National Highways' 2040 net zero ambitions
- the pavements' perspective

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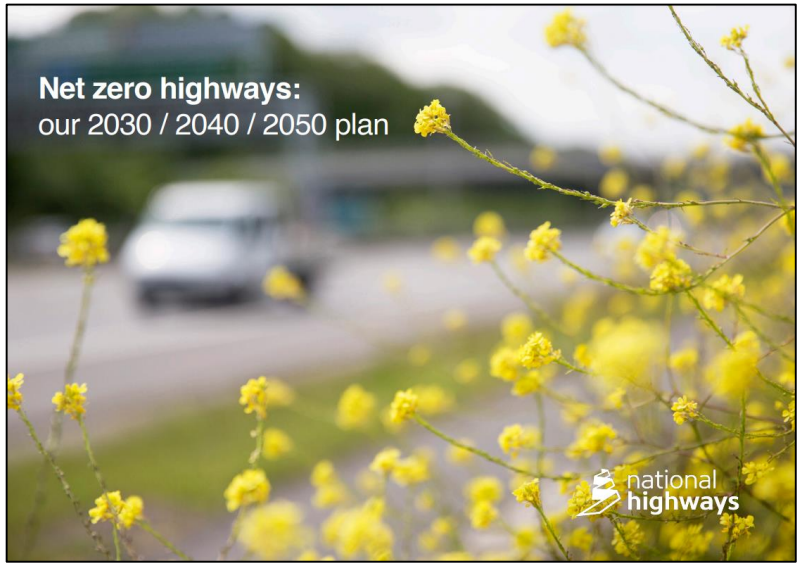
Overview

- Net zero highways: our 2030 / 2040 / 2050 plan
- Net zero for maintenance and construction by 2040 – key actions
- Company initiatives that will affect pavements
- Specific pavements team initiatives (in Safety, Engineering & Standards)

Net zero highways: our 2030 - 2040 - 2050 plan



- Launched to support DfT's decarbonising transport plan (July 2021)
  - A clear programme with time-bound targets
  - Aligns to the 1.5°C reduction goal of the Paris Agreement
  - Also refers to our other environmental priorities: AQ, noise, biodiversity, CC adaptation
- Only a few months for actions to filter down to us who look after specific assets (pavements are one of nine asset classes)

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Net zero highways: Our 2030 – 2040 – 2050 plan

2030
Our direct emissions

- Switching to electric vehicles
- Using our green estate
- Roadside equipment

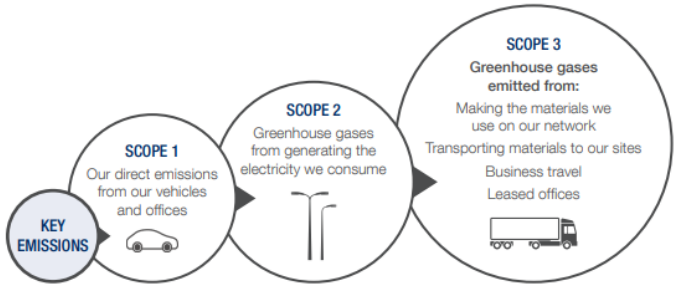
2040
Construction & maintenance

- Materials and plant
- How we buy
- Demonstrator projects

2050
Enabling zero-carbon vehicles

- Customer service for EV users
- HGV technology trials
- Modal shift

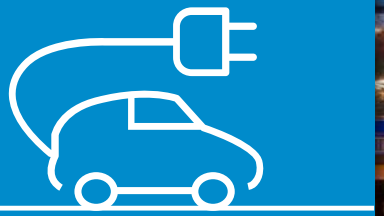
The Greenhouse Gas Protocol standards



We are already taking action to tackle carbon emissions

We have made progress in Road Periods 1 and 2, so we are not starting from scratch:

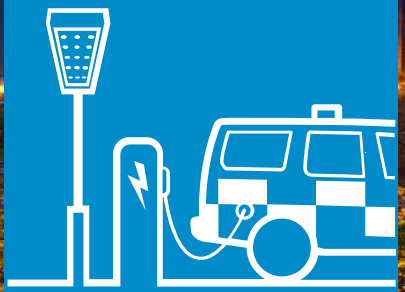
95% of the network within 20 minutes of a rapid charger



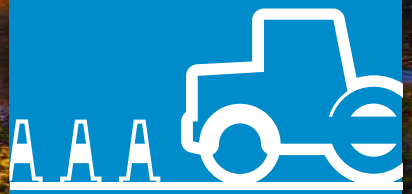
150 cycle schemes in RP1

£12.5m invested to support electric vans

Over 50 PHEV inspection vehicles



Carbon neutral construction of A590 J36 to Brettargh Holt



Innovation in projects

A14, M20, M4: hybrid electric excavators

A160: lower carbon warm asphalt

Our indicative roadmap

While our 2030-40-50 targets drive this plan, we also have developed an interim trajectory, shown here. These will drive immediate action and provide an indicator of progress.

