

Net Zero - The Ambition Gap

Will the UK Government's
Net Zero Strategy keep
1.5°C alive?

A summary of our science-led
assessment of the UK Net Zero
Strategy. The first independent
analysis to focus on the gap
between UK targets and
what's necessary to reverse the
destruction of nature and limit
the most dangerous impacts of
global warming

Updated for Government policy
announcements, June 2023

Full report: zerohour.uk/reports



ZERO HOUR 

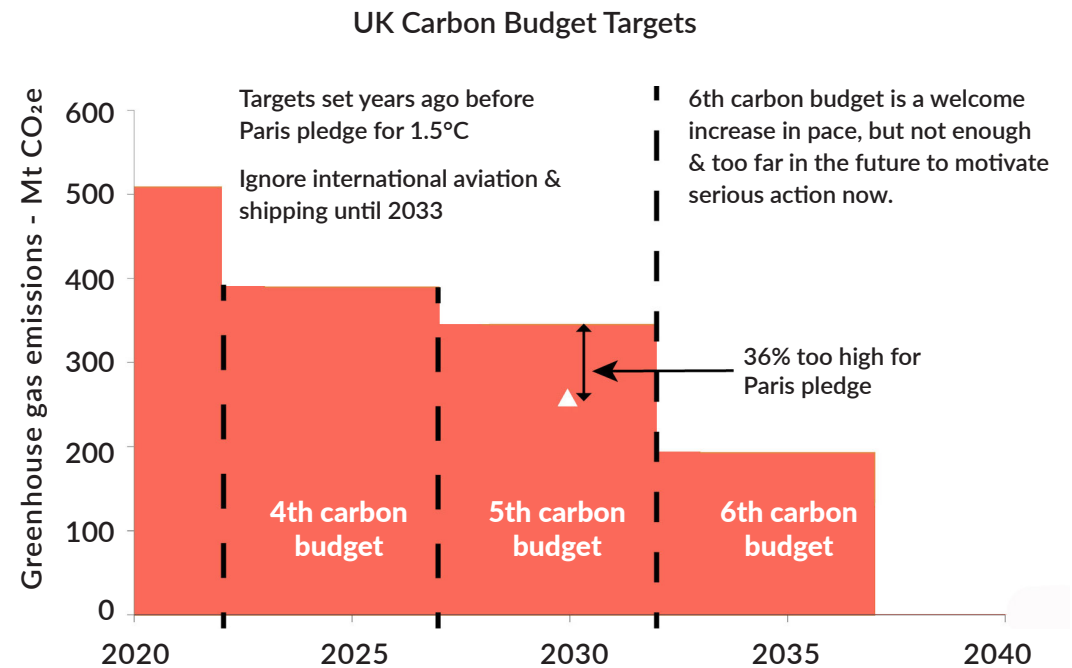
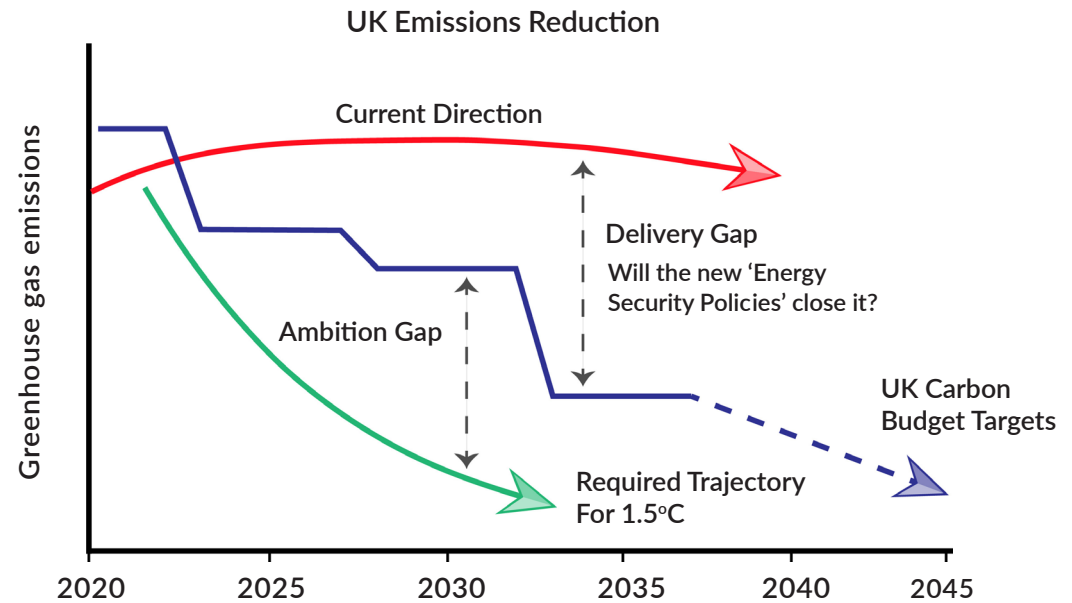
UK emissions targets need urgent review

Carbon budgets, set under the Climate Change Act 2008, remain unchanged and fall far short of the UK's share of emissions cuts needed to avoid global average temperatures exceeding 1.5°C.

