SUPPLY CHAIN SUSTAINABILITY SCHOOL

highways england

REGIONAL DELIVERY PARTNERSHIP

Webinar: Reducing Carbon in Highways

8 July 2021

VolkerFitzpatrick

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GallifordTry plc

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Welcome

Andrew Wilson

Supply Chain Sustainability School

Housekeeping

- Use the Q&A for questions

- Share your feedback afterwards

Slides & recording will be shared with all participants

AGENDA

10.00 **Welcome and Context**
Andrew Wilson *Supply Chain Sustainability School*

10.10 **Understanding Carbon Reduction**
James Cadman *Lead Consultant, Action Sustainability*

10.30 **Working together to tackle carbon in the Supply Chain**
Dean Kerwick-Chrisp
Team Leader & Principal Environmental Advisor, Safety Engineering and Standards - Highways England

Tim Jordan
Supply Chain Manager, Highways – Balfour Beatty

Emma Hines
Senior Manager, Sustainable Construction - Tarmac

11.00 **Panel Q&A**
James Cadman *Lead Consultant, Action Sustainability*

11.20 **Conclusions and Close**
James Cadman *Lead Consultant, Action Sustainability*

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Introduction and Context

Regional Delivery Partnership
Supply Chain Sustainability Programme

Balfour Beatty

bam

COSTAIN

GallifordTry plc

GRAHAM

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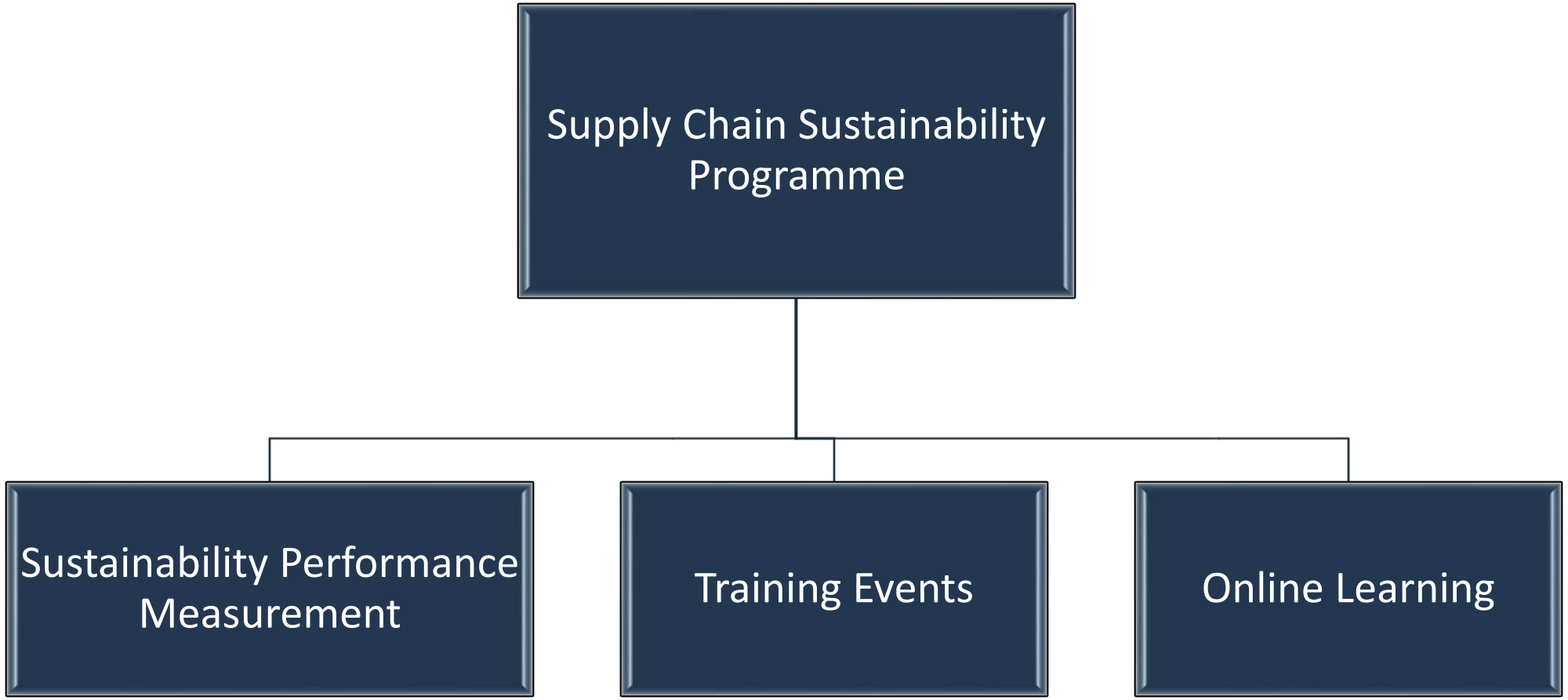
Programme Overview



Training Activity

TRAINING WORKSHOPS and WEBINARS - 2021
Carbon
Collaborative Working
Wellbeing
Offsite
Fairness, Inclusion, Respect (FIR)
Lean
Social Value
Modern Slavery
Sustainable Procurement
Waste / Resource Efficiency
Business Ethics

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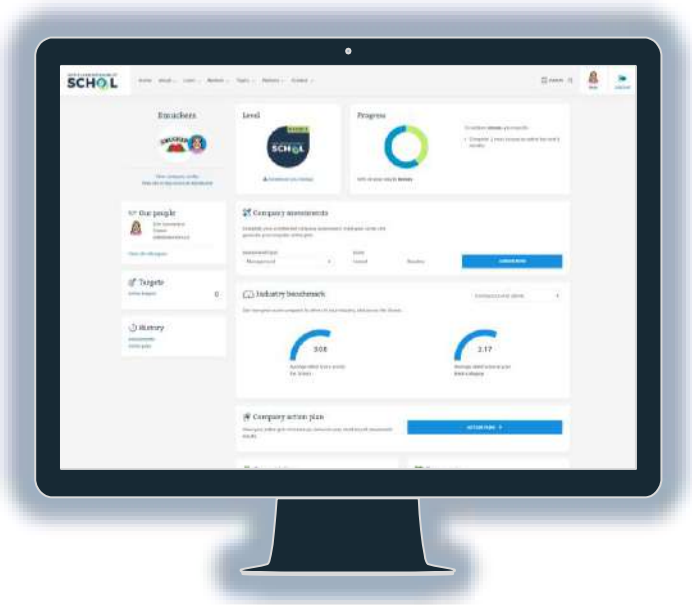
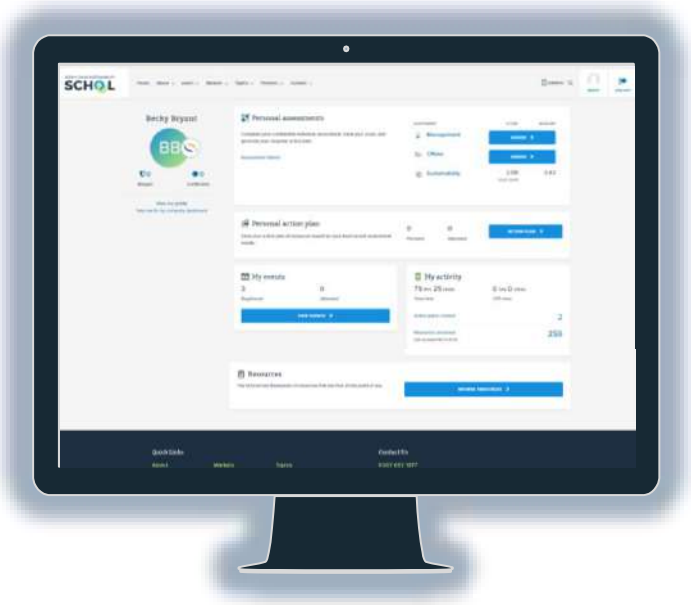
Online Learning





Corporate Dashboards

Each company gets their own sustainability dashboard to track progress and action plans.

Individual Learning Accounts

Individuals can use the School for their own professional development. **Self-Assess** your knowledge level to follow a bespoke learning **Action Plan**.