Our three targets

CORPORATE EMISSIONS

Net zero by 2030

Net zero corporate

2020 – We buy 100% of our electricity via a certified renewables tariff

2022 – Develop our renewables roll out plan and submit planning for our first pilot site

2022 – Zero carbon memoranda agreed with our landlords

75% reduction in emissions compared to 2017/18

2025 – 75% of our light fleet switched to electric or hybrid

2027 – 70% of our lights network switched to LED

2027 – light fleet is 100% electric excluding traffic officer vehicles

100% Our corporate emissions are **net zero** without purchased offsetting

2030 – Light fleet including traffic officer vehicles is 100% electric vehicles

2030 – Generate at least 10% of our electricity from renewables on our estate

2030 – Plant at least 3 million trees since 2021

2040 – 100% electric or hydrogen heavy vehicles

MAINTENANCE & CONSTRUCTION EMISSIONS

Net zero by 2040

Net zero construction and maintenance

2022 – Implement and certify a construction carbon management system

2022 – Our specifications Manual of Contracts Documents of Highways Works (MCHW) have integrated net zero thinking

2022 – Launch a zero carbon materials innovation programme

2022 – Develop a 2040 zero carbon road map for concrete, asphalt and steel

0-10% reduction in emissions compared to 2020

2025 – Our specifications Design Manual for Roads and Bridges (DMRB) integrate net zero thinking

2025 – Our Tier 1 and Tier 2 suppliers have certified carbon management systems

2025 – Commission a long term delivery partner to design a major net zero road scheme

40-50% reduction in emissions compared to 2020

2030 – Only zero carbon plant on our sites and site cabins

70-80% reduction in emissions compared to 2020

2035 – First major scheme that aims to be net zero constructed

100% Our schemes are net zero, and where there are residual emissions, these will be offset using robust certified 'removal' offsets

2040 – Zero carbon HGVs deliver to our sites

ROAD USER EMISSIONS

Net zero by 2050

Net zero road user

2020 – 33 $MtCO_2e$ annual emissions from road users

2020 – 95% of the SRN is within 20 minutes of a rapid charger

2021 – We are continuing to equip our traffic officers with the tools to recover EVs

2021 – Implement our remoding trials

2023 – Support to 'project rapid' delivering £950 million of charging infrastructure at MSAs

2025 – emissions reduced to between 31-26 $MtCO_2e$

2025 – By end of road period explore options for further freight demonstrators

2025 – Explore the potential to work with partners to practically demonstrate the EV charging services blueprint

