Strengthening Demand Signals for Steel Reuse in UK

MAY 2026

MARKET FORMING INTERVENTIONS FOR LOW-CARBON AND RESOURCE EFFICIENT INNOVATIONS

Sustainability is our business

Contents

This project addresses the barriers to accelerate market uptake of low carbon and resource efficient innovations

- The UK is home to a **fertile innovative ecosystem,** resulting in a wide range of novel **low-carbon, resource- efficient** materials, products and circular business models across many industry sectors.
- Innovators face **economic, technical and organisational barriers**, reinforced by weak market demand and limited market-forming support.
- **Without targeted interventions** to stimulate demand, de-risk investment and align supply chains, high-potential innovations may not commercialise.
- Innovate UK (UKRI) and DESNZ funded this project to research **market-forming interventions (MFIs)** for the **automotive, chemicals and built environment** sectors.
- The project builds on existing research to define MFIs that drive growth, unlock private capital, enhance competitiveness and strengthen supply-chain resilience while supporting a **net-zero, circular economy**.
- The work was delivered by a combined consulting team between **October 2025 and March 2026.**

- **This report presents the findings of the project. The views and recommendations expressed are those of the authors and do not reflect official policy or government position.**
- This report concentrates on the **built environment,** specifically addressing **structural steel reuse**.
- The project involved comprehensive stakeholder engagement; however, no individual stakeholders are identified or attributed within the report.

This report has been prepared by:

ERM EigenVentures SCOPE3 PEER GROUP SRS SUSTAINABLE BUSINESS

Funded by:

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The project was delivered in four distinct phases, with stakeholder engagement throughout, resulting in the identification of potential Market Forming Interventions

Project approach

This project was delivered in four distinct phases:

1. **Sectoral analysis and targeting** – prioritisation of innovative product, or service for intervention design within the sector. Identification of demand-side barriers for selected innovation.
2. **Defining Market Forming Intervention (MFI) types and enablers** – development of an "MFI toolkit" and understanding of suitability of MFIs to address different demand-side barriers
3. **MFI and enabler prioritisation** – shortlisting of suitable MFIs/enablers for design
4. **MFI and enabler design** – development of MFI/enabler design brief

Stakeholder engagement was critical throughout each phase of the project.

What is an MFI?

Within the context of this project, an MFI is defined as a government-led, demand-side measure that seeks to accelerate the adoption of novel or replacement innovations or business models to reduce carbon emissions.

What are demand-side barriers?

When considering innovative materials, technologies or services, there are often significant barriers associated with supply-side (e.g. technology readiness etc.). However, demand is not always forthcoming, even for innovations that are market-ready. This project focussed on unlocking **demand-side** barriers which have been categorised as:

- **Standards:** inability to describe in quantifiable and verifiable terms the innovation.
- **Value Perception:** Lack of regulation/policy incentives; too high price premium; lack of quantifiable non-financial benefits.
- **Demand Delivery Ecosystem:** Lack of necessary physical/technology infrastructure.
- **Disincentives:** Existing regulation, concerns on technology lock-in.

Please refer to Appendix A1 for more details.

Structural steel reuse in construction projects emerged as the most promising value chain for targeted market support

- Five built environment innovation areas were assessed: **Maximise reuse, minimise impact & waste, design for optimisation[1], use standardisation, and Products as a Service (PaaS).** These align with the UK Green Building Council's (UK GBC) Circular Principles.
- Across all areas, solutions varied widely in their carbon and resource impacts, with many not delivering material emissions reductions. This constrained the scope for effective, targeted market interventions.
- **Maximising reuse consistently ranked highest** for carbon reduction and resource efficiency. Evidence suggests reuse could reduce built environment emissions by up to 75% by 2050[2]. Stakeholders also highlighted its potential for near-term impact and strong alignment with policy momentum. By design, focussing on reuse also drives innovation and resource efficient outcomes in all the other areas. More details can be found in Appendix A2.
- Despite this potential, **reuse rates in the UK remain extremely low**, at c.1% of construction materials, due to a range of technical, commercial and market barriers. Reuse opportunities considered included soils, structural materials, cladding and internal fit-outs (Category A & B).
- **Pilots and early commercial offerings demonstrate feasibility** of reuse, particularly for commercial building fit-outs and structural steel.
- **Structural steel reuse** can provide carbon savings of up to 97% compared with virgin steel which is the second highest contributor to embodied emissions in the built environment, behind concrete. Presently, the majority of used steel is sent overseas for recycling. There are standards and insurance for structural steels reuse and there are 40+ UK case examples across building types.
- As such, structural steel reuse was selected as the priority innovation area, with significant room to increase structural steels reuse. This report sets out options to address these barriers and unlock availability and demand.

- Reusing structural steels in buildings is a known process; it can be one of the most cost-effective ways to reduce embodied carbon
- Demand is evident and costs of reused vs new can be comparable.
- Key barriers to scale-up are used steel availability, visibility, designer awareness and normalising practices more widely

[1] Included: Lean design, MMC, Design for disassembly, use of Low Carbon materials. Low-carbon cement/concrete was out of scope as it is being addressed by another UK initiative.
[2] World Economic Forum, 2023 [Link]

Contents

The following innovation areas in the Built Environment were evaluated, based on the UKGBC Circular Economy in Construction Principles

Innovation Areas	Examples
Maximise reuse (building, component and materials)	• Material and component recovery & reuse. e.*g. reuse of structural steel* • Life extension through repurposing. *e.g. re-fit/retrofit*
Design for optimisation	• Life extension through repurposing *e.g. flexible use* • Lean design *e.g. process optimisation* • Design for assembly (*e.g. MMC)* and disassembly (*e.g. material passports)*
Use Standardisation	• Modern Methods of Construction (MMC) *e.g. prefabricated techniques*
Product as a Service	• Circular business models *e.g. Pay per lux; façade as a service*
Minimise impact and waste	• Design for disassembly. *e.g. deconstruction & buildings passports* • Use of alternative materials *e.g. low carbon steel*

Each innovation area was scored and benchmarked against evaluation criteria

Scoring used a 5-point scale with 5 being most suitable for intervention targeted and 1 being the least suitable

Innovation Areas	Environmental Factors		Market Factors			Economic Factors				Innovation Factors		
	Carbon reduction potential	Energy and/or Material efficiency gains	Policy and standards alignment	Impact on UK sector resilience	Stakeholder appetite, demand signals and domestic scale for MFI	Investment mobilisation potential	Market size and growth potential - domestic and export	Cost-saving potential	UK Job creation and skills development potential	UK innovation availability, maturity and scalability	Perceived innovator barriers to scale	Existing incentive structures for MFIs
Maximise Reuse	5.0	4.0	5.0	4.0	5.0	4.0	5.0	3.0	4.0	4.0	4.0	4.0
Design for Optimisation	5.0	4.0	5.0	3.0	4.0	4.0	5.0	3.0	3.0	4.0	3.0	3.0
Use Standardisation	3.0	3.0	4.0	2.0	2.0	3.0	4.0	4.0	3.0	3.0	4.0	2.0
Products as a Service	3.0	3.0	3.0	2.0	3.0	2.0	2.0	3.0	3.0	3.0	4.0	1.0
Minimise Impact & Waste	4.0	4.0	5.0	4.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0

Non-negotiables

Prioritised Innovation Area/s for intervention targeting

Maximising Reuse of building materials and components was identified as highest priority for potential MFI targeting

Scope of Maximising Reuse: Reuse of existing assets, materials and components, including refurbishment and repurposing.

Key opportunities:

- Reuse reduces embodied carbon - **potentially cutting built environment emissions by up to 75% by 2050**.[1]
- UK **construction sector accounts for 60% of waste** in the UK at 120 Mt per year, with excavation and dredging representing almost 50% of this. At the same time, new material use in the industry is 400 Mt per year.[2]
- In 2024, the UK had a **trade deficit of construction materials of £14.4 bn**.[4] Reuse at building and material level can improve economics while increasing supply chain resilience.
- Digital tools beginning to be used to support the reuse of buildings and materials across the sector – pre-project audits, building material passports, digital product passports, trading platforms etc.
- Larger property portfolios issuing Specification Briefs for retrofit/fit-outs with core and stretch targets for embodied carbon & material reuse [5,7]

Materials reuse benefits:

- Reuse materials can have **emissions that are over 90% lower** than virgin materials
- Significant potential to **strengthen resilience and resource security**
- **Reduces carbon payback time** for retrofit projects.[5,6]
- Contribute towards reuse and recycling targets and **reduce waste**

Building reuse benefits:

- Adaptive reuse of buildings has **embodied carbon benefits**, and reduces waste
- **Long-term economic savings** (as much as 60% vs demolition and rebuild), reduced risk of stranded property assets
- Potential to **rejuvenate and boost local communities** and economies

[1] McKinsey, 2024 [Link]; [2] Business Waste, 2023 [Link]; [3] CPD, 2023 [Link]; [4] Department for Business & Trade, 2025 [Link]; [5] UKGBC , 2024 [Link]; [6] EU CRREM, 2023 [Link]; [7] British Land [Link]

There are different demand drivers for reuse across stakeholders in the built environment's complex ecosystem

- The built environment consists of many stakeholders across the value chain, from government and regulators through to the end users – residents, businesses etc. It includes property portfolio owners, designers, developers, contractors, manufacturers, engineers, facilities managers, demolition companies, salvage operators, digital platforms etc. making it a complex ecosystem.
- As a result, demand drivers for reuse materials/buildings differ depending on the perspective taken, but demand from one part of the value chain alone is unlikely to drive change. Demand we are seeing today is coming from:
  - **Forward thinking property portfolio owners and investors** who see reuse as an opportunity for extending asset lifetimes, market differentiation(low-carbon offices etc), higher yields, and intent to meet Regulatory, Sustainability or Net Zero targets.
  - **Motivated clients, occupiers and building users are driving demand** with desire for low-carbon office spaces aligned to corporate ESG strategies, workforce retention etc; or for cultural/heritage appeal within communities; or homeowners with desire for period-character modernised (healthy) eco-credential homes.
  - **Large Property Portfolios** issuing Specification Briefs for bidders on (office) retrofits & fit-outs above a minimum value (e.g. £2m) that have 'core and stretch' targets for embodied carbon & material reuse. Some inventorising materials in their buildings and requiring pre-project audits to identify reuse opportunities.
  - **Construction industry players (developers/contractors)** who see reuse as an opportunity for costs savings in the long term and improved supply chain resilience; salvage & scrap **trade operators** transitioning to 'value-added' reused product handling; **digital platforms** seeing more demand for pre-project audits, inventories, and exchanges linking eco-systems of property owners, trade operators and designers.
  - **Local authorities** encouraging 'adaptive reuse/ retention first' to reduce disruption (and cost), speed-up regeneration, create local jobs, reduce demolition and landfill, maintain local environments and meet carbon targets - but not consistently throughout the UK.

There is good nascent demand for reuse in some segments of the built environment but demand is not consistent across those segments, and neither are the necessary capabilities in the supply bases available.

