

HS2

# Net Zero Carbon Plan

A cleaner,  
greener future

January 2022



# Introduction

HS2 is being designed and built to be the most sustainable high-speed rail network in the world. Cutting carbon emissions informs our work as we build a climate-resilient railway that will transform long distance, intercity travel and rebalance the UK economy.

Tackling climate change is the most pressing challenge of our time. According to the latest science, we need to cut global carbon emissions by 50% by 2030 and achieve net zero by 2050 to avoid exceeding 1.5°C of warming. It is only by doing this that we will avoid the most catastrophic effects of rising temperatures.

As Europe's biggest infrastructure project, we are acutely aware of our responsibilities and we are playing our part in the collective endeavour to combat the climate emergency. We are publishing our **Environmental Sustainability Vision** which includes targets for HS2's overall operations to be net zero from 2035. This covers all construction, the running of high-speed services and the maintenance we will need to carry out to make sure travel is comfortable, reliable and safe. Passengers will enjoy zero carbon journeys on HS2 from day one of service because the electricity powering our trains will come from zero emission sources.

HS2's Net Zero Carbon Plan explains the work we have undertaken to date and what we are doing now. It maps the progress we will make in the years ahead on our journey towards 'destination net zero' in 2035, taking bold action to reduce our carbon emissions ahead of 2035. From this point on, the emissions HS2 adds to the atmosphere will be balanced out by the emissions we remove. In this way, HS2 will not add to net UK carbon emissions from 2035. Our targets will be kept under review.

This plan also looks at the ways we will influence the wider construction and manufacturing industries to create a cleaner, greener future.

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**Front cover image:** Visualisation of HS2's Curzon Street station.

## Destination net zero

Cutting the carbon emissions that contribute to climate change is central to the strategic and economic case for HS2<sup>1</sup>. We are reducing and, where possible, removing emissions as we design, build and operate the railway and we will make sure the network is resilient to climate change.

Our work is well underway as we move towards destination net zero in 2035 – the point from which carbon emissions created by HS2 will be matched by the emissions we will remove or offset. We will keep this target under review.

In 2016, we challenged our contractors to achieve a 50% reduction in carbon emissions by 2030. They are making good progress and we were able to report an overall emissions reduction of 24.6% in March 2021. These targets are driving our supply chain to cut emissions, using efficient design and cleaner construction and following our carbon reduction hierarchy to prioritise actions that eliminate or cut emissions.

As part of HS2's Net Zero Carbon Plan, we have applied to join the United Nations' Race to Zero global campaign, and in doing so, set science-based targets that will allow us to achieve net zero emissions. The size of HS2 means this is an evolving process taking place over the years that build towards 2035.

We are working with our supply chain partners and industry peers to hit the following key net zero targets.

- We will introduce our first diesel-free site in 2022 – and stop using diesel on all our sites by 2029.
- We will work with our supply chain partners and industry peers to set ambitious new science-based targets in 2022. These will tackle carbon emission 'hotspots' year-on-year as we build HS2.
- We (HS2 Ltd) will cut emissions from sources our organisation owns or controls – known as Scope 1 emissions – and indirect emissions from electricity production – known as Scope 2 emissions. From 2025, we'll offset the Scope 1 and Scope 2 emissions we can't eliminate. (See 'How HS2's emissions are defined by scopes' on [page 9](#).)
- We will cut emissions from the concrete and steel we source by 50% (tCO<sub>2</sub>e/t) by 2030 compared with 2021 levels.
- We will use 100% zero carbon electricity generation to power our trains – making journeys on HS2 zero carbon for emissions from 'day one'.
- We will invest in innovation and form partnerships to speed up ways to cut emissions in HS2's supply chain.
- We will offset residual carbon emissions we cannot eliminate as we build, maintain and operate HS2 from 2035. This includes looking at ways we can capture and store carbon emissions using nature-based interventions as part of our long-term plan to achieve biodiversity net gains for HS2.

HS2's Net Zero Carbon Plan will be complemented by HS2's forthcoming Biodiversity Plan, which will examine our targets to preserve and promote the natural environment, progressively moving to biodiversity net gains for the high-speed railway. Both our carbon plan and biodiversity plan fit under the overarching targets we set out in [HS2's Environmental Sustainability Vision](#).

<sup>1</sup> Full Business Case High Speed 2 Phase One, DfT (April 2020), p40, 1.108 – 1.109 and p47, table 2.2 [assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/939905/full-businesscase-hs2-phase-one.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/939905/full-businesscase-hs2-phase-one.pdf)

## Destination net zero

### What we mean by net zero and carbon emissions

The United Nations Intergovernmental Panel on Climate Change (IPCC) defines net zero carbon as the point when “anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period”<sup>2</sup>.

In other words, net zero takes place when the emissions we create are balanced by steps we take to remove them from the atmosphere.

Greenhouse gases (GHGs) occur naturally in the atmosphere and they are also caused by human activity. They absorb and ‘trap’ heat in the Earth’s atmosphere and prevent it escaping back into space. This is known as the greenhouse effect. The primary GHGs in the atmosphere are water vapour (H<sub>2</sub>O), carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), methane (CH<sub>4</sub>) and ozone (O<sub>3</sub>)<sup>3</sup>. While the greenhouse effect is needed to sustain life on Earth, human activity has increased the concentration of GHGs, leading to rising temperatures.

GHGs are presented in carbon dioxide equivalent units (CO<sub>2</sub>e)<sup>4</sup>. Carbon dioxide dominates UK emissions, accounting for about 80% of GHG emissions in 2019<sup>5</sup>. For details on how we calculate our carbon footprint, please see [page 8](#).

