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IEMA Webinar:

Circular economy in practice: How to Integrate CE Principles into Highways Maintenance & road infrastructure projects

28.01.21

Olly Beech, Environment Manager, Infrastructure Services, Skanska

Stuart Gready, Managing Director, OCL Regeneration Ltd

Sarah Gilbert, Team Leader Climate Action, Oxfordshire County Council

Tim Shickle, Group Manager (Asset Renewals), Oxfordshire County Council

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Focus of this session

Background:

- This webinar will provide an insight into some of the treatment and recycling operations which have been implemented and trialed to produce usable materials and close the loop on highways waste.

During this session you will gain:

- An understanding of some of the key challenges associated with implementing this circular economy approach;
- A case study overview of the application of this approach in Oxfordshire;
- Practical recommendations from experts in the sector, including local authority and supply chain perspectives on the value of these circular economy initiatives, the key factors facilitating implementation and how challenges may be overcome.
- Some of the methods described may also be transferable to organisations in other sectors to help them drive management of waste in accordance with circular economy principles.

Speakers

Olly Beech
Environment Manager

Skanska

Sarah Gilbert
Climate Action Team Leader

Oxfordshire County Council

Tim Shickle
Group Manager

Oxfordshire County Council

Stuart Gready,
Managing Director

OCL Regeneration Ltd

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Webinar slides and recording

All IEMA webinars are recorded.
They can be found here:

https://www.iema.net/event-reports

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Questions and Answers

We will have a Q&A/discussion session at the end of the presentations.

Send in your questions as we go through today's webinar.

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Want to join the debate?

If you have expertise, or keen interest, in sustainable resource management and wish to engage with IEMA on how we can work together to make the transition to a circular economy a reality, then join our Circular Economy network:

https://www.iema.net/policy/ce/ce-engagement

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Questions

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Presentations

Highways Maintenance & Circular Economy

Olly Beech (Skanska)

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Local Authority Highways Maintenance

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Adapting our approach in Oxfordshire

External supply of virgin materials for highways maintenance → Waste generated from highways maintenance activities → Disposal of waste

Materials:

>100,000t asphalt
5,600 tCO2e / >£7.25m

~75,000t aggregates
580 tCO2e / >£1.2m

Waste:

~30,000t of excavated waste
(soil, stone, asphalt, concrete)
45 tCO2e / >£300,000

~8,000t asphalt waste containing coal tar
34 tCO2e / >£680,000

~1,000t gully waste & street cleaning residues
1.5 tCO2e / >£87,000

1. Identify uses for recycled products in designs / specifications

2. Waste from highways maintenance activities

3. Return waste to recycling 'hubs'

4. Process waste into new materials

5. Use re-processed materials to carry out maintenance

Potential savings over 4 years:
£4.3m
1,000 tCO2e

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Case Study 1 – Asphalt & Aggregate Recycling

Stuart Gready (OCL Regeneration Ltd)

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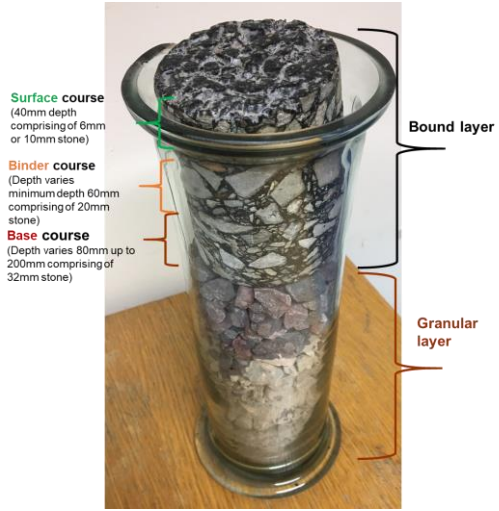
Asphalt Waste Containing Coal Tar (AWCCT)

- Coal tar used widely as the binder ('glue') for aggregates in pavements up until mid-1980s. More recently replaced with Bitumen due to the hazardous properties associated with coal tar (carcinogenic and toxic to aquatic life).
- This presents several challenges:
  - Asphalt waste containing >0.1% of coal tar is hazardous
  - Needs to be identified and managed appropriately
  - Relatively few facilities permitted to accept it
  - Costly disposal and significant transport distances
  - Limited options for recycling…or is there?



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OCL Approach

- Invested in bespoke waste permits and mobile plant permits to facilitate recycling 'hub' approach
- These permits (and the Environment Agency (EA) Regulatory Position Statement (RPS) 157) allow AWCCT to be manufactured into a specified and approved product for re-use in highways and other construction works
- Treated AWCCT re-used in accordance with the EA's RPS 075 and the Association of Directors of Environment, Economy, Planning and Transport (ADEPT) guidance
- It may be feasible to amend designs to avoid AWCCT altogether if it is identified in advance but this approach is currently the next best option in terms of the waste hierarchy and circular economy principles

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Feedstock, not waste

Concrete and bricks

Soil and stones (hazardous and non-hazardous)

'Clean' asphalt waste

Asphalt waste containing coal tar (AWCCT)

