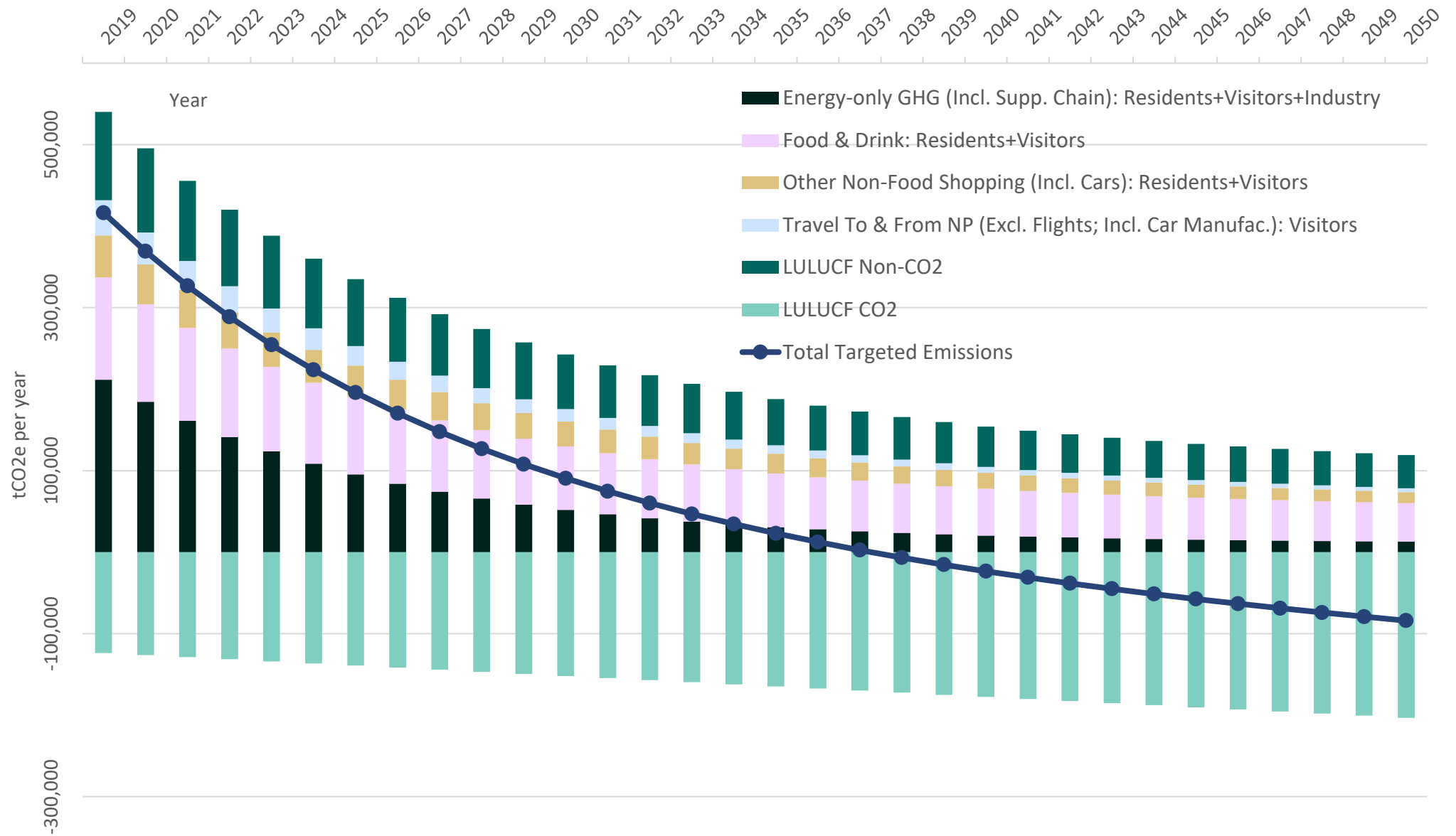


Figure 6: Recommended target pathways leading to net zero emissions for the Wye Valley AONB by 2038 (subject to the caveats outlined in the text)

