Department for Transport

ADEPT LIVELABS2
Decarbonising Local Roads

Centre of Excellence
for Decarbonising Roads

North Campus – Carbon Baselining Overview

NORTH LANARKSHIRE COUNCIL

Transport for West Midlands
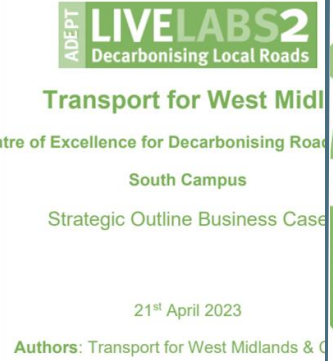
Amey

COLAS

2023 in Review

MARCH

Progression past Dragon's Den

MAY

Outline Business Cases approved, and funding awarded

AUGUST

Logo finalised, and first Steering Board and Expert Advisory Panel meetings held
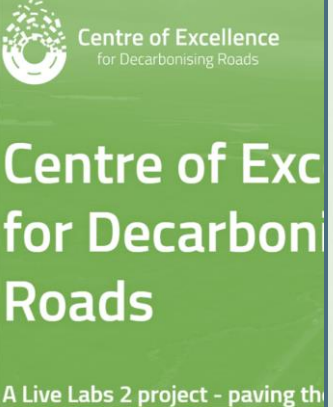
SEPTEMBER

Governance documents completed

OCTOBER

Exhibition at World Road Congress, and market scanning for maintenance kicked off

NOVEMBER

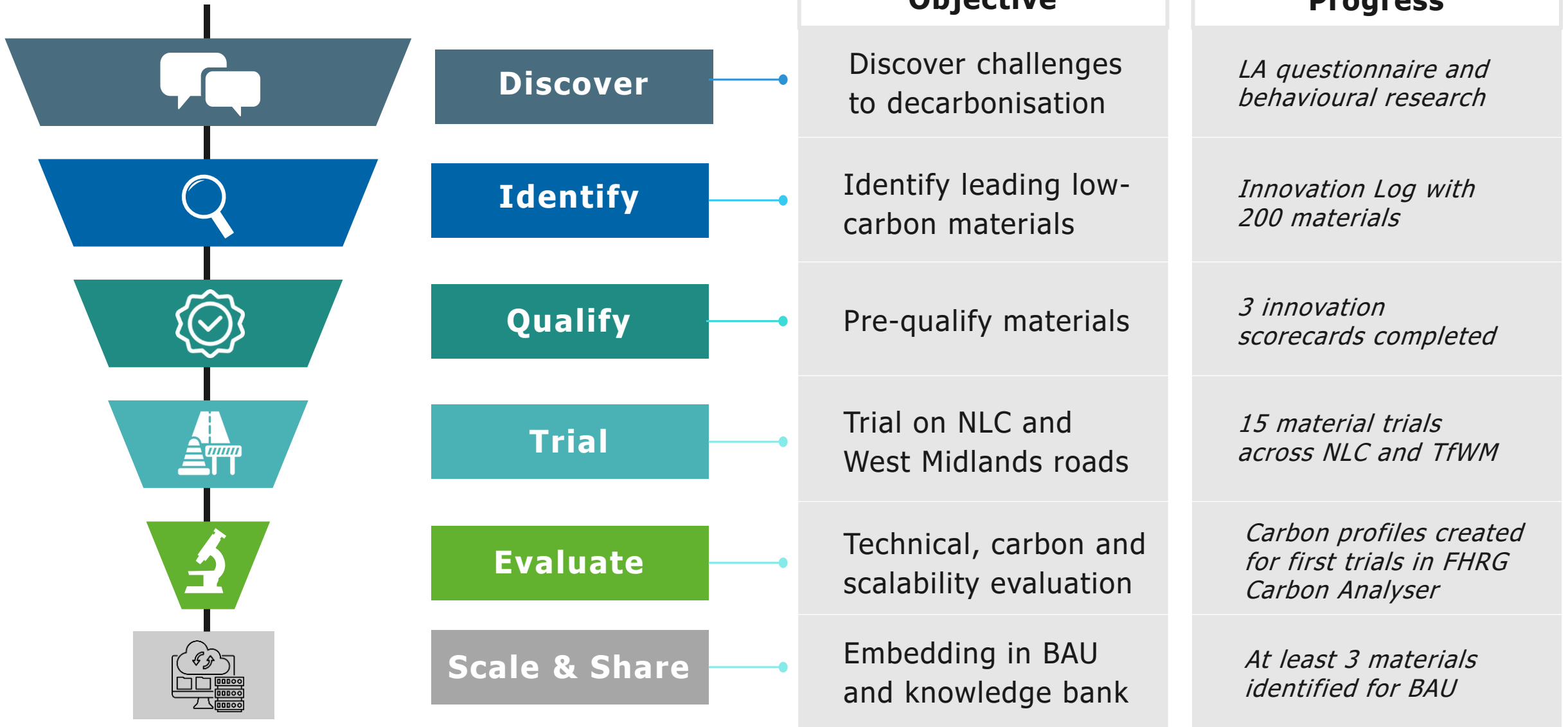Website launched, innovation scorecard created, and first pitching session held

