

CLIMATE ACTION IN AONBS

Toolkit

October 2022



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I. Purpose & context



Why produce a Climate Action Framework and Toolkit now?

Areas of Outstanding Natural Beauty are designated for the nation. The combined climate and biodiversity crisis is one of the biggest challenges we face and whilst AONB teams have moved forward on nature recovery in recent years, the AONB Family was not in any position to clearly state what contributions it brought to facing climate change issues as a collective until recently. **Responding to climate change is however fundamental to the conservation and enhancement of natural beauty.**

Whilst AONB teams are small and cannot alone address the challenge, they cannot ignore it. With their partnerships they can generate influence and help move entire communities in the right direction. Through the orientation of their actions they can also give more weight to the AONB designation.

To do so, AONB teams and partnerships must have clarity on what climate change means for them and what role they can play in addressing it. They need to be able to convey this ambition to their stakeholders and they need practical guidance to deliver results with their communities and partners.

The present Framework & Toolkit is the foundation to support this process. It is the result of a sustained collaborative endeavour involving close to 40 people from 18 different AONBs. They have come together drawn by a sense of urgency and a need for clarity.

This Climate Action Framework & Toolkit is not meant to be set in stone nor take dust on a virtual shelf. It is meant as a working document and will be added to with further contributions and collaborative activities. AONB staff as well as their partners are strongly encouraged to provide feedback and challenge.

The Framework

The Climate Action Framework is presented in a separate document. It establishes five topic-specific narratives as well as an overarching narrative on the role of AONBs in facing climate change. These narratives hold several purposes:

- To set the level of ambition of climate action in AONBs and generate consensus on an AONB position on climate change;
- To convey our collective position to our partners and communities;
- To help inform AONB Management Plan reviews and any other strategic/business plan.

The Toolkit

The Climate Action Toolkit is a separate document. Topic-specific pull-out will be made available in due course. The Toolkit contains useful information on relevant policy and targets, a rich glossary of relevant terms and concepts, AONB case studies on various aspects of climate action, and a set of targeted guidance and tools to support AONB teams and their communities.

For whom?

The Framework is aimed both internally and externally as it sets out AONB positions on key climate change related issues. The Toolkit is primarily aimed at AONB staff teams but they are strongly encouraged to share it with their partners as well as volunteers and to use specific pull-out versions to support farmers, communities, planners and other relevant stakeholders in planning their own climate actions.

Resourcing

The 40 people involved in developing this Framework & Toolkit did so in addition to their daily, local responsibilities. The effort they have produced collectively is valuable, but AONB climate action cannot rely solely on the will-power of dedicated AONB staff.

The Framework and Toolkit was coordinated by the National Association, notably with the support from Natural England funding in the last quarter of the 2021-22 financial year.

The NAAONB is now actively engaging with Natural England to explore further funding opportunities to coordinate further collaborative climate action and tangibly increase our capacity to deliver on our ambition.

Transformational delivery to address climate change will however only happen if the need for resources in AONBs is met to the level set out in the Landscapes Review. The present Framework and Toolkit is therefore also the evidence of what AONB teams and partnership can deliver to contribute to the nation's fight against climate change, and a call for resources to allow them to meet this need and ambition.

Statement of commitment from AONB chairs on Climate Action

Through co-ordination from the NAAONB, AONB chairs have come together to draw a series of commitments they will fulfil in order to contribute to AONB climate action delivery. Through their Statement, they endorse the present Framework & Toolkit and commit to promoting it to partnership members and using it to inform strategic priorities.

The Statement of commitment from AONB chairs is currently being reviewed and signed by AONB chairs. It will be made available on the AONB website and the list of signatories will be updated in due course.

II. Toolkit for climate action in AONBs



1. Climate change targets: what are we working towards?

UK government targets

The Climate Change Act 2008 established the basis for the government's response to climate change and requires the government to set legally-binding targets and carbon budgets.

By 2050, the UK government must reduce GHG emissions by at least 100% of 1990 levels.
This means achieving net zero.

It includes reducing emissions from devolved administrations, currently accounting for about 20% of the UK's emissions.

The UK's sixth Carbon Budget released in 2021 led to a new target to help achieve the 2050 target:

By 2035, the UK government must reduce GHG emissions by 78% of 1990 levels.

Many local authorities and organisations have also declared climate emergencies and set their own targets for net zero sooner than 2050. We encourage you to try and find out about those near you.

What does this mean for AONBs?

The Department for Business, Energy and Industrial Strategy (BEIS) is leading on climate change mitigation policies (reducing emissions).

The approach for emission reduction is broken down under:

- Power
- Fuel supply and hydrogen
- Industry
- Heat and buildings
- Transport
- Natural resources, Waste & F-Gases
- Greenhouse Gas Removals

Under the Natural Resources element the government notably committed to achieve:

- 75% of farmers in England engaged in low carbon practices by 2030, rising to 85% by 2035 – notably supported by environmental land management scheme
- Treble woodland creation rates by the end of this Parliament and maintain new planting at least at this level from 2025 onwards. Mobilise private investment into tree planting, including through the Woodland Carbon Code.
- Boost the existing £640 million Nature for Climate Fund with a further £124 million of new money, ensuring total spend of more than £750 million by 2025 on peat restoration, woodland creation and management.
- Restore at least 35,000 hectares of peatlands in England by 2025, through the Nature for Climate Fund. Restore approximately 280,000 hectares of peat in England by 2050, including via funding from the new environmental land management schemes and through reforms to the Peatland Code.

BEIS also stated that ‘Biodiversity co-benefits and other environmental objectives [must be] maximised alongside decarbonisation’. This will notably happen through Local Nature Recovery Strategies.

However, it is worth bearing in mind policy changes in buildings, transport and other sectors will also have an impact in AONBs and their communities.

All commitments for each sector are described in the [Net Zero Strategy](#).

Defra on the other hand is leading on the adaptation policy.

The current National Adaptation Programme runs from 2018 to 2023 and is notably based on the [2017 Climate Change Risk Assessment](#).

It is broken down into:

- The natural environment
- Infrastructure
- People and the built environment
- Business and industry
- Local government sectors

The current [National Adaptation Programme](#) is 128-pages long but the Annex from p.91 provides a detail of key actions and milestones under each theme.

They notably directly tie up with 25-Year Environment Plan targets described below.

There is an **opportunity within the AONB Management Plan process** for all AONB Partnerships to assess potential climate change impacts on their landscapes and to include Management Plan actions to help adapt to the changes that are coming, using the learning from the National Adaptation Programme. This would provide an **ongoing 5 year review of climate change impacts and adaptation responses** that would be embedded within the statutory Management Plan framework.

The role of the Climate Change Committee

The [Climate Change Committee](#) is an independent, statutory body whose purpose is ‘to advise the UK and devolved governments on emissions targets and to report to Parliament on progress made in reducing greenhouse gas emissions and preparing for and adapting to the impacts of climate change’.

In June 2021 they reported on both mitigation and adaptation measures and provided a set of joint recommendations. Key messages are presented on [this page](#) (scroll down to point 3). The CCC notably [highlight the lack of progress on large elements of the adaptation policy](#).

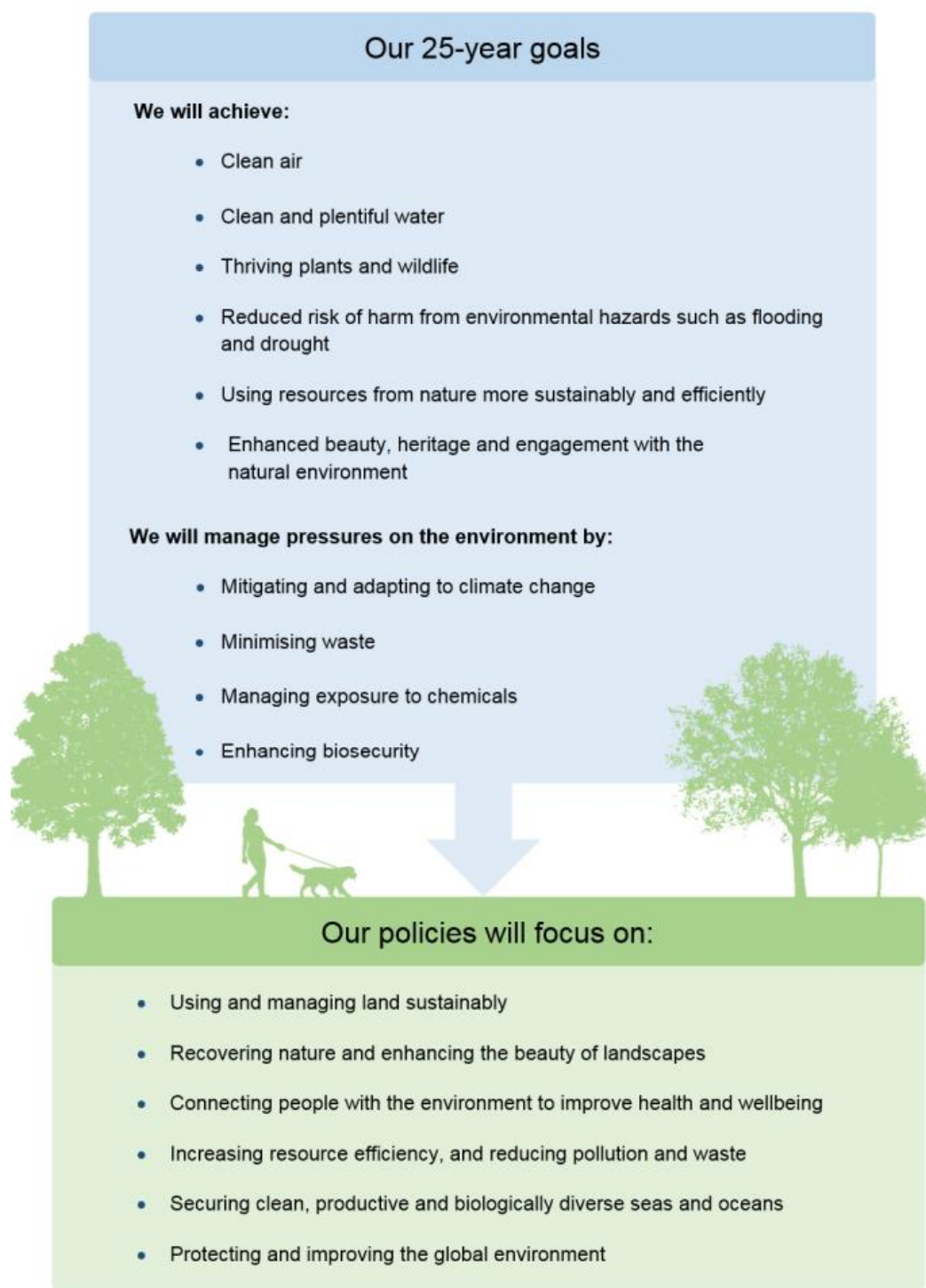
The [Sixth Carbon Budget](#) was published in December 2020. Here are some summaries particularly relevant to AONBs:

- [Agriculture and land use, land-use change and forestry \(LULUCF\) - Sixth Carbon Budget](#)
- [Local authorities and the Sixth Carbon Budget](#)

Members from the CCC have engaged with AONBs and the National Association and notably visited Kent Downs AONB in March 2022 in the context of a visit to Kent County Council.

25 Year Environment Plan targets

The Government's 25 Year Environment Plan was adopted in 2018 and sets out what the UK will do to improve the environment within a generation:



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Actual targets to achieve these goals are summarised [here](#). You can read the full report [here](#).

A monitoring framework including 66 indicators has been established to assess progress on the 25 YEP. Our annual AONB KPIs notably address some of these indicators and aggregated data is sent to Defra each year.

2. AONB Tools & Guidance for climate action

This section references the resources created by the five climate action sub-groups (available in the Appendices) and also provides links to useful external guidance and tools.



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Agriculture and climate change

Farm carbon calculator guidance

We have developed a short but informative guidance on the main farm carbon calculator tools available online for farmers. This include some general advice, a summary table of five different tools, an overview of their data requirements, and further useful links.

It is meant for AONB staff working with farmers as well as for farmers themselves. Please do share it directly with your farming communities!

You can find it in Appendix A.

‘How to get started’ with climate action in farming

This is a short guide intended for farmers in AONBs. It outlines five key steps farmers can take to bring their business to contribute to climate change adaptation and mitigation.

You can find it in Appendix B.

Useful links

- [First year progress report for Farming in Protected Landscape](#)
- Recent [open letter from Sustain Alliance to Ministers G. Eustice and V. Prentis](#)
- [Farming for Change report from the Food, Farming & Countryside commission](#), setting out the changes necessary to achieve closer to national food self-sufficiency while protecting the environment
- [Soil health report](#) from the Food & Global Security Network
- The Prince’s Countryside Fund has produced a [brilliant glossary](#) for farmers to ‘break free from environmental jargon’.

Agriculture and climate change glossary

At the end of the present document you can find a general glossary as well as one dedicated to terms and concepts relating to Agriculture and Climate Change.

National Landscapes Platform resources on agriculture and climate change

If you have access to the National Landscapes platform, you can [browse the resource library items shared on the topic](#) of Agriculture and Climate Change. When appropriate, you can download these resources them to share them with your partners and communities. Do add your own too!



Nature-based solutions

See the Nature-based Solutions supplement, produced as a separate document and hosted on the NAAONB website.

Useful tools and guidance

- [National Trust Wimpole Nature-Based Solutions Compact](#) (12th October 2021): sets out some useful principles for Nature-Based Solution; the NAAONB is a signatory to this (also accessible [here](#) if you do not have access to the National Landscapes Platform).
- [Natural England Carbon Storage and Sequestration by Habitat 2021 \(NERR094\)](#): definitive and detailed figures for carbon storage and flux for different habitats and changes to other land uses.
- [IUCN Peatland Restoration page](#): including links to strategies, case studies and Conserving Bogs Management Handbook.
- [Nature-based Solutions for Climate Change in the UK: A Report by the British Ecological Society](#): excellent, informative guidance on NBS in general and detail on peatlands, woodlands, saltmarsh, hedgerows and field margins, agroforestry.
- [UK government web page on tree planting and woodland creation](#): good information on planning schemes, grants and funding, links to case studies and advice.
- Good summary of [blue carbon stocks and fluxes](#) in UK marine and coastal waters.
- [Working with natural processes to reduce flood risk evidence base](#): including links to case studies, digital mapping resources, webinar, etc.
- [Saltmarsh Restoration Handbook UK & Ireland](#), November 2021. Authoritative handbook providing practical guidance, case studies and lessons on restoring and creating saltmarsh habitat, with lots of content on carbon storage and sequestration.

Nature-based solution glossary

At the end of the present document you can find a general glossary as well as one dedicated to terms and concepts relating to Nature-based Solutions.

National Landscapes Platform resources on nature-based solutions

If you have access to the National Landscapes platform, you can [browse the resource library items shared on the topic](#) of Nature-based Solutions. When appropriate, you can download these resources them to share them with your partners and communities. Do add your own too!

You can also browse [nature recovery & climate change resources](#) (some of these will overlap with the nature-based ones).



Building Design and Planning

Retrofitting Guidance

The wealth of knowledge and resources developed by Historic England is extremely useful but somewhat overwhelming. We have curated some of their top guidance documents on energy efficiency and carbon reduction measures and created a reference to help signpost AONB planning officers and their communities to the most relevant resources.

This guidance will be improved upon in the future and we strongly welcome your comments. Case studies will be added to it in the future.

You can find it in Appendix C.

Building Design and Planning glossary

At the end of the present document you can find a general glossary as well as one dedicated to terms and concepts relating to Building Design and Planning.

National Landscapes Platform resources on building design & planning

If you have access to the National Landscapes platform, you can [browse the resource library items shared on the topic](#) of Building Design and Planning. When appropriate, you can download these resources to share them with your partners and communities. Do add your own too!



Renewable Energy

Drafting a Renewable Energy Guidance for AONBs

John Mills, Planning and Landscape Lead for the Cotswolds National Landscape, has produced a topic paper on renewable energy to serve as draft for a future AONB guidance for renewable energy. It focuses on onshore wind and solar energy, although the aspiration is to extend it to cover all relevant forms of renewable energy. You can read it in Appendix D.

The overall goal of such a guidance would be to plan positively for renewable energy in AONBs. The topic paper presented in Appendix D will go through a review and discussion process before adoption by the NAAONB and the network of AONBs. If you are interested in participating in this process, please get in touch with Marie Micol marie.micol@landscapesforlife.org.uk.

National Landscapes Platform resources on Renewable Energy

If you have access to the National Landscapes platform, you can [browse the resource library items shared on the topic](#) of Renewable Energy. When appropriate, you can download these resources them to share them with your partners and communities. Do add your own too!



Sustainable Tourism & Transport

The sub-group will be working on developing bespoke tools and guidance in the near future. In the meantime, here are some useful resources.

De Bois Review of Destination Management Organisations in England

Nigel McDonald, Sustainable Tourism Officer for the Shropshire Hills AONB prepared a short discussion paper on potential implications of the De Bois review for AONBs. An informal online workshop was convened with a group of interested AONB lead officers and staff to further discuss this topic. You can find the discussion paper in Appendix E.