2 The Intergovernmental Panel on Climate Change [ipcc.ch/sr15/chapter/glossary/](https://www.ipcc.ch/sr15/chapter/glossary/)

3 The Intergovernmental Panel on Climate Change [ipcc.ch/sr15/chapter/glossary/](https://www.ipcc.ch/sr15/chapter/glossary/)

4 2019 UK Greenhouse Gas Emissions, Department for Business, Energy & Industrial Strategy (February 2021), p4. [assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/957887/2019\\_Final\\_greenhouse\\_gas\\_emissions\\_statistical\\_release.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/957887/2019_Final_greenhouse_gas_emissions_statistical_release.pdf)

5 2019 UK Greenhouse Gas Emissions, Department for Business, Energy & Industrial Strategy (February 2021), p6. [assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/957887/2019\\_Final\\_greenhouse\\_gas\\_emissions\\_statistical\\_release.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/957887/2019_Final_greenhouse_gas_emissions_statistical_release.pdf)

# Destination net zero

## Achieving our 2035 net zero target – how we will get there

From 2035, we will either reduce the emissions we produce to zero or make those we cannot eliminate net zero using natural or technological methods, known as carbon offsetting. This will allow us to remove the same level of emissions that HS2 produces. Our target covers the way the high-speed rail network is built, operated and maintained from 2035.

Cutting carbon emissions is integrated into all areas of our work as we build HS2. We have carried out significant carbon-reduction work through the design of the railway and we are reducing emissions during the early works that are preparing the ground for HS2. This carbon-cutting work continues in HS2's main works – which started construction in 2020 for the Phase One route between London and the West Midlands – and includes our stations and depots. We have set new benchmarks for environmental performance with our award-winning Interchange station, which has achieved an 'outstanding' rating at the design stage from BREEAM, the leading standard for sustainable buildings.

All this activity – in design, early works and major construction – means we are tackling climate change now and this is allowing us to build towards net zero from 2035.

We will be setting new science-based targets to bring down emissions during construction. New targets in this plan cover diesel, concrete and steel and we will build on them as we continue to construct HS2.

Our approach to delivering net zero is in line with the greenhouse gas management hierarchy outlined on the following page. This prioritises the need to 'eliminate, reduce, substitute and compensate' carbon emissions.

### Our targets for reducing carbon emissions and achieving net zero from 2035



#### Net zero

for HS2 Ltd corporate activities by 2025



#### 50% reduction

in carbon emissions by 2030



#### 100%

zero carbon electricity to power trains



#### 100%

residual carbon emissions offset from 2035



#### Net zero

construction and operation from 2035

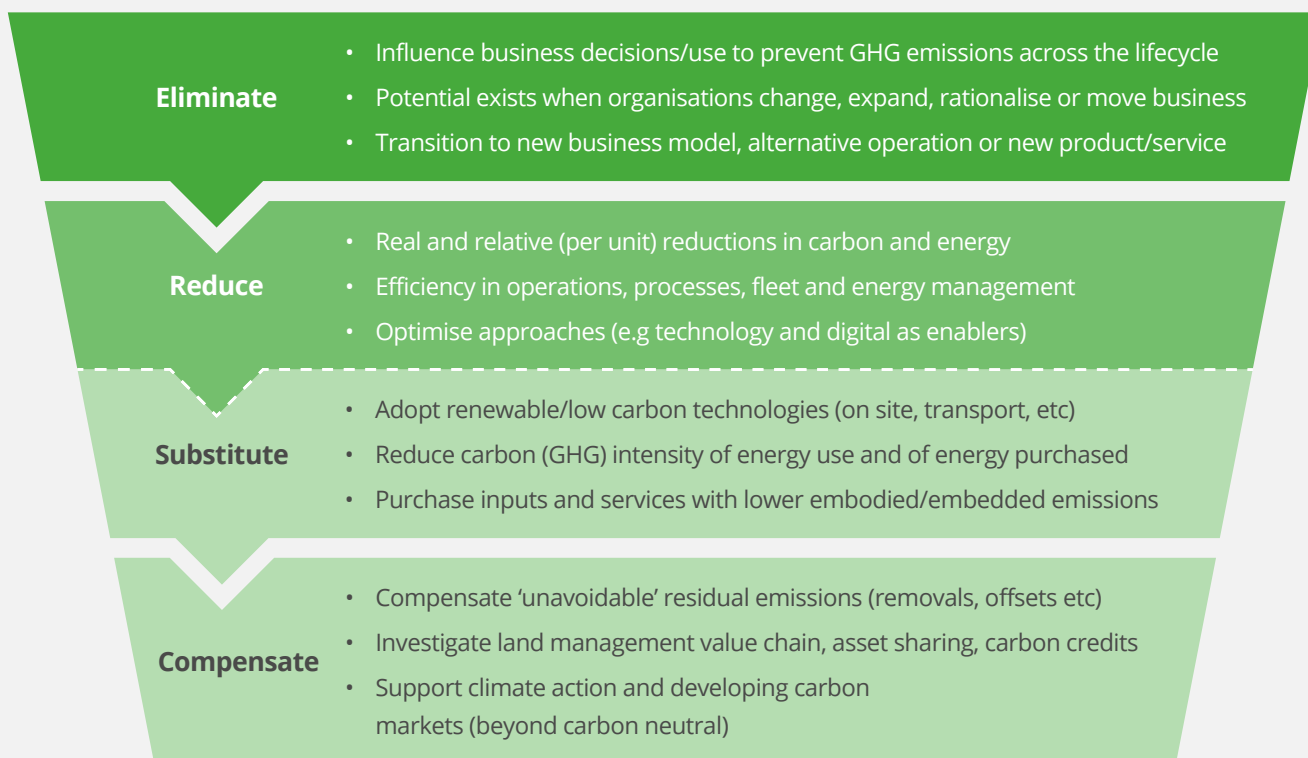
## Destination net zero

HS2 services are set to start running on Phase One between 2029 and 2033 and on Phase 2a, connecting the West Midlands and Crewe, in the range 2030 to 2034. This means part of the network will be operating as we continue to build Phase 2b further north. We recognise there are residual emissions we cannot avoid and from 2035 we will offset these emissions.

