In-Situ Road Recycling

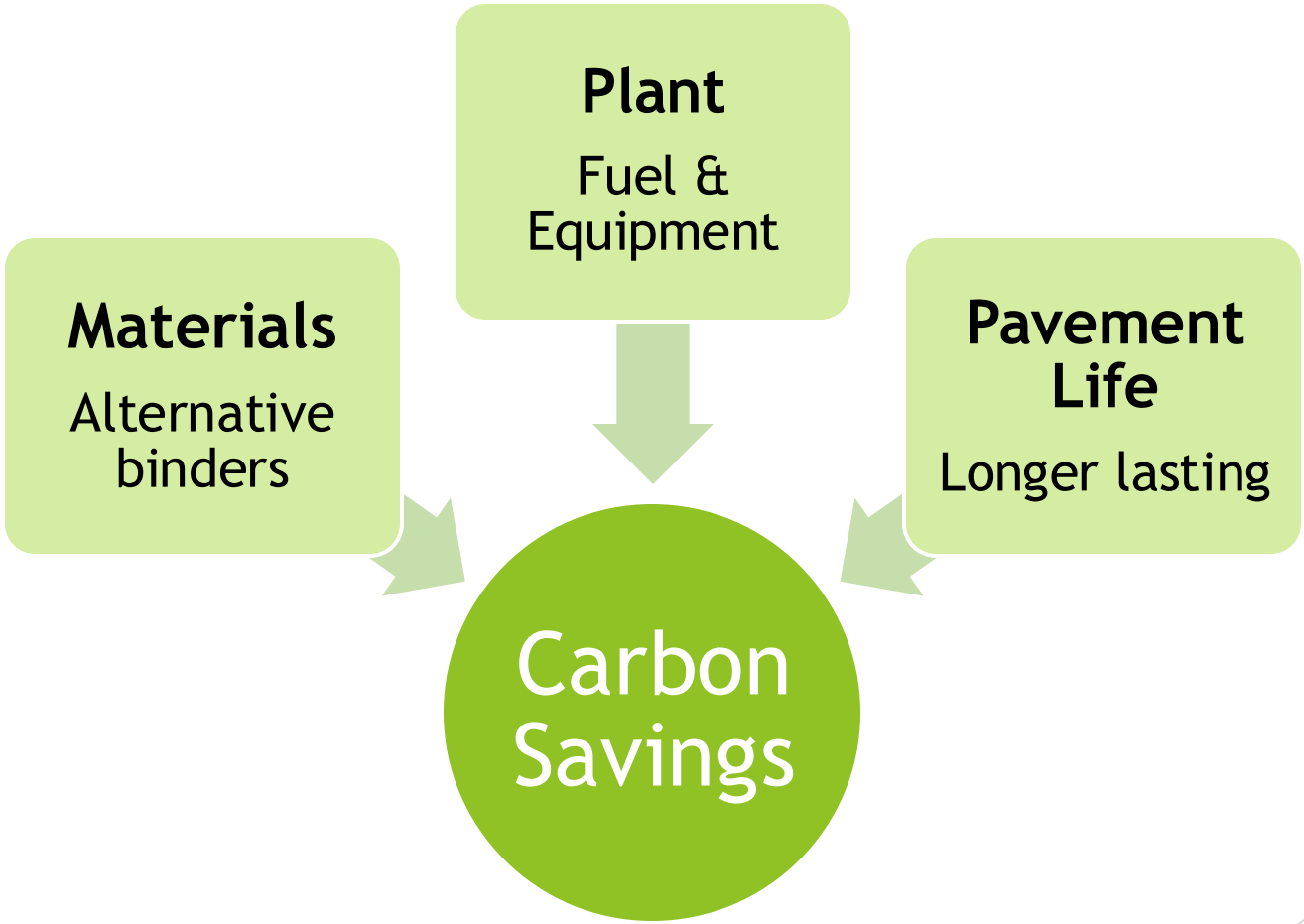
Latest developments driving Carbon mitigation