Three opportunity areas were identified within reuse – structural steel, commercial fit outs and adaptive reuse

Material reuse – structural steel (construction phase)

- High-carbon structural materials are essential in the built environment. [3] Concrete contributes the most to embodied emissions but is outside of scope, steel is second.
- Reusing steel can **reduce embodied emissions by up to 97%** compared to new steel[4]
- In 2020, the UK construction sector generated 1.2 Mt of ferrous waste, with up to 99% recovered but only 13% reused, with the rest **primarily recycled overseas**.[4,5] Reuse instead could **save up to 1 $MtCO_2$**.
- There is increasing momentum for steel reuse, but adoption to date has been limited [7] and is often closed-loop (i.e. within a portfolio) or where scheduling availability is more manageable.
- Public sector procurement guidance advocates for reuse and recycling[12]

Adaptive reuse of buildings (operational phase)

- In 2021, an estimated 165,000 private and 7,000 publicly owned commercial buildings were empty in E,W&S.[1] Of 1.8m non-domestic buildings in E&W c.1-1.5% pa are believed refurbished and c.3%pa demolished or converted. [11]
- Deep refurbishment projects can achieve embodied emissions of 600 $kgCO_2e/m^2$ compared to 1,000 – 1,500 $kgCO_2e/m^2$ for commercial new builds[2] whilst delivering improvements in operational CO_2e.
- Growing push from local authorities to apply retrofit first approaches to planning. Where these planning requirements exist, there are many successful reuse case studies – particularly in London
- Additionally, EPC requirements and or other standards for commercial buildings may require adaptive reuse to achieve minimum rating.
- Many value chain members could benefit from adaptive reuse in terms of sustainability, cost, programme and long-term value

Material reuse – commercial fit outs (operational phase)

- **Two types of fit-out: Cat-A,** Basic infrastructure (floors, ceilings, etc.)**; Cat B,** Tenant-specific (partition walls, finishes etc.)
- Cat-B fit-out can contribute 20-30% of upfront embodied carbon vs base build and Cat A work, with average embodied emissions of **190 $kgCO_2e/m^2$**.[6] However, because interiors are often changed, the carbon impact can be proportionately much higher over the life of the building. Commercial Cat-A & B Fit-outs & Interior Refurbs is £10B UK market[10]
- Commercial **lease lengths** vary but typically **~5-7 years** and less in high-end spaces leads to repeated fit-outs. **Fit-outs can contribute over 60-80% of whole life embodied carbon**.[6] Reuse during fitouts has **significant C-saving potential.**
- Larger Portfolio Owners (e.g. BL, TCE, GPE) publish 'Sustainable Fit-out Briefs' with reuse targets for tenders. To date, reuse for fit-outs is often closed-loop.
- Emerging intermediaries (materials audits, recovery specialists, exchanges & hubs[8,9]).

[1] Eurobrick, 2023 [Link]; [2] Bryden Wood, 2025 [Link]; [3] House of Commons, 2022 [Link];[4] New Civil Engineer, 2025 [Link]; [5] Department for Environment, Food & Rural Affairs, 2025 [Link]; [Link]; [6] British Land, 2025; [7] IstructE & Steel Construction Institute; [8] FIS Reuse Hub Pilot - Finishes & Interiors Sector association [Link], [9] ASPB Hub list [Link], [10] Barbour ABI [Link], [11] UKGBC, 2024 [Link], [12] Government Commercial Function [Link]

Ultimately, structural steel reuse was deemed most suitable for potential intervention

As part of the project governance process, only **structural steel reuse** was carried through to final intervention design:

- **Avoiding duplication:** Commercial fit-out reuse is already the subject of significant ongoing activity across industry, local authorities, and voluntary initiatives. Further work within this project would risk duplicating existing efforts rather than adding distinctive value.
- **Stronger alignment with project objectives**: Structural steel reuse offers clearer evidence of large-scale carbon reduction potential, more directly aligned with the project objectives and evidential requirements.
- **Greatest opportunity for system-level intervention**: Structural steel reuse faces barriers around visibility, aggregation, procurement and coordination. These are areas where system-level interventions could have the greatest additional impact.
- **Focus on deliverability within remaining timeframe**: Narrowing the scope allows the project to consolidate effort and deliver a robust, high-quality set of recommendations within the available time.

Nonetheless, it is recognised that many of the proposed activities in this project could indirectly support reuse of other materials and/or be replicated

Structural steel reuse could reduce the UK's built environment's embodied emissions and increase resource security

What is the innovation being demanded?

- **Structural steel** (e.g., beams, columns etc.) **recovered from existing buildings** during demolition or deconstruction and **reused** in new or refurbished structures.
- Reused steel is lower carbon than recycled steel because it does not require energy-intensive melting and re-casting. Instead, it can be refabricated or reused directly.
- The innovation lies in **developing the supply chain and systems needed to enable reuse at scale**.

What are the specific demand drivers for Structural Steel Reuse?

- The built environment is directly responsible for ~25% of the UK's GHG emissions. Of this approximately 37% (**64 $MtCO_2e$**) are attributed to **embodied emissions.**[1] The most significant contributions to these embodied emissions are from steel and concrete[2]**;** the UK has already launched an Advance Market Commitment to address concrete.[3]
- To reach Net Zero goals, the UK must address construction related emissions. The UK government's Construction Playbook requires all Contracting Authorities to have strategies in place to achieve net zero across their portfolios by 2050. Similarly, **corporate sustainability targets, industry standards and planning requirements** are placing emphasis on embodied and whole-life carbon.
- Steel reuse offers significant environmental benefits - **reducing embodied carbon** for projects by **up to 97%** compared to newly manufactured steel[4], while minimising waste and water use. It is one of the most cost-effective carbon abatement measures for the sector, and has the potential to offer reduced costs as the market scales. The introduction of the UK Carbon Border Adjustment Mechanism (**CBAM)** in 2027 will further strengthen this.
- Reuse steel **reduces reliance on imports**, improving supply chain resilience.

Why should this innovation be supported in the UK?

- While the UK government's updated Steel Strategy[4] focusses on supporting the transition of the UK's steel industry to modern production methods and long-term resource security, structural steel **reuse is an immediately available** measure which complements these aims, with significant environmental and resilience benefits.
- Public sector buildings and civil projects account for ~10% and 36% of demolition revenues in 2026.[7]
- **Industry bodies** such as the UK Green Building Council (GBC) champion circularity principles, with **maximising reuse** key.
- There are already pockets of exemplar activity, particularly in London. Despite this, the reuse of steel has remained stagnant in the UK, due to a variety of factors limiting innovation uptake which this project seeks to identify and address

[1] UK Green Build Council, 2021. Pathway to Net Zero. [Link];[2] Drewniok et al., 2023; [3] UKRI, 2026. [Link];[4] New Civil Engineer, 2025 [Link];[5] Department for Business and Trade, 2026. The UK Steel Strategy [Link]; [6] Department for Environment, Food & Rural Affairs, 2025 [Link]; [7] IBIS World, 2025. Demolition in the UK.

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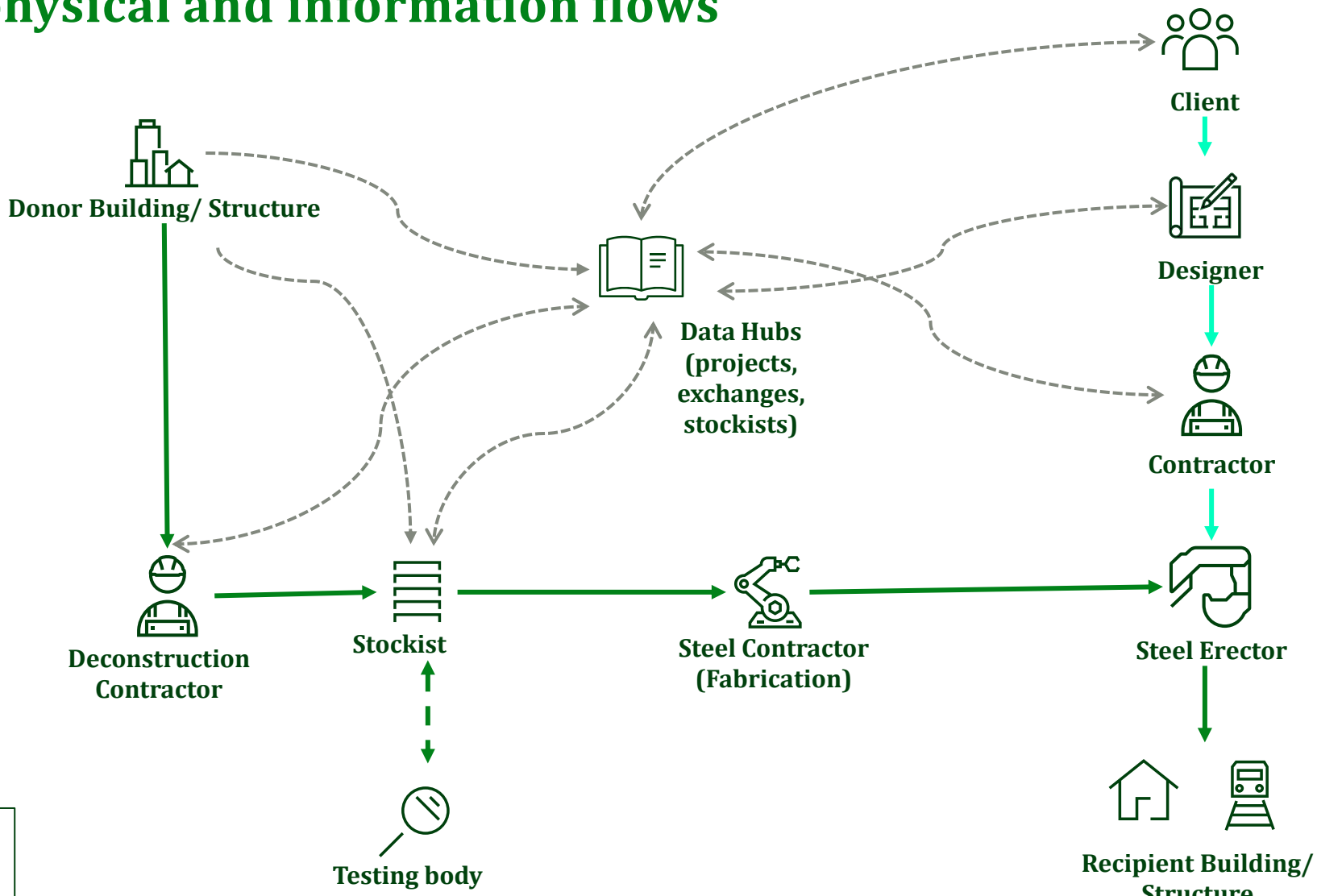
A well-functioning value chain for structural steel reuse requires the coordination of multiple physical and information flows



