



NICER PROGRAMME & INNOVATE UK
CIRCULAR ECONOMY FOR SMEs

Alliance for Sustainable Building Products



DISRUPT: DELIVERING INNOVATIVE STEEL REUSE PROJECT

The Challenge: What We Were Trying to Achieve

Although steel is widely recycled, more benefits can be derived by reusing it. Steel reuse provides huge environmental advantages, such as 96-98% carbon reductions compared to using virgin steel.¹ Over three-quarters of scrap steel generated in the UK is exported for recycling in other countries because of limited capacity. This is a missed opportunity and a loss of value for the UK economy. Instead, steel could be reused, providing local socio-economic benefits while reducing transportation impacts. Retaining this value and keeping materials in circulation for as long as possible are key principles of the circular economy.

Low carbon targets have recently driven steel reuse, leading supply chain actors to call for a collaborative approach to encourage steel reuse in construction projects. However, actual steel reuse remains a niche practice and there are many technical, economic and supply chain concerns to consider.

Responding to this challenge, our project develops scalable and replicable business models for market entrants of steel reuse encompassing the entire value chain, including clients, designers, contractors, stockists, fabricators, and demolition contractors. This will help to raise awareness of steel reuse and, ultimately, expand the market.

The Approach: How We Tackled the Challenge

We conducted the following activities:

- A literature review and mapped supply chain actors involved in steel reuse.

- Developed a business model framework including technical, economic, logistical and other considerations for each actor in the value chain via available literature and interviews with experts in steel reuse.
- Selected 11 real-life case studies covering different project types, sizes, locations, and supply chain models for closer analysis. This included gathering details via published information followed up with interviews with companies involved in steel reuse projects across the value chain.
- Developed business models for supply chain actors that will serve as a blueprint/guide for businesses interested in entering the market of steel reuse or improving their practices.

Our partnership with Cleveland Steel and Tubes was crucial to the success of the project. Roy Fishwick from the company is a renowned expert and advocate for steel reuse and was instrumental in sharing his expertise and connections. The project also received valuable contributions from partners ISG, NFDC, and Grosvenor.

Unexpected Outcomes: What We Learned Along the Way

While we didn't experience any 'unexpected' outcomes, a key lesson learned was that the recovery of steel from buildings during demolition poses a major challenge. To address this challenge, we have applied for a new grant that will focus specifically on demolition approaches to facilitate steel reuse. Watch this space!

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Key Learning: What We Would Do Differently Next Time

The success of this project relied heavily on gaining insights from experts in the field through stakeholder interviews and access to case study information. Hence, having a strong network of contacts and supporters of the project was key. Also, we spent additional time in this project in peer-reviewing work, which was influential in the further development of the project.

The Outcome: What We Achieved and How It Has Impacted the Business, Society and Key Stakeholders

We have developed a toolkit for market entrants of steel reuse, which includes business considerations, 11 case studies, steel reuse supply chain models, guidance and policy notes, and scenario mapping. The business considerations cover technical, economic, supply chain, and other factors that are critical for businesses to consider. The 11 case studies include current construction projects at various scales, different building types and diverse locations. Scenario mapping provides an estimate of structural steel currently reused and forecasted scenarios up to 2050 with an ultimate goal to reuse 45% of beams and columns from demolished buildings. The toolkit can be accessed [here](#).

The toolkit was launched in March 2023 and was hosted by project partner ISG. The project has generated significant interest from the industry and numerous organisations have contacted us after the event. The event was fully booked well before the event, indicating strong interest in steel reuse and the project. The project outcomes have been featured in several media outlets. We are exploring ways to further disseminate the project findings, so more companies will be interested and have guidance on steel reuse.

The project outcomes have contributed to the ongoing 'Reuse Now' campaign by the ASBP, which can be accessed [here](#).

Our project partner, [Cleveland Steel and Tubes](#), has increased its purchase of reclaimed steel, indicating growing market uptake. Another key player stockholder European Metal Recycling (EMR) is also actively

promoting steel reuse. We held webinars on steel reuse with two other project partners [ISG](#) and [Grosvenor](#). These were highly detailed and attracted a lot of attention, evidenced by the numerous comments from participants. In collaboration with the project partner, the [National Federation of Demolition Contractors](#) (NFDC), we have applied for a new grant focused on the demolition processes. NFDC is eager to continue exploring the topic of steel reuse and, if successful, our new grant would result in employing an additional person dedicated to steel reuse and improving their product reuse database.

Looking Forward: Next Steps and Future Directions

We have been awarded two additional grants through the Innovate UK funding program:

DISRUPT II is a continuation of this DISRUPT I project on steel reuse with a closer focus on the demolition approaches for recovering steel from buildings, which was found to be the main blocker for increasing steel reuse. This was developed with the current partners NFDC and Cleveland Steel and Tubes, and supported by the largest demolition contractor in the UK, Keltbray.

E-TRACS (Embedding TRACeability in manufacturing construction Steel to aid reuse) focuses on tracking steel sections so that they can be easily reused in the future. Material traceability has been identified as another obstacle for steel reuse, as testing and design can be challenging without knowledge of the material properties and whether the steel has been exposed to fire, dynamic loads, and other severe conditions. The project is co-partnered with the University Of Hertfordshire, Leeds Beckett University, and Dynatics Solutions.

This project was funded by the UKRI National Interdisciplinary Circular Economy Research Programme and Innovate UK. Development of the case studies has been supported by the UKRI Circular Economy Hub. More information about the CE-Hub can be found [here](#).

Research was carried out by the Association for Sustainable Building Products with support from the UKRI Interdisciplinary Centre for Circular Metals and project partners Cleveland Steel and Tubes, ISG and Grosvenor.