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ADEPT President's Awards 2024

Entry form

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Award category Delivering Clean Growth

Project Title Cheshire West and Chester Council with Colas – Collaborating to deliver highways decarbonisation

Local authority entrant Cheshire West and Chester Council

Partner/s if applicable Colas Ltd

Headline summary (150 characters max.)

A close partnership between Cheshire West and Chester Council and Colas is delivering improved decarbonisation outcomes from highway maintenance.

Please note we need at least one supporting image per award submission. Upload your image/s below.

Video - please paste links to any video evidence here. (Leave blank if not relevant.)

https://www.youtube.com/watch?v=GeFNth-Px4Y

Delivering clean growth: How is this project delivering clean growth, not just now but into the future – demonstrating ambition and vision, anticipating future challenges and future proofing growth including developing the workforce for the future? (150 words max)

In 2019, we declared a climate emergency, setting a target of net-zero carbon by 2045. Our highway maintenance responsibilities remain a significant challenge, with a high carbon footprint in traditional delivery approaches and materials. Addressing this sector-level challenge requires us to think differently about service delivery. All of our officers subsequently embarked on a carbon awareness and skills training programme, enabling ownership of the carbon impact of their decisions.

We also recognised that the decarbonisation challenge cannot be achieved by any single stakeholder, and collaborative delivery can stimulate improved outcomes and decision-making. Accordingly we have developed a close partnership with our term maintenance contractor, Colas, to drive this transition. As well as establishing dedicated collaborative working spaces and ways-of-working in the depot offices, Colas hosted a visit to their CORE Centre for highways-specific R&D, where we identified their Recycol in-situ recycling process as an opportunity to decarbonise carriageway resurfacing. maintenance.

Delivering clean growth: How is this project working across boundaries and with different partners to achieve long lasting clean growth? (150 words max)

We routinely engage with sector-level activities to address the net-zero, safety and mobility challenges, and collaborated beyond our Council boundaries to unlock the potential of Recycol. Coventry City Council had initial trialled Recycol on minor roads, which we engaged with and learned from to deliver the first UK demonstration on a principal road, the A41. Similarly, we invited National Highways to attend operations to assess its suitability for the strategic road network. This collaboration between highway authorities will support clean growth by sharing knowledge to scale-up successful low-carbon alternatives across the sector.

Our team engaged with research organisations to verify Recycol's benefits, providing confidence that this provides a long-term solution for clean growth. The Carbon Trust analysed the process, creating an accurate and reliable assessment of the carbon saving. In addition, the University of Nottingham assessed the technical aspects of the solution including laboratory testing and modelling of asset performance.

Delivering clean growth: How is this project proactively engaging with business to tackle problems and find solutions, stimulating the clean growth sector at the same time? (150 words max.)

Our officers and engineers worked closely with counterparts from Colas to deliver the Recycol project, enabled by the joint-working environment we have fostered in our Guilden Sutton depot. Directly addressing challenges from the Coventry trials, a significantly shorter curing time was needed for Recycol to be successful on major A-roads, enabling the road to reopen as soon as possible and minimise disruption for customers. Through collaboration with Colas the team found a solution, refining the binder mixture by adding cement at 1% of the total mix weight.
This reformulation reduced curing time to one hour, whilst retaining a carbon saving of approximately 65%. This solution also resulted in a time saving against traditional resurfacing, with the 2km section completed in 7 days with Recycol, instead of 13 for a traditional approach.

The project also promoted clean growth within the local SME supply chain, including Watson Plant Hire and L&R Roadlines.

Delivering clean growth: How is this project going beyond the 3-5 year budget cycle to prepare for future challenges including the use or consideration of innovative funding solutions? (150 words max.)

To sustain clean growth, low-carbon solutions to be cost-effective for authorities. Accordingly, the lower-carbon Recycol also delivered a 9.31% cost saving over conventional solutions, challenging perceptions that innovative solutions cost more.

A challenge of early adoption concerning innovative low-carbon alternatives is additional cost associated with validating demonstrations. Whilst, these trials are vital to evaluate outcomes and prove long-term

suitability before the solution can be rolled out as business as usual, there is inherent risk that must be managed. Where appropriate, we therefore aim to leverage alternative funding sources outside the budget cycle to enable this – for Recycol, Colas secured £194,000 of funding from the Department for Business, Energy and Industrial Strategy, enabling independent assessments from the Carbon Trust and University of Nottingham. Outside our highway department, we have already obtained Salix funding to decarbonise 14 public buildings, an approach we seek to replicate with our partners in this directorate.