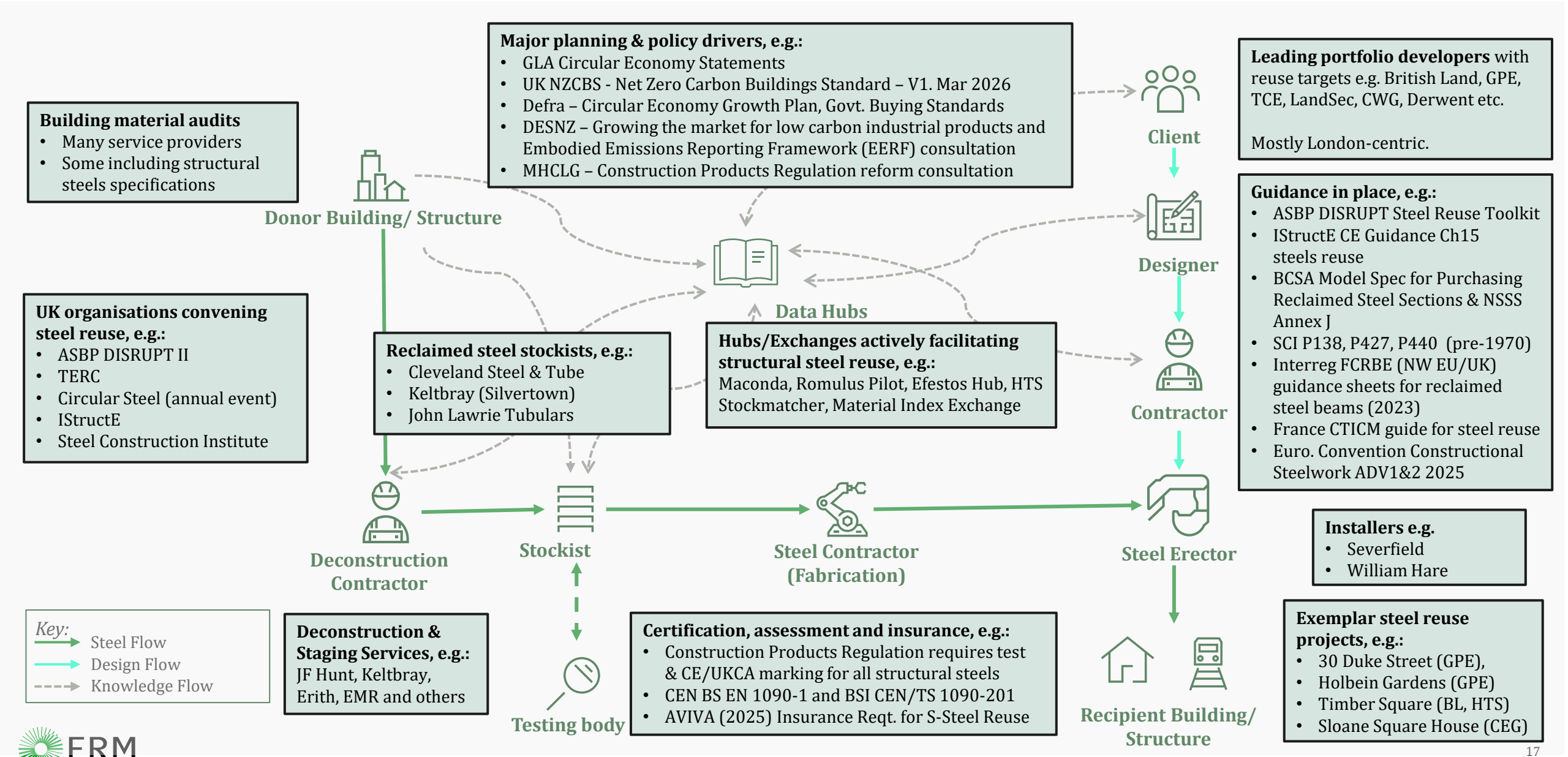
** This represents a common, generic value chain – other value chain model variants exist e.g. ASBP DISRUPT*

There are existing direct and indirect interventions supporting material reuse

Further detail on the existing intervention mapping can be found in the Appendix

Intervention	Reuse of materials/products
Direct	• There is some targeted public funding for R&D support for circular construction and material-reuse pilots through UKRI/Innovate UK and devolved initiatives (e.g. circular construction hubs). • **Standards development and industry guidance is ongoing**: BSI standards (e.g. BS 8895 series, PAS 2080) and industry guidance for design for reuse and whole-life-carbon reduction (e.g. UK NZCB Standard; RICS WLC etc.). • Industry coalitions are actively engaging with the topic & coalescing to develop **informal good practice standards** (e.g. UKGBC, Better Building Partnerships etc). • **Technical innovations** e.g. digital marketplace tools and technical toolkits are also at various stages of development (e.g. reuse platforms).
Indirect	• **Environmental taxes** (LFT, Aggregates Levy) raise the cost of disposal and virgin materials, indirectly favouring reuse and high-value recovery. But lower LFT applies to some high-volume inert construction and demolition waste categories. • **Public procurement rules** (Construction Playbook, Government Buying Standards, devolved sustainable-procurement duties) and planning policies such as the London Plan's Circular Economy Statements support resource efficiency and material retention and reuse. • Some early-stage **insurance / warranty practices** also support certain circular and reuse-friendly solutions. However broader insurance/warrantee of reused materials across product types is yet to be developed
Gaps/ Emerging	• Several marketplace or reuse platforms exist which provide a model of commercial trade in reused construction materials (e.g. Excess Materials Exchange, HTS stockmatcher), however these have not yet reached scale to compete with virgin materials platforms/availability. • No UK examples were identified of price support, or government-backed long-term offtake contracts explicitly for reused building materials.

Industry is also demonstrating pockets of steel reuse across the value chain…



… built around two business models, albeit at limited scales and quantities

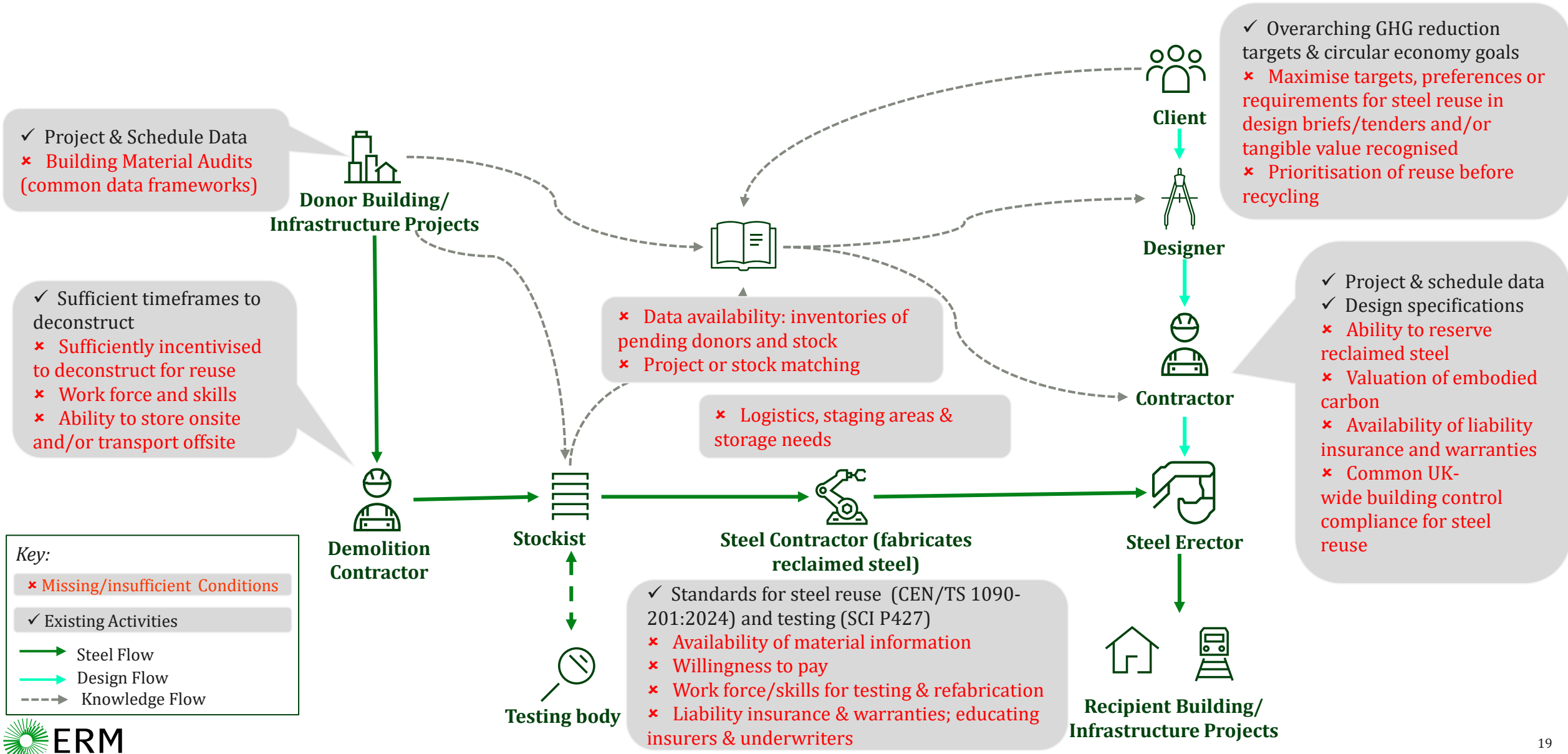
Key existing structural steel reuse routes and business models based on project stakeholder insights and publicly available data

Key value chain players	Roles & Processes	Project to Stock: "Stockist"	Project to "Project Matching"
Donor Project		*Removal of reusable steels for speculative holding / later sale*	*Facilitated within portfolios or between projects under different owners*
In-situ Steels Survey Reuse Assessment	**Conduct reuse survey**: using expertise and data tools; assess reusability to reduce risk; leverage reports & material passports	☑ Done by stockist	☑ Done by 3rd party service (incl. some stockists) with in-situ steels visibility for designers and buyers (1)
Deconstruction Contractor	**Targeted removal and recovery.** alternative is scrap opportunity cost	☑ Included in deconstruction contract	☑ Included in deconstruction contract
Defabrication & Stockist	**Defabricate**: clean, cut, tidy, document	☑ Included in used steels inventory price	☑ Contracted service
	Hold in stock (if not buyer lined up)	☑ Inventory price	☒ N/A
Designer	**Design with reused steels**	*Visibility of inventory of used steels*	*Visibility of reusable steels in donor building (before removal)*
Steel Contractor (Fabrication)	**Fabricate to design spec**. e.g. shotblast, weld plates, holes etc. provides CE/UKCA certificate	☑ Contracted service	☑ Contracted service
Steel Installation	**Transport and install:** costs equivalent for reused or new steels	☑ Contracted service	☑ Contracted service
Recipient project			

Key: Sales points. **Stockist route:** de-fabricated 'cleaned' steels sold by Stockist to fabricators or project contractors. **Project Matching route**: points of payment of fees, deposits and transfer price will vary depending on (i) whether Projects are with one or different owners and (ii) the business model of the 3rd party facilitator.

(1) Project matching requires careful coordination to ensure steels removal is timely and does not create availability risk for the new project. Coordination is easier with a common project owner but several stakeholders have successfully matched projects between owners. Used steels into uses without critical timelines are easier to coordinate but requires an organisation to take some holding risk.

… but some conditions may need to improve for widespread adoption of reused steel



Demand for reused steel is hindered by a demand-supply mismatch, driven by factors such as lack of visibility and logistics

Demand delivery ecosystem barriers

Demand for reused steels exists and would widen if there was more liquidity in supply i.e. reconditioned stocks or visibility of planned removals

- There is limited risk appetite to build speculative stocks of reconditioned steels without (1) more surety over consistent supply volumes and (2) parallel widening of demand through awareness raising.
- No standard process to signal upcoming availability to a wider market (outside portfolios, reuse pilots), but some active exchange platforms and coordination services are developing.

Lack of data adds friction to planning to reuse structural steel e.g. no transparent, consistent data for showing where reusable steel is located, its existing and/or expected availability, or its quality/origin.

- BIM models can provide good data, but only for newer buildings, and even now is not always applied consistently. Older buildings lack digitised records; material data is often missing or poorly documented.
- Pre-Demo Audits are not designed to provide data to assess suitability of steels for reuse or removal costs; in-situ steel reuse surveys are needed.

Lack of visibility of future availability, higher upfront costs and **limited stocks of reconditioned steels** make it difficult to access reused steel when needed. Without a steady demand pipeline or donor-recipient project matching, dismantling and holding or storing steels creates upfront cost with no guaranteed return, often making scrapping more attractive.

Value perception barriers

Designers and buyers:

- **Case studies to date report a range of relative costs** from positive to negative. More work is needed to establish norms and exploit identified ways to minimise or further reduce process and transaction costs**.**
- **Uncertain availability** creating delays and higher costs designers will tend not to specify reused if they are not confident of availability, unless a motivated client requires an achievable % of reused steels to be designed in.
- **New and unfamiliar project and insurance risks:** designers need awareness of designing with reused, existing standards and insurance products etc. Project teams lack expertise to assess and assign risk amongst project partners.