DECEMBER

First carbon baseline complete for NLC, and contract finalised between Colas/TfWM

The Innovation Funnel

Stage	Objective	Progress
Discover	Discover challenges to decarbonisation	*LA questionnaire and behavioural research*
Identify	Identify leading low-carbon materials	*Innovation Log with 200 materials*
Qualify	Pre-qualify materials	*3 innovation scorecards completed*
Trial	Trial on NLC and West Midlands roads	*15 material trials across NLC and TfWM*
Evaluate	Technical, carbon and scalability evaluation	*Carbon profiles created for first trials in FHRG Carbon Analyser*
Scale & Share	Embedding in BAU and knowledge bank	*At least 3 materials identified for BAU*

Our First Step:
Carbon Baseline of NLC

▶ Calculated for financial year 2022-2023 for all NLC local road services to baseline future carbon savings of the programme and identify carbon hotspots

▶ Accounting for carbon emissions across Scopes 1, 2 and 3 for sites & premises, staff & contractors, vehicles & plant, and purchased products & services

▶ **Key insights:**
Although material carbon is significant, energy transition will be necessary to significantly decarbonise

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Case Study
NLC Pothole Trials

Approach

Materials Trialled

- Degafloor Degafill (MMA-based cold-mix)
- Roadmender Elastomac (mastic asphalt)
- FM Conway GreenPatch (cold-mix with RAP)
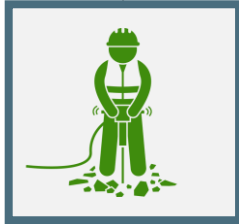- Meon Permafyx (MMA-based cold-mix)

Trial Methods

- A, B, and C road sites in NLC
- 27-28th February and 11th – 12th April 2024
- Creation of 18 simulated potholes and 18 patches 2m apart on 'Amber' roads

Control and Benchmark

- Benchmark solutions: HRA and standard cold-mix material
- Applied on the same road, same size potholes, same operatives, and same weather

Operative Feedback

- Health & safety implications of hot-mix mastic asphalt
- Openness and interest in MMA solutions
- GreenPatch is a simple switch from BAU

Initial Results

Carbon: est. 37.5% saving for GreenPatch

Technical: expected increased longevity from 3 out of 4 materials

Next Steps

- Monitoring and evaluation of repair performance over the next 7 years
- Full carbon profiles in Carbon Analyser
- Transition to best performing materials as BAU in NLC

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Approach

Materials Trialled

- 13 materials and methods demonstrated, including the same materials as the North Campus, as well as Colpatch, Roadpatch, and Velocity Patching

Trial Methods

- A, B, C and old/new residential road sites across 6 combined authorities in West Midlands
- March 2024
- Tested on 'normal' potholes

Control and Benchmark

- Applied on similar road types, in similar weather, and with oversight from core team