Offsetting emissions could include planting new trees to absorb carbon dioxide. It is one of the reasons we are planting seven million trees and shrubs along Phase One as part of the Green Corridor we are creating alongside the railway.

As a company, we are creating a culture that promotes carbon reduction and allows individuals and teams to take action to cut emissions. We are providing industry leadership to speed up activities towards net zero and are working with industry groups and peers, supply chain partners and key stakeholders to make sure our efforts are aligned, effective and inspire action. We are working with our supply chain – who will drive the majority of the reduction – to ensure we have the capacity, capability and competency to deliver our ambitious targets and leave a legacy of green skills for future infrastructure projects.

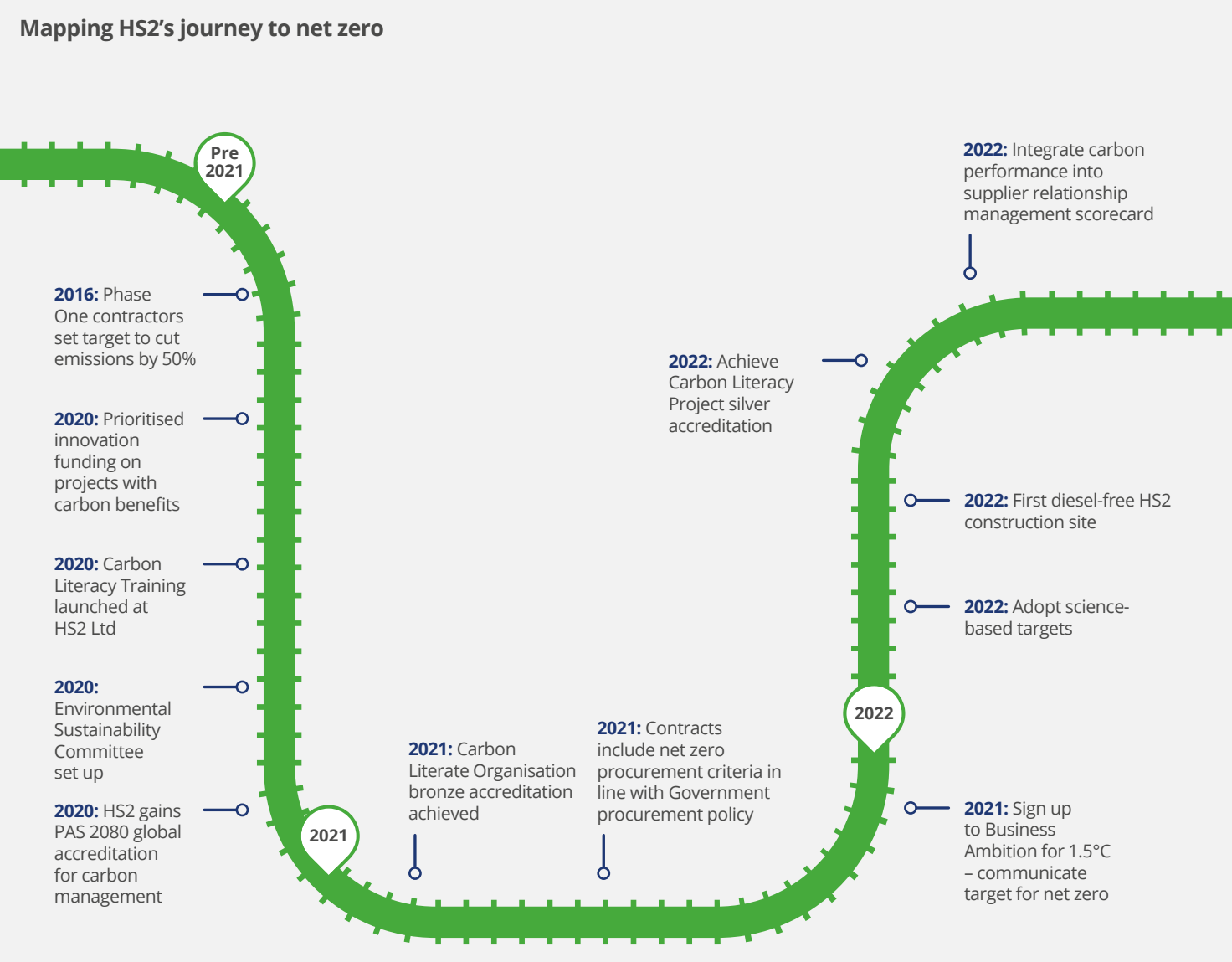