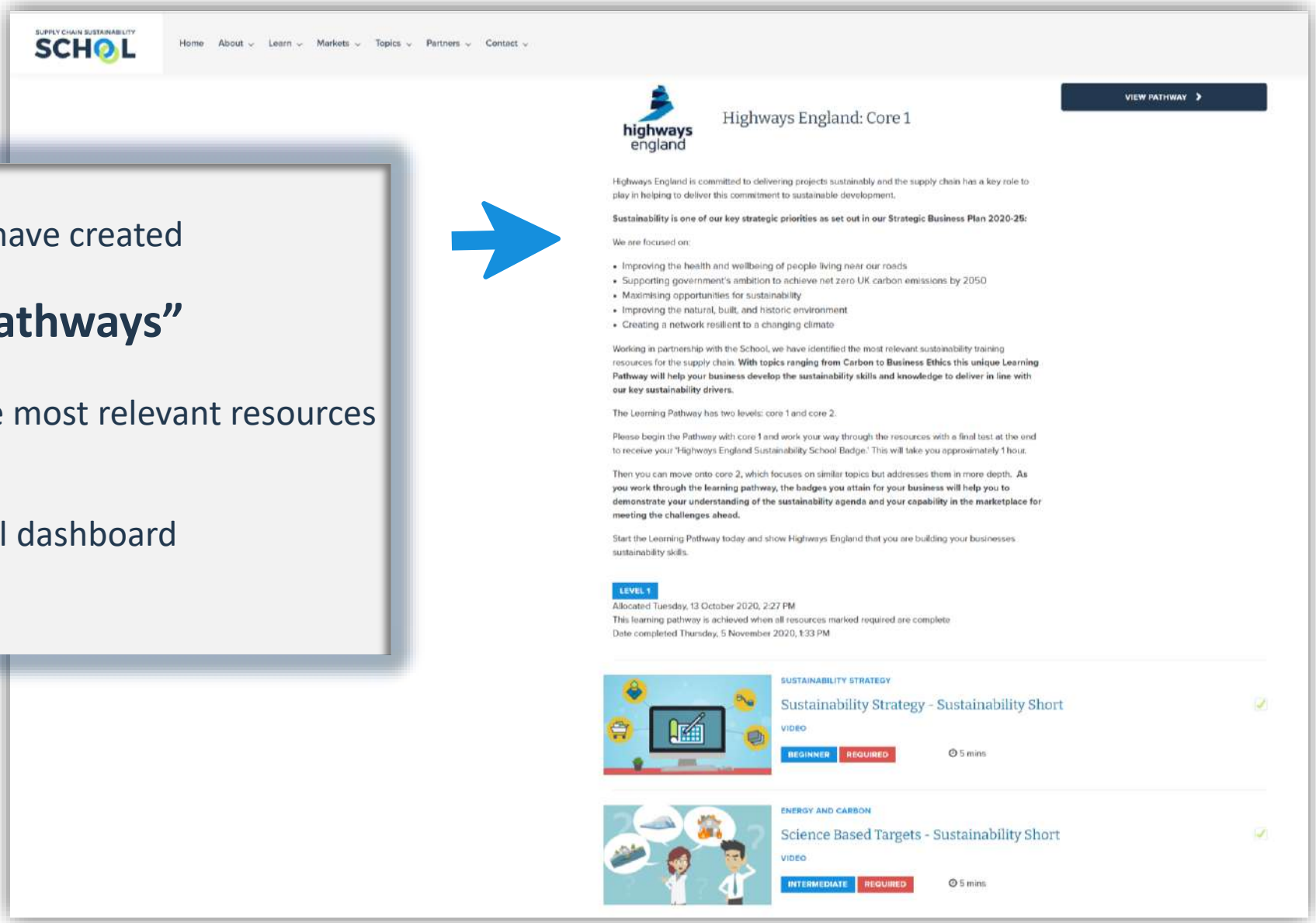
Reports show resources viewed and CPD time accrued.

School & Highways England have created

“Learning Pathways”

To provide easy access to the most relevant resources from our library

Self-Enrol from your personal dashboard



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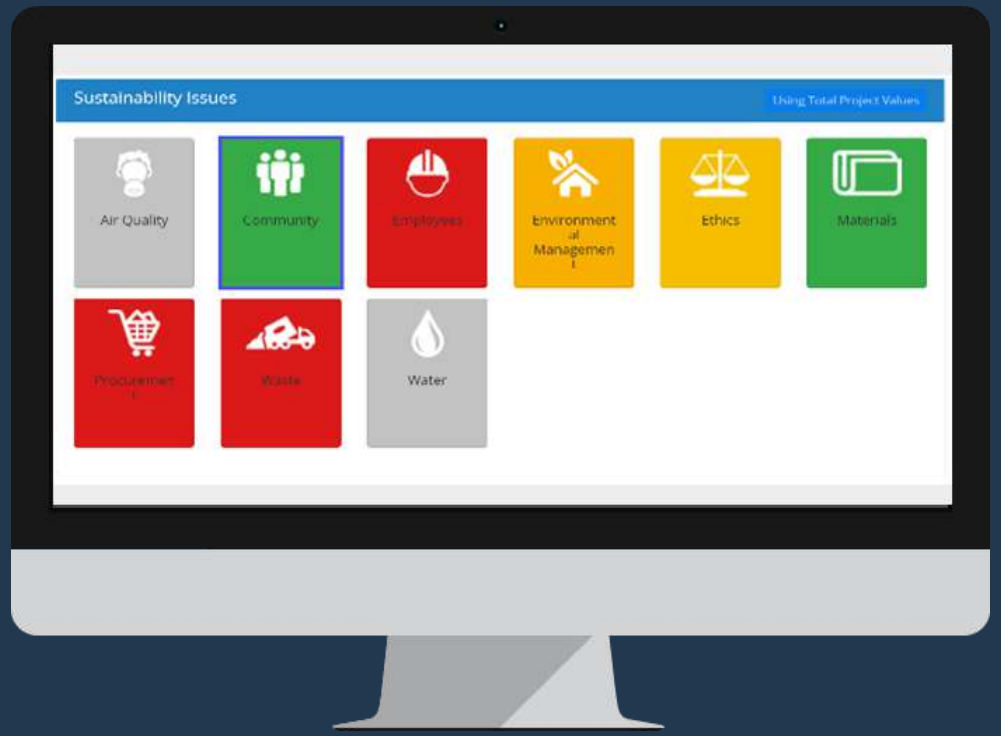
Sustainability Performance Measurement

The Sustainability Tool



- ✓ Accurate performance data accessible at programme, regional and project level, driving transparency, collaboration and shared accountability for performance.
- ✓ Ability to capture, share and measure the overall value created through sustainable delivery methods and collaboration, the full value being created across entire RDP - and not just pockets of best practice.
- ✓ A full training package for RDP Delivery Integration Partners and the supply chain to keep the system on track.

SUPPLY CHAIN SUSTAINABILITY SCHOOL

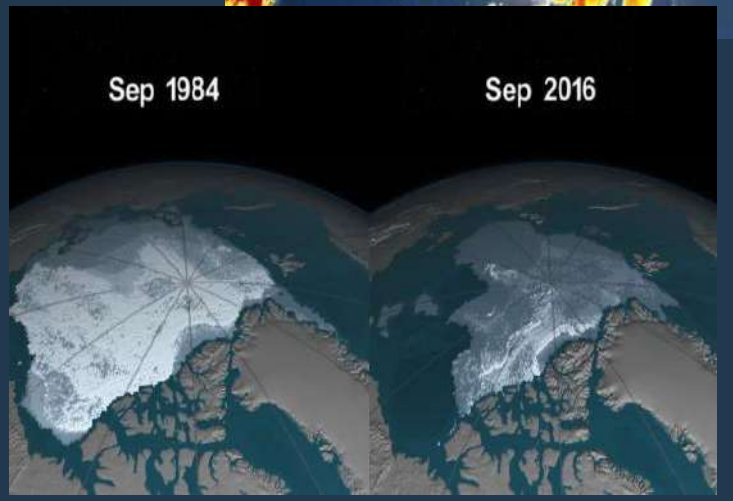
Understanding Carbon Reduction

James Cadman, Action Sustainability

- Go to www.menti.com in a new tab on your phone or computer, or download the app
- Enter the menti code on screen
- Don’t disconnect from the meeting; you will still need to hear the trainer and colleagues