The Carbon benefits

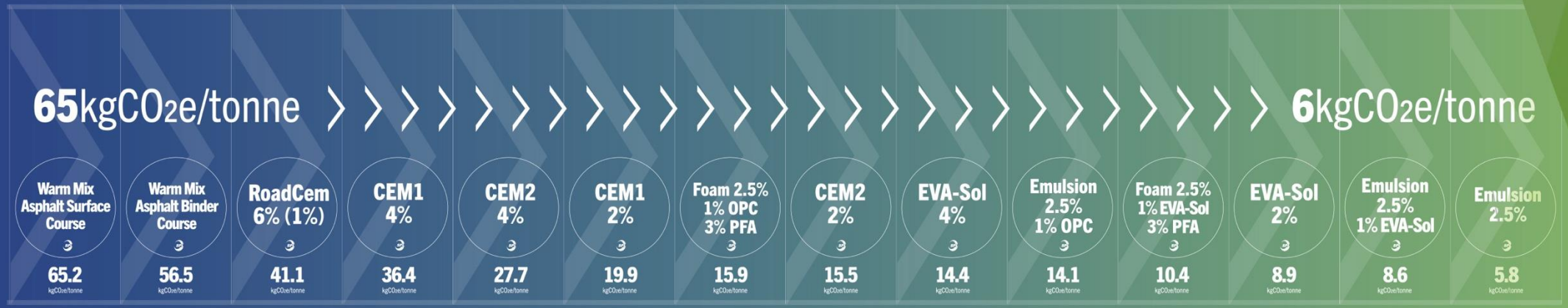
- Recycles 100% of your existing road asset
- Cold process
- New binder addition can be as low as 2%
- Reduction in lorries: 1km of road
  - In-Situ 🚚🚚🚚 17
  - Ex-Situ 🚚🚚🚚🚚🚚🚚🚚🚚🚚🚚🚚🚚🚚🚚 336
- Faster build times