Decarbonising Leisure Travel Network

Richard Weston, Senior Research Fellow at the University of Central Lancashire has recently initiated a Decarbonising Leisure Travel Network. Bringing together a mix of academics and practitioners, it aims to develop a research agenda and share good practice and knowledge. In due course, they also plan to look for appropriate funding to look at specific issues highlighted by the network and to pilot solutions. Nigel McDonald, Sustainable Tourism Officer (Shropshire Hills AONB), is a member of this network, supported by the NAAONB. You can get in touch with him for more information.

Useful external resources

The EUROPARC Federation is very active on sustainable tourism and notably runs the European Charter for Sustainable Tourism in Protected Areas. You can find out more about their activities [here](#).

The UNESCO also has a sustainable tourism toolkit made of a step-by-step series of ‘how to’ guides covering everything from understanding, strategy and governance, to communication, engagement, investment, and much more. You can find it [here](#).

Sustainable Tourism & Transport glossary

At the end of the present document you can find a general glossary as well as one dedicated to terms and concepts relating to Sustainable Tourism and Transport.

National Landscapes Platform resources on Sustainable Tourism & Transport

If you have access to the National Landscapes platform, you can [browse the resource library items shared on the topic](#) of Sustainable Tourism and Transport. When appropriate, you can download these resources them to share them with your partners and communities. Do add your own too!

Shropshire Hills AONB study of the local visitor economy

Nigel McDonald from the Shropshire Hills AONB conducted a [study of the local visitor economy](#) – the final report and case studies contain insights into farm diversification and sustainable tourism options. You can download it from the National Landscapes Platform Resource Library – please get in touch if you can’t access but are interested in the study.

3. Sharing experience and learning on climate action in protected landscapes

This section presents a series of short case studies provided by people involved in the five sub-groups. The aim is to keep growing this body of evidence in the coming months to include both good and 'bad' practice (what didn't work so well).



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Agriculture and CC

Examples of contributions to addressing climate change through FiPL

Building a climate change agenda for local farm clusters

In the Chilterns Conservation Board, the local team has built a climate change agenda into the work of a farmer-led group within the Central Chilterns and Christmas Common farmer clusters. Key elements of the approach were:

- evidence collection;
- exciting, engaging and enthusing the members; and
- end-to-end support from the AONB, including advice, funding, fulfilment, monitoring etc.

Members of the cluster were getting wildlife on their farms as a result of their environmental activities but not comfortable with, or prepared for, other aspects of activity including carbon. Could they use the cluster to get ready for ELM?

The AONB team ran a series of farming webinars (available on YouTube) including one on regenerative agriculture, by Jonty Brunyee and Beck Wilson (from the Farm Carbon Toolkit).

Using the Farm Carbon Toolkit and with funding from the Rothschild Foundation, soil samples have been taken on two fields per farm. This includes both carbon audit and soil analysis.

In relation to FiPL, two farms wishing to begin to use cover crops and herbal leys received 40% grants for new direct drills. One of these is a large arable farm and the other was a smaller dairy farm; both wish to move into a regenerative agriculture system. In addition, two farms are in the process of applying for funding for mob grazing, which would include advice, electric fencing, water supply and herbal leys.

Enthusing farmers was absolutely critical to the whole process.

Using the Farm Carbon Toolkit to support carbon sequestration in the High Weald AONB landscape

The High Weald AONB team's approach involves a Farm Carbon Toolkit assessment of the AONB landscape for carbon sequestration, just including woods and hedges, together with an estimate of sequestration by grassland. All habitat types can sequester carbon if sensitively managed and arable conversion to grass was very beneficial in this respect.

FiPL in the High Weald AONB is supporting deer larders to manage animals which are eating carbon-sequestering vegetation, chillers (for which quotations were needed) and deer seats (paid for at CSS rates) and processing equipment.

Hedges

Hedges can store up to 100 tonnes of carbon per hectare in established networks. There is also mounting evidence of the benefits for soil carbon content of hedges: plus 22% under hedges, and 6% beside them. Game & Wildlife Conservation Trust literature suggests that hedges sequester carbon at twice the rate of woodland.

Drawing on historical maps, the AONB team managed to initiate the restoration of 10 kilometres of lost hedges in four square kilometres of farmland. However, Countryside Stewardship rates were in many cases now not good enough to persuade land managers to plant new hedges.

Grassland and carbon - regenerative agriculture

The High Weald AONB team has been focussing on mobile planned grazing which is both more profitable and better for nature conservation / nature recovery. In partnership with local farmers, they have established three demonstration sites on different farms.

Farmers needed an introduction to the basics of carbon and the required infrastructure (water supply and semi-permanent fencing in particular). The AONB team is also involved with a Pasture-Fed Livestock Association mentoring project.

In Springham Farm, regenerative livestock grazing is being promoted and scrub and hedge regeneration planned, which will help sequester more carbon.

Implementing multiple carbon and nature positive measures on site

Holsome Park, in South Devon AONB, is a 121-ha holding partly in HLS and partly in Mid-Tier Countryside Stewardship. The farmer has been an active member of a facilitation group since 2015. The offer includes meat, a campsite and an events barn.

They are very interested in supporting the climate aims of FiPL. The project involves a pop-up farm shop, stone wall restoration, 262 metres of new hedge (hedging and fencing cost £9,187), soil carbon sampling of 40 different field parcels in rotation using the Farm Carbon Toolkit (soil sampling cost £1,030), information boards, farm walks and consumer education... The aim is to offset carbon and increase carbon sequestration.



Nature-based solutions

Peatlands

Peat is very unevenly distributed in AONBs, with deep peat being very concentrated in the North Pennines along with Forest of Bowland and Nidderdale. Elsewhere peatland work will be at a much smaller scale, but can nevertheless be significant. See the peatland data and maps

Northern upland peat restoration

Action for peatlands can improve carbon sequestration and storage, but also since the condition of many peatlands is poor, it is vital to actually reducing current emissions. 6% of UK carbon emissions come from damaged peatlands (comparable with the 7% of emissions which come from air travel). Restored and well-managed peatland stores and sequesters millions of tonnes of carbon every year, allowing it to then sequester more carbon into the future. Healthy peatland also plays a vital role in flood mitigation and reducing both sediment load and water colour in our rivers.

Since 2006, the North Pennines AONB team has led the restoration of 35,000ha of drained or bare/eroding peatland – an area three times the size of Newcastle. Additionally, since 2010, the Forest of Bowland AONB unit has managed and delivered the restoration of over 4,000ha. of degraded peatland.

The work involves re-wetting large areas of blanket bog through blocking grips (drainage ditches) and gullies, and revegetating bare and eroding peat by managing water flow, spreading seed-rich heather brush, cotton grass planting and *Sphagnum* inoculation. This benefits blanket bog vegetation communities and supports a suite of upland bird species including curlew, golden plover and dunlin.

More recently, AONB Partnerships have been at the heart of the developing peatland restoration initiative, the [Great North Bog](#). This is a landscape-scale approach to restoration across nearly 7,000 km² of upland peat in the Protected Landscapes of northern England, which currently store 400 million tonnes of carbon. Damaged peat in the Great North Bog releases 3.7 million tonnes of carbon annually. The programme aims to develop a working partnership to deliver a 20-year funding, restoration and conservation plan to make a significant contribution to the UK's climate and carbon sequestration targets.

Trees & Woodlands

All AONBs have trees and woodlands but the extent varies a lot by landscape. Some of the most heavily wooded are the High Weald, Wye Valley and the Chilterns. The protection and management of existing woodlands is an important action for nature-based solutions in all AONBs. A high proportion of the carbon stored in a woodland is in the soil.

AONB partnerships play a very significant role in driving, pioneering and enabling the storing and sequestering of carbon in trees and woodlands, across AONB landscapes. Across the AONB network there is 165,289 hectares of woodland in active management, taken as a proxy for regenerating woodland. There are many initiatives spearheaded by AONBs that are linking supply and demand

chains to bring undermanaged woodlands back into management including woodfuel, machinery ring and community projects. In addition, trees outside woodlands are a high priority and there are many active projects, including strengthening field boundaries plus hedgerow trees, protecting veteran trees, wood pasture, orchards and in-field trees/ agroforestry plus mitigating for losses due to tree diseases such as ash dieback.

Effort has stepped up several gears in order to accelerate the re-creation of new trees and woodlands, whether planted or allowed to regenerate, following right place right tree principles. [data being currently sought from the FC & Woodland Trust for data for grant aided new planting since 2019, across all AONBs]. In many AONBs, this is linked to efforts to restore catchments using the catchment based approach.

AONBs are not likely to be areas for the largest scale of new woodland creation, though new woodlands and tree planting will enhance many AONB landscapes at some scale. Some AONBs are however more limited in opportunities, due to the value of open landscapes and habitats, the high proportion of woodland found already, historical and archaeological value and other reasons. In some landscapes such as marginal uplands there is increased pressure for larger scale woodland planting, increasingly driven by carbon objectives or private markets, which may be contentious in landscape terms or in relation to the value of other habitats. The case to retain shallow peatlands as largely unwooded wetland habitats has not been won.

Further links on woodland creation, management and restoration in AONBs:

- [North Pennines AONB woodland creation project](#)
- [Forest of Bowland activity on trees, woodlands and forests](#)
- [Wye Valley woodland conservation work](#)
- [Ancient woodlands in the Chilterns AONB](#)
- [Dedham Vale River Stour Enhancement Project](#) with riparian tree planting and riparian management activities. They have changed the shape of rivers and increased wildlife along the rivers.
- [Shropshire Hills AONB Partnership agency for Woodland Trust MOREWoods scheme](#)

Natural Flood Management

Blackdown Hills Connecting the Culm project

[Connecting the Culm](#) is a catchment based partnership project working to tackle some significant challenges faced by the River Culm in Devon, running from January 2019 until December 2022. It is part of a larger [Co-Adapt \(climate change adaptation through co-creation\) project](#), part funded by EU Interreg 2 Seas. The partnership project aims to:

- Make the River Culm and its floodplain more resilient to flood and drought, using nature-based systems and approaches
- Improve water quality and biodiversity on the Culm (and consequently in the Exe and its estuary)
- Encourage people living in the catchment to feel more involved in decision-making and support the use of nature-based solutions to manage water.

The project will do this by:

- Improving local people's understanding of water management techniques and the function of the river / catchment ecosystem as an integrated whole.

- Creating new opportunities for people to collaborate in addressing water management, leading to communities cooperating more effectively to address the challenges created by climate change.
- Installing tangible demonstrations of appropriate nature-based solutions to build confidence, encourage cooperation and raise aspirations – these will be replicable and provide solutions that can be rolled out by the community.
- Developing a Blueprint for the Culm that will be the masterplan for the whole catchment for the next 25 years, co-created by the people that live and work within the catchment and the organisations that have a role in the area.

Further examples

- [Upper Darent Interreg project](#) working on Natural Flood Management including managed realignment of the Upper Darent river in Kent, working with and using examples from partners in Holland.
- [Shropshire Hills AONB Brook Vessons headwater restoration project](#)
- [Level Up](#) – a good example of joint working through Green Recovery Challenge Fund. Sub-projects in 3 AONB are different but learning going across all partners.

Coastal

We are still on the hunt for some good case studies!

Please get in touch with Marie Micol (marie.micol@landsdscapesforlife.org.uk) if you have something to share.

Ways of working

[Cornwall AONB ELM Test & Trial on natural capital of the Lizard](#) is not specific to one habitat or landscape type, but the approach on natural capital and nature-based solutions is valuable.



Sustainable Tourism & Transport

Engaging with Destination Management Partnerships

In 2012 Shropshire Hills AONB Partnership secured the Europarc Federation Charter for Sustainable Tourism in Protected Areas. In order to achieve this, it formed a Destination Management Partnership for the Shropshire Hills 'Destination' and wrote a destination management plan in collaboration with local partners. This work and the work that has followed has placed the AONB at the centre of tourism planning in the county, currently working to create a new county destination management partnership.

'There is a deliberately close alignment between this plan and three existing strategies: The Cultural Strategy, The Shropshire Hills Sustainable Tourism Strategy and the Great Outdoors Strategy. All three have influenced the content of this plan to a significant extent and are reflected in its vision, aims, objectives and priorities.' *Draft Shropshire Destination Management Plan V4.0 May 2022*

Timeline and significant actions/events:

- 2008 - Shropshire becomes a unitary authority.
- 2010 - AONB forms Shropshire Hills & Ludlow destination partnership after securing funding to produce a destination management plan.
- 2011 - Shropshire Hills & Ludlow DP produces a destination management plan.
- 2012 - Shropshire Hills AONB awarded Europarc Charter for Sustainable Tourism in Protected Areas.
- 2013 - Shropshire Hills & Ludlow DP publishes a visitor survey drawn from visitors interviews at the AONB's most popular locations and market towns on its boundary.
- 2014 - AONB Partnership employs full-time sustainable tourism officer.
- 2015 - Shropshire Council withdraws tourism support as a 'non-statutory function'.
- 2016 - Ludlow sets up its own local tourism partnership.
- 2017 - Shropshire Hills DP develops a new destination management plan. Europarc Federation re-evaluates and renews the AONB Charter.
- 2018 - Shropshire Tourism in threat of bankruptcy sells all assets, makes staff team redundant, and re-brands as Visit Shropshire with a new board.
- 2019 - Shropshire Council employs new visitor economy manager. Covid pandemic shuts down tourism industry AONB Sustainable Tourism Officer working at county level as part of Covid Response Working Group.
- 2020 - Post pandemic restrictions to travel create a staycation boom – day visit locations regularly exceed carrying capacity. AONB working with honeypot owners and local community representatives to manage issues. AONB conducts visitor survey at central honeypot site.
- 2021-22 - Shropshire Council takes the lead for tourism in the county, forming a new Destination Management Partnership and producing Destination Management Plan. Shropshire Hills AONB is a key partner in this work, influencing decision making and policy planning at a county level.

Rail, bus and other transport services with communities and visitors

Working in partnership to promote sustainable, car-free journeys to AONBs

Based on the online workshop held 1st June 2022 with guest speaker Rebecca Catterall from the Devon and Cornwall Community Railway Partnership.

The Devon & Cornwall Community Railway Partnership is a small team of four. They work with local communities and schools and market the brand lines locally, regionally, nationally and internationally. They facilitate communication between communities and the rail industry, raise awareness and promote the places served by the line. They also work with the rail industry on improvements to timetables and facilities. As part of these activities, they have developed a close working relationship with the Tamar Valley AONB. Their more recent work with the Tamara Landscape Partnership has notably led them to focus on hard-to-reach groups and access.

As a Community Railway Partnership (CRP) they have access to funding and can also contribute to funding a number of activities / offer free or discounted travel for specific groups. Rebecca recommends developing links with your local CRP as an AONB team - [How to find your nearest CRP](#). She also mentions local CRPs can support funding applications for jointly developed projects. Effective marketing is one of their strengths and can prove useful in such projects as well.

Further resources shared by Rebecca Catterall:

- The Community Rail Network website resources and notably their [case studies](#)
- A study report on [Valuing the Tamar Valley Line](#)
- A presentation on the [One Cornwall Public Transport System](#)

A recording of the online workshop is available on the [Recording Library](#) of the National Landscapes Platform for those with access to it.

New Forest Tour seasonal bus service: from subsidised to self-funded

As part of the Decarbonising Leisure Travel Network, Aynsley Clinton gave a thorough presentation on the New Forest Tour. [The slides are available on the National Landscapes Platform](#) (please get in touch if you can't access but are interested in this content).

Key takeaways from the presentation include:

- It takes time! The New Forest Tour bus service was initiated in 2004 and became commercially viable (self-funded) 11 years later. It is now operated by a private company and the New Forest NPA are responsible for social media promotion.
- Integrating with other local travel services (other buses, trains, ferries, cycling routes) and accommodation businesses helped promote the routes and easier to use.
- Branding and promotion are absolutely key: signing and infrastructure must be in place to make it easily accessible; it is an exciting experience rather than 'just' a bus service.
- The routes have multiplied and evolved over the year, the ticket types as well... It is important to keep the service relevant to users.

Engaging communities on climate action

Supporting and networking existing climate groups

In February 2020, the Shropshire Hills AONB hosted an Environment and Climate Emergency Community Networking Event. Representatives from over ten local community groups as well as from the AONB Partnership and the Shropshire Wildlife Trust came together to present their activities and network, as well as exchange views and expertise on key challenges and useful resources. Here is the range of topics covered by plenary speakers and workshops:

- tree planting for climate and nature (where and how),
- nature recovery and net zero for the Shropshire Hills,
- habitat creation and networks,
- community energy and transport projects
- using Google maps for project planning
- using publicly available environmental data and mapping
- parish scale habitat/ landscape survey
- Funding

Some of the presentations from the event can be found [here](#).

The event allowed relatively new community groups and members to meet existing ones and learn from each other. The Shropshire Hills AONB fulfilled its role of convener.

4. How are GHG emissions recorded in the UK?

The UK produces a GHG inventory every year since 1990. GHG and GHG emissions are defined in our glossary.