2025 – Investigate energy storage to support EV charging at MSAs

2030 – emissions reduced to between 25-15 $MtCO_2e$

2035 – emissions reduced to between 20-7 $MtCO_2e$

2040 – emissions reduced to between 8-3 $MtCO_2e$

2045 – emissions reduced to between 5-1 $MtCO_2e$

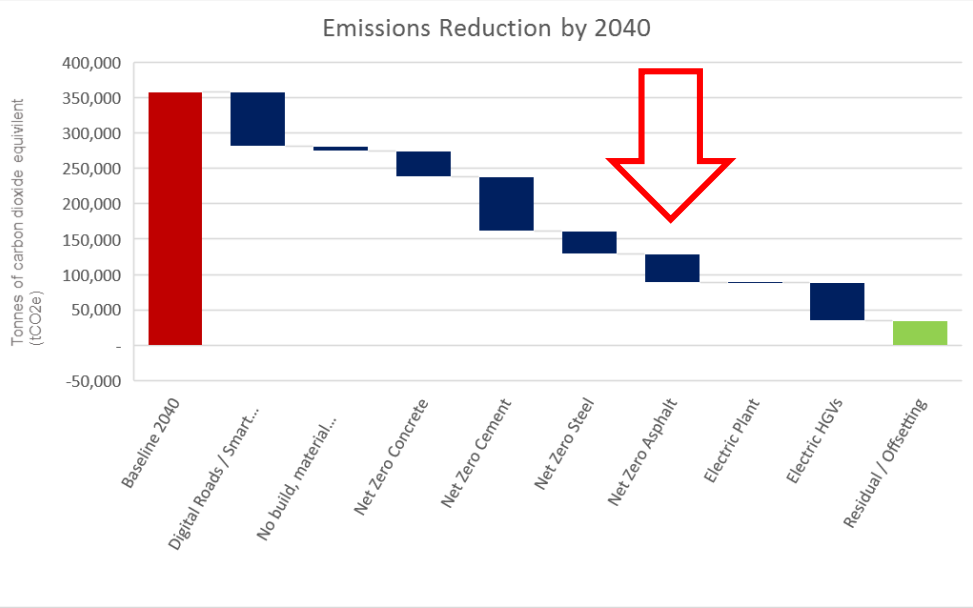
100% The network will be net zero

2020 2025 2030 2035 2040 2045 2050

Achieving net zero for construction & maintenance by 2040

Climate Change Committee has said that Government should target net zero construction (all sectors) by 2040

The Transport Decarbonisation Plan does not address transport construction



Working with our supply chain

Many companies are targeting net zero by 2045. We want to set a faster pace so we are targeting 2040

We recognise that we need to work in partnership with the supply chain and incentivise the right decisions

Cabinet Office

Procurement Policy Note – Taking Account of Carbon Reduction Plans in the procurement of major government contracts

Action Note PPN 06/21 05/06/2021

Issue

1. The UK Government amended the Climate Change Act 2008[1] in 2019 by introducing a target of at least a 100% reduction in the net UK carbon account (i.e. reduction of greenhouse gas emissions[2], compared to 1990 levels) by 2050. This is otherwise known as the 'Net Zero' target. This Procurement Policy Note (PPN) sets out how to take account of suppliers' Net Zero Carbon Reduction Plans in the procurement of major Government contracts.

Dissemination and Scope

2. This PPN applies to all Central Government Departments, their Executive Agencies and Non Departmental Public Bodies. These organisations are referred to in this PPN as 'In-Scope Organisations'. Please circulate this PPN within your organisation, drawing it to the attention of those with a commercial and procurement role.

3. In-Scope Organisations should take action to apply this PPN when procuring goods and/or services and/or works with an anticipated contract value above £5 million per annum[3] (excluding VAT) which are subject to the Public Contracts Regulations 2015 save where it would not be related and proportionate to the contract.

Pavements initiatives

- Three main [current] initiatives within SES pavements:
  - Reporting specific carbon footprints
    - Collaborative project: National Highways, Mineral Products Association, Eurobitume UK
    - Looking at the method to report ‘actuals’ in terms of carbon footprint (+ futureproofing for other impacts)
    - Starting point: asPECT - potentially moving towards EPDs, using concurrent of CEN initiatives
    - Trying to address the methodological issues such as service life etc.
  - Building the roadmap for asphalt, towards Net Zero in 2040
    - Target date June 2022
    - Lots of supply-chain engagement necessary for this
    - We’ll be ‘stakeholders’ on other roadmaps such as cement, steel
  - Facilitating network material trials / switch to WMAs
    - Longer life bitumen, more durable and higher recycled content surface courses…

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Reporting carbon footprints

Carbon emissions calculation tool

A tool to calculate carbon emissions for operational, construction and maintenance activities undertaken on behalf of National Highways.

- Carbon returns from area teams and major projects
  - Have been collected for several years
  - Used to create the ‘baselines’ in the carbon plan
  - Now need to switch to suppliers reporting ‘actuals’
    - Where carbon reduction plans come to fruition
    - Where innovation for carbon reduction in materials can be demonstrated
  - Beware unintended consequences of carbon reduction
  - EPDs, that evaluate a range of impacts, can provide a more holistic viewpoint

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Reporting specific carbon footprints - current

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Delivering through RAMBOLL
On behalf of the WSP supplier group

Home Page | Guidance | Summary Report | Outputs | Emissions Factors | Material Density | Notes