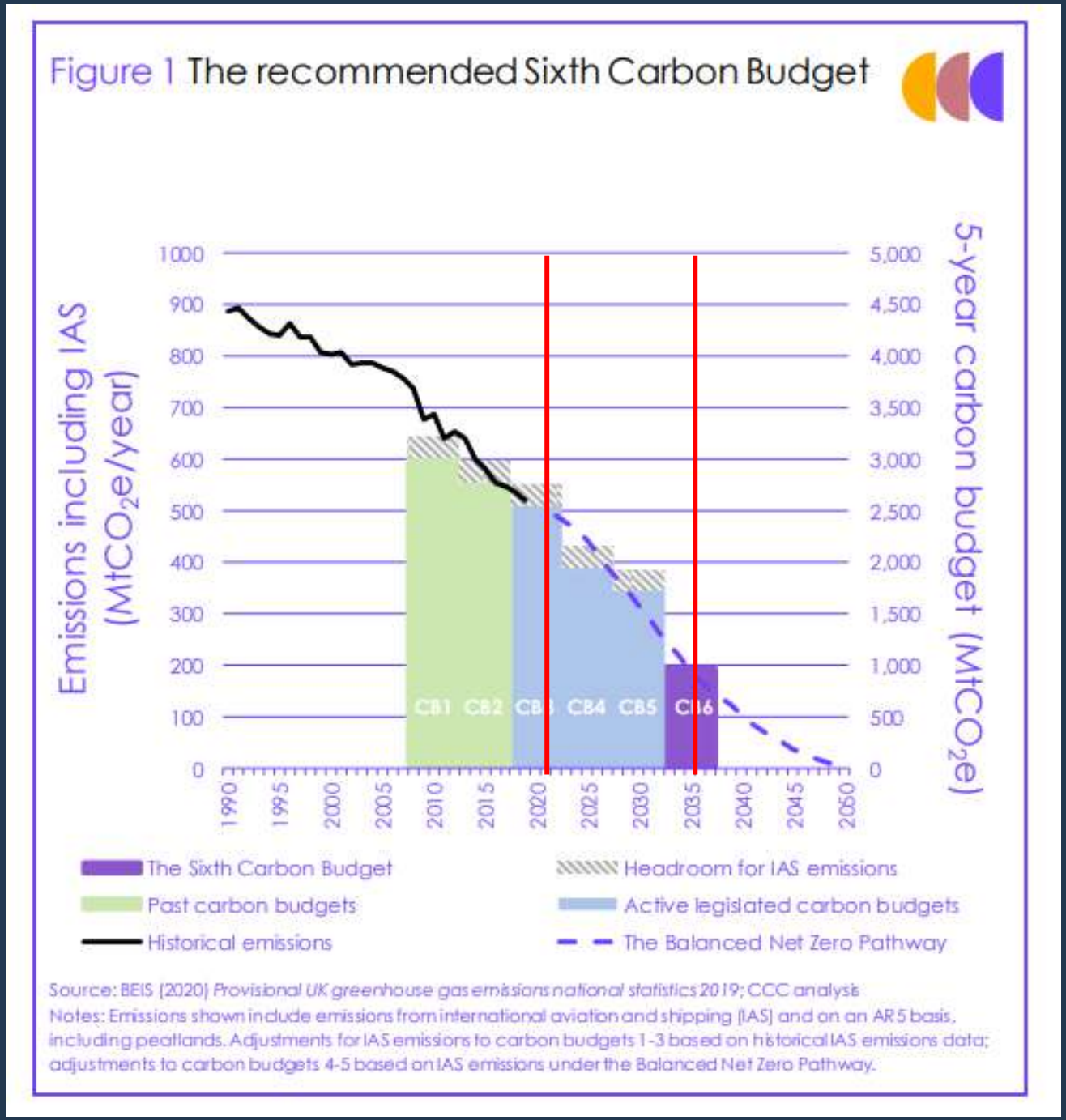
Carbon Jargon Buster!

- Climate Change Act
- PPN 06/21
- Net Zero
- Scopes
- Hierarchy



The Law!

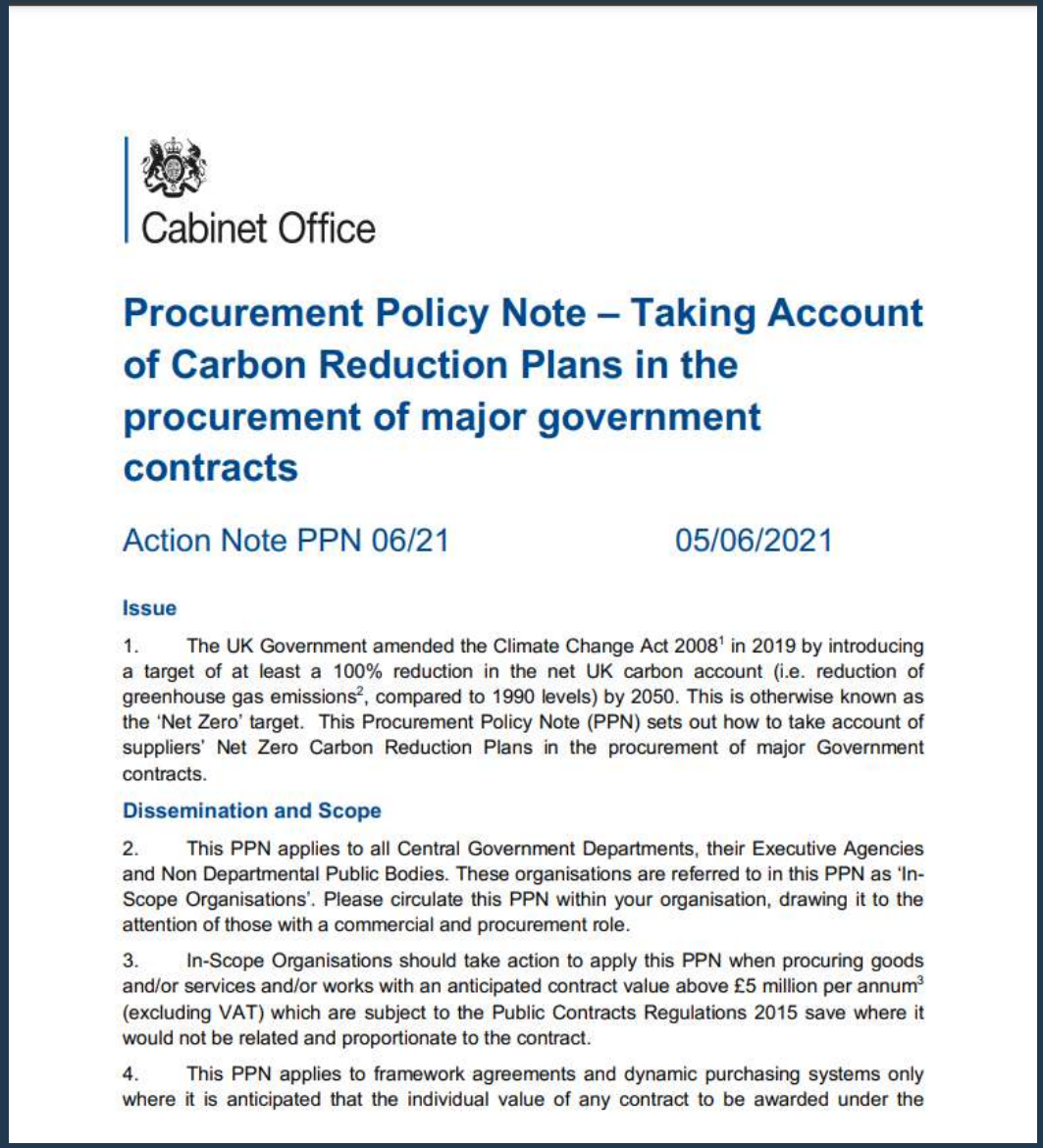
- **Climate Change Act target of 100% reduction by 2050 – 'net zero'**
- **Scotland has legislated to hit net-zero by 2045**
- **Wales' target to reduce by 95% by 2050 but aiming for net zero**
- **New intermediate target of 78% by 2035 vs 1990 baseline**



UK Gov't PPN06/21: 5th June 2021

Carbon Reduction Plans

From 30th September 2021, bidders for any contract over £5m ex VAT per year from Central Government, their Executive Agencies and NDPBs will have to have a carbon reduction strategy in place.



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.