Fuel saved = Carbon Saved

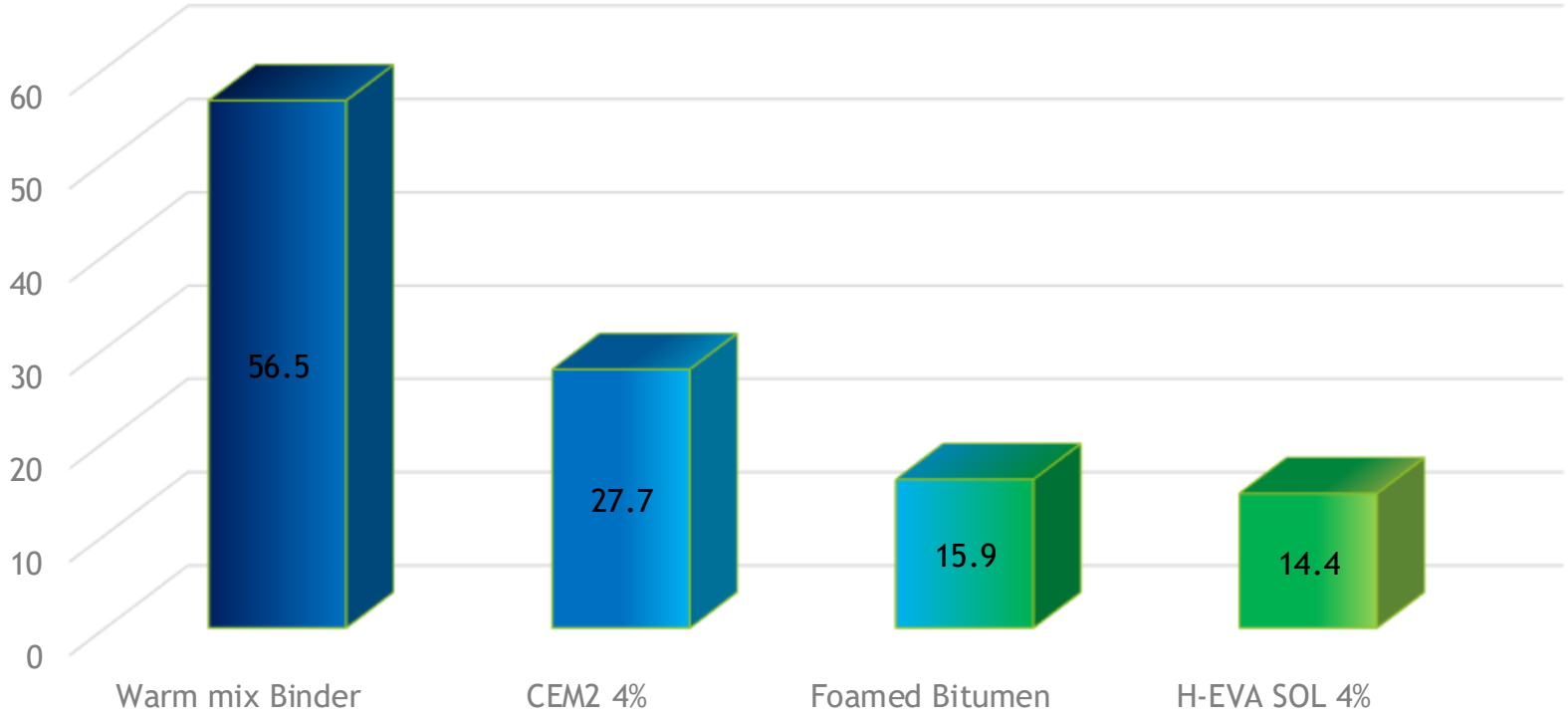
Lowering Carbon



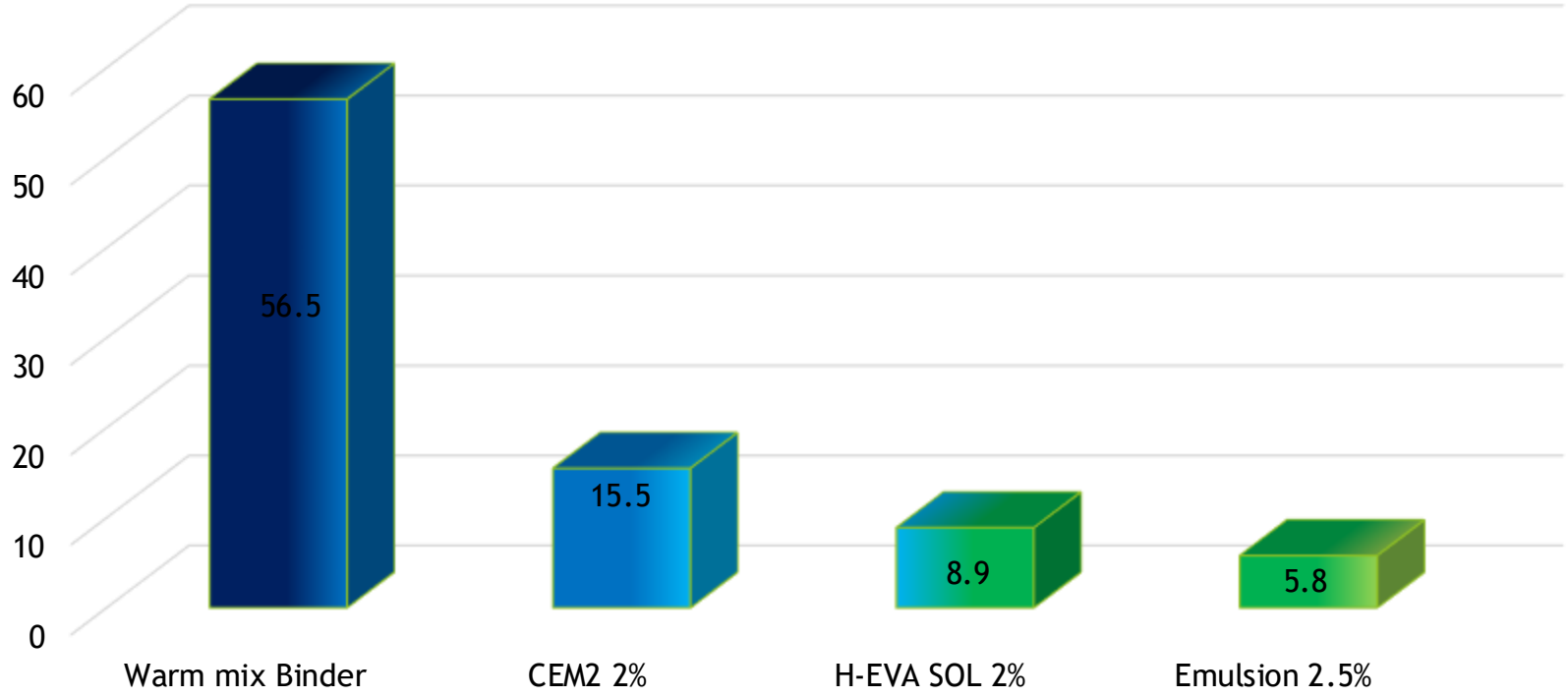
SPL's Carbon Ladder



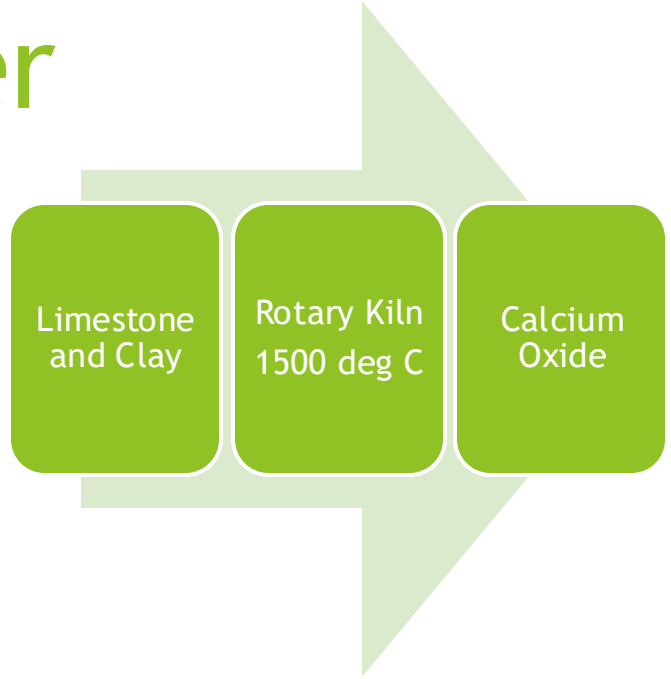
Deep - Recycling carbon savings



Regen – Recycling carbon savings



Reducing the Clinker Factor



Process Emissions
Combustion Emissions
Reduce Temperature
Increase use of substitute industry byproducts

