

Ensuring Supply Chain Capacity for Mass Timber Commercialisation

T Transforming
↑ Timber



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OVERVIEW

Current supply chain challenges for homegrown mass timber components used in the construction of the COP26 SNRG demonstrator project were recently investigated. Conducted in two parts, the studies aimed to demonstrate the feasibility of commercialised homegrown mass timber by reviewing the challenges that are expected to occur in the supply chain following the upscaling of production.

Part 1 laid out the methodology of supply chain mapping and benchmarking, provided initial findings on the components and locations of suppliers, undertook comparisons between industry standard timber kit and current homegrown mass cross-laminated timber (CLT), and outlined a set of key performance indicators (KPIs). Part 2 resulted in a supply chain map outlining links between component suppliers and the manufacturing facility, the benchmarking of supply chain metrics, location of activities, and the providers that could potentially undertake production of activities not locally based.

Further investigation of the supply chain was undertaken using mainly qualitative data which was collected through a visit to the Construction Scotland Innovation Centre manufacturing facility and desk research. Finally, a Supply Chain Workshop was organised to which all suppliers of the SNRG unit were invited, and interviews with two of the suppliers, BSW and EcoSystems, were arranged to explore in more detail their views on the feasibility of different scenarios for upscaling of production and their impacts on supply chains. This information is useful for mass timber manufacturers and suppliers, as well as for those involved in setting government policies that affect the construction market.

SUPPLY CHAIN MAPPING

Evaluating and designing a supply chain is an essential aspect of ensuring the success of launching a product to market such as the relatively new homegrown mass timber products. At the same time, construction supply chains are known for their fragmented state which leads to complexity in the management of sub-contractors and suppliers. To overcome these complexities and liberate the true economic potential of construction using homegrown timber, mapping is crucial to achieving a clear understanding of the supply chain. Supply chain mapping is a tool that can be used to gain visibility of all supply chain activities, from raw material sourcing to the end customer. It can identify not only their location, but also how much stock is kept in the system and at which points, and how this affects lead times. Ultimately, a supply chain map can result in a much better understanding of the costs (inventory, warehousing, transportation and distribution) that should constantly be kept under control by any business.

Research revealed that the supply chains of offsite timber manufacturers in Scotland were closely interconnected with the rest of the UK, mainland European countries such as Germany and Finland, as well as internationally with Canada. Figure 1 shows the supply chain map of the SNRG prototype, and the initial review of key components and organisations in the supply chain are outlined in the full report.

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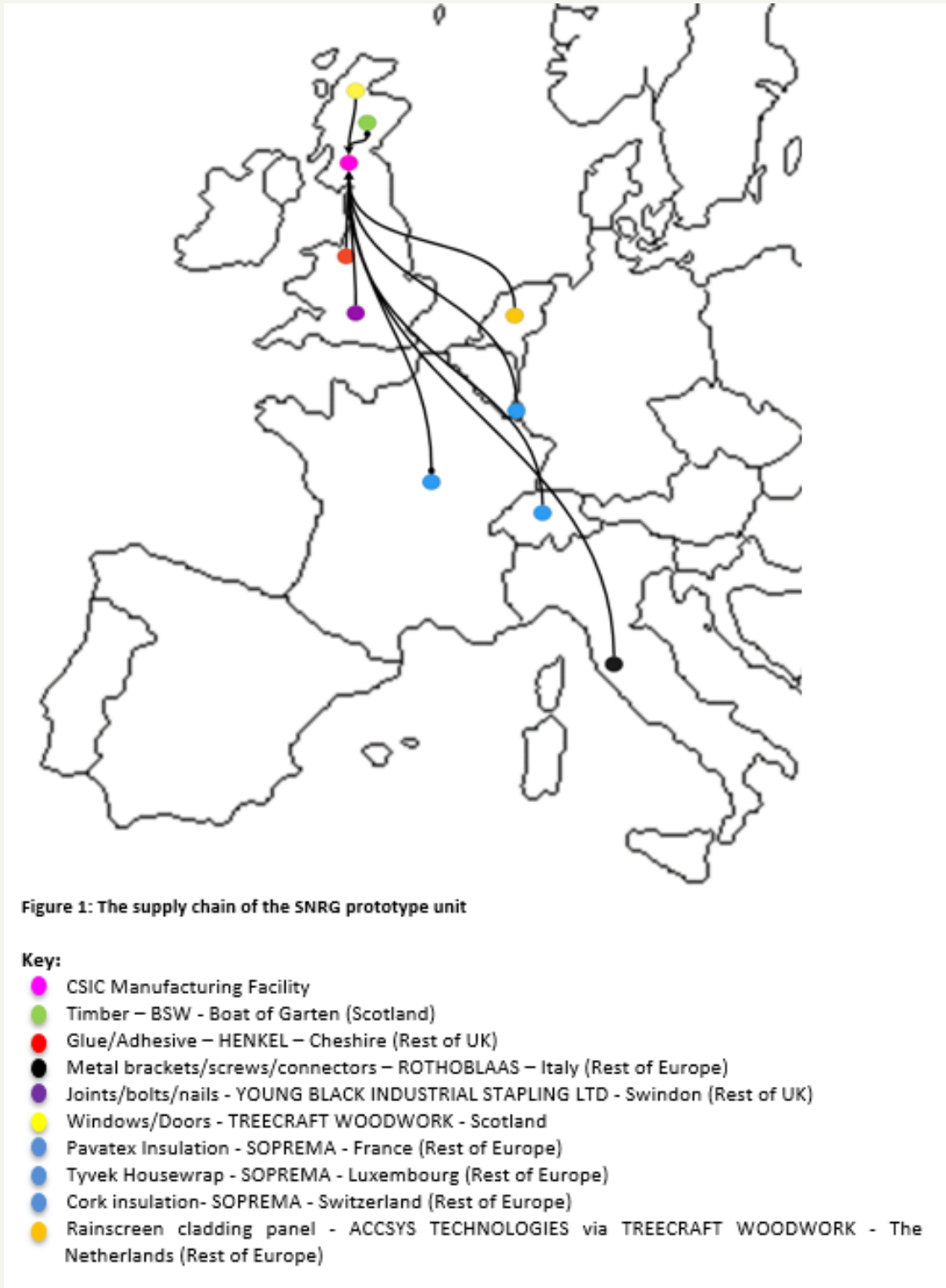