### Greenhouse gas management hierarchy



**Source:** IEMA Greenhouse Gas Management Hierarchy, published 2009, updated 2020.

# Destination net zero

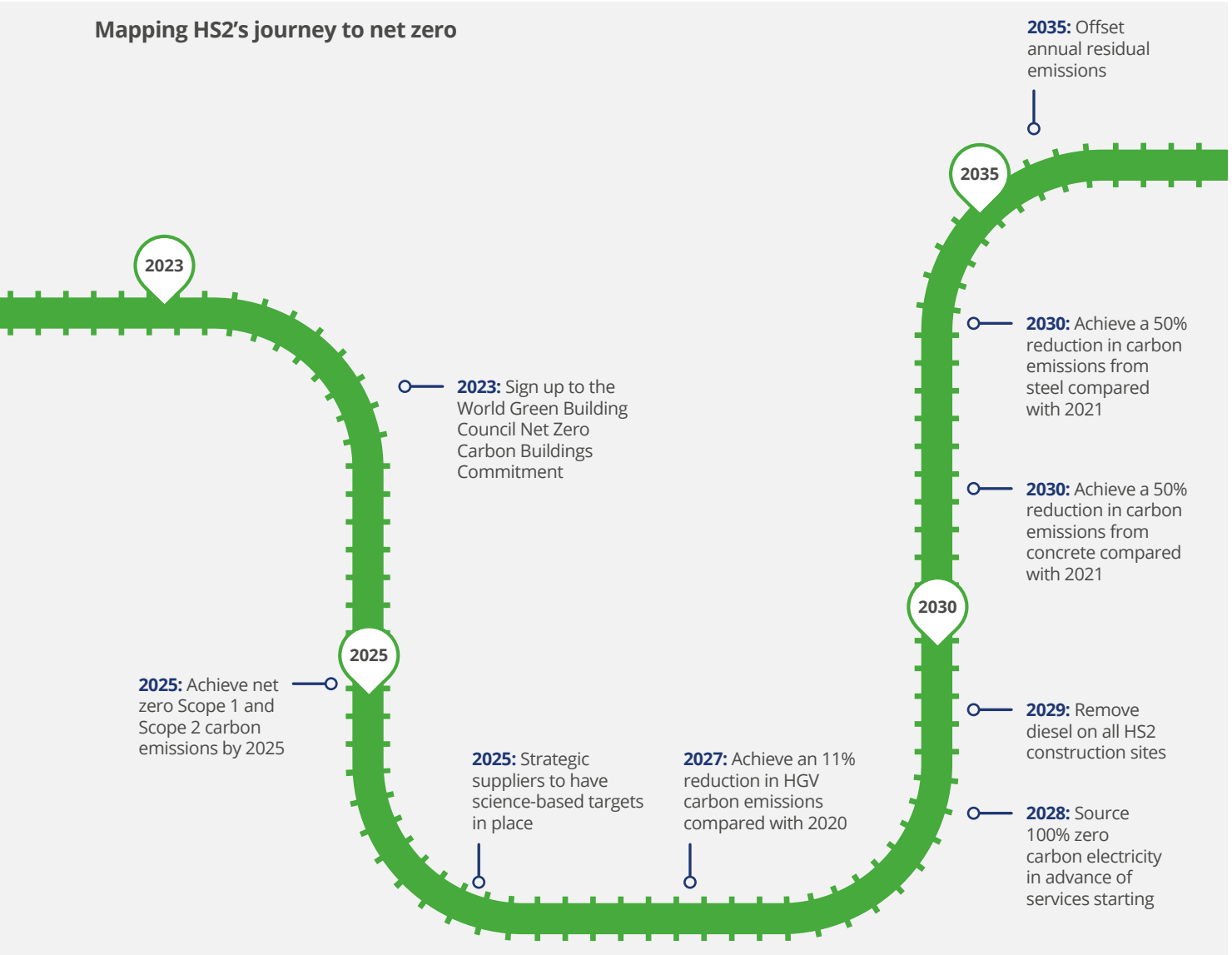
HS2's net zero target builds on earlier action, our work today and our plans for future years, as this graphic shows.



**Note:** Milestones on HS2's timeline towards net zero are continued on the next page.

# Destination net zero

## Mapping HS2's journey to net zero





# HS2's carbon footprint

## How we calculate our carbon footprint

HS2's carbon footprint is measured and assured over the whole life of our assets, which covers 120 years of service. For Phase One, we estimated our baseline for emissions at 14.5 million tonnes of carbon dioxide equivalent. This baseline represents the emissions HS2 would produce if we did not carry out any carbon-cutting measures. As the Project matures, we will be able to estimate baselines for Phase 2a and Phase 2b. Information about HS2's carbon footprint is at [hs2.org.uk/why/carbon](https://hs2.org.uk/why/carbon)