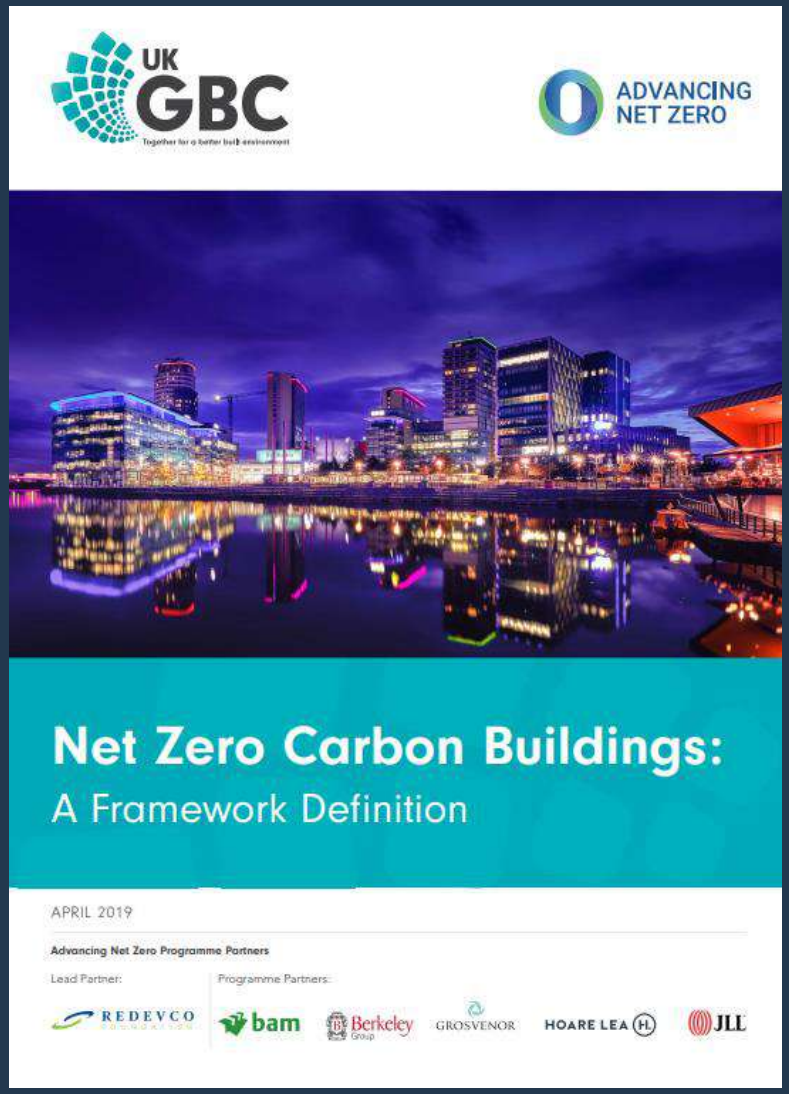
3. In-Scope Organisations should take action to apply this PPN when procuring goods and/or services and/or works with an anticipated contract value above £5 million per annum[3] (excluding VAT) which are subject to the Public Contracts Regulations 2015 save where it would not be related and proportionate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

4. This PPN applies to framework agreements and dynamic purchasing systems only where it is anticipated that the individual value of any contract to be awarded under the

UKGBC Framework Definition of a Net Zero Carbon Building

Net zero carbon – construction: *"When the amount of carbon emissions associated with a building's product and construction stages up to practical completion is zero or negative, through the use of offsets or the net export of on-site renewable energy."*

Net zero carbon – operational energy: *"When the amount of carbon emissions associated with the building's operational energy on an annual basis is zero or negative. A net zero carbon building is highly energy efficient and powered from on-site and/or off-site renewable energy sources, with any remaining carbon balance offset."*



Construction Leadership Council – 9th March 2021

Transport

1. Zero emission vehicles and onsite plant
2. Modern methods of construction, improved logistics, reducing waste and transport
3. Connection with low carbon transport

Buildings

4. Retrofitting to improve energy efficiency of the existing housing stock
5. Low carbon heat solutions in buildings
6. Enhance the energy performance of new and existing buildings with monitoring

Construction activity

7. Carbon measurement to support quantifiable decisions to remove carbon

8. Become world leaders in designing out carbon, developing capability of designers and construction professionals to develop designs in line with circular economy – reducing embedded and operational carbon, shifting commercial models to incentivise and reward measurable carbon reductions.
9. Develop innovative low carbon materials (prioritising concrete and steel), as well as advancing low carbon solutions for manufacturing production processes and distribution.

Sources of Carbon Emissions from your Organisation

Your Suppliers

- *Materials, goods and services,*

"Embodied" Carbon
"Capital" Carbon - CapCarb

Your Business

- *Fuel and energy in company facilities*

"Operational" Carbon - OpCarb

Your Client

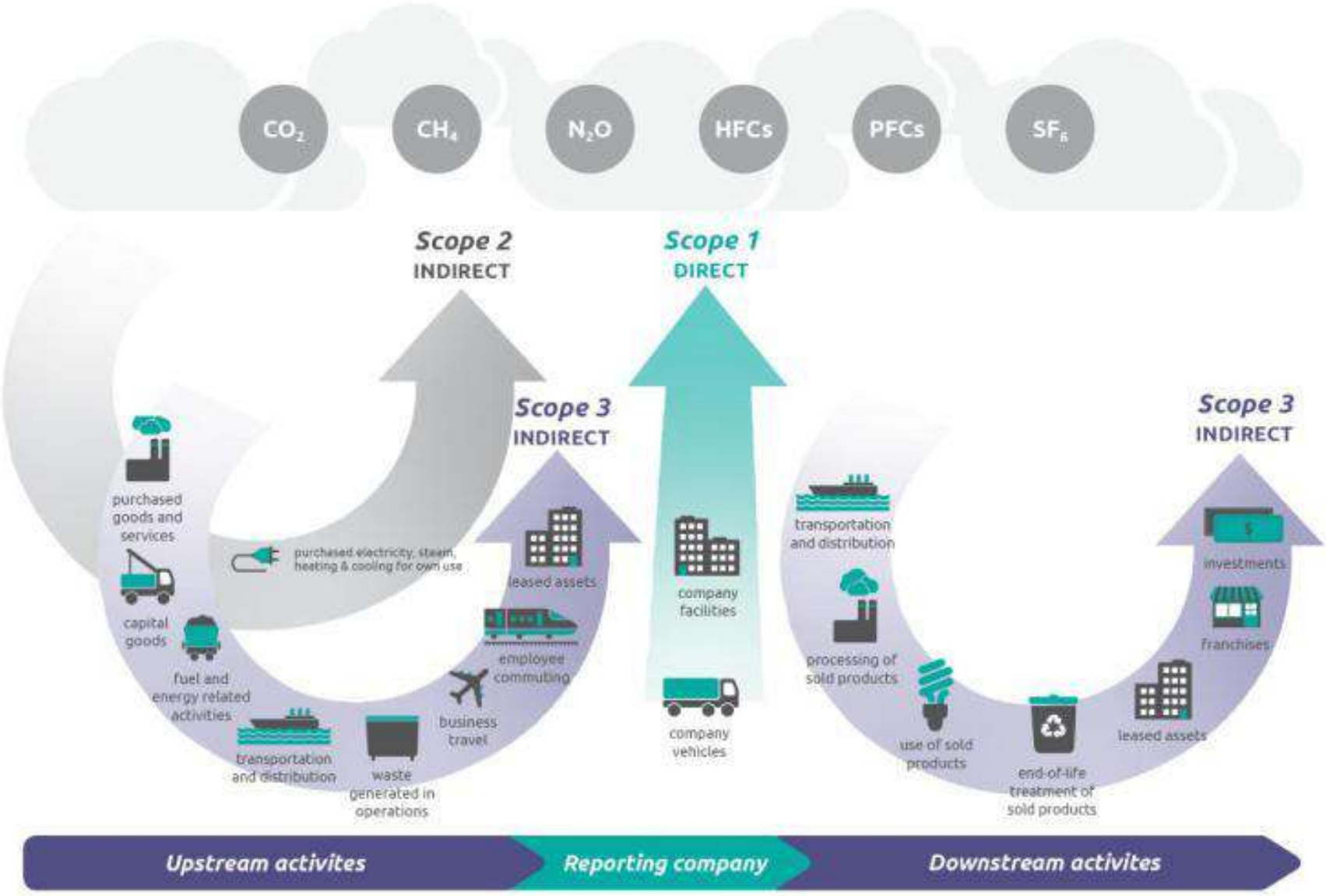
- *In-use emissions from running the*

"End User" Carbon
UseCarb

Upstream | Company | Downstream

Operational Boundaries – Scopes

Figure [1.1] Overview of GHG Protocol scopes and emissions across the value chain



- **Direct emissions** are emissions from sources that are owned or controlled by the reporting company

- **Indirect emissions** are emissions that are a consequence of the activities of the company but occur at sources owned or controlled by another company

Use the Carbon & Energy Hierarchy

AVOID: don't use energy if you can avoid the need

REDUCE: use less by smart design, more efficient equipment, less materials, and better behaviours

