Composites UK Trade Association

COMPOSITE BRAIDING

SUSTAINABILITY: NET-ZERO INITIATIVE

WINNER: Composite Braiding Ltd

Composite Braiding Ltd (CBL) has developed and demonstrated the UK's first prototype thermoplastic composite twin track cantilever (CTTC) for railway electrification, manufactured using its unique high-throughput braiding and consolidation technologies. Constructed primarily from glass fibre reinforced nylon, the CTTC achieved an 83% weight saving compared to traditional steel designs, reducing mass from 1,700 kg to just 277 kg. This has clear benefits for installation efficiency, worker safety, and reduced environmental impact in both manufacture and transport.

Life-cycle analysis highlights dramatic decarbonisation potential. While prototype emissions were broadly comparable to steel, the production variant (GF/PET) demonstrates a 45% reduction in manufacturing emissions per kilogram. When combined with the significant mass reduction, this equates to a 91% saving in overall emissions per structure—from 6,921 $kgCO_2$ for steel to just 616 $kgCO_2$ for GF/PET. Additional unquantified benefits include reduced concrete foundations, fewer road rail access points, and increased recyclability due to thermoplastic materials.

The market impact is substantial. Around 5,000 km of track in Great Britain is still to be electrified, requiring an estimated 100,000 cantilevers. CBL's CTTC can be delivered at a cost comparable to steel but with far lower installation and service costs. The decarbonisation value alone, based on the UK Emissions Trading Scheme, is forecast at over £100 million. International export potential further broadens opportunity.

The project was delivered under the CPC Clean Futures 2 accelerator with BCIMO, Amey, and other Tier 1 suppliers providing technical support. CBL invested more than 2,300 hours in design, process development, and manufacture of the 8m prototype, which was successfully installed at BCIMO in Dudley in February 2025.

CBL's CTTC is a first-of-its-kind demonstration of thermoplastic composites in transport infrastructure—a scalable, sustainable innovation with the potential to transform rail electrification and accelerate global decarbonisation.

Learn more at: www.compositebraiding.com