The National Atmospheric Emissions Inventory website offers an [overview of GHG emissions](#) for each of the main greenhouse gases as well as overall emissions and emissions broken down [by sector](#). The sectors recorded are:

- Agriculture
- Business
- Energy Supply
- Industrial Processes
- Land Use, Land Use Change and Forestry (LULUCF – see below)
- Public
- Residential
- Transport
- Waste Management

Some useful definitions:

Land use

“In national GHG inventories, land use is classified according to the IPCC land use categories of forest land, cropland, grassland, wetlands, settlements, other lands.” (IPCC, 2019)

AFOLU: Agriculture, Forestry and Other Land Use

“In the context of national greenhouse gas (GHG) inventories under the United Nations Convention on Climate Change (UNFCCC), AFOLU is the sum of the GHG inventory sectors Agriculture and LULUCF.” IPCC, 2019

LULUCF: Land Use, Land-Use Change and Forestry

“In the context of national greenhouse gas (GHG) inventories under the United Nations Framework Convention on Climate Change (UNFCCC, 2019), LULUCF is a GHG inventory sector that covers anthropogenic emissions and removals of GHG in managed lands, excluding nonCO₂ agricultural emissions.” IPCC, 2019

Further resources

The Department for Business, Energy & Industrial Strategy (BEIS) provides a [collection of useful documents relating to historical GHG emissions in the UK](#) as well as [Digest of UK Energy Statistics \(DUKES\)](#) for each year.

The Department for Environment, Food and Rural Affairs (Defra) proposes useful collections on [air quality and emissions statistics](#) as well as [the UK’s carbon footprint](#).

Finally, the Office for National Statistics (ONS) gathers [environmental accounts](#) notably showing impacts from the economy on the environment and GHG emissions intensity, i.e. the ratio of emissions relative to the intensity of a particular activity or process. This means roughly that it is a measure for energy efficiency.

5. Useful data

Carbon Audit & Metric

The **contract with Cranfield University to provide an audit and metric for carbon stored and sequestered in soils and vegetation in all English AONBs** is now complete and data and maps are being made available to AONB teams. The project is using pre-existing datasets including Natural England's work on priority habitats, plus land cover and soils data, on which Cranfield is a leader. Some ground truthing is was conducted with AONB teams who have other local spatial data on soil organic matter.

For most AONBS, this is a **considerable step forward in available data and understanding**. Note that a learning point from carbon footprinting of farms and nature reserves is that how the land is managed, especially through livestock, but also fuel etc, often forms a large part of the carbon emissions associated with that land. This aspect is not included in the Cranfield audit, which only looks at carbon storage and flux relating to the vegetation and soils.

The aim is not so much to derive a 'bottom line' carbon figure for each AONB, or to compare them, but more **for each AONB team to have a clearer understanding** of where the significant carbon stores are and where the best opportunities are to support activity to reduce emissions and increase sequestration. An online workshop has already been conducted and another is in preparation to support AONB teams in using this data. For more information please contact Tim Youngs (tim.youngs@devon.gov.uk).

Place-based Carbon Calculator cut to AONB boundaries

The [Place-based Carbon Calculator](#) is a powerful online tool with layered maps and a lot of informative data. Is it not AONB specific but provides estimates of **average carbon footprint per person for each Lower Super Output Area in England**, making it very detailed and informative for policy decisions at the local level, ranging from housing to transport and consumption as well as recreation and many others. It is worth highlighting that the data is **based on residency**, therefore emissions related to travel activities, e.g. a hotel stay, will impact the average carbon footprint of where people live rather than where they stayed at a hotel.

BEIS GHG emission cut to AONB boundaries

The Department for Business, Energy & Industrial Strategy has indicated they will be working on cutting GHG emission by sector to AONB boundaries through the summer. We are expecting this data to be made available by the end of 2022 or early 2023. For more information please contact Iain Mann Iain.Mann@harrogate.gov.uk, Nidderdale AONB manager.

UK Climate Projections

The Met Office provides useful [UK Climate Projections \(UKPC\)](#) showing of the UK climate may change in the future. They are supported by BEIS and DEFRA to produce this data.

Climate projections can be used to inform the preparation of climate change risk assessments and adaptation plans. The Met Office notably proposes a freely available online course to understand and use climate projections (visit the link above for more information).

6. Glossary of useful terms and concepts

General glossary

Biodiversity

“Biodiversity or biological diversity means the variability among living organisms from all sources including, among other things, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.” (IPCC, 2019 adapted from UN, 1992).

Biodiversity Net Gain

“Biodiversity Net Gain is an approach to development that leaves biodiversity in a better state than before. Where a development has an impact on biodiversity it encourages developers to provide an increase in appropriate natural habitat and ecological features over and above that being affected in such a way it is hoped that the current loss of biodiversity through development will be halted and ecological networks can be restored.” (CIEEM, 2022) Visit the [CIEEM dedicated webpage](#) for more information.

Carbon credits

Carbon credits allow a carbon emitter to emit a certain amount of CO₂ or other GHG. Carbon removal, reducing or even avoiding emissions altogether can qualify for carbon credits. Essentially, they are a financial and investment tool and seeking appropriate expert guidance is advised when looking at selling or purchasing carbon credits. Carbon credit are sold on ‘carbon markets’.

Carbon cycle

The flow of carbon in various forms through the atmosphere, hydrosphere (water on or under the surface), terrestrial and marine biosphere and lithosphere (the hard and rigid, rocky layer of the Earth). (adapted from IPCC, 2019)

Whilst we now focus attention to carbon emissions and sequestration, it is important to remember that carbon is essential to life on earth, and that unbalanced carbon flows (i.e. high emission vs. low sequestration) is what causes global temperatures to increase. Nasa has written a [useful article describing the carbon cycle in more details](#).

Carbon dioxide (CO₂)

“A naturally occurring gas, CO₂ is also a by-product of burning fossil fuels (such as oil, gas and coal), of burning biomass, of land-use changes and of industrial processes. It is the principal anthropogenic greenhouse gas (GHG) that affects the Earth’s radiative balance. It is the reference gas against which other GHGs are measured.³ (IPCC, 2019)

Carbon flux

A carbon flux is the exchange of carbon between a sink and pool, for example between the soil disturbed by human activities and the atmosphere in which the carbon is released. Carbon fluxes can be natural or caused by human activities.

Carbon footprint

The carbon footprint is the total amount of GHG emissions of a given entity. It can be measured for an individual, a household, an organisation, or even a product... It is the sum of GHG emissions generated by that entity’s activities.

Carbon offset

A carbon offset is a reduction of carbon or GHG emissions to compensation emissions made elsewhere. It is measured in CO₂ equivalent. Carbon offsets differ from carbon credits in that they are not traded.

Carbon sequestration

“The process of removing carbon dioxide from the atmosphere and storing (“sequestering”) it. It happens through natural biological, chemical and physical processes, but can also be the result of human intervention, e.g. through carbon capture and storage.” (Dimbleby, 2021)

Carbon is said to be sequestered in carbon ‘pools’ (e.g. soils).

Carbon capture and storage is “the process of capturing carbon-dioxide emitted from industrial processes, before it enters the atmosphere, and storing it, for example in underground geological formations, instead of releasing it.” (Dimbleby, 2021)

Carbon sink

“Any process, activity or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas from the atmosphere.” (IPCC, 2019) e.g. forests can be carbon sinks if they absorb more carbon through photosynthesis than they release.

Climate / climate system

Climate is understood as the average weather resulting from variables such as temperature, precipitation and wind. The climate system consists of five major components: the atmosphere, the hydrosphere (water on or under the surface), the cryosphere (ice, snow over, glaciers..), the lithosphere (the hard and rigid, rocky layer of the Earth) and the biosphere and the interactions between them. (adapted from IPCC, 2019)

Climate change

A change in the state of the climate and/or the climate system, identified by statistical analyses. Climate change may be due to natural internal processes or external factors such as solar cycles, volcanic eruptions and persistent anthropogenic changes in the composition of the atmosphere or in land use. However, climate change is often understood to be the change of climate directly or indirectly attributed to human activity. (adapted from IPCC, 2019)

Climate change adaptation

“In **human systems**, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In **natural systems**, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects.” (IPCC, 2019)

Climate change mitigation

A human intervention to reduce GHG emissions or enhance carbon sinks (IPCC, 2019). It can be a change in technology (e.g. renewable energy), process (e.g. waste management) or practice (e.g. public transport behaviours). (IPCC, 2019)

CO₂ equivalent

The amount of carbon dioxide (CO₂) emission that would cause the same temperature change as an emitted amount of a greenhouse gas (GHG) or a mixture of GHGs, over a given time horizon. It is used to compare emissions of different GHGs. (adapted from IPCC, 2019)

Ecosystem services

Ecological processes generating value to humans. They are classified as:

- supporting services (e.g. hydrological cycle, nutrient cycle, soil formation)
- provisioning services (e.g. food, timber, genetic resources for medicine)
- regulating services (e.g. climate regulation, carbon sequestration, water filtration)
- cultural services (e.g. spiritual elements, aesthetic appreciation, sense of place)

The value created by ecosystem services can therefore be monetary or non-monetary.

Equity

“The principle of being fair and impartial, and a basis for understanding how the **impacts** and **responses** to climate change, including costs and benefits, are distributed in and by society in more or less equal ways.” (IPCC, 2019)

Fossil fuels

“Carbon-based fuels from fossil hydrocarbon deposits, including coal, oil, and natural gas.” (IPCC, 2019)

Greenhouse gas (GHG)

“Gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation. Water vapour (H₂O), carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄) and ozone (O₃) are the primary GHGs in the Earth’s atmosphere. Moreover, there are a number of entirely human-made GHGs in the atmosphere” (e.g. halocarbons). (IPCC, 2019) The three main GHG associated with climate change are carbon dioxide CO₂, methane CH₄ and nitrous oxide N₂O.

‘Carbon emissions’ is a term often used in common language to designate GHG emissions (see CO₂ equivalent). This is because CO₂ is the main gas emitted through human activities.

Landscape approach

A landscape approach, also called ‘integrated landscape management’, brings together multiple land uses and sectors of society within a given area to achieve sustainable development through coordinated actions and equitable use of land. You can read more about landscape approach perceptions of protected area staff [here](#).

Landscape-scale conservation

Also known as ‘ecosystem approach’, landscape-scale conservation means working in collaboration to manage land at the level of a specific landscape unit, e.g. a catchment or estuary. One of the key drivers of landscape-scale conservation is to enhance ecological connectivity across the landscape.

The landscape and landscape-scale approaches are often mistaken for one another.

Land use

“The total of arrangements, activities and inputs applied to a parcel of land. The term land use is also used in the sense of the social and economic purposes for which land is managed (e.g., grazing, timber extraction, conservation and city dwelling).” (IPCC, 2019)

Methane (CH₄)

“One of the six greenhouse gases (GHGs) to be mitigated under the Kyoto Protocol. Methane is the major component of natural gas (...). Significant anthropogenic emissions also occur as a result of animal husbandry and paddy rice production. Methane is also produced naturally where organic matter decays under anaerobic conditions, such as in wetlands.” (IPCC, 2019)

Natural capital

“The sum of the world’s stock of natural resources, including water, air, soil and living beings. It is essential for human life, both directly (e.g. clean water and air) and indirectly (e.g. through pollination of plants by insects or water catchment to prevent floods).” (Dimbleby, 2021)

Net Environmental Gain

“An approach for improving the condition of, and ecosystems that flow from, our natural assets in the context of development. Understanding local context and the relationship between communities and the natural environment in a given area is critical to an effective approach.” (Dimbleby, 2021)

Net-zero emissions

Net-zero emissions will be achieved when GHG emissions to the atmosphere are balanced by GHG removals (for technological removal or through nature-based solutions). In other words, it means **reducing GHG emissions to as close to zero as possible** whilst enhancing nature’s capacity to **absorb remaining emissions** (or through technological processes). This is necessary to limit the global temperature increase estimated by the IPCC.

More resources on this particular concept:

- [BEIS Net Zero Strategy 2021](#)
- The latest [CCC progress report](#) (see also our section on climate change targets) and a [useful summary from the BBC](#).
- The United Nation’s [Net Zero Coalition](#)

Nitrous oxide (N₂O)

“One of the six greenhouse gases (GHGs) to be mitigated under the Kyoto Protocol. The main anthropogenic source of N₂O is agriculture (soil and animal manure management), but important contributions also come from sewage treatment, fossil fuel combustion, and chemical industrial processes. N₂O is also produced naturally from a wide variety of biological sources in soil and water.” (IPCC, 2019)

Resilience

When it comes to climate change, resilience is the ability to prepare and respond to disturbances and natural disasters resulting from climate change. Climate resilience can be achieved by understanding the risks and how climate change will impact an area and its communities, but also by implementing measures to improve resilience. Some of the most pressing risks are that of heavy rainfall events, draughts, and sea-level rise.

This can be through nature-based solutions (natural flood management), but also through designing and developing buildings and infrastructure adapted to local risks.

Rewilding

“A form of ecological restoration, where humans’ impact is deliberately reduced through efforts to return an area to its natural state, for example by reintroducing native species to increase biodiversity and create a self-sustaining ecosystem.” (Dimbleby, 2021) More information on the [Rewilding Britain website](#).

Agriculture and Climate Change

The Prince's Countryside Fund has produced a [brilliant glossary](#) for farmers to 'break free from environmental jargon'.

Agrobiodiversity

'The **variety and variability of animals, plants and micro-organisms** that are used directly or indirectly **for food and agriculture**, including crops, livestock, forestry and fisheries. It comprises the diversity of **genetic resources** (varieties, breeds) and **species** used for food, fodder, fibre, fuel and pharmaceuticals. It also includes the **diversity of non-harvested species** that support production (soil micro-organisms, predators, pollinators), and **those in the wider environment** that support agro-ecosystems (agricultural, pastoral, forest and aquatic) as well as the **diversity of the agroecosystems**'. (FAO, 2005)

Agroecology

'The science and practice of **applying ecological concepts, principles and knowledge** (i.e., the interactions of, and explanations for, the diversity, abundance and activities of organisms) **to the study, design and management of sustainable agroecosystems**. It includes the roles of human beings as a central organism in agroecology by way of **social and economic processes** in farming systems. Agroecology examines the roles and interactions among all relevant biophysical, technical and socioeconomic components of **farming systems and their surrounding landscapes**' (IPBES, 2019).

The application of principles from ecology (i.e. the study of relationships between living organisms) in farming, with the goal of achieving balanced growth and sustainable development. *From National Food Strategy – Henry Dimbleby*

To find out more:

- [Food, Farming & Countryside Commission – Agroecology: A force for change](#)
- [FFCC - An agroecological UK in 2050](#)
- [FFCC - Agroecology as a Nature-based Solution](#)
- [FFCC - Section 5: How can agroecology help deliver UK net zero climate ambitions?](#)
- [Soil Association - Transition to agroecology](#)
- [FAO \(United Nations\) - The 10 elements of agroecology](#)

Agroforestry

"Collective name for land-use systems and technologies where woody perennials (trees, shrubs, palms, bamboos, etc.) are deliberately used on the same land-management units as agricultural crops and/or animals, in some form of spatial arrangement or temporal sequence. In agroforestry systems there are both ecological and economical interactions between the different components. Agroforestry can also be defined as a dynamic, ecologically based, natural resource management system that, through the integration of trees on farms and in the agricultural landscape, diversifies and sustains production for increased social, economic and environmental benefits for land users at all levels" (FAO, 2015). Forms of agroforestry include silvo-arable (planting trees in arable fields) and silvo-pasture (planting trees in livestock pastures).

Biochar

'Relatively stable, carbon-rich material produced by heating biomass in an oxygen-limited environment. Biochar is distinguished from charcoal by its application: biochar is used as a soil amendment with the intention to improve soil functions and to reduce greenhouse gas (GHG) emissions from biomass that would otherwise decompose rapidly.' (IPCC, 2019 adapted from IBI, 2018).

Biodynamic agriculture

Biodynamic agriculture is “a type of organic agriculture that recognizes and makes use of the rhythms and cycles of the immediate environment, the Earth, sun moon, stars and planets’ (Prince’s Countryside Fund, 2021).

Visit the [Biodynamic Association’s website](#) for more information.

Carbon calculator

Carbon calculators are tools designed to help farmers assess their farm’s GHG emissions. We have produced a specific guidance on farm carbon calculators which you can find in Appendix A.

Climate-smart agriculture

“An approach to agriculture that aims to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate by: sustainably increasing agricultural productivity and incomes; adapting and building resilience to climate change; and reducing and/ or removing greenhouse gas emissions, where possible”. (IPCC, 2019 adapted from FAO, 2018).

Visit [the FAO’s e-learning academy](#) to find out more about various applications of climate-smart agriculture. You can also read [FAO’s case studies](#)

Conservation agriculture

Conservation agriculture focuses attention on the protection and restoration of soil health. It is guided by three core principles: minimising soil disturbance, maintaining permanent soil cover, and diverse crop rotations (Prince’s Countryside Fund, 2021). The third principle is sometimes rather focused on the diversification of plant species.

More information on the [Climate ADAPT website](#) or on the [FAO website](#).

Conservation tillage

Conservation tillage is a technique used to reduce tillage and maintain soil cover. 30 percent or more of crop residues must remain on the soil surface to reduce soil disturbance and loss of water. (Prince’s Countryside Fund, 2021).

See also Min-till and No-till.

Cover or catch crop

“A crop that is grown to protect the ground between two regular cropping windows.” (Prince’s Countryside Fund, 2021).

They are used to cover the soil during autumn and winter and are typically not harvested to be sold. They help build soil organic matter and increase soil health, but also help with natural flood management. Catch crops more specifically aim at ‘catching’ nitrogen before it washes away.

Eutrophication

The process of a body of water becoming enriched with minerals and nutrients. Without human interference, this is typically a very slow process, but the use of fertilisers and emission of untreated sewage into natural waterways leads to an accumulation of nitrogen and phosphorus which, in turn, stimulate the growth of algae and aquatic plants. *From National Food Strategy – Henry Dimbleby*

Food security

“When all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.” (IPCC, 2019 adapted from FAO, 2001)

High Nature Value farming (HNV farming)

HNV farming refers to low-intensity farming systems with particular environmental value. They are divided into three main types:

“Type 1 - Farmland with a high proportion of semi-natural vegetation.