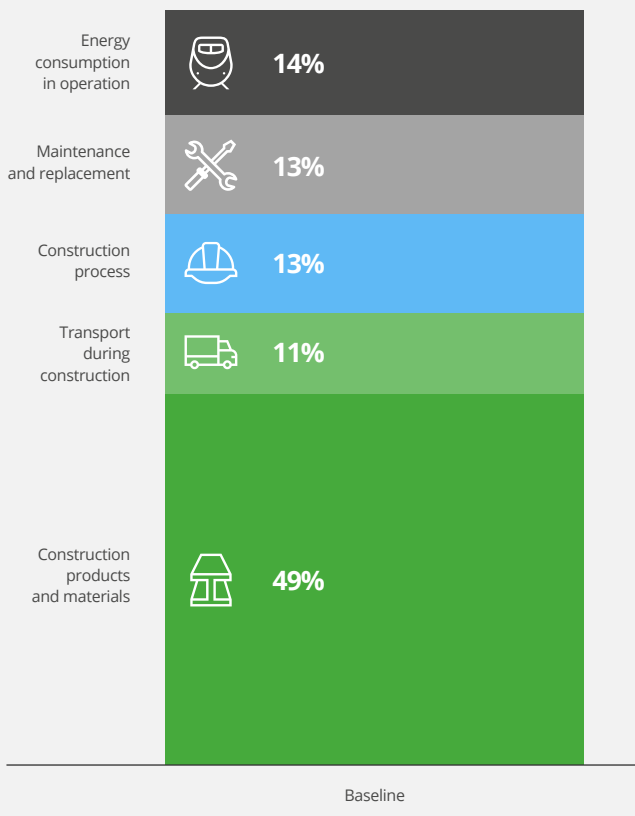
By its nature, construction is carbon intensive. About half the emissions set to be produced by Phase One are associated with the materials we will need to build the railway. Known as embodied emissions, they are produced during the extraction, processing and manufacture of raw materials. For HS2, the main sources of embodied emissions are concrete and steel.

The illustration (right) shows the relative proportion of emissions in our baseline for the different activities and processes needed to build and operate Phase One. We expect the share of total emissions to be similar for Phase 2a and Phase 2b.

HS2's carbon footprint can also be broken down by the main components, or asset types, of the railway. This includes the huge construction programme being undertaken by the main works contractors who are building the tunnels, viaducts, bridges and embankments. Early works and main works account for about two-thirds (63%) of carbon emissions, rolling stock is 14%, stations and depots are 12% and railway systems are 11%.

It is important to note the figure for each activity represents the baseline before any carbon reductions have taken place. It is effectively a 'do nothing' scenario. For example, 'Energy consumption in operation' in the illustration is 14% but for journeys on HS2 this will reduce to zero because we will power our trains using electricity with zero carbon emissions.

## Breakdown of HS2's carbon footprint for Phase One



# HS2's carbon footprint

## How HS2's emissions are defined by scopes

Our net zero target covers emissions from our supply chain partners including: how materials are manufactured and construction work; the way the HS2 network is run – for example, how our stations and trains are operated; and the emissions we produce as a company, such as emissions from HS2 Ltd offices.

The Greenhouse Gas Protocol<sup>6</sup> classifies emissions by three scopes or categories. The scopes are defined by the activities that cause the emissions.

- Scope 1 covers direct emissions from sources owned or controlled by an organisation.
- Scope 2 covers indirect emissions from producing the electricity that an organisation purchases.
- Scope 3 covers indirect emissions in an organisation's supply chain. Scope 3 accounts for the majority of HS2's emissions.

Carbon emissions created by building or diverting third-party assets, such as work carried out by Network Rail or utility companies, are not included in the scope of this plan. This includes work on these assets carried out by our contractors or statutory undertakers and electricity supplied to the existing rail network. The scope of our work in this field will be reviewed each year to make sure it is relevant to our activities and follows best practice.

## How the scope definitions of the Greenhouse Gas Protocol apply to HS2 (the railway) and HS2 Ltd (the company)

### Scope definition

### How our aims align with the scopes



**Scope 1** emissions are direct emissions from sources owned or controlled by an organisation, for example, for HS2 Ltd this includes any fuel combustion at our offices, our vehicle fleet and air conditioning gases.

- ▶ **Corporate:** HS2 Ltd to achieve net zero Scope 1 emissions by 2025, e.g. for fuel combustion or air conditioning gases.



**Scope 2** emissions are indirect emissions from the generation of purchased electricity, for example, for HS2 this would include electricity to power our offices, trains, stations and depots.

- ▶ **Corporate:** HS2 Ltd to achieve net-zero Scope 2 emissions by 2025, e.g. our office electricity.
- ▶ **Operation:** HS2 will be powered by zero carbon electricity.



**Scope 3** emissions include all other indirect emissions in an organisation's value chain. For HS2, these emissions make up most of our carbon footprint. They include the embodied emissions associated with extracting, processing and manufacturing materials and construction products, fuel and electricity used by our contractors to build HS2 and managing waste from construction.

- ▶ **Construction:** Net zero for construction from 2035.

<sup>6</sup> [ghgprotocol.org](https://ghgprotocol.org)

# The journey so far

## Where we are now

HS2's progress towards destination net zero continues to evolve as the complex design and construction programme matures. This is informed by the Government's policy on net zero, global developments in tackling climate change and the innovative building methods and techniques that are being pioneered on HS2.

Since HS2 Ltd was formed by the Government in 2009, we have prioritised our work on HS2's effect on carbon emissions and the wider environment, both in rural settings as well as in urban areas. Reducing the railway's carbon footprint was a key part of the Environmental Statement we produced for the legislation seeking permission to build Phase One of HS2, which was approved in 2017.

The same rigorous standards are being applied to Phase 2a and Phase 2b of HS2.

These are some of the key milestones and achievements to date on HS2's journey towards net zero.

- **2013:** HS2 becomes one of the first major infrastructure projects to have its carbon footprint assessed in the Environmental Statement that is produced for the Phase One hybrid Bill.
- **2016:** We set industry-leading carbon targets for our Phase One contractors to achieve a 50% reduction in emissions. This takes place as the hybrid Bill is being scrutinised by Parliament. Royal Assent is achieved in 2017.
- **2019:** The Government sets a target to bring all greenhouse gas emissions to net zero by 2050.
- **2020:** We become the first UK transport sector organisation to achieve PAS 2080 accreditation, recognising the carbon management processes we have put in place to reduce emissions through the design, construction and operation of HS2. We are involved in developing the standard and are building on this work as members of the PAS steering group.
- **2021:** Early works and design developments for main works already result in significant carbon reductions. More information can be found in our **Environmental Sustainability Progress Report**.
- **2021:** HS2's Net Zero Carbon Plan sets out our target for net zero from 2035. We commit to a range of actions as part of the plan.
- **2021:** Commitment letter submitted to join the UN-backed Race to Zero.