Demolition, Stockists and Steel Contractors:

- **Higher upfront costs and time** to recover, test and prepare reused steel compared to purchasing conventional steel (exception if suitable reconditioned steel already held by a stockist but stocks currently limited due to re-sale risk). Demolition without origin/quality data adds time and cost.
- Deconstruction takes longer and costs more than standard demolition. However, with increasing deconstruction requirements across all materials, steel-specific recovery costs will reduce as it is a high-value secondary material.
- Reclaimed steel usually requires bespoke manual defabrication to meet specifications. Targeted selection can avoid costs and it may be economic to adapt automated processes for larger volumes from larger projects.

Additional identified barriers can be found in Appendix A3

Steel reuse works today, industry engagement suggests that any intervention should focus on scale, confidence and delivery

Established evidence and market realities

Cost is not the primary barrier to steel reuse: visibility of available stock and sufficient volume are the main constraints.

The public sector could be a major source and demand for reuseable steel

Reused steel can be cost-competitive with new steel

Established practices already exist to manage reuse costs, with **further opportunities identified to reduce costs**

Reuse is a cost-effective route to embodied carbon reduction.

Different business models exist – Project Matching & Stockist - both routes are viable, useful and complementary

Reuse requires **specification during procurement, targeted deconstruction** and **auditing practices,** which can also enable broader reuse of other construction components.

Implications for intervention design

Focus on improving visibility and aggregation of reusable steel

Public sector construction and demolition pipelines could be used to unlock scale, aggregating supply and demand

Increase confidence in cost understanding, leveraging existing industry work

Build on existing cost-management approaches, including material passports, recovery techniques, optimised defabrication, and inventory visibility across the value chain.

Promote embodied carbon benefits in decision-making

Support multiple business models to evolve and coexist

Reinforce and expand reuse-ready practices, embedding reuse into **client specification** and designer thinking, as well as auditing and deconstruction considerations earlier in project planning.

Public procurement could uniquely overcome the coordination, risk, and specification barriers that constrain steel reuse

Government is a large, repeat buyer of structural steel

- Public bodies commission a significant share of buildings and infrastructure where structural steel is specified. This gives public procurement direct **market-shaping** power, potentially for early reuse markets that lack scale

Steel reuse is both supply and demand-constrained

- It is technically viable today but uptake is limited by lack of awareness, fragmented uncertain demand, availability or supply-demand mismatches (as discussed in the previous section).
- Managers of donor projects have to want to divert steels for reuse and to allow demolition contractors and stockists access to audit steels and time to bid in contracts for their removal.
- Public procurement could **aggregate demand** and create **predictable pipelines**

Public procurement could remove structural barriers and de-risk early steel reuse

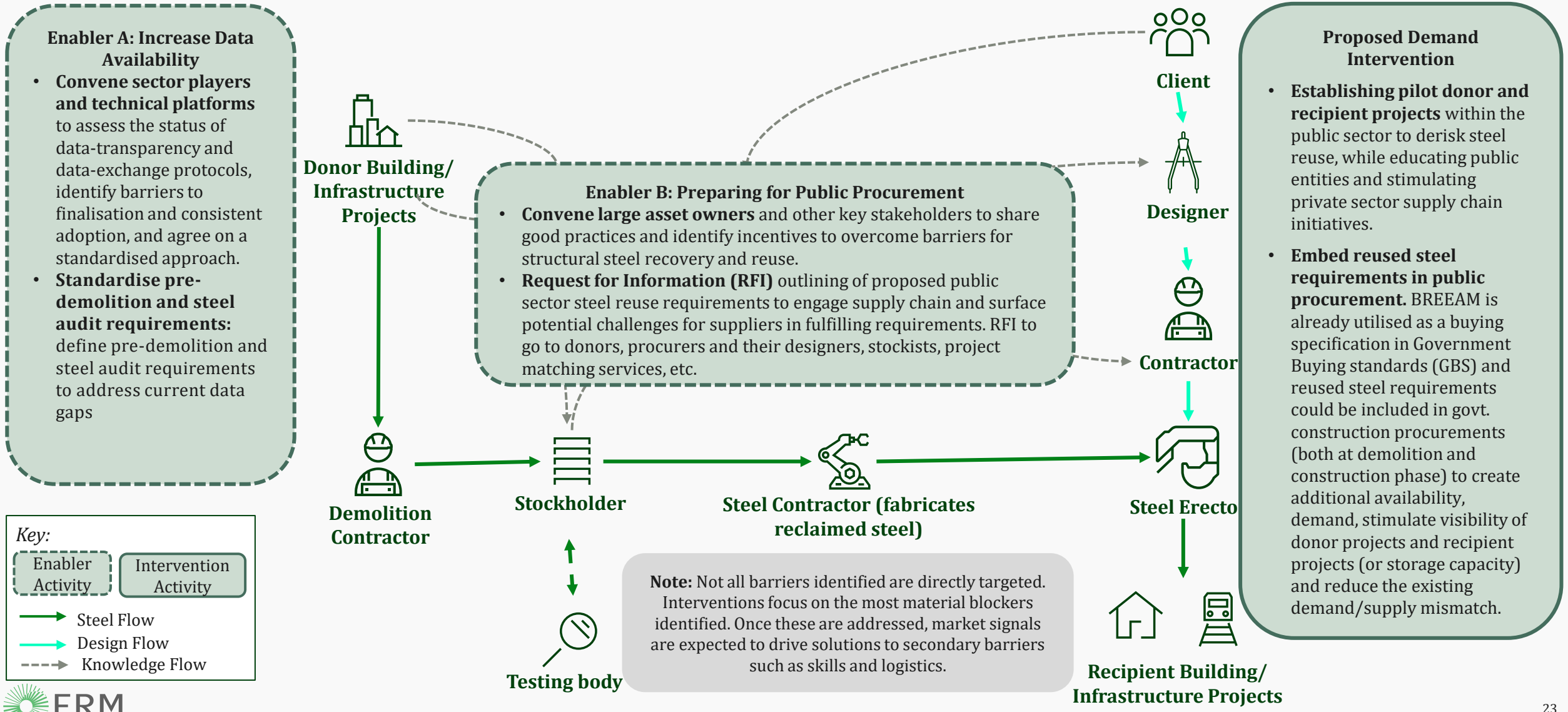
- Public procurement could help address the non-price barriers in the market and **reshape how projects are specified and delivered** by:
  - Mandating or incentivising **reuse-first design** (e.g. Westminster Council's Retrofit First Policy)[1] and early structural audits, and diversion to reuse if proceeding to demolish
  - Prioritising **performance-based specifications** (e.g. Buy Clean California Act[2] sets limits on the global warming potential of some types of publicly-procured steel)
  - Using **frameworks, pipelines**, and **longer-term contracts** to de-risk first movers

Alternative to public procurement

- **Buyers' clubs** are better where:
  - Demand is private, fragmented, and flexible
  - Early learning and voluntary coordination matter most
- **Intermediaries** are needed where:
  - The binding constraint is matching supply to demand, not willingness to buy
- **Risk-sharing and standards** are prerequisites where:
  - Liability, insurance, or uncertainty prevents uptake regardless of buyer type

[1] Westminster Council, 2026. [Link]
[2] DGS, 2025. Buy Clean California Act [Link];
[3] Oxford Climate Policy Hub

Leveraging public procurement could help drive and scale-up structural steel reuse, alongside suggested enabling activities to resolve supply issues.



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The identified enablers could help scale-up the steel reuse value chain by providing clear demand signals

Outcomes

Enabler A: Data Availability

Improved alignment, availability and accessibility of reused steel data across public and private sector projects, leading to greater uptake by convening stakeholders to:

- Define priorities for data improvements
- Define and roll out common requirements for P(R)DAs with steels audits (1)

Enabler B: Preparing for public procurement

Conditions are created for effective reuse and enable procurement to be implemented:

- Roadmap for additional interventions required to target private-sector uptake
- Strengthened confidence and evidence to support steel reuse in procurement and project delivery, through clear guidance
- Public procurement requirements are informed by market readiness and stakeholder feedback, reducing delivery risk.

Public Procurement

Public procurement operates as a credible, repeatable supply and demand signal for reused steel, enabling market confidence, clearer standards and scalable supply:

- Encourage consideration and diversion of used steels for reuse
- Strengthening re-use provisions
- Awareness raising and capacity building

Impact

Public procurement operates as a market anchor

Improved supply-chain resilience and strengthened local economies

Embodied-carbon reductions at scale.

(1) PDAs as currently conducted may not go far enough. In-situ steels audits identify which steels are worth recovering for reuse, inform project matching or stockist buying decisions, inform removal costings and reduce subsequent defabrication costs and risks

(2) Several stakeholders highlighted existing activities which could be developed to facilitate project matching within public sector or between public and private sector, including: ASBP & Efestos proposed 12-month Pilot Project to Improve Visibility of Reusable Structural Steel; Maconda and Romulus project matching services already trialed on London pilot projects; Cleveland Steel & Tubes defabrication and used steels holding or storage services etc.

Contents

Enabler A: Data Availability - convening activities for technical platform as well as standardisation of PDA/PRDAs and steels audits

OUTCOME OBJECTIVE Improved availability and accessibility of reused steel data across public and private sector projects, leading to greater up take

Proposed Activities	A.1 Proposed Activity Requirements	A.1 Activity Outputs
A.1: Convene sector players and technical platforms 1. Convening to address data-transparency and exchange protocols 2. Agree standardised approach	• Convene key stakeholders, including technical platforms, demolition contractors, stockholders, fabricators, designers, insurers. Align with existing UK initiatives such as ASBP DISRUPT, Circular Steel, ROMULUS and BuildZero to avoid duplication or stakeholder fatigue and to maximise impact. • Set Terms of Reference, outlining the purpose and structures of the group. • Survey available data solutions from technical platforms and identify best practice (at each stage in the value chain). This can take the form of a series of workshops facilitated/funded by government. • Identify priorities for data improvements, including requirements on data coverage (e.g., stock visibility and auditing/specification) and data flows. • Support or convene work to address specific data gaps that align with the defined priorities. This could be data transparency or data exchange challenges which are surfaced during the initial convening. • Develop and agree framework to take forward to LAs on data requirements (including coverage and flows).	**Priorities for data improvements are defined:** • Priorities for data improvement are defined based on survey of available data solutions and best practices. • Organisations working on the identified priorities receive support to address data gaps through the convening activity. **Agreed framework to take forward to LAs, with clear requirements on data coverage and data flows.**

Enabler A: Data Availability - convening activities for technical platform as well as standardisation of PDA/PRDAs and steels audits

OUTCOME OBJECTIVE Improved availability and accessibility of reused steel data across public and private sector projects, leading to greater up take

Proposed Activities

A.2: Pre-demolition audit requirements

1. Engage with local authorities
2. Implement policy to increase uptake of pre-demo audits

A.2 Proposed Activity Requirements

- Engage with local authorities which currently require pre-demolition audits **(PDAs** and/or pre-redevelopment audits **PRDAs**), which includes GLA via London Plan SI 7 (several London councils), Manchester, Birmingham, Oxford, Brighton, Bristol, Cardiff , Swansea.
- Central government to align with BSI CEN TC350 S1 committee on guidelines for PDAs/PRDAs. The requirements for the stages of pre-demolition audits needs to be standardised to cover steels characterisation, reuse assessment and reclamation method. PDAs as currently conducted may not go far enough and **in-situ steels audits** need to be included to identify which steels are worth recovering for reuse, inform project matching or stockist buying decisions, inform removal costings and reduce defabrication costs and risks.
- Organise awareness and engagement sessions with local authorities about PDAs/PRDAs with steels audits, using good practice case studies from LAs, a framework developed in previous activity, and central government authority advice on embedding requirements. This will be done through a regional "road show" 1-day training courses to support the inclusion of standardised PDAs within LA Planning Requirements across LAs, including upskilling of planning officers to embed, evaluate and enforce requirements.
- Challenges and learnings can be shared to support the roll out, avoid the use of PDAs as a tick-box exercise, and provide confidence that there is benefit in doing this, though higher value reuse of steel and reduction of embodied carbon in new projects.