Type 2 – Farmland with a mosaic of low intensity agriculture and natural and structural elements, such as field margins, hedgerows, stone walls, patches of woodland or scrub, small rivers etc.

Type 3 -Farmland supporting rare species or a high proportion of European or World populations.”

(source: [High Nature Value Farming website](#))

Holistic grazing (or holistic planned grazing)

“Holistic grazing mimics the behaviour of animals in the wild by concentrating livestock in a small area for a short period of time. The aim is to achieve a balance between vegetation that is trampled to feed the soil; vegetation remaining to continue growing; vegetation to feed livestock; and manure deposited evenly to fertilise the pasture” (Prince’s Countryside Fund, 2021).

The Savory Institute takes holistic grazing to a more strategic level and talks about holistic management, whereby holistic grazing is integrated with a number of other associated approaches to manage complex farm systems. You can find out more on the [Savory Institute’s website](#).

What differentiates holistic grazing from rotational grazing or mob grazing is timing. Rotational grazing moves livestock between pasture areas on set times, with no consideration for plant growth rate. Mob grazing is the same principle, but with more frequent and set rotations (up to 3 times a day). These differences are clearly explained [here](#).

Integrated farm management

Integrated farm management is whole farm business approach. It is notably [promoted by LEAF](#) (Linking Environment and Farming).

“Integrated farm management can help farmers understand, manage and improve their farm’s overall sustainability by taking into account things like soil management and animal husbandry, as well as financial measures (such as the cost of feed and income from sales)” (Prince’s Countryside Fund, 2021)

Land sharing / Land Sparing

Land sharing and sparing approaches aim to help support and protect biodiversity in farmed landscapes. Land sharing is the principle through which biodiversity is encouraged within farmed areas (e.g. through the diversification of crops or reducing the use of agrochemicals). Land sparing is taking this approach further by limiting farming to small productive areas and reserving less productive areas for nature conservation (adapted from Prince’s Countryside Fund, 2021).

Landscape Recovery payments

Landscape Recovery is one of the three constituent schemes of the ELMs, the other two being Sustainable Farming and Local Nature Recovery. Landscape Recovery payments will support land-use change projects that deliver ecosystem recovery, such as large-scale tree-planting and peatland restoration (Dimpleby, 2021).

Low-intensity farming

Farming practices that prioritise environmental sustainability over maximising yield. This typically includes one or more of maintaining extensive grasslands and using little organic manure and manufactured fertiliser (Dimbleby, 2021).

Min-till

“Min-till is cultivating land using mechanical methods other than ploughing” (Defra, 2022).

Defra offers a [concise guidance webpage](#) on min-till and no-till.

Mob grazing

See Holistic grazing for further explanations.

No-till (or zero-tillage)

No-till means completely removing the use of cultivation machinery when preparing the land for crops. “In this approach, drilling is carried out directly into the residues of the previous crop, without any soil cultivations” (Prince’s Countryside Fund, 2021). It is also known as ‘direct drilling’.

Defra offers a [concise guidance webpage](#) on min-till and no-till.

Organic agriculture

“Organic Agriculture is a production system that sustains the health of soils, ecosystems, and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation, and science to benefit the shared environment and promote fair relationships and good quality of life for all involved.” (IFOAM, 2008)

It is important to note that organic agriculture is subject to a globally recognised set of standards, including notably the ban of many agrochemicals, lower animal stocking density, and restricted antibiotics use.

Rotational grazing

Also known as paddock grazing. See Holistic grazing for further explanations.

Regenerative agriculture / farming

“Regenerative Agriculture describes farming and grazing practices that, among other benefits, reverse climate change by rebuilding soil organic matter and restoring degraded soil biodiversity – resulting in both carbon drawdown and improving the water cycle.” (Regeneration International, 2017)

The key to regenerative agriculture lies in going beyond limiting harm to land and nature, by working to improve its condition. It notably uses technologies and techniques to regenerate soil. By necessity, it is a holistic approach that encompasses a wide range of farming practices.

Regeneration International describes a number of [regenerative farming practices](#) on their website.

Regenerative Agriculture aims to not only improve land but also improve farm productivity and food quality whilst contributing to reducing GHG emissions and improving climate change resilience for farms.

Scope 1, Scope 2, and Scope 3 emissions

This is a break down of GHG emission responsibility.

Scope 1 “indicates direct GHG emissions that are from sources owned or controlled by the reporting entity” (IPCC, 2019). For example

Scope 2 “indicates indirect GHG emissions associated with the production of electricity, heat, or steam purchased by the reporting entity” (IPCC, 2019).

Scope 3 “indicates all other indirect emissions, i.e., emissions associated with the extraction and production of purchased materials, fuels, and services, including transport in vehicles not owned or controlled by the reporting entity, outsourced activities, waste disposal, etc” (IPCC, 2019).

They are notably used by farm carbon calculators to help farmers understand their GHG emissions.

Slow food

Slow food is both the name of an organisation and a movement. It works “to prevent the disappearance of local food cultures and traditions, counteract the rise of fast life and combat people’s dwindling interest in the food they eat, where it comes from and how our food choices affect the world around us” (from the [Slow Food website](#)). Their aim is to ensure everyone has access to good, clean and fair food.

Soil carbon sequestration

“Land management changes which increase the soil organic carbon content, resulting in a net removal of carbon dioxide (CO₂) from the atmosphere.” (IPCC, 2019)

Soil Health

Soil health is the condition of soils on Earth. Soils are crucial habitats hosting one quarter of all species on Earth. Soil health is fundamental to the functions provided to nature and humans by soil, notably the cycling of nutrient and storing of water and carbon. Find out more with the [Soil Association website](#).

Soil Organic Carbon

Soil organic carbon is a component of soil organic matter. It is used as a proxy to measure soil organic matter which is more difficult to assess accurately. You can find out more about the two concepts and how they are related [here](#).

Soil organic carbon is the solid carbon stored in soils.

Soil Organic Matter

“The part of soil which is alive, was once living or is the residue from living organisms. Soil is composed of minerals, water, air and organic matter. Soil organic matter changes due to shifts in farming practice such as tillage, grazing, crop rotation and pasture management decisions. The organic matter can include materials that have been added to the soil from somewhere else, such as manure. Levels of soil organic matter can be an important indicator of soil health and increases in the carbon component are used to measure soil carbon sequestration” (Prince’s Countryside Fund, 2021).

Soil Testing

There are many soil testing techniques out there to help assess soil health and soil carbon content. The Soil Association has written a mini-article with [four free ways to test our soil today](#). For more complex soil testing, you can [find support](#) from a range of organizations.

Soilless farming

An umbrella term for techniques for cultivating plants without soil, using water (hydroponics) or air (aeroponics) as a growing medium, for example. The main benefit of these techniques over traditional technologies is that they require less land area and water. (Dimbleby, 2021)

Sustainable Livestock

[Sustainable livestock](#) has come up as a concept to help differentiate sustainable livestock production from intensive, grain-fed productions. Sustainable livestock is characterised by high welfare standards and sustainable farming practices.

Undersowing

Undersowing is initially an organic farming technique. It consists in sowing on land already carrying another crop. Find out more [here](#).

Nature-based Solutions

Agroforestry

See the Agriculture and Climate Change glossary.

Blue carbon

“All biologically-driven carbon fluxes and storage in marine systems that are amenable to management can be considered as blue carbon. Coastal blue carbon focuses on rooted vegetation in the coastal zone, such as tidal marshes, mangroves and seagrasses. (...) If degraded or lost, coastal blue carbon ecosystems are likely to release most of their carbon back to the atmosphere.” (IPCC, 2019)

Deep peat & shallow peat

Exact definitions can vary between organisations, but deep peat soils are generally characterised by a surface peat layer at least greater than 50cm, or sometimes 1m. By contrast, shallow peat soils are peat areas only 10cm to 40cm deep.

Shallow peat is often under-represented in mapping and may be highly modified as forestry or improved pasture. Rewetting remains key to maintaining the carbon store in shallow peats, but the methods for restoring and managing them may vary from deep peats.

Life cycle analysis (for carbon in trees and woods)

Carbon sequestration by different tree species varies across their life cycle, typically from a slow start to a peak growth period and then slowing as the tree matures. Conifers are sometimes said to sequester more carbon due to their fast growth, but a true life cycle analysis needs to consider the harvesting phase when trees are cut down and new ones planted, and the full carbon picture will depend also on what happens to the harvested wood, as well as the carbon release from soil disturbance due to harvesting. It is worth remembering however that the choice of tree species should consider the life cycle analysis along with biodiversity and landscape impacts.

Natural flood management

“Natural flood management is when natural processes are used to reduce the risk of flooding and coastal erosion. Examples include: restoring bends in rivers, changing the way land is managed so soil can absorb more water and creating saltmarshes on the coast to absorb wave energy.” (Environment Agency, 2017)

Specific reports and case studies prepared by the Environment Agency can be found [here](#).

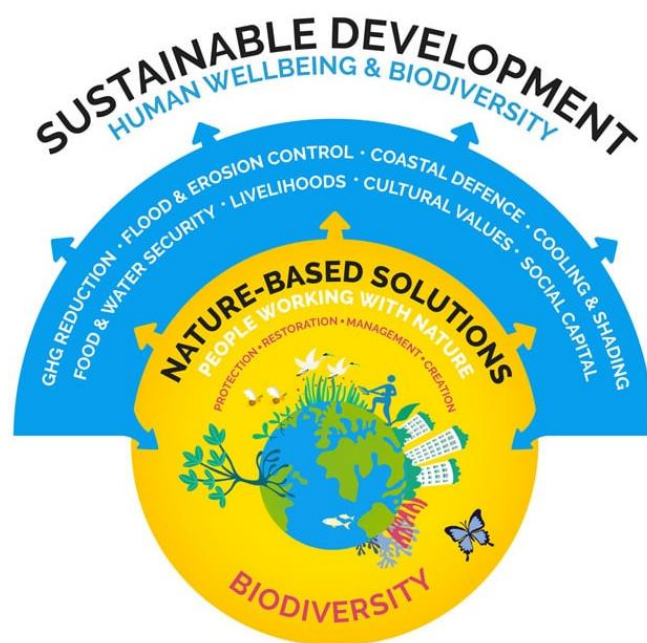
Nature-based solutions

“Nature-based Solutions are actions to protect, sustainably manage, and restore natural and modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.” (IUCN, 2022).

The University of Oxford, through their Nature-based Solutions Initiative, has created a short clip explaining what nature-based solutions are. You can watch [here](#).

The Nature-based Solutions Initiative also created the following illustration summarising what nature-based solutions are and their overarching objective.

You can find out more about nature-based solutions and their potential and limits to address climate [here](#).



© Nature-based Solutions Initiative

Peatland Carbon Code

The Peatland Code is a UK standard to drive investment in peatland restoration. It is a voluntary standard for projects looking to market the benefits of their restoration. Through independent validation, the Peatland Code offers assurance and transparency for investors in peatland restoration projects. Find out more on the [IUCN website](#).

Priority habitat

Priority Habitats form a specific classification for natural and semi-natural habitats which are the most threatened and require urgent conservation action. The original list was established in 1999 (through the [Biodiversity Action Plan – BAP](#)) and revised in 2007. Their geographic extent is [monitored by Natural England](#). The current list of priority habitats (and species) is available on the [JNCC website](#).

Soil Organic Carbon

See the Agriculture and Climate Change glossary.

Soil Organic Matter

See the Agriculture and Climate Change glossary.

Woodland Carbon Code

The Woodland Carbon Code is the UK standard for woodland creation projects. Similarly to the Peatland Code, it allows for independent verification and transparency to encourage investments in sustainable woodland creation. You can find out more about the code [here](#).

Building Design & Planning

Building fabric

‘Building fabric’ refers to all the various materials enclosing the interior of a building, i.e. the roof, external walls, windows, doors and ground floor. It is a key component of a building structure but also very important in terms of landscape character when it comes to AONBs.

Embodied carbon

Embodied carbon are CO₂ emissions from producing materials. When it comes to buildings, embodied carbon is meant as the CO₂ emissions generated through the extraction, transportation and manufacturing of raw building materials. They represent a significant amount of carbon emissions for new constructions.

Lifecycle assessment

“Compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product or service throughout its life cycle.” (IPCC, 2019 adapted from ISO, 2018).

For building materials, the lifecycle assessment helps take into account the environmental impact of various building materials as well as their capacity to be re-used or recycled. Favouring materials with limited environmental impact and that are long lasting participates to sustainable housing.

Vernacular (vernacular architecture)

Relying on local construction materials and architectural traditions to develop

Whole building approach

We have described the whole building (or whole house) approach in details in our Retrofitting Guidance available in Appendix C. In summary, it combines three key considerations: health (of occupants and fabric), energy & carbon, and heritage. This is achieved by assessing each building as a unique combination of location, energy services, lifestyle and behaviours, and of course building fabric performance and condition. You'll find a more detailed definition and further useful links in the guidance cited above.

Sustainable Tourism & Transport

Car-free tourism

Car-free tourism is a type of tourism where visitors go from site to site using walking or cycling routes as well as public transportation alternatives.

Carrying capacity

The World Tourism Organization describes tourism carrying capacity as “the maximum number of people that may visit a tourist destination at the same time, without causing destruction of the physical, economic, socio-cultural environment and an unacceptable decrease in the quality of visitors' satisfaction”. This also involves impacts on the resident community. See also ‘over-tourism’.

Domestic tourism

Visitors coming from within the country they live in.

Environmentally positive tourism

In some cases, tourism can help support positive environmental impact, notably by promoting and giving importance to local natural heritage and sustainable food and craft production, generating buy-in for fund-raising campaigns, raising awareness on environmental issues affecting an area, and even raising water quality and scenic beauty standards to increase attractivity.

Honeypot site

In tourism terms, a honeypot site is a location attracting a very large number of visitors which causes pressure on the environment and the local communities.

Last-mile transportation

The aim of last mile transportation is to provide alternative transport solution for visitors to access their final destination, which is often an area facing particular pressure from over tourism. With last mile buses or other schemes, destinations can better managed the flows of visitors and reduce car pressure on the area.

Low carbon or zero-carbon tourism (carbon neutral tourism)

Low carbon tourism or zero-carbon tourism is the idea of a tourism experience that produces zero net greenhouse gas emissions. The Glasgow Declaration launched at COP26 proposes a coordinated plan for tourism to support the global commitment to halve emissions by 2030 and achieve net zero by 2050 (UNWTO, 2021). In parallel, the World Travel & Tourism Council has published '[A net zero roadmap for travel & tourism](#)'.

Over-tourism

Over-tourism occurs when there are too many visitors for a particular location, notably when adverse effects are caused to the environment or the local population. See also 'carrying capacity'.

Sustainable tourism

The World Tourism Organisation defines key principles for sustainable tourism. It should

“1. Make optimal use of environmental resources that constitute a key element in tourism development, maintaining essential ecological processes and helping to conserve natural heritage and biodiversity.

2. Respect the socio-cultural authenticity of host communities, conserve their built and living cultural heritage and traditional values, and contribute to inter-cultural understanding and tolerance.

3. Ensure viable, long-term economic operations, providing socio-economic benefits to all stakeholders that are fairly distributed, including stable employment and income-earning opportunities and social services to host communities, and contributing to poverty alleviation.”

Source: <https://www.unwto.org/sustainable-development>

Sustainable transport

Sustainable transport is a catch-all concept for ways of transportation with minimal impact on the environment and / or minimal GHG emissions. They can include train travel, electric vehicles, soft mobility (bikes, e-scooters, walking...) or even public transport.

Types of visitors

As defined by the Tourism Society:

- Tourists or overnight visitors are visitors staying away from home for one or more nights (domestic, or from abroad).
- Day visitors spend at least 3 hours away from home outside their usual environment.
- Leisure day visitors spend less than 3 hours away from home but outside their usual environment. They are often also considered as residents.

Farm carbon calculators

Short guidance for farmers and landowners in AONBs

Why use carbon calculators for your farm?

The farming industry faces a complex challenge when it comes to assessing GHG emissions from farm activities. It is not as simple as carbon dioxide in and out, as such an assessment must consider other key aspects such as carbon stored on farms as well as the measurement of all three main gases (carbon dioxide, methane, and nitrous oxide).

However complex, it is now essential for farmers to be able to measure their farm GHG emissions and take steps to reduce them and improve carbon sequestration. Assessing your farm carbon will participate to **future-proofing your business**, making it more efficient, and providing **useful evidence for investments** in low carbon technologies and sustainable practices.

In this context, a range of tools are being developed, often made available free of charge. The current guidance aims at providing an **overview of some of the main tools currently available** online, as well as signpost farmers and landowners to useful existing guidance and information. In this guidance we highlight what type of farming the tools apply to, what results they provide, what data is required, how much it costs, and links to access each tool directly.

The range of tools available should not be a source of concern. Industry experts say tools will become more aligned and standardised in time: **what matters right now is that you find out about the different elements of your business that can be improved and that you begin to understand the positive and negative impacts of the measures you choose to implement.**

It is worth noting that data entry for the first assessment can be very time-consuming but updating it for future years will be much easier.

If you sell to a particular product buyer, it would be worth checking their recommendations or requirements for carbon measurement.