# The journey so far

## Using innovation to cut carbon emissions from HS2

We are championing innovation in design and construction and encouraging the supply chain to use new technologies to improve our carbon reduction targets. At this point, we are working on 32 innovative projects across the programme with projected savings of 1.6 million tonnes of carbon emissions. We are supporting the development of fuel-switching technologies and collaborating with partners to trial advanced technologies, materials and products.

In design, highlights so far include:

- cutting carbon emissions by 45% by redesigning the Chilterns tunnel south portal;
- Interchange station in Solihull becoming the first railway station in the world to achieve BREEAM 'outstanding' for its eco-friendly design;
- redesigning the roof at Old Oak Common station to reduce the amount of steel by 27%, cutting embodied carbon;
- cutting the amount of concrete and steel needed to build the Wendover Dean viaduct, Buckinghamshire, saving 7,433 tonnes of carbon – equivalent to 20,500 return flights from London to Edinburgh; and
- reducing the depth of the paving in the public realm at Curzon Street station by 38% to cut embodied carbon.

In construction, highlights include:

- trials of a new low carbon concrete product that cuts carbon emissions by 42% compared with standard concrete<sup>7</sup>;
- a world-first pilot scheme using recycled wind turbine blades to reinforce concrete – cutting carbon emissions for reinforcement by up to 90%;
- using 3D reinforced concrete printing onsite, cutting quantities of concrete, reducing carbon emission by up to 50% and cutting deliveries by truck;
- pioneering the UK's first electric forklift at a major construction site – achieving the same performance as a conventional model with zero emissions; and
- using Clean Air Gas Engine technology, initially in site welfare units, to cut carbon on construction sites.

<sup>7</sup> [mediacentre.hs2.org.uk/news/hs2-uses-new-pioneering-low-carbon-concrete-to-reduce-carbon-emissions-in-construction](https://mediacentre.hs2.org.uk/news/hs2-uses-new-pioneering-low-carbon-concrete-to-reduce-carbon-emissions-in-construction)

# The journey ahead

## Our next steps

We will seize every opportunity to cut emissions and reduce residual emissions by offsetting them from 2035. In doing so, we will use our Net Zero Carbon Plan as a catalyst to speed up the wider industry's transition to net zero. Some activities are well underway and some are new initiatives that form part of this plan.

In 2022, we will work with our supply chain partners and industry peers to set science-based targets that will build on our progress towards net zero.

We are focused and committed to taking a leading role. The climate crisis demands urgent action and we must be agile as new challenges emerge. We will regularly review our performance – and, where necessary, change our approach – to make sure we hit our targets.

We will report our progress against this plan each year through our Environmental Sustainability Progress Report and show how we are performing against our net zero targets.

To support these targets and actions, we have identified four areas that will be critical in delivering our ambition: people; partnerships; innovation and governance.

## People

All our staff and supply chain partners can play a key role in HS2 achieving net zero. We are building a culture in which people think about ways to cut emissions and we will support new initiatives that allow us to hit our carbon targets. A commitment to net zero will be a condition of winning work on HS2. This will make sure supply chain objectives are in line with net zero carbon and we will link our net zero carbon objectives to the performance of individuals and organisations. We will celebrate success in combatting climate change.

## Partnerships

The move to net zero requires a collective endeavour and we recognise the importance of collaboration, particularly with our peers and supply chain partners. We will communicate our net zero carbon objectives to stakeholders and be clear how we can work together. We will share best practice and lessons learned with the wider construction sector and use our influence to encourage others to take action to tackle climate change. In this way, we will promote best practice, replicate success across the industry and support the UK manufacturing and construction sectors to become net zero. We support the Government's Decarbonising Transport plan that sets out the UK pathway to net zero transport and the wider benefits this can deliver.