Government says its new suite of 'Energy Security Policies' will close the Delivery Gap. Leading scientists disagree. Regardless, the Ambition Gap remains, and our aim is to shine a light on it while there is still time to make the long-term investment necessary to close it.

UK Carbon Budgets too weak for 1.5°C

- 4th & 5th budgets are outdated, with 4th now 12 years old.
- 5th carbon budget exceeds UK's Paris Agreement target by 36%.
- The UK's share of international aviation & shipping ignored until 2033.
- 5-yearly budgets unsuitable for a fast-moving emergency response.
- Ignore 'blue carbon' emissions from UK seas, caused by ecosystem damage such as industrial fishing.



It's not when we reach net zero that matters, it's the path we take

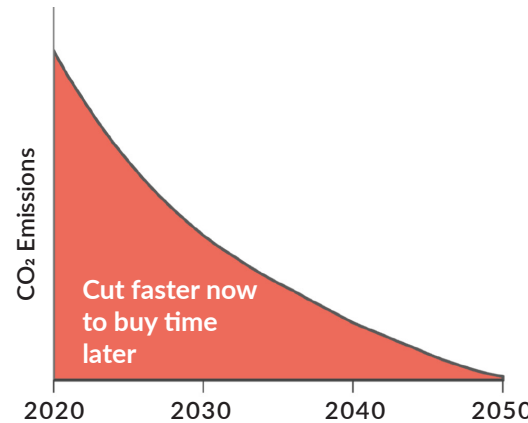
- We are using up our carbon budget far too quickly. Without immediate, rapid cuts there is no chance of keeping to our share of the carbon budget for 1.5°C - or even close.
- The Net Zero Strategy (NZS) would see the UK emit over twice its per-capita share of the global carbon budget for limiting warming to 1.5°C, even if it reaches net zero by 2050.
- The UK is relying on the promise of future CO₂ removals by unproven technology, some of which scientists say **has been mis-sold** and will actually make climate change worse.

Ignoring over 40% of our Carbon Footprint

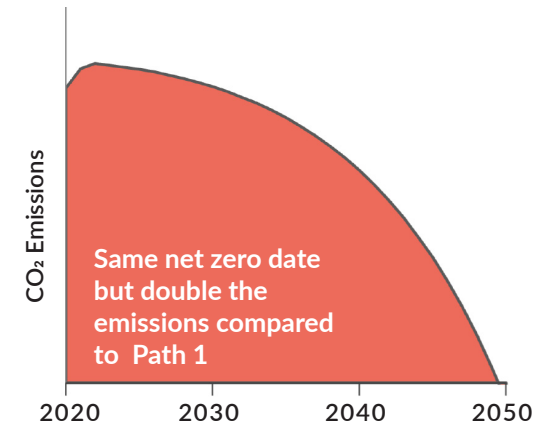
Despite good progress on territorial emissions, largely due to reduced **coal use**, the UK's total carbon footprint has only fallen by 23% since 1990—less than 1% per year. Far from the “rapid, far-reaching and unprecedented changes” called for **by the IPCC**.

The UK is the largest net importer of CO₂ emissions in the G7. By reporting only on territorial emissions we're ignoring emissions from the manufacturing we have offshored.

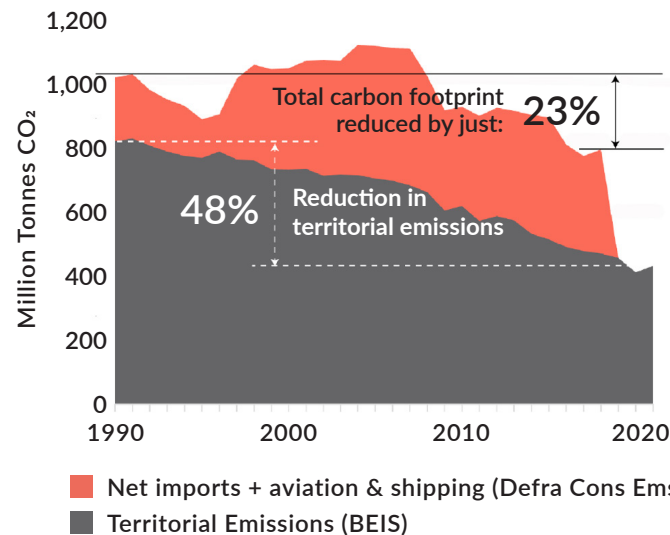
Path 1: IPCC advise rapid cuts now to minimise total emissions for the best chance of limiting warming to 1.5°C