A.2 Activity Outputs

Common requirements for PDAs/PRDAs:

- Recommended common requirements for pre-demolition audit (PDA) and pre-redevelopment audit (PRDA) standards
- Requirements for PDAs and PRDAs are standardized to cover characterization, reuse assessment, and reclamation methods, across various stages of pre-demolition audits

Improved uptake of PDAs/PRDAs

- Increased awareness and upskilling of planning officers to embed, evaluate and enforce requirements
- Sharing of challenges and learnings from pre-demolition audits roll out

Enabler A could build on existing sector initiatives, seeking input from stakeholders already involved in data availability activities

ACTIVITY: Increase data availability

Suggested Input Requirements

Policy inputs	• Clarity on alignment with BSI CEN TC350 and emerging PDA/PRDA guidance • Permission/facilitation to convene national and local stakeholders • Encouraging LAs to include PDA/PRDA requirements
Stakeholder participation	• Participation from relevant sector players including demolition contractors, project matching services, de-fabricators/stockists, fabricators, designers, insurers, platform providers, and local authorities (incl. those with/without existing PDA/PRDA reqts.) • Commitment from key-decision makers in stakeholder organisation to participate • Agreement on Terms of Reference
Data & technical inputs	• Access to existing PDA/PRDA examples (e.g., Westminster, GLA) • Best practice review inputs from sector players • Existing BIM/data-exchange platform specifications • Existing PDA/PRDA formats
Funding inputs	• Technical platform interoperability pilots • Addressing specific data gaps (e.g., CEN/TS 1090-201 adoption, donor–recipient matching tools) • Engagement & training for LA planners
Resourcing and capability inputs	• Operational funding • Analytical capabilities (technical expertise in steel reuse, data standards, PDA design) • Facilitation capability

Stakeholder Roles and Responsibilities

Central Government sponsorship
- Set strategic framing and decision objectives
- Provide legitimacy to intervention

Local authorities
- LAs already using PDAs to share experience and learnings
- LAs not currently requiring PDAs participate in awareness raising & implementation/testing

Neutral/third party facilitator
- Convene stakeholders and manage structured engagement
- Ensure data privacy, competition and confidentiality safeguards are upheld throughout

Wider steel reuse stakeholders (fabricators, stock listers, testing bodies, technical platforms etc.)
- Provide data & technical inputs
- Provide insights on good practice
- Provide feedback on framework, data requirements and exchange protocols

Demand-side participations
- Provide demand-side data inputs
- Provide insights on good practice
- Provide feedback on framework, data requirements and exchange protocols

Enabler B: Prepare for procurement - seeking industry feedback to develop guidance materials and formalise requirements

OUTCOME OBJECTIVE Conditions are created for effective reuse-enable procurement to be implemented

Proposed Activities	B.1 Proposed Activity Requirements	B.1 Activity Outputs
B.1: Convene steel intensive asset owners 1. Engage large asset owners to form a task group to share good practice & identify/over come barriers 2. Produce an output document: "Clients' Guide"	• Could convene task group of steel intensive asset owners to share good practice and overcome barriers to structural steel re-use. • Include representatives from planning jurisdictions (with and without PDA/Reuse requirements) and public sector, e.g. Govt departments, agencies, Local Govt., Development Zones. Start identifying pipeline of potential donor/recipient projects. • Set Terms of Reference for the group, including a "clients' guide" output to feed into public sector implementation that describes good practice and presents a functional model for reuse of structural steel. • Build on work already done (e.g., GPE, British Land and others) on supply chain barriers and how these can be overcome. • Use convening platform to share learnings between public sector and private sector, to identify motivations and incentives that increase recovery and reuse of structural steel, and to build momentum with steel intensive asset owners. • Identify interventions to inform and incentivise public to public or private sector steel reuse. Undertake a wider survey of cost benchmarks for specific donor circumstances and recipient use cases and for both Stockist and Project Matching routes (n.b. Stockists sometimes already have a Project Match opportunity). • Test some of the data solutions from Enabler A with group members; share findings back with Enabler A group.	**Identify incentives to increase reuse:** • Identification of remaining barriers and how to overcome them to increase steel recovery and reuse, particularly within public sector. • Private sector has clarity on opportunities unlocked by public procurement. • Roadmap planning for interventions that can further incentivise private sector activities. **"Clients' Guide" is published sharing learnings and best practice**: • Data solutions from Enabler A are tested with large asset owners. • Learnings between public sector and private sector are shared, including in a "Clients' Guide" output.

Enabler B: Prepare for public procurement - seeking industry feedback to develop guidance materials and formalise government requirements

OUTCOME OBJECTIVE Conditions are created for effective reuse-enable procurement to be implemented

Proposed Activities	B.2 Proposed Activity Requirements	B.2 Activity Outputs
B.1: Convene steel intensive asset owners 1. Seek stakeholder feedback on expansion of public procurement requirements 2. RFI to identify future public construction projects that would include additional reclaimed steel preferences	• Prepare Request for Information (RFI) outlining proposed public sector steel reuse requirements to engage supply chain and surface potential challenges for suppliers, informing updates to GBS and role of public sector as supplier of reused steel. • Develop RFI questions to investigate if the supply chain is ready to fulfil all requirements needed for more structural steel reuse in the public sector and to establish any readiness actions required. • Issue consultation findings so industry suppliers have an understanding of potential additional reclaimed steel requirements and how they will be specified and treated in procurement process. • Based on information gathered, recommend developing a framework for public sector projects to encourage piloting of steel reuse.	**Industry feedback and consultation findings:** • RFI documents with questions to gather insights on supply chain readiness for public sector structural steel re-use requirements. • RFI responses collected and findings issued to keep industry informed and prepared

Effective stakeholder engagement and RFI delivery is supported by Government sponsorship in Enabler B

ACTIVITY: Preparing for public procurement

Suggested Input Requirements

Policy inputs	• Strategic framing, permission to convene sector actors, and readiness to act on findings through policy refinement or procurement guidance. • Explore incentive options, potential to run a consultation/RFI, and consider implications for procurement requirements and future GBS updates.
Stakeholder participation	• Stockists, project matching services, demolition contractors, defabricators, fabricators and construction partners provide evidence on feasibility, cost drivers, capacity, risks. • Public-sector clients share project pipeline information and constraints for reuse and clear views on what will increase steel recovery/reuse in or between portfolios. • Agreement on Terms of Reference.
Data & technical inputs	• Insights from Enabler A (data gaps, platform capabilities, PDA progress), cost differences between demolition/deconstruction, supply–demand visibility, and experience from existing reuse projects. • Understanding of barriers linked to structural steel re-use. • Baseline evidence needed to design incentives and develop an RFI.
Funding inputs	• Government resource for convening activities • Identifying potential funds for incentives identified through Enabler B
Resourcing and capability inputs	• Operational funding for administrative support • Analytical and synthesis capabilities to translate stakeholder insights into incentive options and actionable RFI questions • Facilitation and convening capability

Stakeholder Roles and Responsibilities

Government sponsorship
- Set strategic framing and decision objectives.
- Provide legitimacy.

Neutral/third party facilitator
- Convene stakeholders and manage structured engagement.
- Ensure data privacy, competition and confidentiality safeguards are upheld

Large asset owners
- Share views on incentives that would increase reuse within their portfolios.
- Feedback on data solutions from Enabler A.
- Provide consultation feedback.

Public-sector client(s)
- Share potential donor and recipient project pipeline information and constraints for reuse.

Public sector suppliers (contractors, designers, deconstruction partners etc.)
- Provide consultation feedback.

Wider steel reuse stakeholders (fabricators, stock listers, testing bodies etc.)
- Provide consultation feedback.

MFI: Public Procurement - Government could support public procurement efforts, through pilot projects to build credible case studies and valuable insights.

OUTCOME OBJECTIVE Public procurement operates as a credible, repeatable demand signal for reused steel, enabling market confidence, clearer standards and scalable supply

Proposed Activities	Proposed Activity Requirements	Activity Outputs
Demand Intervention 1 – Pilot Projects 1. Demonstrate impact through upcoming public construction and demolition projects	• Could engage volunteer pilot projects both directly (via an internal govt. department call) and through reviewing key projects in the public sector construction pipeline, considering: ◦ Central government estates, NHS trusts, local authorities, and nationally significant infrastructure projects ◦ Projects with planned construction and demolition within the same 12–24 month window, enabling realistic matching of supply and demand • Provide support for these pilot public-sector clients and programmes (e.g. NHS Trusts, MoJ programmes) to trial and refine approaches for steel reuse in live public projects, for example leveraging the framework developed in Enabler B • Facilitate structured engagement and upskilling with relevant government bodies and delivery partners, including practical guidance on standards, testing, warranties, insurance and programme implications for steel reuse.	**Steel reuse in practice:** • A small number of public-sector pilot projects incorporating re-used structural steel. • Practical insights on feasibility, risks, costs, programme impacts and decision points from live projects • A set of case studies & recommendations

MFI: Public Procurement – Revisions to Government Buying Standards (GBS) could support public procurement efforts further.

OUTCOME OBJECTIVE Public procurement operates as a credible, repeatable demand signal for reused steel, enabling market confidence, clearer standards and scalable supply

Proposed Activities	Proposed Activity Requirements	Outputs
Demand Intervention 2 – Update Government Buying Standards 1. Review and potential expansion of Government Buying Standards (GBS)	• Review RFI feedback to identify (a) gaps and inconsistencies in how steel reuse is currently addressed; (b) barriers arising from performance-based requirements or lack of explicitly reuse provisions; (c) opportunities to introduce clearer, more consistent procurement signals for reclaimed steel across public projects • Use insights to identify practical proposals for expanding GBS for reuse within the public sector portfolio. This might include circularity statements or PDAs, valuation of whole-life carbon (e.g. rewarding highest performers based on carbon intensity of proposed project delivery) and value-for-money etc. Examples include: ◦ The Buy Clean California Act[1], which sets limits on the global warming potential of publicly-procured structural steel, as well as glass and insulation. The Biden Administration (2021 – 2024) rolled this out nationally under the US Federal Buy Clean Initiative[2], where lower embodied carbon, domestically-produced steel (and other materials) was prioritised in federal procurement. [2] ◦ Since 2024, Ireland introduced public procurement guidance to cut embodied emissions in cement and concrete by specifying low carbon materials, seeking EN 15804 EPDs and applying whole-life cycle GHG assessment for large contractors, material suppliers and design teams working on state-funded construction. [3] ◦ US Federal agencies are required to buy at least 95% EPEAT-registered electronics. Between 2006 – 2023, this saved Federal government over $34bn globally and more than 340 $MtCO_2e$. [4] • Assess how GBS could better support the identification and creation of donor projects. • Align recommendations with ongoing revisions to GBS to ensure proposals are timed to influence live policy processes, outputs are framed in a consistent manner and aligned with emerging policy and delivery priorities.	**Proposal for revised GBS and implementation support:** • Evidence-based recommendations for updating Government Buying Standards (GBS), aligned with ongoing revision process ◦ Clearly defined options for strengthening consideration of steel reuse in public procurement ◦ Proportionate, implementable changes aligned with existing GBS structure and language • Draft GBS procurement wording and supporting guidance notes ◦ Design briefs, tenders etc. ◦ Early-stage requirements on auditing, end of life planning etc. ◦ Clear articulation of how reused steel can be recognised in value-for-money and whole-life carbon assessments