All categories: please add anything else that supports your award entry

Background

Having been introduced to the technology through collaborative activities early in our partnership, Recycol – the proprietary, cold asphalt solution developed within the wider group of our term maintenance contractor, Colas Ltd. – was selected due to the considerably higher carbon savings compared with other hydraulic bound solutions and those with high proportions of cementitious material.

The Recycol process targets a step change in total CO2 emissions with respect to traditional Hot Mix Asphalt (HMA) via reductions in:

- Heating of asphalt material
- Materials extraction
- Upstream transportation
- Manufacture of mixtures
- Freight entering/leaving site
- Processing of waste

Likewise, using an emulsion & cement mix design delivers a high visco-elasticity in the new carriageway surface, allowing the asphalt to:

1. Better withstand traffic loads and environmental factors such as temperature changes and moisture
2. Ensure a smoother and safer driving experience
3. Minimise the cost and environmental impact of maintenance and repairs.

Planning and design

To meet our key objective of re-opening the newly-paved road to traffic as soon as possible, CW&C and Colas technical teams (UK. France) collaborated closed during the planning and mix design phase to adjust the binder mixture, adding cement at 1% of the total mix weight. This novel reformulation optimised the mixture for use on a major road, resulting in a curing time within 1 hour of laying and acceptable balance of rigidity and flexibility. This was fundamental in enabling teams to apply the final surface course within just one day, rather than two weeks later, yielding significant potential to reduce scheme timescales over traditional resurfacing techniques.

Colas' state-of-the-art Recycol planer-mixer was imported from Lyons for this trial, requiring significant logistic planning.

Delivery

Recycol comprises the following steps:

- The binder course is planed
- The planed asphalt is carried up into a mixing drum and mixed with water and Colas' proprietary emulsion
- 100% of the recycled material is dropped back onto the road, in a windrow mound behind the planer/mixer.
- The recycled material is then picked up by a "elevator" machine
- Bondcoat is applied to the planed surface below the "elevator"
- The recycled material is dropped into a typical paver vehicle.
- The recycled material is then laid back down in a paved surface

- Another layer of bondcoat is applied and a roller compacts the surface

The location, situated along the A41 around Chowley village, underwent closure to traffic from 3rd October. Watson Plant Hire, based locally, undertook all of the planning. The lining was carried out by L&R Roadlining, who are also based within the borough in Ellesmere Port.

The site was reopened by us to vehicular traffic without restriction on 8th October.

Outcomes

Using Recycol resulted in an area of 14,000m2 being recycled in-situ. With carbon evaluations independently verified by Atkins Realis, the project team were able to rigorously demonstrate to our officers that the Recycol technique achieved a substantial 65% reduction in carbon emissions compared to the initially specified traditional Hot Mix Asphalt. This yields a total project carbon calculation of 39.24 tCO_2e for Recycol, vs 112.1 tCO_2e for SMA 14mm, with corresponding savings for:

- Process Energy: 537,497MJ for Recycol vs 1,523,668 MJ (65% reduction)
- Resources used: 67t for Recycol, vs 1,914t for the 14mm SMA (97% reduction)

As well as carbon savings, the project achieved a cost saving of around 9.31% when using Recycol compared to traditional resurfacing. Correspondingly, the reduction in vehicle movements minimised safety risks and improved air quality.

The performance of the material will be monitored at 6 monthly intervals by the project team for the next two years, as well as through monthly section 58 safety inspections. Feedback from our Ward Members has been really positive, many commenting on the visual quality of the repair and smoothness of the ride.

More generally, findings from this trial have already been used to inform future innovations and improvements in repair techniques and materials across our highway network. We have also identified further funding from within the Council for further innovation in highways, which will allow us and indeed the wider industry to progress more rapidly to reach our collective goal.

Endorsement

Karen Shore, Deputy Leader and Cabinet Member for Environment, Transport and Highways within the Council, said: “I am delighted the Council is using such an innovative product within the borough with our highways partner, Colas. This is a great example of collaborative working and innovation, which has great environmental benefits.”