Path 2: Indicative of the UK and many nations—promises for tomorrow with little action now



UK emissions reduction—limited progress on total footprint



Fossil Fuels

- UK taxpayers support fossil fuels with **£10 billion** in tax breaks per year, distorting the market & slowing the green transition.
- A tax rebate is given against the new Energy Profits Levy—but only for investment in new fossil fuels, not for clean power.
- Over **100** new exploration licences despite strong **scientific consensus** that developing new oil and gas fields is “incompatible” with a 1.5°C target.

Little action on energy use & waste

The Net Zero Strategy (NZS) largely overlooks demand reduction. Cutting wasted energy and reducing demand is the quickest, cheapest way to cut carbon and save money. Saving energy can greatly reduce the challenge ahead of us in expanding the green grid, saving money and helping reach net zero faster.

Over-reliance on unproven CO₂ removal technology

The Net Zero Strategy (NZS) is dangerously reliant on expensive engineered CO₂ removals, particularly BECCS and DACCS. The latest science shows that these technologies have no place in the net zero effort, and will waste precious public funds and time.

BECCS plans centre around Drax biomass power station, with additional unproven carbon capture technology. Drax BECCS plans are expected to cost the taxpayer **£32bn**. CO₂ emissions from Drax are not counted in emissions reporting despite UK biomass emitting **more CO₂ than coal**.

Housing

- UK homes lose heat three times faster than those in Germany. Grants to insulate (£1k) and convert to heat pumps (£6k) are far too low. Italy primed the market with a **110% grant** up to €100k per home.
- A new UK home causes **50 tonnes CO₂**. Action needed to bring as many of the **1.2m surplus** homes as possible into use—reducing new build & freeing up labour for retrofit.

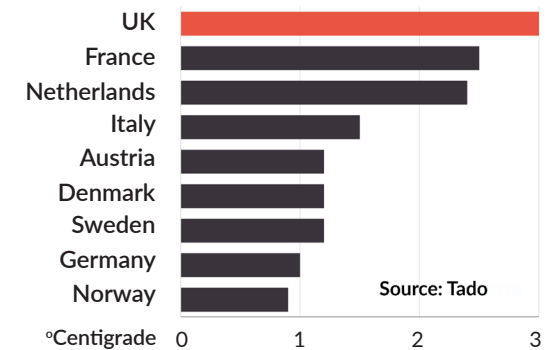
Transport

- No incentives to reduce car journeys. Instead a £27bn road building programme is going ahead.
- Missed opportunity to electrify rail faster.

BECCS - Bioenergy with Carbon Capture & Storage (at Drax power station)

- Based on the theory that burning wood is carbon neutral and if resulting CO₂ is captured, the process is carbon negative. But **claims are false** due to emissions from logging, chipping & shipping. Plus harvested forests take **up to 50 years** to re-capture the carbon lost—**far too long** considering the looming risks of deadly climatic tipping points.
- NZS plans require 2.5 times the current capacity of Drax; untenable when Drax already consumes **over 50%** of the global wood pellet market.
- The NZS warns of ‘significant negative air quality impacts’ regionally and nationally. Biomass emits dangerous particle pollution and **Drax record is poor**.

Housing: temperature loss after 5 hours



- Multiple UK airports have expansion plans.
- Electric vehicle charging network roll-out is far too slow. All new cars to be electric by 2030 but many motorway services still have only two chargers.

DACCS - Direct Air Capture with Carbon Storage

- Extracts CO₂ from the air and bonds it to rock deep underground in a costly, high-energy process, still unproven at scale. Powering DACCS by fossil fuels before we have surplus renewable energy will emit **almost as much CO₂** as it removes.
- Likely to be important in future to lower atmospheric CO₂ levels, but only once we have surplus clean power. Attempting to scale it now in the UK will waste time, money & resources.
- The NZS plans for up to 29m tonnes of CO₂ removals is unrealistic, requiring 5 times the capacity of the trial **Orca plant** in Iceland to be constructed every week, from now to 2050.

Blue hydrogen: a costly mistake

Blue hydrogen, produced from natural gas, **is not low carbon**. One study shows it may even be worse for the **climate than burning coal**. It should be ruled out as a solution. It will impose a huge cost on the public and lock us into a high emissions pathway.

- Yet 84% of UK's 'clean' hydrogen in development is blue.
- The 'Low Carbon Hydrogen Standard' has a weak carbon intensity target (20gCO_e per MJ), 3+ times higher than Regen's recommended 4g to 7g.
- The 'Standard' ignores large parts of the blue hydrogen emissions life cycle, and ignores a **new study** showing that North Sea fugitive methane emissions (leaks) are five times higher than assumed by the Government.