SWITCH to low carbon and renewable sources of energy and materials

COMPENSATE/ REMOVE the residual remaining emissions when all other actions have been taken

Working together to tackle carbon

Dean Kerwick-Chrisp ***Highways England***
Team Leader & Principal Environmental Advisor, Safety Engineering and Standards

Tim Jordan ***Balfour Beatty***
Supply Chain Manager, Highways

Emma Hines ***Tarmac***
Senior Manager, Sustainable Construction

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Sector Improvement Project:

P3 Strategic Sourcing – Carbon

Carbon Webinar 08.07.21

Highways England and net zero carbon

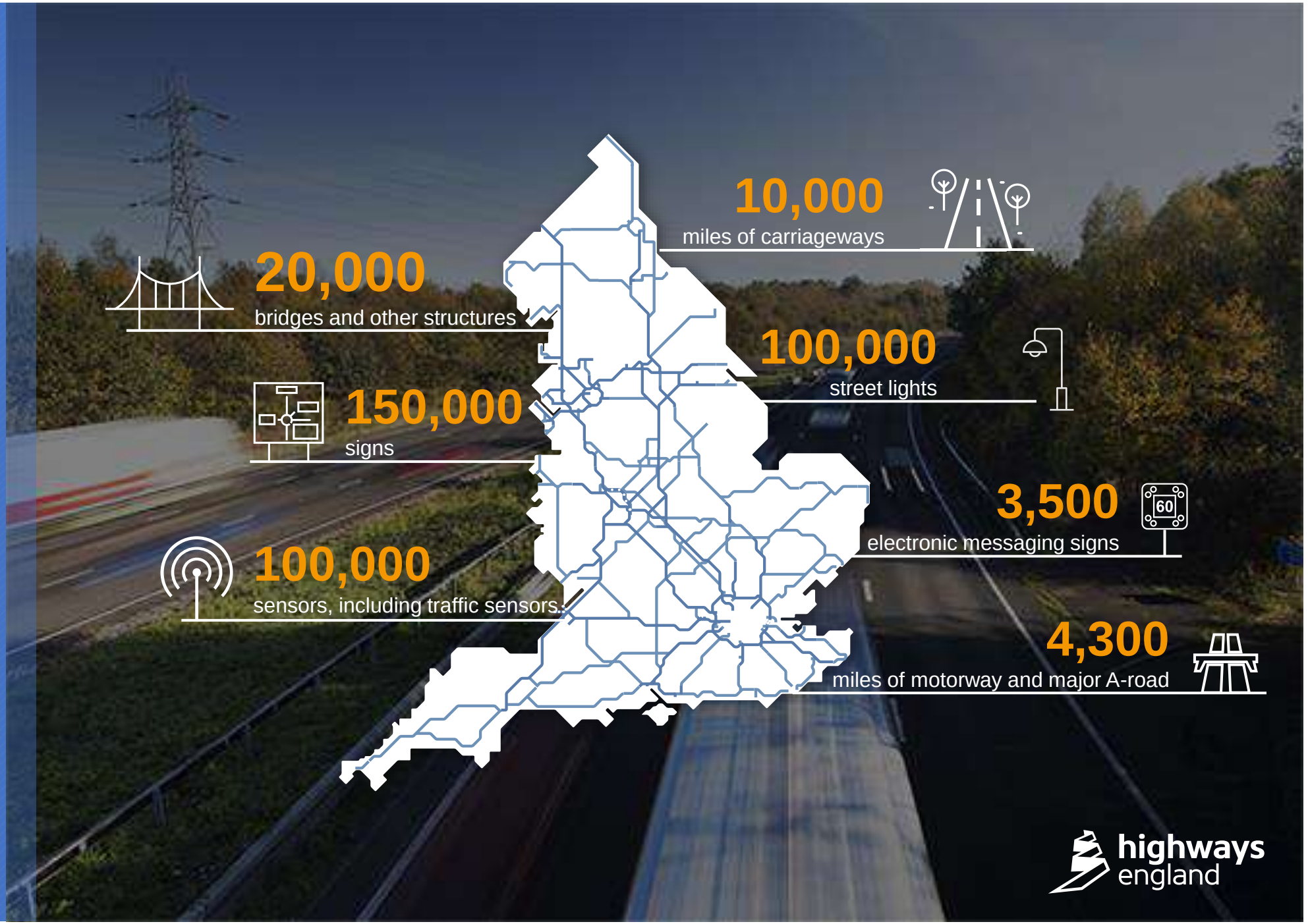
We manage and improve over 4,300 miles of motorways and all-purpose trunk roads in England

Roads will be a vital part of zero carbon travel

Road travel is decarbonising fast, but there is more to do

A net zero Britain will still travel by road in 2050

Investment in Britain's roads supports a thriving net zero economy



Highways England net zero plan

This plan is based on strong science and evidence.

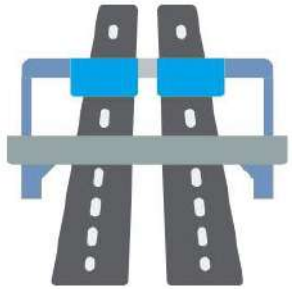
It aligns with:

The 1.5°C reduction goal of the Paris Agreement

The UK's commitment to be a net zero economy by 2050

The Committee on Climate Change's 6th carbon budget

Goals & objectives



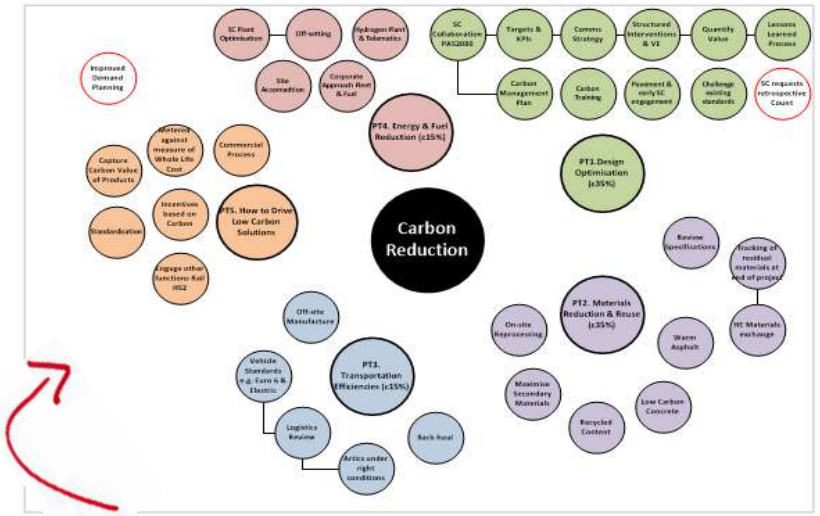
P3 Carbon goals:

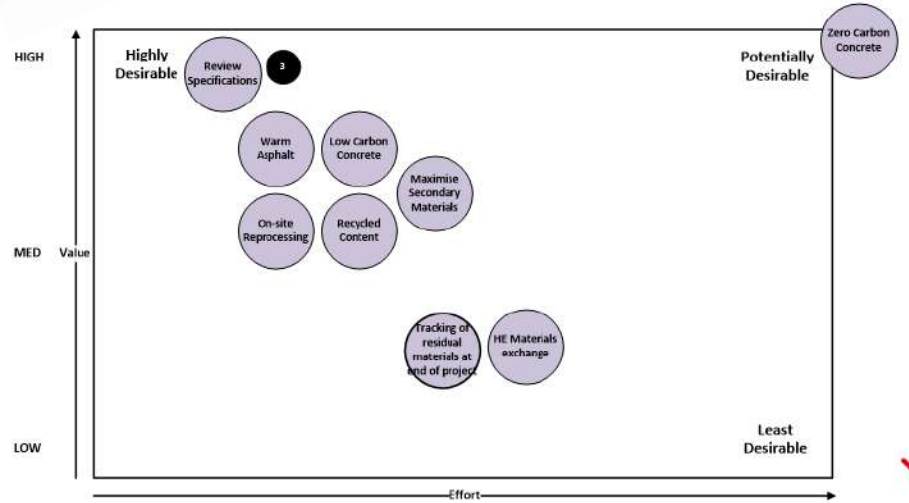
- Improve carbon data maturity for products & solutions
- Use enriched data to influence delivery of very low or zero carbon infrastructure

