

**‘Direction of Travel’
Interim research summary**

1. Introduction

The following interim research summary provides a ‘direction of travel’ in terms of research findings from a three-year programme of research into *Supporting innovation and best practice in the materials supply chain*. This is being conducted by researchers at the University of Hertfordshire Urbanism Unit (UHUU). The research is focusing on experience of these issues in the United Kingdom. It is overseen by an Industry Advisory Group which was established through the University of Hertfordshire-Tarmac Sustainable Living Partnership specifically to advise on this research. It is managed day-to-day by a smaller Management Group drawn from UHUU and Tarmac.

There are a number of primary data sources for this note. The main source is from semi-structured interviews with stakeholders in materials supply chains. These were undertaken as part of developing case studies focused on housing, major transport infrastructure, urban renewal activity and sports related developments. Interviews were conducted with materials specifiers including engineers, architects, urban designers, building designers, quantity surveyors and value engineers; decision makers from a range of managerial roles in the supply chain; clients from a range of different examples across sectors; and Tier 1 contractors (that is, the main contractors on a project). There is also some data reviewed from expert interviews, an online survey, and initial fieldwork piloting results.

This briefing note presents a short stand-alone summary of initial findings. It has been produced in the latter part of the main fieldwork stage of the research project. Primary data is still being collected and analysed, as the fieldwork stage is not yet complete, so this note should be read as an interim rather than final reporting of results to date. It prefigures the detailed analysis of findings and conclusions that will be developed and disseminated in the main reporting phase.

2. ‘Direction of travel’ research summary

The research into *Supporting innovation and best practice in the materials supply chain* has found a number of factors influencing decisions made in the materials supply chain from a sustainability perspective. In this section we provide a summary of these initial findings from the research.

Cost considerations. Cost was noted by all interviewees as a key influence on materials choices, with project viability sometimes seen as difficult to achieve while also meeting materials sustainability outcomes. The supply chain process of pushing costs down through ‘value engineering’, and speed construction up, has implications for materials choices.

Cost weighting. The relative weighting given to costs as against other considerations (such as robust, long life outcomes of development) varies between firms, and depending on the nature of the project being explored. Legacy and sustainability driven firms tend to take a long-term view in relation to sustainability decisions about materials.

'Entry' costs versus lifecycle costs. Supply chain decision makers report they sometimes struggle in trying to find the right balance between lifecycle focused approaches and lower prices in materials decision-making, given very strong cost reduction pressures.

Project timescale. Timescales can affect capacity to maintain high sustainability standards in materials decision-making. When preferred materials are not available or not available in the right amount in a timely way, this means substitutions are inevitable. Again, highly sustainability-focused and legacy-driven firms appear more able to maintain their sustainability materials decisions despite time pressures than do some other firms.

Context. As expected context factors are highly influential. These factors are various and include location (such as in a heritage zone), the type of project (such as refurbishment, new build, modular or onsite construction), or planning requirements. All have influences on material decision-making and choices. Legacy- and sustainability-driven business tend to make decisions which privilege material quality and robustness.

Aesthetics. The more design and/or legacy led businesses tend to see a close interplay between materials that are judged the most successful in aesthetic terms and those judged most sustainable overall. Design codes, pattern books, local materials that represent a vernacular relevant to the place are used to underpin sustainability decision making about materials.

Design and build. The process of procurement by 'design and build' can mean architects and designers have least control over materials choices of all the stakeholders within the supply chain. Cost reduction tends to be a main driver for these material choices.

Changing role of architects. In some cases architects' roles as material specifiers is changing towards more of a 'materials adviser' rather than specifier in the supply chain. This is being driven in part by the growth of offsite construction for some scheme.

Design quality. For some firms interviewed the design quality of the product is directly responsible for the specification of materials and is thus very important in determining their materials choices.

Environmental standards. A number of interviewees spoke about the importance of environmental standards in driving materials supply choices and how parts of the supply chain including materials specifiers can help drive change. Offsite construction could also have a positive role in this process by limiting waste and improving energy performance.

General versus bespoke approaches. Issues can arise in relation to choosing a particular material across a range of projects. 'The problem is that when you're designing at the early stages you need to develop a solution that is generic enough for a whole number of suppliers to be able to build it. But quite often they all have slightly different systems.'