# The journey ahead

## Innovation

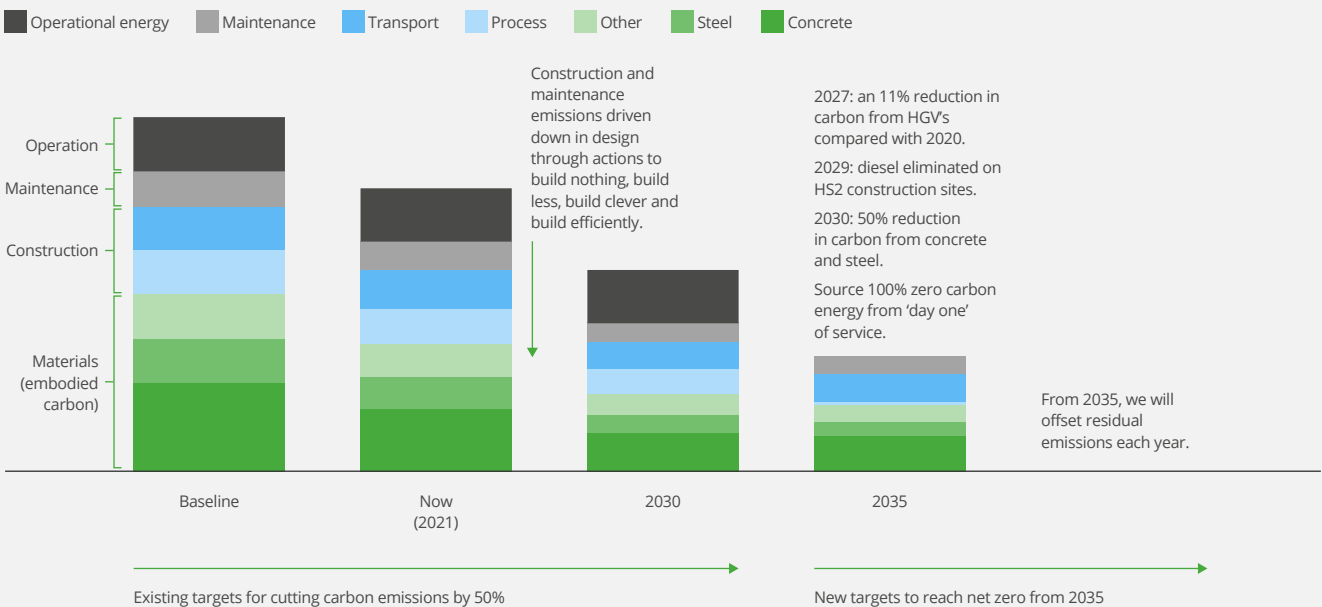
Many of the solutions that will allow us to move to net zero exist but there are barriers stopping them being used. This means there are still lots of ways we can innovate and we need to continually explore new technologies. We will support innovation in fuel-switching technologies, 'first-of-a-kind' demonstration, research into advanced technologies and advances in product innovation. We will set new standards for carbon best practice by creating the cultural and commercial conditions in which innovation can thrive, piloting new ideas to make sure they work and allow standards and specifications to be challenged.

## Governance

Our Net Zero Carbon Plan is owned at an executive level by HS2 Ltd CEO Mark Thurston. The HS2 Ltd Board is responsible for making sure we achieve our targets. Oversight is provided by the Environmental Sustainability Committee, a sub-committee of the HS2 Ltd Board. Our net zero carbon objectives will be incorporated in our existing environmental sustainability frameworks and policies, refining our governance arrangements as required to better integrate carbon into decision-making. We will use governance to raise awareness and drive carbon reduction performance and ensure net zero decision-making, reporting and risk management is efficient and effective. We will report progress against our objectives each year.

## Destination net zero

How the carbon reduction actions in this plan will contribute to net zero from 2035



# The journey ahead

## Our top 10 areas for action on cutting carbon emissions

Action area	Action	Outcomes
<b>1. Setting new targets</b>	<p>We have signed up to the Business Ambition for 1.5°C in 2021 and set science-based targets to be verified by the Science Based Targets Initiative (SBTI) in 2022.</p> <p>We will also require our supply chain partners to have their own verified science-based targets in place by 2025.</p> <p>In this Net Zero Carbon Plan, we commit to the following targets to tackle our key sources of emission sources.</p> <ul style="list-style-type: none"> <li>• All HS2 sites to be diesel-free by 2029 with our first diesel-free site in 2022.</li> <li>• Achieve a 50% reduction in carbon emissions from steel (tCO<sub>2</sub>e/t) compared with 2021 by 2030.</li> <li>• Achieve a 50% reduction in carbon emissions from concrete (tCO<sub>2</sub>e/t) compared with 2021 by 2030.</li> <li>• Achieve an 11% reduction in HGV gCO<sub>2</sub>e/km compared with 2020 by 2027.</li> <li>• Procure only zero carbon electricity from day one of HS2 operation.</li> <li>• Achieve net zero Scope 1 and 2 emissions by 2025.</li> <li>• Achieve net zero Scope 3 emissions from 2035, offsetting any residual emissions from this point.</li> </ul>	<ul style="list-style-type: none"> <li>• Aligning with industry peers shows our intent to the market.</li> <li>• Science-based targets demonstrate how we will achieve our net zero goal for HS2.</li> <li>• Supply chain will buy into our targets and align with our goals, setting their own targets for net zero.</li> <li>• Speed up decarbonisation of key emission sources including diesel, concrete and steel.</li> <li>• Stimulate demand for low carbon materials.</li> <li>• Lead by example on Europe's biggest infrastructure project.</li> </ul>
<b>2. Leadership</b>	<p>HS2's Net Zero Carbon Plan is owned at an executive level by our CEO.</p> <p>Each directorate of our business will develop an action plan in 2022 detailing how it will work towards achieving net zero for HS2 Ltd.</p> <p>We will align our approach with industry peers and work with our supply chain partners.</p> <p>We will work with industry groups and peers, supply chain partners and other key stakeholders to align our efforts and inspire action.</p>	<ul style="list-style-type: none"> <li>• Industry leadership to provide action towards net zero.</li> <li>• Make carbon emissions as important as cost, programme and safety.</li> <li>• Achieving net zero sits with business directorates who understand their ability to reduce carbon emissions and take action.</li> </ul>
<b>3. Collaboration and partnerships</b>	<p>Engage with strategic suppliers and other key stakeholders to understand their carbon reduction plans, investigate joint initiatives and speed up action, e.g. through the Infrastructure Client Group.</p> <p>Share lessons learned and best practice to reduce carbon across HS2 contracts and in the wider industry.</p> <p>Work with supply chain partners to identify and pursue opportunities to reduce carbon in construction – through energy and resource efficiency and use of low carbon materials.</p>	<ul style="list-style-type: none"> <li>• Stakeholders are engaged and we develop common objectives for the industry – leading to more efficient and effective responses through collective action.</li> <li>• Lessons learned and best practice fully carried out and shared across contracts and the wider industry.</li> <li>• Reduction in carbon on site-based and factory processes in the supply chain.</li> </ul>
<b>4. Training people</b>	<p>Continue roll-out of Carbon Literacy Training to staff to achieve silver accreditation from the Carbon Literacy Project by 2023.</p> <p>Assess the ability of our organisation and our supply chain to achieve net zero. Where training is needed, we will work with our supply chain partners to boost skills across the industry, e.g. the Supply Chain Sustainability School.</p>	<ul style="list-style-type: none"> <li>• Carbon literate workforce which is positively engaged in delivering a low carbon programme.</li> <li>• Our organisation and supply chain is able to respond to the challenge of delivering net zero.</li> </ul>