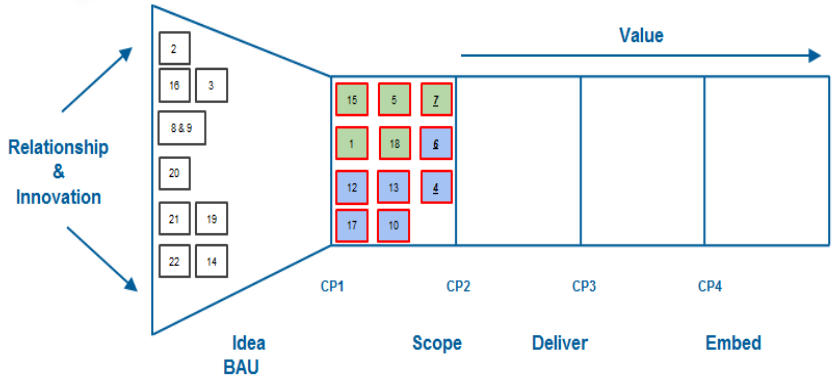
P3 Carbon objectives delivered to date:

- Formed SIP P3 Steering Group
- Collectively identified & prioritised core opportunities & areas of challenge
- Agreed Wave 1 strategic proposals & created initiative delivery teams
- Created Delivery Roadmap or Now, Next, Later positions 6, 12, 24 months
- Delivered WMA pilot initiative Q2 2021
- On-track to deliver CMP pilot initiative Q3 2021

Process: themes, prioritisation, roadmap & funnel







PT1. Design Optimisation (c35%)

Now c6 months
- CMP

Next c12 months
- Carbon Training

Later c24 months
- Carbon Optioneering Tool

PT2. Materials Reduction & Reuse (c35%)

Now c6 months
- WMA

Next c12 months
- Foam-mix
- RAP SC
- Portland Lime Cement

Later c24 months
- CCUS
- Carbon Cured Concrete

PT3. Transport Efficiencies (c15%)

- Deferred until Q3 2021

PT4. Energy & Fuel Reduction (c15%)

Now c6 months
- Plant telematics
- Plant ECV labels
- Connection to Grid for SA

Next c12 months
- Plant Optimizer
- Power Optimizer

Later c24 months
- Battery or Hydrogen Plant

PT5. How to Drive Low Carbon Solutions

- Deferred until Q3 2021

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P3 Pilot 1: Warm Mix Asphalt (WMA)

Warm Mix Asphalt (WMA). Delivered Q2 2021

- Typically produced 40oC lower than HMA & laid using existing equipment
- Reduces CO2 emissions associated with asphalt production by c15%
- If UK switched it would save c61,000 tonnes of CO2 per annum
  - Equivalent of cutting 300 million miles of car journeys
- Achieves trafficking temp more quickly, leading to earlier re-opening of roads, & potential productivity increases achieved by laying more material per shift
- HE specifications team committed to immediate review with intention of adopting WMA as preferred option i.e. no departure required

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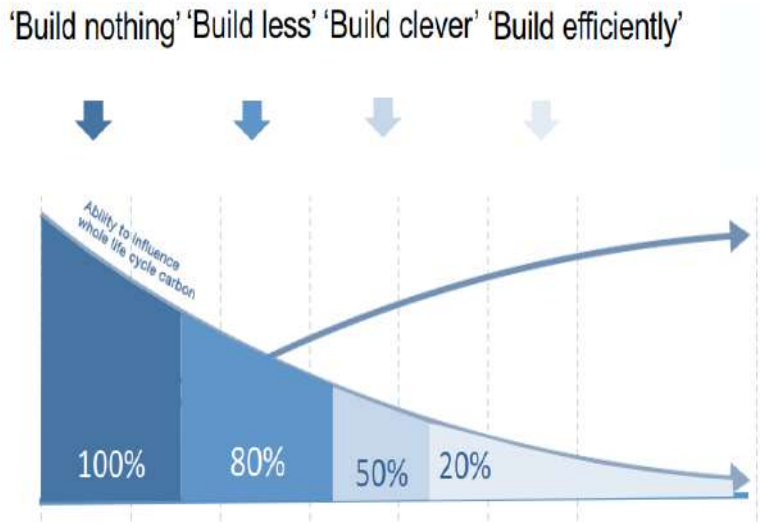
P3 Pilot 2: Project Carbon Management Plan (CMP)

Project Carbon Management Plan (CMP). Delivery Q3 2021

- Establishes means by which carbon management is implemented across value chain
- Defines scope, roles & responsibilities, process and calculation & assessment
- Promotes sharing of best practice
- Ensures decarbonisation is embedded into existing business process
- Outcome is whole life carbon & net zero are key factors in every decision we make



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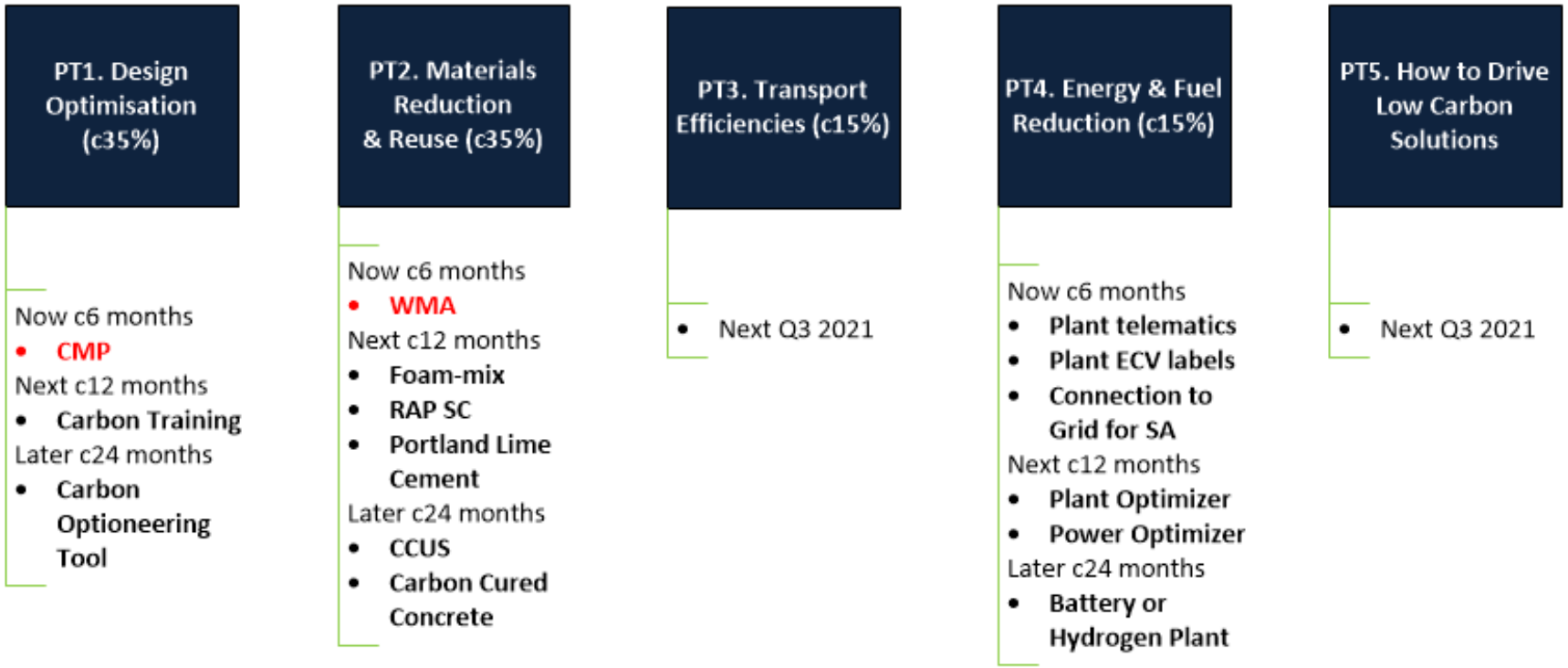
P3 Delivery Roadmap



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Thank you

Highways England
SIP : Responsible Sourcing

Emma Hines

SCSS Highways England : Reducing Carbon in Highways Construction, Maintenance and Repairs