Operative Feedback

- Difficulty with operational ease with some materials due to narrower conditions of use

Case Study
TfWM Pothole Trials

Next Steps

- Monitoring and evaluation of repair performance over the next 7 years
- Full carbon profiles in Carbon Analyser
- Transition to best performing materials as BAU in TfWM LAs

Initial Results

Carbon: est. 37.5% saving for GreenPatch

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Behavioural Change

How we are leveraging behavioural science to design a
fit-for-purpose knowledge bank

10 qualitative, end-user interviews held with LAs across Scotland and England

Identification of individual, social and material influences on LA behaviour
when identifying and adopting material innovations

Operational, informational, organisational, and functional requirements
identified for the knowledge bank development based on LA feedback

Full behavioural research report available on our website

2024

Key milestones in 2024

Market Scanning & Trials	Material Evaluations	Industry Playbook	Knowledge Bank

- Signage – signposts and signfaces
- Surface treatment
- Concrete solutions

Full carbon and technical evaluations of materials, with support from University of Nottingham, Aston University and FHRG

Creation of best practice and guidance for LAs to identify, trial and evaluate low-carbon materials, with support from Connected Places Catapult

Launch of the knowledge bank at the end of 2024, ready for LAs to use
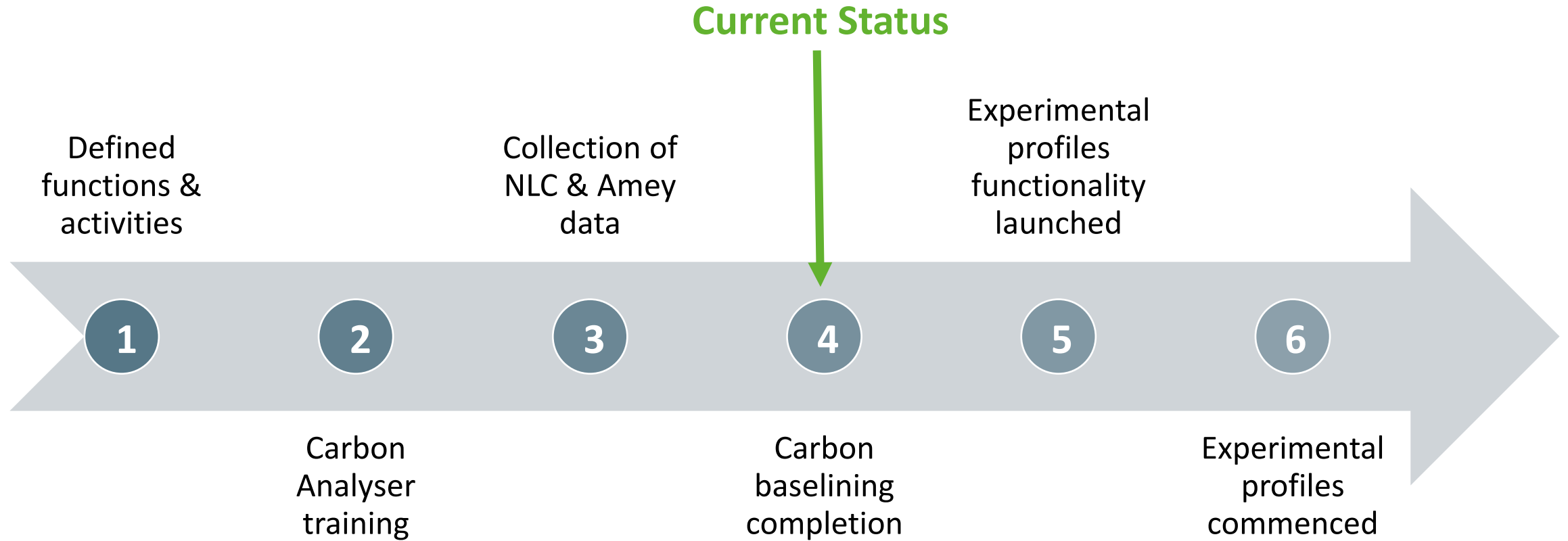
Tools of the Trade

