Use of BioKlair®, a natural and permeable road-surfacing mix, on the ViaRhôna

The project involved the application of BioKlair®, an eco-friendly and permeable road-surfacing mix, on a 2 km stretch of the ViaRhôna (a cycle route linking Lake Leman to the Mediterranean), located on Île du Beurre island.

Starting date of the project	11/2019
Project Localisation Places of implementation of the project at this stage and targeted geography if replicable.	Tupin-et-Semons (Rhône)
Project objectives Type of climate innovation of the project with a description of the problem/issue addressed	The project involves the application of an eco-friendly and permeable road-surfacing mix on a stretch of the ViaRhôna (an 815 km cycle route that extends from Lake Leman to the Mediterranean Sea running alongside the Rhône river), which passes across Île du Beurre island located on the Rhône. Île du Beurre island is a protected natural area under APPB classification (French prefectural order for biotope protection), home to a colony of beavers as well as a large population of birds (an ornithological observatory was installed to monitor it). The area is also subject to flooding from the Rhône river that borders it. The project was carried out within a context of strong pressure from local environmental associations that were opposed to any artificialisation of the green pathway. The project's main objectives therefore were: - Reduce carbon emissions thanks to the application of a mix produced at a lower temperature, using a plant-based binder that provides carbon storage. - Obtain a light-coloured surface, effectively helping to prevent heat islands. - Improve water management by creating a road surface that is permeable.
Detailed project description	Project owner: Auvergne-Rhône-Alpes region. Technical constraints: The need to avoid vibration – Smooth compaction Issue of waterproofing linked to flooding and the infiltration of rainwater - Use of permeable BioKlair® Difficulty of access (no motor vehicles allowed) – use of "small" construction machinery (Sambrons-powered mini paver), manual application for observatory access routes Integration into the landscape – BioKlair® formulated with local light-grey aggregates (Chênes quarry approximately 30 km away). The decision was made to use the eco-friendly and permeable BioKlair® mix, combining local aggregates and a light-coloured plant-based binder, designed and manufactured by Eiffage Route (granular size 0/6 mm over a thickness of approximately 4.5 cm for a total tonnage of 350 T of mix applied). Specially adapted to cycle paths and other soft mobility solutions, this plant-based binder produced at a lower temperature is made from co-products of the forestry and paper industry, combined with a synthetic resin. BioKlair® improves water management because it is designed to be permeable, allowing runoff water to infiltrate the soil (e.g. heavy rains and flood waters). In addition, Bioklair® reduces the temperature of the road surface during periods of high heat, effectively preventing urban heat islands (UHI). Its light-coloured aggregates allow it to better reflect and diffuse solar energy (Albedo effect), compared to a conventional bitumen asphalt. The work was carried out over a two-day period at the end of November, with an ambient temperature of between 4° and 10°C. The mix proved very easy to work with, presenting good overall appearance and a very high level of permeability. The finish obtained (light brown) was in line with the objective of integrating the project into the surrounding environment (blending in with the natural earth footpaths). Since it was applied, the mix has lightened up as a result of the effects of UV rays (a natural phenomenon for a light-coloured mix bringing out the natural color of the aggregates).

Main project's drivers for reducing the greenhouse gas emissions

Enter the information in the appropriate boxes

Reduction levers	Details on the aspects of the project
☐ Energy and resource efficiency (including behaviour)	
☐ Energy Decarbonisation	
☒ Energy efficiency improvements	Lower production temperatures than most other mixes
☒ Improving efficiency in non-energy resources	Use of plant-based raw materials instead of bitumen (fossil).
☒ Emissions absorption: creation of carbon sinks, negative emissions (BECCS, CCU/S, ...)	Plant-based raw materials from forestry industry residues, creating a carbon sink.
☐ Financing low-carbon producers or disinvestment from carbon assets	
☐ Reduction of other greenhouse gases emission	

Emission scope(s) on which the project has a significant impact and quantification of GHG emission reductions per emission scope

Indicate the aspects of the project that contribute to the reduction of emissions per category of emissions considered (left-hand column) and the quantification of associated emissions.