Offsite construction. Offsite construction offers waste reduction, energy performance, and technological innovation benefits to the sustainability decision-making in the supply chain.

There is also evidence of inertia in the construction sector which needs to be overcome to yield the most sustainability benefits.

Custom and practice. Familiarity with existing, reliable materials and products does seem to influence some firms' choices: 'unless someone else is telling them the benefits of doing things a different way they will do them the same as before because they know the outcome and they are comfortable with it.'

Rigidities/resistance to change in the building sector. Among barriers to more sustainable materials decision-making, interviewees identified rigidities and inertia perceived in the existing supply chain, including in the design of manufactured building components and in embracing new technologies.

Evidence of benefit. Choices of materials can be influenced by product and material demonstrations, real-life case studies, and staff training and development involving attending seminars or workshops facilitated by manufacturers presenting their products. Conversely, lack of knowledge of evidence could undermine sustainable material choices.

Regulatory and planning environment. Regulation and planning has a clear impact upon purchasing decisions for some interviewees whereby clients have to modify materials proposed to suit planning regulations. Government should have a strong role through environmental legislation, which can be in a symbiotic relationship with increasing affordability, and together will help drive greater sustainability.

Building regulation versus planning policy. For some, building regulatory requirements are seen to be a more effective driver than planning policy in increasing the level of sustainability focused decision-making. Although planning requirements have tightened up and helped encourage better decision-making, the legal basis for building requirements offers less 'wiggle room' for lower standards.

Project management. Project and development managers who authorise project expenditure on materials and products, can thus be a decisive factor in final materials choices although this influence may vary in terms of the nature of the project (such as 'modular' or 'traditional' construction).

Global markets. A piloting finding was that the global nature of the construction industry supply chain has a bearing on materials choices. From interviews in the main fieldwork stage thus far this issue has not emerged but may still do so.

What constitutes sustainability in relation to materials. The concept of sustainability is deemed much more straightforward in theory than practice, with difficulties of determining exactly the level of sustainability of materials within the supply chain. This means potential for slippage between the intentions of certification schemes and the actual level of materials sustainability.

Knowledge and learning. A number of interviewees noted that the level of knowledge among clients varies greatly and is reflected in large variations in practice (although is not the only driver). An interviewee from a large engineering firm said that lack of knowledge about sustainable materials is a barrier to improved practice.

End users. Materials decision making within the supply chain(s) needs to be aware of the implications on end users, as found in previous research through the Sustainable Living Partnership (Parham, Jones and McCabe, 2015). Decision makers need to take into account social factors and implications for residents in terms of level of control over their living spaces.

Post occupancy evaluation. Sustainability decision-making would be improved by looking more longitudinally at the performance of schemes thought to exhibit good sustainability outcomes (and thus by implication good sustainability decision making in the materials supply chain).

Sector related drivers. Some interviewees perceived that clients are interested in incorporating sustainable materials in their schemes but for different reasons related to the nature of the sector (health, educational, office development etc) within which those decisions are being made.

Tools and measurement approaches. Sustainability measurement tools are considered useful to help decision makers define and measure the sustainability of materials. Some firms have developed their own bespoke tools and this is more likely to occur in larger firms with greater research capacity.

Briefs and tenders. Interviewees identified the importance of developing a sustainability focused brief and making the 'right' decisions as to contractors at the tendering stage of projects. This would underpin specific material decision-making and thus help meet intended sustainability outcomes.

Verification, codes and certification. Claims made by materials producers and suppliers about their products' sustainability can be very hard to verify independently. Additionally a lack of trust or less than complete trust in certification and verification schemes is evident. A 'specification gap' is noted between the most responsibly sourced materials and that which makes most sense in costs terms.

Refurbishment and retrofitting. Remaking existing buildings and areas was seen to have inherent sustainability claims and thus a strong role to play as part of approaches to sustainable development. Sustainability decision-making in supply chains should support this overall approach.

Infrastructure Carbon Review. There are differential levels of knowledge about the Infrastructure Carbon Review. Some firms have embraced it while others are following its requirements in principle even though they are less familiar with it in practice.

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