Tools we use to cerate a carbon baseline
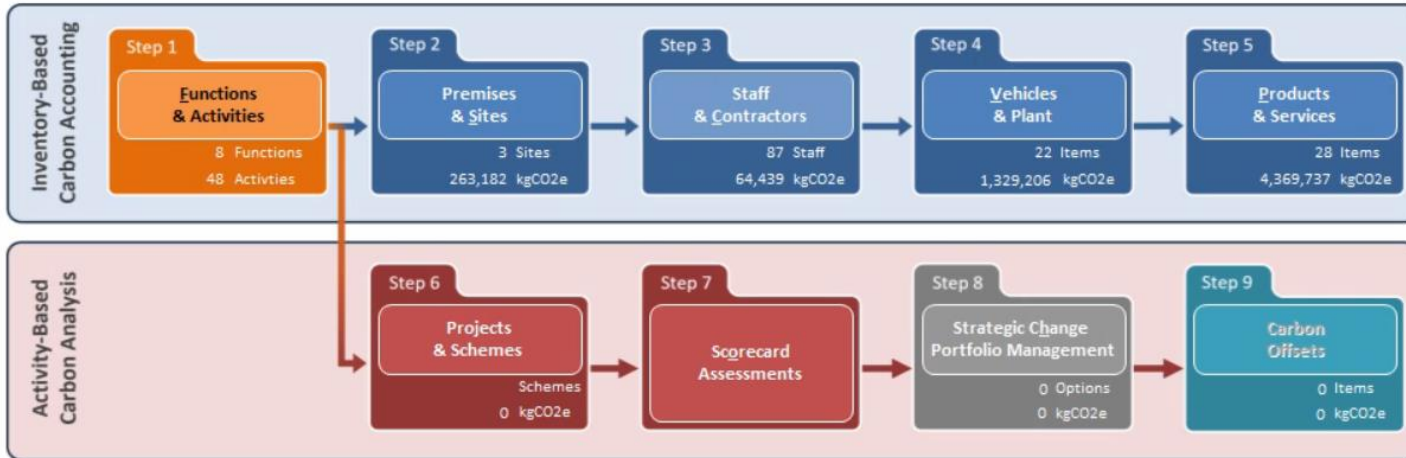
FHRG's Carbon Analyser
- Inventory Based
  - Sites
  - Staff
  - Plant
  - Materials
- Activity based carbon and

OneClick LCA
- Lifecycle analysis
- Carbon analysis of materials
- Live trial carbon comparison
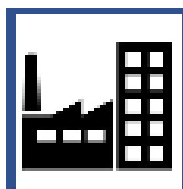
Future Highways
Research Group