If you would like to give us feedback and suggest improvements or share your own experience of using farm carbon calculators, please contact Marie Micol (marie.micol@landscapesforlife.org.uk).

Need further guidance?

General advice

- The Farmer Network offers a [recorded webinar on the impact of climate change on farming practices](#), with Becky Wilson from Farm Carbon Cutting Toolkit webinar on impact of climate change on farming practices.
- You can read an [example from Coton Wood Farm](#) on using the Farm Carbon Toolkit example using Farm Carbon Toolkit.
- An article from Farmers Weekly on [where to start with carbon calculators](#).
- A recorded virtual workshop providing an [introduction to farm carbon calculators](#), by Championing the Farmed Environment, with inputs from Natural England and the NFU.

Carbon calculator comparisons

- Farmers Weekly proposed a [comparison of the three main farm carbon calculators](#) (Farm Carbon Toolkit, Agrecalc, the Cool Farm Tool) – tested by two actual farmers. Please note this was published in September 2020 and most tools have now evolved proposing more advanced features. Please refer to our table in the current guidance for the latest information.
- The NFU also conducted a [review of the same three tools](#) and presented its results in a short report, available online. Please note this was published in January 2020 and the tools have evolved. Please refer to our table in the current guidance for the latest information.

Support services

- NFU Energy proposes a [service](#) to help you choose the most appropriate calculator (or even a bespoke project), support your data input and analysis. See website for further details and contact information.

Soil carbon and soil health

Soil is a crucial aspect of carbon measurements in farming and often deserves its own, detailed assessment.

- [Soilmentor](#) is a dedicated tool to measure soil health and biodiversity. It includes soil carbon measures. This is a self-assessment based on tests and observations conducted by the farmer directly on their land. Lowest fee starts at £140/year for a single farm (8 fields) and packages are available for farm clusters or support organisations. They provide ample guidance on how to conduct the various soil tests and what they are for.
- The Farm Carbon Calculator proposes guidance on [how to measure and analyse Soil Organic Matter and Soil Carbon](#), including a range of other proxy soil health measurements.

Data requirement details for each tool



Data requirements – Farm Carbon Toolkit

Fuels:

- diesel and other liquid fuels – recorded in litres.
- Electricity consumption and source of electricity including renewable sources; any renewable energy produced on-farm and whether it is used or exported to the grid
- Any gas or solid fuels used and the amounts
- Any contracted activities – this can be split out per activity (for example 110 ha drilled) or just recorded as a fuel use.

Materials

- Items used on the farm in the specified 12 month, includes fencing, repair, and maintenance projects; other consumables – silage making, office supplies
- Water use on-farm (m3)

Capital items / inventory

- All machinery, implements and buildings that are under 10 years old on the farm
- Machinery – year of manufacture and engine size for tractors, combines and loaders and trucks
- Implements – year of manufacture and either width or plated weight
- Buildings – year of construction and dimensions of building and materials used.
- Include the renewable energy projects here (if they are under 10 years old)

Fertility and cropping

- Cropping – area and yield of annual crops for the specified year of foot printing
- Any bought in manures / composts
- Any cover crops (area and mix)

Inputs

Amount of fertilisers and sprays applied in the specified year. Sprays can be grouped by product name or broad type (fungicide, herbicide; etc)

Livestock

- Numbers of livestock on-farm (split out by age and category)
- How the animals are managed in terms of manure (type and application)
- Any Livestock feed not produced on-farm (for example cake – amount fed and type)

Waste

Tonnage of waste produced on-farm and whether it is recycled

Sequestration

- Areas and details of stewardship options.
- Areas of hedgerows and single / in-field trees on farm
- Any soil test results that you have that reflect soil organic matter analysis
- Any perennial crops or areas of wetland on-farm
- Areas of grassland

General

Total area of the farm; Area of temporary grassland; Area of permanent pasture; Area of arable...

Crops	Livestock
<p>General crop data Crop types, year, and area; harvested amount; crop yield; residue amount & management; co-products (type, value)</p> <p>Soil data Soil texture, soil organic matter, moisture, drainage, pH</p> <p>Inputs data Fertiliser type, manufacture in, application rate, methos Crop protection category, type, applications</p> <p>Fuel & Energy data Energy source, type of usage, machines, fuel use, number of completed field operations Wastewater volume, treatment Processing and storage emissions (energy source, type of activity, temperatures, time in storage, ...)</p> <p>Irrigation data - to be filled in if not already captured under fuel & energy or to obtain water metrics Water source, pumping depth, distance, power source, total water added, % of area irrigated</p> <p>Carbon data Land use change & when, % of field converted, forest type and age Tillage changes & when, % of field converted Cover changes & when, % of field Tree species, density of trees per hectare, size, trees planted/lost</p> <p>Transport data Transport mode, weight transported, distance</p>	<p>General livestock data Production system, organic / conventional</p> <p>Milk production data Main breed, reference year, total milk production, fat content, true / crude protein content</p> <p>Herd data Beef: category / age, on-farm animals (number & weight), sold animals (number & weight), purchased animals (number & weight); calving data (age first, interval, rate, replacement rate, time to slaughter) Dairy: same as above (category, on-farm, sold, purchased...)</p> <p>Grazing data Category (as per herd data), days / year, hours / day, grazing type, grazing quality Grassland area Fertiliser application: type, rate, amount applied, source region</p> <p>Feed data – 2 approaches Dry matter intake (DMI) per animal: category (as per herd data), feed component, average DMI / animal / day Average feed use for entire herd: feed component, percentage</p> <p>Manure data Category (as per herd data), management type, percentage of total Bedding type, quantity</p> <p>Energy data Energy source, usage</p> <p>Transport data Mode, weight transported, distance</p>

The Cool Farm Tool also proposes a **biodiversity assessment** divided into four components: farmed products, farming practices, small habitats, large habitats. The assessment is based on the practices used on the farm and the score is assigned according to scientific evidence. Examples of practices: bird nesting boxes, setting aside hedges or trees, leaving un-mown strips, ...

Land area and crops

- Owned and tenanted land, seasonal land and annual occupancy, number of years crop is in the ground / used for grazing, etc.
- Surface of hedges, of woodlands (by age categories); surface occupied by roads and buildings
- Total farm area

Fertiliser (data per various types of land use / crops)

- Percentage applied, types of product

Imported & transferred organic manure and lime (data per various types of land use / crops)

- Type applied to each crop, total tonnes applied, home produced organic manure;
- Standard manure content is automatically applied but can be replaced with own data if manure analysis available

Pesticides

- Crop area treated, type of treatment

Crop production and use

- Percentage of crop removed, harvested dry matter, harvested or forage yield, crop used (sold or saved for seed)

Soil carbon sequestration

- Tillage practice, grazing system, fraction of rotation under fallow / perennials and type, cover / companion crop

Livestock

- Category, average number and weight, purchases + sales (and average weight), deaths (kill out percentage); quantity of sales (milk, wool, eggs)
- Calving / lambing percentages, daily live-weight gains

Manure management; bedding

- Time in fields / time housed in manure systems; total tonnes of purchased bedding

Feed

- Total tonnes of purchased feed used

Electricity and fuel + Renewable electricity

- Whole farm electricity use, fuel use (per type of use) => then automatically pre-calculated against land use, crop, and livestock enterprises
- Whole farm renewable electricity produced from wind, solar PV, hydro, biogas... total produced; total used on farm => then automatically pre-calculated as above

Renewable heat

- Whole farm renewable heat from wood logs/chips, wood pellets, grass/straw, biogas... total produced; total used => then automatically pre-calculated as above

Waste, transport, and water

- Type and quantity of waste produced, distanced travelled, water use by whole farm and if known for each enterprise

General

- Area, products, climate zone, dominant soil and texture, dominant soil pH, altitude, rainfall data, temperature data

Livestock – data per category of livestock

- Description: number of animals & live weight, number of days/year on farm, sold, purchased
- Forage intake: type of forage, produced and consumed on farm, purchased, digestibility of the diet (quality)
- Feedstuff intake: types of feed, tonnes purchased, produced and consumer on the farm
- Manure management systems: type, dry matter (%)

Cropland – data per crop type

- Area for each crop,
- Fertilisation: fertiliser applied for each (detailed by component); organic manure applied for each (type & quantity)
- Pesticides; number of treatments for each crop (per type of pesticide)
- Cropland management: management of crop residues, quantity of burnt residues, type of tillage, % legumes, quantity of purchased seeds, practices (cover crops, grazing, soils drained...), surface of agroforestry
- End use: % final product per crop
- Grasslands: questions on practices (overgrazed, productivity losses, productive varieties seeded...)
- Machinery per type of operation: number of operations, fuel consumption
- Irrigation: irrigated surface, total volume of water, type of irrigation, type of energy used

Other inputs

- Energy: fuel consumption per product (machinery, heating, pumping, vehicles, other); electricity & water consumption (annual); renewable energy quantity consumed and sold; potential for renewable energy (heating needs, solar potential on buildings)
- Natural elements & Land use change: width and length of woody and shrubby elements, area of vineyards and orchards, areas converted in the past 20 years
- Buildings & Materials: building age and surface, material (concrete, cement, steel, plastics, etc.) age and quantity
- Organic matter flows (e.g. bedding, manure, ...): quantity entering and sold/exchanged, is it spread on another farm?, type of transport, distance
- Secondary inputs (plastics and oil supplies e.g. plastic hose, bags, strings...): quantity per year and per product, end of life
- Machinery: type, age, % of use on farm, annual use in hours, by product, by usage on farm
- Cooling, refrigerant, and air conditioning systems: number of machines and types of cooling fluids, quantity of gas and years between changes, volume of milk tanks, cooling capacity, office air conditioning...

Climate Action: How To Get Started?

A short guide for farmers and landowners in AONBs

1. Understand your assets and your system from a carbon point of view

Undertake a farm carbon calculation
Please refer to our [dedicated guidance](#) on the topic

These will help you think about:

- where carbon is stored on your farm (soils, woodlands, hedges, and other habitats),
- what carbon emissions your enterprise creates (fuel and other inputs, loss of carbon from soil).

2. Find out if there's local help and support

Join a cluster / seek trusted advice

- There are many farm clusters and topic groups which you can join to share learning and information with other like-minded farmers and land managers. Your AONB team may be able to link you up with these.
- Some product buyers are trying to make their supply chains less carbon-intensive and may be able to offer support and advice.
- You may wish to seek professional independent advice from local consultants or non-governmental organisations. Defra's [Future Farming Resilience Programme](#) is also supporting a wide range of organisations to give you free advice.
- You may be approached by organisations wanting you to trade your farm carbon and biodiversity credits. This is currently an unregulated market; it is important that you take

good independent advice before signing any contracts. Many farming leaders are advising you wait until the market situation is clearer.

3. Maintain carbon storage

Look after what you've got

The majority of carbon on your farm is likely to be stored in soil, with some stored in above-ground vegetation.

- The less disturbed the soil, the more carbon it's likely to store. Can you [reduce tillage](#)? The [Farming Investment Fund](#) can help with purchase of specialist machinery to reduce tillage.
- Seek to understand how you can protect your soils from damage and loss. Are any areas of your farm prone to soil erosion? Are any soil types particularly susceptible to compaction in wet conditions? Do you grow any particularly risky crop types (e.g. maize?) Does your system leave bare soil through the winter? The [Sustainable Farming Incentive](#) includes support for soil protection measures.
- Are your natural habitats in good ecological condition? [They will store more carbon](#) if they are. [Countryside Stewardship](#) and the emerging [Local Nature Recovery](#) scheme could help reward you for more sensitive management of existing natural/semi-natural areas.

4. Minimise carbon emissions

Reducing emissions can happen across several areas of your operation

- Inputs:
 - Fuel: can you minimise your fuel consumption? Fewer machinery passes, less tillage and more efficient machines are all options to consider.
 - Fertilisers and pesticides: can you minimise their use? All have a high energy cost, so their production creates lots of carbon emissions. It may seem obvious, but don't waste any: ensure those that you use are only used when and where really needed. Do you need to use as much? You might be able to maximise [natural soil fertility](#) or [natural pest management](#). Many artificial inputs also harm soil biology, essential to cycling nutrients and turning soil organic matter into stored carbon.
- Tillage: soil carbon is lost to the atmosphere every time a field is ploughed. Can you [reduce your tillage](#) intensity through changes in your rotation and/or changes in your approach to seedbed preparation? Minimum or no-tillage options have been successfully demonstrated on many UK soil types.

- The science about the climate impact of ruminant methane is unclear. We would recommend a greater focus on the overall farm system – the more that livestock can be grass-fed, the lower the overall emissions are likely to be.

5. Maximise carbon drawdown & storage

- If you know where carbon is stored on your farm, can you enlarge that storage? Expanding natural habitats (hedges, woodlands, [grasslands](#), wetlands) will help draw down more atmospheric carbon into your farm's carbon store. [Countryside Stewardship](#) and the emerging [Local Nature Recovery](#) scheme could support you to achieve this.
- Turn temporary leys into permanent pasture. There are no-till techniques that can reinvigorate intensive grasslands.
- Herbal leys – deep rooting plants within the sward help drive atmospheric carbon deep into the soil where it can be fixed. They also help maintain (or restore) good soil structure. This [Duchy College research](#) may be useful.
- [Rotational grazing](#) / mob grazing / pulse grazing: manipulating grazing techniques can significantly increase soil carbon

Retrofitting Guidance

Energy efficiency and carbon reduction measures for historic buildings in AONBs

Current version – August 2022

This guidance document briefly outlines the overall approach to retrofitting older buildings and signposts readers to useful guidance. It is meant to be an **accessible overview** rather than a technical guide.

It is not set in stone, and we are **currently working on gathering relevant case studies** and examples to illustrate this tool. Updated versions of the document will be uploaded on the NAAONB website – please get in touch with Marie Micol (marie.micol@landscapesforlife.org.uk) if you think you might not be looking at the latest version!

Introduction

Historic buildings form an essential element of AONB landscapes and represent a **significant opportunity to contribute to climate change mitigation** through improved energy efficiency.

To **improve energy efficiency and comfort**, as well as to **comply with regulations**, and to do so in **adequation with the AONB designation and landscape character**, retrofitting measures must be carefully thought through and implemented with precaution. In terms of energy efficiency and GHG emissions reduction, there is a double challenge of reducing emissions from building use as well as limiting emissions from the production of materials used in retrofitting.

The wealth of technical information available on the web can be overwhelming. In this current version, this document will **signpost to existing advice** rather than reiterate what has already been produced by qualified organisations.

In future iterations, we will work to propose a menu of specific measures most adapted to historic buildings in AONBs with the aim of positively contributing to addressing climate change issues.

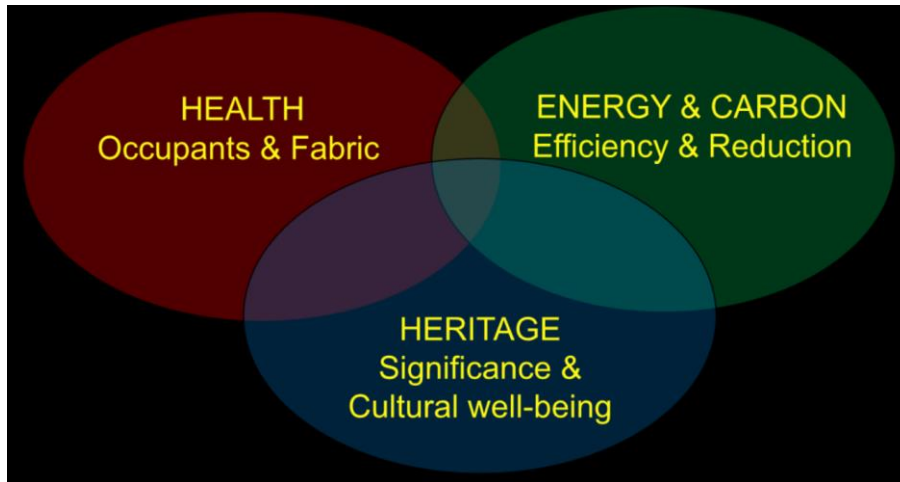
We hope this document will be useful to **AONB teams** as well as to **property owners in AONBs**, to help them conduct retrofitting in a manner that is sensitive to the designated landscape and climate change issues.

Useful readings to get you started

- [Know your home, Know your carbon – Reducing carbon emissions in traditional homes, by Historic England](#) presents an easy-to-read overview of the scale of the challenge and opportunity, with informative graphs and metrics.
- You can also take a look at [Historic England's Climate Change Strategy](#).