July 2021

Building our future

Tarmac at a glance

Leading materials capability

1,720 fleet vehicles

+30 train sets

51 Recycling/RAP plants

3 Cement plants

10 Marine wharves

2 Lime plants

93 Quarries

45 Building products sites

4 Marine dredgers

97 Readymix plants

17 Contracting depots

56 Asphalt plants

Leading materials capability

7,500 people within our organisation

National Contracting and Highways Services

Materials

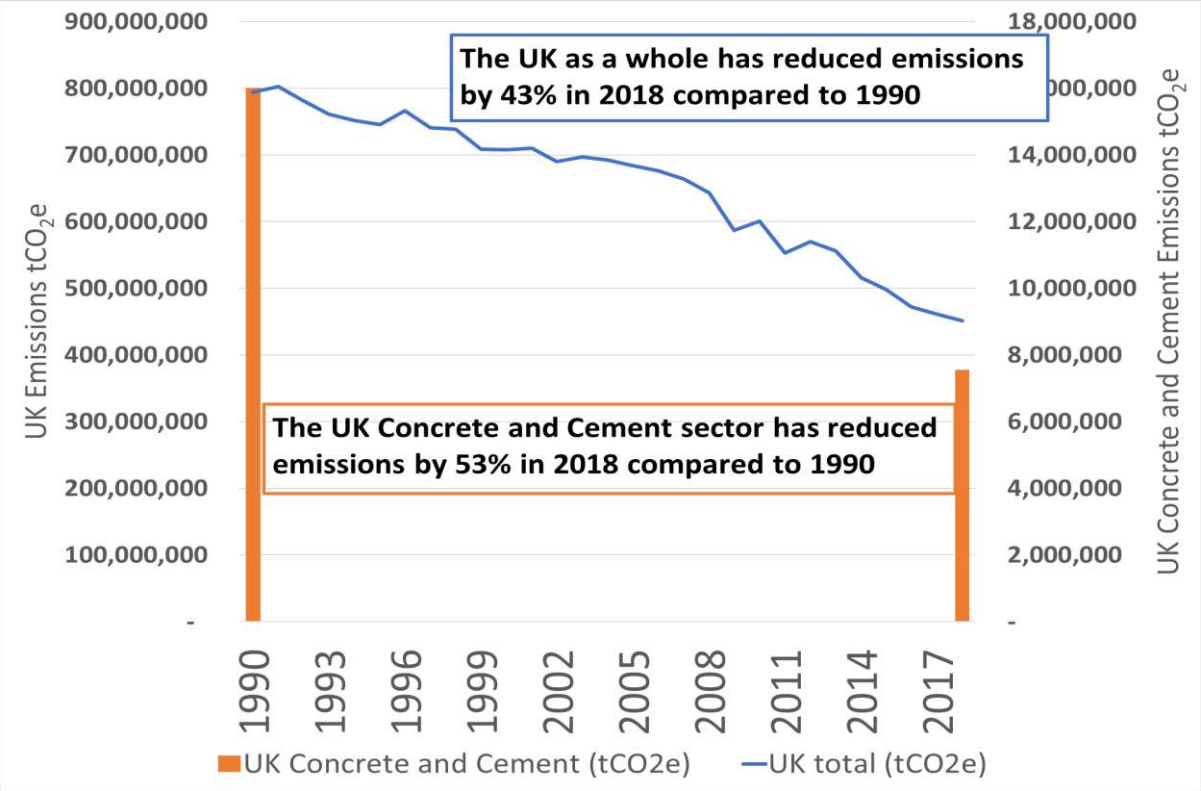
Offsite manufacturing
Building products
Aggregates
Readymix
Pre-cast
Cement
Asphalt
Lime

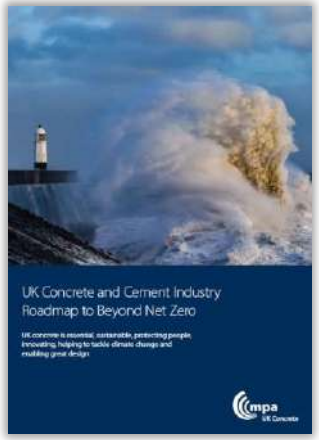
Delivering Low(er) carbon infrastructure

1. Early engagement and collaboration
2. Consider whole life performance / whole life cost
3. Flexible on design and material specification
4. Open to new ideas / innovation
5. Work with a sustainable construction solutions provider

MPA UK Concrete Beyond Net Zero Roadmap

Since 1990 the UK Concrete sector has decarbonised at a much faster rate than the UK economy as a whole and is now less than 1.5% of UK emissions

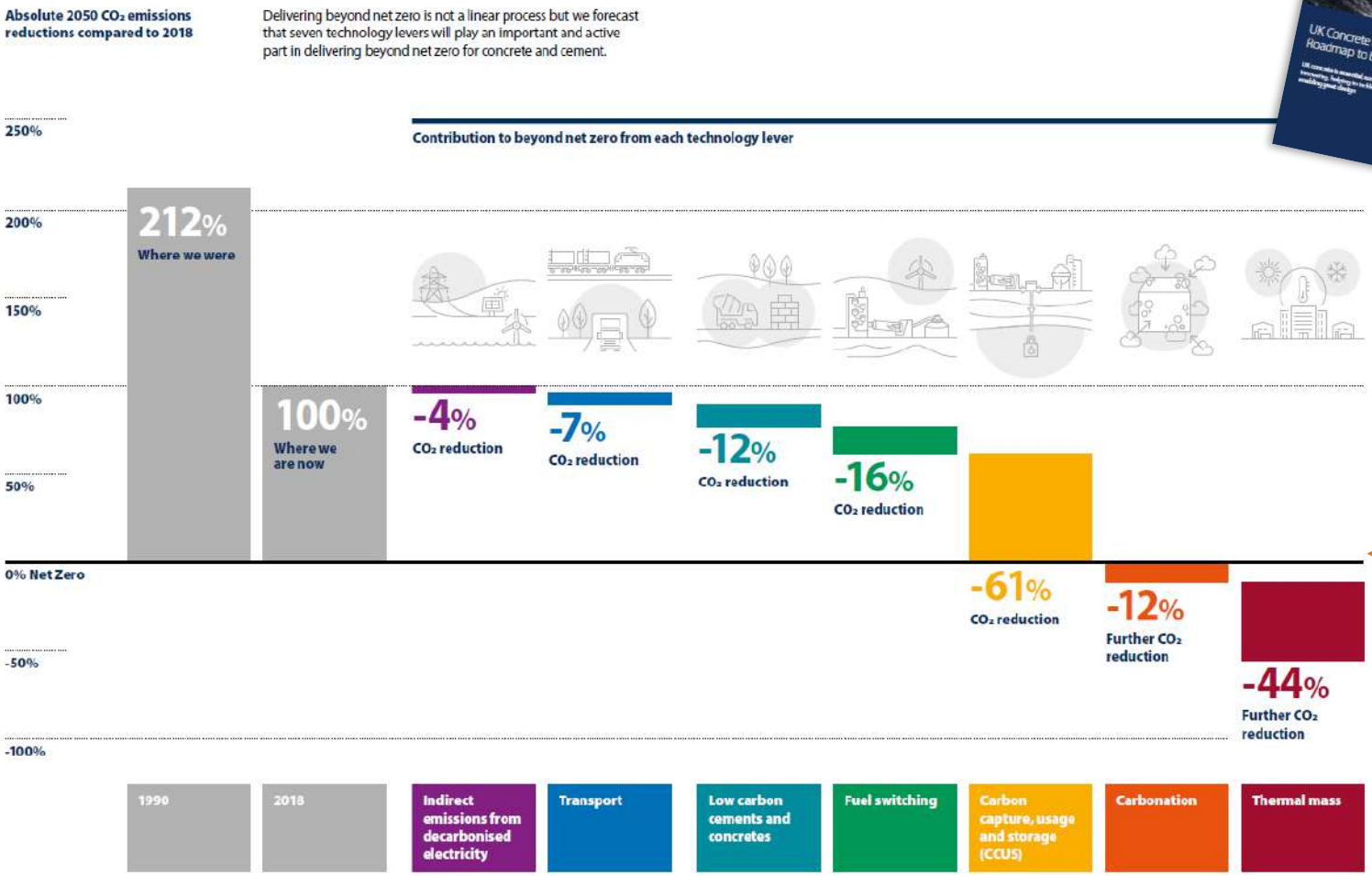




Building our future

Journey to Net Zero

MPA Roadmap to Beyond Net Zero



Net Zero

MPA UK Concrete Beyond Net Zero publication

https://thisisukconcrete.co.uk/Perspectives/UK-concrete-and-cement-sector-sets-out-roadmap-for.aspx

Specifying sustainable concrete

Actions

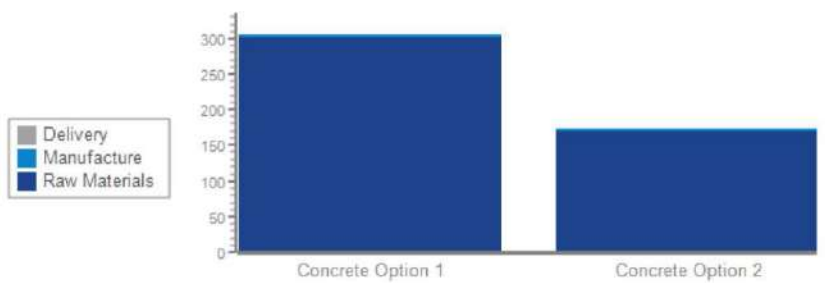
- Permit th e use of recycled or secondary aggregates but do not over specify
- Specify that concrete should contain CEM II/CEM III or an addition
- Embodied CO2 (ECO2) of concrete should not be considered or specified in isolation of other factors such as strength gain
- Permit the use of admixtures
- Specify BES 6001 responsibly-sourced concrete and reinforcement
- Consider specifying strength at 56 days rather than the conventional 28 days
- Specify the largest maximum aggregate size conducive to achieving placing and full compaction.