Cem II currently 604 kgCO2/t
Future aim <400 kgCO2/t

CEMEX
Building a better future

Cement substitute site trial (June 2023)

Norfolk County Council

Hoffmann Green's H-EVA Sol CALCINED CLAY technology Reduces CO2 by 56%* v CEM2

- ✓ Standard in-situ equipment
- ✓ Equivalent 2% binder addition
- ✓ Equivalent water consumption
- ✓ No reduction in outputs

*CEM2 604kg v H-EVA 272kg CO2eq/t

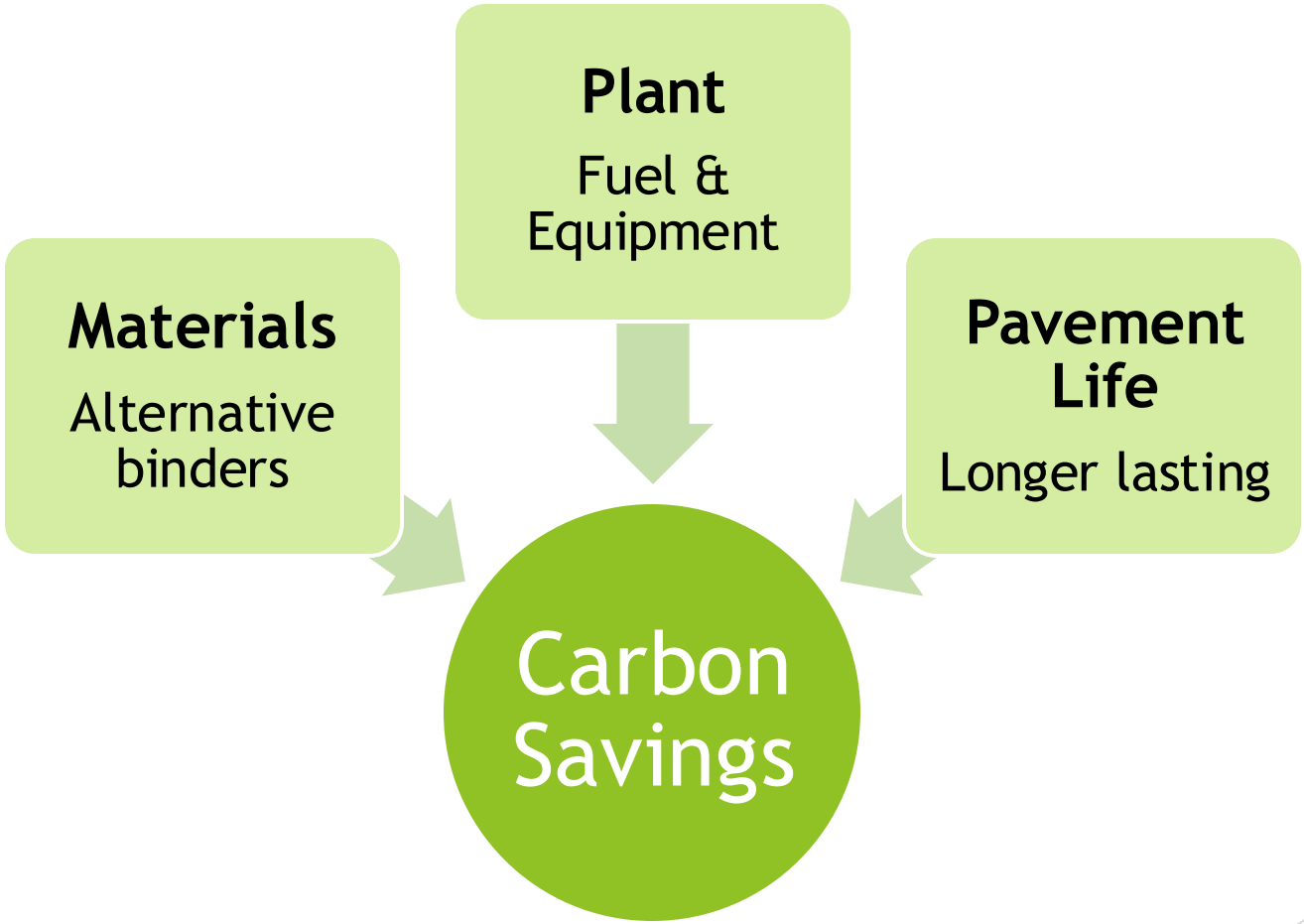
H-EVA Trial: Site testing during recycling