Biofuels & 'sustainable' aviation fuels: grave risk to food security

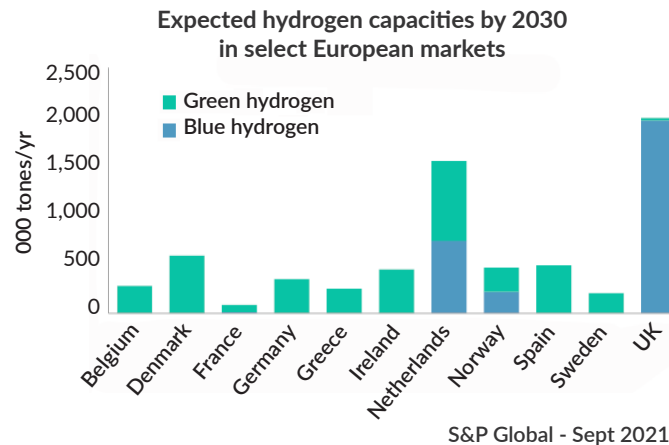
UK is dangerously dependent on food imports at a time when climate change brings a growing risk of simultaneous crop failure in the world's main breadbasket regions.

That is compounded by Brexit, with the UK now at the end of the queue when shortages hit, due to trade barriers.

Low Carbon Hydrogen Standard is too weak

- Associated North Sea fugitive emissions (leaks) of **methane alone** will release almost 9gCO₂e/MJ exceeding **Regen's 4-7g budget**¹.
- Downstream fugitive emissions of hydrogen from pipe network are ignored, yet hydrogen has 33 times the warming impact of CO₂ over 20 years. This could amount to at least 5gCO₂e/MJ.

Blue hydrogen is being developed for the wrong reason: It benefits the owners of North Sea gas reserves.



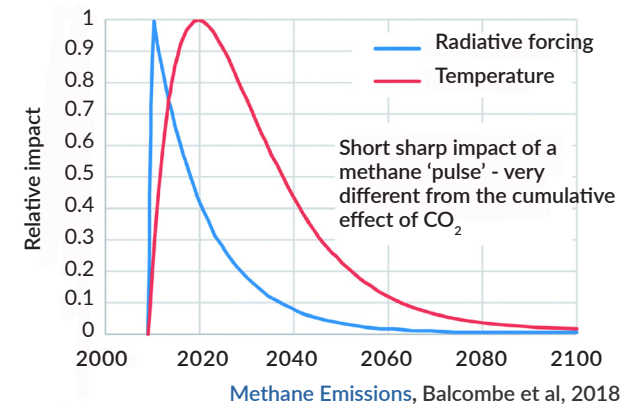
Wasting precious land & natural resources

- Net Zero: We cannot afford to waste land on inefficient energy crops. We need more land to address the ecological crisis: to allow nature to recover, absorb CO₂, and help us adapt to a warming world.
- Energy crops already use **2.1% of UK arable land** threatening sustainable food production. Defra stats show <1% of farmland grows fruit & veg. We import **50% of vegetables and 84% of fruit** risking food security. To move to a healthier diet rich in fruit & veg, including pulses and nuts, we must become more self-sufficient.

- Methane is being accounted for as an impact spread over 100 years (28x CO₂). But this greatly underestimates its powerful short-term impact over 20 years (83x CO₂)
- Emissions caused constructing infrastructure, and leaks from CO₂ storage are ignored.
- Applicants are allowed to treat renewables used in production as zero carbon. But diverting scarce wind turbine or solar panel capacity to support blue hydrogen production will slow our progress to net zero.

UK must update how it accounts for methane to reflect its dangerous short-term impact, which threatens to take us past irreversible tipping points.

Warming impact of a single release of methane



- Biofuels are inefficient: 1 hectare of UK solar farm delivers **48-112x more driving miles** per year than the same land used for biofuels.
- Tax on **domestic flights** has been halved. 'E-fuels' will divert renewable capacity away from replacing dirty power generation, delaying progress in reaching net zero.
- Aircraft condensation trails are responsible for **as much warming as aviation emissions**. Even if a genuinely sustainable fuel can be found, it could only reduce the warming impact of aviation by 50%.

¹ **14g of methane needed to produce 1MJ of hydrogen**. Latest North Sea fugitive emissions estimate: **0.72%**. Fugitive methane per MJ is therefore 8.6g CO₂e using methane's climate impact over 20 years, 82.5 times more potent than CO₂ (GWP20).