The Whole House Approach

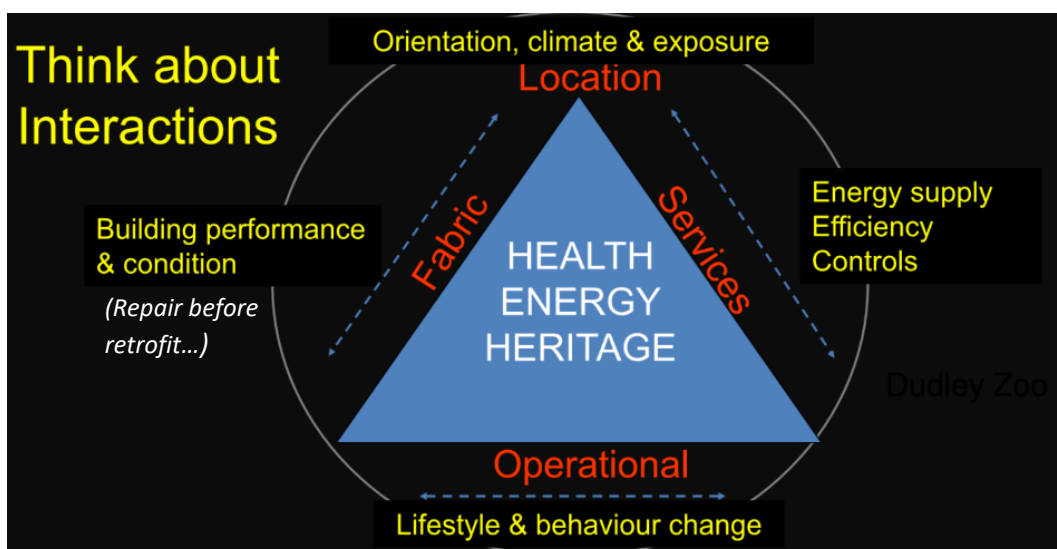
The 'whole house approach' was set out by the Sustainable Tradition Building Alliance and is also used by Historic England. It helps strike a balance between three key considerations: health (of people and buildings), energy and carbon, and heritage.



© Historic England

This approach helps ensure the measures implemented when retrofitting a building are **adapted** to its specific context, **respect the integrity** of the building and are **sustainable**. It also encourages **better alignment of the various parties involved** (from assessors to designers, building managers, technicians, and the people who live in or use the building). More broadly, the whole-house approach will do much more than achieving energy efficiency as it will look to **positively impact local employment and skills, the natural environment and communities' behaviours and attitudes** towards heritage and climate change.

Before diving into implementing specific measures on parts of a building, it invites us to consider the **context, construction, condition, and historic significance** of a building as well as the **many factors that impact energy use** (building location and orientation, building fabric, building services and equipment, and people using the building).



© Historic England

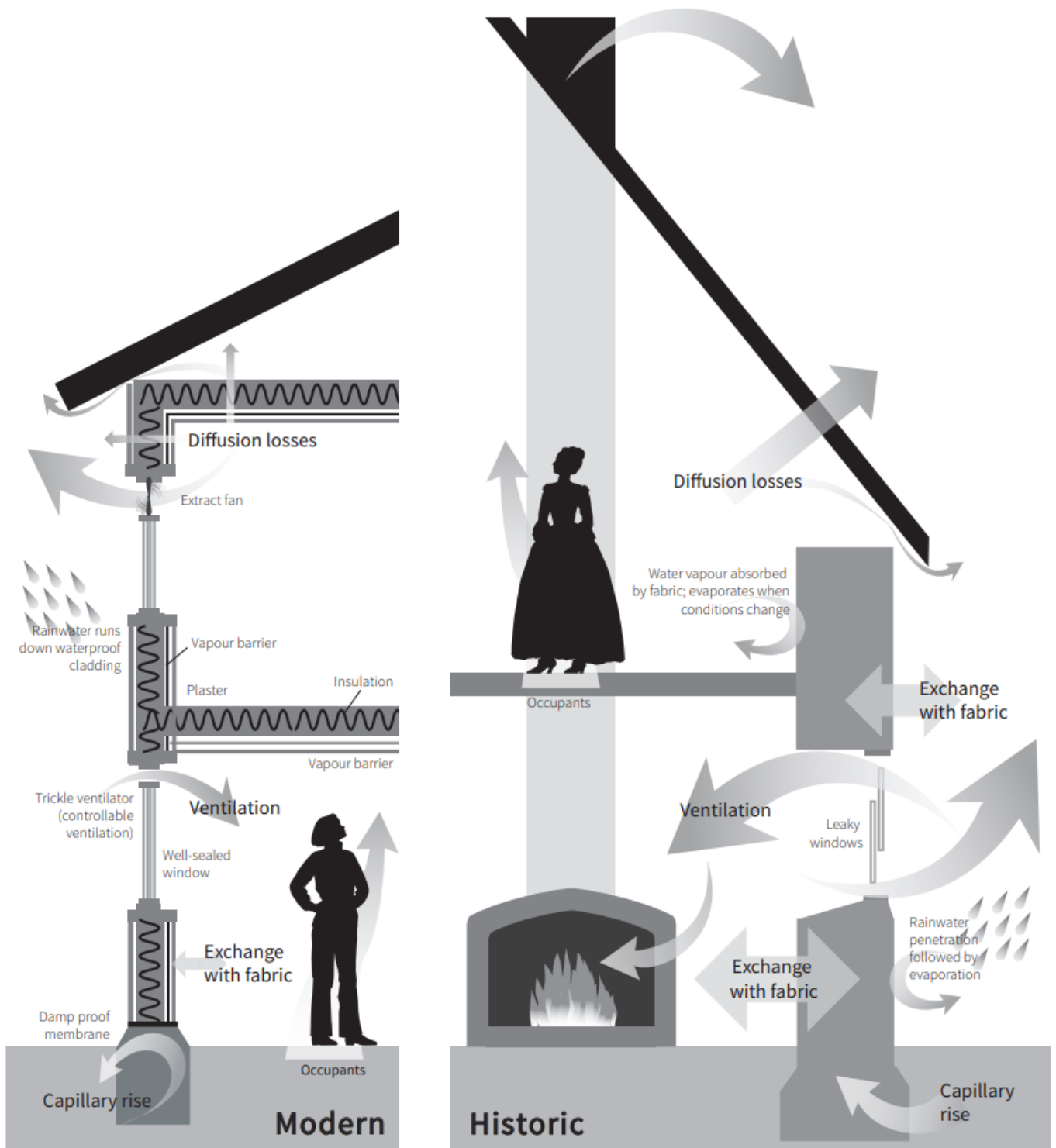
What does it mean for energy efficiency and carbon reduction?

Here are **five key considerations** to bear in mind before initiating retrofitting measures:

1. The way air (notably heat) and humidity circulate and are trapped in a historic building is different from a modern one (see diagram on next page). It is therefore crucial to consider the building as a whole and its interactions with its environment and to **understand how air and humidity behave in the building** before deciding on any measure regarding energy efficiency.
2. Although the general assumption is that old buildings are energy inefficient there is still a **real lack of data about their performance** – their performance is in fact often underestimated, reinforcing the **need for careful assessment of each building**
Read the [SPAB's research findings on energy efficiency in old buildings](#) to find out more.
3. **Changing behaviours** of building users (whether it is a house or a church or other) will play an important role in both limiting energy waste and maximising energy efficiency measures.
4. Many metrics currently in use (e.g. EPC scores) are **not compatible with this approach** and focus on energy cost rather than carbon emission reduction ([EPCs and the Whole House Approach study](#)).
5. **Monitoring and evaluating retrofit measures** is useful to help further improve the approach and impact. Sharing your own retrofitting journey with the local AONB team could also help other property owners across the country.

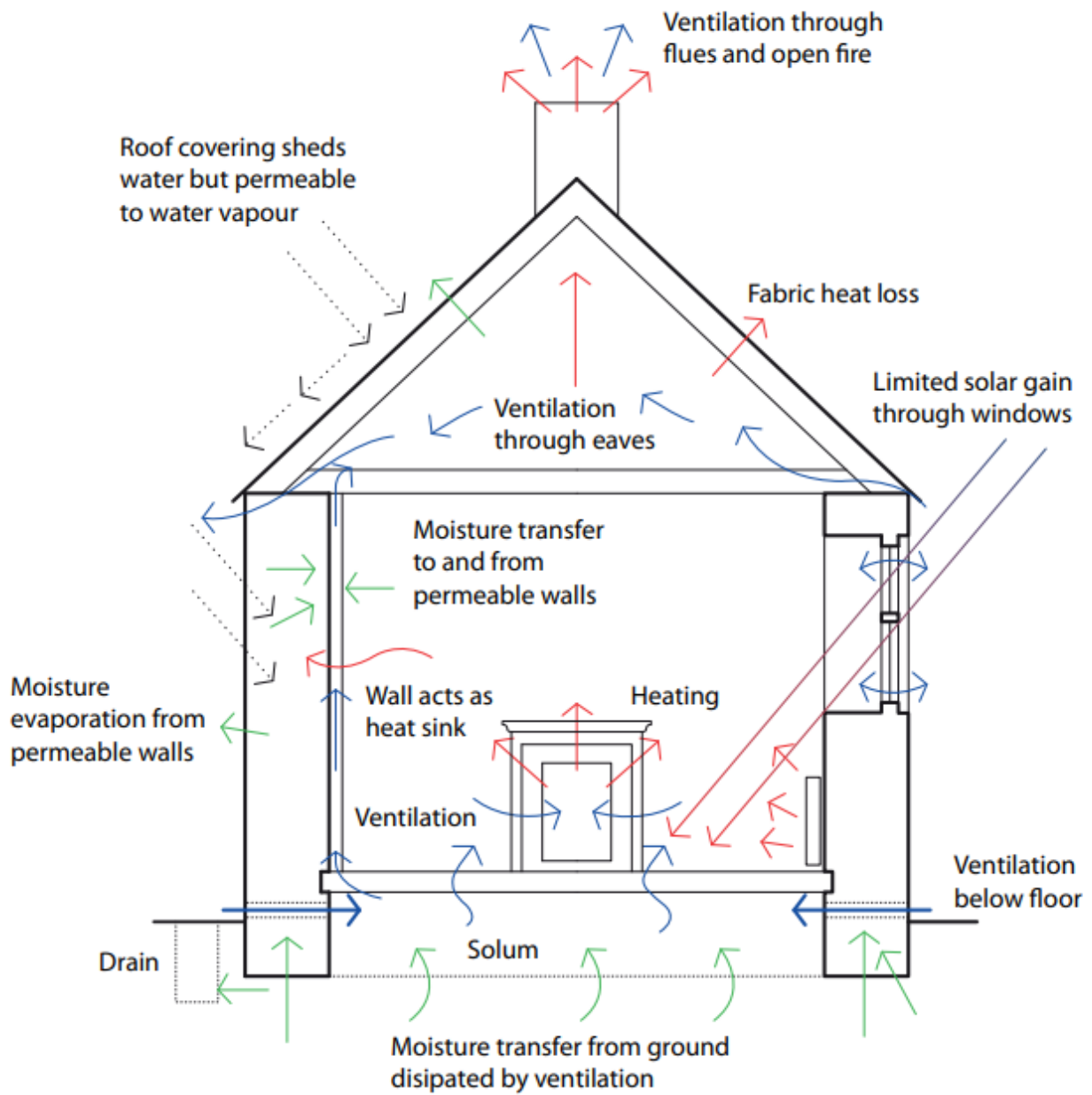
Please note: all specific, technical guidance presented in the rest of this document are meant to be used with the whole-house approach described here. They are focusing on one particular element of a house (e.g. chimneys, or roofs) but they need to be approached with the whole-house environment and system in mind.

Typical differences in the movement of moisture and air in modern and traditional construction



© Historic England

In more details - Air movement in a traditional building



© Historic Environment Scotland
 in [Fabric Improvements for Energy Efficiency in Traditional Buildings](#)

Further resources

To find out more about the whole-house approach

- [Energy Efficiency and Historic Buildings \(Historic England\)](#) – presents the approach and its practical implementation in great details
- [Climate Change Adaptation: Whole-House Approach to Retrofit - direct link to 1-hour webinar recording](#) (and here is the [list of all HE webinar recordings](#) you can browse)

To get started with the whole-house approach

- [STBA's Whole-house Approach Guidance](#) including how to plan for responsible retrofit of traditional buildings and a short handbook on whole-house retrofitting
- [STBA's Survey Tool \(whole-house retrofit survey\)](#) – the tool is currently being redeveloped to include new improvements; it is presented in more details in [this slide set](#)
- [STBA's Guidance Wheel](#) is a very visual tool that allows you to look at the risks from every aspect of retrofitting and how they interact with each other (for example, how a certain measure will induce technical, heritage and energy concerns)
- [STBA's Knowledge Centre on Responsible Retrofit](#) – a very complete resource on all sorts of measures around **fabric, behaviours, and services**
- STBA also offers training courses for surveyors

To better understand air and humidity patterns with a whole-house approach

- [Moisture in buildings: an integrated approach to risk assessment and guidance](#)

Carbon Footprint of Retrofitting

The carbon footprint of any change to be made should be considered. Retrofitting often involves adding new materials or features to a building to make it more energy efficient. **Energy efficiency and overall carbon emission reduction can be in conflict**, and it is important to consider the embodied carbon and life expectancy of products to be used to make a building more energy efficient. In other words, in terms of carbon emitted, the energy efficiency gained must outweigh the footprint of the change to be made.

On building products, the Alliance for Sustainable Building Products has produced a useful [briefing on Environmental Product Declarations](#).

Low and zero carbon technologies

Low and zero carbon technologies in terms of energy sources include photovoltaics, solar water heating, heat pumps, wind turbines, hydroelectric power, combined heat and power and biomass boilers.

On low-carbon heat sources, Historic England offers a webinar recording '[Climate Change Adaptation: Low-Carbon Heat Sources](#)' from 2020 ; a transcript is also available.

Historic England also has a [dedicated webpage on Low and Zero Carbon Technologies](#) with associated case studies for each technology. The focus is on energy sources.

Behaviours

Changing behaviours when it comes to energy use around the house, or a shared building can be difficult. [Know your home, Know your carbon – Reducing carbon emissions in traditional homes, by Historic England](#) presents a series of interesting 'what happens to carbon emissions if I...?' (from p.21). For example:

Slowly moving from 21°C to 18°C means:

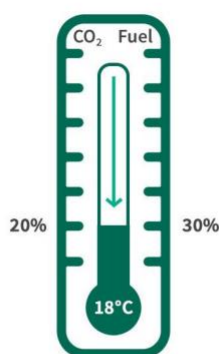
20% reduction
in annual CO₂ emissions

or

30% reduction
in required space heating fuel

or

Saving **£130***
in annual energy bills



© Historic England (Know your home, Know your carbon, Heritage Counts 2020)

Drilling down into technical details

In this section we have tried to signpost readers to specific Historical England technical guidance documents. Where appropriate, we highlight **key considerations to help guide your thinking**.

The references presented in the following sections are taken from Historic England, which has produced thorough guidance reports for each element of a building: roofs, chimneys, walls, windows and doors, and floors.

Historic Environment Scotland has produced a short summary guide of key [Fabric Improvements for Energy Efficiency](#), encompassing the building elements cited above.

Providing a set list of selected measures for older buildings in AONBs is difficult because each building is different, and the permissions which will apply may also vary. With the **whole-house approach** you should be able to identify which measures to prioritise for your specific case. In due course, **we will add case studies of what this could look like in AONBs**. For now, here is a selection of non-AONB examples:

- [Net Zero Carbon Church](#) guidance from the Church of England
- [Refurbishment case studies](#) from Historic Environment Scotland
- [Successful projects](#) gathered by Historic England
- [There's No Place Like Old Homes](#) contains many useful diagrams, examples, and data to inspire you!
- A [practical example](#) from Cornwall Council Historic Environment Service with a thorough review of various measures and their suitability for the local area

If you are currently considering or actually retrofitting an older building in an AONB, we want to hear from you! Please contact your local AONB team or Marie Micol (marie.micol@landscapesforlife.org.uk).

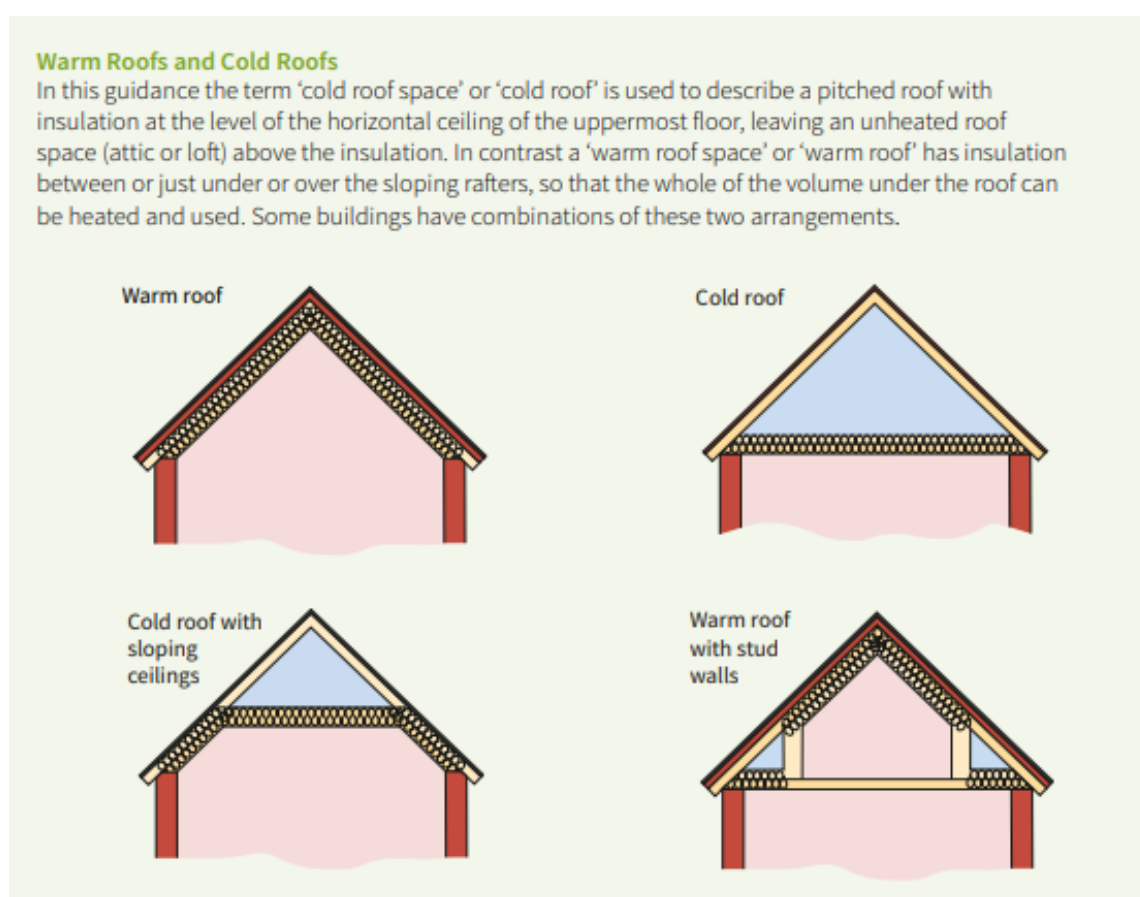
Roofs

On roof measures to improve energy efficiency, Historic England offers a series of guidance documents by roof type:

- [Insulating pitched roofs at rafter Level](#)
- [Insulating pitched roofs at ceiling level](#)
- [Insulating flat roofs](#)
- [Insulating thatched roofs](#)

Each of these documents outlines **pros and cons of different measures** and also covers choices of materials and further technical details, including useful checklists.