# The journey ahead

## Our top 10 areas for action on cutting carbon emissions

Action area	Action	Outcomes
<b>5. Procurement and commercial</b>	<p>Review our commercial contract models to consider how our supply chain partners can be best encouraged and incentivised to deliver the lowest carbon outcome and how we can remove commercial barriers.</p> <p>Integrate carbon performance in the supplier relationship management scorecard.</p> <p>Adopt net zero carbon procurement criteria and incentives for future contracts.</p> <p>'Green leases' in place for retailers and other occupiers of our stations to minimise operational energy consumption.</p>	<ul style="list-style-type: none"> <li>Commercial contract models aligned with goal of delivering carbon reductions.</li> <li>Greater emphasis placed on the importance of meeting carbon reduction targets alongside those of cost and programme.</li> <li>Contracts awarded to suppliers committed to net zero.</li> <li>Occupiers of station retail units aligned to HS2's net zero carbon goals.</li> </ul>
<b>6. Innovation</b>	<p>Continue to pilot and use low carbon materials, fuels and construction methods through the HS2 Innovation programme.</p> <p>Continue to partner with industry groups, such as through the i3P programme, to fund innovation to bring benefits across the construction sector.</p> <p>Capitalise on the potential carbon savings identified through our existing innovation pipeline to accelerate opportunities from ideas to delivery.</p> <p>Explore opportunities for carbon 'insetting' – investment in our supply chain and wider industry to accelerate progress to decarbonise known hotspots – through our innovation programme, peer partnerships and cross-industry collaboration.</p>	<ul style="list-style-type: none"> <li>Promote industry best practice and the uptake of low carbon solutions.</li> <li>Accelerate industry adoption of low carbon construction methods, materials and fuels.</li> <li>Quantify the benefits of our innovation investment and the potential opportunities for carbon insetting in our supply chain.</li> </ul>
<b>7. Organisation and culture</b>	<p>Integrate net zero carbon into performance and development frameworks.</p> <p>Establish a Green Network in HS2 Ltd, for staff to actively contribute and engage with our environmental agenda, promoting and encouraging engagement with diverse groups.</p> <p>Establish ways to recognise and reward low and net zero carbon success.</p> <p>Continue to report on HS2's whole-life carbon reduction performance.</p>	<ul style="list-style-type: none"> <li>Engaged staff and clear responsibility for carbon reduction objectives across the business.</li> <li>Clear role expectations to make carbon reductions.</li> <li>Low and net zero carbon successes recognised in awards for our supply chain and staff.</li> <li>Engaged supply chain and recognition of best practice in carbon reductions.</li> <li>Carbon reduction contributions valued by the business and part of the culture.</li> <li>Transparency in reporting against our targets and commitments.</li> </ul>



## The journey ahead

### Our top 10 areas for action on cutting carbon emissions

Action area	Action	Outcomes
<b>8. Digital and technological solutions</b>	<p>As we build up HS2's <b>digital twin</b> we will use digital engineering tools and processes to transform and improve project delivery to reduce carbon emissions.</p> <p>Develop automation for HS2 maintenance.</p>	<ul style="list-style-type: none"> <li>• Improved accessibility and use of carbon management information.</li> <li>• Reductions in onsite human activity and associated carbon.</li> </ul>
<b>9. Standards, specifications and project delivery</b>	<p>Review standards and specifications to remove potential 'blockers' to adopting low carbon solutions and include net zero carbon as a key objective.</p> <p>Review and enhance carbon reduction performance management and governance to drive improvement.</p> <p>Develop HS2's construction productivity strategy.</p>	<ul style="list-style-type: none"> <li>• Standards and specifications that allow low carbon solutions to be carried out.</li> <li>• Future-proofed design specifications.</li> <li>• Continuous improvement of our PAS 2080 carbon management system to challenge designs on carbon performance and use data to inform business decision-making.</li> <li>• Further challenge designs at key project gateways on carbon reduction.</li> <li>• Improved productivity, less carbon produced in site-based activity and greater use of low carbon, factory-based processes.</li> </ul>
<b>10. Offsetting</b>	<p>Develop a carbon offsetting strategy for the residual carbon emissions that we cannot cut.</p> <p>Explore the opportunities for carbon offsetting projects on the HS2 estate, including opportunities presented by our plan to contribute to delivering HS2's biodiversity net gain objectives.</p> <p>Explore opportunities to support offsetting research and development projects.</p>	<ul style="list-style-type: none"> <li>• Ensure carbon offsets achieve the carbon benefit we expect and create additional value where possible.</li> <li>• Increase the availability of self-generated carbon schemes to support our net zero target.</li> <li>• Support the science and technologies driving offsetting.</li> </ul>

# HS2

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