Figure 1 :The supply chain of the SNRG prototype unit

BENCHMARKING

Supply chain mapping is often followed by benchmarking, which shows areas for improvement against accepted KPIs. Benchmarking is largely concerned with process improvement and process control rather than the output itself and so provides insight into the entire process from input of raw materials to the distribution of the end product. In this case, an initial comparison using desk research between the industry standard timber kit and current homegrown mass CLT was undertaken. However, due to the difficulties in comparing the two products which are associated with two different construction methods, and the fact that they are in direct competition with each other, it was only possible to do some basic comparisons between homegrown timber kits and homegrown CLT.

The results of these comparisons can be found in the full reports, but some key areas of discussion are: relationships with suppliers, alleviation of risks, eliminating waste, supply chain sustainability, and homegrown timber's economic and environmental benefits.. Homegrown timber obviously uses more domestic suppliers that will benefit the local economy, but questions emerge in relation to volume, lead time, and sustainability benefits. Further data and KPIs will aid justification of the homegrown green and local credentials alongside key benefits and potential future challenges from a supply chain perspective.

POTENTIAL CHALLENGES TO UPSCALING PRODUCTION

In order to understand potential challenges that suppliers perceive in upscaling the production of the SNRG unit, a workshop was held to focus on bottlenecks and risks. Additionally, interviews with the prototype's supplier and manufacturer were conducted. Interviewees responded to questions about how they organise logistics operations such as transport and warehousing, what they see as non-value adding activities or bottlenecks in the supply chain, and which resources they utilise from other companies. Key themes that emerged were relationships, risks, investment, and collaboration.

These themes are connected to the general premise that suppliers don't like surprises. Early communication is essential so they can plan for what is needed in the future. It is essential that future developments are structured in advance and expectations are managed. Collaboration and planning are crucial to ensure upscaling without disruption.

When asked about future bottlenecks that might emerge in the case of demand for 10,000 units there was little concern from the suppliers. However, one key supplier of insulation is at capacity. Therefore, a substantial increase in demand that was unplanned could cause an issue. Other potential bottlenecks are related to skills rather than materials or components. What also needs to be considered is transportation and logistics. There are a limited number of vehicles that could cater for units being delivered downstream to the customer/site.

In terms of risks, some suppliers highlighted that producing in the UK would increase their costs and make them unviable for selling across Europe. Even with sufficient local demand it would not be financially feasible. Additionally, there were some concerns raised about the representativeness of the data in the current environment due to Covid 19 and other supply chain disruptions. This is particularly relevant for sourcing from China and other Asian countries.

Another challenge is to increase local capacity to service an upscaling of production. To make it attractive for international suppliers to shift from overseas production to local would require sufficient demand, which in turn would likely require a long-term government commitment. However, a step approach could be used to encourage investing in capacity building. Indeed, commitment could become a reality through Scottish and English government initiatives, such as policy on affordable homes or school production. Demand could also come from legislation that causes a shift from concrete to timber.

In other words, scaling up production is not limited by the availability of material. It's not ultimately limited by the access to labour and skills, although both of those things are challenges to overcome. It's mostly constrained by the forward visibility of continuity of demand and commitment to demand.

CONCLUSIONS

A systems-level approach is essential to envisioning future demand, product levels, and collaboration. This is because it is supply chains that compete, not individual organisations, and it takes a considerable amount of time to increase capacity. A government level commitment on housing and other buildings such as schools, medical facilities, and community centres would give confidence for supply chain partners to invest and recoup their cost over time.

Based on the pledges made by the Scottish Government in its “Housing to 2040” report, it is possible to use forecasting to establish potential scenarios for upscaling production. The suppliers had no concerns about meeting demand; rather, their concerns dealt with achieving market penetration against imported material and in managing production while still needing to deliver material for other projects using their products.

Although the SNRG unit currently is at prototype stage and commercial production has not yet begun, its supply chain is already substantially established. The scenarios given for the upscaling of production appear not to be a challenge for the main suppliers as demand will only be a small proportion of their current capacity and capabilities. There appears to be sufficient wood capacity for the moment, but as with all product developments, the supply chain needs to work together to ensure future demands can be fulfilled. Overall, the key message from analysis of all partners was that information sharing and collaboration is essential in order to prime the supply chain for future forecasted increases in demand and production.

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