They use the terms 'cold roof' and 'warm roof' to describe different types of insulation, further explained as follows:



© Historic England

Also see the dormer window insulation guidance presented under the 'Window and doors' section below – poorly insulated dormer windows can compromise a roof's energy performance.

Chimneys

Specifically on chimneys, Historic England has created a [dedicated guidance document](#). They deserve dedicated measures and special care because they often are significant elements of historic buildings and also sensitive to alterations. Historic England notably highlights **chimneys and fireplaces can play**

a part in improving energy efficiency whether they are used or unused. They offer a series of considerations and measures for both cases.

Walls

Historic England is divided into three main reports:

- [Insulating timber-framed walls](#)
- [Insulating solid walls](#)
- [Insulating early cavity walls](#) (also known as ‘hollow’ walls)

Key highlights from these reports include the fact that **external wall insulation in conservation areas will usually require planning permission**. Also, measures implemented might need to be **adapted to each individual wall** depending on orientation and exposure as well as condition and significance. Wall insulation can therefore be a complex endeavour. These guidance documents will notably help **assess whether wall insulation is suitable or not** and which measure could be most appropriate.

Windows and doors

Windows and doors retrofitting guidance from Historic England focuses on the following aspects:

- [Draught-proofing windows and doors](#)
- [Secondary glazing for windows](#)
- [Insulating dormer windows](#)

They highlight that draught-proofing (i.e. stopping cold air currents from entering the house) is both **cost effective and non-intrusive** and therefore an interesting way to reduce energy use without impacting a building’s overall appearance. Before implementing any measure, windows and doors should however be fully repaired.

Floors

Finally, on floors, Historic England has developed guidance on:

- [Insulating suspended timber floors](#)
- [Insulating solid ground floors](#)

In terms of **insulating solid ground floors**, Historic England stresses that it is **rarely the most energy- and cost-efficient measure** and that there is a risk to exacerbate moisture-related problems and damage valuable heritage. **Insulating suspended timber floors** on the contrary can significantly help **improve energy efficiency**.

Relevant policy and legislation

Here is a **non-exhaustive list** of useful references to help you **understand policy and legislation** in terms of improving energy efficiency in old buildings:

- Section 6 of the [Energy Efficiency and Traditional Homes report \(Historic England\)](#) – pages 12 and 13 highlight the relevant standards and legislation for designated and non-designated heritage assets.
- Consider the PAS (Publicly Available Standards) 2035 for domestic buildings and 2038 for non-domestic buildings
 - [Webinar on PAS 2038 :2021 Retrofitting non-domestic buildings for improved energy efficiency](#)
- [CCC Independent Assessment: The UK's Heat and Buildings Strategy](#)

Renewable Energy – onshore wind and solar energy

Topic paper (draft guidance) – August 2022

by John Mills

Introduction

The National Association of Areas of Outstanding Natural Beauty (NAAONB) believes that ‘*climate change is the biggest threat to humanity and one of the greatest threats to biodiversity*’ and that ‘*designated landscapes offer some of the most powerful solutions to the challenges of climate change*’.ⁱ The NAAONB is committed to ensuring that, by 2024, ‘*all AONB management plans include meaningful measures around climate change mitigation and adaptation, including clear, measurable targets to support Net Zero*’.ⁱⁱ

One of the key challenges for AONBs in putting in place meaningful measures to achieve Net Zero will be to plan positively for renewable energy in AONBs (and their settings) in a way that is, as far as possible, compatible with the statutory purpose of AONB designation (i.e., to conserve and enhance the natural beauty of these areas).

Two forms of renewable energy which have the greatest potential to adversely affect the natural beauty of AONBs are wind energy and solar energy. This draft guidance note addresses this issue, particularly in relation to free-standing wind and solar energy development that is above permitted development thresholds.

[N.B. Building mounted wind and solar energy proposals, and those proposals that would constitute permitted development are not addressed in this document at present].

Wind & solar energy – identification of ‘suitable areas’

Context

Paragraph 155 of the National Planning Policy Framework (NPPF) states that, to help increase the use and supply of renewable and low carbon energy and heat, plans should ‘*consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development*’.ⁱⁱⁱ There is a particularly strong onus on identifying ‘suitable areas’ for wind energy, with the NPPF stating that ‘*a proposed wind energy development involving one or more turbines should not be considered acceptable unless it is in an area identified as being suitable for wind energy development in the development plan*’.^{iv}

In practice, the identification of ‘suitable areas’ for renewable energy development in development plans primarily focusses on wind and solar energy.

- **RECOMMENDATION: Local authority development plans (i.e., Local Plans) should include maps showing ‘suitable areas’ for wind and solar energy development.**

Buffer zones

The Government's Planning Practice Guidance (PPG) on Renewable and Low Carbon Energy states, in the context of identifying 'suitable areas', that '*there is a methodology*' available from the Department of Energy and Climate Change's website on assessing the capacity for renewable energy development'.^{vi}

The methodology outlined above sets out a five-step process for addressing the AONB designation:

- Step 1: Identify the purposes of the landscape area (reasons for designation)
- Step 2: Identify which technologies might affect these purposes/ integrity of the designation
- Step 3: Identify how each technology might affect the purposes/ integrity
- Step 4: Identify the type and level of renewable and low carbon infrastructure that could be accommodated without compromising the purposes/ integrity of the designations
- Step 5: Provide guidance on how to integrate renewable/ low carbon energy without compromising the purposes/integrity

The methodology identifies whether 'constraints', such as infrastructure and nature conservation and heritage conservation designations, should be excluded from further consideration (i.e., not considered suitable for renewable energy development) and whether there should be a 'buffer zone' around these features. The consideration of relevant constraints and buffer zones is reflected in the evidence base of many, current development plan consultations. Appendix 1 lists the types of constraints that are taken into account in this process, based on both the Government methodology and examples from development plan consultations that overlap with the Cotswolds National Landscape.

- **RECOMMENDATION: Relevant 'constraints' (as outlined in Appendix 1), including appropriate buffer zones, should be excluded from suitable areas maps.**

Landscape Sensitivity Assessment

As stated in the Government's Planning Practice Guidance (PPG) for Renewable and Low Carbon Energy,^{vii} '*there are no hard and fast rules about how suitable areas for renewable energy should be identified, but in considering locations, local planning authorities will need to ensure they take into account ... critically, the potential impacts on the local environment, including from cumulative impacts*' (N.B. Underlining added for emphasis).

The PPG goes on to state, in relation to the identification of suitable areas, that:

- '*In considering impacts, assessments can use tools to identify where impacts are likely to be acceptable. For example, landscape character areas could form the basis for considering which technologies at which scale may be appropriate in different types of location*'.^{viii}

In practice, this type of assessment normally takes the form of a landscape sensitivity assessment. Guidance on this topic has been published by Natural England.^{ix}

It is important to note that the PPG says 'could' rather than 'should', in this regard. However, in the context of nationally designated protected landscapes, such as AONBs, and their settings, we consider that it is essential that the identification of suitable areas should be underpinned by a landscape sensitivity assessment.

- **RECOMMENDATION: The identification of 'suitable areas' for renewable energy development in local authority development plans should be underpinned by an up-to-date landscape sensitivity assessment.**

Landscape sensitivity assessments assess the sensitivity of the landscape (i.e., the sensitivity of landscape character areas / types) to different scales of wind and solar energy. Based on current best practice, suggested thresholds are as follows:^x

Size threshold	Wind	Solar
Very small	Up to 25m (to turbine tip height)	Up to 5 hectares (ha)
Small	26-60m	6-10ha
Medium	61-100m	11-15ha
Large	101m-120m	16-30ha
Very large	121m-150m	31-60ha

The sensitivity of the landscape to these different scales of wind and solar energy is normally classed as:

- High;
- Moderate-High;
- Moderate;
- Low-Moderate; or
- Low

[N.B. An appendix will be added to explain these classifications in more detail].

Where the landscape sensitivity is classed as ‘High’, key characteristics and qualities of the landscape are highly vulnerable to change from the proposed scale of wind and solar energy development. Such development is highly likely to result in a significant (adverse) change in landscape character. In AONBs, such development is likely to have a significant adverse effect on the statutory purpose of AONB designation, which is to conserve and enhance the natural beauty of AONBs. The same is also true for such development in the setting of an AONB, where the impact on views from and / or to the AONB is an important consideration in the landscape sensitivity ranking.^{xi}

In order for a landscape sensitivity assessment to have a meaningful role in the identification of suitable areas for wind and solar energy we recommend that areas within AONBs that have ‘High’ sensitivity to particular scales of wind or solar energy development should not be included within ‘suitable area’ maps in local authority development plans. The same principle should also apply to ‘High’ sensitivity areas in the setting of an AONB, where the impact on views from and / or to the AONB is an important consideration in the landscape sensitivity ranking.

- **RECOMMENDATION: The following areas should not be included in ‘suitable area’ maps (or equivalent), for wind and solar energy, in local authority development plans:**
 - i. **Landscape character areas / types within AONBs that are identified as having ‘High’ sensitivity to particular scales of wind or solar energy development.**
 - ii. **Landscape character areas / types within the setting of AONBs that are identified as having ‘High’ sensitivity to particular scales of wind or solar energy development *and* where the potential impact on views from and / or to the AONB is an important consideration in the landscape sensitivity ranking.**

Key characteristics and qualities of the landscape are also vulnerable to change from wind and solar energy development when the landscape sensitivity is classed as ‘Moderate-High’. However, there may be some limited opportunity to accommodate wind turbines/ solar panels in such areas without significantly changing landscape character. Ideally, the landscape sensitivity assessment would specify the circumstances, or locations, where this might be the case. Given the fact that there may be opportunity (albeit limited) to accommodate such development without significantly changing

landscape character, it might not be appropriate to automatically exclude such areas from 'suitable area' maps in local authority development plans.

However, where the scale of wind or solar energy development within an AONB (or its setting) is such that the landscape sensitivity would be 'Moderate-High', such development *could* still have a significant adverse impact on the natural beauty of the AONB. Within an AONB, such development is likely to constitute 'major development', in the context of paragraph 177 and footnote 60 of the National Planning Policy Framework (NPPF).^{xii}

- **RECOMMENDATION:**

- **Landscape character areas / types within AONBs and their settings that are identified as having 'Moderate-High' landscape sensitivity (or lower sensitivity) to particular scales of wind and solar energy development should not automatically be excluded from 'suitable area' mapping in local authority development plans. However, development plans should require consideration to be given to whether such development (within AONBs) would constitute 'major development', in the context of paragraph 177 and footnote 60 of the National Planning Policy Framework.**
- **The local authority development plan (and / or the supporting Landscape Sensitivity Assessment evidence base) should set out the circumstances and / or locations in which wind or solar energy could potentially be accommodated within 'Moderate-High' landscape sensitivity areas without significantly changing landscape character.**
- **Scales of wind or solar energy development that would be classed as**

Renewable energy LSAs that are commissioned by local authorities are normally based on the local authority's own Landscape Character Assessment. However, in fulfilling the statutory duty to have regard to the purpose of AONB designation, they should also have regard to relevant documents published by the relevant AONB Partnerships or Conservation Board, including: (i) Landscape Character Assessments; (ii) AONB Management Plans, particularly with regards to relevant policies and 'special qualities; (iii) Position Statements; and (iv) other guidance relating to landscape character and landscape sensitivity. Natural England's National Character Area profiles would also be a relevant consideration.

- **RECOMMENDATION:**

- **Renewable energy landscape sensitivity assessments, commissioned by local authorities, should have regard to relevant guidance published by the relevant AONB Partnership or Conservation Board.**

QUERY:

- *The identification of 'suitable areas' is intended to help secure the development of renewable (and low carbon) energy^{xiii} and give greater certainty as to where such development will be permitted. The inference is that there should be a presumption in favour of granting planning permission in such areas. Indeed, the evidence base for some Local Plan reviews suggest that this should be the case.^{xiv} However, if such development constitutes 'major development', in the context of paragraph 177 of the NPPF, then there is a presumption against granting planning permission.^{xv}*
 - *Given that there is a presumption against granting planning permission for major development, should scales of wind and solar energy that would be classed as major*

¹ In other words, permission should be refused for such development, other than in exceptional circumstances and where it can be demonstrated that the development is in the public interest.

development be excluded from renewable 'suitable area' maps in development plans?

- *Should scales of wind and solar energy that result in 'Moderate-High' landscape sensitivity within the AONB be classed as major development, in this context?*
- *If so, should the scales of wind and solar energy that result in 'Moderate-High' landscape sensitivity within AONBs be excluded from the 'suitable area' maps?*
- *Would the exclusion of 'Moderate-High' landscape sensitivity areas within AONBs (and their settings), from 'suitable area' mapping, overly constrain the potential for renewable energy provision in AONBs?*

Cumulative effects

The Government's Planning Practice Guidance (PPG) for Renewable and Low Carbon Energy states that:

- *There are no hard and fast rules about how suitable areas for renewable energy should be identified, but in considering locations, local planning authorities will need to ensure they taken into account ... critically, the potential impacts on the local environment, including from cumulative effects.*^{xvi} (N.B. Underlining added for emphasis).

[N.B. More information to be added on this topic.]

Major development – planning policy and development management considerations

As indicated above, the higher the landscape sensitivity to particular types and scales of renewable energy, the more likely it is that a proposed development should be classed as major development, in the context of paragraph 177 and footnote 60 of the National Planning Policy Framework (NPPF).

What constitutes major development?

Footnote 60 of the NPPF states that '*whether a proposal is 'major development' is a matter for the decision maker, taking into account its nature, scale and setting, and whether it could have a significant adverse impact on the purposes for which the area has been designated*'.^{xvii}

A comprehensive checklist of factors that should be taken into account when deciding if a proposed development constitutes major development is provided in Appendix 5 of the Cotswolds Conservation Board's Landscape-led Development Position Statement.^{xviii} Although some of the detail of this checklist is specific to the Cotswolds, the majority of the factors would be applicable in other AONBs.

Paragraph 177 of the NPPF states that '*permission should be refused for major development other than in exceptional circumstances and where it can be demonstrated that the development is in the public interest*'. It then specifies the assessments that should be undertaken for such development proposals. Key points relating to these assessments, in the context of wind and solar energy development, are outlined below.

Major development test A – assessing the need for the development

The priority given to climate change, through the declaration of the climate and ecological emergencies, would potentially make it easier to demonstrate 'exceptional need' for renewable energy proposals. However, exceptional need does not necessarily equate to exceptional circumstances.^{xix} For example, there may be other, more suitable ways of mitigating the impacts of

climate change (or delivering renewable energy) or less harmful locations for the proposed development.

Major development test B – assessing the cost of, and scope for, developing outside the designated area or meeting the need in some other way

In relation to this test, case law has stated that ‘no permission should be given for major development save to the extent the development met a need that could not be addressed elsewhere’.^{xx} As such, all other things being equal, it could be argued that if there are areas outside an AONB (within a local authority area) that are identified as having equal or lesser landscape sensitivity to the type and scale of wind or solar energy development being proposal, then preference should be given to locating the development in those locations.

Major development test C – assessing any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated

In relation to this test, case law has stated that ‘no permission should be given for major development save to the extent the development ... met that need in a way that to the extent possible, moderated detrimental effect on the environment, landscape and recreational opportunities’. As such, it could be argued that wind and solar energy development proposals within an AONB should be required to demonstrate that they have: (i) avoided; and (ii) minimised any potential detrimental effects in this regard.

[N.B. More information to be added on this topic.]

Appendix 1: constraints that should potentially be excluded from ‘suitable area’ mapping

Technical Constraints

Constraint	Exclude from ‘suitable areas’ for wind energy?	Exclude from ‘suitable areas’ for solar energy?	Suggested buffer zone	Comments
Road (A & B roads)	Y	Y	Wind: turbine tip height + 10%.	The DECC guidance excludes A& B roads but not minor roads. The Stroud DC methodology excludes ‘roads’ and the South Gloucestershire methodology excludes ‘major’ and ‘minor’ traffic infrastructure.
Other roads	N	N	N	Consider at development management stage. The Stroud methodology appears to exclude all roads (and associated buffer zone). The South Glos methodology excludes both ‘major’ and ‘minor’ transport infrastructure. Excluding minor roads and an associated buffer zone (with regards to wind energy) would significantly reduce the potential ‘suitable area’. QUERY: Should minor roads (and the associated buffer zone) be excluded from ‘suitable areas’? Would the exclusion of ‘other roads’ result in ‘suitable areas’ being too restricted?