Food & the climate-nature crisis

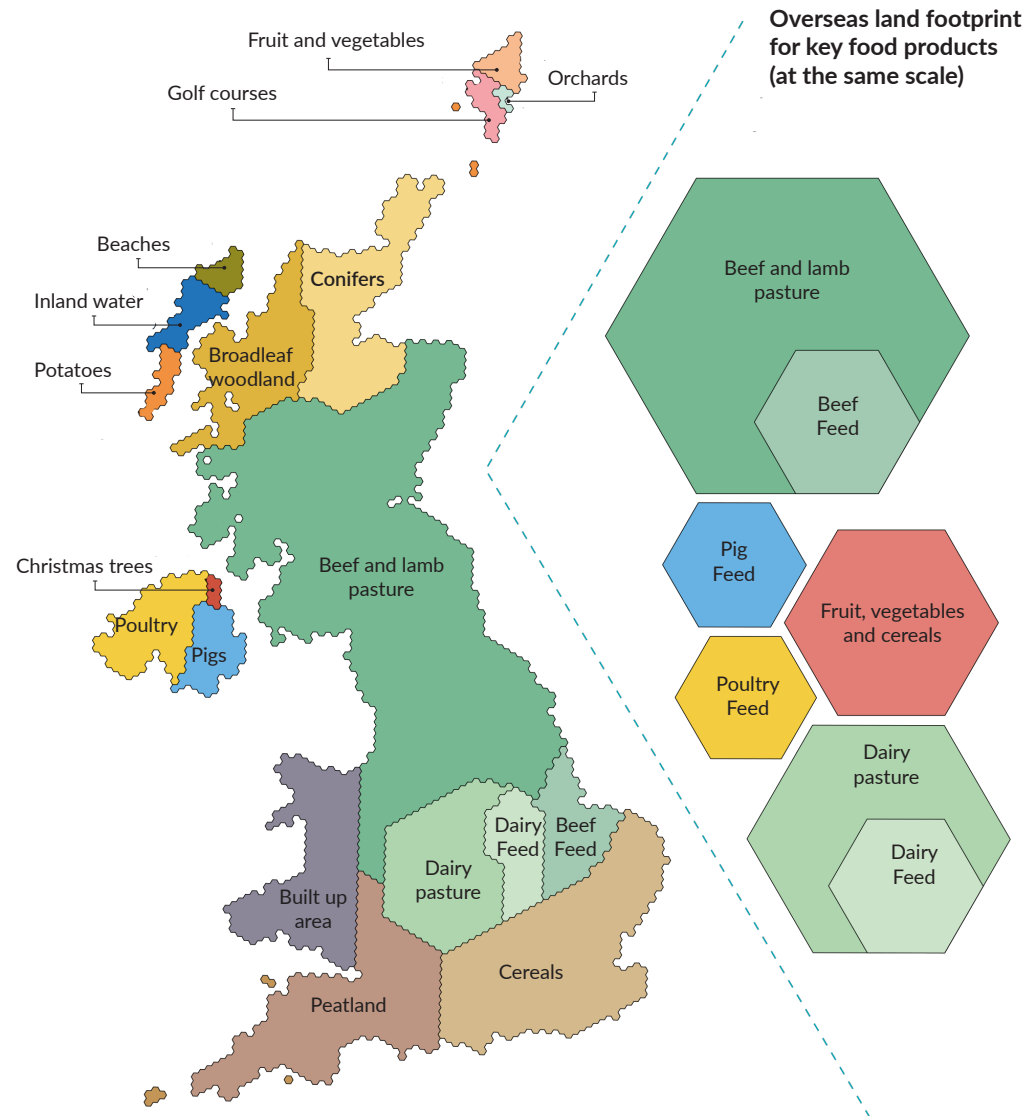
We cannot limit temperature rise to 1.5°C without restoring nature on a grand scale—cutting emissions is only half the story. Nature can help absorb CO₂ and limit climate impacts such as flooding and drought.

Nature has been squeezed to the margins with **insufficient space or connectivity** to thrive. Conservation efforts alone can't fix this. We must tackle the root causes, freeing up much more land to allow nature to recover.

Our **food system** is the biggest driver of the destruction of nature & responsible for **35% of emissions**, including imports. This is a market failure. The Climate Change Committee says we need to free up around **23% of land** from agriculture for climate solutions (around 4 million hectares) and reducing meat consumption would do this. Henry Dimbleby, creator of the **National Food Strategy**, says there is: “no other way to solve the equation”.

The majority of UK land feeds livestock not people. Reducing meat consumption would deliver ‘double the carbon dividend’:

- Lower GHG emissions from animal production & feed (including methane, nitrous oxide & CO₂)
- Restored ecosystems would absorb more CO₂ and enable wildlife to recover.