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Recycling Processes

Crushing & Screening

Blending & Mixing

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New Products

Foambase™ Cold Base & Binder SHW cl.948

Hydraulically Bound Material (HBM) BSEN 14227 & SHW 800 Series

Recycled Type 1 and Type 4 SHW 800 Series

SMR Regen™ BSEN 14227 & SHW 800 Series

Acronyms

SHW = Specification for Highway Works
Cl. = Clause
BSEN = British Standard European Norm
SMR = Structural Material for Reinstatement

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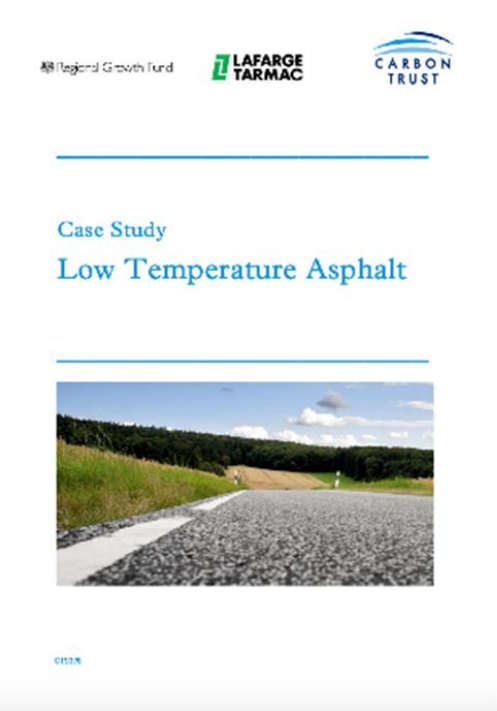
Benefits



Material	Carbon Footprint, Kg CO_2/tonne[5]	Carbon Footprint, Kg CO_2/m^2	Saving over equivalent hot product, %
Surface Course, HRA			
Hot	52.0	5.1	0%
Semi-Warm	47.7	4.7	7.8%
Surface Course, AC10			
Hot	55.0	5.4	0%
Semi-Warm	50.7	5.0	7.4%
Binder Course			
Hot	45.1	6.6	0%
Semi	41.9	6.0	9.1%
Cold	27.0	4.0	39.4%

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Oxford Depot

2017:

- 1,800 tonnes of AWCCT → 2,100 tonnes of HBM
- £32,400 savings
- 60% reduction in material supply transport distance
- 51 tCO_2e carbon saving

2021:

- 6000 tonnes stockpiled currently
- Savings of £144,000 & 180 tCO_2e if 8,000 tonnes processed
- Generating recycled aggregates from circa 5000 tonnes of clean asphalt, stone and concrete annually could save £106,000 & 48 tCO2e

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Case Study 2 – Gully Waste Treatment Trial

Olly Beech (Skanska)

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Gully Waste

£87 per tonne disposal costs

£60-70 per tonne treatment costs
(depending on tonnages & refinement of process)

Fill material	Recycled aggregates	Topsoil replacement

Potential savings of £17,000-£27,000 + 4 tCO2e per annum
(based on successfully processing 1000 tonnes)

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Initial Results

- Compliance with several Standards for Highway Works (SHW) general fill and bedding specifications
- Reviewing chemical testing results against Soil Guideline Values (SGVs) and inert thresholds

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Challenges, Enabling Factors & Benefits

Tim Shickle & Sarah Gilbert (Oxfordshire County Council)

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Challenges

- Reactive nature of many work activities
- Aligning donor and recipient sites
- Space constraints at recycling ‘hubs’ (i.e. highways depots)
- Obtaining and managing suitable waste permits
- Managing feedstock quality

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Enabling Factors

- Early carriageway investigation works (approx. 1 year in advance)
- Client, Design & Supply Chain collaboration
- Engagement with neighbouring authorities and other local development projects
- Clear communication to operatives
- Updates to existing specifications and having a process to deviate if necessary
- Regulatory Position Statements to allow smaller-scale operations without permits

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Benefits

- Greater control and resilience over material supply
- Maximise value of waste permit
- Reduce waste disposal costs and minimise lorry movements
- Minimise reliance on virgin materials
- Support neighbouring authorities
- Generate revenue to invest in further improvements
- Recognition for delivering innovation and industry-leading solutions
- Operational efficiencies

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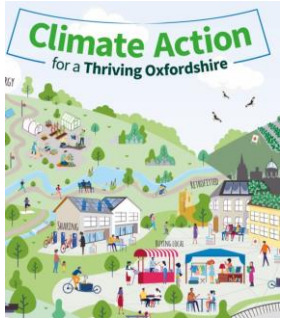
Circularity and Climate Action

- Supports climate commitments
- Maximise Oxfordshire benefits
- Inclusive transition
- Decouple growth from emissions

- Prioritise environmental /social value in our procurement
- Use Oxfordshire as a ‘Living Lab’
- Set policies that drive innovation
- Build a culture of circularity in communities



OXFORD ZERO EMISSION ZONE

The CAG Project COMMUNITY ACTION GROUPS

LEO Local Energy Oxfordshire

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Thank You

Questions welcome…

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Questions and Answers

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Where next?

- Record your CPD on IEMA's new CPD Portal: Plan, record and reflect on your learning.
- Join us at an event near you on www.iema.net/events

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Thanks for joining us

You'll be sent a link to the slides & recording from today's session

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