Functions & Activities

8 Functions

48 Activities
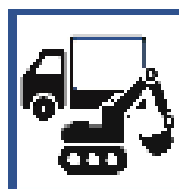
Vehicles & Plant

22 Items

1,329,206 kgCO2e

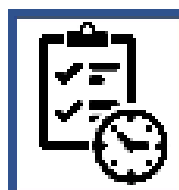## Premises & Sites

3 Sites

263,182 kgCO2e

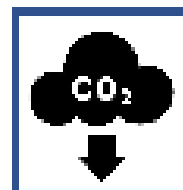## Purchased Products & Services

28 Items

4,369,737 kgCO2e

Staff & Contractors

87 Staff

64,439 kgCO2e

Projects & Schemes

Schemes

0 kgCO2e

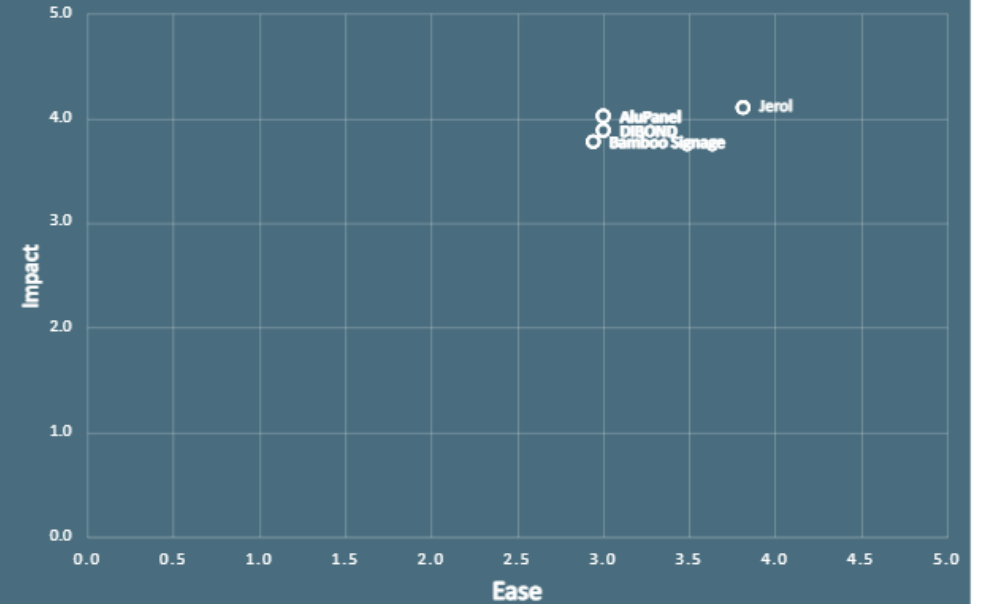## Carbon Offsets

0 Items

0 kgCO2e

Total (kgCO2e)

6,026,563

Innovation Scorecarding

EASE V IMPACT GRAPH

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Innovation Matrix for *Signage*

Innovation Name			The Centre's Scorecard									Transport Scotland Matrix - North Campus						
	Ease	Impact	Strategic Alignment	Anticipated Operational B.	Constraints	Complexity (Inherent Risk)	Scalability & Flexibility	Safety	Total Score	Total Confidence	Whole Life Cost	Technical: Manufacturing & Construction	Technical: FPC	Environment: Emissions & CO2	Environment: End of life	Human health & safety	Link to Evidence
AluPanel	3.0	4.0	4.8	3.3	2.1	4.6	4.2	3	3.8	2.8	0	0	0	0	0	0	https://ameygroup.sharepoint.com/:w:/r/sites/NLCLiveLabs2/Shared%20Documents/General/Innovation/3%20-%20Innovati
DIBOND	3.0	3.9	4.8	3.1	2.1	4.6	4.2	3	3.7	3.5	0	0	0	0	0	0	https://ameygroup.sharepoint.com/:w:/r/sites/NLCLiveLabs2/Shared%20Documents/General/Innovation/3%20-%20Innovati
Jerol	3.8	4.1	4.5	3.9	3.6	4	4	4	4.0	2.8	0	0	0	0	0	0	https://ameygroup.sharepoint.com/:w:/r/sites/NLCLiveLabs2/Shared%20Documents/General/Innovation/3%20-%20Innovati
Bamboo Signage	2.9	3.8	4.8	3	2.1	4.1	3.6	3.5	3.6	3.3	0	0	0	0	0	0	https://ameygroup.sharepoint.com/:w:/r/sites/NLCLiveLabs2/Shared%20Documents/General/Innovation/3%20-%20Innovati

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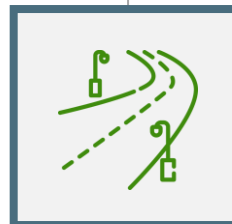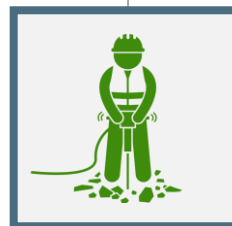
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Next Steps

Key milestones in 2024

Projects Schemes	Trial Analysis	Further Trials	Experimental profiles
Inclusion of larger schemes into carbon baseline.	Building carbon profiles for each trial material in OneClick	Line Marking, Sinage, Concrete, Pavement, etc.	Implementation of experimental profiles within CA. Model material/service adoption against carbon baseline.