This illustration from the National Food Strategy, highlights the scale of animal agriculture. Defra statistics for 2022 show the numbers: Cattle 9.6 million, Pigs 5.2 million, Sheep 33 million. The total for all types of livestock on farms, at the time of survey, was over 230 million animals. Less than 1% of land grows fruit & veg.

Poultry is by far the biggest and most intensive system. During 2022 the number of chickens and other poultry produced for **UK consumption** was over 1 billion. Poultry farming has caused an **ecological disaster** on the River Wye.

Land use change: unlocking a cascade of co-benefits

Transforming the system, to reduce dependence on livestock and free up land, would unlock a cascade of co-benefits: →

Our food system causes multiple environmental and social problems. Commentators blame 'consumer choice' but billions spent on marketing has driven demand for profitable but unhealthy and environmentally damaging products. It has locked farmers and consumers into an unfair, unsustainable market. The average **farm income in England is £17.8k**, down from £20k in 2015. Farmers need more support, they cannot solve the crisis alone.

The UK leads the world in ultra-processed food consumption: The **National Food Strategy** found that more than 50% of UK food consumed is ultra-processed, rising shockingly to almost two thirds for **under fives** and **school meals**. Channel 4's Food Unwrapped reported in 2022 that we eat almost 80 million ready meals each week. Around £19bn worth of food is **wasted**.

This unhealthy diet is high in emissions and heavy on land, water and chemicals. Beyond its climate and nature impacts our food system is driving crises in pollution and public health. Relying so heavily on imports is a leading cause of the cost of living and food security crises. We can turn the tide e.g. with a smart policy on **unhealthy food advertising**.

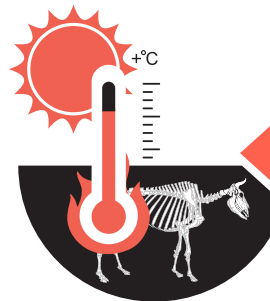
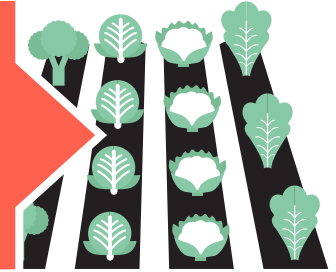


Fix the pollution crisis:

Reducing livestock would cut animal waste & chemical inputs leading to cleaner air & water, restored soil & biodiversity

Grow more food:

Feeding people directly with low carbon fruit, veg, nuts, pulses and grains provides 12 times more calories per hectare than livestock production



Adapt to rising heat:

Supporting farmers to be less reliant on livestock. Defra warns the risk of severe heat stress to animals will rise by 1000% -3000%

Fix the cost of living:

More home-grown to help solve supply issues. Importing most fruit & veg makes us vulnerable to global price rises



Nature-friendly farming:

Effective financial support for rapid transition & Nature-based Solutions, enabling farmers to restore nature & adopt sustainable methods

Boost the economy:

Enormous potential to boost local economies and create jobs e.g. through local food production, green tourism & restoring nature



Fix the health crisis:

Transforming the food system would slash NHS costs. Dietary disease costs £10s of billions and is a leading cause of death.

More land for people

Regular exposure to nature improves health and wellbeing & offers great educational opportunities for those disconnected from the natural world



Nature-based Solutions & protecting our carbon stores

The Government is investing £20bn in carbon capture technology described as an '**extremely costly experiment**'. Only a small fraction of that is committed to restoring vital carbon stores such as peatlands, woodlands, wetlands and seas, which will also protect against climate impacts such as flooding, drought and overheating.

We aren't adapting to climate change fast enough. **Scientists warn** that warming is accelerating and could exceed 1.5°C between 2023-2027. We must cut emissions more rapidly alongside ramping up nature restoration to **adapt and protect** the food supply, fresh water, power, health, homes and livelihoods.

The Climate Change Committee's (CCC) Risk Assessment **CCRA3** says "the pace of climate change is outstripping the action taken to adapt to it". A recent **comprehensive report** on the benefits of Nature-based Solutions (NbS) shows they are more affordable, especially when accounting for the multiple co-benefits.

NbS can enhance the health and diversity of ecosystems to tackle the climate and biodiversity crisis, while also supporting health and local economies



Saltmarsh Tollesbury, Essex: Tollesbury Parish Council

Coastal Wetlands & Seas

The ocean absorbs and stores more carbon ('blue carbon') than any other ecosystem. This isn't mentioned in the UK Net Zero Strategy, but trawling causes emissions levels **similar to aviation**.

UK seas must be fully protected urgently from damaging practices to prevent further loss of biodiversity, including fish stocks, and loss of blue carbon.

The **Tyndall Centre** estimates that up to 200K homes and businesses are at risk of abandonment from sea level rise. NbS such as seagrass and kelp beds, saltmarshes and dunes have enormous potential to help reduce this risk.