- Cylinder Strength:
  - Average: 2.5N/mm2

    + Increase of 19% over pre-testing (2.1N/mm2)

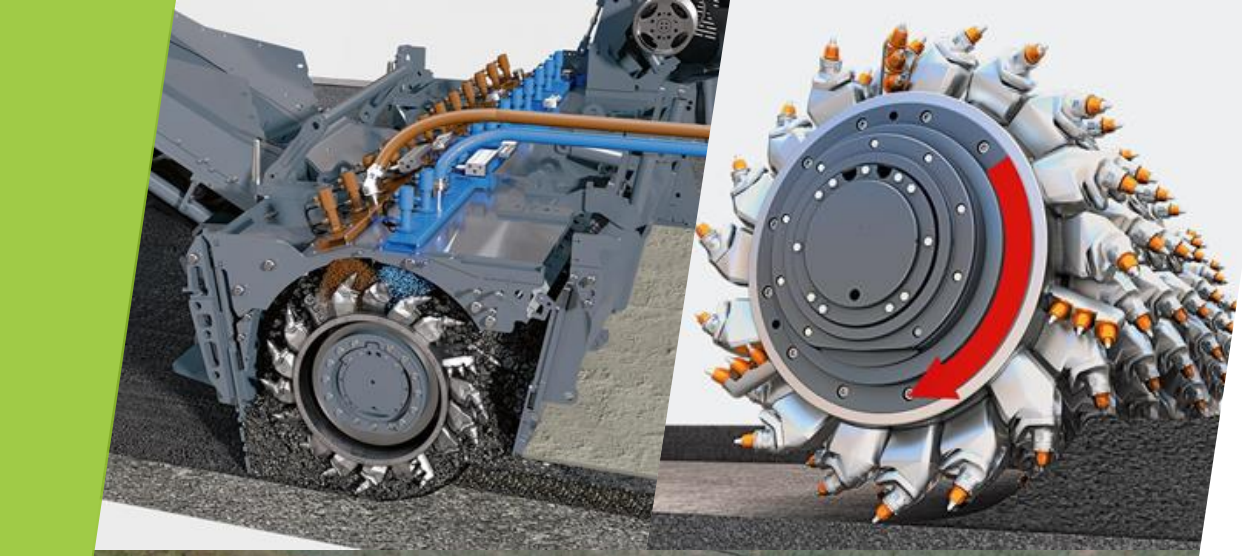
- Surface Stiffness using LWD
  - Completion: 125Mpa
  - +2mths: 225Mpa
  - +4mths: 576Mpa
  - +6mths: 610Mpa

Lowering Carbon



HVO Fuel for SPL Plant

- Wirtgen approve HVO for SPL CIR Plant
- Coordination through Milestone Suppliers for fueling forward programmes of work



Faster construction…

- Higher Outputs: 3.2m mixing drum in single pass
- Precise level control through Paver
- ‘Down-Cut’ process optimises material grading
- Computer control mixing and binder additions

Site efficiencies – Bomag RS-500

‘Moveable mixing drum’