Rail lines	Y	Y	Wind: turbine tip height + 10%	DECC
Major transmission lines	N	N	Wind: turbine tip height + 10%	The DECC and South Gloucestershire methodologies don't refer to transmission lines but they are excluded in the Stroud DC methodology. QUERY: Should major transmission lines (and an associated buffer zone) be excluded? Would this excessively reduce the 'suitable areas'?
Noise buffer – residential properties	Y	N	See comments column	DECC Stroud District Council methodology (wind): <ul style="list-style-type: none"> • Small (@ 25-60m turbine tip height; @ 50kw): 200m • Medium (@60-100m; @0.5MW): 500m • Large (@ 100-150m; @ 2.5MW): 600m² • Very large: (@ 150-200m; @ 4MW): 750m
Noise buffer – commercial properties	?	?	?	Stroud District Council methodology (wind): <ul style="list-style-type: none"> • Small (@ 25-60m turbine tip height; @ 50kw): 150m • Medium (@60-100m; @0.5MW): 200m • Large (@ 100-150m; @ 2.5MW): 300m • Very large (@ 150-200m; @ 4MW): 350m <p>The South Gloucestershire methodology does not address noise buffer zones for commercial properties.</p> <p>The DECC guidance proposes a 600m buffer around all built-up areas but doesn't specifically address commercial properties.</p>
Built-up areas (i.e., settlements)	Y	Y	See noise buffers (above).	
Airport	Y	Y	Wind: 6km?	DECC. A 6km buffer is suggested in the DECC guidance for wind energy in order to avoid interference with radar. QUERY: Would a 6km buffer exclude too large an area? Should the distance from the airport be a development management consideration rather than a 'suitable area' consideration?
Airfield	Y	Y	N	DECC guidance suggests a 6km buffer zone but it might be more appropriate to address this at the development management stage (otherwise very large areas might be unnecessarily excluded).
NATS Safeguarding Zones	N	N	N	Consider at the development management stage (as per the Stroud DC methodology)
MoD sites	Y	Y	N	DECC, South Gloucestershire
MoD Low Flying Zones	Y	N	N	South Gloucestershire
MoD defence radar	N	N	?	Consider at the development management stage (and / or consult MoD at the planning policy stage).
Existing and consented renewable energy developments	Y	Y	N	Stroud DC, South Gloucestershire
Active mines / quarries	Y	Y	Solar: 250m	The suggested 250m buffer zone comes from the Stroud DC methodology (relating to dust deposition). The South Gloucestershire methodology excludes these sites but doesn't specify a buffer zone. Not addressed in DECC guidance.

² This reflects the DECC guidance.

Strategic site allocations in Development Plan (other than for renewable energy)	Y	Y	N	
Inland waters (including rivers, canals and lakes)	Y	Y	2m-50m?	The DECC guidance doesn't propose buffer zones for inland waters but the Stroud DC methodology suggests a 50m buffer zone, whereas the South Gloucestershire methodology recommends a 2m buffer. QUERY: What is the most appropriate buffer zone, if any?
Areas with north-east to north-west aspect and inclinations greater than 3 degrees. exclude all areas greater than 10 degrees	N	Y	N	Stroud DC
Slopes greater than 10 degrees	N	Y	N	Stroud DC
Slopes greater than 15 degrees	Y	Y	N	Stroud DC

Planning and regulatory constraints

Constraint	Exclude from 'suitable areas' for wind energy?	Exclude from 'suitable areas' for solar energy?	Suggested buffer zone	Comments
Constraints relating to natural beauty				
Landscape character				
Landform	?	?	?	See consideration of 'slopes', above.
Special qualities of the AONB	N	N	N	Ideally, the 'special qualities' of the AONB will be taken into account in a landscape sensitivity assessment. N.B. Some of the designations listed in this table will form part of the special qualities of the AONB.
Key features / characteristics of the relevant landscape character types (LCTs)	N	N	N	Ideally, the 'key features / characteristics' of the relevant LCTs will be taken into account in a landscape sensitivity assessment. N.B. Some of the designations listed in this table will form part of the special qualities of the AONB.
Local landscape designations	N	N	N	Ideally, local landscape designations should be considered in the landscape sensitivity assessment. Such designations would potentially increase the 'value' of the landscape and, all other things being equal, the overall landscape sensitivity. Consider at the development management stage.
Natural heritage				
International nature conservation designations (SAC, SPA, Ramsar)	Y	Y	Wind: Blade radius.	The DECC guidance (link) suggests using a 5-step approach, rather than automatically excluding such designations. However, it would not be appropriate to address the climate emergency by exacerbating the ecological emergency. These designations are excluded in South Gloucestershire Council (link) and Stroud District Council (link) renewable energy assessments. We consider that these sites <i>should</i> be excluded.

Constraint	Exclude from 'suitable areas' for wind energy?	Exclude from 'suitable areas' for solar energy?	Suggested buffer zone	Comments
				<p>The suggested buffer zones come from the Stroud District Council methodology and is intended to avoid 'oversail'.</p> <p>QUERY: What should the position be for very large designated areas? Would excluding such sites from 'suitable areas' be overly restrictive?</p>
National nature conservation designations (NNR, SSSI)	Y	Y	Wind: Blade radius.	See comments in previous row.
Local Nature Reserve	N	N	N	<p>Consider at the development management stage.</p> <p>Excluded in Stroud DC and South Gloucestershire methodologies (with the Stroud DC methodology suggesting a 'blade radius' buffer zone). Not addressed in the DECC methodology.</p>
Other local nature conservation designations / sites ³	N	N	N	<p>Consider at the development management stage.</p> <p>Excluded in Stroud DC methodology (which suggests a 'blade radius' buffer zone) but not the South Gloucestershire methodology. Not addressed in the DECC methodology.</p>
Irreplaceable habitat - ancient woodland	Y	Y	Wind: 15m or 'blade radius + 50m'? Solar: 20m	<p>The DECC, Stroud DC and South Gloucestershire methodologies all exclude ancient woodland.</p> <p>The suggested buffer zone comes from the Stroud DC methodology and is intended to reduce risk of impact on bats.</p> <p>The South Gloucestershire methodology suggests a 15m buffer zone (to avoid root damage).</p> <p>QUERY: Which buffer is more appropriate?</p>
Irreplaceable habitat - calcareous grassland pre-dating 1945	Y	Y	N	<p>The Cotswolds Conservation Board also considers calcareous grassland that pre-dates the end of World War 2 to be 'ancient'.</p> <p>ACTION: Need to decide most appropriate wording for grassland habitat.</p>
Broadleaved woodland	N	N	N	<p>Excluded in Stroud DC (with buffer zone of 'blade radius + 50m' for wind and 20m for solar) and South Gloucestershire methodologies but not addressed in DECC guidance.</p> <p>We consider that this criterion could be addressed at the development management stage (through 'biodiversity net gain requirements' rather than excluding it from 'suitable area' mapping).</p>
Other woodland	N	N	N	Stroud DC methodology excludes all woodland on the National Woodland Inventory and suggests a buffer zone of 'blade radius + 50m' for wind and 20m for solar). The South Gloucestershire methodology indicates that this criterion will be given further consideration.

³ Including Local Wildlife Sites / Key Wildlife Sites, Wildlife Trust reserves

Constraint	Exclude from 'suitable areas' for wind energy?	Exclude from 'suitable areas' for solar energy?	Suggested buffer zone	Comments
				See comments in previous row.
Other priority habitat identifies as a priority in AONB Management Plans	N	N	N	Consider at the development management stage.
Other priority habitat	N	N	N	Consider at the development management stage.
Natural England's Impact Risk Zones (IRZ)	N	N	N	Consider at the development management stage.
Cultural heritage				All of the cultural heritage designations listed below are excluded in the DECC, South Gloucestershire and Stroud methodologies (except for 'setting' and, in the case of South Gloucestershire, 'conservation areas' (although these areas will be given further consideration as the local plan review progresses)).
Scheduled monuments	Y	Y	Wind: blade radius Solar: N	
Listed buildings	Y	Y	Wind: blade radius ⁴	
Conservation areas	Y	Y	Wind: blade radius Solar: N	Most Conservation Areas would be within built-up areas so would be excluded on that basis as well. However, some Conservation Areas might extend well beyond the built-up area.
Registered Historic Parks and Gardens	Y	Y	Wind: blade radius Solar: N	
Registered Historic Battlefields	Y	Y	Wind: blade radius Solar: N	
World Heritage Sites	Y	Y	Wind: blade radius Solar: N	
Setting of any of the above 'cultural heritage' designations	N	N	Wind: blade radius Solar: N	Consider at the development management stage.
Constraints relating to tranquillity				
Noise				See reference to noise buffer zones, above.
Constraints relating to enjoyment and understanding				
Public Rights of Way (PROW)	N	N	N	Consider at the development management stage

⁴ A noise buffer zone would apply if the listed building was a dwelling.

Constraint	Exclude from 'suitable areas' for wind energy?	Exclude from 'suitable areas' for solar energy?	Suggested buffer zone	Comments
				<p>The Stroud DC methodology excludes PROW and, for wind energy, a buffer zone of the turbine tip height + 10% (for safety reasons).</p> <p>PROW are not considered in the DECC guidance or in the South Gloucestershire methodology.</p> <p>QUERY: Would excluding PROW (and related buffer zones) excessively restrict 'suitable areas'?</p>
Cycle trails	N	N	N	See comments in previous row.
Common land / access land	N	N	N	See comments in previous two rows.
National Trust inalienable land	N	N	N	<p>Consider at the development management stage.</p> <p>This criterion will be given further consideration in the South Gloucestershire methodology but is not addressed in the Stroud DC methodology or the DECC guidance.</p>
Designated Green Space	N	N	N	<p>Consider at the development management stage.</p> <p>This criterion is excluded in the Stroud DC methodology but is not addressed in the South Gloucestershire methodology or DECC guidance.</p>
Other designation constraints not related to 'natural beauty' or 'enjoyment and understanding'				
Green Belt	N	N	N	<p>Consider at the development management stage.</p> <p>Not excluded in the DECC guidance. Not addressed in the Stroud DC methodology. Will be given further consideration in the South Gloucestershire methodology.</p>
Flood plain / flood zone	N	N	N	<p>Consider at the development management stage.</p> <p>Not excluded in the DECC guidance. Not addressed in the Stroud DC methodology. Will be given further consideration in the South Gloucestershire methodology.</p>
Minerals Safeguarding Areas	N	N	N	<p>Consider at the development management stage.</p> <p>Not addressed in the DECC guidance or Stroud DC methodology. Will be given further consideration in the South Gloucestershire methodology.</p>

END-NOTES

ⁱ https://landscapesforlife.org.uk/application/files/7216/1117/5782/The_Colchester_Declaration.pdf

ⁱⁱ See previous footnote.

ⁱⁱⁱ National Planning Policy Framework ([link](#)). Paragraph 155.

^{iv} National Planning Policy Framework ([link](#)). Footnote 54.

^v LUC and SQW Energy (2010) *Renewable and Low-carbon Energy Capacity Methodology. Methodology for the English Regions*. Commissioned by the Department of Energy and Climate Change (DECC) and the Department of Communities and Local Government (CLG). ([Link](#)).

^{vi} <https://www.gov.uk/guidance/renewable-and-low-carbon-energy>. Paragraph 005.

^{vii} <https://www.gov.uk/guidance/renewable-and-low-carbon-energy> (2015). Paragraph 005.

^{viii} <https://www.gov.uk/guidance/renewable-and-low-carbon-energy> (2015). Paragraph 005.

^{ix} Natural England (2019) *An approach to landscape sensitivity assessment – to inform spatial planning and land management* ([link](#)).

^x These thresholds are based on the figures used in the Renewable Energy Landscape Sensitivity Assessments that form part of the evidence base for the Bath & North East Somerset Local Plan Partial Update consultation ([link](#)) and the South Gloucestershire Local Plan consultation ([link](#)). It is worth noting that the Cotswolds Conservation Board's current Renewable Energy Position Statement ([link](#)) indicates that solar energy developments larger than one hectare would be considered to be major development. As such, the lowest threshold should arguably be one hectare rather than five hectares.

^{xi} Case law ([link](#) – paragraphs 21 and 22) has clarified that the requirements of what is now paragraph 176 of the National Planning Policy Framework (NPPF) should apply to the impact of development outside an AONB on views from the AONB. In other words, great weight should be given to the impact of such development on these views. The Cotswolds Conservation Board's Position Statement on Development in the Setting of the Cotswolds AONB ([link](#)) provides more context on this issue. Although the same principle doesn't apply to the impact of such development on views towards an AONB, these views may still contribute to the 'special qualities' of the AONB and / or the 'key features / characteristics' of the component landscape character areas / types.

^{xii} Footnote 60 of the NPPF specifies that '*for the purposes of paragraphs 176 and 177 [of the NPPF], whether a proposal is 'major development' is a matter for the decision maker, taking into account its nature, scale and setting, and whether it could have a significant adverse impact on the purpose for which the area has been designated or defined*'.

^{xiii} National Planning Policy Framework ([link](#)). Paragraph 155.

^{xiv} For example, the 'Renewable and Low Carbon Energy Assessment Study Report – South Gloucestershire Council' (2021) ([link](#)): Planning Policy Approaches (pages 37-38) – WF-PR-2, WF-PR-4 and SF-PR-4.

^{xv} In other words, permission should be refused for such development, other than in exceptional circumstances and where it can be demonstrated that the development is in the public interest.

^{xvi} <https://www.gov.uk/guidance/renewable-and-low-carbon-energy>. Paragraph 005.

^{xvii} National Planning Policy Framework ([link](#)). Paragraph 177.

^{xviii} Cotswolds Conservation Board (2019) *Landscape-led Development Position Statement*. Appendix 5 ([link](#)).

^{xix} This principle is recognised in relevant case law (R (Mevagissey Parish Council) v Cornwall Council [2013] EWHC 3684 (Admin) ([link](#)), paragraph 52): 'Even if there were an exceptional need ... that would not necessarily equate to exceptional circumstances for a particular development, because there may be alternative sites that are more suitable because development there would result in less harm to the AONB landscape'.

^{xx} R (Advearse) v Dorset Council v Hallam Land Management Ltd [2020] EWHC 807 ([link](#)). Direct quote from paragraph 35.

Implications of the de Bois Review of Destination Management Organisations in England for AONBs

Discussion paper – 29th June 2022

by Nigel Mc Donald

Overview

In August 2021, the Government published their review of destination management organisations in the UK. The report is available [here](#).

The results of the report have been summarised by [Visit England](#).

‘In summary, the recommendations of the review were as follows:

The Government should bring coherence to England’s DMO landscape via a tiering approach, using an accreditation process to create a national portfolio of high performing DMOs that meet certain criteria.

As it is England’s National Tourist Board, with the statutory responsibility for growing tourism at an England level, the Government should charge Visit England with responsibility for creating, maintaining and supporting this new tiered structure. It should receive sufficient funding and resources to do this.

As responsibility for tourism policy cuts across multiple departments, creating a confusing picture, practical measures to address these issues could include elevating the tourism minister to a Minister of State position and either reallocating responsibilities from other departments to sit under that minister or making the minister responsible for the activities of teams within multiple departments

To help DMOs and local authorities take decisions on how best to develop the visitor economy in their local area, the Government should improve access to quality data by introducing the proposed Tourism Data Hub as a matter of urgency.’

What this might mean for your AONB

The de Bois review of Destination Management Organisations recommends a tiered approach to tourism destination management. The highest tier will be the most influential and receive greatest level of support. It also proposes to reduce the number of DMOs by ‘using an accreditation process to create a national portfolio of high performing DMOs that meet certain criteria.’

In short, Visit England will be targeting resources at the most successful, recognisable and representative DMOs. Less coordinated or fragmented destinations will be left without resources or influence at a regional level.

Issues

- There seems to be little recognition of the impacts of 'overtourism' within Government Policy.
- In many cases AONBs and the landscape assets within them, are an essential element of UKs tourism industry, however many are not represented at DMO/DMP level (even in the most popular visitor destinations).
- There appears to be little cross-over between national policy on sustainable transport and travel and tourism promotion.

Conclusions

- **AONBs with an interest in sustainable tourism need to be working to support their DMO as part of a functioning destination management partnership.**
- **From this position AONBs can steer environmentally positive approaches to tourism by providing knowledge, experience and expertise gained from grass roots working**
- **AONBs should collaborate to bring together their DMOs in partnerships that develop sustainable tourism projects**

In order to do this, AONBs need representation at their county/DMO level.

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Image references

Section I title page: Shropshire Hills AONB

Section II title page: Taking the Lead programme

Agriculture and Climate Change tools : Nidderdale AONB © Paul Harris

Nature-based Solution tools: Picture by North Pennines Area of Outstanding Natural Beauty Partnership – Resized Tynehead fell stone dams and bags of brash restoration cumbria LIFE UAV

Building Design & Planning tools: Northumberland Coast AONB

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Sustainable Tourism & Transport tools: Shropshire Hills AONB