Peatlands

UK peatlands are our biggest carbon store. But 80% are degraded, releasing carbon amounting to around 3.5% of emissions, due largely to **agriculture and burning** on shooting estates. **Three quarters of our drinking water** is supplied via peatland—that supply is now under threat.

England's **Peat Action Plan** has committed to restore less than 20% of England's 1.42 million hectares by 2050. The Office for National Statistics estimates that restoring all UK peatlands "would deliver carbon **benefits alone of £109bn** outweighing the cost by 5 to 10 times." That figure doesn't benefits such as prevention of flooding and drought.



Protected peatland: iStock/K Neville



Farm wetland creation: Freshwater Habitats Trust

Rivers & Inland Wetlands

Only 16% of over 5000 water bodies in England are of 'Good Ecological Status' due to pollution from agriculture and sewage discharge. This threatens public health and is devastating aquatic ecosystems, preventing them from absorbing CO₂ and supporting wildlife.

Almost **1.8m people** in the UK are exposed to the risk of inland flooding, also threatening our energy, water, food, transport, health and education infrastructure. Nature-based Solutions can significantly reduce the risk, including: river restoration, wetland creation to store water, and a range of **sustainable drainage** solutions

Woodlands

Woodland has the highest rates of carbon sequestration. Ancient and veteran trees store large amounts of carbon, but have no default legal protection. Woodland is also a crucial asset for natural flood management and cooling in urban spaces and farmland.

The target for England is to increase woodland by just 2% to 16.5% by 2050—largely new woodland and farmers are expected to deliver 90% of target—unlikely under current land use. Friends of the Earth say a **doubling in 10 years** is achievable. The **CCC says >20%** of farmland must be released by 2050, for woodland and other Nature-based Solutions and reducing meat & dairy would achieve that.



Woodland natural regeneration: Jane King

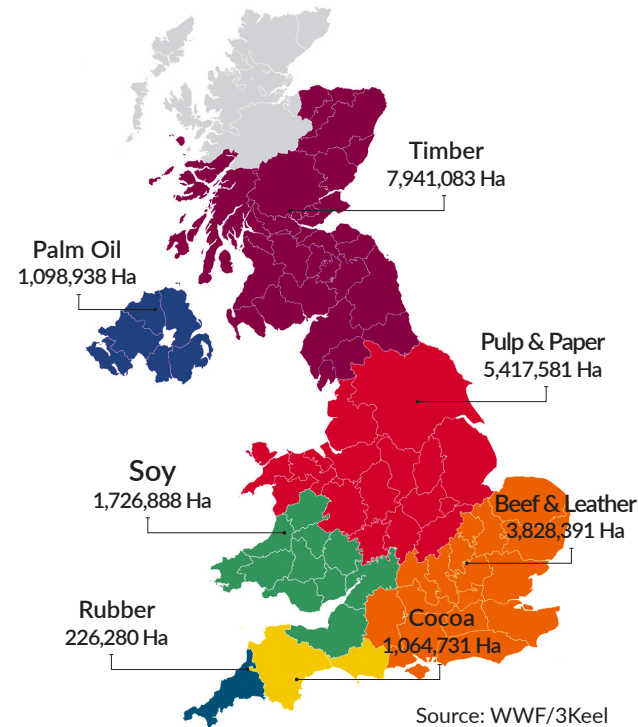
The UK's global climate and nature footprint

The UK's net zero strategy must account for our global emissions and ecological impacts. A priority for all governments in developed countries must be to stabilise the world's critical carbon sinks and stores—the 'global safety net' of ecosystems such as tropical forests, peatlands, and the ocean. Ecosystems that are also the **richest remaining areas for biodiversity**, critical to keeping them functioning—to prevent the loss of **irrecoverable** carbon.

Research published in **The Lancet** found that the EU and the UK are responsible for **25% of global ecological damage**, due to high consumption of meat and **ultra-processed** foods, which drives land clearance for livestock and vast areas of ecologically damaging monocrops such as wheat, palm oil and soy as well as extraction of enormous quantities of water—in regions that can least afford it

Richer nations are stripping natural resources from poorer nations—land, minerals, forests, water, and marine resources—hampering their ability to develop sustainably and to protect the vital ecosystems that all countries depend upon. **Aid for restoration** can only go so far. The answer is to reduce our footprint by transitioning to a food system and economy that's healthier for people and planet.

The WWF report **Thriving Within Planetary Means** shows the consequences of our unsustainable consumption. It maps the UK's overseas land footprint for **just seven key commodities**, covering an average annual area of 21.3 million hectares. This is equivalent to 88% of the total UK land area. Our entire overseas land footprint is much larger.