- Reduces turning onsite
- Safer operation
- Less idling time saves fuel

BOMAG Pivot Steered Tandem Hybrid Roller

In addition to latest compaction technology

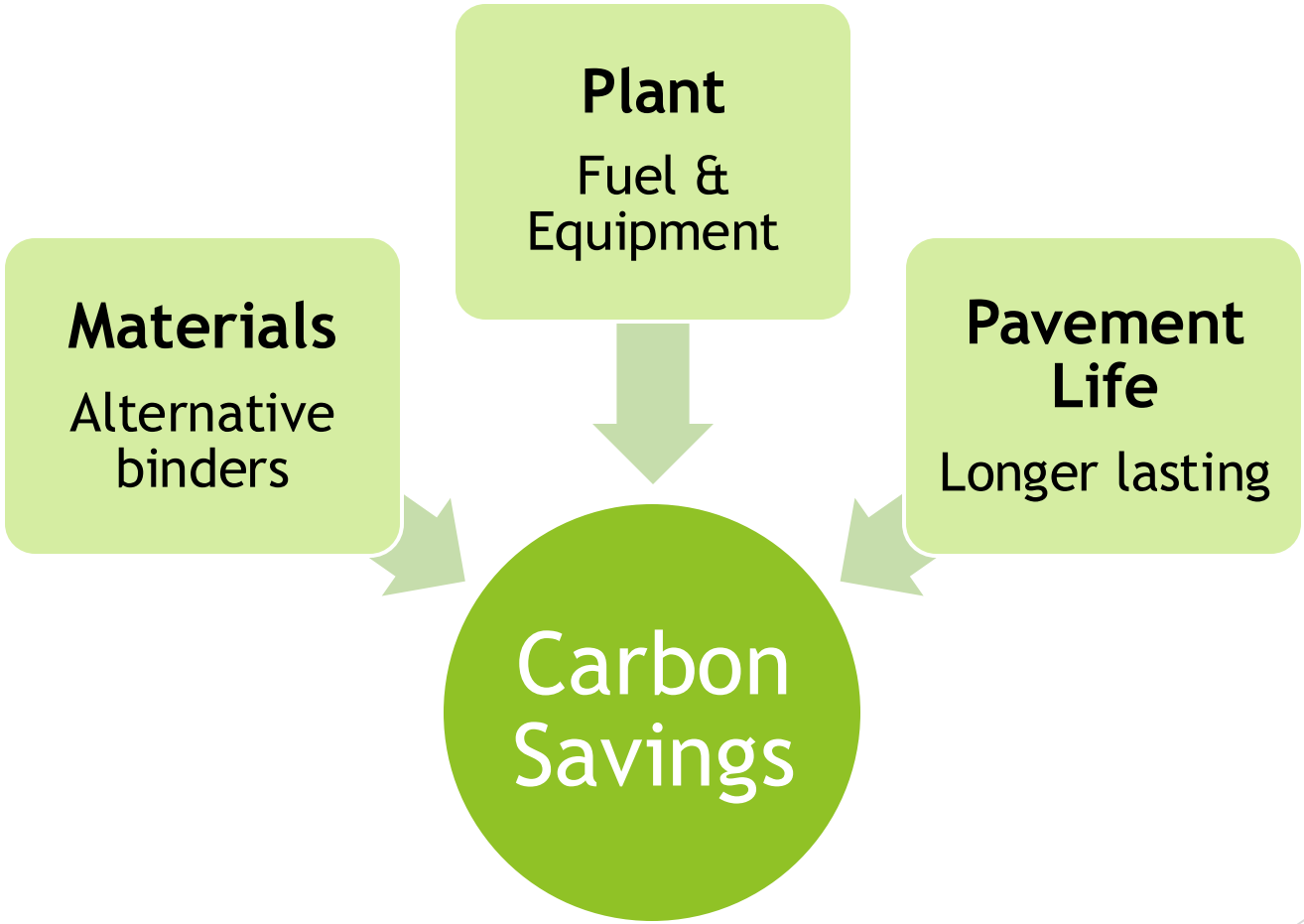
From Bomag, features include:

- * Accredited Back Protection by AGR – the German Campaign for Back Health

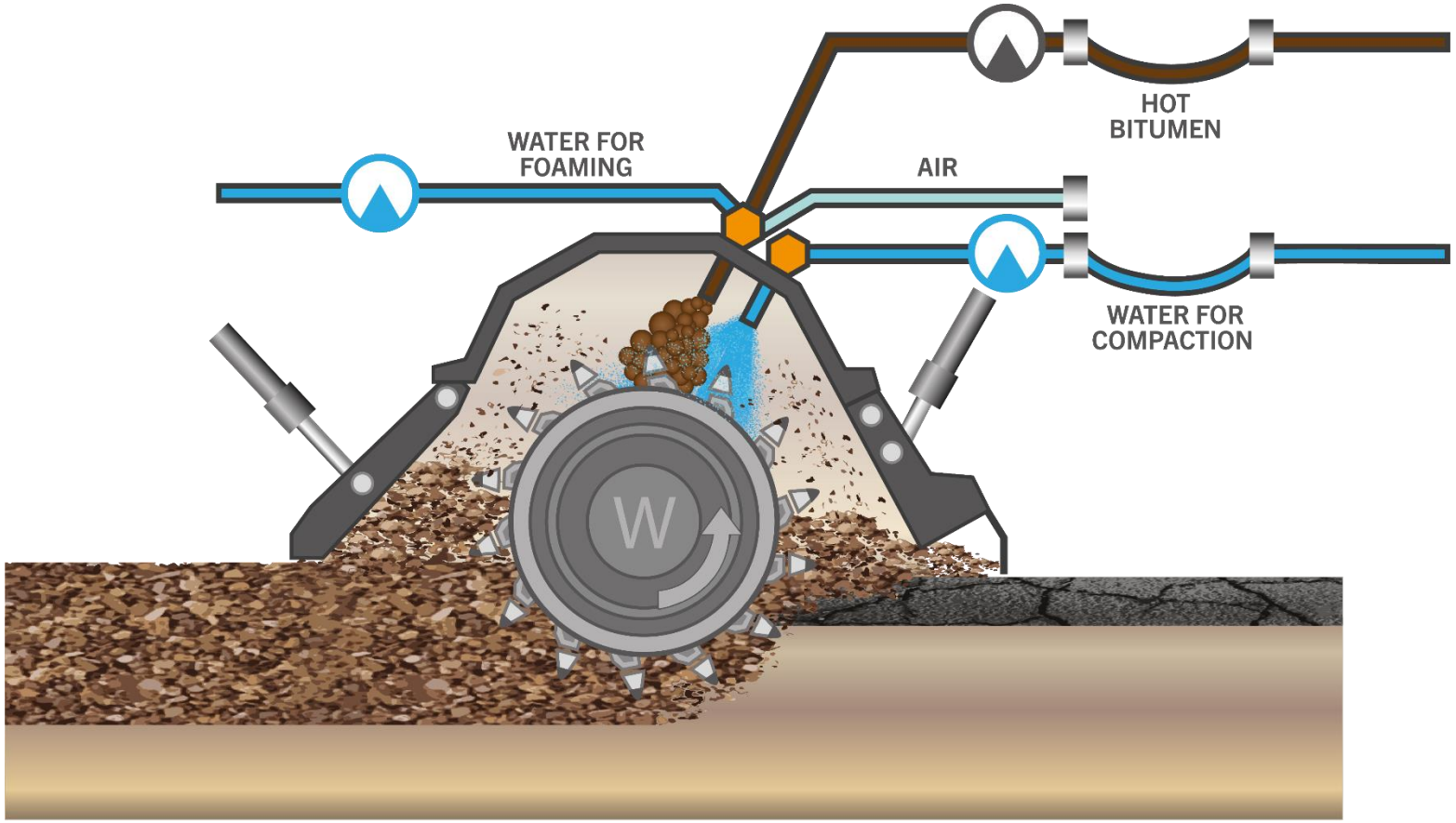
- * Hybrid Technology and Ecomode/stop minimises fuel consumption