Emissions and Conversion Factors

Materials emissions factors have been taken from the Inventory of Carbon and Energy (ICE) version 3 (please note that some of the emisisons factors in version 3 are the same as version 2). Energy, waste and transport emissions factors have been taken from the UK Government emission conversion factors for greenhouse gas company reporting 2021 (BEIS: Department for Business, Energy & Industrial Strategy). Where an input unit is not required as a weight, such as a number (no.) of products or metres of product, a conversion factor has been applied. This is based upon the weight of a product calculated using suppliers specifications and technical drawings. When a product contains multiple materials a weighted average carbon factor has been calculated using multiple factors from the ICE V3. ICE carbon factors used within this tool include the embodied carbon within the raw materials but do not account for the carbon associated with the manufacture or processing of the raw materials into a product prior to their purchase by the reporting contractor. Well to tank emissions, also known as upstream or indirect emissions, is an average of all the GHG emissions released into the atmosphere from the production, processing and delivery of a fuel. Well to tank emissions have been included for fuels directly used on site, but not for fuels used by third parties transporting materials to and from the site.

Category	Item	Material/Product	Input Unit	Material Type	Carbon Factor	Carbon Factor Units	Conversion Factor	Methodology
	Asphalt	General Asphalt	tonnes	Asphalt and Bitumen	0.055	tCO_2e/t	1	Carbon factor taken directly from the ICE V3: Asphalt > Bitumen binder content ranges from 3% to 7%. Value of 5.5% used here as a typical content.
		Warm Mix Asphalt	tonnes	Asphalt and Bitumen	0.053	tCO_2e/t	1	Carbon factor estimated to be 5% lower than the general asphalt value. If you have a carbon factor for a specific warm asphalt product please add a customer carbon factor and provide supporting information in the 'notes' section of carbon tool. The carbon tool guidance provides further information on custom factors and notes.

Step 4) Bulk Materials. Now that you have created a carbon return, you shall enter the data into each of the pages which are accessible from the second row of buttons at the top of the page. You shall start with the bulk materials page. For each material you need to add, click 'standard carbon factor' under the 'add new row' heading and enter the information required in the purple cells. If you believe you have a more accurate or representative carbon factor than the one shown in the tool, you can click the 'custom carbon factor' button which will allow you to input your own carbon factor. More of the cells in the row turn purple, and you should enter information in to each of these, including the methodology as to where the factor came from and why it has been used.

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Reporting specific carbon footprints - WMAs

908 (07/21) **Warm Mix Asphalt (WMA)**

(07/21) **WMA Carbon Footprint (Reduction) Measurement**

9 (07/21) The Contractor shall report CO_2 emissions for asphalt using the calculation tool detailed at: https://www.gov.uk/government/publications/carbon-tool.

10 (07/21) A cradle-to-gate carbon footprint analysis shall be submitted by the Contractor to the Overseeing Organisation and for Highways England contracts by email to: aspect@highwaysengland.co.uk for each WMA mixture in accordance with sub-Clause 9.

11 (07/21) The carbon footprint analysis shall be conducted in accordance with TRL PPR 575 – Protocol for the calculation of whole life cycle greenhouse gas emissions generated by asphalt, covering Steps 1 to 5 of the asphalt life cycle, from 'raw material acquisition' to 'road component production'.

12 (07/21) The carbon footprint shall be stated in $kgCO_2e$ per tonne of the warm mixture and broken down into totals for Steps 1-3, Step 4 and Step 5.

- Warm Mix Asphalts
  - Now permitted via Clause 908 for use on the SRN
  - Publicised as the preferential option to HMAs (with some exceptions)
  - The first pavements spec that requires reporting of actual carbon footprints
    - Will enable us to obtain a better default value
    - Should be the first significant progress towards 0-10% savings by 2025

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Roadmap to 2040 - asphalt

- What can feasibly be done and when?
  - Take a fundamental look across the asphalt life cycle, from quarry or refinery to deconstruction
  - Obtain input from the supply chain (lots of good ideas already)

Longer life binders	Alternative aggregates	Plant tech / fuels
Bio-based binders	Cold recycling	Additives
Higher recycled content	WMAs/HWMAs	Etc.

  - Determine the carbon reduction potentials of each
    - Assessed in context of an asset management strategy, in ‘whole life’ terms
    - Assign technological readiness
    - Access the ‘decarbonisation fund’ to accelerate progress

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Thank you

Net zero highways: our 2030 - 2040 - 2050 plan: https://highwaysengland.co.uk/netzerohighways/#plan

Asphalt pavement embodied carbon tool (asPECT): https://trl.co.uk/permanent-landing-pages/asphalt-pavement-embodied-carbon-tool-aspect/

Carbon emissions calculation tool: https://highwaysengland.co.uk/industry/carbon-emissions-calculation-tool/

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