Fish & Seafood

The UK is a net importer of fish and seafood. **In 2021**, 75% of the 791K tonnes imported were from non-EU sources, more likely to be using damaging practices. Of the 652.8K tonnes fished by the UK, 40% was caught in overseas waters.

The UK has a poor record on Ocean protection. More than **90% of our own** Marine Protected Areas are subject to damaging practices. We must urgently ban damaging practices at home and overseas and import only from truly sustainable sources.

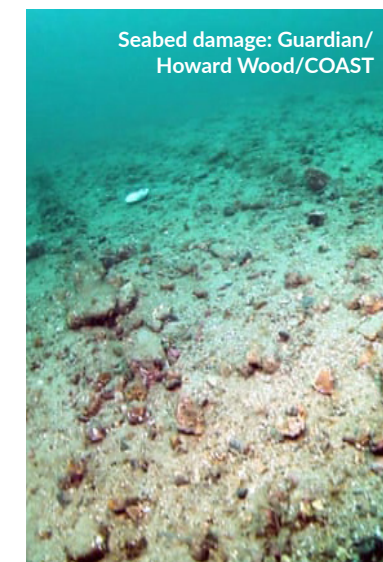
Rwandan beans: [resource-trade.org](https://www.resource-trade.org/)



Fruit & vegetables for people & planet

The UK imports 50% of veg and 84% of fruit but doesn't produce or import enough of either for the **minimum health** recommendation.

A third of imports are from **climate-vulnerable** countries, compounding the growing risk of price shocks. The UK is also depleting other countries of natural resources and increasing food emission unnecessarily when we could produce much more at home. But our unfair market is preventing this. Farmers often make less than **1% profit** and the average annual farm income in **horticulture** is only £14K



Seabed damage: Guardian/
Howard Wood/COAST



Healthy seabed:
Christine Roberts

The Climate & Ecology Bill - the way forward

The **CE Bill** is a legally-binding mission statement which will drive the urgent science-led action necessary to get to grips with the climate and nature crisis. It would set a gold standard for other developed nations, inspiring positive action across the world.

The Bill was created by Zero Hour in collaboration with scientists and constitutional lawyers. It is supported by hundreds of parliamentarians, local authorities, organisations and scientists, along with tens of thousands of individuals.

The CE Bill makes provision for creation of a legally-binding strategy, utilising a whole-of-government approach, to tackle the root causes of the interwoven climate and nature crises. The UK is currently reliant upon a range of disjointed and often conflicting laws and policies. Consequently, communities are being let down by legislation that should be protecting them. We are failing to rise to the challenges posed by the climate and nature crisis; putting our health, well-being, and entire economic stability at enormous risk.

The Bill's legally-binding strategy would offer businesses and individuals certainty about the way forward, instilling much needed confidence for investment in building supply chains, retraining, and modifying homes. The country needs a clear mission statement and a firm commitment from the Government that it intends to steer a long-term course.

Key objectives

- Create a joined-up plan—the crises in climate and nature are deeply intertwined, requiring a plan that considers both together.
- Ensure emissions are reduced rapidly, for the best chance of limiting warming to 1.5°C, in line with our Paris agreement commitments.
- Not only halt, but also reverse the decline in nature—setting nature measurably on the path to recovery by 2030, in line with our COP15 commitment.
- Take responsibility for our overseas footprint—both emissions and ecological.
- Prioritise nature in decision-making, and end fossil fuel production and imports as rapidly as possible.
- Ensure no-one is left behind—through fairness provisions.
- Involve the public—giving people a say in finding a fair way forward through a Climate & Nature Assembly, an essential tool for bringing the public along with the unprecedented pace of change required.

Strategy - fundamental principles

- Limit the UK's total CO2 emissions to no more than its proportionate share of the IPCC's remaining global carbon budget, for a 67% chance of limiting heating to 1.5°C.
- Reduce CO2 emissions caused in the manufacture of the goods we import, in line with UK territorial emissions.

- Reduce the UK's emissions of methane and other greenhouse gases, at rates consistent to limiting global heating to 1.5°C.
- Ensure the end of the exploration, extraction, export and import of fossil fuels by the UK as rapidly as possible.
- Ensure that steps taken to mitigate emissions minimise damage to ecosystems, food and water availability, and human health.
- Restore and expand natural ecosystems, and enhance the management of cultivated ecosystems, to protect and enhance biodiversity.
- Include the **Mitigation and Conservation Hierarchy** so that any development or activity that threatens nature uses this framework to prioritise the protection of nature.
- Address the UK's entire ecological footprint at home and overseas by accounting for and monitoring the impacts on human health and the destruction of nature; through the production and consumption of goods and services and all related activity including financing, the extraction of raw materials and waste production.