([1] DGS, 2026 [Link]; Office of the Federal Chief Sustainability Officer, 2023 [Link]; [3] Gov.ie, [Link]; [4] Global Electronic Council, 2025[Link]

Policy inputs are fundamental to driving forward public procurement efforts

ACTIVITY: Public Procurement (Pilot projects and GBS revisions)

Suggested Input Requirements

Policy inputs	• Clear mandate for steel reuse in public sector procurement (demolition and new build). Key avenue suggested: via revisions to the GBS, along with promotion via Central Government (Defra; DESNZ; Crown Commercial Service) and central gov sustainability groups.
Stakeholder participation	• Public bodies who are willing to pilot reuse in live projects, embed in procurement, accept bounded risk, and share lessons learned to encourage further adoption. • Awareness-raising campaign to highlight opportunity & set out business case highlighting triple-bottom-line, whole life benefits.
Data & technical inputs	• Alignment with established standards and guidance in procurement and delivery (e.g. CEN/TS 1090-201:2024 and SCI P427 Protocol for testing reused steel). • Assurance pathway aligned to existing project, compliance & technical expectations • Alignment with public sector insurance and warrantee processes. • Visibility of upcoming public sector demolitions and new builds/refurbishments. • Projects at early enough stage to influence the demolition, design and procurement
Funding inputs	• Capital allocation to facilitate public procurement of reuse steel and encourage deconstruction over demolition, if come at premium
Resourcing and capability inputs	• Some dedicated capacity to: coordinate and support pathfinder projects, lead on GBS recommendations, maintain momentum across government departments. • Mechanism to capture, synthesise and disseminate lessons learned from pilot projects into procurement guidance and future GBS revisions.

Stakeholder Roles and Responsibilities

Central Government (DEFRA, DESNZ): Own the policy intent and decision rights for GBS revisions

Facilitator: This could be government-led or contracted to coordinate the programme of work

Public-sector client(s): Provide donor/recipient projects; participate in trial; enable evidence capture and derisks reuse in supply chain

Public sector suppliers (contractors, designers, deconstruction partners etc.): Execute reuse pilot projects, provide feedback on programme, cost, assurance and ability to implement; adhere to agreed auditing and specification requirements

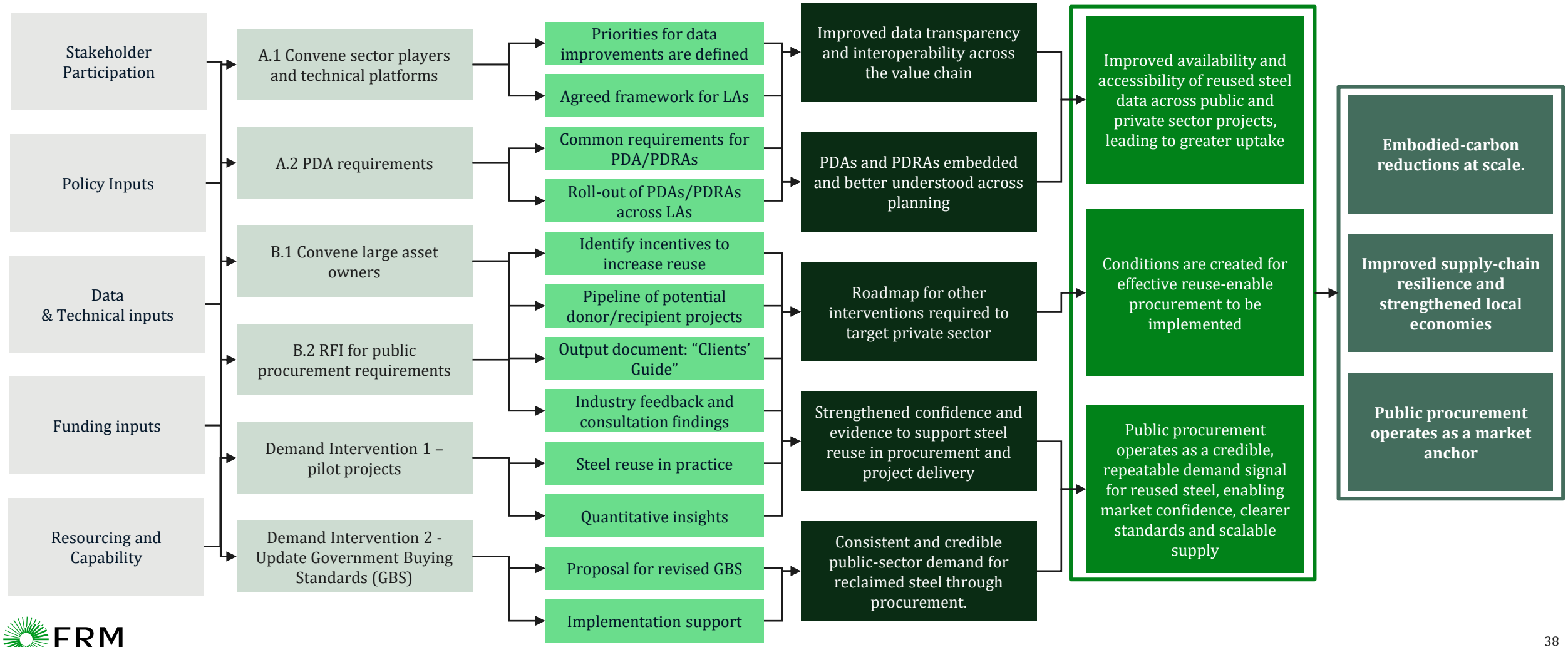
Wider steel reuse stakeholders (fabricators, stock listers, testing bodies etc.): Facilitate the pilot projects by providing capacity and capabilities.

Key risks associated with identified MFIs that should be mitigated

Risk	Description	Mitigation
Smaller actors left out	SMEs may lack capacity to comply with data requirements, reducing inclusivity and slowing scale beyond established markets.	• Simplify "minimum viable" data requirements • Capacity-building for deconstruction, testing and refabrication
Project thresholds for viability	In early stages, "innovation premium" may result in adverse cost-benefit compared to conventional.	• Consider steel reuse in feasibility stage • Share learnings from successful projects • Set appropriate thresholds
Slow or uneven LA uptake	Widespread adoption of PDA requirements may be unrealistic in programme window. This could perpetuate concentration of steel reuse initiatives in London.	• Define "pathfinder LAs" (e.g. major cities or combined authorities) to start with and then scale • Fund training + evaluation support for LA planners • Package case studies from LAs already using PDAs
Conflict with ongoing initiatives	New data protocols and procurement requirements could duplicate or conflict with existing planning and procurement regimes; convening activities can lead to stakeholder fatigue and limit engagement	• Align PDA and data sharing work with emerging standards • Use Terms of Reference to clearly define aims of convening groups • Build on existing work, do not restart
Delivery risk	Unsuccessful delivery of pilots, or if procurement signals outpace supply readiness, projects may face programme delays/cost overruns and erode trust in structural steel reuse.	• Demand intervention to be delivered after Enablers A and B (i.e. after assessing readiness of supply chain) • Select pilots with suitable timelines and donor-recipient matching potential • Publish lessons learned quickly to reduce perceived risk and improve future procurement wording
Data sharing & confidentiality concerns	Reluctance to share donor building data, commercial pricing, or inventories across platforms	• Neutral facilitator • Data governance charter • Anonymised minimum dataset

Contents

A Logic Framework has been developed to summarise the proposed public procurement programme



Thank you

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Overview: MFI Toolkit Approach

This Market Forming Interventions (MFI) Toolkit outlines the process used during this research to 1) identify and prioritise innovation area(s) that would benefit from an MFI 2) match specific MFIs types to address innovation demand-side barriers 3) design an MFI concept.

Definitions

1. **Innovation Type:** a new or significantly improved product or service that addresses user problems in a novel way.
2. **Innovation Demand Barriers:** obstacles that prevent new products or services from being adopted.
3. **Market Forming Intervention (MFI):** Measure(s) that seek to accelerate the adoption of replacement innovations.
4. **MFI Enabling Factor:** a standard, policy, financial or business factor necessary for an MFI to be successful.

Categories of Demand Barriers

Innovation adoption barriers have been categorised into the following:

1. **Standards:** inability to describe in quantifiable and verifiable terms the innovation.
2. **Value Perception:** Lack of regulation/policy incentives; too high price premium; lack of quantifiable non-financial benefits.
3. **Demand Delivery Ecosystem:** Lack of necessary physical/technology infrastructure.
4. **Disincentives:** Existing regulation, concerns on technology lock-in.

Categories of MFIs

The 13 specific MFI types have been categorised into the following:

1. **Regulation & Lower Cost:** Encourage adoption of desired solutions by lowering costs or penalising status quo options.
2. **Demand Aggregation:** Consolidate buyers to create predictable demand, reduce market uncertainty, and enable scaling.
3. **Direct Financial Support:** Reduce upfront costs and risks through different financial mechanisms.
4. **Price Support:** Provide predictable revenue or bridge cost gaps between new and incumbent solutions.

The MFI Toolkit: a four-phase approach was used to select priority innovation areas for MFI/enabling activity concept design

Phase 1:
- Prioritising sectoral "innovations" for MFI targeting
- Map demand drivers and barriers to innovation uptake
- Map relevant sector stakeholders
- Validate findings through sector-surveys and Working Group 1

Phase 2:
- Assess innovation/s suitability for MFI (Framing Questions)
- Map MFI types and suitability characteristics
- Map existing UK and global MFIs
- Shortlisting MFI options

Phase 3:
- Map prioritised MFI to innovation demand drivers and barriers
- Define required MFI and enabler activity to unlock barriers
- Identify stakeholder requirements for MFI activity

Phase 4:
- Establish the logic framework for MFI and enabler activity
- Deliver concept and mobilise

1. Innovation targeting and barrier mapping
2. Define MFI Types and Shortlist Options
3. MFI prioritisation against sector barriers
4. Designing MFI

Working Group 1 (WG1)
- Align on innovations for MFI targeting and design
- Prioritise demand-side barriers to address through MFI development

Working Group 2 (WG2)
- Confirm demand barriers and enablers for innovation/s
- Review and prioritise MFI options and enabler activity for concept development