- * Articulated set up mitigates risks at road edges

Lowering Carbon



In-Situ Foam Mix



Twenty-year design life with in-situ Foam

Design: 300mm Deep Foam Bitumen with Double Surface Dressing

OXFORDSHIRE COUNTY COUNCIL

- 2km of road
- Saved 227 tonnes CO2 (71% reduction)
- Saved 564 lorry movements
- 8 days faster than deep asphalt patching

In-Situ Ground Stabilisation Grid

Case Study

B1160 College Road, Norfolk

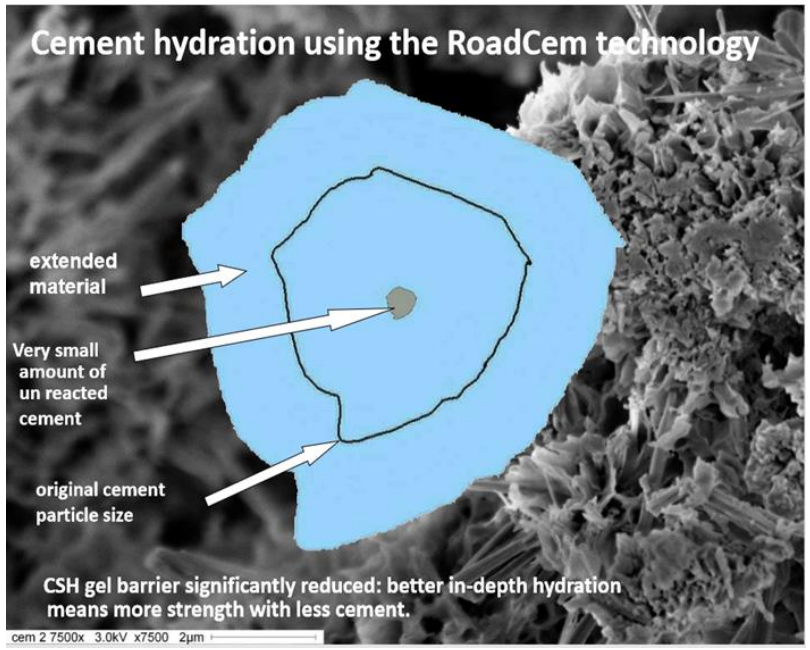
Deep recycling with geogrid installed below material