Indicate the main hypotheses and calculation steps in the intended section (below the table)

For further details, please refer to the methodology guidelines.

	Aspects of the project contributing to the reduction of emissions by emission category	Quantification of associated GHG emissions by emission category Please follow the quantification methodology used in the Afep guidelines.
Reduction of the company's carbon dependency		
Scope 1 *Direct emissions generated by the company's activity.*	Worksite emissions (the constraints of the site required the use of smaller machinery, which is less energy intensive and emits less CO2)	Conventional bitumen solution = 8.2 tCO2eq. Bioklair solution used =7.7 tCO2eq.
Scope 2 *Indirect emissions associated with the company's electricity and heat consumption.*		Included in Scope 1 above
Scope 3 *Emissions induced (upstream or downstream) by the company's activities, products and/or services in its value chain.*	Inclusion of a bio-sourced component in BioKlair® provides the mix with carbon storage properties.	Conventional bitumen solution = 6.1 tCO2eq. Bioklair solution used = -10 tCO2eq.
Increase of carbon sinks		
Emissions Absorption *Carbon sinks creation, (BECCS, CCU/S, …)*	Inclusion of a bio-sourced component in BioKlair®	
GHG emissions avoided by the company at third parties		
Avoided Emissions *Emissions avoided by the activities, products and/or services in charge of the project, or by the financing of emission reduction projects.*		

Clarification on the calculation or other remarks: The biogenic carbon captured by trees during their growth can be attributed to their by-products; BioKlair® is formulated using by-products of the French forestry and paper industry. We can therefore allocate part of the carbon trapped by the trees used in this industry under the so-called “allocation” principle. This allocation can be economic (the carbon footprint of the products is distributed according to their price and their weight), or mass (based on the ratio of the quantity of products and co-products at the output of the transformation process). The principle of mass allocation has been adopted for the Eiffage Route range of plant-based solutions.

Modality of verification of the quantification.

Calculation standard used (ADEME base, GHG protocol, etc.): SEVE eco-comparator tool http://www.seve-tp.com

Verification of the calculation (internal or external): Internal and binder's EPD

Other environmental and social benefits of the project

If possible, list the impacts and Sustainable Development Objectives concerned

Project aligned with the preservation of the surrounding environment, blending in with the landscape and respect for biodiversity at the site.
Respect for local wildlife during construction
The project meets several SDGs:

Project maturity level Tick the corresponding current maturity level	☐ Prototype laboratory test (TRL 7) ☐ Real life testing (TRL 7-8) ☐ Pre-commercial prototype (TRL 9) ☐ Small-scale implementation ☒ Medium to large scale implementation **Remarks** **Already in regular use on Eiffage Route projects**
Capacity and conditions of the project reproducibility, with associated climate impact mitigation potential	Highly reproducible
Amount of investment made (in €)	€290K excl. VAT
Economic profitability of the project (ROI)	☒ ST (0-3 years) ☐ MT (4-10 years) ☐ LT (> 10 years) **Remarks:** **No additional cost compared to fossil-derived light-coloured mixes**
Engaged partnerships	CIRR (Roads & Streets Innovation Committee): BioKlair® winner in 2020, future project monitored by Cerema (technical services of the Ministry of Ecological Transition)
Open comments from the project owner	
More about the project	
Contact the company carrying the project Please specify an ad hoc e-mail address that will allow the reader to contact the project company directly	Julien VAN ROMPU : Julien.VANROMPU@eiffage.com Jérôme DHERBECOURT : Jerome.DHERBECOURT@eiffage.com
Project URL links	N/A
Illustrations of the project 3 photos/videos minimum (in HD format to be attached)	See attached (Photo credits: ACTOPHOTO©; Eiffage Route)