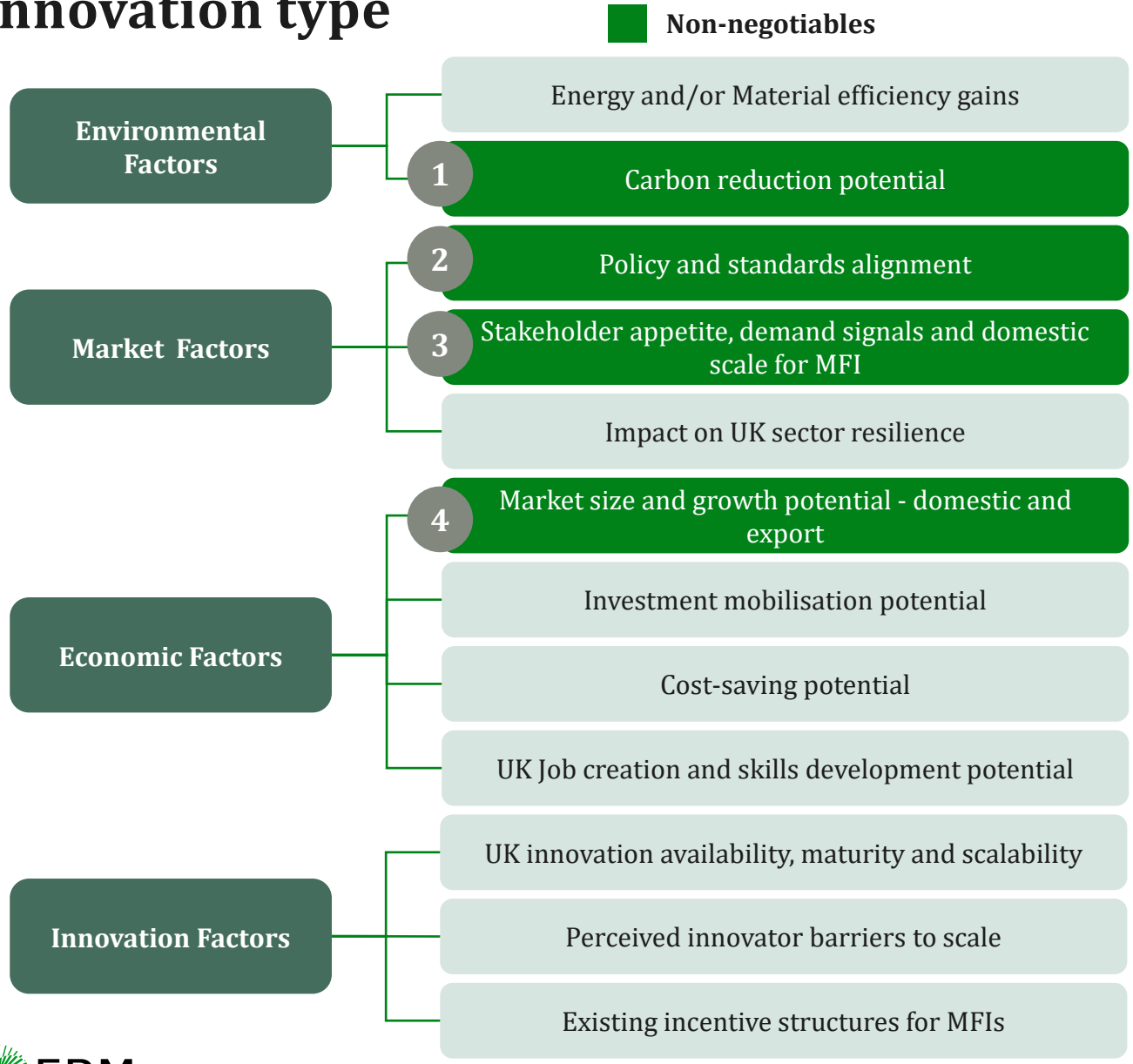
Working Group 3 (WG3)
- Align on MFI requirements
- Validate scope and structure of MFI/enabler activity
- Define stakeholder engagement requirements for activity

Working Groups: Cross Government-Industry workshop engagement to codevelop MFI/enabler activity.

Phase 1 (1/2): Innovation types were prioritised for MFI targeting using 12 evaluation criteria of a structured Prioritisation Framework

Environmental Factors	Energy and/or Material efficiency gains	MWh saved or efficiency gains per unit of output; tonnes of raw material avoided, recycled, or substituted
	Carbon reduction potential	Absolute $MtCO_2e$ reduction achievable within the subsector
Market Factors	Policy and standards alignment	Fit with current UK Industrial Strategy, Net Zero Strategy, sectoral roadmaps, codes and regulatory frameworks
	Stakeholder appetite, demand signals and domestic scale for MFI	Willingness of industry offtakers, financiers, policymakers and innovators to engage in collaborative MFIs
	Impact on UK sector resilience	To international supply-chains disruptions, price-shocks, energy costs etc.
Economic Factors	Market size and growth potential - domestic and export	Sector/subsector value, demand forecasts, and growth rate
	Investment mobilisation potential	Public and private capital attracted by subsector innovations
	Cost-saving potential	Estimated savings for firms and UK consumers through adoption
	UK Job creation and skills development potential	Direct and indirect employment supported
Innovation Factors	UK innovation availability, maturity and scalability	TRLs of available solutions, readiness for commercialisation, and scale-up potential, sufficient solutions to support MFI and market development).
	Perceived innovator barriers to scale	Strength and type of innovation barriers e.g. tech lock-in, infrastructure gaps, financing hurdles, market fragmentation, low offtake willingness
	Existing incentive structures for MFIs	Presence of subsidies, standards, CfDs, or other supportive measures that could complement MFIs

Phase 1 (2/2): This considered four key Non-Negotiables to select the targeted innovation type



Rationale for non-negotiables

1. The **carbon reduction** achievable through adoption of the innovation must be able to deliver substantive impact on carbon reporting metrics and enable offtakers to meet current or future reporting standards within the next 2–5 years.

2. The innovation area should be aligned with the **UK government Industrial Strategy, Sectoral Roadmaps and spending priorities**, for MFIs to be implementable within the next 2-5 years.

3. There is both a **strong local industry appetite** and an **urgent need for adoption** of the innovation area within the next 2–5 years, driven by supportive interventions, evolving policy mandates, competitive pressures, and market disruptions.

4. There should be a **sufficient domestic and export market size, or growth opportunity** to justify the establishment of an MFI.

Phase 2 (1/2): Framing Questions were then used to assess the suitability and nature of prioritised innovation types for MFI development

Framing Questions		
Type of innovation	Product or process? Does a definition of what "it" is exist, (preferably in the form of a standard with certification scheme)?	Prioritise innovations that have an agreed upon standard and associated certification scheme.
Maturity	If product, what Technology Readiness Level (TRL)? If process, how long in existence?	There are MFIs best suited for early-stage innovations (TRL 6 or below) and later stage (TRL 6 and above). Segment innovations into early or late stage.
Substitution/Disrupter	Is the innovation replacing something already there (i.e. "green" steel) or is it disrupter (brand new with no existing demand)?	Majority of govt. MFIs have been utilised to support replacement innovations. Prioritise replacement innovations.
User	Are users UK, international or both? Can you list specific companies who are users or who benefit directly?	Leverage existing user base for feedback via industry workshops.
Motivation & Need	Why are the users adopting this product/process? What need of theirs is it meeting?	Prioritise innovations that meet user motivations and needs. Understanding motivations of current users assists in understanding barriers to adoption of replacement innovations.
Existing policy/regulatory impact	Are there regulations and/or policies that support or detract from this product or process? Intentionally or unintentionally?	Understand the policy landscape to identify existing policies to leverage and ones that serve as disincentive.
Risk	How is the risk of the product/process covered, i.e. grants, subsidies, insurance?	Prioritise innovations where there are existing mechanisms to mitigate the adoption risk.

Phase 2 (2/2): MFI Types were defined and a shortlist of options developed

There are **13 MFI types** to stimulate the demand for ***substitution (replacement)*** and/or ***disruptive*** innovations**.** Key to identifying the most suitable MFI for a specific innovation is understanding the innovation's existing demand barriers. When potential MFIs have been linked to an innovation, one should consider:

- Are there any necessary enabling factors that will influence the potential success of the MFI?
- Do the demand barriers benefit from a govt. sponsored MFI or is the private sector capable of addressing these?

MFI Category	MFI Type	Description
Regulation and Lower Cost	1. Regulations and/or Policy requirements	Legal requirements compelling market behaviour
	2. Government (National/Local) Subsidies	Govt. monies to support R&D, production, and/or deployment that usually do not have to be repaid
	3. Government (National/Local) Tax Incentives	Tax credits or reliefs that lower cost
	4. Government (National/Local) Tax Disincentives	Taxes or levies on existing activity to shift market demand to alternative
Demand Aggregation	5. Buyers Clubs (Aggregated Demand)	Aggregation of buyers behind one contract to increase demand for product/service
	6. Public Procurement (Framework/Bulk Procurement)	Government's use of preferences and/or award weighting within its own procurements
	7. Double-sided Auction	Intermediary signs a long-term offtake agreement with supplier and resells, via auctions, to buyers with govt funds used to cover gap between supplier and buyer price.
	8. Offtake Agreements	Long-term contract guaranteeing purchase of supplier's future output
	9. Advanced Market Commitments	Specific type of offtake agreement for products in prototype/demo stage
Direct Financial Support	10. Blended Finance (Philanthropy/Public/Private Funding)	Combining concessional (public & philanthropy) funds with private funds to reduce risk
	11. Prizes/challenges (private or public sector to fund or procure new materials/products)	Public call for innovations to solve industry challenges, potentially combined with grant offer
	12. Support for solution Guarantees and Insurance	Instruments to mitigate performance or credit risk
Price Support	13. Contract for Difference (or other Price Support Mechanisms)	Guarantees price and revenue per unit by covering the difference between market and strike price (or within a range e.g. cap-and-floor)

Phase 3 (1/5): MFIs were prioritised based on their suitability to address sector-specific demand-side barriers to scaling innovations

There are innovation adoption barriers for demand, supply or both. This Toolkit is focussed on identifying demand-side barriers, including *enabling factors*, which are barriers that, if not addressed, greatly decrease the likelihood of an MFI's success. One of the most common enabling factor barriers is the lack of standards, since they are essential to defining what is being demanded.

Standards

- Lack of accepted standard differentiating the innovation from existing product/process. Includes standards covering production processes and safety considerations.

Value perception

- **Policies/Regulations**: lack of regulations or policy requirements for innovation
- **Price competitiveness:** innovation priced higher than existing product/process with no quantifiable alternative business benefit. Competition between existing recycled vs. potential repair/reuse/remanufacture financial gains.
- **Non-financial benefits:** lack of accepted mechanism to account for benefits (carbon reduction, book & claim).

Demand delivery ecosystem

- **Infrastructure (including technology and/or material dependencies):** lack of physical infrastructure to acquire, store, utilise and/or dispose of innovation (disposal particularly relevant when required). Inability to access technologies and/or material inputs needed for production/use/disposal of innovation.
- **Volume and timing:** inability to address risk associated with guaranteed volume and timing of delivery.

Disincentives

- **Policies/Regulations**: existing policies that hinder demand for steel reuse; frequently unintended.
- **Innovation cycle:** concerns about technology lock-in (e.g. methanol/ammonia for maritime shipping) and changes in recycling infrastructure investment (e.g. silicon-based or thin-film-based solar panels)

Phase 3 (2/5): An MFI Suitability Matrix was developed to identify under which circumstances the different types of MFI are best applied

MFI Category: Regulation and Lower Cost

Category	Market-Forming Intervention	Description	When most suitable	When less suitable
Regulation and Lower Cost	**Regulations and/or Policy Requirements**	Legal requirements compelling market behaviour	**Best once credible alternatives are available, but adoption needs rapid scaling.** Creates assured demand, levels the playing field, and drives widespread industry compliance.	Less suitable for early-stage technologies that cannot yet meet regulatory requirements, or for solutions still under R&D.
	Government (National/Local) Subsidies/Loans	Govt. monies to support R&D, production, and/or deployment that usually do not have to be repaid	**Best for early- to mid-stage technologies where cost is the dominant barrier**. Highly suitable when capital intensity is high, first-of-a-kind facilities are needed, or production costs are significantly above incumbent benchmarks. Effective at accelerating adoption and de-risking scale-up.	Less suitable for mature, commercially competitive solutions where costs are already comparable to incumbents, as subsidies may distort market pricing and reduce incentives for efficiency.
	Government (National/Local) Tax Incentives	Tax credits or reliefs that lower cost	**Most suitable when technologies are technically proven but not yet cost-competitive**. Works well where tax relief can close a moderate cost gap and stimulate adoption without requiring direct subsidies. Encourages corporate investment in low-carbon upgrades and innovation.	Less suitable for very early-stage prototypes lacking revenue or profitability, as tax incentives require a tax liability to benefit from.
	Government (National/Local) Tax Disincentives	Taxes or levies on existing activity to shift market demand to alternative	**Best for shifting demand away from incumbents once viable alternatives exist**. Suitable when behavioural change is needed across large markets and when cost penalties can make low-carbon options comparatively more attractive.	Less suitable when low-carbon alternatives are not commercially available, as disincentives could lead to unintended cost or supply issues without feasible substitutes.