In use | in support | in built | in construction

Carbon footprint

Comparison

	CONCRETE OPTION 1	CONCRETE OPTION 2
Supplying unit	Example	Example
Material	RC32/40 CEMII-BV	RC32/40 GGBS
Source/Detail	PFA at 30% replacement	GGBS at 70% replacement
Recycled %	11.9 %	5.02 %
Carbon footprint	305 $kgCO_2e/m^3$	173 $kgCO_2e/m^3$
Delivery	0 $kgCO_2e/m^3$	0 $kgCO_2e/m^3$
Manufacture	1.61 $kgCO_2e/m^3$	1.61 $kgCO_2e/m^3$
Raw Materials	303 $kgCO_2e/m^3$	171 $kgCO_2e/m^3$



CARBON FOOTPRINT SAVING	
132	$kgCO_2e/m^3$

EPD for Tarmac concretes also available

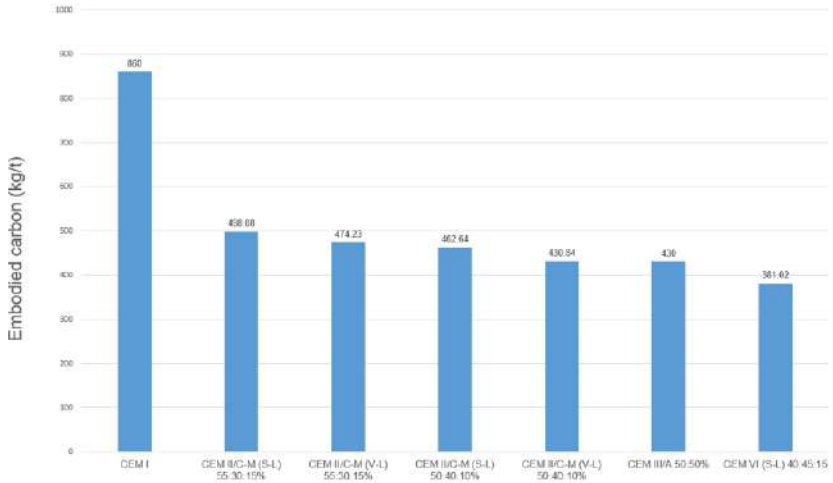
Multi Component Cements

Use of additional powder components to replace the cement clinker, thus reducing embodied carbon.

BS EN 197 introduces new cement types, EN197-5 published in May 2021.

Work is underway via MPA & BSI to amend BS8500 to recognise these new cements.

Expected to be adopted in standards by 2022 / 23.



Capital carbon and whole life performance

Low carbon <u>does not</u> = most sustainable

When thinking about the embodied carbon of materials it is important to consider ‘whole life performance’

Think about:

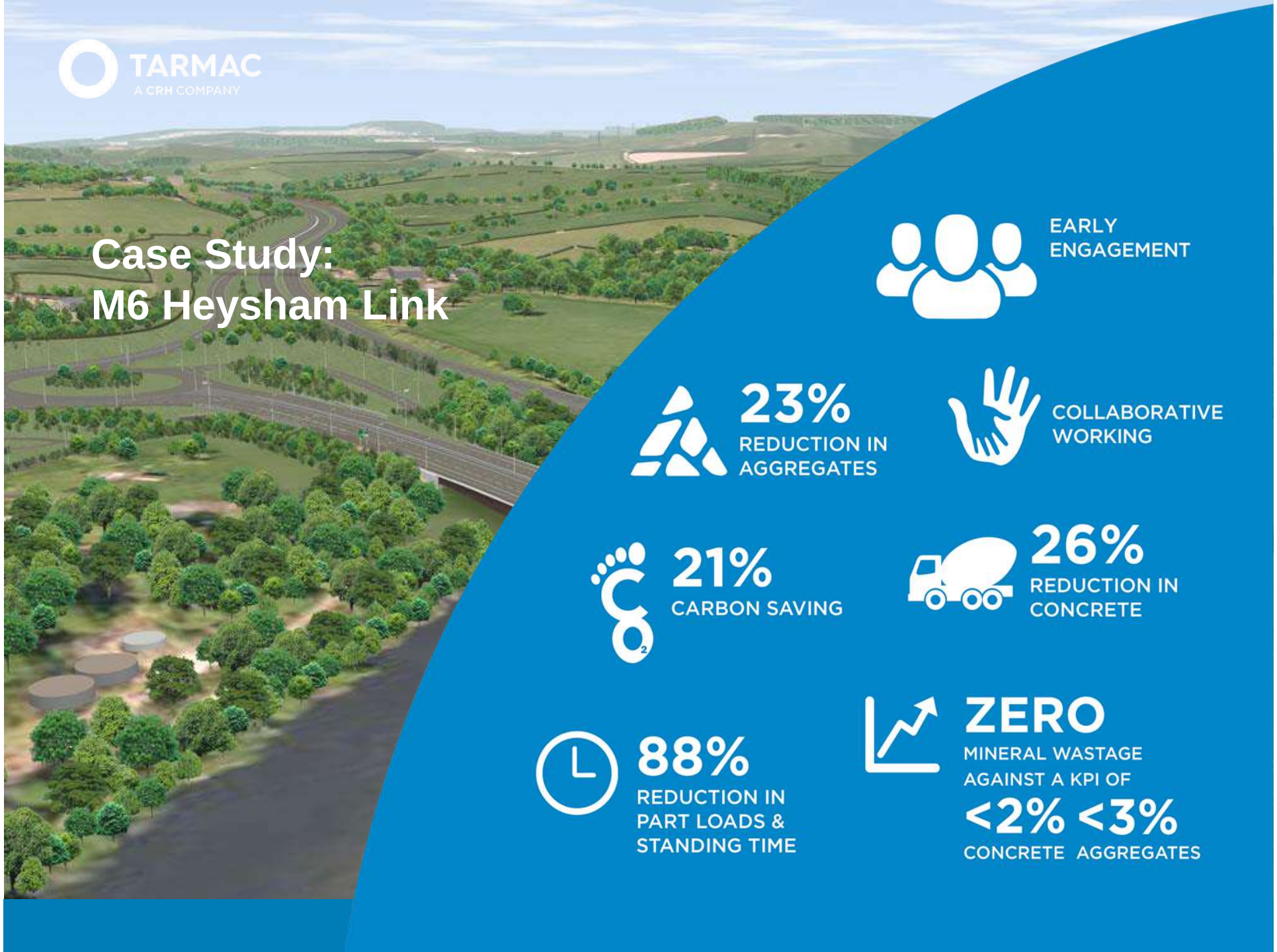
- Opportunities for lean construction
- Resource efficiency
- Long term operational impacts of the asset
- Refurb / disposal / reuse at end of life

Durability and low maintenance

Example 1:
ULTILAYER
Oxford Street

TARMAC
A CRH COMPANY

Case Study:
M6 Heysham Link



EARLY ENGAGEMENT

23% REDUCTION IN AGGREGATES

COLLABORATIVE WORKING

21% CARBON SAVING

26% REDUCTION IN CONCRETE

88% REDUCTION IN PART LOADS & STANDING TIME

ZERO MINERAL WASTAGE AGAINST A KPI OF

<2% CONCRETE <3% AGGREGATES


TARMAC
A CRH COMPANY

Panel Q&A

James Cadman

Lead Consultant, Action Sustainability

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Closing Remarks

Any further questions please contact:

Andrew Wilson

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