



# NICER PROGRAMME & INNOVATE UK CIRCULAR ECONOMY FOR SMEs

## Alliance for Sustainable Building Products



UKRI Interdisciplinary  
Centre for Circular  
Metals

NICER PROGRAMME



Innovate  
UK

# Disrupt II: Demolition approaches to recovering steel

## 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 up to 97% carbon reductions compared to using virgin steel. 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 (CE).

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. Our previous project, DISRUPT I developed scalable business models for market entrants of steel reuse, creating a toolkit which can be accessed [here](#).

However, one of the key challenges which arose out of DISRUPT I was the difficulty of retaining the value of steel during demolition processes. There is no legal obligation in the UK to carry out pre-demolition audits, although an increasing number of clients are requesting them as part of their sustainability criteria. Furthermore, the rewards from steel recovery are given to new projects that use reused steel, rather than to those who recover the material. As a result, demolition contractors are not incentivised to recover steel for reuse, leading to a limited supply of reusable steel.

Responding to this challenge, our DISRUPT II project develops a toolkit for demolition contractors on how to recover steel from buildings for reuse, covering the technical aspects, material acceptability, cost and

procurement, training and reporting. This provides practical support to all those involved in demolition projects and will ultimately increase the amount of reused steel on the market.

## The Barriers: What are the common barriers and how can these be overcome

The key barriers to steel reuse are a lack of knowledge, in terms of what is suitable for reuse and a lack of resources to adopt new practices. Changing processes requires time and a degree of expertise or knowledge to design new systems and ways of working. This project begins to address these challenges through dissemination of knowledge and learning and the development of guidance which can support resource-poor organisations to change their practices. We have also created a guide highlighting the extra equipment which might be required to capture the value of steel during demolition projects.

## The Approach: How we tackled the challenge

We took a collaborative approach to the challenge, partnering with the demolition body the [Institute of Demolition Engineers](#) (IDE) and [Cleveland Steel and Tubes](#).

We conducted the following activities:

- Formed a steel reuse working group of 10-15 demolition contractors.
- Conducted in-depth interviews with 11 demolition contractors and main contractors.
- Organised regular online meetings with demolition contractors.
- Undertook two site visits to demolition projects with lessons learned captured.
- Organised in-person dissemination events to share learning.

*“Steel reuse offers up to 97% embodied carbon savings compared to using new steel and is ten times less carbon intensive than recycling.”*

The outputs have been peer-reviewed by experienced demolition contractors to ensure findings are representative and relevant and to ensure wider adoption of the project results.

### **Unexpected outcomes: What we learned along the way**

Our initial project partner, the National Federation of Demolition Contractors (NFDC), withdrew from the project due to leadership and organisational changes. Collaboration was an important aspect of this project in enabling us to access a wide range of expertise across demolition activities and so we reached out to the IDE who agreed to come on board. Securing this new partnership enabled the project access to demolition contractors and created opportunities for us to disseminate our findings.

This partnership was especially important as we learned that the demolition industry is relatively closed compared to the general construction sector and the topics discussed within it are quite different. Through strong industry engagement we were able to come up with findings based on lived experience rather than assumption.

### **The Outcome: What we achieved and how it has impacted the business, society and key stakeholders**

Our key output on this project is the steel reuse toolkit, supporting demolition contractors and the wider supply chain to overcome the challenges of recovering steel for a growing reuse market. One of the key topics highlighted by our stakeholder engagement was uncertainty around which steels were suitable for reuse. We addressed this by bringing structural engineers into the process to share their expertise, and the toolkit includes a visual guide to assessing the acceptability of steel for the reuse market.

Another topic raised by stakeholders was the development of new contractual arrangements to encourage steel reuse, which the toolkit responds to by clearly outlining the steps and collaborations needed to recover steel, the legislative landscape and changing client demands. The toolkit also includes an overview of the methods by which steel can be effectively recovered and the extra equipment which may be required, alongside cost, procurement, training and reporting. It is underpinned by a range of case studies showcasing projects incorporating reclaimed steel. The toolkit can be accessed [here](#).

Other outputs include encouraging increased adoption of reuse practices through our engagement and dissemination activities. We provided opportunities for knowledge exchange as we brought together a wide range of stakeholders including designers, demolition contractors and stockholders to share their thoughts on steel reuse.

By bringing different stakeholders together, our project fostered collaboration and addressed resistance to change - the behavioural factors that are so critical for driving sustainability initiatives.

### **Looking forward: Next steps and future directions**

As a result of this project, we have extended our member base, meaning that we will have greater influence on CE adoption within the industry championing reuse over recycling where appropriate.

We also extended our network, collaborating with academics across the UK and Europe and are applying for a number of research grants as a result. Watch this space!

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