Phase 3 (3/5): An MFI Suitability Matrix was developed to identify under which circumstances the different types of MFI are best applied

MFI Category: Demand Aggregation

Category	Market-Forming Intervention	Description	When most suitable	When less suitable
Demand Aggregation	**Buyers Clubs (Aggregated Demand)[1]**	Aggregation of buyers behind one contract to increase demand for product/service	**Best** where fragmented demand prevents suppliers from investing in new capacity. Creates a strong, credible, bankable demand signal needed to unlock financing and scale early-commercial low-carbon products.	Less suitable when demand is already sufficient, or the market is highly concentrated, as aggregation adds complexity without additional benefit.
	Public Procurement (Framework/Bulk Procurement	Governments use of preferences and/or award weighting within its own procurements	**Most effective** when early market demand is insufficient to justify investment. Suitable when public sector volume can anchor supply, build confidence for private buyers, and normalise emerging low-carbon solutions.	Less suitable for immature technologies not yet compliant with procurement requirements, or in markets where public demand is too small to influence private adoption.
	Double Auctions / Competitive Bidding Mechanisms	Intermediary signs a long-term offtake agreement with supplier and resells, via auctions, to buyers with govt funds used to cover gap between supplier and buyer price.	**Best for early-mid stage** technologies with variable availability and price premiums. Works when performance specifications are clear and price competition can drive down subsidy needs over time.	Less suitable for early-stage or prototype technologies lacking sufficient capacity or performance certainty to bid competitively.
	Purchase Agreements (PPAs / Offtake Agreements)	Long-term contract guaranteeing purchase of supplier's future output	**Best for mid-late stage technologies** where the main barrier is immediate availability and supply manufacturing investments. Provides supply side the bankability needed for financing production capabilities.	Less suitable for very early-stage prototypes or high-risk pilots, as buyers may not commit without performance or supply certainty.
	Advance Market Commitments (Prototype/Demo Stage)	Specific type of offtake agreement for products in prototype/demo stage	**Best for** prototype or demonstration technologies that need assurance of future demand. Reduces market uncertainty and incentivises developers to invest in commercial readiness and certification.	Less suitable for mature technologies already commercially proven, as AMCs provide limited additional value.

[1] See an overview of buyers clubs from Mission Possible Partnership - Link

Phase 3 (4/5): An MFI Suitability Matrix was developed to identify under which circumstances the different types of MFI are best applied

MFI Category: Financial Support

Category	Market-Forming Intervention	Description	When most suitable	When less suitable
Direct Financial Support	**Blended Finance (Philanthropy/Public/ Private Funding)[1]**	Combining concessional (public & philanthropy) funds with private funds to reduce risk	**Optimal for high-risk, capital-intensive, or first-commercial deployments**. Suitable when private finance is reluctant due to technology, commercial, or scale-up risk. Unlocks private investment and accelerates demonstration-to-commercial transition.	Less suitable for low-risk, mature projects that can be financed commercially, as blending may be unnecessary and administratively complex.
	Prizes/challenges (private or public sector to fund or procure new materials/products)	Public call for innovations to solve industry challenges, potentially combined with grant offer	**Best for early R&D or prototype phases where market pathways are unclear**. Stimulates high-risk, high-reward innovation and draws talent/ideas into new solution areas. Effective where conventional funding mechanisms are too risk-averse.	Less suitable for technologies that are commercially ready, as prizes do not provide sufficient scale or market demand.
	Support for solution Guarantees and Insurance	Instruments to mitigate performance or credit risk	**Best where the key barrier is investor or lender risk perception**, not technical viability. Supports capital access for new low-carbon production capacity and reduces the risk premium associated with unproven technologies or business models.	Less suitable for low-risk, mature technologies where traditional finance is sufficient; adds unnecessary cost and complexity.

[1] See for example, "Practical tools for Blended Finance Fund design" - Link

Phase 3 (5/5): An MFI Suitability Matrix was developed to identify under which circumstances the different types of MFI are best applied

MFI Category: Price Support

Category	Market-Forming Intervention	Description / Mechanism	When most suitable	When less suitable
Price Support	**Contract for Difference (or other Price Support Mechanisms)**[1]	Guarantees price and revenue per unit by covering the difference between market and strike price (or within a range e.g. cap-and-floor)	**Most effective where operating costs for products remain structurally higher than incumbents**. Provides predictable revenue streams that enable investment and accelerate commercial deployment.	Less suitable for low-cost mature solutions, as guaranteed price support may distort competition and reduce incentive for efficiency improvements.

[1] See an overview of energy CfDs- Link

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The operational model for the programme applies a Logic Framework approach to define inputs, activities, outputs and intermediate outcomes

The operational model has been developed by applying a Logic Framework, as shown on this slide.

The components of the Logic Framework are defined below.

INPUTS	ACTIVITIES	OUTPUTS	INTERMEDIATE OUTCOMES	OUTCOMES	IMPACT
The resources required for the activities	The actions taken to achieve the project aims	The tangible outputs from the activities	The aims for the activity while it is taking place	The overall aims of the project	The broader goals of the UK government

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Existing interventions which help support material and component reuse – Direct Support

MFI Category*	MFI Type*	Commentary
Regulation & Lower Cost	Govt. Federal/Local Subsidies	• Public funding for circular construction and material-reuse R&D via UKRI's £30m **National Interdisciplinary Circular Economy Research (NICER) programme** and related calls, incorporating five Circular Economy Research Centres (Textiles, Construction Materials, Metals, Technology Metals, and Chemicals) and the CE-Hub, as well as broader R&D funded projects (e.g. UKRI's REuse of Structural sTeel in cOnstRuction [RESTORE]) plus devolved pilots such as **Scotland's EU-backed Circular Construction Hub** and **West Midlands "Zero Waste Construction Hub"** business case.
MFI Enabler Activity	Directly undertaking or facilitating standard(s) development	• Standards and guidance create frameworks that normalise design for reuse and support comparable specifications. e.g. • **BS 8895** (designing for material efficiency and reuse in buildings), • **BS 8001** (circular economy framework guidance for business) • **PAS 2080:2023** (whole-life carbon in buildings and infrastructure) • **UKGBC** materials-passport guidance
Other		• Industry-led initiatives—such as the **ASBP's DISRUPT toolkit for reused steel**, and **digital reuse platforms like TRACE** (Transforming Resources and Advancing Circular Economy) and materials-passport solutions, directly aim to grow supply and demand for reused materials, even though they are mostly voluntary rather than regulatory. • Roll out of the **UK Govt Digital Waste Tracking System (DWTS)** by end 2026 will improve transparency and could support move to circular economy; however initial rollout is only for waste receiving sites (non-municipal) and sites producing waste will be onboarded later.

*See here for definitions of intervention types

Existing interventions which help support material and component reuse – Indirect Support [1/2]

MFI Category*	MFI Type*	Commentary
Demand Aggregation	Buyers Clubs	• Emerging coalitions (e.g. London Circular Construction Coalition, Engineers Reuse Collective) coordinate clients and professionals on reuse, but they are mainly **knowledge-sharing and policy-influencing rather than formal buyers' clubs** with binding offtake commitments. Local construction reuse hubs are also emerging some with local authority involvement. The ASPB lists **10 or so physical hubs in the UK and c.15 digital platforms** listing UK reused construction products (some relate to a physical hubs) e.g. FIS pilot project (in London) for reused luminaries and ceiling tiles, City of London Corporation's ROMULUS, brings stakeholders together to share building audit data and encourage circular economy etc.
	Public Procurement	• Government Buying Standards for construction and the Construction Playbook require or encourage sustainable materials, waste minimisation and whole-life carbon management; Scotland's sustainable procurement duty similarly embeds circularity, giving reuse a route into public projects but without explicit numeric reuse quotas.

*See here for definitions of intervention types

Existing interventions which help support material and component reuse – Indirect Support [2/2]

MFI Category*	MFI Type*	Commentary
Direct Financial Support	Blended Finance (philanthropy/ public/private funding)	• EU-funded **CirCoFin Circular Construction Hubs** (including Scotland's pilot) blend EU funds with targeted private investment (c. €80m across hubs) to scale second-hand markets for construction materials; West Midlands' Zero Waste Construction Hub explores similar investment cases, but these remain pilot-scale.
	Prizes/challenges (private or public sector to fund or procure new materials/ products)	• DESNZ / Innovate UK "**Contracts for Innovation: Resource Efficient Construction Impacts**" competition offers £3m in fully funded contracts to validate resource-efficient and circular solutions in construction, acting as a challenge prize and procurement tool rather than a reuse-only scheme.
	Support for solution guarantees and insurance	• **Lack of warranties and insurance** is widely cited as a major barrier to reuse, though some projects and manufacturers now extend standard warranties to refurbished façades, reused panels and flooring, and insurers offer cover for recycling/reuse businesses; there is no dedicated national guarantee scheme for reused building products.
Regulation & Lower Cost	Regulations (mandatory) incentivising material, technology or circular business model adoption	• **London Plan** policies require major developments to submit Circular Economy Statements and whole-life-carbon assessments, explicitly prioritising retention, refurbishment and material efficiency • **Devolved and local policies** and the waste hierarchy similarly push up-the-hierarchy options, indirectly driving reuse in projects that must comply.

*See here for definitions of intervention types

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Key barriers to demand for implementation of structural steel reuse in the UK include:

Type of Barrier	Barrier	Steel reuse
Standards	A lack of cohesive and broadly accepted (or applied) industry standards for incorporating reused steel into new builds	🟡
Standards	Lack of standardised testing protocols to certify safety and performance of reused materials and/or buildings	🔴
Value Perception	Uncertainty around liability and insurance coverage for reused steel	🔴
Value Perception	Higher upfront costs despite potential long-term savings; cheap virgin materials remain preferable	🔴
Value Perception	Absence of policy or planning requiring reporting and reduction of embodied carbon and/or reuse prioritisation.	🟡
Value Perception	Lack of awareness and/or poor perception of reuse equating to “less good”	🟡
Demand Delivery Ecosystem	Managing stockpiles and inventory for reused steel requires certainty about future availability: there is often a long delay between design spec and use of the steel	🔴
Demand Delivery Ecosystem	Limited marketplaces and fragmented supply chains, including storage facilities, restrict the availability of reused products when needed.	🔴
Demand Delivery Ecosystem	There is a lack of warranties available for remanufactured steels, limiting confidence in their use and leading to perceived risk of quality.	🔴
Demand Delivery Ecosystem	Integrating reused products into new or existing designs/structures can pose challenges in technical compatibility, e.g. dimensions or spec mismatch	🟡
Demand Delivery Ecosystem	Lack of standardization, uptake and/or interoperability between digital platforms (such as material audits and exchanges) limits visibility and quality of available reuse stock.	🟡
Demand Delivery Ecosystem	Insufficient depth in the market of trade operators providing reuse services results in higher costs for deconstruction, reconditioning, quality control, storage, and inventory management	🟡
Demand Delivery Ecosystem	No clear business norms and mechanisms for clarity on who can and how to capture and apportion the, including carbon benefits, and risk associated with reuse	🔴

Key: 🔴 High significance 🟡 Medium significance