B1160, College Road, Norfolk

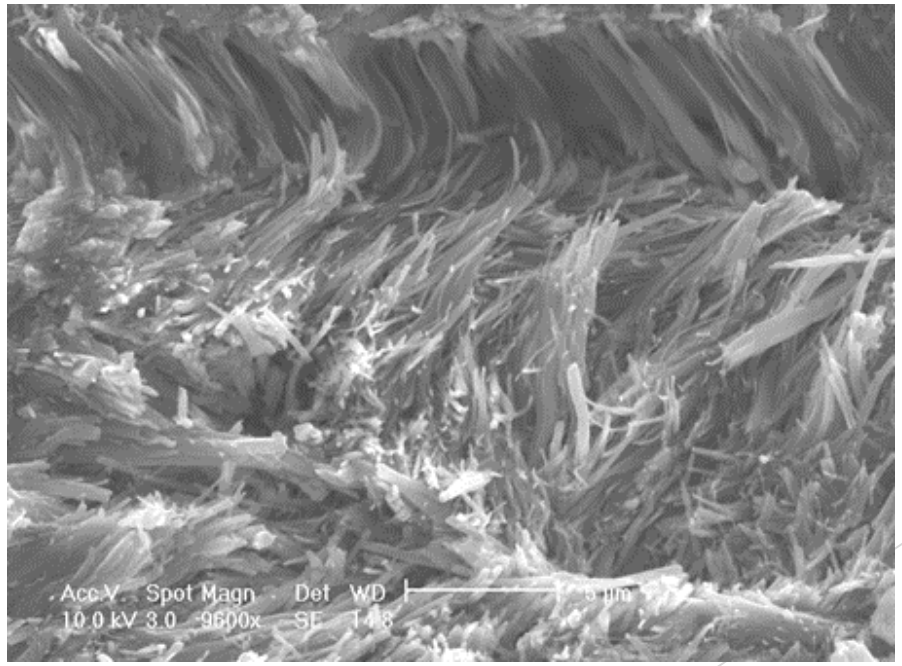
RoadCem overcomes UK challenges:

- Poor Drainage
- Shallow Clays
- High Water Table

Roadcem

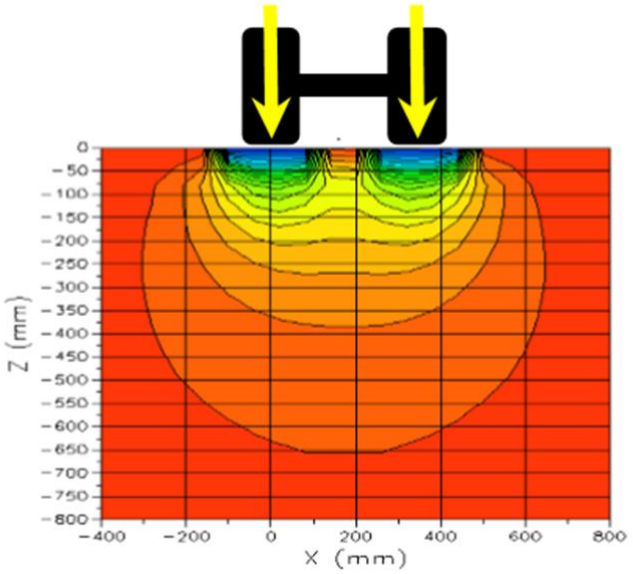


- **Enhanced cement performance**
- **Flexibility through formation of long strings wrapping particles**

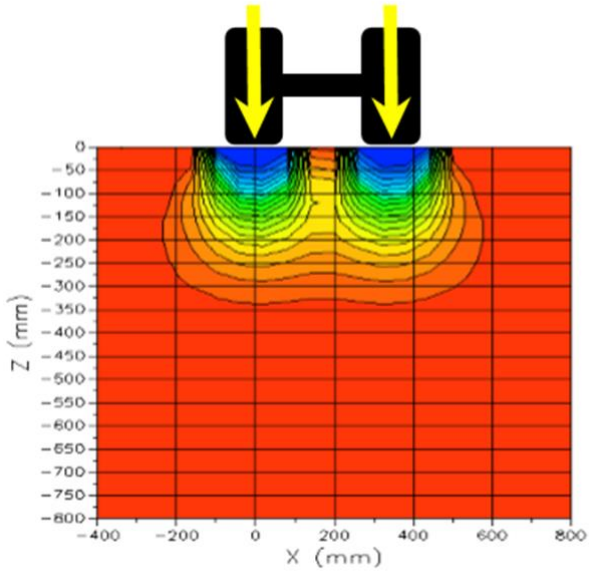


Powercem

RoadCem Smart technology creates stiff platforms with a greater modulus of elasticity…



Traditional



RoadCem

Graphene Trial – A1 for National Highways

- Graphene Nano Platelets (GNP) in powder form
- GNPs are two-dimensional carbon structure materials with single or multilayered graphite plane

- Characteristics:

- high electrical conductivity
- high modulus
- high strength
- high thermal conductivity
- high specific surface area.

Where can it be used?

Collaboration – How we get there

Communication through Industry Events

Client adoption and SPL's role in early uptake

Provide Laboratory evidence for design adoption

Provide commercial benefits

Developing Collaborative Partnerships crucial for innovation and future improvements to Highway Maintenance

Thanks for Listening

Latest Developments on Pavement Recycling

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